THE POLITICAL-ECONOMIC DIMENSION OF TRANSFORMATIONS IN EU-RUSSIA GAS TRADE MECHANISMS

Luca Franza

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PREFACE

Natural gas plays an increasingly important role in the energy mix of many countries around the world. The recent expansion of natural gas consumption beyond the traditional gas markets in North America, Europe and OECD Asia has also been facilitated by the growth of Liquified Natural Gas (LNG) supply in recent years. OECD Asia was already familiar with LNG, but the markets in North America and Europe were predominantly supplied by pipeline and expanded their LNG infrastructure more recently. In North America this development was largely due to the development of shale gas, and the willingness to export some of the gas to international markets, while in Europe the expansion was due to the wider availability of LNG in world markets and the ambition to diversify. Also, emerging market economies are increasingly expanding gas demand due to competitive pricing and the ability to improve urban air quality when replacing coal-fired power plants with gas-fired power plants. In many emerging market economies, particular in Asia, natural gas is part of climate change strategies and also in North America the recent market driven switch from coal to natural gas has reduced CO_2 emissions substantially.

In Europe the future role of natural gas has become problematic with regard to climate change policies and geopolitical tensions over gas supply. In the past decades, the completion of the EU internal market was realized and led to a fundamental change in the relations with external gas suppliers. With EU production in decline, relations with external suppliers became more important, particularly with the pipeline suppliers. Despite the growth of LNG supplies in the world, pipeline supplies from Norway, Algeria and Russia represent the bulk of supplies in the EU. LNG supplies to the EU have also gained importance but remain dependent on price formation in world markets. In recent years, the EU has become the market of last resort for LNG.

The gas relation of the EU and Russia is exemplary for the profound changes that all countries on this continent have experienced since the 1990s. In this book, written as a PhD thesis at the University of Groningen, the changing relationship between the EU and Russia due to the creation of the EU internal market is placed center stage by Luca Franza. This book fits in the long tradition at CIEP to research international gas market developments and energy relations and is very relevant to understand what possible developments could unfold in EU-Russia gas relations and the important political and economic implications of changed trade mechanisms.

The Hague, October 2020,

Coby van der Linde
Director Clingendael International Energy Programme (CIEP)

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On a personal level, I also want to warmly thank my Italian friends – in particular Alberto, Alessandra, Alessandro, Gaia, Marco, Mariagiulia, Nora, Pietro, Sofia and Valeria – who have helped me to miss home a little less while I was in The Netherlands.

Last but not least, I am deeply grateful to my parents and to Joran for their unconditional love and amazing support. Without them, I would not have made it. Their kindness and warmth have given me the energy and motivation to work hard and pursue my goals.

SUMMARY

This book studies the features and the political-economic implications of transformations in natural gas trade mechanisms between the EU and Russia, focussing on the shift from long-term, oil-indexed, point-to-point contractual schemes towards shorter term, destination-flexible gas trade with hub-based pricing. It combines International Political Economy (IPE), New Institutional Economics (NIE) and Transaction Cost Economics (TCE). TCE is a useful framework because it helps explaining the logic and rationale of long-term contracting, but Williamsonian literature mostly looks at contracts as elements of private ordering. In order to study contracts at an additional level, that of interactions between the State and the firm, notions and findings by North and Spiller have been included. These authors studied the public dimension of contracts at the domestic level. In order to properly investigate the international dimension of contracts, IPE has been integrated with TCE/NIE. An additional advantage of IPE is that it considers economic and political variables as equally important and closely intertwined.

The origins of gas trade between Western Europe and the Soviet Union were rooted in a combination of co-constituted political and economic objectives (Chapter 5). The design of historical long-term contracts, highly relational in nature, responded to geopolitical, economic, and commercial objectives. They were designed to minimise and manage conflict, distribute trade gains and cross-border rents between Western Europe and the Soviet Union, and ensure the viability of capital-intensive, asset-specific investment allocated in conditions of bounded rationality and uncertainty – in line with the findings of TCE, particularly by Williamson (1975 and 1979) and Klein et al. (1978). Historical contracts were a cornerstone of Euro-Soviet gas relations, and constituted the 'institutional environment' (North, 1990) in which gas trade was conducted.

The EU's unilateral attempt to entrust market-based mechanisms with a more central role since the 1990s transformed the institutional environment of EU-Russia gas trade, with significant political-economic repercussions. The EU did not push for transformations in gas trade mechanisms with the primary objective of hurting Russia. Instead, EU gas market liberalisation was one occurrence of a paradigm shift (Goldthau, 2012) that went far beyond Russia and gas. Nonetheless, liberalisation had collateral geo-economic objectives vis-à-vis Russia (cf. Lisbon Strategy). EU gas market liberalisation has neither been completely value-free nor fully impartial. Instead, it had an inherent consumer bias (Goldthau and Sitter, 2018) and thus an inherent EU bias. The EU engaged in a neo-liberal policy transfer attempt by pressuring Russia to adopt the new pro-market paradigm, without listening to Russian grievances. More broadly, the EU also engaged in 'milieu shaping', an attempt to shape a benign international milieu to pursue its own economic and security interests (Hyde-Price, 2008), taking advantage of its leverage vis-à-vis a weakened Russia and exerting 'structural power' (Strange, 1987 and 1988). Governance structures mirror the interests of the group that has the power to alter the rules (Williamson, 1979) and are a key determinant of commodity prices (Mommer, 2000).

Market-based pricing was promoted in a historical phase where the EU was strong and Russia weak and it was clear that the transition to market-based pricing would entail a cross-border rent redistribution between the EU and Russia. EU governments could boost their citizens' welfare by means of lower end-user prices without foregoing rents obtained by means of taxation – targeting the producer's rents instead.

Liberalisation was a necessary but not sufficient condition to trigger transformations in EU-Russia gas trade mechanisms (Chapter 5). Both structural and conjunctural changes in gas markets put historical oil-indexed long-term contracts under pressure. Asset specificity of both the European and gas investment stocks diminished in the 1990s and 2000s (Neuhoff and Von Hirschhausen, 2006), lowering the efficiency gains brought by long-term contracts (Doane and Spulber, 1994). Lower capital intensiveness leads to lower risks and limits the 'hold-up' problem (Chyong, 2015). In addition to these structural changes, gas oversupply at the end of the 2000s created a situation whereby EU importers were committed to buy expensive gas from Gazprom but had to compete with cheap spot-priced gas in the end-user market. As a result, renegotiation and arbitration cases skyrocketed in number (Franza, 2014).

The observation that the success of gas market liberalisation endeavours depends on specific market fundamentals also entails that, should the underlying market circumstances change, setbacks could occur. In any case, in light of the structural changes described earlier, historical oil-indexed long-term contracts will most likely not make a comeback. However, there could be a return to more long-term contracting (albeit in different forms from the past), in line with Neuhoff's and Von Hirschhausen's (2005) finding that long-term contracts make cyclical comebacks (Chapter 3). Indeed Chapter 8 demonstrates that there has been an increase in contracting in 2018 when investment on new LNG capacity had to be allocated. Moreover, the pace of the transition towards market pricing could be slowed down or stopped in regions where it is not yet complete. This is the case of some Southern and Eastern Member States of the EU but also of non-OECD Asia, whose contracting behaviour will have a bearing on the availability of flexible supply for the EU market (Chapter 8 and below).

Chapter 6 contains a detailed analysis of contractual provisions, demonstrating that long-term gas import contracts in the EU – including contracts with Gazprom – have been deeply transformed. The first transformation has been a widespread introduction of hub indexation, initially through dynamic adaptation schemes, preferred by Gazprom. These included the introduction of price collars and partial hub indexation, one-off discounts, a relaxation of limitations to review pricing terms and a relaxation of take-or-pay thresholds. As the transition matured, the transformation became more structural – namely leading to the introduction of full, direct hub indexation. Chapter 6 also accounts for the temporal and geographical dimensions of the transition, which started in North-Western Europe and subsequently expanded towards Southern and Eastern Europe. The second trend has been a shortening of the average duration, although some long supply contracts have still been signed in the last decade. The third has been a diminution in the average Annual Contracted Quantity (ACQ) per contract over the last decade, reflecting fear of over-contracting owing to uncertain prospects for demand.

Even if LNG is still often sold in the EU under long-term oil-indexed contracts, its destination flexibility is an important novelty. The emergence of self-contracting and aggregators has introduced new business models in which LNG trade is effectively subject to some short-term dynamics even when there is a long-term contract in place. These novel business models mean that investments are less asset-specific, reducing the strategic need for long-term contracting. Long-term gas import contracts remain in place albeit transformed. In EU-Russia gas trade, long-term contractual coverage will remain extensive throughout the 2020s. New long-term contracts are being signed, both for piped gas and LNG supply. This is particularly the case when guarantees are needed for new capital-intensive projects, although some Final Investment Decisions (FIDs) are now being taken without long-term contract support, with an acceleration of this trend in 2019. Overall, long-term contracts have been weakened.

Transformations in EU-Russia gas trade mechanisms did not only unfold through changes to long-term contracts. Another aspect of these transformations is Gazprom's more visible presence on spot markets (Sharples and Henderson, 2019). Gazprom's involvement in spot trade has been growing, in a way that is still not possible to quantify precisely. The establishment of the Electronic Supply Platform (ESP) in 2018 and the fact that offtake from long-term contracts is now close to maximum contracted quantities suggest that Gazprom aims to further enhance its participation in spot trade to sell larger volumes of gas to the EU. The rationale for Gazprom's involvement in EU spot trade is multifaceted. In addition to using hubs for balancing purposes, Gazprom has stepped up its presence in order to gain experience in a form of trade that is expected to further grow in importance. Gazprom might also nurture an interest in influencing EU hub prices under certain circumstances (Mitrova and Boersma, 2018). While in the current market phase Gazprom is mostly a price-taker, its ability to influence hub prices could improve in future, in case of prolonged phases of market tightness. As a major gas supplier, Gazprom could also play with uncertainty in case it further adapts current business model (Boussena and Locatelli, 2017). At the moment, the prevalence of long-term contract coverage provides guarantees and price discovery, which make a pricing strategy based on uncertainty difficult to implement.

In the current market phase, Gazprom's ideal gas price in the EU is the maximum achievable without significant loss of market share to LNG. This optimal level is clearly influenced by a number of factors, including factors that are exogenous to EU-Russia trade, such as global demand for LNG and contracting behaviour in emerging markets. Gazprom has not engaged in a full-fledged price war so far, and lacks an interest in doing so in default of a downward spiral in prices and a serious threat of displacement. Gazprom takes into account the abovementioned optimal contract price when dynamically adapting contract prices to hub prices, as described in the section on renegotiations and arbitrations. Another important finding is that while the EU has strived to stimulate gas-to-gas competition and develop well-functioning hubs to get rid of oil indexation and pay lower import prices, hub prices are often still (indirectly) influenced by oil prices – depending on the market phase (Chapter 6).

In addition to describing the transformations undergone by EU-Russia gas trade mechanisms in the last decade, their political-economic impact has been assessed (Chapter 7). For this purpose, an observation of the evolution of EU gas price levels throughout the period in which the transformations in trade mechanisms unfolded has been conducted. The analysis has confirmed that transformations in EU-Russia gas trade did not completely eliminate the influence of oil prices, and has demonstrated that such transformations did not provide the EU with the Henry Hub price parity that some of the proponents of liberalisation had been striving for, and did not avert phases of high gas prices in the last decade. The analysis showed price fluctuations. The first time that gas prices declined significantly in the period considered, helping gas in its competition with coal, was when (all) commodity prices crashed in 2014. However, this analysis presented significant limitations, notably because it did not allow to insulate the pricing effect. For this reason, a more quantitative analysis has been conducted. Even with a quantitative analysis, establishing the exact impact of the adoption of hub indexation on price levels has proved impossible.

The quantitative analysis found that the adoption of hub indexation resulted in savings for the EU, and an order of magnitude of such savings has been indicated (between 3.03 and 6.87 billion euros per year on average between 2009 and 2018). The calculation rests on several assumptions and approximations, motivated also by the lack of precise figures on the price indexation of actual sales – this being an element covered by industrial secret. In order to translate these findings in political-economic terms, we have calculated the EU's energy import bill between 2010 and 2018. We have emphasised the finding that Russian gas, and gas in general, are not, by far, the main driver of the EU energy import bill. Russian gas imports accounted for 7.4% of the EU's energy import value on average between 2012-2018 (and total gas imports accounted for 18.3%). The focus of the EU's foreign energy policy discourse on Russian gas is thus not justified on political-economic grounds. Fluctuations in oil prices greatly affect the energy import bill and overall trade balance of the EU, overshadowing other commodity market developments, including effects of the transition to hub pricing in long-term gas import contracts. The savings realised thanks to gas contract renegotiations are certainly not irrelevant and can be regarded as a positive development for the EU. However, they have not greatly affected the EU's overall energy import bill (which ranged between 254 to 533 billion euros per year approximately between 2012 and 2018), let alone the overall trade balance of the EU.

Beyond immediate savings, transformations in EU-Russia gas trade mechanisms can also have negative repercussions on the EU both in terms of affordability and security of supply. The way in which gas relations between the EU and Russia have evolved in the last decade is a far cry from the original notion of planning a sector together that inspired the original gas-for-pipes deals. In the last decade, conflict, confrontation and mutual distrust have risen as a result of increasingly diverging views on how to organise gas trade. Arbitrations have proliferated. These are time-consuming, expensive processes, which can destabilise balance sheets and are counterproductive for investment planning. Besides being a sign of conflict, arbitrations also lead themselves to further uncertainty in the gas sector. Gazprom and its EU trade counterparts have become increasingly wary of each other's moves, and uncertain about future prospects for mutual trade. Unlike import bill savings, the long-term damage to the EU-Russia gas trade relation is impossible to translate into quantitative variables. The impact of the deterioration in the trade relation will be felt more acutely by the EU when today's buyers' market gives way to a sellers' market, potentially posing risks for the EU's security of supply.

A related theme is the possible long-term impact of transformations in EU-Russia gas trade mechanisms on investments. As was concluded in Chapter 6, long-term gas import contracts are still alive. This could explain why there are no clear indications of declining gas investments in Russia. However, long-term contracts have been weakened by the transformations described in this book, and it is possible that further adjustments will take place, particularly now that Gazprom is increasingly trading on the spot market. There is a risk that the current architecture discourages the signature of long-term contracts, with the risk that this will lead to underinvestment in future. One of TCE's central teachings is that long-term contracts are an important instrument to cope with uncertainty. Chapter 8 shows that uncertainty is mounting, particularly when it comes to projecting the EU's future gas import needs. Two reasons have been studied more in depth: the ambition of decarbonisation (and the major challenges it is faced with) and the EU's growing exposure to global gas dynamics, especially to gas demand and contracting behaviour in non-OECD Asia.

The rising importance of non-OECD Asia as an off-taker in global LNG markets makes the EU a market of last resort. While this is beneficial for the EU at times of oversupply, under-contracting might pose security of supply challenges in the longer term. There is significant uncertainty on the size of the import gap of non-OECD Asia that will have to be filled by flexible LNG. The size of non-OECD Asia's import gap will be decisive to determine how much flexible LNG will eventually flow to the EU. Relying solely on flexible LNG, particularly in a tight market, could pose significant security of supply risks. To be sure, the presence of fast-growing demand centres in non-OECD Asia is positive for the EU in that it provides support for new investment in LNG which, if the EU were the sole potential off-taker, would probably never take place. However, non-OECD Asian buyers might decide to lock large volumes in long-term contracts in future, potentially threatening the EU's ambition to rely on free-flowing LNG for its security of supply. By understating its future energy import needs and discouraging the signature of new long-term contracts, the EU is pursuing a risky security of supply strategy (or not pursuing a strategy at all).

Finally, the impact of recent transformations in EU-Russia gas trade mechanisms on Gazprom has been analysed (Chapter 9). Low EU prices have undoubtedly hurt Gazprom's revenues. Clearly, the ideal conjuncture for Gazprom would be a combination of large sales volumes and high prices. This can materialise when gas-to-gas competition is limited and/or import demand is very high. In practice, Gazprom has been presented with a trade-off between volumes and price in the last decade. Its strategy has gradually shifted from value to volume protection. The transformations described here have occurred in a difficult phase for Gazprom, marked by increased domestic competition from independent gas producers, lower sales to Former Soviet Union countries and a rise in taxation levels imposed by the Russian government. Gazprom has become even more dependent on revenues from sales to the Far Abroad in the period under observation. This goes in the opposite direction of long-standing Russian government proposals to increase profitability of the domestic market, diversify sources of gas revenues and reduce dependency on the EU gas market.

Gazprom still has relatively healthy balance sheets and a low level of indebtment. However, its market valuation is low relative to the industry's average and some financial indicators have worsened. As a result, Gazprom has come under increased scrutiny in Russia, where many competing players would like to see a lifting of its pipeline export monopoly. Gazprom has been accused of pursuing 'value-destroying' projects to enrich contractors (Fak and Kotelnikova, 2018). The Russian government has been intensifying its efforts to extract additional rents from Gazprom through export duties and especially royalties (Yermakov and Kirova, 2017). At the same time, Gazprom has embarked on highly capital-intensive pipeline projects such as Nord Stream 2, Turk Stream and Power of Siberia. While there is commercial rationale behind these projects (besides a geopolitical one) there is significant uncertainty about the future utilisation of these pipelines. The issues listed so far compound concerns about the company's long-term financial sustainability. As long as it was widely believed that Gazprom could increase its shipments to the EU at a 'push of a button', the perceived urgency for investments on new production capacity on behalf of Gazprom was low. This perception has changed since 2018, when a report revealed that Russian spare production capacity had diminished (Yermakov, 2018). Production decline in mature fields continues. Gazprom's production is drifting further north and drilling has to take place at increasingly higher depths.

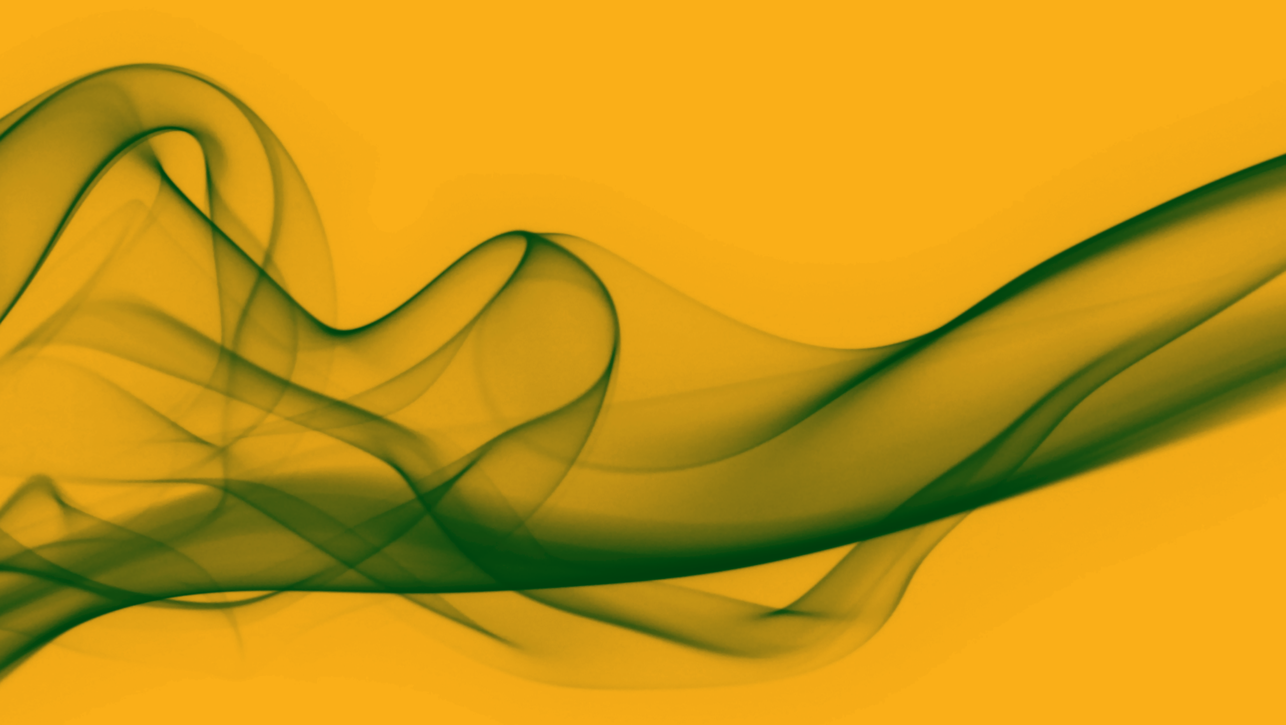
The second part of Chapter 9 has reflected on the evolving importance of Gazprom's gas sales revenues in the EU for Russia from a political-economic perspective. The combination of Russia's economic growth in the 2000s and a resurgence of geopolitical divergences reinforced the rhetoric that oil and gas were strengthening an increasingly adversarial Russia vis-à-vis the West. It has been observed that, from a geo-economic perspective, it would mostly be oil (if anything) that strengthened Russia relative to the West in the 2000s. The fact that transformations in EU-Russia gas trade dented Gazprom's sales revenues in the EU between 2009 and 2018 was not a key development for redressing Russia's increased defiance of the West. From a macro-economic and fiscal perspective Gazprom's revenues in the EU are certainly not negligible. It has been estimated that the value of Gazprom's gas exports to the EU was just short of 8% of Russia's total export value in 2018. Gazprom's net sales revenues in the Far Abroad amounted to 2.8% of Russia's nominal GDP in 2018. Within the period analysed (2008-2018), they oscillated between 2.2% and 3.1% of nominal GDP. The Russian government regards gas as an important source of revenues, and it also scrutinises Gazprom's management based on its ability to deliver revenues to State coffers. Taxes on gas production and exports generated 7.5% of federal budget revenues in 2018. With a 68% share in Russian gas production, a monopoly on pipeline exports (which represent 90% of Russia's total gas exports), and a share of approximately 60% of Russian LNG exports in 2018, Gazprom remains by far the largest upstream player as well as exporter of Russian gas and provides the bulk of gas tax revenues to the federal budget.

Finally, prospects for gas market liberalisation in Russia have been studied. The notion that the liberalisation of EU gas markets and aspects of EU-Russia gas trade would trigger Russian gas market liberalisation neglects the presence of logics of appropriateness, institutional complementarities and path dependencies. By presenting the notion of 'logic of appropriateness' (March and Olsen, 2009), it has been argued that institutions are only effective when there is a sufficient degree of acceptance of norms – in other words, when norms are 'internalized' by agents. Russia did not have time to internalize neo-liberal norms that are still perceived as being imposed from the West. Chapter 9 unveils some of the complexities of reforming the Russian gas market. Given the intricate *quid pro quo* that takes place between the Russian government, Gazprom, and independent gas producers, it is difficult to deeply transform some aspects of gas market organisation while leaving other areas unreformed. This resonates in the concept of 'institutional complementarity' introduced in Chapter 3. Notably, Aoki (2001) exposed the existence of dynamics of interdependence whereby institutions tend to hang together in systems, making it difficult to change one institution without changing other institutions at the same time. Some of Russia's institutional features limit the room for manoeuvre of proposed reforms. Applying a framework of 'institutional complementarity', we have supported Locatelli's (2013) argument that Russian gas reforms mimicking unbundling and a complete break-up of vertical integration as implemented in the EU have never been credible because of their incompatibility with Russia's institutional environment.

Calls for lifting Gazprom's pipeline export monopoly neglect that complementary measures would be necessary. This is due to a complex entanglement of benefits and duties in Russia, where Gazprom needs to perform significant socio-economic functions. Gazprom has a cumbersome legacy of commitments, towards EU importers, the Russian State, and, ultimately, the Russian population. These commitments limit its room for manoeuvre. As argued by Argyres and Libeskind (1998), the characteristics of isolated transactions can be insufficient to explain the boundaries of a firm. The governance of existing transactions, but also of new transactions in which firms seek to engage, is profoundly influenced by the governance of other transactions in which the firm is already engaged. This is referred to as 'governance inseparability of transactions'. The conclusion is that there are limited prospects for an overarching liberalisation of the Russian gas sector.

CHAPTER 1

INTRODUCTION AND FORMULATION OF RESEARCH QUESTIONS



CHAPTER 1 – INTRODUCTION AND FORMULATION OF RESEARCH QUESTIONS

1.1 DEFINITION OF THE THEME AND FORMULATION OF THE RESEARCH QUESTIONS

The subject of analysis of this work are the recent transformations in natural gas trade mechanisms between the European Union (EU)[1] and Russia. The aim is to assess both the features and implications of these transformations. The focus is particularly on the shift from long-term, oil-indexed, point-to-point contractual schemes towards shorter term, destination-flexible[2] gas trade with prices set by supply and demand. Some of the most important tangible manifestations of this shift – which will hereinafter be often referred to as 'the transition' for the sake of brevity – are the renegotiations and arbitrations of long-term supply contracts between EU companies and Gazprom that have taken place at an intensified pace since the end of the 2000s[3], the growth in EU hub trade activities by Gazprom and its subsidiaries[4], the launch of the Saint Petersburg Mercantile Exchange (SPIMEX)[5] and Electronic Sales Platform (ESP), and Gazprom's commitments pursuant to the European Directorate-General for Competition's Statement of Objections in 2017[6] (Chapters 5 and 6).

Our choice to focus on contracts is rooted in the observation of their central role in EU-Russia gas relations. As observed by Gustafson (2020), "the significance of the contract as the foundation of the gas business cannot be overestimated. […] Long before the European gas industry was interconnected physically by pipelines, it was interconnected by the common intellectual structure of contracts, enabling very different players to manage risks and reach agreements".[7]

1 The term 'European Union' (EU) will be used in this book when specific reference is made to the grouping of Member States composing the EU. The United Kingdom (UK) left the EU shortly before the conclusion of this book. Unless otherwise specified, the UK is treated as part of the EU in this book, particularly because all the figures relative to the EU prior to 2020, on which our analysis is based, reflect the UK's membership in the EU. The term 'Europe' is used when a more generic reference is made to the broader geographical region or when a clearcut division or allusion to a specific grouping is avoided on purpose – for instance when describing trends that generally affect the entire region rather than EU Member States specifically. In order to avoid confusion, given the subject of this book, Russia is always excluded from our use of the term 'Europe', even if the country is partly located in Europe and even if it can be regarded as culturally European. Turkey is also excluded, except in cases in which external data and figures are presented, where Turkey might be part of the grouping 'Europe'.

2 In this context, destination-flexible gas trade refers to the fact that, in the new EU gas market architecture, gas tends to flow more freely across countries than in the past, rather than being subject to strict point-to-point structures. The same holds true for LNG in the global gas market.

3 For an account of renegotiations and arbirations, see D. Schwartz, *The Energy Regulation and Markets Review* (London, 2015): The Law Reviews, Law Business Research.

4 J. Henderson, *Gazprom – Is 2016 the Year for a Change of Pricing Strategy in Europe?* (Oxford, 2016): Oxford Institute For Energy Studies (OIES).

5 J. Henderson et al, *The SPIMEX Gas Exchange: Russian Gas Trading Possibilities* (Oxford, 2018): OIES.

6 Proposals for Commitments, COMP/39.816 – Gazprom, Commitments under Article 9 of Council Regulation N1/2003.

7 T. Gustafson, *The Bridge: Natural Gas in a Redivided Europe* (Cambridge-MA, 2020): Harvard University Press, page 27.

The overarching research question is to establish whether the transition has political-economic dimensions, in addition to contractual and commercial implications for EU importing companies and Gazprom. By 'dimensions' we refer to both cause and effect. On the one hand, it will be studied whether the transition towards more market-based trade mechanisms, initiated by the EU, was at least in part politically motivated. On the other hand, there will be an attempt to establish whether this transition has the potential to generate political-economic repercussions on the EU, Russia, and EU-Russia relations. One element of this overarching research question that needs to be investigated is whether transformations are still unfolding or a new, stable *status quo* in EU-Russia gas trade relations has been reached.

Let us go back to the underlying reasons for formulating the overarching research question in these terms.

Our conjecture that it is necessary to investigate whether the transition is still in flux or it has led to a new stable *status quo* or equilibrium resonates in Gustafson's statement that "the revolution in the European gas market rolls on, and Gazprom's hybrid solution, which amounts to temporizing under pressure, is unlikely to survive."[8] In our opinion, the main elements that cast doubts about the permanent nature of the current EU-Russia gas trade architecture are: 1.) the fact that the new regime has so far proved satisfactory for the EU in conditions of abundant supply and/or relatively weak demand, while it has not been tested in conditions of market tightness – raising doubts as to whether adaptations will be required once LNG markets tighten[9]; 2.) the observation that neither Europe nor Russia are monolithic blocks: different perceptions and interests coexist on both sides and are expressed by stakeholders whose relative power changes over time[10]; 3.) the observation of cases of backtracking on liberalization processes in the past[11]; 4.) the different degrees of gas-to-gas competition and hub maturity across Europe – pointing to the fact that a number of important adjustments still need to take place in regions where the gas market liberalisation process is less advanced[12]; 5.) Gazprom's dissatisfaction with the new regime and its insistence on the fact that the adoption of hub indexation is not always structural and/or that it is reversible[13]; 6.) the observation that Gazprom's position in the Russian domestic market and its posture in Europe are interlinked, leading to a debate on the future of Gazprom's monopoly on piped gas exports and further adjustments on one side or the other of the EU-Russia borders.[14]

8 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 315.

9 L. Franza, *Long-term Gas Import Contracts in Europe: The Evolution in Pricing Mechanisms* (The Hague, 2014): Clingendael International Energy Programme (CIEP).

10 E. Shadrina, *Russia's Foreign Energy Policy: Norms, Ideas and Driving Dynamics* (Turku, 2010): Pan European Institute.

11 C. Robinson, *From Nationalisation to State Control: The Return of Centralised Energy Planning* (London, 2013): Institute of Economic Affairs.

12 P. Heather, *The Evolution of European Traded Gas Hubs* (Oxford, 2015): OIES.

13 S. Komlev, *LTCs: You Can't Have Your Cake and Eat it Too* (Berlin, 2017): presentation at the Long Term Gas Supply Contracts C5 Conference; see also S. Boussena et al, *Gazprom and The Complexity of the EU Gas Market: a Strategy to Define* (Grenoble, 2017): University of Grenoble.

14 J. Ćwiek-Karpowicz, 'Russia's Gas Sector: In Need of Liberalization in the Context of the Shale Gas Revolution and Energy Relations with the European Union', *Journal of East-West Business*, 18:1 (2012), 54-65.

The conjecture that the transition could be at least in part politically motivated stems from: 1.) the explicit reference by EU policy-makers to the fact that gas-to-gas competition is not only meant to deliver affordability but also security of supply, an objective that usually carries a political undertone[15]; 2.) Russian suspicions that the EU has been using gas market reform, of which the transition towards more market-based mechanisms is an important component, as a political instrument[16]; 3.) the observation that EU policy-makers, in part due to US pressures, might have a vested interest in deliberately eroding Russian gas revenues in order to disadvantage Russia geopolitically, in a context of deteriorating political relations; 4.) the notion that Western countries are engaged in neo-liberal policy transfers in a number of fields to advance their own interest.

Finally, our conjecture that the transition could have political-economic repercussions on the countries involved and their relations stems from: 1.) the observation – made in the public debate, but not yet grounded on systematic quantitative investigations covering a long period – that the move from oil indexation to hub indexation has entailed a drop in Gazprom's revenues[17], thus potentially impacting on the balance of power between the EU and Russia; 2.) the observation, further substantiated in Chapter 5, that the roots of the foregoing gas trade regime, dating back to the 1970s, were essentially political[18], and the deduction that its deep transformation thus necessarily also has some political repercussions[19]; 3.) the claim that trade interdependence – and the levels and the connotations of it – are a defining factor of political relations between countries[20]; 4.) the Western claim that a competitive trade model also brings

15 "The internal market in natural gas, which has been progressively implemented throughout the Community since 1999, aims to deliver real choice for all consumers of the European Union, be they citizens or businesses, new business opportunities and more cross-border trade, so as to achieve efficiency gains, competitive prices, and higher standards of service, and to contribute to security of supply and sustainability. […] Ownership unbundling, which implies the appointment of the network owner as the system operator and its independence from any supply and production interests, is clearly an effective and stable way to solve the inherent conflict of interests and to ensure security of supply". From the Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 Concerning Common Rules for the Internal Market in Natural Gas, paragraphs 1 and 8 of the preambles.

16 Gustafson (2020) shows how, in Russia, the spread of pro-market legislation is framed as a political threat posed by the EU to Russia: "in the Russian narrative, the source of conflict is the aggressive eastward spread of EU law and regulation motivated by anti-Russian hostility, in disregard of commercial precedent and economic rationality – especially in Brussels". From Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 4.

17 M. Seddon, 'Lower Gas Prices Hit Gazprom Profits', *The Financial Times*, 10 August 2016; Gustafson (2020): "the emphasis in European liberalization was very much on cutting gas and power costs to the final consumer. To anxious Russian ears this sounded very much like a plan to gang up on producers to force down supply prices". From Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, pages 297-298.

18 A. Vavilov, *Gazprom: an Energy Giant and its Challenges in Europe* (London, 2015): Palgrave Macmillan.

19 Already at the end of the 2000s, it was suggested that the liberalisation of the EU gas market was set to provoke political adjustments between the EU and Russia: "The liberalisation of the European gas market and, especially, the modification of long-term contracts, compels Gazprom to examine its export strategy to the EU, its main market. New political approaches are emerging in the fields of industry, trade, and coalition building; they have to form the future backbones of gas relations between the EU and Russia". Translated by the author from the Russian text: "Либерализация европейского газового рынка и, особенно, модификация долгосрочных контрактов, вынуждает Газпром пересмотреть свой стратегии эксспорта в ЕС, свой основной рынок. Новые политические подходы возникают в области промышленности, торговли, создания альянсов; им предстоит сформировать будущие схемы газових отношений между ЕС и Россией". From C. Locatelli, Газовая Либерализация в ЕС - Ключевой Фактор Стратегий Газпрома (Paris, 2008): IFRI/Центр Россия ННГ.

20 E. D. Mansfield et al, *Economic Interdependence and International Conflict: New Perspectives on an Enduring Debate* (Ann Arbor-MI, 2003): University of Michigan.

security of supply[21] and allegedly leads to the depoliticization of gas, which is set to benefit EU-Russia relations at large.[22]

It should be highlighted that these statements are only presented here as plausible *prima facie*. At this stage, they constitute conjectures that need to be verified. They serve the purpose of illustrating the process that led to the formulation of the overarching research question introduced earlier.

The next sections of Chapter 1 and Chapters 2, 3, and 4 identify the theories and methodologies that are most suitable for tackling the overarching research question and place the subject of analysis in the framework of the academic discussion.

Energy analysis can be approached from various standpoints. In the second section of **Chapter 1**, we will ascertain if social science has a role to fulfil in energy analysis. In this regard, it is necessary to provide an overview of energy literature and examine to what extent social sciences have been applied to energy in the past, and whether the field is saturated or there is room for additional research. Subsequently, we will consider what branches of social science could be regarded as suitable to advance knowledge in the specific topic under discussion.

The topic is complex and multifaceted, as it unfolds at various levels. For this reason, an approach that combines various disciplines is best suited to study it. At one level, contracts can be analysed as arrangements between firms to organise certain transactions. At the same time, however, the firms exchanging gas between the EU and Russia were originally State-owned (some of them still are) and, regardless of ownership, State involvement remained important by virtue of the strategic social, political and macro-economic value of the commodity. It is thus necessary to delve into complex interactions between States and firms. Furthermore, the international dimension of EU-Russia gas trade needs to be accounted for. In sum, we need a versatile analytical toolkit that allows us to study complex interactions between States and firms, and thus complex entanglements between commercial and political-economic phenomena, in a deeply changing international setting where individual EU countries, the EU, Russia and the gas industry all operate.

There is a trade-off between synthetic, rigorous and coherent theories and more eclectic approaches that tend to be more informative, agile and to-the-point in analysing a single issue but run into risks of excessive descriptivism. An attempt needs to be made to allow for an eclectic approach that retains theoretical rigour and internal consistency. The merits of applying a combination of notions of politics and economics to energy, and to EU-Russia gas relations more specifically, are assessed in the next sections of Chapter 1. As said, the overarching aim of this work is to establish whether the transition towards more market-based EU-Russia gas trade mechanisms has political-economic dimensions.

21 *European Gas Market Model Review and Update* (Ljubljana, 2015): Agency for the Cooperation of Energy Regulators (ACER).

22 D. Bochkarev, 'Gazprom Plays Ball: the Depoliticization of the European Gas Market', *The Energy Post*, 25 January 2017.

Endeavours to combine politics and economics as explanatory variables of phenomena are by no means new in academic research. The discipline of International Political Economy (IPE) notably embodies such endeavours. **Chapter 2** contains a literature review of IPE frameworks in energy, giving an account of both the state of affairs in IPE and proposed ways forward. We will conclude by looking into possible applications of IPE to the analysis of the features and implications of the evolution in gas trade mechanisms between the EU and Russia. IPE allows to explain and understand the international dimension of EU-Russia gas trade: on the one hand the interaction between States, the EU, and the gas industry and on the other hand the political-economic consequences of the transformations analysed. IPE represents an evolution from International Relations (IR) interpretations (Chapter 4) that would follow a strict logic of Realism (whereby Russia is seen as using gas as a weapon, and the EU is seen as using liberalisation as a weapon) but also from those that would follow a strict logic of Liberalism (which would describe interdependence as frictionless and gas market liberalisation as a politically neutral win-win). Relative to IR approaches, IPE gives a prominent place to economic factors – instead of regarding them as subordinate to political ones.

Furthermore, notions of New Institutional Economics (NIE) will be introduced in **Chapter 3**. NIE shares several tenets with the broader discipline of IPE. In Chapter 3, we show that NIE postulates that the economy is far from being the market-driven, frictionless utopia envisioned by neoclassical economics, and that institutions play a crucial role in defining the conditions in which economic transactions take place. The need to depart from neoclassical economics is particularly strong in analysing natural gas and EU-Russia gas trade. We study long-term contracts as complex risk allocation schemes, representing an encompassing bargain between sellers and buyers rooted in the economic and political organisation of gas markets of that time. Long-term contracts cemented the consensus between importers and exporters and provided the backbone of EU gas security of supply for decades. They also set resilient and widely respected rules, including dispute settlement mechanisms. From this follows the conjecture that their transformation must have produced encompassing consequences on the EU-Russia gas relation. This conjecture is verified in Chapters 7-9. In Chapter 3, we start by reviewing the Williamsonian literature on contracts, focussing on notions that will subsequently (Chapter 5) be applied to the historical long-term contracts between the Soviet Union and Western Europe to understand why they were designed in a certain way, and what function they played from a Transaction Cost Economics (TCE) perspective. We also introduce contract literature subsequent to Williamson, and use it (Chapter 5) to explain why long-term contracts came under pressure in the 1990s and why they changed in a certain way (for example, why contract duration diminished). We also present notions from the incomplete contract literature which, again in Chapter 5, will be applied to understand the contractual renegotiations between the 2000s and 2010s. Finally, we broaden the Williamsonian focus on contracts as 'private ordering' mechanisms by looking at other NIE concepts and authors, which devote more attention to the interaction between contracting behaviour and the regulatory and political environment, as well as to the interaction between States and firms.

Chapter 4 looks at how EU-Russia gas trade relations have been framed in the West, by both scholars and policy-makers. The competing logics of Realism and Liberalism (as framed in an IR context) are analysed. Some of the limitations of the application of blunt Realist and Liberal IR logics are shown. While a blunt Western Realist discourse would only focus on gas as a political weapon, and generally look at Russia as a hostile actor and at trade as a mere zero-sum game, blunt Liberalist discourses would only focus on optimistic win-win aspects of EU-Russia gas trade, depict the EU as a benevolent actor that simply wants to frame neutral, pro-market rules of the game, and downplay political motives behind liberalisation. Both fail to capture the complexity of the topic. This does not imply any judgment on IR's applicability to the topic under discussion. In fact, Chapter 4 does not have the ambition to provide a literature review of IR approaches to the theme, but rather to present the current dominant competing logics in the Western framing of EU-Russia gas trade relations. As mentioned, IPE marks in a way a departure from these competing logics and offers better analytical potential for this topic.

Conversely, Chapters 5 to 9 are devoted to empirical analysis. **Chapter 5** starts by providing an analysis of the origins and foundational features of historical long-term supply contracts between EU companies and Gazprom. By using notions from IPE and NIE, it shows how those contracts were carefully-crafted governance structures with a marked relational nature, reflecting not only the commercial, but also the geopolitical and political-economic objectives in which they were rooted. Such objectives are also briefly presented and discussed. The Chapter provides a fairly detailed account of the various provisions crafted to allocate long-term commercial risk between contracting parties, with particular emphasis on oil-indexed pricing mechanisms as a backbone. This Chapter then provides a historical account of how the EU unilaterally attempted to 'depoliticise' gas trade with Russia by gradually entrusting the market with a more central role in the 1990s. The logic and rationale of long-term gas contracts from an NIE and IPE perspective changed in such phase. We show that, far from being a mere technocratic undertaking as it is sometimes suggested, liberalisation was in itself a highly 'political' process in line with the *zeitgeist* of that era, requiring the mobilisation of substantial political and economic capital. We will discuss why gas market liberalisation was not value-neutral and how it produced far-reaching consequences, including extraterritorial ones. From this perspective, we will discuss whether the promotion of market-based pricing mechanisms can be regarded as a case of attempted neoliberal policy transfer and whether inflicting geo-economic damage to Russia has been a prominent objective of EU gas market liberalisation. Finally, Chapter 5 discusses why, while liberalisation was a necessary condition for triggering deep transformations in EU-Russia gas trade, it cannot be considered a sufficient one. Notably, by making use of post-Williamsonian contract literature, Chapter 5 investigates in what way a deep change in gas market fundamentals accounts for liberalisation's different degrees of success in transforming EU-Russia gas trade between the decade 1998-2008 and the next. A theme that is not always receiving sufficient attention is that there is a strong relation between supply abundance and both the incentive to liberalise markets and the success of such endeavour.

Chapter 6 provides a detailed analysis of how long-term supply contracts between EU importing companies and Gazprom have changed in the last decade, i.e. in the period between 2009 and 2019. Once again, the logic and rationale of long-term contracting underwent a significant transformation (relative to the original logic and rationale in the 1970s, and the first change observed in the 1990s). In Chapter 6 we explain how such logic and rationale changed from an IPE and NIE perspective. Notions from incomplete contract literature are also tested, for example by showing: how exogenous changes shifted the bargaining power of the contracting parties, leading to renegotiations; that price levels were essentially the main item that parties were interested in; that trade-offs between changes to pricing mechanisms and other contractual terms took place; and that their built-in flexibility proved essential for the survival of long-term gas contracts. While the focus is on contracts with Gazprom, we also look at contracts with competing piped gas and LNG suppliers, as they are an integral part of the process of transformation analysed. This is done by making an inventory of renegotiations and arbitration cases, and by cross-checking information available on them. This is relatively scarce, given the confidentiality of long-term supply contracts. Besides, information on newly signed or renewed contracts is also analysed. First, Chapter 6 explains how, where and when hub indexation has been introduced in long-term supply contracts. In addition to pricing mechanisms, we also examine changes to other clauses and provisions, such as contracted volumes and flexibility, amongst others. This is to ensure that the transition towards more market-based trade mechanisms – and its implications – are fully understood: looking exclusively at pricing would only provide partial information on the new risk allocation between contracting parties. In light of these observations on pricing and other clauses, we assess whether the process of transformation has come to an end, or whether there are still pending imbalances that prevent a new equilibrium from being reached. In addition to transformations in long-term contracts, a way in which market-based trade mechanisms have gained in importance has been the increased resort to spot trade as a platform for exchange, alongside contracts. Chapter 6 thus also assesses the changing role of hubs in EU-Russia gas trade, as well as Gazprom's strategic positioning on gas hubs. The final part of the chapter is devoted to discussing the important issue of oil indexation's indirect influence on hub prices, to appreciate whether the level of oil prices might still influence prices in EU-Russia gas exchange, in spite of all the transformations analysed – aimed at marginalising oil as a price-setter.

Chapter 7 shifts the focus away from companies and contractual relations towards States and the political-economic impact of transformations in international gas trade mechanisms, thus shifting from NIE/TCE to IPE. The first section is a digression, which analyses the relation between pricing mechanisms and wholesale gas price levels in the US, a country that, in part, had served as a model for supporters of EU gas market liberalisation. This case study complements information on US gas market liberalisation provided in Chapter 5, and serves the purpose of showing that pricing mechanisms are only one of the many factors that influence price levels. It helps invalidating some simplifications that became part of the discourse in support of EU gas market liberalisation. Our observations on the US case study suggest that there is no sufficient ground to conclude that liberalisation leads to lower price levels always and everywhere, and that exposure to global market dynamics and LNG price fluctuations are a key factor to watch when considering wholesale gas price levels. The relevance of these observations for the EU become clear in Chapter 8. Chapter 7 then focusses on the EU, by examining how selected wholesale gas price levels evolved in the period comprised between January 2009 and May 2019. This selection allows to achieve a comprehensive and workable overview of Russian gas import price levels throughout the period under consideration, deliberately excluding poorly integrated markets. We then qualitatively analyse the drivers of spreads between TTF prices and other key EU markers. The purpose is to insulate the difference between hub prices and different average Russian gas import prices throughout the period, which is a first step in trying to establish who benefitted when from the adoption of hub indexation. Acknowledging the limitations of such approach, Chapter 7 then considers a theoretical indicator offered by Platts that shows how contract prices *would have evolved* if the original oil indexation had been preserved, with no renegotiations nor price/pricing concessions on the part of Gazprom. This theoretical indicator is then compared with hub and contract prices. The spread gives additional indications on the potential price effect of pricing transformations. In order to translate these findings into considerations on potential implications for the European gas import bill, we calculate monthly Russian gas import volumes and multiply them by the different wholesale unit prices presented so far. This operation provides with an approximation of gross potential savings in moving from oil indexation to hub indexation. A full, accurate quantification of the impact on the gas import bill is impossible, one of the reasons being that we cannot exactly say how much Russian gas would have been sold in the past had price conditions been different. However, it is possible to demonstrate that the transition to hub pricing is a development that has a clear political-economic significance. Also, an indication can be given on who – between the EU and Russia – profited from the introduction of hub indexation in long-term contracts.

Chapter 8 broadens the assessment, recognising that the findings of Chapter 7, albeit relevant, are only partial. The first reason is that Chapter 7 does not take into account the impact of the transformations in EU-Russia gas trade mechanisms on security of gas supply. The second reason is that, in Chapter 7, the assessment only refers to the period 2009-2019. Economic reforms sometimes lead to one distributional outcome in the short term and to a different one in the long term. Chapter 8 thus responds to the need of exploring the potential long-term ramifications of transformations in EU-Russia gas trade mechanisms, including the impact on the relational features of long-term contracts. Moreover, by negatively impacting on new investments, it cannot be excluded that the recent transformations might lead to higher prices in future, and/or leave EU importing companies more exposed to volatile prices and global competition for gas import procurement. While competition is not negative, a potential concern is that non-OECD Asia will be the main driver of gas markets in the next decades. The EU's ability to understand and forecast developments in that part of the world is limited. In addition to competition with non-OECD Asia, an important source of uncertainty in the EU gas market is decarbonisation. Recent geopolitical developments suggest that a return to mercantilist tendencies in gas trade should not be ruled out. The EU, having embraced a completely different approach to gas trade, might be less prepared to counteract such mercantilist tendencies than in the past. In Chapter 8, the role of long-term contracts as instruments to cope with instability and uncertainty is analysed. Since the liberalised gas-to-gas competition model has been in place – the EU has not experienced a combination of prolonged global market tightness and fast-rising internal consumption. It is possible that, under different gas market and geopolitical circumstances, the impact of transformations in EU-Russia gas trade mechanisms will be very different from what has been described in Chapter 8.

Finally, **Chapter 9** studies the political-economic impact of transformations in EU-Russia gas trade mechanisms on Russia – thus offering a specular analysis to that provided in Chapter 7. First of all, the Chapter looks at Gazprom's financial performance. In doing this, it first assesses how the relative weight of export revenues in the Far Abroad, Russia and the FSU Region has changed for Gazprom over time. Furthermore, it assesses Gazprom's long-term financial sustainability, in light of changes in the EU but also in view of high investment needs in both the upstream and the midstream. In the second part of Chapter 9, we attempt to draw conclusions about the relevance of variations in Gazprom's gas export revenues in the EU for Russia's export value at large, as well as for Russian GDP and federal budget – thus adopting a markedly political-economic perspective. In the final part of Chapter 9, we discuss whether liberalisation of EU gas markets and the introduction of hub indexation in long-term supply contracts has the potential to trigger Russian gas market liberalisation.

1.2 THE CASE FOR SOCIAL SCIENCES IN ENERGY

While the notion that energy has an impact on society is largely undisputed, the specular causal relationship (i.e. that societal processes influence energy markets) is less widely acknowledged as important. As a result, not all "hard scientists", such as engineers, mathematicians and econometricians, recognise an added value in social science as a method of enquiry in energy. This is mostly explained by their focus on measurable issues such as relative costs and the technological feasibility of certain energy options, as well as by their preference for quantitative methods of enquiry and mistrust in non-quantifiable explanatory variables.

Meta-literature exposes this cleavage. One of the most convinced advocates of the need to boost the standing of social science in energy is Benjamin Sovacool, editor-in-chief of a journal that is illustratively called 'Energy Research and Social Science'. As reported by Sovacool (2014), environmental scientist and psychologist Paul Stern, writing about energy use patterns in the 1980s, argued that "like Ptolemy", his contemporary energy researchers "seemed tempted to fiddle perpetually with their models and retain core theoretical assumptions based on economics and engineering in the face of newly emerging data".[23] He also denounced a problem with models, namely that they are often conformed *ex-post* to observational evidence – which could sometimes be a way to hide arbitrariness under a coating of scientific rigour.[24]

In our opinion, models are essential to process large datasets, unveil complex interactions that would otherwise be difficult to detect, and point to future scenarios that – albeit not exact forecasts – can at least be taken as a starting point for informed discussions. What we argue here is not that models are inadequate methods of investigation. What we argue is rather that, in order to be in touch with reality, models, regression and other quantitative methods

23 B. Sovacool, 'What Are We Doing Here? Analyzing Fifteen Years of Energy Scholarship and Proposing a Social Science Agenda', *Energy Research and Social Science*, 1 (2014), page 1.

24 P.C. Stern, 'Blind Spots in Policy Analysis: What Economics Doesn't Say About Energy Use', *Journal of Policy Analysis and Management*, 5:2 (1986), 200-227.

need to rest on an assessment of the wider economic, political and social context.[25] This does not only hold true for the interpretation of modelling results, but also for the initial steps of modelling such as the formulation of assumptions, the selection of variables and their relative weighing. One of the contributions of social sciences lies precisely in their ability to provide a critical assessment of the wider economic, political and social context – so they can be employed alongside modelling exercises.

An important function of social sciences in energy is to step in when models fail to provide insights on a certain issue. As Stern (1986) noted in the 1980s, energy models can be theoretically rigorous and appear to deliver solid and verifiable results from a mathematical point of view, while at the same time being limited in their potential to advance knowledge in a certain area and failing to grasp the root causes of certain events.[26] Based on these observations, Stern (1986)[27] and Lutzenhiser (1992)[28] urged the contemporary research community to incorporate methods borrowed from other areas of enquiry into energy analysis. Unfortunately, as observed by Sovacool (2014), most of the issues that Stern had noted remain unaddressed more than thirty years later.[29]

The inability of models or strictly qualitative approaches to capture all relevant aspects of an issue area also applies to the topic under discussion. For instance, the emergence of a traded hub is itself a process that cannot be fully explained mathematically. Issues such as trust in the benchmarking function of a hub price, 'band-wagoning' dynamics of trade parties on a certain pricing mechanism, market players' expectations, the presence of a trading mindset among industry executives and different degrees of cultural aversion to financial risk are all important factors, but impossible to translate into quantitative variables and quantifiable indicators. Also, a company's pricing strategy does not always respond to short-term profit maximization. Companies that trade on hubs are widely different from one another: while trading companies with little or no interest in the underlying asset prefer short-term value propositions, larger companies involved in the production, transportation and trade of gas tend to also have longer term strategic objectives. They might forego immediate value gains to cultivate relationships with their customers, sustain the reputation of their product, gain market share, drive out competitors, and so on. The case for using social sciences in energy analysis does not only rest on the shortcomings of models and strictly quantitative approaches.

25 For instance, a model built to understand prospects for coal decommissioning in a certain country would factor in variables such as CO2 prices, commodity prices, levelised cost of electricity for renewables, and proxies for climate targets and announced clean air regulations. However, it could not possibly capture less tangible factors such as the influence of coal lobbies, the sensitiveness of employment considerations and the government's strategic objective of avoiding geographic political-economic imbalances when faced with the decision to close coal mines. Similarly, based on figures on cost competitiveness, spare production capacity and transport capacity availability, a model could potentially forecast an exponential growth of Gazprom's market share in Europe. While theoretically possible, such scenario is unlikely to materialize owing to supply diversification objectives in importing countries, political hostility towards Russia in many EU countries and other strategic considerations. Although possible from an economic and technical point of view, it is extremely unlikely that Western European countries will accept that Gazprom's market share will grow above 50% as that would determine a situation of over-reliance and stifle gas-to-gas competition. These digressions serve the purpose to show that it is hard to incorporate certain political and security of supply variables in a model.

26 Stern, 'Blind Spots in Policy Analysis: What Economics Doesn't Say About Energy Use'.

27 *Ibid.*

28 L. Lutzenhiser, 'A Cultural Model of Household Energy Consumption', *Energy*, 17:1 (1992), 47-60.

29 Sovacool, 'What Are We Doing Here? Analyzing Fifteen Years of Energy Scholarship and Proposing a Social Science Agenda'.

An important ground to employ social sciences is that society, economics and politics influence energy as much as energy influences them. The social dimension of energy, which has always been present, is arguably becoming more and more prominent, thanks to phenomena like globalisation and climate change.

Whereas mankind has consumed biomass without significant energy transitions for the entire pre-industrial era before the 19th century[30], in the industrial and post-industrial world energy transitions have marked the pace of economic and socio-political development. In turn, social, political and economic factors have been key in shaping energy transitions. Technological progress alone cannot explain past energy transitions. Therefore, in imagining future energy transitions it is important to look beyond technology. While technology is a necessary condition to transform the energy mix, it is not a sufficient one. After all, at the beginning of the 20th century in the US there were more electric cars than cars running on petroleum products. Hydrogen, the most abundant element in the universe, has been known as a source of energy for a long time. Similarly, batteries have been built for a couple of centuries in order to store energy. English scientist Michael Faraday knew how to liquefy gases as early as in the 1820s. And yet, people are now looking at electric vehicles, hydrogen, batteries and liquefied natural gas (LNG) as a symbol of what is ‘new’ in energy. To be sure, technologies to design, produce and distribute electric vehicles, hydrogen, batteries and LNG have dramatically improved. However, one should not underestimate the importance of industrial policies, geopolitics, political lobbying, and a myriad of other social, political and economic factors in determining what technologically feasible options would ultimately take off and be adopted on a large scale, starting energy transitions.

Energy is today a lifeline for the economy and a determinant of the current modes of production, lifestyle, and social patterns. In turn, social discourse influences the mindset of energy decision-makers, social demands for measures to limit climate change are shaping energy policies and energy markets worldwide; pressures from social groups can crucially affect energy projects in many different ways[31]; political sentiment can increase the social preparedness to bear the cost of more expensive fuel for diversification purposes; cultural traits can affect how communities perceive extraction of mineral resources; and so on.

Social science investigation in energy is set to gain in importance as efforts to decarbonise take on a new dimension. Ambitious decarbonisation objectives require profound changes to our current energy infrastructure, which we can expect to affect landscapes, the organisation of cities and communities, lifestyles, etc. More and more economic resources will be diverted from other dossiers, with probable social implications. To achieve advanced stages of decarbonisation, changes to social behaviour are likely to be needed. It is possible that consumerism, and capitalism’ focus on individualism will be increasingly questioned and

30 W. Colton, ‘The Evolving Energy Mix’, *Perspectives Blog – Exxon Mobil*, available at: https://energyfactor.exxonmobil.com/perspectives/evolving-energy-mix/

31 We can think of social actions that have a negative impact on projects such as in the case of NIMBYism, opposition to drilling activity based on environmental convictions, and so on, but also of cases where society or certain stakeholders strive to keep a certain energy-related activity running, for instance lobbyists aiming to keep a plant or a refinery open or trade unions opposing coal mine closures for employment reasons.

challenged from a climate perspective. Debates such as the compatibility of long-term decarbonisation with the short-term electoral cycles of democracy and capitalism are likely to gain in importance. Social science is needed to investigate important issues such as imbalances potentially created by removing fossil fuel subsidies in countries affected by energy poverty. How to balance energy access with decarbonisation is indeed one of the most important challenges ahead. There is also the very important question as to whether fossil fuel producing countries will survive decarbonisation: what will happen to countries in the Middle East and Northern Africa (MENA) and Former Soviet Union (FSU) regions? Is there a possibility that these countries fail economically and politically, with potentially destructive repercussions on neighbouring countries, including European ones?

Moreover, the energy sector is increasingly affected by politics after a long cycle in which markets seemed to be opening indefinitely (particularly after the end of the Cold War), depoliticising trade. Today, new trade barriers are being introduced or threatened, sometimes even in relation to climate objectives (such as carbon border taxes). The US-China trade war has already had major consequences on flows of oil and gas, reducing US exports to China and further increasing the latter's dependence on the Middle East. Moreover, the US heavily interfered in EU energy policy by imposing sanctions on Nord Stream 2, to hurt Russia geopolitically and to pursue mercantilist objectives, such as to promote its own LNG exports to the EU. Energy geopolitics is also an important factor in the East Mediterranean, where competing powers have sent in warships to protect their drilling activities. Turkey has angered the international community by conducting unilateral drilling in Cypriot waters, and by signing a legally questionable deal for maritime borders with Tripoli's government.

More examples could be provided of how phenomena that are analysed by social sciences impact energy. However, the aim here is not to be comprehensive, but simply to show that there is room for social science in energy and that not all the important variables are easily quantifiable.

What has been said so far points to the conclusion that energy is an interlinked part of the society, the economy and politics. What remains to be established is *how* to make room for social sciences in energy.

A literature review actually reveals that the field is not at all close to saturation and that, on the contrary, the topic is understudied.[32] As noted by Van de Graaf et al. (2016), 'political scientists and other social scientists have lagged behind their colleagues from science, engineering, and economics in addressing [energy] issues'.[33] Van de Graaf et al. (2016) also highlighted that the number of publications in this field has been fluctuating, rising in times of energy crises and high energy prices (such as the 1970s) and decreasing in less critical periods. In recent years, political scientists rediscovered energy as an important area of inquiry. The intermittent

32 B.K. Sovacool et al, 'What About Social Science and Interdisciplinarity? A 10-year Content Analysis of Energy Policy', in D. Spreng et al (eds.), *Tackling Long-Term Global Energy Problems: the Contribution of Social Science* (2012): Springer.

33 T. Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics', in T. Van de Graaf et al (eds.), *Palgrave Handbook of the International Political Economy of Energy* (London, 2016): Palgrave Macmillan, page 3.

attention to the international energy sector has repercussions for scholars as there are no established theories to which we can easily turn to interpret the global politics of energy.[34]

With a view to investigate the application of social science to energy, Sovacool (2014)[35] conducted a quantitative survey on a large sample of 4400 energy articles written by more than 9500 authors. Using content analysis methodology, he found that the typical author of an energy article is a male trained in science, economics or energy studies, working at a North American institution. Only 19.6% of the authors have a specific training in social sciences. Of these, three quarters have a public policy, business and law training, whereas political science, sociology and geography are significantly under-represented. Furthermore, social science and arts and humanities journals constitute less than 5% of all peer-reviewed citations in energy, according to Sovacool. In terms of methodologies, most analyses have been conducted with quantitative methods, while qualitative methods are under-represented (only 12.6% of the total). Finally, Sovacool's content analysis shows a lack of interdisciplinarity. Only 22.8% of the articles involve interdisciplinary training, affiliations, or collaboration – and these are typically between economics and engineering disciplines rather than between social sciences.[36]

Social sciences can play an important role in reviewing assumptions behind modelling and in helping interpreting modelling results. As not all variables are easily translated into numbers, quantitative analyses cannot explain everything. Social sciences can integrate and complement "hard sciences" in a number of fields. This holds true also for energy, including the subject of analysis of this work. Noting that social sciences are overall under-represented in energy studies, calls have been made to include more social science analysis in energy – as well as to strengthen its theoretical foundations. This book lends an ear to these calls.

1.3 THE CASE FOR AN APPROACH COMBINING POLITICAL AND ECONOMIC NOTIONS

Energy is vital for the functioning of modern economies and the societal and political systems that are based on them. In other words, energy is very relevant both politically and economically. As noted by Belyi (2015)[37], research lamentably tends to operate within disciplinary boundaries, with the result that discussions on crucial topics such as environmental issues and economic development tend to remain disconnected from key matters of energy policy. Indeed, 'silos' thinking prevents us from adequately analysing the impacts of certain policy decisions on a wider range of policy areas. Policies that are primarily targeting one area (e.g. trade liberalisation) can have an impact on other areas (e.g. geopolitical balance) which can in turn impact the areas that the original policy decision had been targeting (e.g. market functioning).

The case for combining notions of politics and economics is particularly strong in this work, given its subject of analysis. First of all, natural gas is a special commodity – given the long lead time of gas investments, the fixed nature of transportation assets, its essential socio-economic

34 Van de Graaf, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'

35 Sovacool, 'What Are We Doing Here? Analyzing Fifteen Years of Energy Scholarship and Proposing a Social Science Agenda'

36 *Ibid.*

37 A. Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations* (London, 2015): Palgrave Macmillan.

function in heating, power generation and industrial production, and the substantial involvement of State companies in the gas business. Secondly, as is evident from recent evolutions in EU-Russia relations, the EU and Russia are more than just trade partners. Issues such as EU and NATO enlargement; conflicts in Georgia and Ukraine; Russia's defiance of Western normative paradigms and support for radical parties in the EU; Russia's activism in Libya, Turkey, Syria and other strategic areas in the EU's Neighbourhood are affecting EU-Russia relations.

Energy policy-making is broadly speaking shaped by three policy priorities: security, affordability and sustainability. While economics can be most effectively used to assess measures against the objective of affordability, it needs to be compensated by other approaches to account for the broader strategic implications of energy choices. Sustainability has an increasingly important weight, particularly since the presentation of the European 'Green Deal' in December 2019. Securitisation has also taken place, including with the Energy Union and Security of Supply directives.

The case for an interdisciplinary (political-economic) approach manifests itself also when we consider the actors' level. Markets, firms, and governments are all relevant players in EU-Russia gas trade relations. Disciplinary approaches tend to focus on only one actor among the market, the firm and the State – neglecting how the other two determine economic outcomes. Interdisciplinary approaches, on the other hand, study interactions between firms, markets, and States without giving pre-eminence to one actor. More specifically, as noted by Moon (2017)[38], Political Economy studies the interaction between the market and the State; the Economics of the Firm analyses how firms and the market influence each other; and International Political Economy (IPE) investigates how the market and the State interact in international settings. As we will further argue in the next paragraph, the third interdisciplinary approach listed here (IPE) is the most applicable to this research.

The proposition of applying an interdisciplinary approach to EU-Russia gas relations – and more specifically an approach combining notions of economics and politics – responds to calls made by a number of academic studies. Sovacool's content analysis of energy publications[39] – introduced earlier in this chapter – demonstrates a clear lack of interdisciplinarity. Merely one fifth of the energy articles included in Sovacool's sample involved interdisciplinary training, affiliations, or collaboration. Most interdisciplinary approaches in the sample were combining branches of economics or economics and engineering, while the combination of politics and economics is found in very few studies. Sovacool criticises the lack of interdisciplinarity on grounds that it makes analytical frameworks more rigid. He points out that more efforts are devoted to reach theoretical coherence and to get access to certain strands of academic debates than to actually answer the most relevant and urgent questions. As he also argues, this is at the basis of the cleavage between what is investigated by academic research and what is deemed important by policy-makers and business executives.

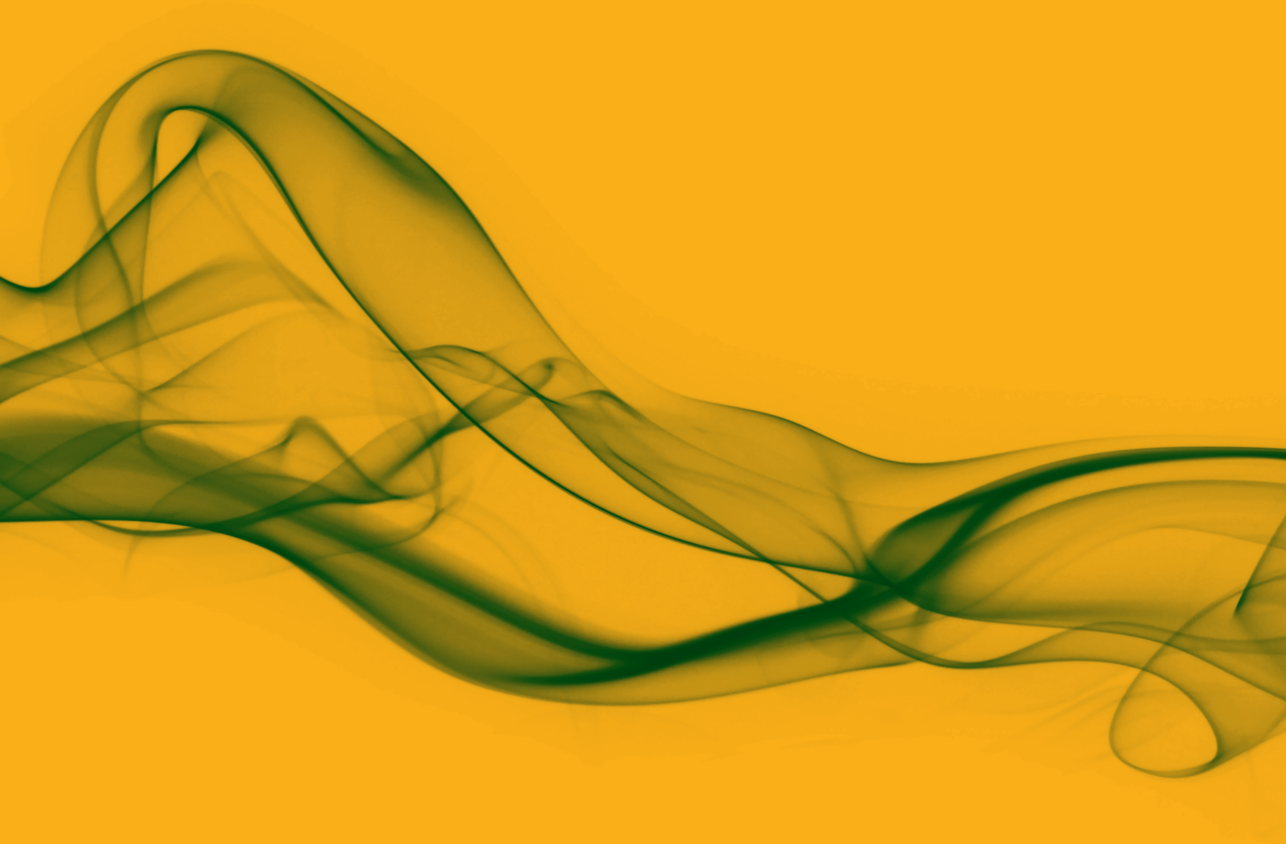
38 W. Moon, *Developing an Institutional Political Economy Framework Integrating Firms, Markets, and States* (Mobile-AL, 2017): Conference Paper, Southern Agricultural Economics Association (SAEA) Annual Meeting.

39 Sovacool, 'What Are We Doing Here? Analyzing Fifteen Years of Energy Scholarship and Proposing a Social Science Agenda'.

While, as argued, interdisciplinary approaches have a number of advantages, there seems to be a trade-off between 1.) synthetic, rigorous and coherent theories that can be successfully generalised and 2.) more eclectic approaches that tend to be more informative, agile and to-the-point in analysing a single issue but run into risks of excessive descriptivism and contingentism. An attempt needs to be made to allow for an interdisciplinary/eclectic approach that retains theoretical rigour and generalization potential. In the next paragraph we will explore the value of International Political Economy (IPE) as an investigation lens, given its ability to combine politics and economics and its ability to reconcile flexibility with analytical rigour.

CHAPTER 2

INTERNATIONAL POLITICAL ECONOMY (IPE) AND ITS APPLICABILITY TO THE RESEARCH QUESTIONS



CHAPTER 2 – INTERNATIONAL POLITICAL ECONOMY (IPE) AND ITS APPLICABILITY TO THE RESEARCH QUESTIONS

2.1 IPE OF ENERGY: AN INTRODUCTION

In the quest for a flexible yet authoritative discipline to study the changing world of energy, the field of International Political Economy (IPE) holds great promise, as has been acknowledged in the academic debate.[40]

IPE attempts to provide answers to the questions raised by Harold Lasswell (1936) in his book 'Politics: Who Gets What, When, How?'.[41] These fundamental questions stem from the realisation that the distribution of resources is ultimately at the heart of politics, together with the power relations that determine such distributional outcomes. According to Hancock and Vivoda (2014)[42] whenever the role of resources on policies and international relations (or vice versa) is the subject of analysis, IPE is the most fertile framework that can be adopted. IPE has the advantage of avoiding deterministic ideas about the primary role of either markets or States. Belyi (2015)[43] defines IPE as 'the analysis of complex interactions between political and economic factors related to policies, markets and societies', while Gilpin (1987)[44], more concisely, defines it as how the government interacts with the private sector at the international level.

IPE draws on many distinct academic fields, among which the most prominent ones are certainly politics and economics, but that also include communication studies, history and sociology. Interdisciplinarity is a characteristic of IPE, as it is inescapable to elucidate upon the interdependencies between economic and political variables.[45] This is particularly desirable in the case of energy. International energy affairs straddle the self-imposed disciplinary boundaries of public policy, international relations, economics, geography and international development[46] and are located in what Strange (1988) called a disciplinary 'no man's land'.[47] Energy thus 'presents a greater need for an interdisciplinary politico-economic framework of

40 Van de Graaf, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.
41 H. Lasswell, *Politics: Who Gets What, When, How* (New York, 1936): Whittlesey House.
42 K. J. Hancock, V. Vivoda, 'International Political Economy: A Field Born of the OPEC Crisis Returns to its Energy Roots', *Energy Research and Social Science*, 1 (2014), 206-216.
43 Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations,* abstract.
44 R. Gilpin, *The Political Economy of International Relations* (Princeton, 1987): Princeton University Press.
45 E. Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative', *European Security*, 22:4 (2013), 437-463.
46 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.
47 S. Strange, *States and Markets* (London, 1988): Pinter.

study than most areas of political science'.[48] As highlighted by Van de Graaf et al. (2016), 'the multifaceted nature of energy as a policy area makes it defy unidimensional analysis.' And again, 'economists who have attempted to apply economic theory to energy markets have come home empty-handed, since these markets are often strongly influenced by political factors. Theorists in political science and IR have also been ill-adapted to the terrain, because they have been mostly area specialists […] or security experts, whose methods and concepts tend to underrate the forces of the market and technological change'.[49] On the other hand, sociologists and anthropologists[50] focus on the importance of beliefs and attitudes in shaping energy consumption and perceptions about energy policy issues in certain constituencies but tend to overlook the wider commercial, technological or infrastructural factors that determine the energy mix. Stoddard (2013)[51] also highlights that it is crucial to combine political and economic factors in a solid theoretical framework of international energy relations. A genuinely politico-economic approach should not rank political and economically variables hierarchically, but rather treat them as equally important.[52] As Phillips (2005) put it, the twin perils of excessive economism and excessive structuralism should be avoided.[53] Literature on EU-Russian gas needs to incorporate more politico-economic factors in analysing a complex system of energy exchange and the impact of the social and political context, which may in turn be influential in shaping the behaviour of firms.

As we have introduced here and as we will see in more detail in the next sections, IPE is flexible, eclectic, and diverse in terms of content and epistemology. However, there are common tenets that bind together the various schools and approaches within IPE. By reviewing IPE literature, and papers that reflect on IPE's identity as a discipline[54], we can recognise five common propositions on which IPE is founded: a.) there should not be a strict analytical separation between international and domestic spheres because the two influence each other in point of fact, especially in today's highly globalised world; b.) multiple actors and institutions need to be considered as players in IPE, including corporations, lobbies, civil society actors, treaties, international organisations, but also norms, guiding principles, policy narratives and ideologies[55] c.) one of the most important questions defining international relations regards

48 M.F. Keating et al, 'Introduction: Bringing Energy into International Political Economy' in C. Kuzemko et al (eds.), *Dynamics of Energy Governance in Europe and Russia* (London, 2013): Palgrave Macmillan, 1-19.

49 Van de Graaf, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics', page 9.

50 Cf. S. Sorrell, 'Reducing Energy Demand: A Review of Issues, Challenges and Approaches', *Renewable and Sustainable Energy Reviews*, 47 (2015), 74–82 and S. Owens, L. Driffill, How to Change Attitudes and Behaviours in the Context of Energy, *Energy Policy*, 36 (2008), 4412–4418, mentioned in Van de Graaf, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.

51 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

52 "The study of international energy relations requires a framework of analysis that is truly politico-economic in nature, that is to say, an approach capable of merging political and economic analysis without privileging one a priori over the other", *Ibid*., page 448.

53 N. Phillips, 'Globalizing the Study of International Political Economy' in N. Phillips (ed.), *Globalizing International Political Economy* (New York, 2005): Palgrave Macmillan, as quoted in Keating et al, 'Introduction: Bringing Energy into International Political Economy', page 5.

54 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'; Keating et al, 'Introduction: Bringing Energy into International Political Economy'; Hancock et al, 'International Political Economy: A Field Born of the OPEC Crisis Returns to its Energy Roots'; Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'; S. Bromley, *American Hegemony and World Oil: The Industry, the State System and the World Economy* (Cambridge, 1991): Polity Press.; Strange, 'States and Markets'.

55 Keating et al, 'Introduction: Bringing Energy into International Political Economy'

the distribution of economic resources; d.) there is a mutual relationship between economic structures and agents, for instance agents like States contribute to creating economic structures of production but are in turn shaped by processes that unfold within such structures; e.) IPE tolerates and actually encourages eclectic analyses that incorporate variables derived from various fields.

2.2 IPE OF ENERGY: 'STATE OF THE ART' AND CALLS FOR A RENEWED ENGAGEMENT

IPE investigates the relationship between politics and economics at the international level and can be seen as distantly rooted in a tradition established by classical economists John Stuart Mill, David Ricardo and Adam Smith, who had also pondered over the mutual influence between States and commercial enterprises in the international arena. The socio-political foundations of economic systems and the impact of economic structures on social and political structures were also prominent areas of enquiry in the works of theorists of social change Emile Durkheim[56] and Karl Marx[57] and economists John Maynard Keynes[58], Karl Polanyi[59] and Torstein Veblen[60] – among others.

However, the formal establishment of IPE as a discipline can only be dated back to the 1970s, when scholars began to explicitly identify with it. In a way, IPE has its roots in energy. In fact, one of the two events that are widely recognized as having triggered the evolution of IPE into a discipline is the 1973 oil shock – along with the demise of the Gold Standards.[61] It is significant that IPE emerged as an area of enquiry when a politically-motivated decision affecting energy production in the Middle East generated major geopolitical and macro-economic repercussions worldwide. This genesis notwithstanding, the focus of IPE largely moved away from energy issues as oil prices subsided in the 1980s and concerns on access to energy lost their priority position in policy agendas.

As a result, during the 1980s and 1990s, energy studies have mostly been conducted from the perspectives of quantitative economics, science and engineering – while social scientists have been lagging behind.[62] Recently, energy has been rediscovered as a major area of enquiry by social scientists but is still sometimes excluded from handbooks of IPE. The growing interest in energy by social scientists can be attributed to a number of developments including renewed emphasis by policy-makers on achieving self-sufficiency in oil and gas[63]; the increase in US shale production since the mid-2000s and its global repercussions; the implications of unprecedented instability in the Middle East in the wake of US invasions and the Arab Spring;

56 E. Durkheim, *De la Division du Travail Social* (Paris, 1893): Félix Alcan.

57 For instance, K. Marx, *Zur Kritik der Politischen Ökonomie* (Berlin, 1859): Franz Duncker..

58 J.M. Keynes, *The Economic Consequences of the Peace* (1919) and J.M. Keynes, *The General Theory of Employment, Interest and Money*, (London, 1936): Palgrave Macmillan.

59 K. Polanyi, *The Great Transformation* (New York, 1944): Farrar and Rinehart.

60 T. Veblen, *The Theory of Business Enterprise* (New York, 1904): Charles Scribner's Sons; T. Veblen, *The Theory of Leisure Class* (New York, 1899): Macmillan; T. Veblen, *An Inquiry into the Nature of Peace and the Terms of its Perpetuation* (New York, 1917): Macmillan.

61 Hancock et al, 'International Political Economy: A Field Born of the OPEC Crisis Returns to its Energy Roots'.

62 Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.

63 For instance, in the doctrines of George W. Bush and its Administration. Autarkic tendencies in energy do not only have geopolitical consequences, but also macroeconomic ones. They notably have implications for global trade and trade balance considerations.

and the 2006, 2009 and 2014 Ukraine gas crises. This revival in social sciences' coverage of energy is illustrated in the figure below, which displays the number of articles that applied social sciences to energy in the period 1959-2015.

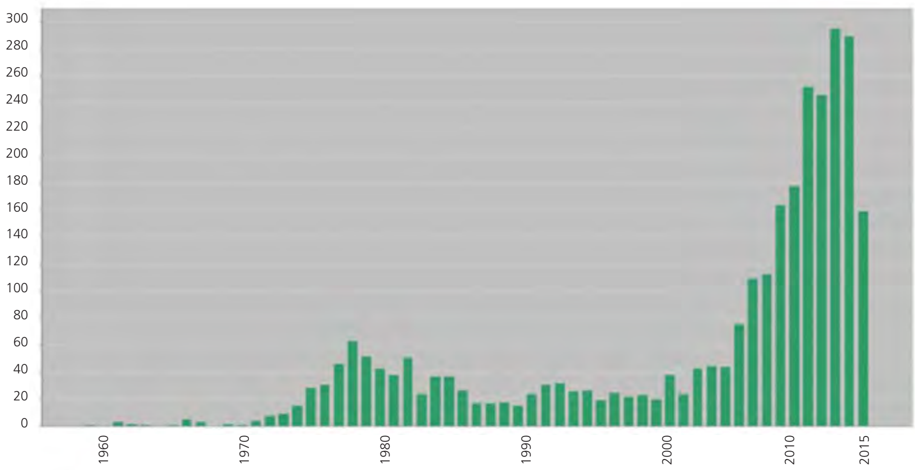


FIGURE 1: NUMBER OF ARTICLES APPLYING SOCIAL SCIENCES TO ENERGY (1959-2015), FROM VAN DE GRAAF ET AL.

In line with this renewed interest, handbooks on the IPE of Energy have started to appear[64], and an increasing number of academics identify themselves as IPE scholars with a specific expertise in energy.[65] While this revitalisation is certainly a positive development, the intermittent coverage of energy over time has had negative repercussions in terms of scarce consistency in the theoretical apparatus according to Wilson (1987)[66] and Van De Graaf et al. (2016)[67].

On the basis of this observation, many scholars are now calling for a renewed and structured engagement of IPE scholars in the field of energy. Implicit calls have already been made at the end of the 2000s. Robert Keohane (2009), one of the pioneers in this area of enquiry, has argued for instance that energy price volatility is one of the most compelling issues in international affairs at large, and one of the most overlooked by contemporary IPE scholars.[68] Along similar lines, Kathleen McNamara (2009) has noted that 'energy issues […] seem ripe to reorder the international political economy in ways that [IPE] as a field [has] not adequately analysed'.[69] In addition to these more implicit calls, explicit and structured calls for establishing

64 A. Goldthau et al (eds.), *Handbook of the International Political Economy of Energy and Natural Resources* (Cheltenham: 2018), Edward Elgar Publishing; T. Van de Graaf et al (eds.), *The Palgrave Handbook of the International Political Economy of Energy* (London: 2016), Palgrave Macmillan.

65 Hancock et al, 'International Political Economy: A Field Born of the OPEC Crisis Returns to its Energy Roots'.

66 Wilson, 'World Politics and International Energy Markets'

67 Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.

68 R. Keohane, 'The Old IPE and the New', *Review of International Political Economy*, 16:1 (2009), 34-46.

69 K. McNamara, 'Of Intellectual Monocultures and the Study of IPE', *Review of International Political Economy*, 16:1 (2009), 72-84.

a new IPE of Energy have been made in the last years by Van de Graaf et al. (2016)[70], Keating et al. (2012)[71], Stoddard (2013)[72], Ostrowski (2013)[73] and Hancock and Vivoda (2014)[74].

This book has the ambition of acting on the numerous pleas to strengthen the IPE of Energy and aims to apply IPE to the subject of analysis identified in Chapter 1. In order to do this, it is first necessary to assess the 'state of the art' in the IPE of Energy literature. This serves the purposes of checking what areas of enquiry have already been extensively covered; clarifying if the IPE of Energy is indeed an applicable discipline; and looking for valid theories that could be applied to the topic under examination. We will then provide an overview of different approaches within IPE, distinguishing schools on the basis of content as well as on the basis of methodology and epistemology. Finally, we will demonstrate that IPE is flexible and eclectic, and we will explain why these are key added values in the analysis of international energy issues.

A review of IPE of Energy literature reveals that scholars have concentrated their attention on a relatively limited number of topics. This is in line with a tendency observed in academic energy research, whereby publications proliferate in relatively few strands for aspirations of visibility and academic relevance. In this way, the academic debate often takes a shape of its own and continues in parallel with developments in energy markets – the most relevant or urgent of which are not necessarily picked up first.

From the literature review, it clearly emerges that one of IPE's most iconic strands of research, which has inspired a cascade of publications in the last two decades, is the 'resource curse' theory and its refutations. One camp argues that commodities – especially oil and gas – have negative macro-economic effects, including high inflation; loss of competitiveness in sectors other than oil and gas; de-industrialisation; scarcity of qualified workforce for non-commodity sectors; overreliance of export revenues, State revenues and GDP on oil and gas; vulnerability to commodity cycles; and so on. A number of critical studies focus on negative socio-political effects, which can derive from the abovementioned macro-economic distortions. These include high inequality; the lack of a middle class, a cornerstone constituency of liberal-democracy; centralization of rents and power which result in rent-seeking behaviour; sectarian tendencies, cronyism and authoritarian rule; a heightened risk of civil wars and inter-State conflict for the control of natural resources; and so on. In the opposite camp, a number of publications argue that oil and gas are not responsible for all the distortions mentioned above. Some studies limit themselves to claim that evidence supporting the 'resource curse' theory is insufficient, while others further argue that if oil and gas are managed properly – which hinges on well-designed

70 Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.

71 Keating et al, 'Introduction: Bringing Energy into International Political Economy'.

72 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-Economic Alternative'.

73 W. Ostrowski, 'The Political Economy of Global Resources' in R. Dannreuther et al (eds.), *Global Resources: Conflict and Cooperation* (London, 2013): Palgrave Macmillan.

74 Hancock et al, 'International Political Economy: A Field Born of the OPEC Crisis Returns to its Energy Roots'.

and resilient institutions – they can actually boost economic development, prosperity and social stability.[75]

The second fertile branch of the IPE of Energy is that of energy governance studies. These studies investigate issues such as the role of regional investment banks in energy markets; the role of inter-governmental agencies or multilateral frameworks like the IEA, the IEF and the G8/G20; the type of players that set the norms governing international energy trade; changes in global energy governance as a result of India's and China's emergence as large importing countries; the importance of regional energy cooperation for energy projects; the role of free trade agreements in commodity trade, and so on.[76]

Strictly related to energy governance research, studies on the evolving role of OPEC deserve a separate mention given their large number and the specific direction taken by the debate on OPEC's future. Recent studies focus on the question as to whether OPEC retains its original price-setting function in the international oil market after the shale revolution and the rise in non-OPEC market share.[77]

The fourth large stream of studies relatable to the IPE of Energy comprises of analyses on the relationship between companies and governments, which have gained momentum with the resurgence of resource nationalism in the 1990s and 2000s. These studies try to discern a difference in the strategies and posturing of National Oil Companies (NOCs), International Oil Companies (IOCs), and the so-called International-National Oil Companies (INOCs), both in

75 For studies in this area of research, cf. W.M. Corden, 'Booming Sector and Dutch Disease Economics: Survey and Consolidation', *Oxford Economic Papers*, 36:3 (1984), 359-380; R. Arezki, M. Brückner, *Oil Rents, Corruption, and State Stability: Evidence from Panel Data Regressions*, Research Paper 2011/07 (Adelaide, 2011): University of Adelaide; Auty, R.M., 1993, 'Sustaining Development in Mineral Economies: the Resource Curse Thesis', Oxford University Press; T. Dunning, *Crude Democracy: Natural Resource Wealth and Political Regimes* (Cambridge, 2008): Cambridge University Press; T.L. Karl, *The Paradox of Plenty: Oil Booms and Petro-States* (Berkeley, 1997): University of California Press; M.L. Ross, 'Does Oil Hinder Democracy?', *World Politics*, 53:3 (2001), 325-361; M.L. Ross, *The Oil Curse: How Petroleum Wealth Shapes the Development of Nations* (Princeton, 2012): Princeton University Press; J.D. Colgan, 'Oil, Domestic Politics, and International Conflict', *Energy Research and Social Science*, 1 (2014), 198-205; P.J. Luong, *Oil is Not a Curse: Ownership Structure and Institutions in Soviet Successor States* (Cambridge, 2010): Cambridge University Press.

76 For studies in this area of research, cf. B. Kong, 'Governing China's Energy in the Context of Global Governance', *Global Policy*, 2 (2011), 51-65; C. Kuzemko, *The Energy Security-Climate Nexus: Institutional Change in the UK and Beyond* (London, 2013): Palgrave Macmillan; T. Meyer, 'The World Trade Organization's Role in Global Energy Governance' in T. Van de Graaf et al (eds.), *The Palgrave Handbook of the International Political Economy of Energy*; D. Lesage et al, 'Thriving in Complexity? The OECD System's Role in Energy and Taxation', *Global Governance*, 19:1 (2013), 83-92; Van de Graaf, T., 2012, 'Obsolete or Resurgent? The International Energy Agency in a Changing Global Landscape', *Energy Policy*, 48 (2012), 233-241; A. Goldthau et al, 'Assessing OPEC's Performance in Global Energy', *Global Policy*, 2 (2011), 31-39; S.I. Karlsson-Vinkhuyzen, 'The United Nations and Global Energy Governance: Past Challenges, Future Choices', *Global Change Peace Security*, 22:2 (2010), 175-195; B.K. Sovacool, 'Energy Policy and Cooperation in Southeast Asia: the History, Challenges, and Implications of the Trans-ASEAN Gas Pipeline (TAGP) Network', *Energy Policy*, 37:6 (2009), 2356-2367; R. Auty et al (eds.), *Energy, Wealth and Governance in the Caucasus and Central Asia: Lessons not Learned* (Abingdon-on-Thames, 2006): Routledge; J. Ravenhill, 'Resource Insecurity and International Institutions in the Asia-Pacific Region', *The Pacific Review*, 26:1 (2013), 39-64.

77 For studies in this area of research, cf. C. van der Linde, *The State and the International Oil Market: Competition and the Changing Ownership of Crude Oil Assets* (2000): Kluwer Academic Publishers; J. Colgan 'The Emperor Has No Clothes: The Limits of OPEC in the Global Oil Market', *International Organization,* 68:3 (2014), 599-632; A. Alhajji et al, 'OPEC and Other Commodity Cartels: A Comparison', *Energy Policy*, 28:15 (2000), 1151-1164; J. Mitchell et al, 'States and Markets in the Oil Industry' in A. Belyi et al, *States and Markets in Hydrocarbon Sectors*, (London, 2015): Palgrave Macmillan; F.J. Al-Chalabi, *OPEC at the Crossroads* (Oxford, 1989): Pergamon; 1989; A. Alnasrawi, *OPEC in a Changing World Economy* (Baltimore, 1985): Johns Hopkins University Press; D.H. Claes, *The Politics of Oil-Producer Cooperation* (New York, 2001): Perseus Publishing.

international markets and in their relations with host governments. A specific direction taken by research in this field is analysing implications of changing ownership of oil and gas assets, and notably the impact of NOCs' growing share in oil and gas resource ownership.[78]

The fifth large area of enquiry that can be identified within the IPE of Energy brings together papers on energy poverty, energy justice and political ecology. Access to energy remains limited and intermittent in large parts of Sub-Saharan Africa, South Asia and South America – with immense social, political and economic repercussions. Improving it is a priority for regional and international development programmes, and a major challenge for local governments. The intensification of the transition towards clean energy has relaunched the debate on energy poverty. While renewable energy offers excellent opportunities to improve energy access, fossil fuels might still be the most affordable sources for large-scale centralised production, particularly in oil and gas producing countries. The decarbonization narrative should thus not overlook the fact that for many developing countries endowed with fossil fuels, the priority is fulfilling the basic needs of their populations.[79]

2.3 DIFFERENT SCHOOLS WITHIN THE IPE OF ENERGY

IPE is a broad field comprising of diverse currents of thoughts. IPE academics were once encouraged to formulate their assertions by resorting to one of few codified paradigms.[80] At the most general level, a distinction could be made between Realist/Mercantilist and Liberal/Institutionalist approaches. Within the first group, it is possible to further differentiate between classical Realist approaches (revolving around the postulate that economics tends to be an instrument of politics) and the Marxist tradition (more normative and based on the belief that economics drives politics). Hancock and Vivoda offer a comprehensive review of Realist literature in the field of the IPE of Energy. Most studies focus on energy security, by adopting an extensive concept of 'security' that includes affordability and other economic parameters. Attention is especially devoted to the macro-economic and strategic implications of import

78 For studies in this area of research, cf. P. Stevens, 'National Oil Companies and International Oil Companies in the Middle East: under the Shadow of Government and the Resource Nationalism Cycle', *Journal of World Energy Law and Business*, 1:1 (2008), 5-30; I. Bremmer et al, 'The Rise and Fall of Resource Nationalism', *Survival*, 51:2 (2009), 149-158; G. Joffé et al, 'Expropriation of Oil and Gas Investments: Historical, Legal and Economic Perspectives in a New Age of Resource Nationalism', *Journal of World Energy Law and Business*, 2:1 (2009), 3-23; V. Vivoda, 'Resource Nationalism, Bargaining and International Oil Companies: Challenges and Change in the New Millennium', *New Political Economy*, 14:4 (2009), 517-534; V. Marcel, *Oil Titans: National Oil Companies in the Middle East* (Washington-D.C., 2006): Brookings Institution Press.

79 B.K. Sovacool, 'The Political Ecology and Justice of Energy', in T. Van de Graaf et al (eds.), The Palgrave Handbook of the International Political Economy of Energy; M. Cooper, 'Energy Justice in Theory and Practice: Building a Pragmatic, Progressive Road Map' in T. Van de Graaf et al (eds.), The Palgrave Handbook of the International Political Economy of Energy; R.M. Acuna, 'The Politics of Extractive Governance: Indigenous Peoples and Socio-Environmental Conflicts', The Extractive Industries and Society, 2:1 (2015), 85-92; S. Bouzarovski et al, 'A Global Perspective on Domestic Energy Deprivation: Overcoming the Energy Poverty-Fuel Poverty Binary', Energy Research and Social Science, 10 (2015), 31-40; M. Eames et al, 'Energy Justice in Sustainability Transitions Research' in K. Bickerstaff et al (eds.), 'Energy Justice in a Changing Climate: Social Equity and Low-Carbon Energy' (London, 2013): Zed Books; B.K. Sovacool et al., Global Energy Justice (Cambridge, 2014): Cambridge University Press; D.G. Arnold, The Ethics of Global Climate Change (Cambridge, 2011): Cambridge University Press.

80 Hancock et al, 'International Political Economy: A Field Born of the OPEC Crisis Returns to its Energy Roots'.

dependence, efforts to diversify, attempts to challenge the established global energy order and strategic realignments triggered by energy or occurring in the energy world.[81]

Following Marxist theories, a number of materialist IPE approaches emphasise that infrastructure influences economic structures and transactions. In turn, economies, also and especially through the infrastructure on which they are based, are embedded both historically and socially.[82] The development of oil products to cater for the transportation sector – for instance – modified the world's economic landscape, social habits and political regimes. An important implication is that legacy infrastructure limits policy choices, creating a lock-in effect that is at the basis of path dependencies in the relation between institutions and economics. Apart from legacy infrastructure, also energy technologies, access to resources and the energy mix all contribute to the perpetuation of policy decisions. Apart from endowment, another crucial element shaping energy resources and markets are institutions.[83] As noted by Belyi, Australia and China have the largest coal resources but the Industrial Revolution has not been started in these two countries.[84] Similarly, today, we notice that Germany is a front-runner in solar technology in spite of relatively low irradiation. On the other hand, Saharan countries, blessed with the highest irradiation levels, are clearly not leading developments in solar PV manufacturing. What makes a difference in both examples are institutions, and their engagement in national industrial policies.

Contrary to Realist and Marxist interpretations, Liberalism believes that economics and politics coexist in separate spheres, while retaining the conviction that they can influence each other – in line with International Political Economy's *raison d'être* as a discipline. Liberal studies in the IPE of Energy focus on the role of institutions, advocacy networks and global energy governance.[85]

Although a Realist or a Liberal emphasis can be identified in some IPE works, by taking a step back and by looking at IPE from the wider perspective of social sciences, IPE can itself be seen as a way to overcome the division between questions of political economy (the traditional realm of Liberalism) and questions of 'hard security' and geopolitics (the traditional realm of

81 F. Ciuta, 'Conceptual Notes on Energy Security: Total or Banal Security?', *Security Dialogue*, 41:2 (2010); S. Gaylord et al 'Developing World: National Energy Strategies', in H. Dyer (eds.), *The International Handbook of Energy Security*, (Cheltenham, 2013): Edward Elgar Publishing; V. Vivoda, *Energy Security in Japan: Challenges after Fukushima*, (2014), Routledge; V. Vivoda, 'Japan's Energy Security Predicament post-Fukushima', *Energy Policy*, 46 (2012), 135-143; D.W. Klein, 'Japan 1979: the Second Oil Crisis', *Asian Survey*, 20:1 (1980), 42-52; D. Zweig et al., 'China's Global Hunt for Energy', *Foreign Affairs*, 84:5 (2005); P.C. Evans et al, *Untangling China's Quest for Oil through State-Backed Financial Deals* (Washington-DC, 2006): Brookings Institutions.

82 R. Hayter, 'Economic Geography as Dissenting Institutionalism: the Embeddedness, Evolution and Differentiation of Regions', *Geografiska Annaler*, 86:2 (2004), 95-115.

83 P. Andrews-Speed, 'Applying Institutional Theory to the Low-carbon Energy Transition',*Energy Research & Social Science*, 13 (2016), 216-225.

84 Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations*.

85 M.E. Keck et al, *Activists beyond Borders: Advocacy Networks in International Politics* (1998): Cornell University Press; A. Goldthau et al, 'The Role of Rules and Institutions in Global Energy' in A. Goldthau (ed.), *Global Energy Governance: the New Rules of the Game*, (Washington-DC, 2013): Brookings Institutions Press; J.D. Colgan et al 'Punctuated Equilibrium in the Energy Regime Complex', *The Review of International Organizations*, 7 (2012), 117-143; R. Keohane et al, 'The Transnational Politics of Energy', *Daedalus* (2013): MIT Press; R. Keohane, 'International Agencies and the Art of the Possible: the Case of the IEA', *Journal of Policy Analysis and Management*, 1:4 (1982), 469-481.

Realism). This is in line with what we have enunciated in the introduction, that is that IPE's identity as a discipline rests on Susan Strange's (1988) and Simon Bromley's (1991) observation that States and markets influence each other and that there should not be a sharp disciplinary distinction between them.[86]

To this traditional trichotomy between Realism, Liberalism and Marxism, a fourth current of thought can be added, along the same lines of what has been discussed in the previous chapter with regards to IR: Constructivism. Rejecting the emphasis on material interests and rationality of governments, market participants and classes, Constructivism argues that material elements do not exist outside our social interpretation of them.[87] The world's political economy is therefore also constructed: not only material elements, but also ideas, values, norms and identities shape international political economy developments.[88] In the IPE of Energy, Constructivism has found applications in a number of analyses, including on how social phenomena and perceptions by communities affect decision-making on environmental issues; on the role of identities in energy security posturing; activism in energy and interpretations of international economy and international energy trends by different social groups.[89]

While, as mentioned, academics were once compelled to indicate their affiliation with one of the "-isms", the discipline has become considerably more flexible over time.[90] IPE scholars have become increasingly able to move between paradigms, selecting the argument with the strongest explanatory potential in a specific context. Today, intra-IPE debates actually revolve around methodology and epistemology rather than the affiliation to Realism, Liberalism, Marxism or Constructivism. If the classification is made on the basis of methodology and epistemology, two main schools of IPE can be identified. The rationalist school, prevalent in North America, prefers objective observation and systematic testing with scientific methods. Rationalists tend to be concise, by reducing the number of hypotheses and supportive arguments to the minimum. Most of the effort is directed towards seeking solid grounds for the supportive arguments and towards the generalization of findings. To the contrary, the post-positivist school, prevalent in Great Britain, 'evinces a deeper interest in normative issues, […] is less wedded to natural scientific methods, […] does not shy away from grand theories and takes an explicit problem-posing approach'.[91]

86 Strange, *States and Markets* and Bromley, *American Hegemony and World Oil: The Industry, the State System and the World Economy.*

87 Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.

88 A. Broome, *Issues and Actors in the Global Political Economy* (London, 2014): Macmillan; R. Abdelal, 'Constructivism as an Approach to International Political Economy' in M. Blyth, '*Routledge Handbook of International Political Economy: IPE as a Global Conversation*' (Abingdon-on-Thames, 2009): Routledge.

89 R. Floyd et al (eds.), *Environmental Security: Approaches and Issues* (Abingdon-on-Thames, 2012): Routledge; A. Simpson, *Energy, Governance and Security in Thailand and Myanmar (Burma): a Critical Approach to Environmental Politics in the South* (Abingdon-on-Thames, 2014): Routledge; R. Abdelal et al (eds.), *Constructing the International Economy* (Ithaca-NY, 2010): Cornell University Press; R. Abdelal et al, *Identity as a Variable* (Cambridge, 2006): Cambridge University Press; A. Leopold, 'The Changing Constellation of Power and Resistance in the Global Debate over Agrofuels', *Innovation: the European Journal of Social Science Research*, 23:4 (2010), 389-408.

90 Hancock et al, 'International Political Economy: A Field Born of the OPEC Crisis Returns to its Energy Roots'.

91 Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.

2.4 GENERAL REMARKS ON THE APPLICABILITY OF THE IPE OF ENERGY TO THE SUBJECT OF ANALYSIS

It is at this point necessary to connect our IPE literature review with the subject of analysis of this book. Based on the considerations formulated in previous sections, on what grounds can we describe IPE as valuable in studying changing gas trade mechanisms between the EU and Russia?

Six overarching reasons can be identified: a.) IPE's primary focus on the political nature of resource distribution; b.) IPE's denial of the primacy of either States or markets; c.) IPE's rejection of a sharp distinction between international and domestic dimensions; d.) the persuasiveness of calls recently made by scholars to 'bring IPE back to its energy roots'; e.) the finding that the attention of IPE energy literature has been concentrated on a relatively limited number of topics and that natural gas has not been covered extensively; f.) the fact that IPE is flexible and eclectic. The next few paragraphs provide additional substance to these statements.

First of all, as we have shown, IPE revolves around the central research question of how economic resources are distributed, affirming that the distribution of economic resources is the key political subject to be studied by social scientists today. For starters, this is a fundamental corollary behind our hypothesis that gas market liberalization – by means of the ensuing long-term contract renegotiations, changes in gas pricing mechanisms and the transformation of the way of doing business – has altered and will alter the value of trade between the EU and Russia. Distributional transformations provoked by liberalisation stem from a variety of factors, which will be analysed in the next chapters of this book – namely: a.) the lower import price levels so far delivered by gas-to-gas competition (the future permanence of which is – however – uncertain); b.) the augmented uncertainty and short-termism (and, potentially, volatility) in a sector perceived as strategic by Russia; c.) the reduced opportunities for the EU and Russia to take a common long-term view on the future of a key aspect of their mutual trade; d.) the greater difficulty for Russia to plan long-term investments and e.) the possibility that changes in the EU gas market will engender changes in Russia's export regime and thus in Russia's domestic gas market too.

Moreover, IPE has the advantage of attaching equal importance to market players and State actors. This allows IPE to reconcile the schism between Realism and Liberalism that is particularly strong in IR. Although also present as sub-schools in IPE, Realism and Liberalism are more nuanced in IPE than in IR in that they recognise the importance of both economic and political factors as well as their mutual influences. In line with Susan Strange and other IPE scholars, we take issue with both excessively market-centric and State-centric analysis and instead argue in favour of a genuinely 'politico-economic approach'[92] noting that this is a very valuable approach to energy by virtue of its 'multifaceted nature'[93] if oversimplifications are to be avoided. As we have argued in the previous section, we recognise that market parties are

92 Strange, *States and Markets*; Bromley, *American Hegemony and World Oil: The Industry, the State System and the World Economy;* Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

93 Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.

playing an important role in EU-Russia gas relations, and that their role is becoming more prominent in the light of globalisation and commoditisation in gas trade. Hub liquidity is improving, price setting increasingly takes place in the market and market responses to short-term security of supply challenges have been effective in the last years. Two caveats are however needed. First of all, it is naïve to think that politics stops exerting pressures on market players in a post-liberalisation landscape. EU policy-makers remain vigilant and avail themselves of energy regulation to pursue political objectives, or at the very least to attune regulation to political developments. Examples include the proposed amendments to the Gas Directive, selective exemptions to the Third-Party Access (TPA) rule, selective financing of LNG terminals interconnectors and international pipelines, prohibition to acquire downstream assets and so on (more in § 2.2). The second caveat is that the idea of liberalisation *itself* is not politically neutral. As a number of IPE studies have concluded, States attempt to shape the international economic order in a way that profits them – and there are reasons to think that the EU is doing the same with the global gas market (more in § 2.2).

With regard to the third statement introduced at the beginning of this section, internal reforms in the EU's domestic gas market changed the rules of the game in international gas trade – affecting the profitability, room for manoeuvre, investment options and strategic positioning of gas suppliers. As gas suppliers such as Gazprom also perform a crucial socio-economic function in the Russian domestic market (Chapter 9), it is evident that developments in the EU and Russia are intertwined. The feedback loop is also clear: for instance, lower investments by Russian gas suppliers may very well be reflected in higher prices in the EU gas market. Specific concepts and theories of IPE that demonstrate the depth of links between the domestic and the international dimension will be analysed more in detail in the next sections.

The fourth reason prompting us to apply IPE to this topic is the fact that many calls have recently been made by scholars to bring back IPE to its energy roots. This entails that there is momentum for IPE energy studies in academic research. As a result, there are numerous recent valuable insights to draw inspiration from and the development of this strand of research holds great promise.

Our literature review allows us to conclude that a study applying IPE to EU-Russia gas relations is not only building on this 'momentum', but also that the attention of IPE energy studies has been captured by a relatively limited number of topics and that gas has received relatively little attention. Moreover, as found by Hancock and Vivoda (2014), only a few studies have so far been able to adequately put 'politics into policy'.[94] This means that an application of IPE to EU-Russia gas relations and to the theme of gas market liberalization policies is timely and can contribute to advancing knowledge on this topic.

Finally, IPE has a number of methodological advantages in dealing with a topic that requires to switch from politics to economics and vice versa. IPE responds to the criteria of being sufficiently flexible and eclectic while also containing rigorous, generalising theories that allow

94 Hancock et al, 'International Political Economy: A Field Born of the OPEC Crisis Returns to its Energy Roots'.

to escape the trap of excessive descriptive accounts. Some of these theories, with a potential application to the subject of analysis, will be discussed more in detail in the next sections.

As underlined in previous sections, the last five to ten years have seen a resurgence of IPE energy studies. One of these recent studies, conducted by Stoddard (2013), identifies four concepts and theories derived from IPE that help understanding developments in EU-Russia gas trade relations: a.) complex interdependence in structural diversity; b.) territorial non-coincidence between regulation and economic transactions; c.) 'milieu-shaping' of the international economic order; d.) intangible bargains between market operators and authorities.[95] In the next sections we will consider the first three of these four concepts and theories applying them to the subject of analysis and expanding on Stoddard's considerations by adding concepts derived from the work of Susan Strange, Luttwak and other scholars.

2.5 COMPLEX INTERDEPENDENCE BETWEEN STRUCTURALLY DIFFERENT COUNTRIES AND THE 'RESOURCE CURSE'

Stoddard proposes to combine findings of studies on complex energy interdependence[96],[97] and the resource curse literature (above) in analysing the implications of energy interdependence between structurally diverse States, with the EU and Russia specifically in mind.

As proposed by Mañé-Estrada (2006), Eurasia can be described as a 'geo-energy' space which comprises of countries that have energy interdependence as their common denominator.[98] At the same, however, these countries are profoundly different in their social-economic structures.

As highlighted by Ladislaw and Verrastro (2007)[99], energy infrastructure is designed to support those interdependent relationships – and this is visible in Eurasia more than in any other part of the world. A massive infrastructure consisting of processing facilities, compressor stations, pipelines, tankers, ports, export terminals, storage sites and receiving terminals has been built around gas trade. Moreover, gas trade has engendered movements in financial capital, labour, and a wide variety of associated goods and services. Along these lines, energy can be described as a 'social-technical system' ('a large technical system that is deeply embedded in the overall

95 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

96 Robert Keohane and Joseph Nye theorised 'complex interdependence' describing a condition whereby States are inextricably tied together in ways that are not immediately detectable. This is also because States use multiple channels to interact with each other. They distinguished between inter-State, trans-governmental and trans-national relations and recognised that contacts between scholars and businessmen, and not only between State representatives, also crucially contribute to the relation. They also described complex interdependency as a condition where agendas and policy priorities change over time. Finally, they argued that complex interdependence in a highly integrated world was discouraging the use of miltary force or other coercive measures. Cf. R. Keohane and J. Nye, *Power and Interdependence: World Politics in Transition* (Boston, 1977): Little, Brown.

97 N. Choucri and V. Ferraro, *International Politics of Energy Interdependence: the Case of Petroleum* (1976): Lexington Books; S. Ganguli, 'Energy Interdependence as a Strategic Factor in the Post-Cold War Context', *Strategic Analysis*, 40:3 (2016), 185-198.

98 A. Mañé-Estrada, 'European Energy Security: Towards the Creation of the Geo-Energy Space', *Energy Policy,* 34:18 (2006), 3773-3786.

99 S. Ladislaw and F. Verrastro, 'Providing Energy Security in an Interdependent World', *The Washington Quarterly*, 30:4 (2007), 95-104.

structure of society').[100] Dismantling this socio-technical system, significantly altering this infrastructure or foregoing this accompanying trade in capital, labour and goods would require substantial time and money. This cost does not only serve as a deterrent to disruptions, but it also creates a strong 'path dependency' between the EU and Russia. This relates to Van der Vleuten's observations about the difficulty to changing established energy infrastructure, including transnational infrastructure, and how this is intertwined with historical choices and societal factors, among others.[101]

While this tight interdependence and path dependency are *per se* an incentive to cooperation, structural differences create attritions that *de facto* complicate or hamper cooperation – as is visible between the EU and Russia. This is also reflected in the type of institution that is chosen to regulate relations. According to Padgett (2011)[102], these attritions take two forms: 'distributional problems' and 'enforcement problems'. Distributional problems are defined as originating from divergent interests in cooperation or an asymmetrical distribution of benefits from cooperation. Enforcement problems, on the other hand, arise when one or more parties are incentivised to step out of an agreement for short-term gain. Distributional problems exist between the EU and Russia and hamper cooperation. According to Koremenos et al. (2001)[103], distributional problems give rise to flexible institutional arrangements. This is also the case in EU-Russia gas trade, which is not governed by formal institutions.[104] Instead, for decades, long-term contracts constituted a key element of the 'institutional environment' (§ 3.2 and § 5.1) of EU-Russia gas trade. On the other hand, enforcement problems – which have already been detected by the literature in the specific case of market liberalization in the EU[105] – call for binding rules and centralised institutions ensuring compliance. By interfering with national sovereignty, these institutions can also jeopardise cooperation.[106]

According to Stoddard (2013), and in line with resource curse theories, energy is one of the few sectors that have the capacity of shaping a nation's political and economic system.[107] As a result of dissimilar domestic systems, logics applied to energy are also dissimilar across the Eurasian 'geo-energy' space and thus determine different types of interactions with international structures and positioning in international energy markets by the EU and Russia. The EU tends to promote multilateral energy governance frameworks (while not completely

100 Definition from Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'. On social-technical systems, cf. also T.P. Hughes, *Networks of Power: Electrification in Western Society* 1880–1930, (Baltimore, 1983): John Hopkins University Press. For the related notion of 'technical-industrial complex', see § 3.1

101 E. Van der Vleuten, 'Infrastructures and Societal Change. A View from the Large Technical Systems Field', *Technology Analysis and Strategic Management*, 16:3 (2004): 395-414; E. Van der Vleuten and P. Högeslius, 'Resisting change? The transnational dynamics of European energy regimes' in G. Verbong and D. Loorback (eds.), *Governing the Energy Transition: Reality, Illusion, or Necessity?* (London, 2012): Routledge.

102 S. Padgett, 'Energy Cooperation in the Wider Europe: Institutionalizing Interdependence', *Journal of Common Market Studies*, 49:5 (2011), 1065-1086.

103 B. Koremenos et al., 'The Rational Design of International Institutions', *International Organization,* 55:4 (2001), 761-799.

104 The Energy Charter never became a formal institution governing EU-Russia gas trade, cf. Chapter 5.

105 L.L. Martin, 'Interests, Power and Multilateralism', in L.L. Martin et al (eds.), *International Institutions: An International Organization Reader* (Cambridge-MA, 2001): MIT Press.

106 Padgett, 'Energy Cooperation in the Wider Europe: Institutionalizing Interdependence'.

107 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

foregoing bilateral engagements, notably with Central Asian and Caspian producers) and believes in a liberalised and global gas market as a setting that is conductive to security of supply and low prices. Russia, on the other hand, seems to prefer bilateral approaches – especially when they allow it to bypass the EU and deal directly with Member States – and aims to retain strong State control over the value chain.

The solidity of domestic social, political and economic models also hinges on outcomes of processes set in motion in the international energy order. Every State desires different outcomes from these processes, depending on the role played by energy nationally and internationally[108]. An all-encompassing discussion on whether dependency on fossil fuel exports has determined resource curse dynamics such as Dutch disease and authoritarianism in Russia is beyond the scope of this book. Moreover, no firm conclusion has been reached on this topic. However, it is both more pertinent to this book and straightforwardly accepted that certain secondary aspects of the resource curse are observable in the Russian gas sector, including the importance of informal politics and phenomena of neo-patrimonialism and rentierism[109].

Bringing together the two discussions presented above (on interdependence of structurally different States and on the resource curse), Stoddard suggests that the continued flow of rents from the importer to the exporter prolongs and propagates Russia's rentierism, neo-patrimonialism and informal politics.[110] From this perspective, it is possible to put forward the hypothesis that by setting in motion gas market liberalisation the EU has pursued the primary objective of affordability for its gas consumers but perhaps also the secondary objective of shaking up Russia's sector organization (Chapter 9) and rent-based model. From this perspective, gas market liberalisation can be seen as part of a neo-liberal policy transfer from the EU to Russia in line with Europe's policy in the 1990s when it tried to push reforms in Russia by means of the World Bank and the International Monetary Fund.

2.6 TERRITORIAL NON-COINCIDENCE AND USE OF REGULATION TO CAPTURE ECONOMIC BENEFITS

As we have indicated in the previous section, the proponents of the theory of complex interdependence Robert Keohane and Joseph Nye (1977) introduced the distinction between the two dimensions of 'interstate' and 'transnational' relations – calling for a recognition of the role of non-State players and informal channels in shaping the international order.[111] Writing at the end of the 1970s, Murray (1978) elaborated on this distinction by introducing the notion of 'territorial non-coincidence'[112] between economic activity (increasingly transnational) and political systems (still State-centred). As the phenomenon that is today

108 N. Kaveshnikov, 'The Issue of Energy Security in Relations between Russia and the European Union', *European Security*, 19:4 (2010), 585-605.

109 A. Franke et al, 'Kazakhstan and Azerbaijan as Post-Soviet Rentier States: Resource Incomes and Autocracy as a Double Curse in Post-Soviet Regimes 2009', *Europe-Asia Studies,* 61:1 (2009), 109-140.

110 'Transnational interdependence across Eurasia presents risks for diverse actors with different demands for energy outcomes, yet the continuing transnational flows of capital from importers to exporters (in the absence of political reform) can exacerbate the very resource curse trends that deepen this diversity'. In Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative', page 454.

111 Keohane and Nye, *Power and Interdependence: World Politics in Transition*.

112 R. Murray, 'The Internationalisation of Capital and the Nation State', *New Left Review*, 67 (1971).

known as 'globalisation' was making headway, Murray noted that the expansion of the international economic order was starting to defy national borders. One of the implications was that the effectiveness of national policies aimed at regulating increasingly transnational economic activity was being challenged.

As proposed by Stoddard, territorial non-coincidence can also be applied to the context of EU-Russia relations[113], and this seems to be particularly true after the collapse of the Soviet Union. The concept alludes to the misalignment between the political, institutional and regulatory system on the one hand and the transnational energy system on the other hand. This misalignment generates tensions. Adjustments need to be designed to overcome these tensions, particularly when regulation in one country or bloc of countries changes – with the potential to generate repercussions externally – or where policy-makers deliberately overstep their jurisdiction's borders to achieve extraterritorial regulatory clout.

These notions echo Luttwak's (1990 and 1993) theory of 'geo-economics'[114], which however has different, more Realist, connotations.[115] Writing twenty years after Murray, Luttwak noted that countries and blocs of countries facilitate international trade but that – by virtue of their nature as territorial entities that are defined 'spatially' rather than 'functionally' – they do not ignore their own borders in crafting their commercial logics. The implication is that countries do not put forward regulation to achieve disinterestedly transnational purposes. Instead, they aim to maximise wealth within their own boundaries, unconcerned about whether this delivers suboptimal economic allocations in the transnational dimension. On the basis of this view, and given the growing importance of commerce, Luttwak sees economic regulation as a tool of statecraft that is gradually replacing military defence. According to Luttwak, 'geo-economics' is thus replacing 'geo-politics'. In other words, in the new context of transnational relations, countries and bloc of countries apply the logic of conflict[116] to commerce. In Clausewitzian

113 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

114 See E. Luttwak, 'From Geopolitics to Geo-economics: Logic of Conflict, Grammar of Commerce', *National Interest,* 20 (1990) and E. Luttwak, 'The Coming Global War for Economic Power: There are no Nice Guys on the Battlefield of Geoeconomics', *International Economy*, 7:5 (1993).

115 Luttwak's positions have been criticised by a number of scholars, cfr. for instance O'Tuathail: 'Upon closer examination, Luttwak's reasoning is merely an extension of the essentialist realist assumptions that had underpinned and legitimated Cold War militarism. Essentialist because they posit an absolute truth about States without regard to history, these realist assumptions held, as Luttwak put it, that states as spatial entities structured to jealously delimit their own territories, to assert their exclusive control within them, and variously to attempt to influence events beyond their borders, are inherently inclined to strive for relative advantage against like entities on the international scene, even if only by means other than force. As bureaucracies, states are, Luttwak claimed, "impelled by the bureaucratic urges of role-preservation and role-enhancement to acquire a 'geo-economic' substitute for their decaying geopolitical role." Conflict between states, as a consequence, is inevitable, though with the waning of the Cold War this conflict is more and more likely to be geo-economic rather than geopolitical in nature. Though appealing in its simplicity, Luttwak's thesis [...] is flawed both by its conceptualization of a transition from geopolitics to geo-economics and in its reliance on ahistorical and unjustified realist assumptions about the nature of states. Like Fukuyama's earlier opposition between economics and politics/strategy, Luttwak's opposition between geopolitics and geo-economics mischaracterizes a more complex reality. For a start, Cold War geopolitics was also about geoeconomics, the policy of Cold War militarism being closely associated with an international Pax Americana and the power of a domestic military-industrial complex. Geopolitics and geo-economics are not opposites but concepts entwined in each other'. In G. O'Tuathail, 'Introduction' in G. O'Tuathail et al, *The Geopolitics Reader* (London, 1998): Routledge, page 107.

116 'As such, its attributes include the typically warlike use of secrecy and deception for the sake of surprise (as, for example, when product standards are first defined in secret consultations with domestic producers, long before their public enunciation).' Luttwak quoted in O'Tuathail, *The Geopolitics Reader*, page 126.

terms, it could be said that this means that the 'logic of war' is applied to the 'grammar of commerce'.[117]

Stoddard agrees that States attempt to bend regulation to maximise economic benefits within their own borders and proposes an example that is not only very illustrative of this dynamic but also very much applicable to the subject of analysis of this book: importing States pushing for liberalisation in upstream markets to profit from lower prices for their own national consumers and/or enabling the maintenance of high taxes (and thus rents) downstream.[118]

The work by Goldthau and Sitter is also very rich in insights. Goldthau and Sitter make a distinction between various ways in which EU energy regulation relates to power.[119] Some regulatory measures are expression of 'normative power'. This happens when the EU uses regulation to establish and manage markets in ways that are neutral with regard to the specific interests of the EU in the energy sector. Essentially, the EU's approach in these cases is shaped by the overall approach to trade liberalisation, without specific targets and without discriminatory intents. Instead, there could be the benevolent intention of establishing an international system that is advantageous to all. In any case, Goldthau and Sitter argue that even this approach is not value neutral – as it is in any case shaped by the EU's liberal outlook – and that neutrality cannot be absolute. Other approaches by the EU in energy are expression of 'regulatory power'. The objective in this case is to favour the EU's interests by making use of regulation (including regulation implemented in the broader context of liberalisation). An exemption from Third Party Access aimed at favouring non-Russian pipelines would be an example. Finally, the EU could use its economic power in more direct ways to expand its political clout.[120]

We agree and stress that liberalisation can be regarded as having an inherent consumer bias regardless of the explicit intent of the player that is promoting it. In the context of EU-Russia gas relations, it is clear that the EU is the consumer. Therefore, EU gas market liberalization is a political process with an inherent bias towards the EU. It has certainly been increasingly perceived as such by Russia, in a context of growing distance between the EU and Russia in broad geopolitical terms but also in terms of ideas on how to organise society, the economy and gas trade.

This discussion can also be linked to core-periphery analyses that underline how economically advanced countries try to shape transnational economic governance to concentrate wealth within their own borders.[121] A scholar that thought along these lines with regard to the energy market is Mommer[122], who discussed the use of energy regulation to maximise rents and

117 E. Luttwak, 'From Geopolitics to Geo-economics: Logic of Conflict, Grammar of Commerce', *National Interest,* 20 (1990)

118 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

119 A. Goldthau and N. Sitter, 'Regulatory or Market Power Europe? EU Leadership Models for International Energy Governance' in J. Godzimirski, *New Political Economy of Energy in Europe: Power to Project, Power to Adapt* (London, 2018); A. Goldthau and N. Sitter, 'Soft Power with a Hard Edge: EU Policy Tools and Energy Security', *Review of International Political Economy*, 22:5 (2015), 941-965.

120 *Ibid.*

121 I. Wallerstein, 'The West, Capitalism, and the Modern World-System', *Review,* 15:4 (1992), 561-619.

122 B. Mommer, *The Governance of International Oil: Changing Rules of the Game* (Oxford, 2000): Oxford Institute for Energy Studies.

reflected upon the role of prices, which is very pertinent to this book. His work on oil markets contains very useful insights for our discussion on changing trade terms between the EU and Russia, which include contract renegotiations and modifications to pricing regimes. Mommer criticises the conventional assumption that the only two parties seeking to capture rents are the governments of resource-rich countries and the IOCs.[123] This neglects that governments of net importing countries or bloc of countries (like the EU) also play a key role in rent-capturing endeavours. He finds that competition is strategically about prices and it is at the strategic level that the governance structure of oil and gas has to be analysed. The governance structure establishes the rules of the game that are decisive in shaping the oil price level in the long term, to which the tactical rules of rent-capturing are actually subordinated. Mommer stresses that such governance structures have a history, as they are established at a time when a dominant player can exercise power (for instance, by importers in a buyers' market phase).[124] While the tactical game involves maximising benefits within the set of established rules, the strategic game aims at changing the rules themselves: all players will be seeking ways to bend governance in their favour. The longstanding bone of contention is that consuming countries deny the relevance of producing countries' claims to natural resource ownership. In spite of rising shares of NOC resource ownership, the trend of the last 30 years has been favouring the consuming countries, in the sense that their preferred governance structure has made significant inroads. However, there has been no convergence towards a universally accepted governance structure and also the EU and Russia are far from replacing the old consensus based on oil indexation and long-term contracts with an equally consensual formula. The fact that each governance structure delivers a price, and therefore different governance structures deliver different prices, is obvious to social scientists, but not to all economists. As Mommer stated in 2000 'economists tend to look at the problem the other way around: price is the outcome of demand and supply conditions in the market and the governance structure has simply to adapt to changes in these competitive market forces'.[125]

2.7 MILIEU SHAPING AND STRUCTURAL POWER

What we said in the previous sections lays the ground to understand why actors try to shape the nature of energy relations outside of their territorial jurisdiction. This discussion can be taken one step further by introducing the notions of milieu-shaping and structural power. As Hyde-Price[126] argues, regional powers strive to shape a benign international milieu to pursue their own economic and security interests. In doing so the EU will frame its intervention in broader terms as something that makes the environment 'safe for capital' (and therefore as the mere exertion of a Liberal State's economic functions) rather than in bluntly Realist terms. In the case of EU external energy policy, the pursuit of economic and security interests is simultaneous. As argued by Stoddard, 'promoting state economic functions and seeking to shape the regional milieu in Eurasia to ensure a reduced level of risk for market actors is a

123 *Ibid.*

124 *Ibid.*

125 *Ibid.* page 2.

126 A. Hyde-Price, 'A Tragic Actor? A Realist Perspective on Ethical Power Europe', *International Affairs*, 84:1 (2008), 29-44.

strategic priority for the EU member states and EU institutions and a clear example of the overlap, if not co-constitution, of economic and strategic security objectives in energy'.[127]

This discussion can be linked to Susan Strange's (1987 and 1988)[128] notion of 'structural power' – which can be found in EU's efforts to liberalize the gas market and project the policy on external actors by shaping the milieu by means of soft power. In Susan Strange, the material foundations of power are somehow secondary in the analysis. The form of power that is considered overriding is the one shaped through inter-subjective agreements that unlock resources where none previously existed. The most notable example is credit, an instrument of power that hinges on intangible yet absolutely real and crucial phenomena of 'credibility' and 'trust' (similar to the well-functioning of a gas hub). As argued by Randall Germain, 'credit is entirely about faith in a future that can be expected and/or predicted'.[129] This faith derives from relationships and structures. According to Strange structures and relationships matter more than physical endowments in economic relations. Along these lines, power can be understood at two levels: relational and structural. Relational power is the ability of A to get B to do something that B would not otherwise do. Structural power goes beyond, as it is the power to shape and determine the structures of the global political economy. Structural power is the ability to decide how things are discussed and done – according to Benjamin Cohen, the 'power to shape frameworks within which actors relate to each other'[130].

Susan Strange theorized that policies are shaped by four international structural powers – knowledge, production, finance and security – and operate within them.[131] The most significant added value of Susan Strange's work is to include knowledge and finance as essential elements of power, alongside elements recognised traditionally such as security or more materialist elements such as factors of production. Knowledge confers the power of setting the rules, adhering to them and maximising benefits within their boundaries. It includes for instance best practice transfers. Finance is becoming more and more important, particularly in energy market. According to a Marxian view echoed by Strange, capital is 'a commodity in itself'.[132] Indeed, what we see these days is that financial market transactions related to oil and gas have a value in excess of that of the actual global production level of hydrocarbons. While in the energy relation between the EU and Russia, the latter has substantial power in the security sphere and factors of production, the EU prevails both in terms of knowledge on how to set market rules and on how to maximise benefits by playing by the same rules and control of the financial sector.

As Stulberg stated, 'structural power theorists question the extent to which markets rule, and draw attention to the indirect mechanisms through which States can exert power over global outcomes. Some States rely on the second face of power controlling not only what other

127 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

128 S. Strange, 'The Persistent Myth of Lost Hegemony' in *International Organization*, 41: 4 (1987), 551-574; Strange, *States and Markets*.

129 R. Germain, *Susan Strange and the Future of Global Political Economy* (Abingdon-on-Thames, 2016): Routledge, page 4.

130 Strange, *States and Markets*, page 24.

131 Strange, 'The Persistent Myth of Lost Hegemony'.

132 Strange, 'The Persistent Myth of Lost Hegemony'.

States do but also what they want, by their sheer weight in deterritorialized markets and institutions, a preponderant State can skew material incentives and trigger policy adjustments from foreign targets merely by taking action at home'. Is this the case with gas market liberalization in the EU vis-à-vis Russia?[133]

133 A. Stulberg, *Well-Oiled Diplomacy: Strategic Manipulation and Russia's Energy Statecraft in Eurasia* (New York, 2007), State University of New York Press, page 20.

CHAPTER 3

NEW INSTITUTIONAL ECONOMICS (NIE) AND ITS APPLICABILITY TO THE RESEARCH QUESTIONS

CHAPTER 3 – NEW INSTITUTIONAL ECONOMICS (NIE) AND ITS APPLICABILITY TO THE RESEARCH QUESTIONS

3.1 GENERAL CONSIDERATIONS ON NEW INSTITUTIONAL ECONOMICS

The term 'New Institutional Economics' – coined by Oliver Williamson in 1975[134] – does not designate a single discipline with defined boundaries, but rather a group of disciplines potentially stretching as far as including Transaction Cost Economics, Evolutionary Economics, Property Right Studies, Constitutional Choice, New Institutional Economics of History, Collective Action Theory, Public Choice Theory and Economic Contract Theory, among others.[135] Some of these disciplines differ fundamentally from one another, including in their core assumptions.[136] Attempts have been made to define the common ground between these diverse disciplines. Richter identified three elements that bind them together: 1.) the assertion that institutions are crucial; 2.) the emphasis on the need to study the relationship between economic activity and the institutional and political environment and 3.) the application of economic analysis to the study of factors that determine the nature of institutions.[137] Aside from these common elements, many different approaches coexist within NIE and each discipline places the emphasis on different issues and variables.

Similarly to IPE (Chapter 2), NIE investigates the interrelation between economics and politics. At the basis of both IPE and NIE there is the recognition that institutions have key distributional effects and that political choices influence economic outcomes. This recognition is important when approaching the subject of analysis of this book: institutions retain a prominent role

134 The term has been coined by Oliver Williamson in 1975, cf. O. Williamson, *Market and Hierarchies: Analysis and Antitrust Implications, a Study in the Economics of Internal Organization* (New York, 1975): Free Press. His acceptation of the term was quite broad. Williamson himself made the study of transaction costs the core subject of his work. He later dubbed the discipline that ensued 'Transaction Cost Economics', which has become one of the most prolific branches of NIE.

135 This classification aggregates the various fields assigned by different editors of collective volumes on NIE published in the 1980s and 1990s, based on R. Richter, 'The New Institutional Economics, Its Start, Its Meaning, Its Prospects', *The European Business Organization Law Review*, 6 (2005).

136 Within NIE there are studies that diverge in some core assumptions – for instance perfect rationality of economic actors. Studies on property rights that are commonly considered integral part of NIE assume perfect rationality, in line with neoclassical economics – whereas most other NIE approaches, including Transaction Cost Economics and the New Institutional Economics of History, are rooted in a rejection of this assumption, which they replace with bounded rationality.

137 Richter, 'The New Institutional Economics, Its Start, Its Meaning, Its Prospects'.

even in liberalised markets, and European gas market liberalisation in particular heavily rests on detailed, pervading regulation (Correljé, 2016).[138]

It can also be said that NIE *de facto* extends the boundaries of 'economics' by including the social and legal norms that lie behind economic activity.[139] NIE thus marks a departure from neoclassical economics, which postulates a frictionless market-driven economy where social and legal norms only play a marginal role. On the other hand, unlike 'old institutionalism' (which refuses the excessively abstract constructs of neoclassical economics)[140],[141], NIE does not completely break away from neoclassical economics. NIE retains two important elements of neoclassical economics: methodological individualism[142] and the general principles of rational choice (although these principles are often relativized, for instance with the notion of 'bounded rationality'[143]).[144] NIE does not deny that neoclassical economics provides powerful explanatory tools for economic activity in perfect market conditions. However, NIE scholars believe that real-world economic activity does not always take place along the lines of perfect market functioning. In addition to bounded rationality, mentioned above, NIE has distinctive assumptions that differentiate it from neoclassical economics: opportunism, uncertainty and imperfect information.

138 Even in a liberalised market with gas-to-gas competition, it is an illusion to think that institutions do not have a primary role. Actually, there have been several examples in the last years of increased regulation and increased political conditioning, often as a reaction to market failures. De-regulation is not in sight. The new liberal gas market architecture that Europe has embraced rests on pervading regulation. As highlighted by Correljé (2016) "the evolution of the European natural gas policy creating a strongly regulated version of a 'well-functioning' gas market remains a highly politicized and instable experiment" – A. Correljé, 'The European Natural Gas Market', *Current Sustainable/Renewable Energy Report,* (2016): Springer. Experiences with Hinkley Point long-term price guarantees and the introduction of carbon price floors in the UK are examples that even one of the most liberalized markets of Europe (the UK) is partially backtracking and introducing elements of State control or at least of strong institutional/regulatory conditioning of energy choices.

139 Clague describes NIE as 'expanded economics', see C. Clague, *Institutions and Economic Development, Growth and Governance in Less-Developed and Post-Socialist Countries* (Baltimore, 1997): John Hopkins University Press.

140 A notorious rejection of the postulates of neoclassical economics is contained in Veblen's famous quote: "the hedonistic conception of man is that of a lightning calculator of pleasures and pains, who oscillates like a homogeneous globule of desire of happiness under the impulse of stimuli that shift him about the area, but leave him intact. He has neither antecedent nor consequent. He is an isolated, definitive human datum, in stable equilibrium except for the buffets of the impinging forces that displace him in one direction or another. Self-poised in elemental space, he spins symmetrically about his own spiritual axis until the parallelogram of forces bears down upon him, where-upon he follows the line of the resultant. When the force of the impact is spent, he comes to rest, a self-contained globule of desire as before. Spiritually, the hedonistic man is not a prime mover." – T. Veblen, 'Why is Economics not an Evolutionary Science?', *The Quarterly Journal of Economics*, 1898, quoted in C. Camic and G. Hodgson, *Essential Writings of Thorstein Veblen* (Abingdon-on-Thames, 2011): Routledge, page 154.

141 Fast-forwarding decades of debates around the issue of what distinguishes Old and New Institutionalism, cf. R. Langlois, 'What was Wrong with the Old Institutional Economics and What is Still Wrong with the New', *Review of Political Economy*, 1:3 (1989). A recent account of the differences between Old and New Institutionalism is found in Pereira et al (2018): "Institutionalism, which originates from the 'Old' (Original) Institutionalism [...], assumes the existence of various markets [...], with distinct and various modes of operation. It challenges the assumption of (perfect or imperfect) markets operating in accordance with a price system, therefore fully integrated (hence the idea of market economy, in the singular form). Also, it differs from the proposition that imperfections would be an exception to the rule (market failures), as viewed by mainstream economics and by its institutional trend, New Institutional Economics (NIE)." – A.J. Pereire at al, "The Market for the Old and New Institutional Economics", *Brazilian Journal of Political Economy*, 38:3 (2018).

142 For a discussion on methodological individualism as opposed to methodological holism, see Langlois, 'What was Wrong with the Old Institutional Economics and What is Still Wrong with the New'.

143 'Bounded rationality' implies that individuals act rationally from their own perspective, but their ability to understand reality and the implications of their choices is limited. "Bounded rationality arises because there is a finite limit to the amount of information the human brain can hold and process. [...] Bounded rationality casts doubt on the model of the economic consumer considering all possible alternatives and optimizing by choosing the most preferred option." – J. Black et al., *Oxford Dictionary of Economics* (Oxford, 2017): Oxford University Press.

144 P. Klein, *New Institutional Economics* (Athens-GA, 1999): University of Georgia.

What has been said points to the observation that, rather than conflicting with neoclassical economics, NIE can be regarded as complementary to it[145]: while neoclassical economics focusses on 'simple' or 'standard' market exchange[146], NIE aims to explain 'complex' market exchange. This is especially the case for Transaction Cost Economics (TCE), which criticises the idea that the market always delivers efficient economic outcomes. In particular, TCE questions the market's ability to efficiently allocate long-lead investments. In TCE, and NIE more broadly, the market is seen as *one* of the ways in which economic transactions can be organised, but not as the only one.

NIE sees the political-economic system as a collection of 'formal' and 'informal' institutions (the 'rules of the game') and organisations (the 'players' of the game), which are studied together with their interactions. Institutions are regarded as having at least a component of endogenous determination. The significant implication of this is that they are subject to systematic enquiry rather than being assumed away as exogenously 'given'[147]. The cause-effect relationship between institutions and economic performance is not univocal. In fact, NIE does not only use institutional design as a variable to assess economic performance: it also explains how institutions are shaped by the economic environment and other exogenous factors.

3.2 TRANSACTION COST ECONOMICS AND CONTRACT LITERATURE

First of all, the applicability of NIE to the subject of analysis of this book rests on the interpretation of gas trade mechanisms as 'institutional arrangements'[148] or, in other words, 'governance structures'[149]. Long-term contracts (LTCs) are regarded by NIE as a hybrid type of governance between spot market exchange and full vertical integration.

Within NIE, TCE devoted substantial attention to the study of market exchange and LTCs as alternative governance structures. LTCs emerge from the need of parties that undertake long-term transactions – characterised by recurrence, asset-specificity and uncertainty – to create a 'private order' that limits the negative effects of bounded rationality and opportunism in their pursuit of trade gains. LTCs are described by TCE as an instrument to reduce transaction costs in bilateral relationships in which relationship-specific investment takes place with complex arrangements that solve the *ex-post* hold-up problem (*infra*), in default of full vertical integration.

145 O. Williamson, 'The Lens of Contract: Private Ordering', *American Economic Review*.92:2 (2002), 438-443.

146 Williamson describes the market as the classic non-specific governance structure. According to the definition by Ben-Porath, the market is the structure where 'faceless buyers and sellers […] meet […] for an instant to exchange standardised goods at equilibrium prices'. In Y. Ben-Porath, 'The F-Connection: Families, Friends and Firms and the Organization of Exchange', *Population and Development Review*, 6:1 (1980), page 4.

147 It becomes clear here why it is so important to appreciate the possibility of endogenous change in institutions. Not appreciating endogenous change leads to believe that institutions are exogenously determined – and this clearly diminishes their importance as explanatory variables for political-economic dynamics (which is the main tenet of NIE).

148 The term 'institutional arrangements' is used by North in 1990 as opposed to 'institutional environment'. The 'institutional environment' is made up of the fundamental political, economic, social and legal institutions of a system – while institutional arrangements are circumscribed understandings (for example, an agreement between two organisations) – see D.C. North, *Institutions, Institutional Change and Economic Performance* (Cambridge, 1990): Cambridge University Press.

149 Williamson uses the term 'governance structures' and refers to Long-term Contracts (LTCs) as governance structures.

As we will see later in the text, TCE is not only concerned with this 'private order' but also by the 'public order' or 'institutional environment', the broader institutional framework within which economic transactions of different types take place.

The long-term gas contracts of the type that prevailed in Europe since the 1970s have been challenged in some of their core provisions by the gas market liberalisation process, and have changed substantially since around 2010. Moreover, larger gas volumes are now traded on the spot market. Williamson's early observations on what governance structures are better suited to certain transactions are relevant in the discussion on the implications of moving away from traditional LTCs and entrusting the market with an ever-increasing share of gas transactions. The same holds true for the findings of scholars that followed up on Williamson's seminal work of the 1970s.[150] A rich strand of contract literature has developed since this seminal work. Both Williamson's original findings and the ensuing contract literature are presented in the sections below.

Williamson's observations on LTCs

Williamson drew inspiration from principles that had been enunciated by Ronald Coase in 1937, notably the pioneering idea that firms are created because they can, under certain circumstances, decrease the 'transaction costs' that arise during the production and exchange of goods, capturing efficiencies that individuals are unable to capture.[151] Firms are thus a way to organise transactions outside the market, and not only the fundamental unit of production described by neoclassical economics. In Williamson's own words[152], Coase's main contribution was to introduce the idea that all economic phenomena can be studied by looking at their contractual dimension. In the 1970s, Williamson built on Coase's findings, which had remained on the back burner for four decades, placing additional emphasis on treating transactions as the basic unit of analysis.[153]

Under the perfect market conditions described by neoclassical economics, there are no transaction costs. Since, under such conditions, they are assumed to operate on the basis of perfect information, economic actors are able to set up contracts that can foresee all future eventualities and are easy to implement. In other words, with zero transaction costs, Williamson argues, there would be no need for economic organisation.[154] However, TCE finds that in real-world economic exchanges, as opposed to theoretical situations, information is not

150 O. Williamson, *Market and Hierarchies: Analysis and Antitrust Implications, a Study in the Economics of Internal Organization* (New York, 1975): Free Press and O. Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations', 22:2 (1979), *Journal of Law and Economics*, 233-261.

151 R.H. Coase, 'The Nature of the Firm', *Economica,* 4:16 (1937), 386-405

152 O. Williamson, 'New Institutional Economics', in C. Menard and M.M. Shirley (eds.), *Handbook of New Institutional Economics* (2005): Springer.

153 O. Williamson, *The Economic Institutions of Capitalism: Firms, Markets, Relational Contracting* (New York, 1985): Free Press; O. Williamson, 'Comparative Economic Organization: The Analysis of Discrete Structural Alternatives', *Administrative Science Quarterly*, 36:2 (1991), 269-296; O. Williamson, O., 'The Lens of Contract: Private Ordering', 92:2 (2002), *American Economic Review*; O. Williamson, 'The Economics of Governance', 95:2 (2005), *American Economic Review*.

154 Simple market exchange prevails when there are no transaction costs, or transaction costs are negligible: "To the degree that transaction costs are negligible, buying rather than making will normally be the most cost-effective means of procurement", cf. Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

perfect and transaction costs do exist. Special governance structures will thus have to replace standard market exchange when transaction-specific value is high.[155]

Salient characteristics of transactions

According to Williamson, transaction-specific governance structures have to be created to govern transactions that are recurrent, entail 'idiosyncratic' investment, and are conducted in a context of uncertainty.

Frequency is important because problems related to imperfect information (and the parties' ability to project future costs and benefits) begin to matter when an interaction is repeated or continuing because of the recurrent transaction costs, while they are less pressing in one-time transactions.

Secondly, Williamson argues that goods that are not specialised do not pose significant hazards because buyers can easily fall back on alternative suppliers and vice versa. However, in cases when the individuality of the parties affects costs significantly, conditions of 'non-marketability' can arise.[156]

Williamson (1983)[157] identified four dimensions of asset specificity: site specificity, present for instance when a resource is available in a location and transporting it is expensive; physical asset specificity, present for instance when a specialized machine is designed for a certain purpose; human asset specificity[158], present when individual skills are highly specialised; and dedicated assets, present when there is a discrete investment in a plant or infrastructure that cannot readily be put to work for other purposes. Malone et al. (1987)[159] made the addition of time specificity. An asset is time-specific if its value depends on its reaching the user within a specified and limited amount of time.

155 Why do transaction-specific governance structures replace standard market exchange sometimes? The assumption is that the objective of companies is that of economising (economsing on the sum of production and transaction costs). Economising on transaction costs can be described as "economising on bounded rationality while simultaneously safeguarding the transactions in question against the hazards of opportunism" – Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

156 Because the value of the capital is significantly lower in other applications than the specialised application for which it has been allocated, the supplier is locked into the transaction. The same holds true for the buyer: he cannot easily fall back on alternative supplies and transact on favourable terms because the cost of supplies from non-specialized capital is going to be high. Also the buyer, as a result, is locked into the transaction. – Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

157 O. Williamson, 'Credible Commitments: Using Hostages to Support Exchange', *The American Economic Review*, 73:4 (1983), 519-540.

158 Based on Polanyi, cf. M. Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy* (Abingdon-on-Thames, 1962): Routledge, Williamson emphasised the importance of transaction-specific investments in human capital. Specialized training and learning by doing are often key to many economic transactions. Polanyi's example of personal knowledge is notorious: "it is pathetic to watch the endless efforts to reproduce a single violin of the kind the half-literate Stradivarius turned out 200 years ago" (Polanyi, *Personal Knowledge: Towards a Post-Critical Philosophy*, page 55). Williamson further observed that familiarity allows to economise on communication. Sharing the same register is particularly key in the context of repeated transactions – Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'. Because the value of the capital is significantly lower in other applications than the specialised application for which it has been allocated, the supplier is locked into the transaction. The same holds true for the buyer: he cannot easily fall back on alternative supplies and transact on favourable terms because the cost of supplies from non-specialized capital is going to be high. Also the buyer, as a result, is locked into the transaction. – Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

159 T. Malone et al., 'Electronic Markets and Electronic Hierarchies', *Communications of the ACM,* 30:6 (1987), 484–497.

Transactions involving this type of goods are called 'idiosyncratic'. Contracts covering idiosyncratic activities have to solve problems arising from bounded rationality and opportunism[160]. Once an investment is made on assets that have no alternative use to the one for which they were earmarked, such investment will be 'sunk'. In default of special governance structures, this may lead to what Klein et al. (1978) described as a 'hold-up' situation[161]: perceiving a high risk of not being able to recoup the benefits of its investment, the investing party will be reluctant to invest, which can lead to inefficient investment levels. When there are idiosyncratic activities, spot exchange will fail to provide the right investment incentives, and the assurance of a long-lasting relation is necessary as a ground for investments.

Uncertainty also plays an important role. LTCs implemented in uncertain conditions make comprehensive contracting ('presentiation'[162]) pricey if not impossible. Not all future eventualities for which revisions are needed can be anticipated at the beginning. Moreover, it will only be clear what revisions are necessary when new circumstances occur. Flexibility is thus key. In contracts whose future payoffs depend on future states of the world ('state-contingent claims'), disputes are likely to arise[163] and, given that parties are assumed as opportunistic, it is difficult to establish whose claims should be believed.[164] Mechanisms for dispute settlement are thus also needed.

Possible types of contracts

Contracts help parties creating some order where there would otherwise be chaos.[165] According to Williamson, when transactions have some of the characteristics analysed above, there are a number of alternatives to classical contracting[166]: 1.) not engaging in transactions at all; 2.) organising transactions internally ('vertical integration'); 3.) organising transactions under alternative contracts, which maintain the trading element while at the same time adding an extra governance structure.

The study of these 'alternative contracts' (alternative to simple market exchange, or 'classical contracting', and to vertical integration[167]) is of great interest for TCE. When transactions are occasional and non-standardised, Williamson posits that there will be 'neoclassical contrac-

160 For standardised (non-idiosyncratic) transactions, players are sheltered from opportunism by their ability to switch to an alternative supplier. Bounded rationality poses lesser problems because market players can decide whether to continue a commercial relationship based on their own experience, and (owing to the standardised nature of the activity) can easily craft different arrangements.

161 B. Klein et al, 'Vertical Integration, Appropriate Rents and the Competitive Contracting Process', *Journal of Law and Economics*, 21:2 (1978), 297-326.

162 Presentiation is "comprehensive contracting whereby all relevant future contingencies pertaining to the supply of a good or service are described and discoutned with respect to both likelihood and futurity" - Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations', page 69.

163 Save for situations where change is unambiguous.

164 Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

165 N. Van der Beek, N., 'Long-term Contracts and Relational Contracts' in G. De Geest, *Contract Law and Economics* (Cheltenham, 2015): Edward Elgar Publishing.

166 In classical contracts, the identity of the parties is treated as irrelevant, the agreement is carefully delimited and remedies are narrowly prescribed. These are the three ways in which Williamson describes classical contracts as implementing 'discreteness' and 'presentiation'. Discrete transactions are those of an isolated character.

167 LTCs have been described as an 'intermediate organizational form somewhere in between vertical integration and short-term market-based trading' – A. Neumann and C. von Hirschhausen, 'Long-Term Contracts and Asset Specificity Revisited: An Empirical Analysis of Producer–Importer Relations in the Natural Gas Industry', *Review of Industrial Organisation,* 32 (2008), 131-143.

ting'[168]. The longer-term relationship begins to assume more importance in neoclassical contracting than in classical contracting, and relational tendencies develop. In these contracts, there are provisions that provide for the flexibility needed by the parties, whereas rigid planning tends to be avoided. Finally, unlike in classical contracting, third-party intervention (arbitration or litigation) is envisaged in case of disagreement. On the other hand, neoclassical contracting is different from the governance structure with the highest degree of transaction-specificity described below. The reason is that such governance structure entails high set-up costs, which the occasional transactions governed by neoclassical contracting would not allow to recover.

When transactions are not occasional but recurrent and non-standardised[169], there will be 'relational contracting'.[170] Contracts with higher duration and complexity are of a 'more thoroughly transaction-specific, ongoing administrative kind'[171] than all other contracts. In this type of LTCs, extra governance structures that limit opportunism and infuse confidence are paramount. In relational contracts, the commercial relationship between the parties assumes equal if not greater importance than the formal legal agreement.[172] The parties share benefits and burdens to a great extent. Besides, there is a more significant degree of interdependence than in other types of contracts.[173] According to Williamson, if the investment is completely idiosyncratic, there will be 'unified governance' such as joint ventures or mergers and acquisitions. If on the other hand the investment is mixed (only partly idiosyncratic), there will be 'bilateral governance'[174] (strategic alliance or partnering).

168 This is based on Ian Macneil's classification of Classical Contract Theory, Neoclassical Contract Theory and Relational Contract Theory – I.R. Macneil, 'Contracts: Adjustment of Long-Term Economic Relations Under Classical, Neoclassical and Relational Contract Law', *Northwestern University Law Review*, 72:6 (1974), 854-902.

169 Recurrent transactions can be conducted on spot markets if products are standardised, but not if there is idiosyncratic investment.

170 Ian Macneil had written about relational contracts before Williamson, and the latter had drawn inspiration from the former, although there are significant differences between their interpretations. As Mouzas and Blois pointed out, different scholars have studied contractual relations under different angles, and there is no univocal definition of what constitutes a relational contract. Mouzas and Blois distinguished the 'norms-based approach' from the organisational economists' study of incomplete contracts: "the 'norms-based approach' evolved out of the 'Relational Contract Theory' developed by Macneil. Macneil […] has challenged lawyers' traditional premise that all contracts are mere transactions. In particular he stressed the role of norms in determining the manner in which commercial exchanges operate in practice and introduced the concept that individual transactions lie on spectrum ranging from 'discrete' through to 'relational'. On the other hand, "the organizational economists' study of incomplete contracts recognizes that, absent vertical integration, some form of contract is needed between a supplier and a customer. However, such contracts will almost always be 'incomplete' because they contain some 'third-party unenforceable' elements. Such elements are described by economists as the relational elements of a contract and are those parts which help firms [circumvent obstacles to formal contracting]" – S. Mouzas and K. Blois, *Relational Contract Theory: Confirmations and Contradictions* (2008): University of Lancaster, Conference Paper, pages 1 and 2.

171 Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

172 Relational contracts have also been defined as complementary to legal contracts. Relational contracts can fill the gaps when legal contracts fail to efficiently foresee and regulate future contingencies. Relational contracts are quickly adapted to changes in the environment because they are not built on credible threats of legal enforceability, but rather on actions and expectations related to the continuation of the relationship. – cf. Van der Beek, 'Long-term Contracts and Relational Contracts'.

173 B. Colledge, 'Relational Contracting – Creating Value Beyond the Project', *Lean Construction Journal*, 2:1 (2005), 30-45.

174 "Although large numbers competition is frequently feasible at the initial award stage for recurring contracts of all kinds, idiosyncratic transactions are ones for which the relationship between buyer and supplier is quickly thereafter transformed into one of bilateral monopoly, on account of the transaction-specific costs referred to above" - Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations', page 241.

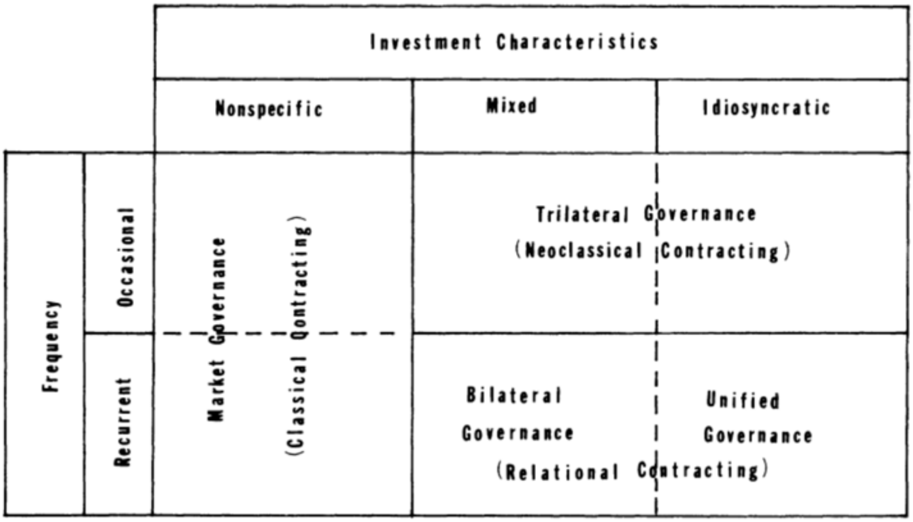


FIGURE 2: TYPES OF GOVERNANCE STRUCTURES DEPENDING ON TYPES OF TRANSACTIONS – WILLIAMSON, 1979

The rationale for having LTCs of a relational nature in energy markets is that they reduce the transaction costs linked to the uncertainty and asset specificity of investments found in the sector, and help mitigate issues related to counterpart credibility and opportunistic behaviour.[175] At the same time, Williamson argues that although certain types of transactions are better governed by certain governance structures, all governance structures are at least partially flawed.[176]

Similar to other NIE approaches, in TCE there is no assurance that institutions or governance structures are efficient, in part because they are seen as mirroring the interests of groups that have the power to alter the rules.[177] Also, choices do not necessarily result from a well-informed process of welfare maximisation. Instead, they often result from a process of bargaining between stakeholders. The resulting institutional arrangements, which take into consideration transaction costs and political constraints, are thus at least partly flawed. Williamson suggests that the concept of 'remediableness' should be applied to choices between alternative governance structures. Remediableness describes as presumably 'efficient' a practice or mode of organisation for which no superior practice or mode can be described, and executed with net gains. Yet this does not mean that the said practice or mode or organisation is the best possible ever, or that it is not at least partly flawed.[178]

175 Klein et al, 'Vertical Integration, Appropriate Rents and the Competitive Contracting Process'.

176 "According to [the lens of the contract approach] all feasible forms of organization are flawed. This […] is an immediate ramification of describing human actors as boundedly rational, which disallows omniscience, and given to subgoal pursuit (opportunism), which disallows benevolence. Upon recognizing implementation obstacles, moreover, omnipotence also drops out." – Williamson, 'New Institutional Economics', page 59.

177 D.C. North, Understanding the Process of Economic Change (Princeton, 2005): Princeton University Press.

178 Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

Williamson's contribution is not limited to explaining relations between types of transactions and types of contracts. His insights on how contractual relations evolve over time are also valuable. As mentioned, a significant degree of flexibility is needed in relational contracts because conditions are likely to change from the moment when the contract is originally signed. Both parties have a clear incentive to sustain the relation. At the same time, each party has access to a separate revenue stream, so it cannot be expected to always readily accept any modifications. Williamson notices that, as a general rule, quantity adjustments tend to be less contentious than price adjustments because there are less reasons to suspect that one party is trying to take advantage of the other. Exogenous factors can induce one party to require an increase or decrease in the exchanged quantities. Buyers do not have an incentive to go for alternative supplies (because these are faced with high setup costs) nor buy larger volumes than needed and divert favourably priced supplies to other users (because an idiosyncratic product is non-fungible across users). Similarly, the specialised character of the assets in question removes any potential incentive for the seller to withhold supply because better opportunities have arisen. Price adjustments are on the other hand more zero-sum than quantity adjustments, although not all price adjustments produce equally disruptive consequences. If requests to change the price relate to exogenous, relevant and verifiable events, they are less likely to disrupt the contractual relation. Another condition is that quantifiable cost consequences (from the price change) can be calculated. For instance, the request would entail little hazard if price relief were permitted by allowing pass-through according to a pre-determined formula.[179]

What has been said so far refers to the private ordering dimension of contracts, but TCE – including Williamson himself in some later studies – is not only interested in the 'play of the game' but also in the 'rules of the game', i.e. the 'public ordering' that creates a framework within which companies find arrangements among themselves or with the host government (Spiller, 2008 and Henisz and Zelner, 2005) [180] For any 'science of contract', it is equally important to look at both 'public ordering' and 'private ordering'.

The gas contracts that were signed in the 1970s between the Soviet Union and Western European countries share many features with the relational contracts described by Williamson. For starters, gas sales were clearly meant to be recurrent rather than one-off transactions. European buyers needed steady supply and the Soviets needed a steady flow of revenue. Secondly, gas trade from the Soviet Union to Europe entailed a significant degree of idiosyncratic investment. For starters, as will be discussed in more detail in Chapter 5, upstream investment on Western Siberian gas fields was idiosyncratic. That investment was hinging on the gasification of Western European economies. An investment of that scale would not have

179 Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

180 P.T. Spiller, *An Institutional Theory of Public Contracts: Regulatory Implications* (Cambridge-MA, 2008): National Bureau of Economic Research and W. Henisz and B.A. Zelner, 'Legitimacy, Interest Group Pressures, and Change in Emergent Institutions: The Case of Foreign Investors and Host Country Governments', *Academy of Management Review*, 30:2 (2005).

been allocated to supply the USSR and Warsaw Pact countries only.[181] Investment on trunk pipelines from Siberia to Western Europe was even more markedly idiosyncratic. Unlike destination clause free LNG, pipeline supplies have a point-to-point nature. They need to see trade flows over many years to be paid back and cannot be easily converted to another use, nor physically moved to connect different trading parties. Another relational element, which will again be explored in more detail in Chapter 5, is that long-term gas contracts included complex risk allocation mechanisms that allowed the parties to share benefits and burdens and maintain a consensus. Besides, the contracts were endowed with flexibility (in the form of take-or-pay provisions and clauses for renegotiations). In Chapter 5, we will show how the unprecedented scale of price renegotiations in the 2010s challenged relational contracts and put a strain on relations between Gazprom and some European importers, in line with Williamson's observations. Finally, what we have said about the 'public ordering' dimension gives central stage to the rules of the game designed by the EU (in this case, gas market liberalisation) alongside individual choices by companies, and the notion of 'remediableness' is useful because it accounts for the possibility of change in governance structures. All this suggests that TCE is a powerful lens of investigation for the changing gas trade terms between Russia and the EU.

Literature on LTCs after Williamson

Williamson's original observations on LTCs have been operationalised, complemented and in some cases criticised by a number of studies since the late 1970s. A vast empirical literature supports the proposition that actors select organisational forms and contractual terms to achieve efficient adaptation and transaction cost minimisation.[182] The strategic importance of LTCs was first extensively studied in the field of industrial organisation by Klein, Crawford and Alchian (1978), who – as mentioned in the previous section – devoted special attention to hold-up problems.[183]

Soon after the establishment of TCE, it became clear that the discipline could be fruitfully applied to energy, and gas in particular, given the high degree of asset-specific investments found in the sector. Masten and Crocker applied a TCE framework to gas LTCs in 1985[184], focussing on the role of take-or-play clauses. They observed that the incentive to provide flexibility was a key consideration in designing contract terms, and that the inclusion of take-or-pay provisions essentially had an efficiency motivation.[185] The flexibility provided by take-or-pay clauses is important because it averts contract violations and thus expensive renegotiations of the contractual terms.

181 See "The creation of the gas bridge [between Western Europe and Russia] in an economy that was largely closed to the outside world was motivated by the need to develop the vast discoveries of gas in West Siberia." in Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 5 and "For the Soviets, countertrade was the key to the entire development of West Siberia's gas reserves: no Western pipe and equipment and finance, no West Siberian gas." In Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 70.

182 S. Ruester, 'Changing Contract Structures in the International Liquefied Natural Gas Market : A First Empirical Analysis', *Revue d'Economie Industrielle*, 127 (2009), 89-112.

183 Klein et al, 'Vertical Integration, Appropriate Rents and the Competitive Contracting Process'.

184 S. Masten and K. Crocker, 'Efficient Adaptation in Long-term Contracts: Take-or-Pay Provisions for Natural Gas', *The American Economic Review*, 75:5 (1985), 1083-1093.

185 Take obligations induce purchasers to release output to alternative uses only when it is efficient to do so, cf. Masten and Crocker, 'Efficient Adaptation in Long-term Contracts: Take-or-Pay Provisions for Natural Gas'.

Joskow (1985) conducted an important empirical study on the American coal industry with the intention to test the 'predictions' of transaction cost theory. The test held positive results. The author found that spot trade accounted for a small portion of coal transactions for electric utilities and that, for utilities in general, LTCs were the most favoured governance structure. Joskow found the framework of transaction cost theory to be a powerful instrument to improve the understanding of the nature of vertical supply relationships between power plant owners and their coal suppliers.[186] Joskow's study on coal production in the US empirically proved TCE's notion that the trading parties ink longer-term commitments when asset- or site-specific dedicated investments are allocated.

Parsons (1989) conducted a study in which he quantified the strategic value of long-term gas contracts, whereas most of the previous studies had been qualitative or theoretical. Parsons used a quantitative model to demonstrate how LTCs mitigate strategic problems which arise in imperfect or incomplete markets. While the use of LTCs makes capital investments contingent upon negotiation results, spot contracts are negotiated after an irreversible capital investment. By making long-term investments contingent upon the results of negotiations, firms have two advantages relative to competitors that engage in 'speculative' investments: a.) they gain the information on demand that is revealed in a market price and b.) they acquire the ability to negotiate a higher sale price for their products, by avoiding an obsolescing bargaining problem. Parsons found that spot prices tend to be biased downwards as a result of a loss of bargaining power by suppliers. LTCs increase the efficiency of capital investment decisions both by means of the information they yield and because the firm assumes its investment's marginal value. Parsons also made important findings with regard to the conditions under which the strategic value of long-term contracting changes over time. In the US Midwest, the growing number of buyers to which a seller could route gas had significantly diminished the strategic value of LTCs. To the contrary, when the number of buyers remained limited, such as in New England, traditional long-term take-or-pay contracts retained a higher strategic value. Finally, Parsons observed that the strategic value of contracts also depends on the cost structure of gas fields. In general, the strategic importance of the contract diminishes with proportion of costs that must be incurred before a spot negotiation.[187]

In 1993, Pirrong studied contracting practices in bulk shipping. The author focussed on external factors such as the structure of the market and the level of specialisation of the vessels to explain the diversity of observed governance forms. Pirrong observed that spot exchange is chosen when there is no bilateral dependency relationship. Conversely, forward contracts are chosen when there is remarkable temporal specificity. In default of the possibility to integrate vertically, LTCs are the organisational solution that allows to minimise transaction costs in a shipping market that is specialised, and has remarkable contractual and temporal specificity.[188]

186 Joskow, P., 'Vertical Integration and Long-Term Contracts: the Case of Coal Burning Electric Generating Plants', *Journal of Law, Economics and Organization*, 1:1 (1985), 33-80.

187 J. Parsons, 'Estimating the Strategic Value of Long-Term Forward Purchase Contracts Using Auction Models', *The Journal of Finance*, 44:4 (1989), 981-1010.

188 S.C. Pirrong, 'Contracting Practices in Bulk Shipping Markets: A Transactions Cost Explanation', *Journal of Law and Economics*, 36:2 (1993), 937-976.

Analysing coal supply contracts, Saussier's (1999)[189] empirical study proved that the duration of contracts reflects the objective to minimise transaction costs. Saussier also found that duration increases with the amount of appropriable quasi-rents at stake[190] and decreases with the level of uncertainty.[191] Kerkvliet and Shogren (2001) empirically proved a positive relationship between asset-specific investments and contract duration, and observed that contract duration decreases with rising trading and market experience.[192]

An important contribution criticising and complementing Williamsonian literature is offered by Hodgson (2004)[193], who showed that opportunism is not such a stringent condition for long-term contracting: even in default of strong opportunism, the other conditions identified by TCE are sufficient grounds on which the choice to organise transactions may fall on long-term contracts.

Apart from Williamson's seminal work, relational contracts were one of the forms of organising transactions studied by Ring (1992) and Ring and Van de Ven (1994).[194] They argued that different combinations of business risk and confidence induce the parties to a transaction to choose between four organisations: occasional, recurrent, relational and hierarchical. In conditions of low risk and low confidence, the transaction will be occasional – or, in other words, performed in the open market. In conditions of high risk and low confidence, the transaction will be hierarchical. With low risk and high confidence, the transaction will be classified as recurrent. Relational control will take place when a transaction involves high risk but also a high level of confidence.

Campbell and Harris (1993)[195] also applied Williamson's theoretical framework to explain the parties' behaviour in long-term contracts. Campbell and Harris notably showed that the parties to a long-term contract want to preserve and develop the relationship as long as a number of conditions are met: confidence needs to be intact; the usefulness of the business relationship needs to be superior to what can be offered by others; and both parties need to keep on investing in the relationship.[196]

189 S. Saussier, "Transaction Cost Economics and Contract Duration: An Empirical Analysis of EDF Coal Contracts", *Louvain Economic Review*, 65:1 (1999), 3-21.

190 The temporary gain that a factor of production earns by virtue of a temporary limitation of its supply.

191 A summary of Saussier's work is offered in Ruester, 'Changing Contract Structures in the International Liquefied Natural Gas Market : A First Empirical Analysis'.

192 J. Kerkvliet and J.F. Shogren, 'The Determinants of Coal Contract Duration for the Powder River Basin', *Journal of Institutional and Theoretical Economics*, 157:4 (2001), 608-622.

193 G. Hodgson, 'Opportunism is Not the Only Reason Why Firms Exist: Why an Explanatory Emphasis on Opportunism may Mislead Management Strategy', *Industrial and Corporate Change*, 13:2 (2004), 401-418.

194 P.S. Ring, 'Structuring Cooperative Relationships Between Organizations', *Strategic Management Journal*, 13:7 (1992), 483-498 and P.S. Ring and A.H. Van de Ven, 'Developmental Processes of Cooperative Interorganizational Relationships', *The Academy of Management Review,* 19:1 (1994), 90-118.

195 D.Campbell and D. Harris, 'Flexibility in Long-term Contractual Relationships: The Role of Cooperation', *Journal of Law and Society*, 20:2 (1993), 166-191.

196 Cf. also T. Roxenhall and P. Ghauri, 'Use of the Written Contract in Long-lasting Business Relationships', *Industrial Marketing Management*, 33:3 (2004), 261-268.

Grossmann and Hart (1986) developed the notion of incomplete contracts as a theoretical response to TCE[197] and a new strand of literature ensued, emphasising that real-world contracts have gaps and missing provisions and their role is that of minimizing *ex-ante* investment distortions rather than that of providing sufficient investments and inexpensive *ex-post* renegotiations (as put forward by TCE).[198] Hart and Moore (1988) observed that, when crafting a new contract, it is difficult to foresee all future contingencies: the contracting parties will thus end up inking a highly incomplete agreement. The parties can compensate this lack of completeness by including a review mechanism. However, the forms that review mechanisms can take are limited. When a contract is supposed to facilitate trade between economic actors that have to allocate asset-specific investment, it is difficult to implement the first-best even if their claims are verifiable, and the second-best often involves underinvestment.[199] The energy industry nicely fits Grossman and Hart's (1988) view that underinvestment dominates unless residual control rights[200] can be assigned to an international oil and gas company, or third party, where renegotiation breaks down. Aghion and Quesada (2010)[201] found that incomplete contract theory is well-suited to explain the unique role of the State in petroleum contracts, indicating that parties will often include renegotiation clauses and essentially structure contracts in short-term phases (two or three years). Chung (1991)[202] and Aghion et al. (1994)[203] discussed how the initial contract can offer incentives by influencing the bargaining position related to certain investments. In particular, Aghion et al. found that an important way to avoid the holdup problem is through renegotiation design. Renegotiation occupies a central position in the theory of incomplete contracts.

Edlin and Reichelstein (1996) found that, when investments are selfish, the first-best is achieved by contracting on the foreseen optimal quantity at the initial stage, allowing for subsequent renegotiation.[204] Segal and Whinston (2002) showed that renegotiation is necessary to ensure ex-post efficiency.[205] Saussier (1999) investigated the relationship between features of certain transactions and the level of completeness of French coal contracts. He proved that contracts are more complete when the level of specific investments is higher and less complete when uncertainty is lower.[206] Writing about climate treaties and externalities, Harstad (2012) found that "in order to encourage investments, the optimal contract is more ambitious if it is short term, and it is tougher to satisfy close to its expiration date and for players with small investment costs. If renegotiation is possible, such an incomplete contract

197 S. Grossman and O.D. Hart, 'The Cost and Benefit of Ownership: A Theory of Lateral and Vertical Integration', *Journal of Political Economy*, 94:4 (1986), 691-719.

198 S. Saussier, S., 'When Incomplete Contract Theory Meets Transaction Cost Economics: A Test on Contractual Choice' in C. Menard, *Institutions, Contracts and Organizations* (Cheltenham, 2000): Edward Elgar Publishing.

199 O.D. Hart and J. Moore, 'Incomplete Contracts and Renegotiation', *Econometrica*, 56 (1988), 755–785.

200 Residual control rights are the rights to make decisions on the use of an asset that a contract does not explicitly assign to another party.

201 P. Aghion and L. Quesada, 'Petroleum Contracts: What Does Contract Theory Tell Us?', in W. Hogan and F. Sturzenegger, *The Natural Resource Trap* (2010): MIT Press.

202 T.Y. Chung, 'Incomplete Contracts, Specific Investment, and Risk Sharing', *Review of Economic Studies*, 58 (1991), 1031–1042.

203 P. Aghion et al. 'Renegotiation Design with Unverifiable Information', Econometrica, 62 (1994), 257–28.

204 A. Edlin, S. Reichelstein, 'Holdups, Standard Breach Remedies, and Optimal Investment', *The American Economic Review*, 86:3 (1996), 478-501.

205 I. Segal and M.D. Whinston, 'The Mirrlees Approach to Mechanism Design with Renegotiation (with Applications to Hold-up and Risk Sharing)', *Econometrica,* 70:1 (2002), 1-45.

206 Saussier, 'Transaction Cost Economics and Contract Duration: An Empirical Analysis of EDF Coal Contracts'.

implements the first-best".[207] Godlewski's and Sanditov's (2020) work exposes important institutional (and legal) implications that follow in case of contracting under asymmetric information. Drawing from the abovementioned literature on incomplete contracts, the authors agreed that renegotiation emerges as an ex-post remedy to the incompleteness of the initial contract. However, because renegotiation is expensive – owing to transaction costs, coordination costs, legal costs, and so on – making the right renegotiation decision remains challenging. They found that network-central (better informed) lenders have a positive influence on the renegotiation process. They did not find support for the claim that central lenders can write more complete, renegotiation-proof contracts at origination. On the other hand, they found that better access to information, greater experience, reputation and trust increase the likelihood of renegotiation, as well as the number of rounds and of amended terms. They also highlighted the crucial role of legal and institutional environments for renegotiation, and found that weaker legal protection decreases trust for renegotiation.[208] Conversely, Herweg and Schmidts (2012) proposed a theory of ex-post inefficient renegotiation, based on loss aversion.[209] The authors observed that when two economic operators sign an LTC that needs to be renegotiated given changed market circumstances, they take the LTCs as a reference point and they compare the gains and the losses implied by the renegotiation. The authors showed that loss aversion makes the renegotiated outcome difficult to agree on and inefficient, explaining why economic actors often refrain from crafting mutually beneficial LTCs in favour of a strict allocation of ownership rights to protect relationship-specific investments.[210]

Renegotiations can also take place between governments and private operators (on opportunism, see more below). In particular, Guasch (2004) studied how governments that want to act opportunistically vis-à-vis private operators with sunk costs and obsolescing bargain can do so by unilaterally renegotiate concession agreements.[211] In turn, private operators that secured concessions could insist on contract renegotiation to seek more favourable term or use regulatory capture[212]. The private operator's leverage in negotiations and ability to renegotiate are increased by its superior access to market information relative to the government.

Literature on LTCs has also reflected on the role of energy contracts for welfare. Apart from making sense from an investor's perspective, as argued above, LTCs have also been found to carry benefits for consumers by increasing competition and reducing opportunities for collusion if compared to spot contracting (Allaz and Vila, 1993)[213]. The rationale is that, at each contracting stage, oligopolist suppliers lock additional volumes in LTCs to avert competition. Volumes traded on the spot are thus low, and so is the incentive to withhold

207 B. Harstad, 'Climate Contracts: A Game of Emission, Negotiations, and Renegotiatons', *Review of Economic Studies*, 79 (2012), 1527-1557.

208 C. Godlewski and B. Sanditov, *Private Debt Renegotiation and Financial Institutions' Network* (Strasbourg, 2020): Laboratoire de Recherche en Gestion et Economie, Université de Strasbourg.

209 F. Herweg and C. Schmidt, *Loss Aversion and Ex Post Inefficient Renegotiation* (Munich, 2012): CESifo Working Papers.

210 *Ibid.*

211 J.L. Guasch, *Granting and Renegotiating Infrastructure Concessions* (Washington-DC, 2004): World Bank.

212 Regulatory capture occurs when the regulator is co-opted by particular interests and starts favouring the corporations that it is supposed to regulate neutrally.

213 B. Allaz and J.L. Vila, 'Cournot Competition, Forward Markets and Efficiency', *Journal of Economic Theory*, 59:1 (1993), 9-16.

supply. The lower the incentive to reduce supply, the lower the spot price. Since low spot prices are anticipated, LTCs will also be signed at lower prices. Allaz and Vila argued that if producers could collude not to sign LTCs, they would capture higher rents. Because a firm could obtain advantages by engaging in contracts before selling on the spot, all market players engage in contracting and, as a result, competition among suppliers increases and prices tend to decrease.[214]

After receding in the 1990s, the debate on the role of LTCs both in terms of welfare and security of supply was revamped by European gas market liberalisation – which was threatening their importance.[215]

With regard to security of supply, the two most relevant aspects are the need for LTCs for timely investments to avert future shortages and the guarantee of delivery offered by LTCs. According to Helm (2002)[216], the market liberal idea that security of supply can be guaranteed by price spikes that signal scarcity and thus attract supply misses the point because the notion of security of supply should take into account the need to have relatively stable and predictable prices. Helm clearly linked the newly emerged security of supply challenges to market liberalisation and its impact on contracting: "The opening up of retail markets to full competition broke the link between long-term sunk investments and the guarantee of cost recovery from customers […]. Financial markets will not be in a position to hedge efficiently longer-term contract risks […]. A crucial fact for energy policy is that transparent, liquid futures markets do not exist for anything like the timeframe over which price risk may need to be hedged […] There is a core contracting problem in energy markets."[217]

The debate between those arguing that liberalisation does not expose importing countries to supply risks and those arguing that liberalisation is incompatible with long-term supply security[218] has continued until today. When it comes to LTCs, an intermediate position between those who defend their key security of supply role and those who believe that well-functioning spot markets can deliver security of supply more effectively is one that advocates a portfolio approach with a mix between LTCs and spot exchange. These issues will be covered more in depth in the next chapters of this book.

With regard to welfare, in 2005 Onofri showed how LTCs in energy can prevent double marginalisation[219] in the short term. Neuhoff and Von Hirschhausen made important observations with regard to the relation between the rationale for LTCs and gas demand elasticity in the short and long term – shedding additional light on the question as to what

214 *Ibid.*

215 Neumann and Von Hirschhausen, 'Long-Term Contracts and Asset Specificity Revisited: An Empirical Analysis of Producer–Importer Relations in the Natural Gas Industry'.

216 D. Helm, 'Energy Policy: Security of Supply, Sustainability and Competition', *Energy Policy*, 30:3 (2002), 173-184.

217 *Ibid.*

218 Cf. D. Helm, *Towards an Energy Policy* (Oxford, 2002): Oxera Press.

219 Firms with market power set prices above marginal costs, triggering a loss of welfare. This is aggravated (whereby the term double marginalisation) when a firm with market power buys a product from another firm with market power that operates in a different segment of the value chain. With LTCs or vertical integration this aggravation is limited.

extent LTCs profit gas suppliers or consumers.[220] Neuhoff's and Von Hirschhausen's analysis was rooted in the observation that gas demand is relatively inelastic in the short-term but is more elastic in the long term, as users can resort to alternative energy carriers only after having converted their appliances. In default of LTCs, gas would be sold on the spot market, and thanks to low short-term demand elasticity, oligopolistic producers would be able to charge higher prices. In the longer term, this would however discourage gas demand, hurting gas sales and therefore the producer's business itself. From this perspective, oligopolistic producers might prefer LTCs because these contracts allow them to defend the long-term role of gas as an energy carrier.

Neuhoff and Von Hirschhausen also analysed strategic behaviour. In the short term, strategic producers are known to be able to play value-over-volume tactics[221]. These pose a clear trade-off between value (price) and volume. If producers sell at least part of their volumes under LTCs, the total value gain (from price increases of volumes sold on the spot market) is lower than if they sell everything on the spot. In default of expected high value gains, strategic producers selling gas under LTCs will thus be less ready to incur volume losses, and would sell larger volumes at competitive prices.[222] Bushnell (2007)[223] and Willem and De Corte (2008)[224] also found that LTCs limit the incentives to manipulate spot prices and increase traded volumes, particularly when supply concentration is limited.

In the long term, LTCs encourage asset-specific investments with long pay-back time. This can contribute to keeping marginal costs of production and spot prices at a lower level. As expressed by Hauteclocque and Glachant, in this way LTCs contribute to market building when spot prices are volatile.[225] LTCs also arguably provide information about future production capabilities and costs. Neuhoff and Von Hirschhausen notably observe that without LTCs, producing-exporting countries would have an incentive to overstate their future production capability to keep demand in importing countries high and competing investments low.[226] If actual production were to be lower than announced, producing countries would then benefit from higher prices. To the contrary, if all the volumes were locked in LTCs, suppliers would have the strongest incentive to produce all contracted amounts, because otherwise they would have to purchase gas on the spot (in what would then be a tight market) in order to honour their long-term commitments. Finally, if importers act on time with forward-looking strategy, long-term contracting can also favour supply diversification, thus further precluding the

220 K. Neuhoff, and C. Von Hirschhausen, *Long-term vs Short-term Contracts: A European Perspective on Natural Gas* (Cambridge, 2005): Cambridge Working Paper, 2005.

221 Decreasing supply until the loss of revenue originated by such supply decrease would equal the gain originating from the ensuing price increase.

222 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

223 J. Bushnell, J., 'Oligopoly Equilibria in Electricity Contract Markets', *Journal of Regulatory Economics*, 32 (2007), 225-245.

224 B. Willem and E. De Corte, 'Market Power Mitigation by Regulating Contract Portfolio Risk', *Energy Policy*, 36:10 (2008), 3787-3796.

225 A. De Hauteclocque and J.M. Glachant, *Long-term Energy Supply Contracts in European Competition Policy: Fuzzy not Crazy* (Florence, 2009): EUI/RSCAS Working Papers.

226 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

exertion of market power.[227] The only way to make frontier projects[228] viable is often to sign LTCs upfront.

Writing in 2005, Neuhoff and Von Hirschhausen anticipated that LTCs would remain an important component of the European gas market architecture. Their expectation was that even if liberalisation and an increase in short-term transactions would temporarily reduce the scope for LTCs, these would make a comeback because of cyclical dynamics whereby incumbents – wary of higher prices – would at some point be willing to re-engage in LTCs.[229]

In a later study[230], Neumann and Von Hirschhausen showed that contract duration was diminishing over time, in line with the predictions of transaction cost theory that growing maturity of transportation infrastructure and higher competition would lead to such an outcome[231]. The main factors identified by Neumann and Von Hirschhausen were decreasing capital intensity, especially in LNG, the lower asset-specificity of gas investments, from upstream to downstream, and the development of spot markets with a higher number of participants. The notion that a decrease in asset specificity lowers the efficiency gains brought by long-term contracting was already put forward by Doane and Spulber (1994).[232] Along similar lines, Hartley and Brito (2001) demonstrated that the duration of LTCs is likely to diminish when: a.) capital expenditures are decreasing, b.) the discount rate is increasing; c.) transport costs are falling; d.) there is a larger number of players in the market.[233]

The notion that LTCs lead to competition and lower prices was challenged by a number of studies. The most recurrent arguments are that LTCs can have anti-competitive foreclosure effects when competition is imperfect (Aghion and Bolton, 1987[234], Rasmusen et al., 1991[235], Fumagalli and Motta, 2006[236]) and that LTCs facilitate collusion among oligopolistic producers

227 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

228 Projects that are either in remote regions or technically difficult.

229 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

230 Neumann and Von Hirschhausen, 'Long-Term Contracts and Asset Specificity Revisited: An Empirical Analysis of Producer–Importer Relations in the Natural Gas Industry'.

231 On the basis of the observation that, under these conditions, the importance of LTCs as investment incentives would diminish.

232 M.J. Doane and D.F. Spulber, 'Open Access and the Evolution of the US Spot Market for Natural Gas', *Journal of Law and Economics*, 37:2 (1994), 477-517.

233 P.R. Hartley and D. Brito, *New Energy Technologies in the Natural Gas Sectors* (2001): The James A. Baker III Institute for Public Policy, 2001.

234 In 1987, Aghion and Bolton argued that buyers can sign inefficient LTCs with the aim to reduce the size of the market for a potential entrant, which in turn prevents market entry – with the result that other buyers will be forced to pay a higher prices subsequently – P. Aghion and P. Bolton, 'Contracts as a Barrier to Entry', *American Economic Review*, 77:3 (1987), 388-401.

235 In 1991, Rasmussen et al. showed how an incumbent monopolist can take advantage of its customers' disunity and use LTCs for market foreclosure. An incumbent monopolist will make this attempt if it is able to secure a higher profit than the amount that it has to give to its customers as a compensation for their exclusion from an alternative supplier. – E.B. Rasmusen et al 'Naked Exclusion', *American Economic Review*, 81:5 (1991), 1137-1145.

236 Fumagalli and Motta built on the abovementioned literature on the anti-competitive effects of exclusionary contracts, but added that the scope to use exclusionary contracts to deter competition depends on how competitive downstream markets are. They found that sufficiently intense competition among buyers downstream hampers the incumbent monopolist's plans to use exclusionary contracts to deter entry – C. Fumagalli and M. Motta, 'Exclusive Dealing and Entry, When Buyers Compete', The American Economic Review, 96:3 (2006), 785-795.

(Le Coq, 2004[237]; Liski and Montero, 2006).[238] Mahenc and Selanié (2004) argued that producers with long-term positions can keep prices high by buying their own production ahead. Neumann and Von Hirschhausen – who had acknowledged some of the merits of LTCs – also pointed out that when spot prices fall much below contract prices, producers are pushed to renegotiate LTCs in a liberalised market. Producers are thus threatened by important losses due to price reduction on their entire output, so they have a strong incentive to retain high spot prices to avoid that low spot prices feed through to their contract prices.[239]

With gas market liberalisation, the compatibility of LTCs with emerging EU Energy Law started to be questioned. In its Energy Sector enquiries[240], the European Commission scrutinised LTCs for their potential market foreclosure effect, stating that under certain market conditions they compound the dominance of incumbent companies and market concentration.[241] The European Commission particularly took issue with the very long duration of LTCs and destination clauses. The enquiries also contested that because of their high degree of flexibility[242], LTCs discourage hub exchange, thereby depressing hub liquidity. From the perspective of proponents of market liberalisation, this is detrimental to welfare because well-functioning hubs improve transparency on supply and demand as well as production costs, and liquid trade among numerous suppliers reduces chances of abuse of market power.[243]

As the debate evolved, it became increasingly clear that it was difficult to make generalisations about the impact of LTCs on European welfare, as such impact very much depends on different conditions. As showed by Bonasina et al. (2007)[244], Smeers (2009)[245] and Hauteclocque and Glachant (2009)[246], results of modelling of market power depend very much on what assumptions are included[247], with the result that there cannot be firm and universally valid policy recommendations on how to treat LTCs from an antitrust perspective. It was also observed that it is difficult for antitrust bodies to make a distinction between legitimate scarcity rents and market power (Fraser, 2003).[248]

237 Le Coq shows that in case of repeated interactions on the spot market, LTCs help sustaining collusion on the spot market, although collusion is not the only motive behind decisions by companies, which are primarily interested in hedging – C. Le Coq, *Long-term Supply Contracts and Collusion in the Electricity Market* (2004), SSE/EFI Working Paper Series in Economics and Finance.

238 "Contrary to the pro-competitive results of finite-horizon models, we find that the possibility of forward trading allows firms to sustain collusive profits that otherwise would not be possible to achieve"- M. Liski and J.P. Montero, 'Forward Trading and Collusion in Oligopoly', *Journal of Economic Theory*, 131 (2006), page 220.

239 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

240 *Energy Sector Inquiry*, Issue Paper, European Commission, DG Competition, Version of 15 November 2005.

241 "LTCs can have similar effects [to vertical integration] if they result in effective foreclosure of key inputs. LTCs can also foreclose access to customers" (Energy Sector Inquiry) - *Energy Sector Inquiry.*

242 In particular because of the gulf between Annual Contracted Quantities (ACQs) and Minimum Contracted Quantities (MCQs)/Take-or-Pay (ToP) thresolds, often as low as 70-75% of the ACQ.

243 De Hauteclocque and Glachant, 'Long-term Energy Supply Contracts in European Competition Policy: Fuzzy not Crazy'.

244 M. Bonasina et al, *Imperfectly Competitive Contract Markets for Electricity* (Milan, 2007): IEFE.

245 Y. Smeers, 'How Well can One Measure Market Power in Restructured Electricity Systems?' in J.M Glachant and F. Leveque (eds.), *Electricity Reform in Europe: Towards a Single Energy Market* (Cheltenham, 2009): Edward Edgar.

246 De Hauteclocque and Glachant, 'Long-term Energy Supply Contracts in European Competition Policy: Fuzzy not Crazy'.

247 Especially whether a Cournot competition or a Bertrand competition is assumed.

248 P. Fraser, *Power Generation Investment in Electricity Markets* (Paris, 2003): OECD/IEA.

In 2009, Hautecloque and Glachant observed that LTCs help decrease transaction costs and benefit welfare under some conditions, while reinforcing the collective dominance of incumbents and creating foreclosure in other conditions. The welfare effect of LTCs depends on numerous variables, including different levels of risk, market fundamentals, gas storage options, the architecture of the gas market and especially the role and market positioning of contracting parties.[249]

As will be shown in Chapter 5, the idea that regulation should strike a balance between stimulating investments and precluding the detrimental effects of LTCs on gas-to-gas competition started to gain traction as a compromise between the opposed factions, comprising of those wishing a dismantlement or a substantial downsizing of LTCs and those defending their role, with a lot of intermediate positions in the middle. Yet, the debate on the future of long-term contracts continues. Their recent transformations, discussed in detail in Chapter 6, are raising fundamental questions, such as whether LTCs may be 'increasingly less necessary' and whether they may be 'dying out'.[250],[251] The proponents of these arguments often corroborate it with the observation that the number of new LTCs signed by European importers has been decreasing in the last decade.[252]

249 De Hauteclocque and Glachant, 'Long-term Energy Supply Contracts in European Competition Policy: Fuzzy not Crazy'.

250 I. Conti, *Surviving without gas Long-term Contracts: at Which Price? The 'Gas Supply' Perspective* (Florence, 2017): Florence School of Regulation.

251 The issue of the future of LTCs has recently been revamped by the Quo Vadis study: "until the end of the 2000s, natural gas trading in continental Europe had been built on long term commodity and capacity contracts […] a discussion of the current and future role of LTCs on the EU gas wholesale market is necessary to formulate a vision about the future of the IGM [Internal Gas Market]". In the same study, doubts are expressed as to whether LTCs are not in the process of evolving towards arrangements that should rather be called 'multi-year' contracts. The study portrays a future in which LTCs are substantially downsized: "mid-term (3-10 years) commodity contracts are likely to remain part of the EU's gas wholesale trading structure up to at least the mid-2030s. Contract size is difficult to forecast because of the conflicting interest of sellers and buyers. We expect a portfolio of contracts with different duration and different volumetric and price risk profiles to replace single LTCs". In *Quo Vadis EU Gas Market Regulatory Framework – Study on a Gas Market Design for Europe,* pages 72 and 77.

252 Long-term Contract Database by Cedigaz.

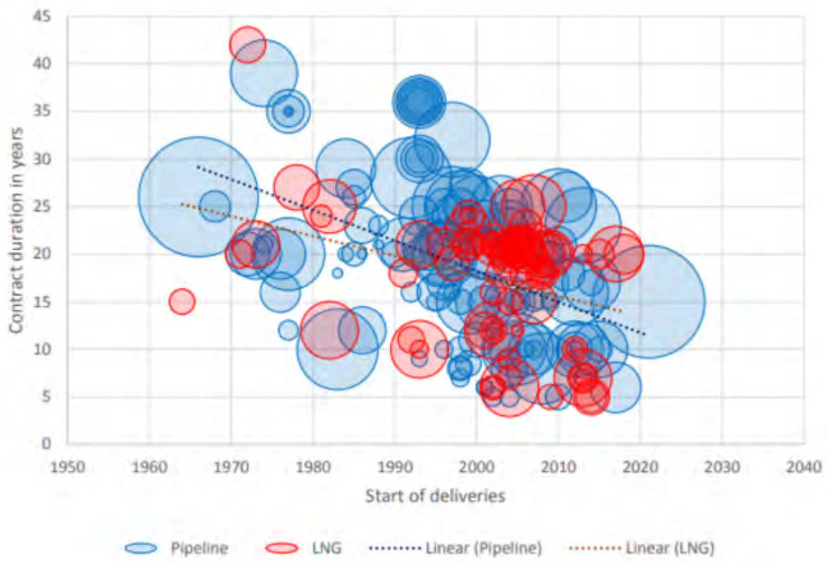


FIGURE 3: CONTRACT DURATION FOR START-UP YEAR OF DELIVERY – QUO VADIS, 2018

Moreover, LTCs seem to be less and less linked to investment on European gas infrastructure, also because investment on capital-intensive infrastructure has generally been paid back and the costs to realise new – relatively small – infrastructure within Europe is usually socialised and regulated on a cost-plus basis. These questions are triggering a debate on the prospective implications of the end of LTCs in terms of TSO tariffs[253], hub liquidity[254] and security of supply[255].

This discussion leads us to the second dimension of LTCs that is dealt with in this book. The recognition of the presence of a further dimension rests on the observation that EU-Russia gas trade has rarely been a mere private business. In this vein, long-term import contracts have not simply been elements of private ordering between companies. There have been and there still are political entities on the sending and receiving sides of gas trade, and these entities perceive gas as a strategically important commodity – either for security of supply (in the case of Europe) or for security of demand (in the case of Russia). As a result, the debate on LTCs also carries a clear public policy, if not geopolitical, component. Since their signature in the 1970s, LTCs have not only represented 'governance structures' or, to use North's wording[256], 'institutional arrangements', but also the cornerstone of the 'institutional environment' in which gas is traded, something that was not addressed by Williamsonian literature as such.

253 Lower import volumes may negatively affect TSO returns, forcing TSOs to increase tariffs.

254 Hub liquidity and cross-hub convergence might be negatively impacted by the end of LTCs because large reduntant volumes from LTCs are now exchanged on the hubs, contributing to their liqudity. In future, local market conditions might filter through to prices more powerfully than today.

255 For the discussion of the role of LTCs for security of supply, see Helm, 'Energy Policy: security of supply, sustainability and competition'.

256 North, 'Institutions, Institutional Change and Economic Performance'.

Albeit proving flexible throughout the decades, the architecture of long-term gas contracts was rooted in the economic and political organisation of the time when investments on fields, pipelines and distribution networks were first allocated (Chapter 5). In turn, the architecture of LTCs has influenced the organisation of gas markets. LTCs have traditionally mirrored and cemented consensus between importers and exporters. For decades, there was the perception that risk was allocated 'fairly' across borders. LTCs have represented the fundamental governance structure underpinning cross-border partnerships that have kept the EU-Russia dialogue running in times when it was difficult to mediate through official political channels.[257] LTCs have also represented the backbone of European gas security of supply for decades. Resilient and widely respected norms and practices have been built around this architecture, and contract sanctity has never been questioned by neither side – even at the height of geopolitical tensions between the EU and Russia.

The transition triggered by EU gas market liberalisation – which, as said, has challenged the identity and rationale of LTCs – will have an impact not only on bilateral trade between energy companies, but also on the 'institutional environment' in which gas trade is conducted. The transformation of gas trade modes between Europe and Russia can thus be studied as 'institutional change'.

3.3 INSTITUTIONAL CHANGE

So far, we have discussed how NIE – and TCE in particular – can help analyse the economic ramifications of governance choices, notably between entering LTCs or entrusting transactions to the market. In this section, we will consider whether NIE can also contribute to identifying factors that cause (or hamper) changes in the institutional environment. More specifically, we ponder if NIE provides useful leads to answer one of our three main research questions – whether the transition to hub pricing and short-term trade is still in flux, or whether a new stable *status quo* has been reached. In the next paragraphs we expose the reasons why it is legitimate (and timely) to raise this question.

The EU gas market has witnessed significant institutional change, which has in turn produced a deep transformation of the institutional environment in which Russia and the EU conduct gas trade. The departure from vertical integration, demand aggregation, destination clauses, oil indexation and the 'original' LTCs (as they were designed in the 1970s) has triggered a noteworthy redistribution of risk across the value chain, the introduction of new ways of trading gas, the disappearance of old governance structures and the emergence of new market players.

The full extent and implications of these transformations cannot be entirely grasped as of yet – also because gas market conditions, which crucially impact the vulnerability of the various players, can and will change. This is casting doubts on the survival of governance structures (e.g. LTCs) and organisations (e.g. midstreamers) that used to play a central role in the old architecture of gas trade but that are challenged in the new one.

257 This is what Skalamera (2016) calls the 'hidden level' of governance. Cf. M. Skalamera, 'Invisible but not Indivisible: Russia, the European Union, and the Importance of Hidden Governance', *Energy Research and Social Science*, 12 (2016), 27-49.

Additional factors of indecision and uncertainty stem from the lack of testing of the new architecture under conditions of market tightness and the dissatisfaction expressed by a number of stakeholders with regard to the *status quo*. The profusion of policy proposals formulated in recent years – ranging from targeted interventions proposed by the 'Quo Vadis' study to more encompassing measures considered by early versions of the Energy Union policy framework[258] and controversial initiatives aimed at extending the EU's regulatory reach to offshore pipelines[259] – reflect the fluidity of the current state of affairs.

In particular, the plan of applying Third Party Access (TPA) requirements to new Russian pipelines could be linked to the objective of persuading Russia to revoke Gazprom's monopoly on pipeline exports. The idea is also present in 'Quo Vadis', where there are scenarios modelling what would change if three Russian suppliers exported gas to Europe rather than only one.[260] As we will see, Gazprom's export monopoly is closely linked to the role that Gazprom plays within the Russian domestic market. Revoking it might require deeper institutional changes within the Russian gas sector itself. Regardless of Europe's ambitions of triggering Russian export liberalization, gas sector reforms have been discussed for years within Russia based on an honest debate on what would be better for the country's welfare. The country has already taken some significant steps to increase market-based mechanisms.

Our hypothesis is that the concepts of path dependence and institutional complementarity could be fruitfully employed in discussing the feasibility of market liberal reforms on the Russian side of the border, the compatibility of Gazprom's and more broadly of Russia's governance with the new EU gas trade architecture, and the impact of two different gas governance models[261] in the EU and Russia on relations.

NIE studies have demonstrated the embeddedness of economic institutions in values, ideas, social norms and political regimes. Based on this, critical NIE studies have warned against attempts to transfer institutions from one social, economic and political context to another, in the hope that they will always be effective regardless of the context. The implication for our research is the observation that – before promoting institutional change in Russia's gas sector – it needs to be established whether the proposed changes are compatible with the other institutions in place in the country.

Literature on institutional change is relevant because all these questions can be related to the debate on whether further adjustments in governance (including potentially the demise of LTCs or the end of Gazprom's export monopoly) is unavoidable and what shape these adjustments could take.

258 Such as the proposal to establish a single buyer entity for natural gas imports into the EU, the request that the European Commission should gain access to confidential information related to long-term gas contracts and calls to step up political engagement with new prospective pipeline suppliers in the Caucasus, the Caspian region and the Middle East as well as both LNG exporters and importers around the world.

259 Including the European Commission's attempt to obtain a mandate to negotiate an ad hoc legal regime for Nord Stream 2 and the proposed amendments to the 2009 Gas Directive which would extend the application of the Third Energy Package to the territorial waters of EU Member States.

260 *Quo Vadis EU Gas Market Regulatory Framework – Study on a Gas Market Design for Europe.*

261 The former being based on discrete market transactions and the latter largely on vertical integration and relational contracting.

NIE's view that the way in which economic transactions are governed is the product of a certain phase and circumstances (including changing interests) is a powerful ground on which to refuse eschatological and dogmatic market liberal views that the adoption of free market paradigms is an unavoidable and desirable end result for every society or economy. NIE shows that – although there is significant inertia to change – reforms are reversible and backtracking on liberalization is actually possible if conditions change.

To summarise, the most important open questions that need to be tackled are: a.) have we reached a new institutional equilibrium in the European gas market?; b.) is the new governance reversible, and under what conditions?; c.) will we see similar institutional changes in the Russian gas markets?

NIE and sociological institutionalism offer valuable insights on why there is significant resistance to change institutions and on why it is difficult to only change some aspects of governance without changing others. It also offers insights on dynamics that lead to project institutional change onto other countries (in other words, cross-border institutional transfer). The key concepts in this respect are path dependence, institutional complementarity and governance inseparability. They will be introduced here only in general terms, as they will be applied to the subject throughout the book.

Path dependence and institutions

The notion of *path dependence* can be extended from technologies to institutions.[262] Four main factors that lead to path dependence can be identified: 1.) large set-up costs (pointing to the fact that the cost of setting up a new institution is higher than the cost of maintaining an already existing one); 2.) the necessity of going through a learning process for both organisations and individuals that act within the institution; 3.) network effects (institutional rules are reinforced through complementary activities by various organisations) and 4.) adaptive expectations (the more organisations follow certain rules, the more others will be certain of the expected behaviour, and thus respect and obey the organisation and, ultimately, the institutional environment as a whole).[263]

Path dependence allows to make a number of considerations with regard to institutions, including that: 1.) there are many possible institutional arrangements – the failure to shift to a different institution is not necessarily rooted in the lack of alternatives, but in institutional restraints related to path dependences; 2.) the institutions of our time and geography are not necessarily the 'best' in absolute terms – one of the implications being that due to high political and economic transaction costs, inefficient institutions may persist for long periods of time[264][265]; 3.) small differences in institutions at an early stage can lead to big differences subsequently ('non-ergodicity'); 4.) there tends to be lock-in, so institutional change is, generally speaking, difficult.[266]

262 North, *Institutions, Institutional Change and Economic Performance*.

263 Presentation by M. Lockwood, *New Institutional Economics* (2012): University of Exter.

264 North, *Institutions, Institutional Change and Economic Performance*.

265 Richter, 'The New Institutional Economics, Its Start, Its Meaning, Its Prospects'.

266 Lockwood, *New Institutional Economics.*

In energy, as argued by Unruh[267], there is a powerful 'technical-industrial complex' that propagates path dependencies. Numerous elements concur to inertia in energy systems: specialised skills in business practices; the preference for investment in incremental adaptations within a known trajectory and compatible to the extant business model rather than revolutionary changes; presence of complementary underlying assets; financial risk aversion; presence of specific institutions engaged in self-survival endeavours; and laws that protect incumbents.

The best-known ways out of the inertia determined by path dependence are: a.) technological changes (which can also be seen as changes in relative costs), b.) social change (social movements calling for change); c.) exogenous change (for instance what the EU was trying to achieve in the Russian energy sector by promoting the Energy Charter).[268]

Institutional complementarity

Another approach, also useful to study the subject of analysis, is that of Aoki. He criticised the Northian approach for paying too much attention to conscious designs. Instead, Aoki defined institutions from a game theoretical perspective. Institutions according to Aoki are a "self-sustaining system of shared beliefs about a salient way in which the game is repeatedly played".[269]

In 2001, Aoki exposed the existence of 'institutional complementarities', dynamics of interdependence whereby institutions tend to hang together in systems, making it difficult to change one institution without changing other institutions at the same time.

In Aoki's institutional complementarity model there are two institutional fields (A and B), and two groups of agents (C and D). The type of institution established in field A influences the outcomes of the actions undertaken in field B, and vice versa.

It is assumed that agents in field A are able to choose between option A1 and option A2, and that agents in field B can choose from either B1 or B2. The model assumes that the agents have the same payoff functions $ui = u(i \in C)$ – for agent C in field A – or $vj = v(j \in D)$ for agent D in field B. We can say that there is institutional complementarity when the following 'supermodular' conditions are met within the system:

$$U\ (A1;B1) - u\ (A2;B1) \geq u\ (A1;B2) - u\ (A2;B2)$$

$$U\ (B2;A2) - u\ (B1;A2) \geq u\ (B2;A1) - u\ (B1;A1)$$

The first condition entails that the incremental payoff from opting for A1 instead of A2 is higher if the institutional environment is B1 rather than B2. The second condition entails that the incremental payoff from opting for B2 instead of B1 is higher if the institutional

267 G. Unruh, 'Understanding Carbon Lock-in', *Energy Policy*, 28 (2000), 817-830.

268 Lockwood, *New Institutional Economics.*

269 M. Aoki, *Toward a Comparative Institutional Analysis* (Cambridge-MA, 2001): MIT.

environment is A2 rather than A1. The fundamental implication is that agents in both fields need to take into account which rule is institutionalized in the other field. In other words, there are two Nash equilibria in the system assumed by the model: 'A1; B1' and 'A2; B2'. When such multiple equilibria exist, 'A1;B1', as well as 'A2;B2' are institutional complements.

An implication is also that an institutional arrangement could be Pareto suboptimal to the other, but history determines which type of institutional arrangement is likely to emerge, with the consequence that suboptimal outcomes are possible. If for some historical reason A1 is chosen in domain A and becomes an institutional environment for domain B, agents operating in B will have to choose B1 owing to institutional complementarity even if they are aware that institutional arrangement A1;B1 is Pareto-suboptimal.

Institutional complementarity is employed to: 1.) show how institutions are interdependent; 2.) elucidate the extent of institutional diversity across socio-economic systems and 3.) explain why introducing new institutions into a system can lead to unintended consequences and imbalances. The concept of institutional complementarity has notably been embraced in the discussion about varieties of capitalism, where it is employed to conclude that, given path dependencies and complementarities, individual measures may work in a model but not in another.[270]

Locatelli (2014) has applied the concept of institutional complementarity to EU-Russia gas relations by highlighting how these relations are being increasingly impacted by the confrontation of two different organizational and institutional models – integrated in different environments on the two sides of the border. She uses this framework to stress that Russian gas reforms mimicking unbundling and a complete break-up of vertical integration as implemented in the EU have never been credible because of their incompatibility with Russia's institutional environment.[271]

Governance inseparability

A concept that is closely related to institutional complementarity is that of governance inseparability, elaborated by Argyres and Libeskind in 1998.[272] While rooted in the school of Transaction Cost Economics (TCE), Argyres and Liebeskind took issue with TCE's focus on isolated transactions. [273] More specifically, they argued that characteristics of isolated transactions can be insufficient to explain the boundaries of a firm – the central research question in TCE. Their argument was mainly grounded on the observation that the governance of existing transactions, but also of new transactions in which firms seek to engage, is profoundly influenced by the governance of other transactions in which the firm is already engaged. This is referred to as the governance inseparability of transactions.

270 Lockwood, *New Institutional Economics.*

271 C. Locatelli, 'The Russian Gas Industry: Challenges to the Gazprom Model', *Post-Communist Economies,* 26:1 (2014), 53-66.

272 N. Argyres and J.P. Liebeskind, 'Contractual Commitments, Bargaining Power, and Governance Inseparability: Incorporating History into Transaction Cost Theory', *Academy of Management Review,* 24:1 (1998), 49-63.

273 Transaction Cost Economics says that transactions with certain characteristics are better governed by some types of organizational arrangements (or governance structures) than others. In particular, firms are formed to govern transactions that would otherwise be governed by free market exchange when there is a high degree of uncertainty, and when there is asset indivisibility or specificity.

There are two main factors behind governance inseparability: contractual commitments and changes in bargaining power. Contractual commitments engender governance inseparability because they are costly if not impossible to overturn. As a result, a firm's array of outstanding contractual commitments is likely to drastically restrict its governance options in the future. Sometimes there is also governance inseparability due to a firm division's contractual commitments towards another division of the same firm.

As regards bargaining power, parties (suppliers or buyers, for instance) can use unanticipated increases in their leverage to induce a firm to adopt mechanisms that are not in the latter's interest. A condition for this to happen is that the bargaining power increases unexpectedly. In gas, the relative bargaining power of Europe and Russia has changed drastically when shale gas production boomed in the US, abundant flexible Qatari LNG became available on global markets, and European gas demand subdued owing to weak economic performance and competition from coal and renewables. This conjunction of factors created a strong buyers' market in Europe – a propitious moment for the EU and European importers to successfully impose new conditions on Russia.

On a number of circumstances, governance inseparability may obligate a firm to use an existing governance framework even when that transaction would be more efficiently governed by other means. This entails that governance inseparability may compel the firm to suboptimal governance in some cases. The notions of applying criteria of optimal performance to Gazprom and suggesting EU-style reforms – on grounds that these would be in Gazprom's interest – tend to neglect the wider, specific context in which Gazprom operates. Not everything is captured by efficiency criteria developed in (and applied to) Western Europe.

Another important implication for the case of Russian gas market liberalization is that according to Argyres and Liebeskind governance inseparability makes it more difficult for a firm to increase (or reduce) its scope.[274] This could entail that it might be impossible for Gazprom – given its governance structure rooted in choices made years ago – to now leave a number of transactions to be governed by the free market, even if the company were willing to try.

Two additional concepts originated from the theory of governance inseparability introduced by Argyres and Liebeskind appear applicable to the study of Gazprom: self-bonding and social contracting. Self-bonding takes place when a firm invests in firm-specific assets whose value can only be recouped if the firm then adopts certain market behaviours. For instance, the question could be raised as to whether Gazprom would have allocated speculative, high-cost investment for the development of new fields in the Yamal peninsula should it have known that value protection via market partitioning and foreclosure in the EU would become untenable after the implementation of EU reforms. The answer to this question is likely to influence our predictions on Gazprom's future investment patterns. With regard to the social contract, it is well known that Gazprom is bound by unwritten social rules in Russia and its

274 N. Argyres and J.P. Liebeskind, 'Contractual Commitments, Bargaining Power, and Governance Inseparability: Incorporating History into Transaction Cost Theory'

neighbourhood, and by the social role that it has traditionally played in Russia, where gas is largely seen as a public good. Whenever it is exploring new business opportunities (and with them, potentially, new governance structures), Gazprom is bound to take into account the social implications that these would have.

Governance inseparability can also tell something about strategic behaviour – for instance, the exertion of market power. The main message is that as firms become constrained over time, their strategic flexibility is greatly reduced. This could be used to explain Gazprom's relative acquiescence in altering gas trade terms with European counterparts that do not look favourable for the firm. Argyres and Liebeskind also noted that 'older firms tend to be more encumbered with past commitments, constraining their ability to switch or differentiate their internal governance mechanisms'.[275] Although Gazprom has been established as a company in the 1990s, it inherited the Soviet Ministry of Energy's portfolio made up of some old legacy fields and pipelines. Overall, governance inseparability could explain limits to changes within Gazprom.

Logic of appropriateness

As mentioned in previous sections, the EU has not made a secret of its willingness to trigger gas market reform in Russia. One of the research questions discussed in this book is whether the transformations envisaged by EU gas market reforms can be considered an example of neoliberal institutional transfer attempt. Another question is whether this attempt will be successful, and what consequences it will produce. The notion of 'logic of appropriateness' complements concepts already discussed, and sheds further light on resistance to institutional change and on what conditions are required for change to occur.

NIE reminds us of the importance of social values as grounds for the development and enforcement of norms. As argued by Belyi, who has specifically discussed logic of appropriateness in the context of EU-Russia gas relations, social values confer legitimacy to norms and determine their acceptance by agents. [276] A widespread acceptance of extant norms is indeed a fundamental prerequisite in a system of economic governability. Institutions are in fact only effective when there is a sufficient degree of acceptance of norms – in other words, when norms are 'internalized' by agents. This concept is captured by the notion of 'logic of appropriateness'.[277]

This notion also implies that new norms and practices are better transferred onto other agents without subjecting them to coercive power, but rather by intervening at the level of social values. External influence can contribute to altering social values in another country, but this process usually takes time. Soft power is an important tool for an entity that aims at transferring its economic model across a border, while it is difficult for an entity to simply impose a system of economic governance to another if values remain incompatible. If the

275 N. Argyres and J.P. Liebeskind, 'Contractual Commitments, Bargaining Power, and Governance Inseparability: Incorporating History into Transaction Cost Theory'

276 Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations.*

277 J. March and J. Olsen, *The Logic of Appropriateness* (Oxford: 2009), The Oxford Handbook of Public Policy.

institutional transfer is not accompanied by social adhesion to norms, the resulting institutions will be challenged by many agents and they will thus be ineffective.

Some organizations and networks have an important role in stimulating internalization of norms by other agents. In particular, 'epistemic communities' have been found to play a key role in framing cross-border normative paradigms. These communities comprise of expert and business circles (think-tankers, academia, journalists, influencers, analysts, advisors, workshop goers etc.) who develop transnational norms in a 'horizontal' or 'bottom-up'. Epistemic communities[278] lay the groundwork for the acceptance of norms. This builds on the transnational governance theory of Keohane and Nye – scholars who had stressed the importance of governance, rather than governments, in international relations.[279]

Belyi observes that a number of elements of horizontal governance are present in the oil and gas industries. Horizontally developed norms that have acquired special importance are those related to pricing and dispute settlement – which are key in our discussion on changes in gas trade terms between the EU and Russia. As Belyi puts it, 'the idea of a more fluid market has been pushed by an increasing number of producers, consumer companies and national oil companies worldwide in both producing and consuming States. Epistemic communities have contributed to trading practices, and some traders have directly contributed to the formation of norms. A transnational market has evolved since the 1980s and has created a set of related practices and norms'.[280]

Belyi also regards investment dispute settlement mechanisms as transnational norms. Applying Susan Strange's judgments about the constant condition of tension between States and markets, Belyi observes that, while States intervene in markets and occasionally deny rights to investors, the existence of norms of investment protection acts in turn as a constraint on State sovereignty.[281] After the Second World War and the movement of decolonisation, Western governments made efforts to promote transnational norms for investment protection to support the interests of their oil and gas companies, threatened by expropriation and nationalisation. From this perspective, transnational norms for investment protection can thus be seen – at least historically – as an instrument of Western energy diplomacy.

The Arbitration Institute of the Stockholm Chamber of Commerce is an important component of this architecture, being the institution of last resort for the guarantee of contract sanctity. Its importance in settling contract disputes between Gazprom and EU importers is well known. More recently, the Arbitration Institute has been adjudicating in disputes between Russia and Ukraine on supply and transit contracts.

278 First defined in P. Haas, 'Introduction: Epistemic Communities and International Policy Coordination', International Organization, 46:1 (1992), 1-35.

279 J.S. Nye and R.O. Keohane, 'Transnational Relations and World Politics: an Introduction', International Organization, 25:3 (1971), 329-349.

280 Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations.*

281 *Ibid.*

Except for confronting the decision by the Arbitration panel in a recent case[282], Russia has generally displayed strong commitment towards verdicts and transnational norms[283], although opposing Western normative dominance at both a rhetorical and diplomatic level.

The influence of transnational norms has been growing in international gas markets. Western neoliberal paradigms are being propagated by epistemic communities and are dominant in the international gas discourse. These paradigms are also making concrete inroads, for instance by inspiring gas market reforms in Northeast Asia. As we will see, some stakeholders in Russia may be receptive to the neoliberal paradigms promoted by the EU in the gas sector. Moreover, epistemic communities have continued exchange between the EU and Russia – even when official political channels were frozen. However, it would be counterproductive for the EU to attempt to impose reforms. New norms would need to be internalized by agents in Russia and therefore they would need to be aligned with social values in that country.

Against this background of Western dominance, it is useful to take into account alternative views, although not necessarily to fully embrace them. These critical views expose the shortcomings of neoliberal paradigms. A particularly relevant critique to neoliberal institutional transfers is offered by Chang.[284] The scholar puts forward three caveats: 1.) even if an institution fosters growth when implemented in a certain dosage, it may encumber economic growth when implemented in a larger dosage. For example, while a certain degree of property rights protection is conductive to investments and growth, an excessive protection of property rights may actually suffocate growth; 2.) the same institution in the same dosage may be good for one country but bad for another; 3.) even in the same dosage and country, the same institution may promote growth in one phase (of economic development, or of a market cycle) but not in another. Chang also argues that 'the supposed evidence showing the superiority of liberalized institutions relies too much on cross-section econometric studies, which suffer from defective concepts, flawed measurements and heterogeneous samples'. [285]

As we have mentioned in our chapter on social science's applicability, institutional quality is difficult to be captured by quantitative variables. Chang contends that these parameters are often elaborated by institutions with biases towards market liberalism and Anglo-Saxon economic institutions. For this reason, they often do not attempt to investigate whether institutions that fail to fit into a market liberal narrative may promote prosperity growth. [286]

With regard to sample heterogeneity, Chang finds that econometric studies propagating the prevalent discourse on institutions and economic development acritically assume that the same kind of relationship exists across countries. Differences in the relationship entail that the

282 In April 2018, for the first time, Russia raised doubts on the competence and impartiality of the arbitration panel when this concluded that Gazprom should pay 4.5 billion to Naftogaz for failing to honour ship-or-pay cluases in the transit contract – potentially marking a worrisome departure from Russia's track record of leaving verdicts undisputed, including cases of clearly unfavourable verdicts.

283 Russia has respected contract sanctity and either paid compensations or adapted its behaviour when found in breach of rules, demonstrating commitment towards transnational norms, cf. Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations.*

284 H.J. Chang, 'Institutions and Economic Development: Theory, Policy and History', *Journal of Institutional Economics*, 7:4 (2011), 473-498.

285 Chang, 'Institutions and Economic Development: Theory, Policy and History'

286 *Ibid.*

homogeneity condition – in statistical terms – is not met, which makes the indicators unstable and the results sensitive to the sample. The dominant discourse has a poor understanding of changes in institutions, with the implication that the discourse is overly optimistic or pessimistic about the feasibility of institutional reform. On the one hand, we find the extreme voluntarism of the Global Standards Institution school, which has confidence in that institutions can be transformed easily along standard best practices, provided that there is political will. On the other hand, there is the extreme fatalism of the climate-culture school – which denies that certain countries will ever develop efficient institutions. Neither extreme should be applied to our subject of analysis. Following the first school would entail arguing in favour of a neoliberal institutional transfer to the Russian gas sector, without taking into account the specificities of Russia. Following the second would lead to the deterministic conclusion that no reforms are possible in Russia. [287]

Opportunism

Another key area of enquiry of NIE is opportunism – by both politicians and private parties. Every actor tries to shape the governance environment to serve its self-interest (which is not necessarily understood as short-term profit maximization but also longer-term strategic gains). This is a good starting point to study liberalization as a political preference.

This is instrumental to analyse our first research question as to whether the transition towards hub-based trade was politically motivated. EU policy-makers point to the fact that gas-to-gas competition is not only meant to deliver affordability but also security of supply, an objective that usually carries a political undertone.

Besides, there have been insistent Russian allegations that the transition is politically motivated and that the EU is using gas market reform as a political instrument: "in the Russian narrative, the source of conflict is the aggressive eastward spread of EU law and regulation motivated by anti-Russian hostility, in disregard of commercial precedent and economic rationality – especially in Brussels" (Gustafson, 2020).[288] These allegations need to be verified because they appear to contribute to straining the relationship and to Russia's lack of trust in Europe's motives. In this regard, it is important to establish whether EU policy-makers pursued liberalization with the vested interest of deliberately eroding Russian gas revenues in order to disadvantage Russia.

It is also important to discuss the notion as to whether Western countries are engaged in neo-liberal policy transfers to advance their own interest to the detriment of countries that are less equipped to profit from open competition. Apart from contributing to explaining whether the transition towards hub-based trade was politically motivated, opportunism can also be used to explain how various stakeholders could manoeuvre the transition for their own interests. Rent-seeking, strategic behaviour, the non-neutrality of regulators and issues of credible commitments are all central notions in NIE.

287 *Ibid.*

288 Gustafson, "The Bridge: Natural Gas in a Redivided Europe", page 4.

In another chapter, we have argued against conventional Realist approaches owing to their negligence of non-State actors and the emphasis on the geopolitical dimension of energy security which often results in simplistic depictions of Russia as a country that is only using energy as a political tool. On the other hand, we have argued in favour of some other aspects of Realism, including its ability to grasp balance-of-power implications carried by economic measures such as gas market liberalization and the assumption that also Russia is a (bounded) rational actor.

Without being full-fledged Realist, NIE studies are based on the assumption of opportunism – as mentioned in the previous sections. The assumption of opportunism can come in useful in investigating whether the transition provokes a shift in the balance of power between Russia and the EU, and notably whether it entails a cross-border redistribution of rents, whether it delivers new stakeholders the key to control prices, and whether it gives rise to new ways of undertaking strategic behaviour in the gas business.

Moreover, NIE also sheds light on dynamics between governments (with specific regard to regulatory agencies) and market operators. Some reflections are very pertinent to the new model of free market exchange coupled with extensive regulation embraced by the EU and now increasingly projected onto EU-Russia gas transactions.

Relations between governments and utilities are characterized by third-party and government opportunism. Both types of risks interrelate and increase the rigidity and specificity of regulation, which is needed to avoid instability. They also lead to more litigation and conflict than is normally witnessed in contracts between private entities.

Spiller (2013)[289] qualifies governmental opportunism as the tendency by governments to change regulation to extract the quasi-rents of utility investors. Regulatory interventions can be blunt, but also done in subtle and not easily recognizable ways. This is clearly an important remark to test our hypothesis on EU's far-reaching intentions when embracing the gas-to-gas competition model. What is especially relevant to our discussion is Spiller's emphasis on the fact that governments can issue legislation that discourages or incapacitates a certain conduct, namely certain contract clauses or pricing mechanisms, even one it may have originally agreed to.[290]

When investors face the risk of disruptive governmental interventions, they will be reluctant to invest, or demand some sort of up-front compensation for that risk. Government opportunism heavily affects companies that are State-owned, or partially State-owned. Savedoff and Spiller[291] explain how governmental opportunism risk leading such companies in particular to protect their cash flows by undertaking suboptimal courses of action, for instance hiring too many permanent or transitory employees, granting excessive benefits and so on, which translate into low efficiency and quality levels.

289 P. Spiller, 'Transaction Cost Regulation', *Journal of Economic Behavior and Organization*, 89 (2013), 232-241.

290 P. Spiller, 'Transaction Cost Regulation', *Journal of Economic Behavior and Organization*, 89 (2013), 232-241.

291 W.D. Savedoff, P. Spiller, *Spilled Water: Institutional Commitment in the Provision of Water Services* (Washington-DC, 1999): Interamerican Development Bank.

Energy is a special sector, where opportunism manifests itself at a particularly high degree. More than anything, it is the existence of sunk investments that renders governmental opportunism a fundamental hazard in interactions between governments and investors. Once the investment has been allocated, the investor will be willing to continue operating as long as revenues exceed operating costs. Moreover, TCE teaches that when the business activity relies strongly on economies of scale and scope, there will only be a few suppliers. Thus, Spiller observes, the 'whiff of monopoly will always surround utility operations'. [292] Besides, because utility services tend to be massively consumed, politicians and interest groups will always care at least to some degree about the level of utility pricing.[293]

To be efficient and reasonably priced, investments require some long-term guarantees if specific assets are at stake. Without such guarantees, inefficiencies are likely to arise. First of all, there will be a tendency for market operators to underinvest systematically. Investments might then be forced by governments and their cost socialized. Secondly, investments will only be made in segments with short payback periods and high returns. Thirdly, maintenance tends to be minimized and investments will tend to be made with standardized inefficient technologies, with the risk that the quality of service will worsen. It is also possible that investors will seek up-front rents, charging unjustifiably high prices when they can.

Governments are not the only opportunistic agents. Third-party opportunism is rooted in the fact that regulatory agencies are usually not controlled by other agencies, but by committees whose work is influenced by interested third parties. It is usually interest groups that trigger oversight activities when they feel that their positions are being undermined by regulatory agencies. This oversight is fundamental, but a key feature of interest groups as overseers is that they are, by definition, 'interested'.

Often agents (both public and private) have to devote time and expense to defend their actions and administrative monitoring costs are high. In complex sectors, there tends to be some informational asymmetry in interactions between States and companies – which increases the risk of third-party opportunism. Many examples, especially from Latin America, show that utility third party opportunism – if escalated – can lead to instability and public protests. This all appears to point to the fact that third-party opportunism poses risks to all agents. In response, agents have incentives to formalize their relation – and notably to move away from implicit agreements and formalize relations as deeply as possible (the reference to highly specific and rigid regulation made at the beginning of this paragraph).

With a view to minimize the insurgence of third-party opportunism, regulatory contracts are crafted to limit challenging situations. Examples quoted by Spiller are measures to avert cash flow volatility, the indication of precise ways on how to trigger and conduct renegotiation in case new circumstances arise, and so on.[294] Spiller finds that these devices constrain but do not annihilate third-party opportunism, and thus the relationship between governments and

292 Spiller, 'Transaction Cost Regulation'.

293 *Ibid.*

294 *Ibid.*

utility investors are characterised by a higher degree of conflict than relations between companies. Relational contracting is unlikely to evolve in relations between governments and utilities characterised by third party opportunism. In so-called 'open access' States (i.e. countries that embraced a neoliberal market paradigm, like Western Europe), third party interest groups are prominent and their formulation is facilitated by the system – whereas in the so-called 'natural' States (i.e. countries with more centralised economic organisations and stronger informal economic institutions, like Russia), public agents have the upper hand in overcoming challenges by third parties.[295] The key characteristics of natural States is that they lack perpetuity[296] and impersonality[297]. Some observers, like Weingast (1995), put forward the idea that it is dangerous or counterproductive to force alien measures to natural States – arguing that 'market reforms threaten to undo the glue that holds natural States together'.[298] In the former environments, attention should be on making procedures resilient, while in the latter ones it should be on limiting the government's discretionary powers. Whenever these adaptations cannot be easily implemented, there will be a push to develop vertical integration in the sector in question.

Complete absence of government intervention is impracticable. Nonetheless, government intervention can be substantially limited if technological change or other factors induce a drastic fall in economies of scale or if sunk investments lose prominence. When energy activities largely lose their 'utility' characteristic, major deregulating attempts will be implemented.

It is important to analyse utility risks in the light of the institutional environments in which they operate. Stressing the differences of institutional environments, for instance between the EU and Russia, is crucial to understand the room for manoeuvre of investors in both jurisdictions. What has been said above about natural states vis-à-vis open access States allows us to hypothesise that mimicking regulatory regimes without adaptations across borders is probably not conductive to efficient outcomes. It is difficult to compare regulatory regimes across jurisdictions. Performance differs on the basis of risks inherent to different institutional environments.

295 *Ibid.*

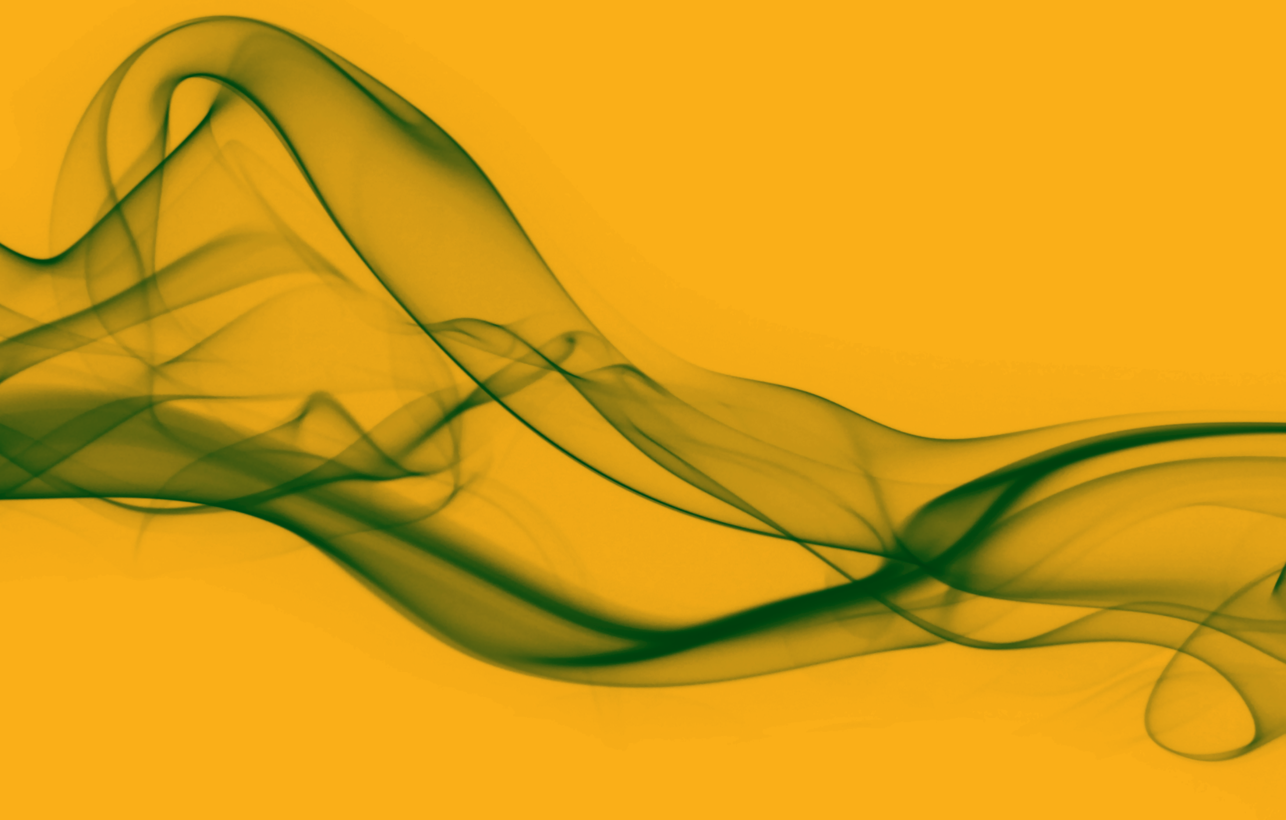
296 Guarantees are not limited to what the Law is today, but also extend to what it will be tomorrow.

297 Stability is not only guaranteed by one person, but rather by the systems. Functions (e.g. presidency) are more important than persons (e.g. presidents).

298 B.R. Weingast, 'The Economic Role of Institutions: Market Preserving Federalism and Economic Development', *Journal of Law, Economics and Organization*, 11:1 (1995), 1-31.

CHAPTER 4

WESTERN FRAMING OF EU-RUSSIA GAS TRADE RELATIONS ACCORDING TO THE COMPETING LOGICS OF REALISM AND LIBERALISM



CHAPTER 4 – WESTERN FRAMING OF EU-RUSSIA GAS TRADE RELATIONS ACCORDING TO THE COMPETING LOGICS OF REALISM AND LIBERALISM

In Chapters 2 and 3, the applicability of IPE and NIE notions to the subject of analysis has been discussed. In this Chapter, we look at Western framing of EU-Russia gas trade in an international relations context, according to the competing logics of Realism and Liberalism. The aim is not to provide a complete literature review of IR studies in energy, nor to test the applicability of IR notions and theories to the subject of analysis. The aim is rather to show the different ways in which the logic of Realism and the logic of Liberalism frame EU-Russia gas trade relations. These different logics are used in the academic debate as well as in the political discourse, and influence the way in which the organisation of EU-Russia gas trade is perceived, and dealt with politically.

4.1 THE LOGIC OF REALISM

One way to frame EU-Russia gas trade is along 'Realist' lines. Realism comprises of several distinct branches, generally unified by the tenets that: 1) the international system is fundamentally dominated by anarchy; 2) States are inherently prone to conflict; 3.) States – rather than international organizations, firms or individuals – are the only important players in global affairs; 4.) States are rational actors.[299] In Realist terms, rationality entails acting towards the maximization of self-interest defined in relative power positions in terms of military means, supported by economic and demographical means: powerful States strive for dominance, while weaker States seek survival.[300] Realism tends to focus on material foundations of power, and notably on military strength, demography and territorial size.The crudest assumptions of early, Classical Realism have been refined over time. Neorealism – most prominently represented by Kenneth Waltz, who labelled it 'structural Realism' – emphasizes the importance of the international structure, and the outcome rather than the process of power accumulation. Defensive Realism is more relativistic than other versions of Realism. Contrary to Offensive Realism (below), it argues that States tend to limit themselves to react to external threats. The anarchical structure of the international system leads States to maintain policies to attain security, but States are not inherently aggressive. It explains the occurrence of wars by arguing that 'rogue States' misunderstand the incentives to maintain peace provided by the environment and thus interfere in rational States' agendas – thereby igniting conflicts. Offensive realism is another branch of Neorealism which is distinguished by the emphasis that

299 R. Goodin, *The Oxford Handbook of International Relations* (Oxford, 2010): Oxford University Press.

300 C. Reus-Smit and D. Snidal, *The Oxford Handbook of International Relations* (Oxford, 2010): Oxford University Press, 2010.

States with different domestic characteristics behave similarly because they are pushed to do so by the structure of the international system. Even though States may have benign motives, they are often forced to act offensively by the international system, particularly if they are great powers.[301] Conflict is always possible and a State needs to be militarily ready all the time. More pessimistic than Defensive Realism, it depicts conflict as somehow unavoidable. The main difference between Offensive Realism and Defensive Realism is that the latter regards countries as *status quo* preserving powers, while the former looks at countries as essentially revisionists. The productive base influences military strength but if military and economic objectives contradict each other, the military one always prevails. However, Offensive Realism recognizes that when the most cost-effective way to enhance power is by means other than military ones, States will opt for such non-military option. Finally, Neoclassical Realism synthetises Classical Realism and Neorealism, while also intercepting some of the lightest constructivist ideas.[302][303] For Neoclassical Realism, power is an instrument to realise foreign policy interests rather than an end in itself. Neoclassical Realism considers both domestic factors and the nature of the international system as two independent variables.[304] Among domestic factors, perceptions by policy-makers are emphasized, so much that imbalances and shifts in power are explained by misperceptions in the policy-making community. [305] In Neoclassical Realism, States do not expand to seize control over natural resources but rather as a consequence of increased resources and thus relative power.[306]

In the course of the 20th century, Realist analyses started to incorporate the economy and natural resources as elements of State Power[307] – albeit initially relegating them to a backstage position relative to military power. Hans Morgenthau notably argued that States primarily attempt to exert dominance through military supremacy, turning to economic supremacy only in case they fail to prevail militarily.[308] Kenneth Waltz also expressed himself against an excessive broadening of the concept of security, which would give prominence to economic explanations over military ones.[309]

Since the 1990s, owing to the phenomenon of globalization and growing trade interdependence subsequent to the end of the Cold War, Realism has been placing emphasis on the importance of a prosperous economy for State power. When applied to the economy, Realism is also known as statism, economic nationalism or (neo)-mercantilism.

301 J. Measheimer, *The Tragedy of Great Power Politics* (New York, 2001): W.W. Norton and Company.

302 A. Wendt, *Social Theory of International Relations* (Cambridge, 1999): Cambridge University Press.

303 Particularly insofar as constructivism believes that structures are not a given, but they rest on the way in which the structure is constructed by social practice.

304 T. Christensen, *Useful Adversaries: Grand Strategy, Domestic Mobilization, and Sino-American Conflict* (Princeton, 1996): Princeton University Press.

305 Notably misperceptions leading to spending excessive resources to balance an enemy that is perceived as more powerful than it actually is, or spending insufficient resources because an enemy has been underestimated.

306 F. Zakaria, *From Wealth to Power: The Unusual Origins of America's World Role* (Princeton, 1998), Princeton University Press.

307 R. Gilpin, R., *War and Change in World Politics* (Cambridge, 1981): Cambridge University Press.

308 H. Morgenthau, *Politics among Nations: the Struggle for Power and Peace*, (New York, 1948): Knopf; H. Morgenthau, *Scientific Man vs. Power Politics* (Chicago, 1946): University of Chicago. This is also a reflection of Adam Smith's statement that when the quest for security and wealth conflict, the former supersedes the latter.

309 K. Waltz, *Theory of International Politics* (Boston-MA, 1979): Addison-Wesley.

At the end of the 1990s, Legro and Moravcsik indicated mercantilism as an element of State power and as part of the Realist domain, noting how – in a highly interdependent world – economic coercion had become one of the most effective means to expand influence abroad.[310] Samuel Huntington argued that economic activity is a source of power as well as of well-being – and that the economy is the most important element available to a State in pursuing Realist means.[311] Huntington brought the example of Japan as a country that abjured military power and used its economy for the pursuit of power, also to the detriment of well-being. Post-Cold-War emphasis on the economy as an instrument of State power is well exemplified by Daniel Bell's variant on the Clausewitzian dictum that 'economics has become the continuation of war by other means'.[312]

In conjunction with this growing interest for the economy as an instrument of State power, Realism has also been increasingly applied to energy. Realist energy analyses usually emphasize the primacy of the State as an energy player, the strategic importance of controlling energy, and the relationship between energy and conflicts.

The emphasis on the State as a key player in energy rests on the notion that the government has ultimate sovereignty over the resource and is the primary source of legislation affecting the energy business. From this perspective, companies are able to operate only insofar as States allow them to do so. Certain States are more involved in the energy sector than others and do not limit themselves to pass legislation, but actively participate as stakeholders in the energy sector.

The emphasis on the importance of controlling energy has its roots in the Realist reading of States as self-interest maximizing actors, which entails that they strive for access to energy as an instrument to aggrandize their power.[313] Energy supply policy has been described by some Realist scholars as 'part of the policy arsenal of a State as much as military power'.[314] This is based on the conviction that only States that have access to energy are strong militarily.[315] After all, military hardware is still very much dependent on oil. When conducted in net energy-importing countries, Realist analyses are typically accompanied by urges to cut dependence on specific fuels or countries, and consume national energy instead. There are several examples of calls for self-sufficiency both in the US and in Europe, particularly with regard to natural gas – the imports of which should be replaced by renewables or domestic shale gas.[316,317]

310 J. Legro and A. Moravcsik, 'Is Anybody Still a Realist?', *International Security*, 24:2 (1999), 5-55.

311 S. Huntington, 'Why International Primacy Matters', *International Security*, 17:4 (1993), 68-83.

312 D. Bell, *Germany: The Enduring Fear* (1990): Dissent.

313 Hancock and Vivoda, 'International political economy: A field born of the OPEC crisis returns to its energy roots'.

314 B. Shaffer, *Energy Politics* (2009): University of Pennsylvania Press.

315 J. R. Deni, 'New Realities: Energy Security in the 2010s and Implications for the US Military' (2015): US Army War College Press, 2015.

316 M. Klare, *Blood and Oil: the Dangers and Consequences of America's growing Dependency on Imported Petroleum* (New York, 2004): Metropolitan Books, Henry Holt.

317 G. Luft and A. Korin, *Energy Security Challenges for the 21st Century* (Santa Barbara-CA, 2009): ABC-Clio.

With regard to the relationship between energy and conflicts, Realists note that – in their quest for resource endowment and material power – States encounter other States that engage in the same activity because energy resources are scarce and finite. This leads to tensions and, occasionally, armed conflicts. On this basis, some of the most intransigent Realist scholars predict that the largest conflicts of the future will break out precisely for the control of increasingly scarce energy resources.[318] This theory is less popular now than it used to be as the shale revolution in the United States has expanded the horizon of accessible resources, invalidating earlier apprehensions of a peak in oil and gas production. In point of fact, oil and gas are more often a victim of armed conflicts than a cause. Attacks on oil and gas assets have intensified in recent years, and many projects have been shelved due to instability. This has renewed interest in the energy-security nexus, where the logic of Realism prevails.[319]

Not all Realist analyses result in gloomy predictions of wars sparked by energy interests or targeting energy assets. Examples of less radical – and far more recurring – measures that States can adopt to defend their energy interests are diplomatic campaigns to secure access to energy resources, subsidies to support certain energy carriers, protectionism, actions in support of national champions, sanctions to prevent other countries from accessing international capital and technologies, and so on.[320] Examples of 'energy mercantilism' can indeed be found across different regions and periods. France for instance notoriously engaged in nationalizations and the promotion of nuclear energy in the 1960s to become self-sufficient, but also – more broadly – to emancipate itself from American hegemony.[321] After the oil price shocks in the 1970s, Japan has made it a priority to upgrade its political relationship with Middle Eastern oil producers and new LNG suppliers in South-east Asia.[322] More recently, China has promoted strategic investments in energy-rich countries and pushed its national champions to increase the percentage of equity oil and gas in overseas projects.

In the light of these general considerations on Realism and its applications to the economy and energy more specifically, it will be easy to understand why Western Realist interpretations of Russia as an energy actor typically emphasize that: a) Gazprom is a branch of Russia's State apparatus and pursues a State agenda, as determined directly by the Kremlin; b) Gazprom is used as a foreign policy vector – vividly in CIS and Eastern European countries but to an extent also in the rest of Europe; c) Gazprom's projects and Russian energy policies are primarily dictated by geopolitical, rather than commercial, considerations; d) Russia sees oil and gas as

318 M. Klare, *Resource Wars: the New Landscape of Global Conflict* (New York, 2001), Henry Holt.

319 Examples are numerous. Limiting the list to cases involving natural gas in the last decade, there have been disruptions in Libyan exports to Italy through Green Stream; the shutdown of 10% of Algerian gas production in 2011 following the terrorist attack on In-Amenas; disruptions in Egyptian exports to Israel and Jordan due to attacks on pipelines in the Sinai Peninsula; PKK guerrilla activity increasingly targeting gas infrastructure in Turkey; and the interruption of Yemeni LNG exports owing to Houthi insurgency. Examples of projects shelved for security reasons include the abandonment of plans to build the Syria-bound Arab Gas Pipeline (AGP) project due to the Syrian civil war; the postponement of infrastructural projects to monetize Iraq's vast gas reserves due to both ISIL activity and disagreements between the Kurdish Regional Government (KRG) and the central government in Baghdad; and the constant deferral of plans to build the long-discussed TAPI pipeline aimed to bring Turkmen gas to India through Afghanistan and Pakistan.

320 See for instance Stoddard 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative' and S. Gaylord and K.J. Hancock, 'Developing World: National Energy Strategies' in H. Dyer and M.J. Trombetta (eds)., *The International Handbook of Energy Security* (Cheltenham, 2013): Edward Elgar.

321 L. Hughes and P. Lipscy, 'The Politics of Energy', *Annual Review of Political Science*, 16:1 (2013), 449-469.

322 D. Klein, 'Japan 1979: the Second Oil Crisis', *Asian Survey*, 20:1 (1980), 42-52.

instruments to pursue geo-economic strategies and notably to extinguish its external debt and thus dependency on creditors, amass foreign exchange reserves, and run a trade surplus; e) Russia uses gas to 'divide and rule', for example by partitioning markets and by signing bilateral deals that frustrate EU-wide initiatives and/or EU political cohesion; f) Russia deliberately attempts to render gas importers overdependent on Russian gas, in order to make them politically subjected to it – rewarding allies with preferential prices and threatening enemies with price spikes; g) Russia aggressively opposes competition by acquiring midstream and downstream assets in export markets, and by lobbying to frustrate investments on renewable energy or shale gas exploration and production; h) Russia doesn't allow foreign takeovers in its energy sector unless strictly necessary for the acquisition of foreign capital or technology, or as part of strategic asset swaps; i) not only foreign, but also Russian private players need to thread carefully and gain political credentials in order to operate in Russia. This is a typically Western Realist interpretation of Russia's energy politics. Other possible perspectives, including Russia's Realist interpretation of energy politics and a Realist interpretation of the EU's posture, also exist, but they feature less prominently in the gas discourse. The logic of Realism resonates in politicians' calls to reduce dependence on Russian gas, in Trump's insistence on American 'freedom gas' as a preferred alternative to Russian gas, and in some of the tenets of the Energy Union, which argue in favour of additional political involvement to promote active supply diversification.

Realism recognizes that economic measures can have strategic and geopolitical implications, and that governments can device economic measures to pursue strategic objectives in relation to other countries. As mentioned, Realism places an emphasis on material endowments, a category that certainly includes commodities like natural gas. Realist scholars Legro and Moravcsik give prominence to this aspect, stressing that competition for survival or domination is increasingly based on competition for material elements: "interstate politics is […] a perpetual interstate bargaining game over the distribution and redistribution over scarce resources".[323] Following the logic of Realism, therefore, trade liberalization is not necessarily a politically neutral and technocratic undertaking. The implications of liberalization can go well beyond the establishment of a free market where competition thrives in a level-playing field, politics ceases to matter and incentives to cooperation abound. Although defendants of free trade typically reject zero-sum game logic – in the belief that free trade eventually benefits everyone – neo-liberal policies can also be supported on the basis of mercantilist considerations.

In other words, neo-liberal instruments can be used for the pursuit of realist objectives. This holds true because companies – and countries – are equipped differently when it comes to withstanding open competition. While some thrive in a free market, others struggle to adapt. Following the logic of Realism, the transition from long-term contracts to hub trade, as one important aspect of liberalization, thus also has strategic implications for the balance of power between gas suppliers and buyers. Following the same logic, the EU has a more discernible interest in liberalization, and also appears better equipped to turn it to its advantage. Even before the transition to hub pricing, it was clear that the EU had a more developed financial sector than Russia – around which price-setting hubs could develop. Moreover, it was clear

323 Legro and Moravcsik, 'Is Anybody Still a Realist?'.

that the incorporation of new business practices and adaptation of company structures would be easier in the EU, which had already acquired experiences with liberalization in other sectors. Neo-liberal paradigms are also generally more rooted in European business cultures and mirrored in the organization of socio-economic structures. Besides, the EU is endowed with stronger institutions and rule of law, which are key conditions for a successful liberalization. Finally, there is a fundamental asymmetry between the EU and Russia in that gas is inevitably far more strategic for Russia than it is for Europe, which might explain Russia's reluctance to embrace a process that would result in a loss of control over the value chain.

Another element of the logic of Realism in its framing of EU-Russia gas trade modes is its characterization of the international system as 'anarchic', which is apposite for energy and natural gas in particular. In the energy sector, international governance is weak. Fossil fuels, given their strategic value, are largely excluded from international trade rules set by the World Trade Organization, which are instead widely applied to other goods and economic sectors.[324] Derogations to free trade principles are frequent in the energy sector, usually on security of supply grounds. Multilateral organizations with worldwide membership have been established in virtually all policy fields – concurring to the creation of 'international regimes' made of rules and institutions.[325] Fields covered by international organizations include security, international law, trade, industry, sustainability, culture, food and agriculture, police and counter-terrorism, aviation, shipping, monetary policies, finance, health and migration. Many of these areas are highly strategic, and the fact that States transferred part of their sovereignty to international bodies in these areas is highly significant. The lack of similar organizations in the field of conventional energy is equally significant, especially because every country of the world consumes conventional sources of energy and is impacted in a way or another by oil and gas market developments. In spite of their economic and political importance, EU-Russia energy relations are not governed by multilateral bodies and the only multilateral governance framework is the EU-Russia Energy Dialogue, which has been narrowed down in its scope from its original ambitions, as it is now mostly conducting technical rather than strategic discussions.[326] An attempt to govern energy relations with a multilateral treaty was made in the course of the 1990s and early 2000s – when the EU pushed the Energy Charter Treaty (ECT) onto Russia. Russia signed but never ratified the ECT, which Moscow regards as a threat to its strategic interests and a devious bid to deprive Russia of sovereignty over its energy resources.[327] This lack of multilateral organizations and frameworks gathering together exporters and importers brings State actors and bilateral relations to the forefront. Also, it is legitimate to work with the hypothesis that the deficit of institutionalized dialogue and the absence of a common plan to transition away from an old mode of trade to a new one might be at the basis of the tensions between the EU and Russia on the gas dossier.

324 J. Nedumpara, 'Energy Security and the WTO Agreements', in S. Mathur, *Trade, the WTO and Energy Security* (2014) Centre for WTO Studies (CWS), IIFT.

325 S.D. Krasner, 'Structural Causes and Regime Consequences: Regimes as Interevening Variables', *International Organization*, 36:2 (1982), 185-205.

326 L.C. Talseth, *The EU-Russia Energy Dialogue* (Berlin, 2012): Stiftung Wissenschaft und Politik.

327 *Ibid.*

Finally, the logic of Realism tends to operate under assumptions of rationality. Following the logic of Liberalism, Russia is every so often labelled as irrational – as if all Russian policies were dictated by paranoia, outdated militarism and inability to understand how advantageous the adoption of Western-style liberal-democratic institutions would be to the country. While criticism of Russian policies is certainly legitimate and, in some cases, well-grounded, it is important to realise that seemingly 'irrational' behaviour can reveal itself rational at a closer look – albeit, possibly, according to different parameters. In fact, the consideration of something as 'rational' depends on our subjective understanding of values, priorities and objectives that are or should be pursued in a certain situation. However, it is simplistic to depict Russia as an irrational actor in IR simply because its values and priorities differ from the West's. Rationality does not necessarily correspond with economic rationality. Sometimes States sacrifice short-term economic benefits in order to increase their long-term political and geopolitical power. In this regard, it appears useful to investigate whether gas market liberalization might not be in the interest of Russia after all – taking into account that Russia, as a supplier, tends to take a longer-term vision on gas market developments and has different priorities than the EU.

Among the various schools of thought in Realism, one that stands out in influencing the discourse on EU-Russia gas trade Neoclassical Realism, as it offers a synthesis of insightful elements of classical Realism and Neorealism.[328] It includes the analysis of domestic variables in the formation of energy policies, allows States to be treated as units, and takes into account the importance of different values and ideas. As argued above, it is important to understand national prerogatives and differentiate the posture of Russia from the posture of the EU on the topic of gas market liberalization. Furthermore, as we will see, the consideration of domestic elements is particularly important in this subject because Gazprom's export strategy in Europe is intertwined with Gazprom's domestic role as a provider of socio-economic services. Neoclassical Realism includes the analysis of statesmen's perceptions of the international system as an important factor. Its attention for domestic variables does not necessarily mean that it is descriptive, as it actually investigates changes to domestic politics or changes in statesmen's perceptions to understand changes in a country's foreign policy. The consideration of statesmen's perceptions is certainly important in the discourse on EU-Russia gas trade because of the Russian Presidential Administration's central role in energy policy-making and the gas sector specifically.[329] The transition from Yeltsin's presidency to Putin's presidency at the end of the 1990s marked a shift from an era where Russia was incorporating free-market reforms to an era where these were rejected and mistrust about Europe's intentions in promoting them mounted.

The logic of Realism has a number of limitations. It tends to focus on the State, while neglecting the so-called 'transnational' actors such as International Oil Companies (IOCs) and National Oil Companies (NOCs) as well as complex spill-overs and externalities involving a variety of actors.[330] Realism's emphasis on the State, although partially justified in the case of

328 G. Cesnakas, 'Energy Resources in Foreign Policy: a Theoretical Approach', *Baltic Journal of Law and Politics*, 3:1 (2010).

329 Shadrina, *Russia's Foreign Energy Policy: Norms, Ideas and Driving Dynamics.*

330 Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations*.

EU-Russia gas relations, entails that it does not consider the influence that private and semi-private companies[331] also have on energy markets and energy relations. This leads to simplistic analyses.[332] Energy still seems to be most often studied from narrow geopolitical perspectives which 'fail to conceive of a far more complex energy world in which States, NOCs corporations, consumers/citizens, local energy cooperatives and markets all play a pivotal role'.[333] Susan Strange and IPE authors inspired by her work have been the first to reappreciate the role of non-state actors in IR, and to criticise political scientists for not having understood the 'retreat of the State' in favour of the global economy. With globalization, "markets have outgrown governments, dispersing power among a widening cast of actors and eroding the global system's political underpinnings."[334] According to Susan Strange, industrial policies and macro-economic management strategies have overridden foreign and defence policy as the primary determining factors of how resources are allocated. Whereas States have retained sizable negative power to disrupt, manage or distort trade, their positive power to exploit national resources is constrained when they attempt to influence where and how international production takes place.[335]

A wide range of hub trade participants – which include utilities, wholesalers, trading companies, hedge funds, private equities, aggregators and vertically integrated companies – need to be taken into account in a study on the implications of hub trade. The interactions between public and private spheres are not always easy to capture, and the border between the two spheres can be quite porous even in the most liberalized markets of Western Europe, such as The Netherlands and Norway for instance. Gasterra, which is a gas trading company and one whose business model perfectly exemplifies the new gas trade architecture that has been built in the EU post liberalisation, has been instrumental to the Dutch government in the strategic objective of establishing a hub with benchmarking functions.[336] Another example is Equinor – a profit-driven company with significant State participation, which has played and still plays a crucial role in national wealth creation.[337] Equinor is an active participant in European gas hubs where its production profile – within the limits set by a government production quota – can influence prices.[338] While Equinor's primary focus is profit maximization,

331 This includes companies that are primarily state-owned but that have commercial interests alongside political ones.

332 This somehow simplistic approach is visible in a number of studies (quoted in Keating et al), notably those that aim at explaining the link between energy and the role of the US as a global hegemon (arguing for instance that the US will completely disengage from the Middle East as a result of acquired self-sufficiency in oil and gas); those that cover Chinese interests in Africa only taking into account State motives and referring to China's behaviour as colonialist; those on "Russia's energy weapon" and "New Great Game" approaches to energy politics in the Caspian, the Gulf and the Arctic regions. Cf. Keating et al, 'Introduction: Bringing Energy into International Political Economy'.

333 Van de Graaf et al, 'States, Markets and Institutions: Integrating International Political Economy and Global Energy Politics'.

334 B. Cohen, 'Money, Power, and Crisis', draft prepared for the workshop 'A Retrospective on the Work of Susan Strange: Structure, Power, Knowledge, and Norms', Princeton University, 2014.

335 J.M. Stopford and S. Strange, *Rival States, Rival Firms* (Cambridge, 1991), Cambridge University Press.

336 "Despite the TTF having been established a few years previously it had not really attracted any significant trader interest, however, with the commitment of all key stakeholders it was effectively kick-started to become what is today Europe's second largest traded gas hub. [...] It was the government that had a vision that it strongly wanted to implement. This involved passing laws to make sure that change was effected." in Heather, *The Evolution of European Traded Gas Hubs.*

337 "Equinor is an important case study to understand how a professionally run national oil company can serve the producing country through economic development and as a force in international politics" in R. Gordon and T. Stenvoll, 'Equinor: a Study in Political Entrepreneurship' (2007): The James A. Baker III Institute for Public Policy at Rice University.

338 'Extended Norway Gas Plant Outage Lifts British prices' (2017): *Reuters*, 26 July 2017.

it cannot be excluded that it also pursues longer term commercial strategies, similar to Russia.[339,340] On the Russian side, private companies such as Rosneft and Novatek and a wide network of businessmen with a more or less tangible influence on policy-making also need to be included in the analysis of how Gazprom and Russia will adapt to the changes to gas trade modes in Europe.

A Realist, Hobbesian reading of the world whereby States are purely self-interested and cannot resist using their power risks giving rise to highly deterministic analyses. The strongest criticism to this view is that it cannot explain why not all States use greater energy power to expand their power.[341] The assumption that Russia will always try to make an instrumental use of gas to aggrandize its power risks leading to oversimplifications and misses the point that Russian stakeholders also have commercial interests, that gas is an important source of revenues and that Russia can deliberately refrain from using gas as an instrument of power for strategic reasons.[342] As recently noted by Belyi[343] and confirmed by developments in the European gas market[344], gas is not an effective political instrument because of some of its characteristics in production, demand and trade. The dominance of 'hard security' frames in public policy debates on energy has been criticized in recent years, also specifically with regard to EU-Russia gas relations. Goldthau and Witte, for example, have rightfully lamented that 'the lopsided attention to the geopolitical dimension of energy security is based on the myopic and erroneous presumption that global energy politics is necessarily a zero-sum game in which one country's energy security is another's lack thereof'.[345]

To conclude, the logic of Realism applied to the subject of analysis places emphasis on strategic balance-of-power implications carried by economic measures such as gas market liberalization. In the West, the emphasis on the geopolitical dimension of energy security often results in simplistic depictions of Russia as a country that uses energy as a political tool in an aggressive foreign policy. Understanding the logic of Realism is the first step to understand certain policy choices vis-à-vis Russia, including sanctions and ad-hoc EU legislation aimed at blocking Russian-backed gas projects. Following a strict logic of Realism, the introduction of hub indexation is presented as a way in which the EU hurts Russia (a geopolitical rival) by hitting

339 "The strategy followed by both Russia and Norway has been to maintain their market share, benefiting European consumers as prices in NW [Northwest] Europe have remained rather stable", Carlos Torres-Diaz (Rystad Energy) quoted in 'Filling Norway's Pipelines' (2018): *Natural Gas World*, February 2018.

340 A. Gawlikowska-Fyk et al, *The EU Gas Game: Time to Redefine the Rules? Case Studies of Russia and Norway and Lessons for the EU, Norway and Poland* (Warsaw, 2015): Polish Institute of International Affairs, 2015.

341 For instance Norway and Canada.

342 Russia has an interest in nurturing its reputation as a reliable supplier and in conferring to gas the reputation of a reliable commodity so that it is given the possibility to replace coal in the energy mix of importing countries. Moreover, Russia is aware that power cannot be exerted in any market conditions and that it might be better to adopt self-restraint and wait-and-see attitudes in certain circumstances. Russia has given strategic concessions to importers and showed an interest in cultivating long term contractual relations with them – at the very least in order to avoid that EU counterparts would go bankrupt.

343 Belyi, *Transnational Gas Markets and Euro-Russian Energy Relations*.

344 After the latest Ukraine crisis (2014), Gazprom has tried to reduce shipments of gas to countries in Central-Eastern Europe to prevent reverse flows from those countries to Ukraine. However, reverse flows continued, threatening Gazprom's market share and inducing Gazprom to resume shipments at normal levels. This can be considered evidence that Gazprom has largely lost the ability to influence flows inside of the EU.

345 A. Goldthau and J.M Witte, 'Back to the Future or Forward to the Past? Strengthening Markets and Rules for Effective Global Energy Governance', *International Affairs*, 85:2 (2009), 373-390.

Russia's gas revenues. We will see how this argument does not fully hold. This logic is not the only one that forms the current discourse on EU-Russia gas trade. In fact, it competes with other logics, and most prominently with that of Liberalism.

4.2 THE LOGIC OF LIBERALISM

Liberalism does not deny that States are key actors in international relations. Contrary to Realism, however, the Liberal tradition in IR maintains that non-governmental actors such as lobbyists, advocacy networks, NGOs and multinational corporations also shape the international political arena. This entails that Liberalism does not only relax the Realist assumption that States are the sole actors that participate in IR, but also the assumption that States act coherently as units. A central belief in Liberalism is indeed that contemporary societies are connected by multiple channels, which go well beyond the old Westphalian system of interstate relations. In fact, Liberalism typically studies 'trans-national' and 'trans-governmental' relations rather than 'inter-state' relations.[346]

Liberalism has a more optimistic view than Realism in that it argues that cooperation is likely. It prescribes that governments should limit their interventions in the economy as much as possible, allowing markets to operate freely and foster peace through trade interdependence. This optimism becomes eschatological in some Liberal writings, such as Francis Fukuyama's *The End of History*[347] – which predicted that the Western liberal-democratic model would eventually prevail in the rest of the world not to be replaced by another model. As we will see, some gas analysts consciously or unconsciously think along similar lines.

Given its focus on non-State actors and confidence in free markets, the logic of Liberalism actually tends to prevail over Realism in analyses that give prominence to economic factors in international relations and that study the interaction between international politics and economics. Liberalism has also been widely applied to the analysis of energy specifically, including its international dimensions[348], although in this case not necessarily prevailing over Realism owing to energy's status as a strategic sector for the State.

Liberal studies in energy consider a wider range of actors than only the government, and notably IOCs, NOCs and International-National Oil Companies (INOCs), but also NGOs, charismatic leaders, influencers, local communities and advocacy networks. Unlike Realists who consider the world anarchic, Liberals believe in international governance and stress the importance of institutions and frameworks such as the IEA, the IMF, the World Bank, the WTO and the EITI.[349] Institutions do not necessarily have to be full-fledged organizations: there exist

346 Keohane, 'The International Energy Agency: State Influence and Transgovernmental Politics'.

347 F. Fukuyama, *The End of History and the Last Man* (New York, 1992): Free Press.

348 For instance: A. Goldthau and N. Sitter, 'A Liberal Actor in a Realist World? The Commission and the External Dimension of the Single Market for Energy', *Journal of European Public Policy*, 21:10 (2014), 1452-1472; A. Herranz-Surrallés, 'An Emerging EU Energy Diplomacy? Discursive Shifts, Enduring Practices', *Journal of European Public Policy*, 23:9 (2015), 1386-1405; J. Stern, *Is Russia a Threat to Energy Supplies?* (Oxford, 2006): Oxford Energy Forum; M. Thurber et al, 'Exporting the Norwegian Model: The Effect of Administrative Design on Oil Sector Performance', *Energy Policy*, 39:9 (2011), 5366-5378.

349 For example see C. Corrigan, 'Breaking the Resource Curse: Transparency in the Natural Resource Sector and the Extractive Industries Transparency Initiative', *Resources Policy*, 40 (2014), 17-30.

also informal institutions and arrangements of a quasi-institutional nature, in which category we may include probably long-term gas contracts, as we will see in one of the next chapters.

Liberals argue in favour of a hands-off approach for the State in the energy sector. Although there are several schools within Liberalism, one of the State's most important functions according to Liberals is to produce and enforce norms that guarantee property rights[350], and more broadly the well-functioning of free markets. Australia, the United States and the United Kingdom are usually taken as models for energy market liberalization, including in Continental Europe.[351] In fact, the Third Energy Package and previous EU gas market reforms appear to have been largely inspired by the Anglo-Saxon model. Henry Hub in the US and the NBP in the UK are among the most liquid gas hubs in the world – with Continental European hubs only now catching up.

Where Realists see opportunities for energy-related conflict, Liberals see opportunities for cooperation[352,353] and deem wars for energy obsolete.[354,355] According to Liberals, cooperation lowers transaction costs and thus leads to lower energy prices, with a net benefit for the international community.[356] Rational States therefore cooperate rather than fight. Net energy importers are interested in cooperation as it delivers lower prices, while exporters are interested in maintaining a cooperative attitude to avoid volatility and defend the reputation of their product in the long term. Both have an interest in avoiding supply disruptions and securing energy transit routes. Therefore, indistinctively qualifying energy suppliers as States that use energy as a political instrument to dominate over other States is simplistic.[357] Consuming and

350 Cf. the notions already presnted by Adam Smith in the 18th Century – A. Smith, *An Inquiry into the Nature and Causes of the Wealth of Nations* (1776).

351 D. Buchan, 'From Liberalisation to Intervention: Europe, the UK, and the Changing Agenda' in I. Rutledge and P. Wright (eds.), *UK Energy Policy and the End of Market Fundamentalism* (Oxford, 2010): Oxford Institute for Energy Studies.

352 Liberals emphasise that cooperation – rather than confrontation – takes place in international energy dealings. A famous example is that, in spite of their complicated political relations, Algeria and Morocco have cooperated on the construction of the international pipeline that brings gas from Central Algeria to Spain. Not only were initial negotiations successful, leading to the construction of the infrastructure, but the pipeline continued its operations undisturbed for decades, without negative political interference. Another commonly quoted example is that cooperation is also common between States that share oil and gas resources straddling the border. This is typically done with unitization or framework agreements for the joint development of trans-boundary oil and gas fields. There are also standard agreements such as the Association of International Petroleum Negotiators (AIPN) Model Unit Agreement issued in 2006. Many countries have sat around the negotiating table and successfully agreed on terms for joint development: the UK and Norway for fields in the North Sea, Norway and Iceland for the exploitation of the Continental Shelf between Iceland and Jan Mayen, Canada and France for the exploitation of the Continental Shelf near Newfoundland and Labrador, the UK and the Netherlands for the Markham and Orca fields, Kuwait and Saudi Arabia for the Khafji and Wafra fields, Qatar and the United Arab Emirates for the Al-Bunduq field, USA and Mexico for fields in the Gulf of Mexico, Russia and Kazakhstan for the Imashevskoye field in the Caspian Sea, Venezuela and Trinidad and Tobago for the Loran Manatee gas field, Thailand and Malaysia for the Cakerawala and Bumi Bumi fields, Australia and Indonesia for the Bayu-Undan field in the Timor Sea, and Australia and East Timor for the Greater Sunrise field. The final examples it that – despite alarmistic press headlines about the scramble for the Arctic – countries with claims on the Arctic have so far shown a cooperative attitude, being aware that the environmental and technical difficulties require joint efforts.

353 E. Meierding, 'Joint Development in the South China Sea: Exploring the Prospects for Oil and Gas Cooperation between Rivals', *Energy Research and Social Science*, 24 (2017), 65-70.

354 C. Fettweiss, 'No Blood for Oil: Why Wars for Resources are Obsolete' in G. Luft and A. Korin, *Energy Security Challenges for the 21st Century*.

355 V. Smil, 'War and Energy', *Encyclopedia of Energy*, 2 (2004).

356 Colgan et al 'Punctuated Equilibrium in the Energy Regime Complex'.

357 T. Romanova, 'Is Russian Energy Policy towards the EU Only about Geopolitics? The Case of the Third Liberalisation Package', *Geopolitics*, 21:4 (2016), 857-879.

producing countries can be seen as complementary as the former ones are often endowed with superior technological and financial resources while the latter ones are in need of innovative technology and investments for developing their oil and gas resources. Cooperation allows to reach synergies in research and development, technology transfers, information exchange, and the development of more precise statistical data.

On this basis, Liberals believe that net benefits from cooperation are positive and reject zero-sum game logics. Liberals are focusing on absolute gains, whereas Realists are focusing on relative gains. Autarkic energy policies are also rejected on the basis of the conviction that trade helps cementing good political relations and economic interdependence acts as a deterrent to escalations.

Liberals look with optimism at current developments in the international gas markets. They foresee the emergence of a truly liquid and global gas market based on the observation of a number of trends, including: a.) the growth in LNG trade relative to pipeline trade[358]; b.) the decided advance of gas market liberalization in OECD importing countries and first moves towards market-based pricing in China; c.) the emergence of new business models with supply and demand aggregation and portfolio optimization; d.) the rise in the number of active market parties and e.) the growing importance of paper trading. In a liquid and global market, from a Liberal perspective, the room for political manoeuvring is diminished and both security and affordability are boosted.

The logic of Liberalism is appealing for gas analysts and decision makers who consider non-State actors as important players in IR. It is understandable why the logic has gained traction in the last decades, given the growing importance of private companies (traders, portfolio players) in gas trade. Secondly, Liberalism observes that States often fail to act as coherent units – a relevant finding in that it allows to take into account the diversity of players in the debate on gas market liberalization within Russia, too often wrongfully treated as a monolithic block. Liberalism rejects deterministic views that foresee unavoidable conflict and confrontation – a perspective that rightfully takes into account the condition of mutual dependence between the EU and Russia and records all the instances in which the EU and Russia have actually overcome their divergences and applied self-restraint.

As was mentioned in the previous section, Liberalism is standing out as a promising lens of investigation in this field also partly because EU gas market liberalization is itself a product of Liberal ideas. Actors in the EU legitimized their course of action through the logic of Liberalism. Proponents of this logic express satisfaction for the opening of global gas markets and growing gas-to-gas competition. While commodity cycles are recurrent and a tightening of global LNG market is likely between 2022 and 2025, some elements of the growing gas-to-gas

358 LNG trade has destination flexibility and therefore is a key enabler of the transition from point-to-point trade to a global gas market. New business models such as the aggregator model inaugurated by British Gas (BG) are mostly applicable to LNG rather than pipeline trade – which is more difficult to break up in small volumes. LNG is also less subject to geopolitical risks such as transit and long-term captivity to capital-intensive legacy infrastructure. Furthermore, LNG allows to bring gas to new markets that are either too small or to remote to attract investment on import pipelines, thereby increasing the size of the market and the number of market participants – which, as argued below, reduces the chances of market dominance and manipulation.

competition could turn out to be enduring and may structurally change some fundamental aspects of gas trade between nations. We have identified three of these elements.

First of all, small-scale solutions are proving useful to fill the gap between long-lead investment decisions and the moment when projects become operational, thereby shortening investment cycles and balancing supply and demand faster than before.[359]

Secondly, the success of shale oil and gas exploration in the United States is also contributing to fastening supply-side responses to an increase in demand. US LNG project operators do not have to develop gas fields when they aim to add liquefaction capacity as they can purchase gas on the US domestic market, which is cheap and abundant thanks to plentiful shale production. Furthermore, the prevalence of tolling agreements means that the offtake of US LNG will be flexible and responsive to market conditions. If US LNG cannot recover short-run marginal costs in the market of last resort or if Henry Hub prices increase to a level where it is more profitable to sell in the US domestic market rather than liquefy the gas and ship it to Europe or Asia, not the entirety of US liquefaction capacity will be used. This type of price responsiveness is unique to the United States.

Thirdly, gas majors are increasingly showing their eagerness to form large portfolios in order to acquire the capacity to source supply from a wide pool and sell it to an equally wide pool of buyers – overcoming the classical point-to-point trade model and optimizing flows and portfolio management.[360] Volumes are becoming more flexible as swaps and diversions are becoming increasingly common. This is also thanks to regulatory measures in importing countries, such as steps taken by Japan's Fair-Trade Commission (FTC) to remove destination clauses from contracts. The final outcome of these developments is likely to be greater commoditization of LNG and interlinkage in global markets.[361]

Even if global gas markets will tighten – potentially hampering gas-to-gas competition and reducing its benefits in terms of affordability and security of supply – these recent developments suggest that gas trade has fundamentally changed in some of its aspects. In the new configuration, more players are active, flows are more numerous and there is destination flexibility – something that empowers the market and 'de-politicizes' trade, according to the logic of Liberalism.

359 Small-scale projects are growing in various segments of the value chain: a.) small-scale final applications, notably in transportation (heavy duty vehicles and shipping); b.) small-scale floating regasification and storage units (FSRUs); c.) small-scale liquefaction terminals, including floating LNG (FLNG). The importance of small-scale solutions in the current market environment – characterised by uncertainty – seems to be underscored by the fact that the only terminal that has moved to final investment decision (FID) in 2017 – a year marked by very low gas prices internationally – was Coral FLNG in Mozambique.

360 Recent farm-ins by ExxonMobil in papua New Guinea have been interepreted as signals that oil and gas majors do not want to miss out on opportunities to create large portfolios to keep up with their competitors. Shell, which has built a very large portfolio particularly after the takeover of BG, has indicated that thanks to its new business model it can now commit up to supply buyers with up to 2 Million Tons per Annum (MTPA) of LNG without having to underpin supply deals with specific volumes. Other trends pointing to greater commoditization of LNG are Total's acquisition of ENGIE's LNG assets, the merger of Qatargas and Rasgas, consolidation of buyers (such as the establishment of JERA, a Japanese buyers' consortium), and greater cooperation in procurement.

361 *World Gas Intelligence*, January 2018.

The reading of gas as the object of cooperation – if not instrument of peace – between the EU and Russia is also more reflective of reality than pessimistic accounts of gas as a bone of contention. In a paper on relations between the EU, Russia and Ukraine, Adam Stulberg gives a detailed account of the diplomatic steps that have been made by all three parties to avert a disruption to gas supplies in 2014 and 2015.[362] It is remarkable that, with a proxy war fundamentally ongoing in Eastern Ukraine and clear Russian violations of Ukraine sovereignty, shipments of Russian gas through Ukraine have continued largely undisturbed – whereas disruptions had occurred in 2006 and 2009 when the threat of a military confrontation was very remote. One may argue that, if it were not for the vital energy interests at stake, the Ukraine crisis could have escalated further. And that gas actually obliged the belligerent parties to sit at the negotiating table to renegotiate Ukraine's loan repayment, Russia's pre-payment of transit fees and other sensitive issues. This is a compelling example that induces to reappreciate traditional depictions of gas as a bone of contention between the EU and Russia. From this Liberal perspective, contrary to uncompromising Realist calls for self-sufficiency, discontinuing gas imports from Russia or other countries would deteriorate, rather than ameliorate, Europe's security. The reasoning is that having something substantial at stake induces States to act rationally and cooperate rather than disrupt relations.

If considered in the time span of the last decade (2008-2018), some of the normative aspects of Liberalism also appear at least partially truthful when applied to gas, and notably the conviction that liberalization brings lower prices for consumers without hampering security of supply. The idea is actually to increase security of supply by means of competition.[363] As we will see, this holds true in conditions of sufficient supply on the European and global gas markets, while the resilience of this model still needs to be proven in tight markets. However, as said, it is undeniable that liberalization has allowed the EU to profit from lower gas prices than if markets had still been dominated by vertically integrated incumbents.

This can be proven by comparing Platts' Northwest Europe Oil-Indexed Gas Contract Price Indicator (GCI) – a theoretical price indicator showing what price levels would be applied to oil-indexed long-term contracts for gas in static conditions, i.e. in default of renegotiations and applying the traditional formulae – and spot prices or average import prices at the German border (BAFA)[364]. The comparison shows that spot prices and the GCI price have decoupled at the end of 2008, followed by a decoupling between the GCI and the average import price (BAFA) in 2009-2010. The lowering of the import price – which has become increasingly aligned with hub prices until reaching nearly full convergence in 2013 – reflects the acquired ability of European importers to renegotiate long-term contracts with Russia. Without European gas market liberalization, and especially rules allowing buyers to switch supplier and procure gas directly on the hub, the Europeans would not have had the leverage to renegotiate Russian contracts so that they would reflect mutated market conditions.

362 A. Stulberg, 'Out of Gas? Russia, Ukraine, Europe and the Changing Geopolitics of Natural Gas', *Problems of Post-Communism*, 62:2 (2015), 112-130.

363 What the Clingendael International Energy Programme has named 'competitive diversification', cf. *Prospects for Sustainable Diversification of the EU's Gas Supply* (The Hague: 2016), Clingendael International Energy Programme.

364 Used as a proxy for Continental Europe's contract prices. This price is partly oil-indexed and partly hub-indexed, reflecting the hybrid pricing mechanism applied in Continental Europe.

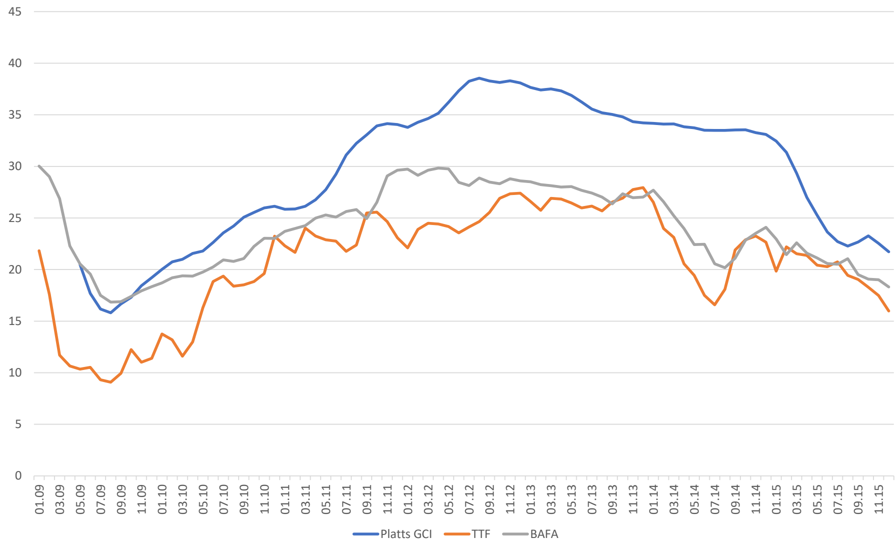


FIGURE 4 – COMPARISON OF LONG-TERM CONTRACT GAS PRICES AND SPOT PRICES IN EUROPE (2009-2015) IN EUR/MWH. SOURCE: PLATTS

With falling oil prices in 2014, reflected in lower prices in oil-indexed gas contracts – albeit with a 6-9 months' time lag owing to the composition of the pricing formula, the GCI and spot and average import prices have realigned. However, it can be claimed by proponents of liberalization that the reforms that allowed end-users to procure gas directly at the hub have enabled European buyers to save substantial amounts of money on Russian gas contracts between 2009 and 2015.

A scholar who researched international energy relations extensively is Robert Keohane.[365] While strongly influenced by Liberalism, Keohane combined it with insights from other schools and rejected rigid categorisations of himself as a purely Liberal scholar[366]. His work has great value as it provides useful notions that can be applied to EU-Russia gas relations. Keohane is the father of the theory of complex interdependence, elaborated together with Nye in the 1970s[367], which contends that interdependence is frequently asymmetrical and highly political. It is precisely asymmetries in interdependence that generate power resources for States – which is a foundational finding given that the central enquiry of IR theories is identifying the sources of power.

This is an interesting perspective to analyse EU-Russia gas relations. At the moment, as Europe is a buyers' market, Russia appears to need Europe as a gas importer more than Europe needs

365 Keohane, 'The International Energy Agency: state influence and transgovernmental politics'.

366 Keohane does not fully embrace the label of 'liberal institutionalism' and 'neo-liberal institutionalism' assigned to his work. He particularly takes issue with the term 'Liberalism'. He admits that his theory is rooted in liberalism but he does not embrace elements that are typically considered part of Liberalism and notably (1) that commerce leads to peace; (2) that individuals are essentially good; (3) that progress is inevitable; (4) that liberty should have a priority over social justice or equality; (5) the Washington Consensus, which dictated the dismantling of governmental regulation of markets in developing countries.

367 Keohane and Nye, *Power and Interdependence: World Politics in Transition*.

Russia as a gas supplier. Gazprom's hands are somewhat tied for a number of reasons, namely: a.) legacy infrastructure links Western Siberian fields to European markets; b.) historically low revenues limit the room for investment aimed at diversification of demand and c.) progress in LNG projects within Gazprom is lagging behind. In these circumstances, Europe's negotiating power is greater and has been greater since 2008 – which is why Europe has managed to renegotiate many of its long-term gas contracts with Russia – setting in motion what could be regarded as a transfer of rents from a gas supplier to a gas buyer. The advantage of Keohane's theory is that it is inherently dynamic. If the theory is applied, it becomes clear that when the present interdependence asymmetry levels off, Europe will lose its leverage. If the balance is then tilted in favour of Russia, possibly in sellers' market conditions, it is possible that some of the advantages obtained in this decade will be nullified. Only time will tell.

Keohane's Neo-Liberal Institutionalism 'emphasizes that interdependence among human beings produces discord, which generates a need for institutions'.[368] It also recognizes that institutions can be oppressive, although ideally institutions should rest as much as possible on honest persuasion rather than on coercion or bargaining based on asymmetrical resources. Keohane's work on power and interdependence did not solve all the conundrums. Notably, Keohane still remained puzzled by why States establish international regimes. In *After Hegemony* – published in 1984 – Keohane presents a theory of international institutions based on rationalist theory, in particular economic theories of the firm and of imperfect markets.[369]

In this work, he argues that States can accept transferring sovereignty to institutions because institutions perform important tasks, enabling States to cooperate. In particular, institutions: a.) reduce the costs of making, monitoring, and enforcing rules (transaction costs); b.) provide information; and c.) facilitate the making of credible commitments. Guarantors of compliance with these credible commitments are: a.) reciprocity – chiefly represented by threats of retaliation and promises of reciprocal cooperation and b.) reputation. Without fully solving the conundrum as to why rational States guided by self-interest[370] keep on complying with obligations that have become inconvenient, Keohane insists that concern for reputation is a key driver. He also observes that there is a 'consistent pattern, when commitments are inconvenient, of ingenious attempts to design policies to avoid reputational constraints'. If long-term gas contracts are considered institutional arrangements – and, as we will discuss, they should be considered such – Keohane's paradigm can be applied to them and to EU-Russia gas relations more broadly. Reputation is indeed a key element in strategic decisions, particularly on Russia's side. Reputation is what enables Russia to maintain a position in the European gas market in the long term. First of all, gas as a fuel needs to have a solid reputation – otherwise policy-makers would implement measures in favour of other energy carriers or just not in support of natural gas. This perspective, which is worth exploring, would thus appear to suggest that the Russians have gradually accepted deteriorating contractual conditions in order to preserve their reputation as a flexible, reliable supplier and maintain a long-term position in the market.

368 R. Keohane, *Power and Goevrnance in a Partially Globalized World* (London, 2001): Routledge.

369 R. Keohane, *After Hegemony: Cooperation and Discord in the World Political Economy* (Princeton, 1984): Princeton University Press.

370 Rationality does not mean full information, or the ability to calculate perfectly; instead, it is bounded rationality (cf. Chapter 3).

Even if – as argued – Liberals have grounds in expressing optimism about the commoditization of LNG and in rejoicing at the beneficial effect of market liberalization on European gas import prices in the last decade, one of the shortcomings of Liberalism is its excessively prescriptive nature. The pro-market reforms pushed on Russia at the end of the 1990s were conceived in a decade when the Western liberal-democratic model seemed invincible. When Liberals argue that all countries should and will eventually embrace this model, they neglect that economic and political regimes are never final and depend on contingent values, ideas, culture and geography. What is in the interest of consuming countries might not be in the interest of producing countries – or at least it might not be perceived as such by producing countries owing to their different set of ideas and values. Furthermore, a model that is successful in a specific economic phase might turn out to be defective in another economic phase. Finally, no model is perfect: compromises and trade-offs are inevitable, for instance between affordability and security of supply when talking about energy policies. This is proven by the fact that, instead of leading to de-regulation, market liberalization has led to a substantial body of regulation that is meant to correct liberalization's unintended consequences. The most enthusiastic proponents of gas market liberalization and gas-to-gas competition apply Fukuyama's end-of-history reasoning to the theme of spreading hub indexation across Europe. Rooted in 'core' countries of Northwest Europe and gradually embraced by countries in Central and Southern Europe, hub indexation is indeed making inroads in the peripheral regions of the Iberian Peninsula and Eastern Europe. This can lead to the deterministic view that eventually, the whole world – including suppliers – will embrace hub indexation and ditch oil indexation and perhaps long-term contracts altogether. While this may eventually turn out to be the case, it is at least legitimate to raise the question as to whether this account should not be tempered and investigated further.

Pro-market assumptions on how energy *should* be governed make Liberalism ignore alternative governance methods or dismiss them as being simply wrong or obsolete. This approach has visible shortcomings, for example: 1.) the possibility that liberalisation might actually disrupt security of supply, at least under certain circumstances, is simply ignored; 2.) market failures are under-appreciated, leading to unsatisfactory analyses of how challenges can be met; 3.) energy security is associated with free markets and, in the most radical *laissez-faire* approaches, all policy interventions are interpreted as negative interferences, which is of course not always the case if only because mutating market conditions require the adjustment of the policy environment.[371] In the specific case of EU-Russia relations, Liberalism fails to appreciate the importance of coordination between States for security of supply and the role that long-term contracts and vertical integration have had for security of gas supply since the 1970s. By focusing on the downstream segment, or at least on the well-functioning of the European market, these approaches appear to neglect the broader picture, where suppliers need long-term guarantees to allocate substantial investments. In sum, Liberalism tends to downplay the strategic value of energy commodities, where by 'strategic value' it is meant the value beyond their market price – which is clearly the case for gas.

371 Keating et al, 'Introduction: Bringing Energy into International Political Economy'.

The logic of Liberalism is used to emphasise that EU-Russia gas relations are also shaped by non-state actors notably including international oil companies and emerging gas players such as Rosneft and Novatek; that neither the EU nor Russia are monolithic blocks – as States do not always act coherently as units – entailing that within Russia there are a number of supporters of liberalization and within Europe there are forces that oppose it; and that in EU-Russia relations gas is not always a bone of contention, but rather an instrument of peace and a reason to sit around a negotiating table and cooperate as proven by events surrounding the latest Ukraine crisis in 2014. Liberals have a point in observing that the gas market is becoming more global and liquid and that several of the market liberal principles embraced by Europe are spreading to other regions of the world, notably East Asian importing countries. They also have a point in claiming liberalization's positive effect on EU gas prices in the last decade. The logic of Liberalism can lead to the deterministic forecast that the whole world will embrace EU-style governance in energy and to the statement that market liberalization is an inherently superior model regardless of the market phase in which it is adopted. The resilience of a model based on gas-to-gas competition in the EU has not yet been proven in a tight market. It is important to critically examine whether liberalization might end up hurting security of supply in tight market conditions. Finally, due to its bias on consuming markets and consumers, Liberal approaches appear to neglect the strategic value of gas as a commodity and the broader picture, where suppliers need long-term guarantees to allocate substantial investments.

4.3 CONCLUSIONS

In this Chapter, we have presented two competing logics, that of Realism and that of Liberalism, and articulate how changes in EU-Russia gas trade are interpreted following these logics. The logic of Realism is used by gas analysts, scholars, observers and politicians who want to emphasize the use of gas as a political tool. In the West, the logic of Realism is used to justify tough policy initiatives vis-à-vis Russia. Following this logic, the introduction of hub indexation could be interpreted as a facet of the EU's geopolitical competition with Russia. Conversely, the logic of Liberalism is used by actors who favour trade interdependence and highlight the merits of economic cooperation. Following this logic, EU-Russia gas trade relations are improved if free-market principles, including market-based pricing, are applied. From this perspective, the introduction of hub indexation is defended as a step in the good direction for both the EU and Russia (win-win).

The logic of realism is appealing for a number of reasons. Realism's assumption of rationality allows to reject the simplification that Russia paradoxically acts against its own interest and that instead it ought to conform to 'benevolent' Western advice on how to organize its gas sector**.** Disagreement with Russian gas policies is legitimate and, by neoclassical economics metrics, the Russian gas sector is indeed rife with inefficiencies. Yet, disputing the *rational* foundations of Russian gas policies does not seem to be justified. The Russian government regards gas as a strategic commodity that generates key revenues and requires long-term planning given the Artic conditions of the fields and their remarkable distance from the demand centres. From this perspective, defending State control, an integrated value chain, long-term guarantees and price stability is a rational – albeit contestable – course of action, consistent with the perceived socio-economic role played by the commodity in the country.

Realism – with its emphasis on the importance of the State and scepticism of multilateral effectiveness – is used as a lens to grasp the exceptionalism with which commodities have been treated within the Washington Consensus. Finally, the logic of Realism is employed to appreciate the strategic balance-of-power implications carried by economic measures.

Liberalism, on the other hand, emphasizes that EU-Russia gas relations are not only shaped by governments but also by non-state actors. With the breakup of incumbents in Europe and with the emergence of private oil companies and independent producers in Russia, this is increasingly proving to be the case. Contrary to Realism, Liberalism does not depict a world of constant tensions. Gas can indeed be regarded as a bone of contention, but also as a reason to sit around a negotiating table and cooperate. Recent self-restraint on the Ukraine dossier, as well as past cases where countries put aside their political disagreements to work together on gas projects, are used to demonstrate this. After all, the idea of importing gas from the Soviet Union and gearing Western European economies to gas is rooted in plans of distension and cooperation. The logic of Liberalism has definitely gained momentum in the last years, at least in gas discussions. European markets are functioning well, as liquidity is increasing and hubs are becoming mature. Market-based responses to security of supply challenges such as the 2017 Baumgarten explosion and outages in pipelines from Norway to the UK have been effective. Moreover, the Western model of liberalized gas markets is seemingly spreading to other parts of the world, particularly Northeast Asia. Thanks to a changed mindset and abundant supply, larger volumes of LNG are flexible and traded outside of long-term contracts. In other words, global gas markets are going through a 'Liberal' phase. The logic of Liberalism is used by proponents of hub indexation to present it as beneficial for both the EU and Russia, and in line with the 'spirit of the age' (consisting of the expansion of open markets).

CHAPTER 5

ORIGINS AND FEATURES OF HISTORICAL LONG-TERM IMPORT CONTRACTS AND CONSEQUENCES OF STRUCTURAL ENDOGENOUS CHANGES IN GAS TRADE, MARKET LIBERALISATION AND OVERSUPPLY

CHAPTER 5 – ORIGINS AND FEATURES OF HISTORICAL LONG-TERM IMPORT CONTRACTS AND CONSEQUENCES OF STRUCTURAL ENDOGENOUS CHANGES IN GAS TRADE, MARKET LIBERALISATION AND OVERSUPPLY

Gas trade between the EU and Russia has undergone significant transformations since 2008-2009. The first set of transformations relates to the fact that long-term gas import contracts have changed quite fundamentally in some of their core features. The second relates to the fact that these contracts have come under additional competitive pressure from spot trade, leading to the outcome that – while long-term contracts are still the prevalent vehicle for Gazprom's sales to the EU – Gazprom has consolidated its presence on EU hubs and increased quantities offered on the spot market.[372]

The objective of Chapter 5 is to define the main features of historical long-term gas supply contracts between the EU and Russia, understand their political-economic significance and identify the reasons[373] behind the transformations that they have undergone.

The predictions of TCE introduced in Chapter 3 will be tested. First of all, we will examine the rationale of the historical contracts from the perspective of TCE. We expect the characteristics of the gas sector and particularly of the investments required to start and sustain trade to explain both the existence and the specific features of historical contracts. Similarly, we expect transformations in at least some of the conditions indicated by TCE as conductive to long-term contracting to explain the transformations in EU-Russia gas trade mechanisms observed in the last decade.

In Chapter 6, these transformations will be qualified and quantified in more detail. This will allow us to test more specific predictions made by the contract literature with regard to renegotiations and changes in contract duration and take-or-pay clauses. We will also try to establish whether a new contractual equilibrium has been reached or whether the transition to

372 A. Bros, *Gazprom in Europe: A Business Doomed to Fail?* (Paris, 2014): IFRI.

373 The reasons why transformations of contractual structures have taken place are not only examined out of historical interest, but also to gain insight on whether such transformations are likely to be permament or temporary. While structural changes generate more durable effects, there might also be contingent factors. If it is found that contingent factors have played a predominant role in triggering the transformation, a return to the status quo if such contingent factors are overridden is at least theoretically possible.

a new business model is still in flux – one of the key research questions presented in Chapter 1. The other key research questions presented in Chapter 1 related to assessing the *impact* of these transformations on the EU, Russia and their relations – which will be studied in Chapters 7-9.

5.1 THE 'HISTORICAL' LONG-TERM IMPORT CONTRACTS BETWEEN EUROPE AND RUSSIA

Origins of historical long-term contracts

The first long-term contracts between Western Europe and Russia were signed in the 1970s to underpin the so-called 'gas-for-pipes' deals. Under these deals, Western European countries agreed to sell large-diameter pipes of high-quality steel to the Soviet Union in exchange for gas from the Urengoy and Yamburg regions. Western Europe was a catalyst for the exploitation of those new Soviet reservoirs.[374] Considerable upfront asset-specific investments needed to be allocated for the development of giant Western Siberian fields as well as for laying trunk pipelines measuring up to 4,500 km, the longest ever built at the time. For the Soviets, it was the prospect of exporting gas to Europe[375] that motivated both upstream and midstream investments of such a scale.[376] Those investments were thus markedly destination-specific. For this reason, Moscow sought long-term assurances on security of Western European demand. Long-term contracts indexed to oil (*below*) were the governance structure chosen to provide such long-term assurances, sustained and reinforced by high-level political engagement.[377]

We suggest that the origins of gas trade between Europe and Russia cannot be studied as a purely commercial phenomenon. Instead, they were rooted in commercial, political-economic and even eminently geopolitical considerations.

One reason why we should look beyond the purely contractual dimension is that participants to gas trade were either political players or strongly connected to political players. The USSR had a planned economy and hydrocarbon production and trade were directly controlled by the Government. In Western Europe, too, the State had an important presence in the gas industry.

The second reason is that high-level political coordination was essential to start gas trade between Europe and the USSR. First of all, the sizeable investments required for the production and transportation of gas were only possible with cross-country demand aggregation.[378] Coordinating the scale and the timing of the 'gasification'[379] of different countries on both

374 "For the Soviets, countertrade was the key to the entire development of West Séiberia's gas reserves: no Western pipe and equipment and finance, no West Siberian gas." in Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 76.

375 Both Warsaw Pact countries and Western Europe.

376 A. Vavilov and G. Trofimov 'A Phantom Energy Empire: the Failure of Gazprom's Downstream Integration', in A. Vavilov (ed.) *An Energy Giant and its Challenges in Europe* (2015): Palgrave Macmillan.

377 These long-term gas import contracts, in the configuration they had prior to the series of transformations occurred after 2008, will be hereinafter referred to as 'historical'.

378 P. Högselius, *Red Gas: Russia and The Origins of European Energy Dependence* (2013): Palgrave Macmillan Transnational History Series.

379 A term used to describe the conversion to gas of end-user appliances in a country, and more in general the wider adoption of gas in the energy mix of a country.

sides of the Iron Curtain required highly complex political negotiations.[380] An element of special complexity was that upstream and midstream investments needed to be coordinated with downstream investments in receiving markets, to allow for a deeper penetration of natural gas in the energy mix. The Soviet Union needed (political and contractual) guarantees on Western European purchase to allocate asset-specific investment on fields and trunk pipelines. Similarly, Western Europe needed (political and contractual) guarantees on Soviet supply to invest in specific downstream assets and 'gasify' the economy.

The third reason why early gas trade between Europe and the USSR cannot be studied solely as a commercial venture is that the gas-for-pipes deals had a number of geopolitical and political-economic functions.

The gasification of European economies, already initiated in the 1960s after the gas discoveries in the North Sea, assumed further strategic importance after the oil price shock in 1973, when European governments became keen on diversifying their energy supply away from Middle Eastern oil.[381] Although the first gas deals with the USSR predate the oil price shock, this event encouraged more Western European countries to sign deals with the Soviet Union beyond the initial circle of forerunners that comprised of Austria (OMV), West Germany (Ruhrgas) and Italy (ENI). Finland, France and Switzerland followed in the 1970s and gradually, other European countries signed deals for Western Siberian gas.

For the Soviets, the 'gas-for-pipes' scheme presented a number of strategic advantages. For starters, selling gas to Western Europe was a way to obtain much needed hard currency[382], a quintessentially 'geo-economic' objective.[383,384] In addition to this, there was also a prominent geopolitical objective[385], namely to improve relations with Western Europe after these had deteriorated in the aftermath of the Soviet repression of the 1968 Prague riots.[386] The rationale was that trade interdependence would contribute to create a climate of *détente*, which was being established by this and other means in the early 1970s. The easing of tensions culminated in the 1975 Helsinki Act.[387] The objective of *détente* was shared by Western

380 Högselius, *Red Gas: Russia and The Origins of European Energy Dependence.*

381 *Ibid.*

382 Currency that is not likely to depreciate all of a sudden or to fluctuate substantially in value.

383 Intervening in global currency markets and/or building foreign exchange reserves are among the most important means to boost national economic power and pursue geo-economic objectives, cf. S. Scholvin and M. Wigell, 'Power Politics by Economic Means: Geoeconomics as an Analytical Approach and Foreign Policy Practice', *Comparative Strategy*, 37:1 (2018).

384 In his seminal article, Luttwak links the emergence of geo-economics with the end of the Cold War. However, other authors have de-linked the two events, showing that geo-economic dynamics were at play during and before the Cold War as well. In their article on geo-economics, Scholvin and Wigell embrace this second definition: 'geoeconomics is not, in the understanding advanced in this article, about a fundamental shift in the international system'. Cf. S. Scholvin and M. Wigell, 'Power Politics by Economic Means: Geoeconomics as an Analytical Approach and Foreign Policy Practice'. Similarly, Cowen and Smith observed that geoeconomics was fundamental to international relations long before the end of the Cold War, showing that the US established its global primacy in the early 20th century through free trade. Cf. D Cowen and N. Smith, 'After Geopolitics? From the Geopolitical Social to Geoeconomics', *Antipode*, 41:1 (2009), 22-48.

385 Högselius, *Red Gas: Russia and The Origins of European Energy Dependence.*

386 Vavilov and Trofimov, 'A Phantom Energy Empire: the Failure of Gazprom's Downstream Integration'.

387 The final act of the Conference on Security and Co-operation in Europe held in Helinski. The document, though non-binding, was an important step toward reducing Cold War tensions between the Eastern and the Western blocs.

European governments[388], especially after 1968.[389] The thesis that the Soviets entered the 'gas-for-pipes' deal for geopolitical reasons is reinforced by the finding that the higher quality of European pipes did not justify the high cost of the gas deals at the time.[390] Brezhnev, facing criticism that the gas deals were not in the economic interest of the USSR, argued that *détente* was 'more valuable'.[391] For the USSR, the strategic importance of exporting gas to Western Europe was such as to sacrifice national welfare and economic competitiveness.[392] This does not mean that the USSR did not eventually profit from gas sales to Europe[393], but (immediate) commercial gains were not the only and arguably not the primary driver behind Soviet plans. Gustafson (2020) also attaches considerable importance to gas deals between Western Europe and the USSR in catalysing distension: "the Soviet-Austrian contract of 1968 had shown that an East-West gas deal was feasible, but what had made it possible was the exceptional circumstances of the Austro-Czechoslovak relationship – in effect, a loophole. But if the Soviet-Austrian deal was a loophole, the Soviet-West German contract was a breakthrough, *the beginning of the breach in the Iron Curtain* that would only grow larger over the following decades."[394]

Reflecting the geopolitical and political-economic objectives behind them, the 'gas for pipes' deals – and the long-term contracts underpinning them – were given a marked relational nature. At the time this could not have been otherwise, as the construction of capital-intensive cross-border infrastructure and the gasification of importing countries required high-level strategic decisions. The next section sheds lights on the most important features of these historical long-term contracts.

In Chapter 1, we have introduced the notion that energy is an interlinked part of the society, economics and politics. We also observed that there is a need to combine notions of politics and economics in studying EU-Russia gas relations because gas is a special commodity with characteristics that make it subject to politicization, and that in EU-Russia gas relations commercial issues are entangled – unfortunately, one could add – with other broader political issues, including military and geopolitical ones.

On the basis of this strong political-economic nature of EU-Russia gas trade, we also motivated our choice to embrace IPE's call, and in particular Susan Strange's, to avoid giving analytical

388 "While there is no denying the significance of the United States and the Soviet Union in the shaping of Europe's fortunes in the 1960s and 1970s, detente began in Europe". J. Hanhimäki, 'Détente in Europe: 1962-1975' in M. Leffer and O. Westad (eds.), *The Cambridge History of the Cold War* (Cambridge, 2010): Cambridge University Press, Summary.

389 Western governments thought that Soviet-style totalitarianism should be dealt with and eventually destroyed through rapproachement rather than confrontation, cf. Högselius, *Red Gas: Russia and The Origins of European Energy Dependence*.

390 Vavilov and Trofimov, 'A Phantom Energy Empire: the Failure of Gazprom's Downstream Integration'.

391 *Ibid.*

392 "Northwestern Siberia was the world's largest gas region, but lack of pipeline capacity nevertheless made gas a scarce resource in the red empire. Soviet gas users, therefore, had to compete with West European importers for insufficient volumes of gas. Moscow, desperately seeking to ensure the West of its reliability as a partner, opted to sacrifice domestic supplies rather than cut exports. The result of this highly political choice, in terms of human suffering and industrial productivity, was devastating". Högselius, *Red Gas: Russia and The Origins of European Energy Dependenc*e, page 8.

393 "Gas rents […] played a vital role in maintaining the Russian economy, through both exports and subsidized domestic distribution", Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 5.

394 *Ibid.*, page 72 (emphasis added by us).

primacy to either the market or the State, and to consider both key analytical units of our work, switching gears back and forth as necessary. We also agreed with Stoddard's point that a genuine politico-economic approach should not attempt to rank political and economic variables hierarchically.

This brief digression on the origins of EU-Russia gas trade shows how gas trade originated as a series of economic transactions rooted in politics. The observations of this Chapter therefore prove some of the conjectures presented in Chapter 1. The commercial relevance of the gas-for-pipes deals is explained below. On the basis of TCE literature presented in Chapter 3, we expect to find that, in addition to the factors already highlighted so far, the key features of historical long-term contracts responded to the need of the parties to minimise risks related to opportunism when allocating highly asset-specific investment.

Features of historical long-term contracts

The fact that geopolitics played an important role for concluding the gas-for-pipes deals does not mean that the contracting parties were prepared to incur economic losses and realise their geopolitical objectives at any cost.

To the contrary, both the Soviets and the Europeans took a long-term view on the strategic and economic significance of the deals. Adopting a long-term strategic view implied foregoing immediate profit to obtain higher value later.[395] Even if European steel pipes were arguably too expensive to justify the transaction on purely commercial grounds, the Soviets saw their purchase as a necessary prerequisite to close the deal at a political level, a deal that they saw as not only geo-politically – but also geo-economically – advantageous in the longer run.[396] This is typical of a geo-economic posture (Chapter 2), cf. Luttwak (1993) or Huntington (1993).[397]

The fact that contracting parties devoted substantial attention to make the gas deal work economically is confirmed by the manner in which they designed the arrangements governing gas trade.

From an economic perspective, the choice of long-term contracts over short-term contracts or spot transactions is explained by TCE theory. According to Williamson (1979)[398], long-term contracts are adopted to minimise transaction costs in commitments involving highly specific assets (and thus idiosyncratic investments) where full[399] vertical integration is impossible. As

395 As we will discuss later in this book, while Russia has maintained a long-term strategic approach to gas trade with the EU, the EU's mindset has shifted in the 1990s, becoming much more short-termistic and much less strategic.

396 In the first half of the 1970s, the cost of importing pipelines and compressors to transport the gas to Western Europe were much higher than revennues derived from exports of natural gas. Only in the early 1980s revenues became positive, cf. J. Stern, The Pricing of Gas in International Trade – an Historical Survey' in J. Stern (ed.), *The Pricing of Internationally Traded Gas* (Oxford, 2012): The Oxford Insitute for Energy Studies.

397 Investing in losses in order to ultimately dominate an industry is geo-economic behaviour. Huntington, 'Why International Primacy Matters'.

398 Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

399 Long-term contracts can be described as forms of quasi-vertical integration. Moreover, Gazprom achieved partial integration into the European downstream sector (although not at the early stage of EU-Russia gas trade).

has been observed by Chyong (2015)[400], both elements are applicable to the beginning of EU-Russia gas trade. Investment on Soviet fields, downstream appliances and distribution systems, and especially midstream infrastructure were highly transaction-specific in the 1970s. At the same time, full vertical integration was impossible due to the presence of State borders and national prerogatives (Stern, 2005).[401]

Williamson's two additional criteria for a transaction to require special governance structures (recurrence of transactions and uncertainty) are also applicable to early EU-Russia gas trade, as argued in Chapter 3. In Chapter 3 it has also been shown that the historical long-term contracts shared many features with the 'relational contracts' described by Williamson. We follow Hodgson's (2004)[402] observation that opportunism is not an essential pre-requisite for long-term contracting. In fact, high level political pressures to promote distension largely eliminated the possibility for contracting parties to act opportunistically, and yet long-term contracts were signed.

In light of the considerable financial effort mobilised, long-term contracts were first of all concerned with eliminating the risk that contracting parties would lose the initial investment. In Chapter 3, we discussed how Klein et al. (1978)[403] showed that capital-intensive idiosyncratic investment under uncertainty and opportunism requires long-term guarantees, in default of which 'hold up' problems rise. At the time of the gas-for-pipes deals, a risk allocation scheme acceptable to both buyers and sellers had to be found.

The scheme that was adopted conferred greater price risk to exporters and greater volume risk to importers. Exporters were exposed to (higher) price risk in the sense that they were committed to provide contracted volumes regardless of the contract price. Fluctuations of oil prices trickled down to contract prices, and there was no guarantee that these would not be low for protracted periods of time. To limit price volatility, contract prices were calculated on the basis of the average price of a basket of oil products over several months (typically the 12 previous months) and applied for a shorter period (typically the 6 following months). It would however be incorrect to state that price risk was entirely taken by exporters. Importers were in fact also exposed to price fluctuations, but with a limited risk – as they could pass through (higher) sourcing costs to their end users, which were captive. Instead, the main risk for

400 "All of the factors that give rise to a high transaction cost structure were present at the beginning of the development of the natural gas industry in Europe and persisted until European authorities launched the liberalisation of the electricity and gas markets in Europe. As the transaction cost theory predicts, the European gas industry was developed based on a system of complex [long-term contracts] between buyers and sellers.", C.K. Chyong, *Markets and Long-term Contracts: the Case of Russian Gas Supplies to Europe* (Cambridge, 2015): Energy Policy Research Group, University of Cambridge.

401 Gazprom has made attempts to integrate vertically into the European downstream since the 1980s, in order to capture rents held by European importing companies, which enjoyed a position of market dominance. However, joint venture projects that would have given Gazprom access to downstream European markets with Edison (Italy) and Ruhrgas (Germany) were never implemented. In the 1990s, Gazprom started to be more successful, starting with the signature of a cooperation agreement with Wintershall, giving rise to an alliance (WIEH, later Wingas) that marketed Gazprom gas in Eastern regions of Germany. In the 1990s, Gazprom established undertakings throughout Europe. These amounted to as many as 18 in 2005. See J. Stern, *The Future of Russian Gas and Gazprom* (Oxford, 2005): Oxford Institute for Energy Studies.

402 Hodgson, 'Opportunism is Not the Only Reason Why Firms Exist: Why an Explanatory Emphasis on Opportunism may Mislead Management Strategy'.

403 Klein et al, 'Vertical Integration, Appropriate Rents and the Competitive Contracting Process'.

importers was to be unable to sell the contracted gas volumes in case of lower-than-expected demand (volume risk).

Oil indexation, with which the Dutch had replaced cost-plus city gas pricing in the 1960s[404,405], was the selected pricing mechanism in long-term contracts between Europe and Russia. As a liquid gas market did not exist, contracting parties found it necessary to peg contract prices to a more deeply traded commodity. Oil indexation was also chosen because Western European companies already had experience with it, and international oil market dynamics were well-known to operators in the energy sector. Furthermore, oil indexation made sense because gas and oil were deeply interwoven at the time, not only in the upstream (with sizeable associated gas production) but also in the downstream – since gas was competing with oil products in heating and industry, and to a lesser extent in power generation.[406] Unlike Asian contracts, indexed to crude oil, contracts between Russia and Europe were indexed to oil products, especially heavy fuel oil – competing with gas in industry – and gasoil – competing with gas in the residential sector. A typical oil-indexed formula used in European import contracts could be simplified as follows**:**

$$P_t = P_o + \alpha \times a_1 \times b_1 (Go_t - Go_o) + (1-\alpha) \times a_2 \times b_2 (HFO_t - HFO_o)$$ [407]

with P_t representing the contract price, P_o the base price, α and $1-\alpha$ the weight of different market segments (in this example, the residential and industrial sectors); a_1 and a_2 the factors to convert oil product units to natural gas units; b_1 and b_2 the pass-through factors to transform oil product price changes into gas price changes (usually applying an 80-90% discount rate vis-à-vis oil products); Go_o and HFO_o the values of gasoil and heavy fuel oil at a time t_o, calculated on an average of several months.[408]

This pricing mechanism was chosen because indexing gas to a third commodity subject to an independent price formation mechanism eliminated suspicions of manipulation. Moreover, this arrangement guaranteed reasonable returns while making sure that gas would remain competitive with other fuels in the downstream markets.

404 Stern, 'The Pricing of Gas in International Trade – an Historical Survey'. Stern evokes that when the 'Groningen principle' formula based on a cost-plus approach was introduced, the only significant criticism came from Odell, who argued that the costs were low and that the formula was designed to guarantee high profits to a limited number of players, including the Dutch government. Cf. P.R. Odell, *Natural Gas in Western Europe: a Case Study in the Economic Geography of Energy Markets* (1969), De Erven F. Bohn NV. Stern also evokes that this view was later acknolwedged by others. An Energy Charter Treaty document from 2007 mentions that the formulae allowed Shell, Exxon and the Dutch government to obtain higher revenues than what would have been obtained through a cost-plus formula given the low costs of production. Cf. also *Putting a Price on Energy: International Pricing Mechanisms for Oil and Gas* (2007): Energy Charter Secretariat.

405 For the origins of pricing in the Dutch market, see A. Correlje, C. van der Linde and T. Westerwoudt, *Natural Gas in the Netherlands: from Cooperation to Competition* (2003): Oranje Nassau Group.

406 The explanation provided in this chapter is coherent with what has been noticed by Jonathan Stern, who argued that oil price linking is maintained under four separate circumstances: a.) if there is a clear economic rationale for the practice, b.) if oil price linkage is not fundamentally important for consumer prices, c.) if there is an absence of easy alternative pricing systems, and the parties are unable to agree an alternative that both regard as suitable and not subject to manipulation, d.) if both buyers and sellers feel they gain from oil-linked contracts, in Stern, 'The Pricing of Gas in International Trade – an Historical Survey'.

407 J. Vermeire, *Commodity Pricing* (2014), Presentation, Energy Delta Institute.

408 Franza, *Long-term Gas Import Contracts in Europe: The Evolution in Pricing Mechanisms.*

Another fundamental property conferred to long-term contracts between the EU and Russia was flexibility. As the pay-back time of transmission pipelines was projected to extend over decades, contracting parties anticipated that market conditions would change along the life span of contracts, requiring dynamic adaptations.

The first element of flexibility was applied to volumes: at times of low demand, buyers could purchase volumes below the Annual Contracted Quantity (with the possibility of compensating in the following years). The Minimum Contracted Quantity (MCQ) was usually somewhere between 75 and 85% of the ACQ. In addition to this downward flexibility, there was also upward flexibility, allowing sellers to ship volumes above the ACQ. The second type of flexibility was applied to pricing. Price review clauses allowed contracting parties to ask for amendments to pricing mechanisms (usually every three years) if justified by changes in the market. This was done to avoid that pricing formulae would deliver price levels that were entirely unprofitable for either contracting party. Given the asset specificity of the investments and the need for market access, Gazprom was interested in extracting profits from gas sales as much as they were in keeping their European counterparts content (to avoid switching to other energy sources or gas suppliers) and solvent. This is a clear example of the relational nature of these contracts (cf. Chapter 3).

So far, we have demonstrated that long-term contracts were complex governance structures designed to allocate economic risk between contracting parties involved in schemes with high geo-economic, geopolitical and commercial significance. Given the prominent ambition of *détente* as a catalyst for the gas-for-pipes deals, and the characteristics of the underlying transactions, long-term contracts were endowed with a markedly relational character and with provisions designed to minimise and/or manage conflict. The mechanisms and clauses described above were intended to limit ex-post opportunism by the parties in presence of highly asset-specific investment, recurrent transactions and remarkable uncertainty, in line with TCE's predictions (cf. Chapter 3).

The lack of gas-to-gas competition, the presence of captive end-users to which costs could be passed through, and the shared interest of establishing (and then protecting) a market for gas, helped cementing consensus around long-term contracts for more than three decades.

The nature of the historical long-term contracts was at least in part shaped by the political engagement in which they were rooted and by the geopolitical and political-economic objectives that they were serving. This finding explains why Europe's unilateral attempt to depoliticize gas trade by entrusting the market with a more central role in the 1990s also involved changes to long-term contracts and why this had the potential to generate political-economic repercussions. Long-term contracts have not only represented governance structures or, using North's[409] wording, 'institutional arrangements', but also a true cornerstone of the 'institutional environment' (§3.3) in which gas has been traded between Russia and Europe. These are some of the key research questions of this book, introduced in Chapter 1.

409 North, 'Institutions, Institutional Change and Economic Performance', Cambridge University Press.

Long-term contract literature presented in Chapter 3 suggests that long-term contracts can be regarded as a way to distribute trade gains between contracting parties (Masten and Crocker, 1985[410]; Crocker and Masten, 1988[411] and Mulherin, 1986[412]). Also in the historical gas contracts between Europe and Russia, the pricing mechanism – described above – was essentially crafted to divide the rents associated with the production, transportation and marketing of gas between Russia and European buyers (Chyong 2015).[413] On the basis of this observation, we conjecture that changes to pricing mechanisms must have had a political-economic impact on the EU and Russia. This will be analysed empirically in Chapters 7-9.

Historical long-term contracts come under pressure

The process of transformation was set in motion in the 1990s, when the notion that long-term contracts were indispensable to govern EU-Russia gas trade started to be questioned, although strong support for the *status quo* remained in the industry until the late 2000s. In part, the debate arose because some of gas trade's underlying structural endogenous[414] elements had changed.

Firstly, the achievement of full amortisation of the Brotherhood system and the distribution pipelines built in the 1970s called into question the need to preserve schemes that had been conceived to guarantee a payback.

Secondly, the relative maturity of the European gas market and the belief that no major new gas infrastructure needed to be built inside Europe convinced some European policy-makers that they could organise the internal market differently without major security of supply risks.

In other words, the asset specificity of the European gas investment stock diminished. The long-term contract literature (Chapter 3) identifies this as one of the grounds on which long-term contracts tend to give way to short-term contracts (Neuhoff and Von Hirschhausen, 2006).[415]

In addition to the reduced asset specificity of gas infrastructure in Europe, a broader drift was underway globally. Relative to the early days of international gas trade, both pipelines and LNG, as vehicles for the transportation of natural gas, became subject to significant reductions

410 Masten and Crocker, 'Efficient Adaptation in Long-term Contracts: Take-or-Pay Provisions for Natural Gas'.

411 K. Crocker and S. Masten, 'Mitigating Contractual Hazards: Unilateral Options and Contractual Length', Rand Journal of Economics, 19:3 (1988), 327-343.

412 J.H. Mulherin, 'Complexity in Long-Term Contracts: An Analysis of Natural Gas Contractual Provisions', *Journal of Law, Economics and Organization,* 2:1 (1986), 105-117.

413 Chyong, 'Markets and Long-term Contracts: the Case of Russian Gas Supplies to Europe'.

414 Endogenous to gas trade or to the gas trade relations, as opposed to exogenous triggers (such as liberalisation, discussed later) and non-structural, contingent triggers (such as oversupply in 2008, also discussed later).

415 Neuhoff and Von Hirschhausen, 'Long-term Contracts and Asset Specificity Revisited'. Writing in the mid-2000s, Neuhoff and Von Hirschhausen noted that asset specificity of gas investments was diminishing. In the upstream, contracts stopped being field-specific and assumed a portfolio dimension. Similarly, investments stopped being contract-specific, meaning that a specific field could be exploited to serve various contracts. These developments were reflected in the abolition of destination clauses in European contracts. In the midstream, most of the long pipelines had been established by then. Newer projects only required smaller capacity expansions. In the downstream, distribution infrastructure had similarly been largely established, meaning that no large investments from scratch were required.

in their capital intensiveness thanks to technological progress.[416] Lower capital intensiveness leads to lower risks and limits the 'hold-up' problem (Chyong 2015)[417], thus softening the requirement of backing investments with long-term contracts.

Another global trend that added pressure to historical long-term contracts was the growth of LNG relative to pipeline trade. Since LNG trade is less asset-specific (Chapter 3) than pipeline trade owing to its liquid nature, LNG trade brought more flexibility to both sides of the market (Chyong 2015).[418] Access to flexible LNG and an increasing number of trade players contributed to changing the underlying structural conditions under which the historical long-term contracts had thrived.[419] This is in line with Doane and Spulber (1994)[420], who, as we presented in Chapter 3, had found that asset specificity lowers the efficiency gains bought by long-term contracts.

Thirdly, the fact that gas and oil products were not competing as much as in the past cast doubts on the continuing rationale of oil indexation. The question on the continued rationale for oil indexation started to be fiercely debated and remains debated until today. Among the most vocal opponents of keeping oil indexation were Jonathan Stern and his colleagues of the Oxford Institute for Energy Studies (OIES). In a paper published in 2007[421], Stern contended that gas and oil had ceased to be substitutes, owing to the high cost of maintaining oil-burning equipment and stocks of oil products, the advent of efficient gas-burning equipment where oil could not be efficiently burned, and stricter emission standards. The usage of oil products instead of gas in stationary appliances was decreasing and not expected to recover under any scenario. Moreover, gasoil and fuel oil prices – used in contract price indexation – were found to be set by developments in transportation demand, where gas-to-oil competition was (and remains) very marginal. Thirdly, Stern argued that oil supply was irrelevant to gas supply to Europe. Thus, Stern concluded, the only rationale for maintaining oil-linked gas pricing was that no other acceptable indexation had been available for a long time, and that dominant market players were comfortable with oil indexation and retained the market power to maintain it.[422] Instead, Gazprom continued to defend oil indexation. In addition to (more) convincing arguments about the merits of historical long-term contracts, Sergey Komlev[423] also argued that limited day-to-day substitution between oil and gas did not rule out a deep-rooted relationship between the two fuels. Firstly, he observed that gas continued to compete with oil in the residential sector – with one third of German households still using oil products for heating in 2012. Furthermore, oil products and gas played the same peak or semi-peak function in power generation – contrary to coal, used for baseload. Oil products were also a reserve fuel used by power plants and industrial users in case of gas supply failures. Moreover,

416 S. Cornot Gandolphe, *The Challenges of Further Cost Reductions for New Supply Options* (2003), Paper for the 22nd World Gas Conference; J. Jensen, 'The LNG Revolution', *The Energy Journal*, 24:2 (2003), 1-45.

417 Chyong, 'Markets and Long-term Contracts: the Case of Russian Gas Supplies to Europe'

418 *Ibid.*

419 Neuhoff and Von Hirschhausen, 'Long-term Contracts and Asset Specificity Revisited'.

420 Doane and Spulber, 'Open Access and the Evolution of the US Spot Market for Natural Gas'.

421 J. Stern, J., *Is There a Rationale for the Continuing Link to Oil Product Prices in Continental European Long Term Gas Contracts*? (Oxford, 2007): Oxford Institute for Energy Studies.

422 *Ibid.*

423 S. Komlev, *Europe Needs Oil Indexation More than Ever* (2012): Working Paper presented at the Kuala Lumpur World Gas Conference.

Gazprom highlighted that the rising use of gas in transportation would strengthen the competition and thus the price relation between gas and oil products in future.[424]

So far in this chapter, structural changes in gas trade have been identified as concurrent causes for the process of transformation of long-term import contracts. However, as it will be discussed in the next section, change in structural endogenous factors does not capture the phenomenon in its entirety.

The process that led to questioning the desirability of preserving the historical long-term contracts should also be studied in the light of a much broader social, political and economic transformation that took place in those years: economic liberalisation. Unlike endogenous developments discussed so far, such as reduced asset specificity and switching potential between oil and gas, liberalisation was not value-free, nor fully neutral from a political and geo-economic point of view (cf. Chapter 3).

Highlighting only endogenous factors as grounds for change in EU-Russia gas trade means neglecting political and geo-economic variables. Inspired by prior experiences in the US and in the UK, the ground for gas market liberalisation started to be laid in Continental Europe in the 1990s. In the same decade, gas trade relations between Russia and former Comecon[425] countries became subject to a distinctive set of pressures originating from the collapse of the Soviet Union and transition to market economy (Stern, 2005).[426] These are case-specific issues and lie outside the scope of this dissertation. Only issues common to all of Russia's European partners are considered.

5.2 LIBERALISATION AS A DRIVER OF THE TRANSFORMATIONS IN EU-RUSSIA GAS TRADE

This section investigates how gas market liberalisation affected the underlying conditions of EU-Russia gas trade and long-term gas supply contracts between EU companies and Gazprom. One aim is to understand the context in which EU gas market liberalisation was started, in order to determine to what extent Russia – and its gas export rents – were a prominent target of EU policy-makers when they promoted liberalisation. In Chapter 1, we introduced this as a key research question. Another aim is to understand the objectives of liberalisation with regard to the EU gas market. This will allow us – later in the dissertation – to establish to what extent price-related objectives were achieved, and what role long-term gas contracts played in this transition towards liberalised gas markets. Finally, this section aims to establish whether liberalisation has been a necessary and/or sufficient condition to trigger change in EU-Russia gas trade and long-term gas supply contracts more specifically, in addition to structural endogenous factors analysed in the previous section.

424 *Ibid.*

425 COMECON or CMEA (Council for Mutual Economic Assistance)

426 Notably Russia's requests for hard currency payments at world-parity prices and attempts to be given a role in transportation and distribution. J. Stern, *The Future of Russian Gas and Gazprom* (Oxford, 2005): Oxford Institute for Energy Studies (OIES).

Gas market liberalisation in the context of a broad neoliberal paradigm shift

First of all, it is important to highlight that the push for gas market liberalisation in the EU arose in a wider international context of economic liberalisation. The proposed gas market reforms were only one component of a broader process of restructuring designed to boost economic efficiency by increasing reliance on market forces. To be sure, there is a link between this process and the structural sectoral changes described in the previous section. In fact, incentives to establish more competitive markets increased also because some of the sectors that had been established or expanded during the post-war economic expansion started to move towards maturity. While monopolies are often tolerated in the early stages of an industry, owing to the presence of high marginal costs, high risks and low returns, calls to eradicate monopolies tend to become stronger as industries progress towards maturity.

The wider context of economic liberalisation emerged along the lines of what Goldthau calls a 'paradigm shift' that took place in the 1980s.[427] The move from a Statist paradigm[428] towards a neoclassical paradigm was favoured by the election of Ronald Reagan as US President and by the election of Margaret Thatcher as UK Prime Minister. The two Heads of State were inspired by the ideas of a number of scholars, including public choice theorists Anthony Downs[429] and William A. Niskanen[430] and Chicago School economists[431]. These scholars thought that the excessive size of the public sector was partly responsible for the protracted economic recession of the 1970s, and their theories became increasingly popular in that phase. In the course of the 1980s and early 1990s, these ideas spread from the Anglo-Saxon countries and gradually gained ground in Western Europe, too. The end of the Cold War further strengthened the attractiveness of these ideas, as the fall of the Soviet Union could be saluted and presented by neoliberals as the definitive triumph of free-market economies over the socialist model. In the same period, Fukuyama suggested that history might have 'ended', voicing the widespread feeling that free economic exchange and the liberal-democratic model had prevailed and were destined to be embraced, sooner or later, by all countries around the world.[432] This is also illustrative of the 'universalistic' ambitions of the neo-liberal paradigm.

One of the core notions of the neo-liberal paradigm is that State-owned companies tend to be inefficient because they lack the incentive to make profits and innovate. Privatisation and market liberalisation are thus seen as a key ingredient to boost sluggish growth, innovate and gain competitiveness. Neo-liberal economic recipes started to be implemented in telecommunications, and gradually expanded to other sectors and geographical areas. Reform attempts were met with greater resistance in sectors considered to be natural monopolies.

427 A. Goldthau, A., 'From the State to the Market and Back: Policy Implications of Changing Energy Paradigms', Global Policy, 3:2 (2012), 198-210.

428 A Statist paradigm, with State intervention aimed to boost economic growth, had been prevalent since the Second World War.

429 A. Downs, *An Economic Theory of Democracy* (New York, 1957): Harper and Brothers.

430 Niskanen, W.A., 'The Peculiar Economics of Bureaucracy', *The American Economic Review*, 58:2 (1968), 293-305.

431 Cf. G.J. Stigler, 'The Theory of Economic Regulation', *The Bell Journal of Economics and Management Science*, 2:1 (1971), 3-21.

432 Fukuyama, 'The End of History?'.

In the US, removal of wellhead price controls was one the first key steps in the liberalisation of gas markets[433], followed by the introduction of competition in the wholesale market through unbundling of transmission infrastructure and third-party access. In the UK, BP and BNOC were already privatised in the 1980s, but the true liberalisation of British gas markets was spearheaded by the 1986 Gas Act. The main legislation for liberalisation of the power sector with the 1989 Electricity Act. The National Balancing Point (NBP), however, was launched as a gas hub only in 1996. British gas market liberalisation came later than in the US but was in many respects more wide-ranging than its American counterpart, as it also opened retail markets to competition and mandated third party access to distribution infrastructure.[434]

Following the lead of the US and the UK, some Continental European countries, namely The Netherlands, Spain and Germany, started to experiment early forms of gas market liberalisation in the first half of the 1990s.[435] Also Japan, traditionally less enthusiastic about reducing State intervention, liquidated the Japan National Oil Corporation in the 1990s owing to its loss-making activities. Even some producing countries introduced elements of free market exchange, including Russia where the oil sector started to be privatised in 1992[436] and competition was gradually introduced in the electricity sector between the end of the 1990s and the beginning of the 2000s.[437] In that period, it seemed that indeed every country would, sooner or later, embrace the neo-liberal paradigm.

The neoliberal '*mission civilisatrice'* underway in other fields of the economy eventuated in energy, too.[438] Since the 1990s, Western countries attempted not only to liberalise their own energy sector, but also to transfer neo-liberal energy policies to other countries. It is difficult to establish whether this was rooted in a disinterested conviction to 'do good' and create win-win conditions or rather in the opportunistic goal of paving the way for Western interests by opening up vulnerable markets. In any case, internal gas market reform in the EU had an outreach that went beyond the Union's borders. As indicated by Goldthau and Boersma[439], the internal pro-market drive had a dual external dimension.

The first external dimension of internal EU gas market reform is that liberalisation had "spill over effects for external companies that would like to 'come and play' on the attractive EU market".[440] Even without considering the *intentions* of EU legislators, it is undeniable that, with liberalisation, the "rules by which gas is bought and sold have been turned upside

433 The first steps in deregulating the US gas market were made in the 1978 Natural Gas Policy Act, which contained rules for the gradual removal of price ceilings at the wellhead. Complete deregulation of wellhead prices was carried out later, by the 1989 Natural Gas Wellhead Decontrol Act.

434 *Natural Gas Pricing* (Paris, 1998): OECD/IEA.

435 *Natural Gas Pricing* (Paris, 1998): OECD/IEA.

436 *Russia's Oil Privatization is More Greed than Fear*, Oil and Gas Journal, 28:27 (2000), 30-32.

437 M. Wilson, *Reforming the Russian Electricity Sector* (1998): The World Bank.

438 For critical analyses of neoliberal economic policy transfer attempts compared to 'missions civilisatrices', see Bauzon, K., *Capitalism, the American Empire and Neoliberal Globalization* (London, 2019): Palgrave Macmillan, page 25 and N. Cooper et al 'The End of History and the Last Liberal Peacebuilder: a Reply to Roland Paris', *Review of International Studies*, 37:4 (2011).

439 T. Boersma and A. Goldthau, 'Wither the EU's Market Making Project in Energy: From Liberalisation to Securitisation?', in S. Andersen et al (eds.), *Energy Union: New Liberal Mercantilism?* (London, 2016): Palgrave Macmillan.

440 *Ibid.* page 102.

down"[441], with clear repercussions for suppliers. When confronted with reflections on the impact that liberalization would have on suppliers, the self-confident assumption of EU legislators was that the EU market was so large and attractive that companies would adapt their *modus operandi*, even painfully, in order not to lose access to it. The necessity for gas exporters to adopt business practices that would be in line with the new EU rules entailed an element of 'extraterritoriality', as the implication was that the European Commission would not simply monitor the behaviour of suppliers in the EU market, but also *de facto* retain a say in the export regime of which Gazprom, Statoil and Sonatrach were part.[442]

It can be argued that the EU bent its neo-liberal energy law regime to pursue 'geo-economic' objectives, also vis-à-vis Russia, in a variety of ways. First of all, the EU did so by allowing for discretion in applying general principles on the basis of security of supply considerations. For instance, projects that improve security of supply receive priority in vetting for funding and can be included in the list of 'Projects of Common Interest (PCIs)' for faster regulatory approval. Security of supply is also a widely used criterion to exempt projects from third party access rules and other provisions, as well as to ask private undertakings to temporarily perform public service functions. Gazprom in particular accused the EU to pursue discriminatory geo-economic objectives by hiding behind a legalistic approach. In this vein, it filed a case at the World Trade Organisation in 2014. While the WTO ruling concluded that the main principles of the Third Energy Package were lawful, it also established that some specific provisions were in breach of WTO norms and principles. One provision that was found discriminatory was the 50% cap imposed by the EU on the utilisation of the OPAL pipeline, which entailed reduced utilisation of Nord Stream. The other element that was not found to be in line with WTO principles was that the Trans-European Networks for Energy (TEN-E) strategy unlawfully provided most favourable conditions for the transportation of gas of any origin other than Russian, thereby engaging in deliberate discrimination.[443] At the time of writing, the Nord Stream 2 consortium was denouncing the amendment to the Third Gas Directive approved in 2019 as discriminatory.[444]

In addition to the implicit or indirect extraterritorial reach of internal reform described above, the EU established vehicles more explicitly designed to spread the liberal paradigm abroad, such as the Energy Charter Treaty organisation in the 1990s and the Energy Community in the mid-2000s, tasked with spreading the *acquis communautaire* to countries of the Neighbourhood. Norway, as Member of the European Economic Area (EEA) was also pressured to bring its regulatory regime in line with the one adopted by the EU in the 1990s. Among these initiatives, the ECT is the most relevant for EU-Russia gas trade relations. The ECT promoted the objective of stimulating cross-border investment and cross-border trade in Eurasia. According to some interpretations, the ECT did not necessarily deliberately favour one country or grouping of countries over another.[445] From this perspective, the ECT is regarded as

441 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 2.

442 Andersen et al (eds.), *Energy Union: New Liberal Mercantilism?.*

443 M. Siddi, *Russia's Evolving Gas Relationship with the European Union: Trade Surges Despite Political Crises* (Helsinki, 2018): FIIA Briefing Paper.

444 *Nord Stream 2 Asks Court to Annul Gas Directive Amendment 'Because of Discrimination* (2019): Offshore Energy, 26 July 2019.

445 Goldthau et al, 'Regulatory or Market Power Europe? EU Leadership Models for International Energy Governance.

an instrument to create a pan-Eurasian energy space governed by a single trade regime[446] and the international rule of law established as a result aims at creating a level-playing field for all participants to trade, resulting in a win-win situation.

Other scholars have described the original ECT as an instrument to strengthen the role of Western energy companies relative to companies from producing countries, primarily Russia[447]. Because no policy measure is completely neutral, including measures inspired by the neoliberal paradigm[448], the ECT can in any case be regarded as a vector of Western neoliberal values – regardless of the judgment on the selflessness of its underlying intentions. Russia's willingness to establish a 'market economy' right after the demise of the USSR was initially in line with the EU's approach.[449] This initial alignment soon gave way to mounting Russian suspicions that the ECT was a malevolent move contrary to Russia's interests. This took place against a background of deteriorating political relations beyond the energy dossier[450] but also as a result of Russia's change of energy policy in the 2000s – when the role of the State in the energy sector grew again and centralisation took place. This brought the EU's normative power in stark contradiction with Russia's new institutional environment[451], leading, among other things, to Russia's refusal to ratify the ECT. This work lends an ear to pleas to study this growing incompatibility of institutional environments in the EU and Russia as one of the main causes of the deterioration and politicisation of EU-Russia energy relations after the end of the 1990s.[452]

In most of the West, although at varying degrees across different countries, liberalisation was embraced by elites and sanctioned by the electorate, as said by Goldthau.[453] Under the new paradigm, energy started to be seen as a private good and public opinions became persuaded of the desirability of free market exchange. Even Western left-leaning parties gradually accepted the new paradigm. In the 1990s, the position of the IEA[454], reflecting that of energy-consuming countries, was that:

> *"The establishment of a market structure with competing suppliers and consumers who have the right to exercise choice spurs suppliers systematically to seek out productivity gains and comparative advantages. This is a self-reinforcing process. As energy markets become more competitive and more complex, new forms of competition emerge and industry structures evolve accordingly. As new market entrants appear, they disturb the rules of the game and generate new competitive pressures and commercial initiatives. The drive for economic efficiency leads inevitably to a radical reorganisation of market and industry structure. The way government seeks to meet its social, environmental and*

446 J. Dore and R.D. Bauw, *The Energy Charter Treaty: Origins Aims and Prospects* (1995): Royal Institute of International Affairs

447 P. Andrews Speed, 'The Politics of Petroleum and the Energy Charter Treaty as an Effective Investment Regime', *Journal of Energy Finance and Development*, 4:1 (1999), 117-135.

448 Goldthau et al, 'Regulatory or Market Power Europe? EU Leadership Models for International Energy Governance.

449 S. Boussena and C. Locatelli, 'Energy Institutional and Organisational Changes in EU and Russia: Revisiting Gas Relations', *Energy Policy*, 55 (2013): 180-189.

450 Including, for instance, Russia's discomfort with Western criticism for Russia's human right violations in Chechnya.

451 Boussena and Locatelli, 'Energy Institutional and Organisational Changes in EU and Russia: Revisiting Gas Relations'

452 *Ibid.*

453 Goldthau, 'From the State to the Market and Back: Policy Implications of Changing Energy Paradigms'.

454 *Natural Gas Pricing* (Paris, 1998): OECD/IEA..

supply security objectives also changes in response to these pressures." – OECD/IEA Natural Gas Pricing, 1998

Attractiveness of US and UK gas prices

The most important selling point of the US model – from which free market proponents drew inspiration in the 1990s – was that, for the time being at least (see Chapter 7), it could showcase lower prices. The claim was that competition had delivered lower prices. The fact that US end-user gas prices had remained stable (or had been decreasing) while delivered volumes had increased during the 1980s and early 1990s was used as an argument to promote liberalisation also in Continental Europe. The explanation, according to proponents of market liberalisation, was that – thanks to reforms – US gas was being produced, transported and delivered more efficiently than in the past. As shown by Figure 5, in the decade preceding EU gas market liberalisation (1989-1998), US wholesale gas prices were on average 30% lower than in the EU.

The price charged to US industrial consumers was also lower than the price charged to European industrial consumers, which clearly raised issues of economic competitiveness across the Atlantic.

As shown by Figure 6, in the decade leading to the adoption of the EU's First Gas Directive, US industrial gas prices remained well below IEA median prices. In the early 1990s, German industrial gas prices were twice as high as US industrial gas prices. Moreover, the early 1990s saw industrial gas prices grow in most European countries, with the highest increases seen in Italy and Spain. On the other hand, the graph also shows that differences within Continental Europe were more marked than between Anglo-Saxon countries and some EU countries with relatively competitive prices. This was thought to be due to the fact that the EU gas market was a patchwork of national markets. Highly heterogenous regulation and different levels of taxation accounted for the price differences inside Europe.

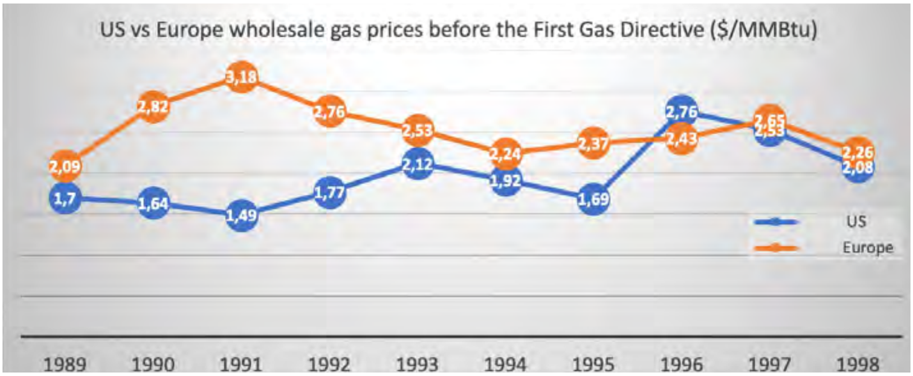


FIGURE 5: WHOLESALE GAS PRICES IN THE US AND IN EUROPE[455] (1989-1998), IN USD/MMBTU. SOURCE: BP

455 Here, Europe indicates BP's definition of Europe, which includes a number of non-EU Member States.

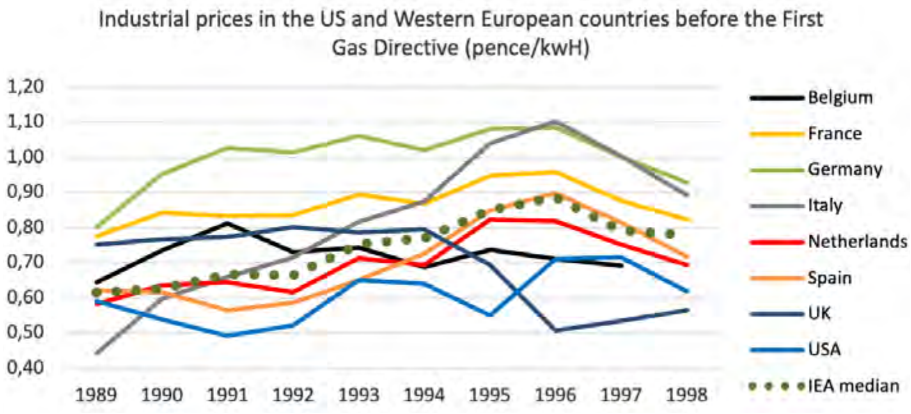


FIGURE 6: AVERAGE PRICES CHARGED TO INDUSTRIAL CONSUMERS IN THE US AND SELECTED WESTERN EUROPEAN COUNTRIES (1989-1998), INCLUDING TAXES, IN PENCE GBP/KWH. SOURCE: DEPARTMENT FOR BUSINESS, ENERGY AND INDUSTRIAL STRATEGY, UK GOVERNMENT (DERIVED FROM THE INTERNATIONAL ENERGY AGENCY PUBLICATION 'ENERGY PRICES AND TAXES')

As shown by Figure 6, the only EU country where industrial gas prices in 1998 were lower than in 1989 was the UK, which had liberalised its gas markets in the meantime. In addition to industrial prices, also residential and commercial gas prices were lower in the UK than in most of the rest of the EU. This issue will be covered in more detailed in the chapter devoted to analysing the impact of gas trade changes on the EU, to check whether end-users have actually eventually enjoyed lower prices. What has been presented in this section serves the purpose of showing how lower US and UK prices played a role in stimulating reform.

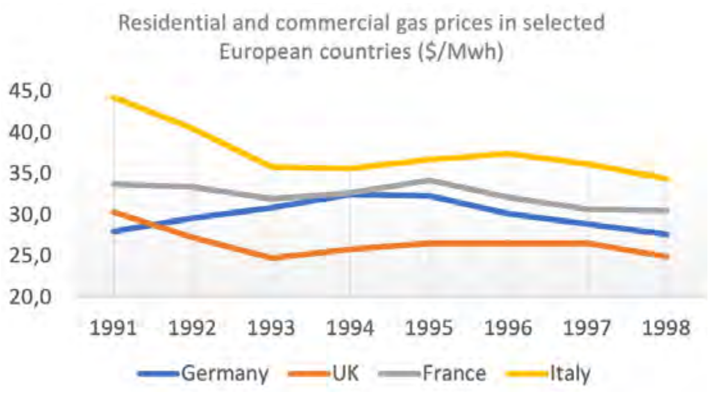


FIGURE 7: AVERAGE PRICES CHARGED TO RESIDENTIAL AND COMMERCIAL USERS IN SELECTED EUROPEAN COUNTRIES (1991-1998), IN USD/MWH. SOURCE: EUROSTAT.

EU Gas Market Liberalisation

EU gas market liberalisation[456] has been a long and far-reaching process. In the course of the years, this process has seen the participation of many different stakeholders and has been executed by means of a wide array of instruments. While the focus is often on the importance of law-making (at both the EU and Member State level), other actions have been equally fundamental to the completion of the process. These include high-level political bargaining[457] (often conducted in the run-up to new legislation), law enforcement (notably in antitrust, *infra*) as well as private and public investments, which have been vital in integrating previously fragmented gas markets and in enabling gas flows in multiple directions – an essential component of establishing a well-functioning market place. EU gas market liberalisation was not a mere technocratic process. Substantial political and financial capital was invested in this process. A timeline summarising the most important measures for gas market liberalization is provided below (Figure 8).

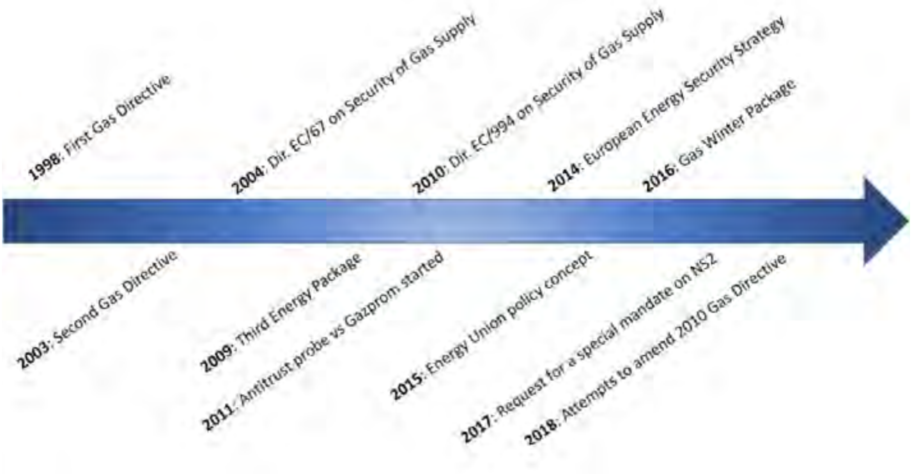


FIGURE 8: TIMELINE OF THE MAIN LEGISLATIVE AND NON-LEGISLATIVE MEASURES AFFECTING GAS TRADE TAKEN BY EU INSTITUTIONS (1998-2018)

It was in the context described in the previous sections – characterized by the maturation of EU gas markets, the spreading out of the neoliberal paradigm and the persistence of a gas price gap between Continental Europe and Anglo-Saxon countries – that the European Commission, after long negotiations among European governments, passed the First Gas Directive in 1998.[458] The First Gas Directive introduced legal unbundling and negotiated and

456 In this book, this umbrella terms also includes the objective of creating a European internal gas market. Although conceptually different from liberalisation stricto sensu, the establishment of the internal gas market (a market without cross-border trade barriers, enabling the free flow of gas in response to price signals based on market fundamentals) is strictly related to liberalisation. The two objectives reinforce each other and have been largely pursued simultaneously as part of the same process.

457 Both between public institutions and the gas industry as well as between the European Commission and Member States. For an account of these negotiations, see N. Haase, *European Gas Market Liberalisation: Are Regulatory Regimes Moving Towards Convergence?* (Oxford, 2008): Oxford Institute for Energy Studies.

458 Directive 98/30/EC of the European Parliament and of the Council of 22 June 1998 concerning common rules for the internal market in natural gas.

regulated third party access. Barriers to cross-border trade and the impact of take-or-pay provisions on third party access started to be scrutinised. This scrutiny soon exposed the potential tension between the new liberalised gas market model and the historical long-term contracts.

The aim of this directive was to increase efficiency, reduce prices and raise standards of service for consumers. In socio-economic terms, the objective of the directive – and the entire gas market liberalisation legislation that followed – was to generate long-term benefits for consumers (Joskow, 2006) [459] and thus ultimately enhance the overall welfare of all Europeans (Haase, 2008).[460] The idea that welfare can be boosted by influencing the economic performance of market players comes from a well-established literature (Mason, 1939[461]; Bain, 1968[462], Graham, 2000[463]). When liberalisation has welfare enhancement as its objective – instead of also having ulterior motives such as altering the geo-economic balance between an importer and an exporter, to the detriment of the latter – it can be regarded as politically 'neutral' (Goldthau et al.).[464] Neutrality in this case is "linked to the idea that the EU seeks to shape the global political economy not by pursuing its own narrow economic interests but by building rules and regulations intended to be attractive to all market-oriented global players".[465] To be sure, liberalisation processes can be more explicitly used to pursue Realist/ mercantilist objectives, but can also exist in more neutral forms. However, an important *caveat* also expressed by Goldthau et al. – and which we emphasise here – is that neutrality is never absolute nor value-free (cf. Chapter 2). [466] Even in its 'neutral' forms, EU gas market liberalisation has a consumer bias, and therefore – in the context of EU-Russia gas trade relations – an EU bias, being the EU the net importer of gas and Russia the net exporter of gas.

In 1998, the target date indicated by the EU for the completion of the internal market was 2004, although with hindsight we know that it took much longer than its promoters had anticipated. The process of liberalising the market and establishing an internal market required much more than the adoption of one European directive. As recounted by Gustafson (2020), "in Western Europe, the drive to create a single European space evolved by the early 2000s into a supranational legal and regulatory structure based in Brussels, driven by a militant market-oriented doctrine and armed with formidable enforcement powers".[467] Besides pursuing the original objective of boosting welfare and benefitting consumers, gas market liberalisation became the vehicle of another objective, charged with higher geo-economic significance. In 2000, the EU articulated a broad strategy at the Lisbon Summit in response to the mounting economic competition provoked by globalisation. The Lisbon Strategy posited ambitious objectives: making the EU the most competitive economy in the world and achieving

459 P.L. Joskow, 'Introduction to Electricity Sector Liberalization: Lessons Learned from Cross-Country Studies', in F. Siohansi and W. Pfaffenberger (eds.), *Electricity Market Reform: An International Perspective* (2006): Elsevier.

460 Haase, *European Gas Market Liberalisation: Are Regulatory Regimes Moving Towards Convergence*.

461 E. Mason, 'Price and production policies of large-scale enterprise', *American Economic Review*, 29:1 (1939), 61-74.

462 J. Bain, *Industrial Organisation* (Hoboken-NJ, 1968): John Wiley and Sons.

463 Graham, C., 'The Utilities Bill', *Utilities Law Review*, 11:3 (2000(.

464 Goldthau and Sitter, 'Regulatory or Market Power Europe? EU Leadership Models for International Energy Governance'.

465 *Ibid.*., page 30

466 *Ibid.*

467 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 3.

full employment by 2010.[468] In line with the dominant neoliberal paradigm, economic competitiveness was to be enhanced by market liberalisation. At the time, promoting further liberalisation was a priority especially in the energy sector – where progress was still lagging behind due to national prerogatives and the perception of energy as a strategic good. The Lisbon Strategy and gas market liberalisation thus became quite closely related to each other.

In the early 2000s, slow but steady progress could be observed in some areas thanks to the adoption of a number of measures. The first was the abolition of centralised gas sales organisations in Norway and Denmark following EU rulings stating that joint sale and purchase organisations were against competition. The second was the implementation of release gas programmes, which contributed to encourage the emergence of new entrants by increasing available gas volumes. The third, and perhaps most important, was the removal of destination clauses from import contracts (*infra*). This enabled the re-selling of gas, an essential step to avoid market partitioning and boost gas hub liquidity.[469]

In 2003, noting scarce progress, the Commission adopted the Second Gas Directive, which called for liberalised access for business consumers by 2004 and for all consumers by 2007. In practice, the Directive allowed consumers to switch supplier and protected them in case of disputes. The directive introduced management unbundling and the establishment of independent authorities to carry out regulation.[470] In this period, from the adoption of the First Gas Directive until the mid-2000s, it became clear that gas market liberalisation would be anything but a smooth and fast process. In fact, most incumbents were opposed to seeing their business models and governance structures revolutionised by the new norms. In part, opposition was simply grounded on the lack of experience with new ways of conducting business. It was hard to foresee all possible implications of such a deep transformation. In part, liberalisation was also perceived by incumbents as a threat to their rents. There were also concerns about the uncertainty – bad for the ease of doing business and allocating new investments – that new legislation was creating.

Negotiations and clashes took place on the subject of gas market liberalisation between the energy industry and national governments, but also between industry-oriented governments and the European Commission.[471] On the other hand, federations of industrial users of gas were lobbying for liberalisation. Larger Member States exerted their leverage to influence regulation. An often-quoted example of how Member State intervention softened liberalisation is when France and Germany opposed full ownership unbundling to protect their national champions.[472] Instead, a compromise on lighter forms of unbundling was reached after drawn-out negotiations. This led to the adoption of the ISO/ITO models introduced by the Third Energy Package (below).

468 *Presidency Conclusions*, Lisbon European Council, 23 and 24 March 2000.

469 Haase, *European Gas Market Liberalisation: Are Regulatory Regimes Moving Towards Convergence.*

470 Directive 2003/55/EC of the European Parliament and of the Council of 26 June 2003 concerning common rules for the internal market in natural gas and repealing Directive 98/30/EC

471 Haase, *European Gas Market Liberalisation: Are Regulatory Regimes Moving Towards Convergence.*

472 A. Riley, *Ownership Unbundling: A Logic Outage for the Anti-Energy Liberalisers?* (Brussels, 2008): Centre for European Policy Studies.

Discrepancies in support to market liberalisation across Europe are explained by a number of factors. First of all, by different institutional environments, notably the maturity of liberal-democratic institutions and ease in setting truly independent regulators. The second relevant variable is the economic structure, which includes the level of dynamism of the private sector, the existence of traders and the level of development of the financial sector. Thirdly, it is relevant if a country has domestic gas production. Both the UK and The Netherlands were able to place significant volumes on hubs to launch them. While underlying physical production can decline without compromising the solidity of a long-standing benchmark – as demonstrated by Brent – large volumes are the necessary 'spark' to lit a hub at the beginning of the process. A fourth important factor is what are the dominant paradigms in a country. As has been widely documented by NIE studies, there are 'varieties of capitalism' across Europe.[473] Some of them are more corporativist while others more clearly reject State intervention. Finally, political willingness plays a key role: some governments are keener on promoting liberalisation than others.[474] Of these factors, political willingness is the one that can change the most over time. For instance, Spain was one of the forerunners of liberalisation in the 1990s but progress significantly slowed down in the 2000s.[475]

Even though simplistic accounts tend to divide Europe between an advanced North-West and a lagging 'Rest', there are also significant variations within traditional country groupings that need to be taken into account. Significant differences exist within the group of Member States that joined in 2004. Parts of Central-Eastern Europe, especially the Czech Republic and Slovakia, are now highly integrated with North-Western European markets. Hub indexation has made inroads in these countries since the early 2010s, and is now the prevalent pricing mechanism. On the other hand, Poland has always had an ambiguous position vis-à-vis the issue of gas market liberalisation – accusing Gazprom of market dominant behaviour while failing to liberalise its own market and refusing to reduce the role of national champion PGNiG. Finally, Northern European gas markets are not always necessarily more liberalised than Southern European gas markets. The Italian hub, for instance, is more liquid than the Belgian hub and all the Scandinavian hubs. The premium still paid by Italy relative to North-Western European economies is largely due to its geographic position.[476]

What has been said so far serves the purpose of clearing the air from the interpretation of gas market liberalisation as a technocratic process promoted by the EU as a coherent and united player to the detriment of Russia and other gas exporting countries. Instead, what has been said so far shows that liberalisation has had supporters and enemies inside of the EU, too. Substantial political capital has been mobilised in this process. Opposition from EU incumbents and industry-oriented governments was as strong as opposition from gas exporting countries – and yet liberalisation continued, bolstered by the broader socio-economic paradigm shift towards economic liberalisation that was underway in the entire Western world.

473 P. Hall, D. Soskice, *Varieties of Capitalism: The Institutional Foundations of Comparative Advantage* (Oxford, 2004): Oxford University Press.

474 Heather, *The Evolution of European Traded Gas Hubs.*

475 Haase, *European Gas Market Liberalisation: Are Regulatory Regimes Moving Towards Convergence.*

476 *Gas Market Monitoring Report* (Ljubljana, 2006): Agency for the Cooperation of Energy Regulators (ACER).

In 2005, regulation 1775 established detailed guidelines for third party access, capacity allocation, congestion management and transparency requirements.[477] Ancillary legislation for the fine-tuning of norms regulating balancing, cross-border tariffs and the performance of other functions that had emerged with liberalisation was issued. The process of fine-tuning continues until this day and it will always be difficult to declare it fully concluded. As recently as in 2018, the *Quo Vadis* study commissioned by the European Commission proposed further alternative interventions to fine-tune regulation – unveiling some inherent contradictions of gas market liberalisation that will be hard to solve.[478]

Antitrust actions complemented and supported legislation throughout Europe.[479] In the early 2000s, the idea to forbid long-term contracts was put forth by antitrust bodies and started to be strongly debated in the sector.[480] Free market proponents opposed long-term supply contracts on grounds that they were an obstacle to gas-to-gas competition, favouring foreclosure (Aghion and Bolton, 1987[481]; Rasmusen et al., 1991[482]; Fumagalli and Motta, 2006[483]) and collusion among oligopolistic producers (Le Coq, 2004[484]; Liski and Montero, 2006[485]). Others defended the importance of long-term supply contracts on security of supply grounds (Wybrew, 2002[486]; Roze, 2007[487]) while others claimed that long-term contracts contributed not only to security but also to the long-term affordability of gas, for example by preventing market abuse by large players (Allaz and Vila, 1993[488]; Neuhoff and Von Hirschhausen, 2005[489]; Bushnell, 2007[490]; Willem and De Corte, 2008[491]). Suppliers, namely Gazprom, strongly defended long-term contracts as the only instrument that could provide

477 Regulation (EC) No 715/2009 of the European Parliament and of the Council of 13 July 2009 on conditions for access to the natural gas transmission networks and repealing Regulation (EC) No 1775/2005.

478 '*Quo Vadis EU Gas Market Regulatory Framework – Study on a Gas Market Design for Europe*

479 On the antitrust treatment of long-term take-or-pay natural gas contracts, see: K. Talus, 'Long-term Natural Gas Contracts and Antitrust Law in the European Union and the United States', *The Journal of World Energy Law and Business,* 4:3 (2011), 260-315.

480 Stern, *The Future of Russian Gas and Gazprom*.

481 In 1987, Aghion and Bolton argued that buyers can sign inefficient LTCs with the aim to reduce the size of the market for a potential entrant, which in turn prevents market entry – with the result that other buyers will be forced to pay a higher prices subsequently – Aghion and Bolton, 'Contracts as a Barrier to Entry'.

482 In 1991, Rasmussen et al. showed how an incumbent monopolist can take advantage of its customers' disunity and use LTCs for market foreclosure. An incumbent monopolist will make this attempt if it is able to secure a higher profit than the amount that it has to give to its customers as a compensation for their exclusion from an alternative supplier. – Rasmussen et al, 'Naked Exclusion'

483 Fumagalli and Motta built on the abovementioned literature on the anti-competitive effects of exclusionary contracts, but added that the scope to use exclusionary contracts to deter competition depends on how competitive downstream markets are. They found that sufficiently intense competition among buyers downstream hampers the incumbent monopolist's plans to use exclusionary contracts to deter entry – Fumagalli and Motta, 'Exclusive Dealing and Entry, When Buyers Compete'.

484 Le Coq shows that in case of repeated interactions on the spot market, LTCs help sustaining collusion on the spot market, although collusion is not the only motive behind decisions by companies, which are primarily interested in hedging – Le Coq, 'Long-term Supply Contracts and Collusion in the Electricity Market'.

485 Liski and Montero, 'Forward Trading and Collusion in Oligopoly'.

486 J. Wybrew, 'The Security of Future Gas Supplies for the British Market: The Need for Adequate Gas Infrastructure' in Helm, *Towards an Energy Policy*.

487 J. Roze, 'Security of Gas Supply for Europe', *European Review of Energy Markets*, 2:2 (2007).

488 Allaz and Vila, 'Cournot Competition, Forward Markets and Efficiency'.

489 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

490 Bushnell, 'Oligopoly Equilibria in Electricity Contract Markets'.

491 Willem, B. and De Corte, E., 'Market Power Mitigation by Regulating Contract Portfolio Risk', Energy Policy, 2008.

guarantees necessary for long-term investment planning[492] and accused liberalization of neglecting the interest of suppliers and cracking the long-established consensus around historical contracts.[493]

Mergers and acquisitions in the European utility sector and the merger between Exxon and Mobil[494] – combined with complaints filed by consumers – caused the Directorate-General for Competition (DG COMP) to scrutinise gas contractual structures for the first time at the end of the 1990s.[495] DG COMP found long-term contracts to hamper competition and, in the early 2000s, EU competition legislation seemed to threaten the very existence of long-term contracts.[496] One of the most criticised provisions was the 'destination clause', restricting re-trade of gas to third parties and important for the Russians, who feared that its demise would pave the way for manipulation by buyers.[497] DG COMP started to project itself as a proactive player in the liberalisation process, attacking long-term contracts.[498]

A comprehensive Energy Sector Inquiry was launched by the Directorate-General for Competition in 2005, ending in 2007.[499] This inquiry looked into the effect of long-term contracts on competition, finding that long-term contracts could have vertical foreclosure effects[500]. It also denounced oil indexation as a 'distortive' pricing mechanism, preventing contract prices to reflect market fundamentals.[501] On the other hand, the inquiry could not prove that oil indexation resulted in higher price levels than hub indexation and also highlighted positive aspects of oil indexation, namely lower volatility.[502] Apart from European law, two decisions in Germany opened up the German end-user market and catalysed change across Continental Europe. In 2006, a regional court in Düsseldorf confirmed that long-term contracts between E.ON and regional distributors were illegal and prescribed restrictions to the duration of future contracts.[503] The second important decision came from the Federal Court of Justice in 2010. The court outlawed direct indexation to heating oil in contracts supplying private customers.[504]

492 "Those who declare the need to eliminate the long-term contract system must answer at least one question: how could the financing of super-large projects be arranged in low investment rating countries? We know from our own experience that so far there are no ways of doing it without long-term contracts". Y. Komarov (2000): Gazprom Speech at the Offshore Northern Seas Conference, August 2000.

493 P. Rodionov, *Liberalization of the Gas Market – Gazprom's Perspective* (2001): European Gas Summit Conference.

494 Commission Decision of 29 September 1999, Case No. IV/M.1383 'Exxon/Mobil' 3093 Final, 1999.

495 Stern, *The Future of Russian Gas and Gazprom*.

496 *Ibid.*

497 This clause was eventually declared in breach with EU competition rules and gradually removed from contracts.

498 M. Albers, M., *Energy Liberalization and EC Competition Law* (2001): 28th Annual Conference of Antitrust Law and Policy, 26 October 2001.

499 DG Competition Report on Energy Sector Inquiry, DG Competition, European Commission, 2007.

500 "Depending on market circumstances long-term contracts can result in foreclosure", *Ibid.*

501 "Prices paid by purchasers under long-term contracts do not react smoothly (or at all) to changes in the supply and demand of gas markets. This effect is exacerbated by the fact that the indexation in long-term contracts is usually linked to variables calculated with trailing averages, further reducing response to price signals. No trend towards less distortive, more market based pricing mechanisms can be observed at this stage.", *Ibid.*

502 *Ibid.*

503 H. Lohmann, *The German Path to Natural Gas Liberalisation* (Oxford, 2006): Oxford Institute for Energy Studies.

504 H. Rogers, *European Gas Contracts: Will Oil Indexation Persist?* (2011): Oxford Institute for Energy Studies, Presentation at the BIEE Seminar, October 2011.

The polarised debate on long-term contracts (also presented in Chapter 3) resulted in a compromise. The view that long-term supply contracts were necessary (perhaps a 'necessary evil') for security of supply prevailed [505]. This pragmatic approach was also adopted by the European Commission, notably in the Gas Security Directive issued in April 2004.[506] As long as they abode by new competition rules, long-term contracts could remain in place. The idea that regulation should strike a balance between stimulating investments and precluding the detrimental effects of LTCs on gas-to-gas competition prevailed. This was a pragmatic solution as EU institutions were themselves divided on the topic, as proven by the preparatory documents leading to EU energy legislation.[507] In spite of its enquiries on the legitimacy of LTCs, the Commission eventually preserved the right of even large incumbent players to enter new LTCs and both the Second Gas Directive and the Third Energy Package (below) recognised that LTCs have a role to play, particularly in security of supply. At the same time, efforts have been made to boost hub liquidity and stimulate spot or short-term exchange. In recent years, these efforts have started to bear fruits as European gas hubs have become more mature and European gas markets have become more open and competitive.[508] Not only have larger volumes of gas been traded on the spot than ever before, but LTCs themselves have changed substantially since the beginning of the liberalisation process. Today's LTCs look very different from the original LTCs signed at the establishment of European gas markets as successive rounds of renegotiations and arbitrations have led to changes in key pricing and flexibility clauses. The duration of LTCs has also been diminishing[509],[510], including for reasons mentioned earlier. Finally, antitrust initiatives have greatly reduced the market foreclosure potential of LTCs. The latest example is DG Competition's ruling that has obliged Gazprom to eliminate restrictions to gas trade in Eastern Europe.[511]

Long-term capacity contracts were also scrutinised. The Energy Sector Inquiry found that one of the reasons why the Second Gas Directive had been ineffective in establishing a competitive and transparent market was that long-term capacity contracts were outside of its scope. The inquiry called for action to redress the negative effects that these contracts had on cross-border trade and liquidity. Overall, the conclusions of the inquiry were not encouraging. After almost ten years since the adoption of the First Gas Directive, competition was still inadequate. Not only were European markets still fragmented, but progress on limiting market dominance

505 In a case involving Electrabel, the Commission explicitly noted that the significant principles that it sought to balance were free competition and the principles of security and continuity of supply, cf. K. Talus, 'Long-term Natural Gas Contracts and Antitrust Law in the European Union and the United States'. Another implicit recognition of the role of long-term contracts for security of supply by the European Commission is in the 2017 Security of Supply Regulation, which requires Member States to report long-term contracts that are considered relevant to security of supply.

506 "Long-term take or pay contracts have played a very important role in securing supplies for Europe and will continue to do so. The current level of long-term contracts is adequate on the Community level and it is believed that such contracts will continue to make a significant contribution to overall gas supplies as companies continue to include such contracts in their overall supply portfolio". Council Directive 2004/67/EC of 26 April 2004, concerning measures to safeguard security of natural gas supply, Recital 11, 2004.

507 A. De Hautecloque et al, *From a Reactive to a Proactive EU Regulatory Framework for Long-term Gas Import Contracts* (Florence, 2015): Florence School of Regulation.

508 *Gas Market Monitoring Report* (Ljubljana, 2016): ACER.

509 A. Neumann et al, *Long-Term Contracts in the Natural Gas Industry (1965-2014)* (Berlin, 2015): Deutsches Institut für Wirtschaftsforschung.

510 *Quo Vadis EU Gas Market Regulatory Framework – Study on a Gas Market Design for Europe* (2018): Ernst & Young and REKK.

511 European Commission Decision of 24 May 2018 relating to a proceeding under Article 102 of the Treaty on the Functioning of the European Union and Article 54 of the EEA Agreement, Case AT.39816, European Commission, 2018.

and vertical foreclosure was largely unsatisfactory. Impetus for new legislative action emerged as a result of this highly critical inquiry.

It is in this context that a comprehensive set of gas market legislation was adopted in July 2009. Until today, what became known as the 'Third Energy Package'[512] constitutes the regulatory backbone of the EU gas market. One important measure contained in the Third Energy Package was the obligation to split transmission from supply and distribution, either through full ownership unbundling or under watered-down schemes called 'Independent System Operator' (ISO)[513] or 'Independent Transmission Operator' (ITO) models[514]. Moreover, the Agency for the Cooperation of Energy Regulators (ACER) was founded, with a mandate to coordinate the work of energy regulators across the EU towards the completion of a single market. ACER played an important function in coordinating the adoption of common network and market rules throughout the EU.[515]

Moreover, the newly implemented legislation mandated the certification of TSOs[516], introduced entry-exit zones[517] in order to favour location-independent trading, established that tariffs should be cost-reflective, non-discriminatory and provide efficient scarcity signals, and that they should be set independently rather than on the basis of point-to-point transportation paths specified by contracts[518]. Finally, it provided framework guidelines for pan-European network codes on balancing, interoperability, capacity allocation, congestion management, tariffs, network security, network connection, third party access, data exchange, operational emergency procedures, energy efficiency, trading and transparency to be developed by ACER and the European Network of Transmission System Operators for Gas (ENTSOG).[519] After the adoption of the Third Energy Package, the Council of European Energy Regulators (CEER) developed the Gas Target Model (GTM), which called for a reduction of the number of entry-exit zones and a de-linkage of these zones from national borders.[520] In an ideally functioning market, gas is traded at hubs located within such entry-exit zones, which offer price discovery. The ambition was to establish a single liberalised gas market by 2014.

512 The Third Energy Package is made up of three regulations and two directives.

513 An ISO does not have ownership of the transmission network. It is simply the mother company (ex incumbent) that leases the network to an ISO to be managed by an ISO. This system had many shortcomings: maintenance, operation and development are too interdependent and they should be carried out by the same company. The ISO model does not provide the right incentives to investment and posed coordination problems. Italy, Spain, Switzerland applied this model but had to revert their decision.

514 An ITO is a fully independent subsidiary of the mother company that owns and manages the network. Of course the challenge here is to ensure effective independence. To ensure it, there is a very stringent regulation on the location of the HQs, budget and staffing. There is also a compliance office that always checks the lawfulness of every action (high administrative costs).

515 J. Stern and H. Rogers, *The Dynamics of a Liberalised European Gas Market* (Oxford, 2014): Oxford Institute for Energy Studies.

516 Certification guarantees that the certified TSO abides by EU unbundling obligations.

517 Entry-exit zones constitute a system where entry capacity to a transmission system network is booked independently from exit capacity.

518 In the point-to-point model, capacities are booked bound to a particular transportation path and transportation costs depend on the length of the transportation path. In the entry-exit model, the input and offtake of gas are separated, there is no defined contract path and there is a virtual trading point, i.e players buy and sell gas without booking transportation capacity, see *Entry-Exit Model for Gas TSO – The Basic Principles*, PricewaterhouseCoopers, October 2013.

519 Stern and Rogers, *The Dynamics of a Liberalised European Gas Market*.

520 *CEER Vision for a European Gas Target Model*, CEER, 11 December 2011.

While the target was once again missed, liberalisation and market integration advanced much more than following previous legislative initiatives. In 2008-2009, substantial changes finally started to occur in EU gas markets, deepening gradually until today. Vertical integration among incumbents, market foreclosure and the passing through of high prices to end-users gradually became more and more untenable.[521] Today's liberalised market has unbundled production, transmission and distribution systems, a large number of trade parties, end users that are able to switch suppliers, and widely respected rules against market dominance. New ways of conducting business, commercial opportunities and professional roles have emerged in the last decade. Younger executives operate with a new mindset, moulded in a liberalised market. Alongside some of the traditional players that still operate in the European gas market, new ones have come to the scene. These include trading companies, Transmission System Operators (TSOs) and Distribution System Operators (DSOs). Unbundled companies have invested across borders, furthering the process of establishing a truly pan-European gas market.[522]

Mature hubs have developed, starting in Northwestern Europe. As we will see later, the British and Dutch hubs in particular have become fully fledged liquid hubs, serving as benchmarks for the rest of the EU. Gas-to-gas competition has risen and gas prices are increasingly set by supply and demand. The borders of liberalised EU gas markets have gradually expanded in the last years, and are still expanding. Liquidity in Western European hubs outside of the Anglo-Dutch context – particularly in Germany and Italy – has risen substantially in the 2010s. The gap between wholesale prices in Northwest Europe and the rest of Europe has narrowed significantly.[523] All this is very much in line with liberalisation's ambition of allowing gas volumes to move freely across European borders, reacting to price signals.[524] The developments described above further reduce asset specificity of gas trade by increasing opportunities for trade and the number of players in the market. This thus corroborates TCE's predictions on the evolving rationale of long-term gas contracting in case of declining asset specificity.

Concluding remarks on liberalisation

Far from being a merely technocratic undertaking, EU gas market liberalisation required the mobilisation of substantial political and economic capital. It was the result of painstaking political bargaining between the European Commission and Member States, as well as between the gas industry and politicians. Its objectives could not be pursued simply by legislating, but also by investing substantial amounts of money to create an internal EU gas market. Liberalisation involved deep changes to business models in the gas sector, which the EU gas industry was initially reluctant to embrace. The historical digression provided in Chapter 5.2 illustrated that liberalisation, for at least a decade, was met by as much opposition inside the EU as outside of it. Gazprom was not the only 'victim' of liberalisation. Important sacrifices

521 L. Franza, *Gas Market Liberalisation: Does Europe Really Want It?*, Euractiv, 17 May 2018.

522 Fluxys and Enagas have bought Swedegas, Vattenfall has bought Nuon, Rwe has bought Essent, Edf has bought British Energy, Iberdrola has bought Scottish Power, Enel has bought Endesa, Edf has bought Edison and Eni has bought Distrigas. The Netherlands' Gasunie manages part of the German gas network, Italy's SNAM manages part of the Southern French gas network, and Belgium's Fluxys is the main investor in new cross-border capacity between Italy and Switzerland.

523 *Gas Market Monitoring Report* (Ljubljana, 2006): Agency for the Cooperation of Energy Regulators (ACER).

524 Franza, *Gas Market Liberalisation: Does Europe Really Want It?*

and adaptations had to be made by EU incumbents as well, and they tried to resist them as much as possible through lobbying.

Inflicting damage to Russia following a zero-sum geo-economic rationale (Luttwak, 1993)[525] was not a prominent objective of liberalisation. Our conclusion is in line with Gustafson's (2020) observation that "the gas revolution in Europe has deep roots, which originated quite independently of Russia."[526] Instead, the primary objective of liberalisation was to bring long-term benefits to consumers and boost EU welfare, in line with the neoliberal paradigm that became dominant in the Anglo-Saxon world in the 1980s and spread to Continental Europe in the 1990s. Lower gas prices in the liberalised markets of the US and UK helped the proponents of gas market liberalisation to make the case for reform in Continental Europe.

The finding that altering the geo-economic balance between the EU and Russia was not liberalisation's primary objective does not change the fact that liberalisation could have nevertheless altered such balance, or that there could have been collateral geo-economic objectives. In fact, liberalisation overturned the rules, and essentially the structure, of the EU gas sector. Reform had an extraterritorial reach: this is in line with Stulberg's[527] observation (Chapter 3) that a preponderant State can trigger policy adjustments in foreign countries merely by taking action at home. In pushing for EU gas market liberalisation, the EU altered the rules of the game of international trade for a commodity of vital strategic interest for Russia, without taking into account Russia's grievances and concerns. After the end of the Cold War and the brief period in which Russia seemed to be pursuing Western-style reforms, "two worlds struggled to understand one another, in politics, economics and business. In the gas industry and the East-West gas trade the confrontation was particularly sharp."[528]

Even when market liberalisation is not explicitly and prominently promoted in pursuit of zero-sum geo-economic objectives, it is neither completely value-free nor fully impartial. Instead, it retains strong political features. The EU – bolstered by an 'end-of-history' mindset – continued to make pressures on Russia to adopt the new paradigm throughout the 2000s. Our interpretation that liberalisation is highly political is in line with the Northian[529] notion that governance structures mirror the interests of groups that, in a specific historical moment, have the power to alter the rules of the game (Chapter 3). Even if hurting Russia geo-economically was not liberalisation's primary goal, it must have been clear to EU policy-makers that the transition to market-pricing was likely to entail a cross-border redistribution of rents. As we mentioned in Chapter 3, Mommer[530] observed that the governance of commodity trade is a key determinant of commodity prices. As we argued in Chapter 1, social sciences are analytically useful precisely because instead of a narrow focus on supply and demand as determinants of prices, they also consider governance arrangements. From this perspective, we argue that the EU engaged in 'milieu shaping' (Chapter 3), i.e. it shaped a benign

525 Luttwak, 'The Coming Global War for Economic Power: There are no Nice Guys on the Battlefield of Geoeconomics'.

526 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 4.

527 Stulberg, *Well-Oiled Diplomacy: Strategic Manipulation and Russia's Energy Statecraft in Eurasia.*

528 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 160.

529 Cf. North, *Understanding the Process of Economic Change.*

530 Mommer, *The Governance of International Oil: Changing Rules of the Game.*

international milieu to pursue its own economic and security interests (Hyde-Price, 2008)[531], taking advantage of its leverage vis-à-vis a weakened Russia and exerting 'structural power' (Strange)[532]. Stoddard (2013)[533] observes a co-constitution of economic and strategic objectives in EU's external energy policy.

The Lisbon Strategy made it explicit that the EU saw itself as an economic superpower in global affairs and articulated ways to further increase this economic clout. Characterised by an inherent EU bias, liberalisation broke away from a consensus-based, relational trade model in place since the gas-for-pipes deals of the 1970s – of which historical long-term contracts were a cornerstone, constituting what North defines the 'institutional environment'.[534] Contractual structures came under pressure and the complex risk allocation underlying them was altered. This process, entailing deep transformations to the institutional environment of EU-Russia gas trade, had great political-economic significance.

Moreover, the transition to hub pricing was not only pursued by the EU to improve affordability, but also to improve security of supply, an objective that carries a more markedly political undertone. The free flow of gas and the optionality to diversify were seen as enabling the EU, and particularly some Member States, to reduce their dependence on Russian gas and the vulnerability to disruptions of Russian gas. The broader (i.e. outside of the gas realm) deterioration of EU-Russia relations in the 2000s and 2010s created mutual mistrust, with Russia accusing the EU of using liberalisation as a political tool to deliberately discriminate against Gazprom and hurt Russia geo-economically. Russian discomfort with Western neo-liberal policy transfer attempts grew as relations deteriorated.

Finally, while positivistic interpretations emphasise the propelling role of EU legislation in transforming the gas trade environment, our account has highlighted its failure to incite fundamental change in the period 1998-2008. This shows that the transformations that took place in the period 2008-2018 should not be attributed exclusively to gas market liberalisation. These transformations were also a consequence of broader macro-economic developments and changes in global gas markets. Both lied outside of the EU's control. EU legislators could not affect, nor foresee, these developments. What they could do, and what in fact did, was to create the regulatory conditions necessary to translate prospective gas oversupply into tangible effects for the EU market.

This points to the observation that while liberalisation was a necessary condition for change in EU gas trade, it cannot be considered a sufficient one. In fact, although the Third Energy Package was more encompassing than the First and the Second Gas Directive, its fundamental principles and norms were not much different from those put forward in 1998 and 2003. A fundamental change in gas market conditions accounts for liberalisation's different degrees of success in transforming EU gas trade between 1998-2008 and 2008-2018.

531 Hyde-Price, 'A Tragic Actor? A Realist Perspective on Ethical Power Europe'.

532 Strange, *States and Markets.*

533 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

534 Cf. North, *Institutions, Institutional Change and Economic Performance.*

5.3 OVERSUPPLY AS A DRIVER OF THE TRANSFORMATIONS IN EU-RUSSIA GAS TRADE

Relation between market fundamentals and liberalisation

A theme that is not always receiving sufficient attention in the European gas discussions is that there is a strong relation between supply abundance and both the incentive to liberalise markets and the success in establishing a well-functioning, liquid market. In a buyers' market with incipient liberalisation, spot market prices are more likely to be competitive vis-à-vis long-term contract prices, creating an incentive for buyers to push for a move from long-term contracts to market exchange or market price indexation. It is riskier to liberalise the gas market when supply is not projected to remain abundant for a prolonged period of time. Liberalisation can prove unfeasible when supply is too scarce to stimulate a critical mass of gas trading and initiate a hub. Liberalisation can also be risky when short-lived supply abundance enables the development of embryonic hubs and gas-to-gas competition, but an abrupt market tightening then leads to high prices before liberalisation is fully accomplished. A premature demise of long-term contracts in favour of hub exchange in an ill-functioning or immature market, for instance, could lead to hub price manipulation and market abuse by oligopolistic players.

As argued by Dieter Helm, excess supply in oil, gas and electricity was a key enabler of the liberalisation agenda in the 1980s.[535] The gas market liberalisation processes mentioned in this chapter[536] were conceived and inaugurated in periods of relatively abundant supply. Theoretically, the process can be subject to cyclical dynamics (phases when liberalisation progresses faster, and phases when it stagnates) and also setbacks.

Also the US launched liberalisation[537] from a position of excess production capacity (Neuhoff and Von Hirschhausen, 2005)[538]. In the 1970s, upstream (oil and) gas investment in the US had been stimulated by a multi-tier price structure – introduced as a reaction to the supply scarcity experienced after the oil crisis. In the 1970s, in stark contrast with the 1980s, US policy-makers actually used to force private operators to sign long-term contracts. Liberalisation started in 1978 with the Natural Gas Policy Act. US demand fell until 1986, when it finally started to recover as a result of low prices. It then remained quite stable for fifteen years. Abundant supplies from Canada helped keeping the US market well supplied all along. When US gas demand rose in the early 2000s, long-term contracts became attractive again and many started to ponder whether they should be allowed a comeback.[539] The shale revolution started in the mid-2000s created new supply abundance and averted a 'setback' (in the form of a return of long-term contracts). In Chapter 7, it will be shown that the US experienced very high gas prices at some point in spite of having liberalised.

535 D. Helm, *European Energy Policy: Meeting the Security of Supply and Climate Change Challenges* (2007): European Investment Bank.

536 Liberalisation processes in the US, UK and Continental Europe.

537 A. Correljé, M. Groenleer and J. Veldman, 'Understanding Institutional Change: the Development of Institutions for the Regulation of the Natural Gas Supply Systems in the United States and the European Union', *Competition and Regulation in Network Industries*, 15:1 (2008), 2-31.

538 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

539 *Ibid.*

When EU liberalisation was conceived – in the 1990s, before the adoption of the First Gas Directive – the EU market was well supplied. Consumption was growing quite gradually – as steady yet not extraordinary economic growth prevented a UK-style 'dash for gas'[540] in Continental Europe – different sources of imports were available and indigenous production was not declining as fast as today. As a result, prices remained quite stable in that decade. In 1999-2001, EU gas prices rose. A further increase occurred in 2003-2004. Different market conditions in the 2000s contributed to slowing down the process of liberalisation. As noted by Jonathan Stern, while low US and UK prices in the 1990s had been an important selling point of the neoliberal paradigm for Continental Europeans, the tight market conditions and thus the high and volatile prices in the British and US gas markets in the mid-2000s temporarily casted doubts about the virtues of market liberalisation.[541] This is proven by what has been highlighted in the account of European gas market liberalisation provided in 4.2. As a matter of fact, the mid-2000s saw increasingly numerous and vocal attempts to temper incipient liberalisation – as epitomised by French and German opposition to ownership unbundling. Since then, EU gas markets have actually never experienced prolonged tightness, and this might be one of the neglected reasons why pressures to stop or revert liberalisation have been so limited.

Developments after 2008-2009

In 2008, a situation of oversupply arose in global gas markets. Its effects were felt particularly strongly in the EU. On the supply side, the rise in North American shale gas production severely reduced US gas import needs. The expectation of rising import needs in the US was one of the main reasons why sizeable investments had been allocated on Qatari LNG capacity in the early 2000s. These investments were not fully underpinned by long-term contracts. Up to that moment, not underpinning investments with long-term contracts had been regarded as excessively risky, given the high capital intensity of LNG. But gas was thought to be about to enter a new 'Golden Age' in the 2000s. This persuaded project developers in Qatar to proceed without securing purchase guarantees.

When Qatari liquefaction capacity came on stream, however, uncontracted volumes could not be sold to the US, the originally intended destination, owing to the shale revolution. Until the 2011 Fukushima crisis, Qatar managed to storm the unfavourable gas market environment by arbitraging between Europe and Asia. Numerous spot cargoes were diverted from North America to Europe. In the autumn of 2009, Qatari volumes directed to Europe increased further as a result of the opening of two Qatari regasification plants (South Hook and Adriatic LNG) and Qatar's strategy of diversifying sources of demand away from Asia.[542]

As shown by the table below, Qatari LNG sales to Europe rose by 138% between 2008 and 2009.[543] In the same period, there was a six-fold increase in spot and short-term (< 4 years) sales of Qatari LNG to Europe. The availability of large volumes of unsolicited Qatari LNG had a

540 Used to described the widespread adoption of gas in the UK power sector following the construction of last generation Combined-Cycle Gas Turbines (CCGTs).

541 Stern and Rogers, *The Dynamics of a Liberalised European Gas Market*.

542 Franza, *Long Term Gas Import Contracts.*

543 GIIGNL data.

downward impact on European hub prices, while boosting hub liquidity. New supplies from Indonesia (Tangguh), Peru, Russia (Sakhalin) and Yemen further aggravated this local glut[544]. Imports from Qatar grew until the trend slowed and eventually reversed in 2011 due to the Fukushima crisis, after which Japan absorbed more and more flexible LNG.

MTPA	LNG imports from Qatar (Europe)	Share of all LNG imports (Europe)	Of which spot/short-term	Share of spot/ST LNG imports (Europe)
2008	5.87	13.9%	0.32	7.3%
2009	14	27.0%	1.91	21.3%
2010	26.78	41.4%	6.10	45.0%
2011	31.61	48.7%	5.67	46.4%
2012	22.71	47.9%	4.45	50.6%[545]
2013	17.23	46.3%	1.20	24.9%[546]

FIGURE 9: GROWTH IN TOTAL AND SPOT/SHORT-TERM QATARI LNG IMPORTS TO EUROPE (2008-2013). SOURCE: FRANZA (2014)[547]. DATA: GIIGNL (EUROPE = EU28 + TURKEY).

On top of this, after decades of growth, EU gas demand contracted by more than 6% in 2009. It then recovered in 2010, partly due to extraordinarily low temperatures, and declined further in 2011, 2012, 2013 and 2014. In 2014, EU gas demand was 112 Bcm lower than in 2008.[548] European gas market analysts were talking about demand destruction[549], and prospects for gas demand recovery were grim.

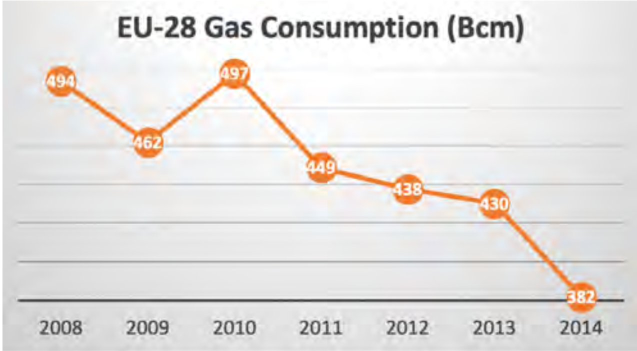


FIGURE 10: EU-28 GAS CONSUMPTION IN THE PERIOD OF FALLING GAS DEMAND (2008-2014). SOURCE: EUROSTAT

544 Stern and Rogers, *The Dynamics of a Liberalised European Gas Market*.
545 Excludes re-exports received and re-exports reloaded.
546 Excludes re-exports received and re-exports reloaded.
547 Franza, *Long Term Gas Import Contracts.*
548 Eurostat statistical database.
549 World Gas Intelligence (hereinafter, WGI), *Energy Intelligence*, 13 June 2012; M. Bradshaw et al, *The UK's Global Gas Challenge* (2014): UK Energy Research Centre.

Initially, the fall in gas demand could mostly be explained by the double-dip economic recession that hit the EU in 2008-2009 and 2011. Weak GDP growth primarily affected gas demand in the industrial sector[550], but also gas burn in the power sector through lower electricity demand. However, weak economic growth is not the only explanatory factor. This is proven by the fact that, even when economic conditions improved in 2012, gas demand kept on decreasing. The other explanatory factor is mounting competition from zero marginal-cost renewables and cheap coal. Coal was abundant on global markets partly because of falling US coal demand, another result of the shale gas revolution and low Henry Hub prices.[551] Meanwhile, the European Trading System (ETS) proved unable to prevent coal from replacing gas in European power generation, to the detriment of climate objectives. This was also – in part – a result of the economic and financial crisis: due to sluggish economic activity, demand for allowances remained low, which translated into unexpectedly low CO_2 prices.[552]

While Western European hub prices promptly responded to the new supply/demand balance, reflecting the emergence of a buyers' market, oil-linked contract prices failed to adjust entirely. The reason is that crude oil prices remained relatively high throughout the period, owing to high demand in Asia and geopolitical turmoil after the Arab Spring. After falling briefly during the nadir of the economic and financial crisis, they recovered in the summer of 2009 and hit the one-hundred-dollar threshold again by the end of 2010.

Mounting pressure to discard oil indexation in the EU can also be regarded as a symptom of a wider phenomenon: the decoupling of oil and gas prices triggered by the US shale revolution. Before the mid-2000s, crude oil and gas prices have been strongly correlated because of the relation between the two commodities in both supply and demand. The crude-gas ratio, a measure used by the industry to discover the relative value of oil and gas to make decisions on monetisation, exposes the evolution in their relative price over time. When reading the chart below, it should be kept in mind that thermal parity is 5.85, as one barrel of oil is thermally equivalent to 5.85 MMBtu. In other words, if the prices of crude oil and gas were the same, proportionally to the respective energy content of the two commodities, the crude-gas ratio should be 5.85. In the period 2000-2007, the US crude-gas ratio averaged 8, signalling higher value being attached to crude oil.[553] This is not surprising. For a long time, gas has been treated as a mere by-product of crude oil (the real prize and money-maker for the hydrocarbon industry). Yet, after the shale revolution, the crude oil-gas ratio reached unprecedented high levels, jumping to 27 in 2009 and peaking at 54 in 2012.[554] The reason was that oil prices – largely reflective of global dynamics, in spite of a widening gap between WTI and Brent – recovered strongly after the economic crisis, while gas prices – more directly reflective of local overproduction in the US – remained at low levels for a prolonged period of time.[555]

550 D. Jones et al, *Europe's Declining Gas Demand: Trends and Facts on European Gas Consumption* (2015): E3G Report, June 2015.

551 *Gas and Coal Competition in the European Power Sector*, Cedigaz, June 2014.

552 B. Declercq et al, 'Impact of the Economic Recession on the European Power Sector's CO_2 Emissions', *Energy Policy*, 39:3 (2011), 1677-1686.

553 A. Mchich, *Are Crude Oil and Natural Gas Prices Linked?* (2018): CME Group, 9 May 2018.

554 *Ibid.*

555 *Ibid.*

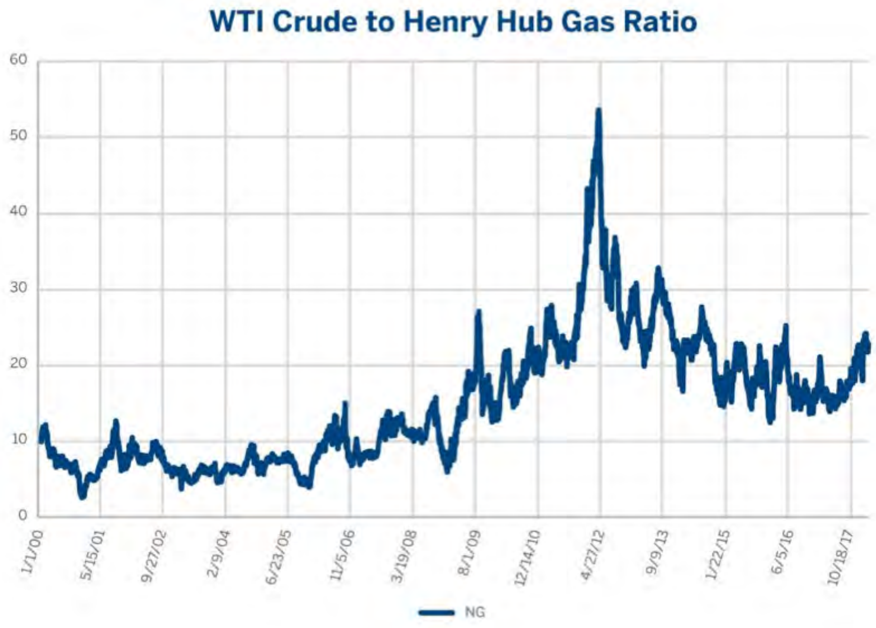


FIGURE 11: RATIO BETWEEN THE WEST TEXAS INTERMEDIATE (WTI) AND THE HENRY HUB GAS PRICE (SOURCE: CME GROUP)

These developments in North America provided further impetus to European ambitions to reduce gas prices. In reality, European gas prices could not decrease to Henry-Hub parity, for the simple reason that domestic gas production in Europe was declining and there was strong opposition to shale. However, proponents of market liberalisation insisted in promoting the idea that Europe's price premium vis-à-vis the US was unjustified. This idea resurfaced as recently as in 2018 with the 'Quo Vadis' study commissioned by the European Commission.[556] In the expectation of more closely interconnected gas markets – thanks to the rise in flexible LNG trade – there was the hope that low Henry Hub prices would exert a downward influence on European hub prices.

In other words, everything in the early 2010s seemed to suggest that oil indexation would deliver higher prices than market prices. As mentioned, oil-indexed prices in EU contracts failed to adjust to the situation of oversupply. A gap opened between TTF prices and (oil-indexed) contract prices.

556 *'Quo Vadis EU Gas Market Regulatory Framework – Study on a Gas Market Design for Europe.*

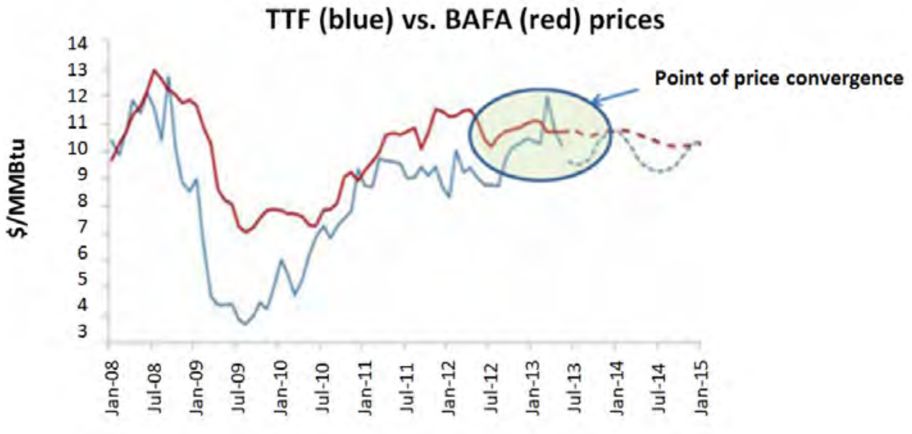


FIGURE 12: EVOLUTIONS IN TTF (DUTCH HUB) AND BAFA (AVERAGE GERMAN IMPORT CONTRACT) PRICES. SOURCE: DEPA.

EU hub and oil-linked gas prices diverged for a prolonged period of time**.** Between 2009 and 2014, TTF spot prices have been trading at a discount of at least $1 and up to $5/MMBtu relative to oil-linked prices.[557] This situation altered the pre-existing market balance. On the one hand, end-users enjoyed access to cheaper hub supplies. In the Northwest European market, hub prices – and notably the *National Balancing Point* (NBP) for the United Kingdom and the TTF for Continental Europe – had already become the benchmarks for transactions between wholesalers and their buyers.

On the other hand, midstream companies were bound by long-term commitments to purchase expensive, oil-linked gas. European importers were thus trapped in a loss-making position, epitomised by E.On's notorious €2,000,000 daily loss in gas merchant activities over 2011.[558] Also due to bullish expectations for gas demand in previous years, which had already resulted in over-contracting prior to the economic crisis, the 60-70 Bcm downward flexibility available in 2009 contracts was insufficient to absorb the subsequent fall in demand.[559] EU importers responded by minimising offtake from existing oil-linked long-term contracts in compliance with take-or-pay obligations, but also by seeking price renegotiations[560] and new hub-linked supplies. At an international conference in 2010, E.ON Ruhrgas' CEO Klaus Schafer declared that hubs had become the reference point for customers and that the historical long-term contracts did no longer reflect the market and thus had to be re-engineered to anticipate future needs. This was regarded as the starting point of a series of renegotiations in the period 2009-2014.[561]

557 Author's calculations based on data from Platts.

558 'E.On Posts Gas-to-Oil Loss, Says Tackling Contracts', *Reuters*, 14 March 2012.

559 A. Melling, *Natural Gas Pricing and Its Future* (2010): Carnegie Endowment for International Peace.

560 In accordance with the terms set by the contracts.

561 Stern and Rogers, *The Dynamics of a Liberalised European Gas Market*.

Chapter 6 contains a detailed analysis of such renegotiations, and sketches their commercial implications for EU gas importers and Gazprom.

In Chapter 5, we have shown how the transition towards market pricing in EU-Russia gas trade was not only triggered by liberalisation (5.2), but also by structural endogenous changes in the gas industry (5.1) and a prolonged situation of oversupply after 2008-2009 (5.3). Chapter 5 confirms findings that gas contract duration diminishes with growing maturity of transportation infrastructure (Neuhoff and Von Hirschhausen, 2005)[562] as well as with lower capital intensity of investments and a with a rising number of players competing in the market (Hartley and Brito, 2001)[563]. It also strengthens the conjecture that a decrease in asset specificity lowers the efficiency gains brought by long-term contracts (Doane and Spulber, 1994)[564].

From an NIE perspective, a liberalised market incentivising gas-to-gas competition can be regarded as a governance structure, and the notion has been presented in Chapter 3 that governance structures mirror the interests of groups that have the power to alter the rules in a specific historical phase. The emergence of marked buyer's market conditions at the end of the 2000s conferred significant leverage to the buyer (the EU), who gained the ability to project its preferred model onto EU-Russia gas trade. This observation helps to challenge deterministic 'end-of-history' claims that pro-market reforms are destined to prevail everywhere. Instead, the likelihood that such reforms are implemented and their effectiveness are linked to specific historical conditions. This finding also entails that, should the underlying circumstances radically change, setbacks can occur. It is very unlikely that historical long-term contracts will make a full comeback. However, the pace of the transition towards market pricing could be slowed down, and long-term contracting (albeit in different forms from the past) could make a comeback, in line with Neuhoff and Von Hirschhausen's[565] finding (see Chapter 3) that long-term contracts make cyclical comebacks.

562 Neuhoff and Von Hirschhausen, *Long-term vs Short-term Contracts: A European Perspective on Natural Gas*.

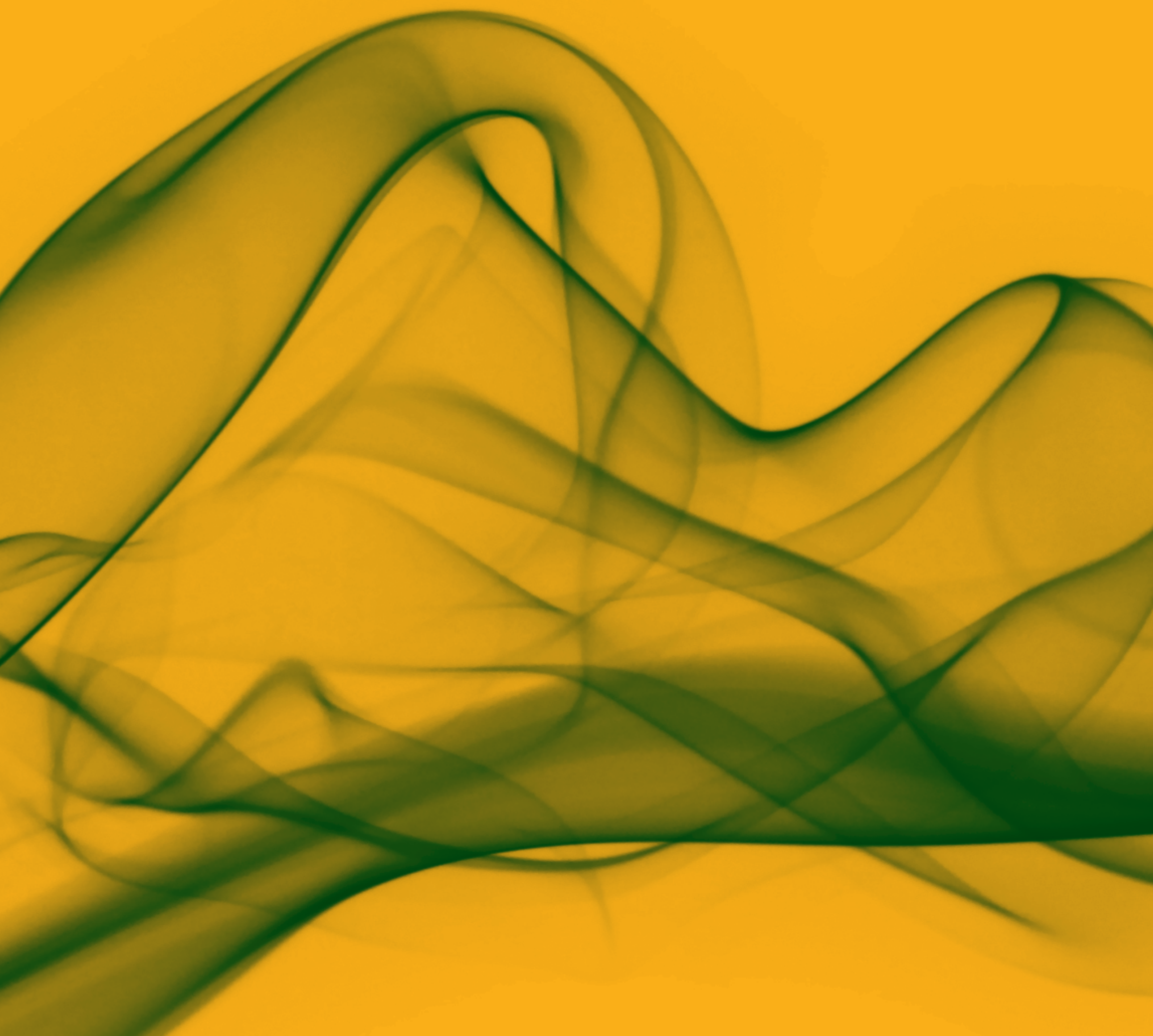
563 Hartley and Brito, *New Energy Technologies in the Natural Gas Sectors*.

564 Doane and Spulber, 'Open Access and the Evolution of the US Spot Market for Natural Gas'.

565 Neuhoff and Von Hirschhausen, *Long-term vs Short-term Contracts: A European Perspective on Natural Gas*.

CHAPTER 6

QUALITATIVE AND QUANTITATIVE ANALYSIS OF TRANSFORMATIONS IN LONG-TERM IMPORT CONTRACTS AND INCREASED HUB ACTIVITY IN EUROPE (2008-2019)



CHAPTER 6 – QUALITATIVE AND QUANTITATIVE ANALYSIS OF TRANSFORMATIONS IN LONG-TERM IMPORT CONTRACTS AND INCREASED HUB ACTIVITY IN EUROPE (2008-2019)

6.1 TRANSFORMATIONS IN LONG-TERM IMPORT CONTRACTS

Price renegotiations in long-term contracts between buyers and suppliers are drawn-out processes, for which solid analysis and interpretation of the business environment are key. In most cases, the parties avoid arbitration and try to reach an agreement on new pricing terms, steered by contractual obligations to periodically review prices and by evolving market conditions. On rare occasions there may even be a shared interest between suppliers and buyers in redefining some of the non-price terms. An example was Algeria's willingness to reduce its gas exports to Italy and Spain around 2010, in response to shrinking demand in Southern Europe but also to its growing domestic demand and upstream constraints.[566]

However, given the deep and rapid transformations that took place in the market (Section 5.3), it proved increasingly difficult to reach negotiated agreements after 2009, and the number of arbitration cases rose as a result.[567] Arbitration, which was traditionally regarded as an option of last resort, became the norm between EU buyers and external supplies. A full-grown arbitration industry, providing work for law firms and a plethora of independent advisors, developed as a result (and has since then tried to preserve itself), marking a departure from the old relational model of trade (Chapter 8). The phase that started in 2008-2009 turned out to be the most conflictual one ever recorded between European importers and Gazprom. The long-standing consensus cementing long-term contracts, which had stormed traumatic events such as economic stagnation in the 1980s and the collapse of the Soviet Union, waned in just a few years. The next paragraphs sheds light on how hub indexation made inroads into EU long-term import contracts since 2008-2009.

The introduction of hub indexation in renegotiations and arbitrations of long-term contracts

The introduction of hub indexation stood out as the most contentious commercial issue between sellers and buyers in their renegotiations, in line with Williamson's (1975)[568] finding

566 H. Darbouche, *Algeria's Shifting Gas Export Strategy: Between Policy and Market Constraints* (Oxford, 2011): Oxford Institute for Energy Studies.

567 S. Sarzana, *The Rise of Price Revision Arbitrations* (2012): Commercial Dispute Resolution.

568 Williamson, *Market and Hierarchies: Analysis and Antitrust Implications, a Study in the Economics of Internal Organization*

that price adjustments are the most contentious elements in a long-term contract renegotiation (Chapter 3). Since 2008-2009, arbitration panels tended to recognise the buyers' claims for hub indexation[569], save for contracts targeted to markets that lacked integrated hubs, as in the 2010 Sonatrach-Gas Natural arbitration.[570] The criterion used by arbitration panels was to check whether contract prices were reflective of 'market conditions' in the destination market. As hubs developed, oil indexation ceased to fulfil this criterion. Hub indexation was not embraced overnight, but after a gradual process. Hub indexation was also not embraced fully and equally across the EU. When looking at the process of long-term contract renegotiations, it is important to distinguish full hub indexation from partial hub indexation, as well as from more creative forms of 'indirect' hub indexation that were adopted and that are still a feature of many long-term contracts nowadays.[571]

Suppliers adopted different attitudes relative to the issue of hub indexation. Some of them led the way in disclosing their position on pricing.

Statoil was the first non-EU supplier who accepted the introduction of direct hub indexation in its existing contracts with large EU importers such as Gasterra, E.On, RWE and GDF/Engie. In 2009, just a few months after the manifestation of the gas market developments described in Section 5.3, Statoil introduced a 25% hub indexation in most of its EU contracts, initially as a temporary measure. This can be interpreted as a relational move aimed at bringing price relief to long-standing European customers in distress or, in more Realist terms, as a strategic move aimed to increase Statoil's own market share vis-à-vis Gazprom.[572] Statoil also signed new fully hub-linked contracts, such as the contract with Centrica in 2011[573] and the one with Wintershall in 2012.[574] In November 2013, Statoil declared that almost half of its supplies to Europe were priced on the basis of gas-to-gas competition, and that all of its contracts with Germany and almost all of its contracts with Belgium, the Netherlands and the United Kingdom contained at least partial hub indexation.[575] In 2016, Statoil announced that its supply contracts were 85% hub-linked.[576] It is important to point out that as a consequence of re-pricing, the Norwegians regained control of volumetric flexibility[577] and started to "sell it as a separate product, or use it as a trading tool".[578] The introduction of flat gas deliveries

569 "Publicly available arbitral decisions over the past few years have been in favour of buyers". In *Outlook for the Long Term Contracts in a Globalizing Market*, 5th Gas Centre Industry Forum (2014): UNECE.

570 'Sonatrach Wins the Right to Increase Prices to Spain', *ICIS Heren*, 17 August 2010.

571 *Ibid.*

572 N. Theisen, *Natural Gas Pricing in the EU: From Oil Indexation to a Hybrid Pricing System* (2014): Regional Centre for Energy Policy Research (REKK).

573 *Ibid.*

574 'Statoil Merges Gas Trading with Oil to Suit Freer EU Market', *Bloomberg*, 18 February 2014, quoting declarations by Eldar Saetre (Statoil) given on 12 February 2014.

575 A. Makan, 'Statoil Breaks Oil-Linked Gas Pricing', *The Financial Times*, 19 November 2013.

576 WGI, *Energy Intelligence*, 18 January 2017.

577 The flexibility of volumes between the Minimum Contracted Quantity (MCQ) and Annual Contracted Quantity (ACQ), see Section 1 of Chapter 4.

578 WGI, *Energy Intelligence*, 13 February 2013

essentially meant that buyers started to have to pay for flexibility.[579] Statoil's position is that "long-term contracts are still important, but take on a modernised form".[580]

Gasterra also publicly declared its support for the TTF trading hub as a basis for gas trade early in the process.[581] This reflected the Dutch government's strong political support for the development of gas trading and transition to market pricing.[582] Such support was in line with the so-called 'Gas Roundabout' strategy, aimed at making The Netherlands the centre of European gas trade – in expectation of lower domestic production and the country's transformation from a supplier and exporter to a net importer of gas.[583] In its 2011 Annual Report, Gasterra stated that it "view[ed] the TTF as being an efficient way to trade gas and a good opportunity to stimulate supply and demand".[584] In the same year, Gasterra agreed to deliver gas at the TTF, rather than at the city gate. This move was a key trigger for the development of TTF as Continental Europe's most liquid hub.[585] In 2013, the consultancy DNV Kema indicated that almost all the gas marketed by Gasterra in the Netherlands was offered at hub-linked prices, and that the Dutch company has gradually been introducing more hub indexation in its export contracts.[586] At the time of writing, Gasterra is reported to have applied hub indexation to long-term contracts with buyers from countries where competitive markets exist.[587] However, even after a comprehensive review of publicly available information, it is not possible to establish with certainty if Gasterra has completely removed oil indexation from all of its export contracts. In spite of Gasterra's early adoption of hub indexation, tensions with buyers have continued until recently, as demonstrated by the outcomes of the 2016 arbitration between Gasterra and ENI[588]. Diverging views with Engie, on the other hand, do not appear to be related to pricing, but rather to volumes.[589] The company renegotiated import and export contracts in 2017 and two arbitration cases were reportedly still outstanding at the end of the year.[590]

579 K. Yafimava, *Outlook for the Long Term Contracts in a Globalizing Market* (2014): 5th Gas Centre Industry Forum, UNECE.

580 J. Økland, *Creating Value in Times of Low Commodity Prices* (2016): Statoil Gas Seminar, 18 February 2016.

581 GasTerra intervention at the European gas hub market conference, Frankfurt (5 December 2011), quoted in P. Heather, *Continental European Hubs: Are they Fit for Purpose?* (Oxford, 2012): Oxford Institute for Energy Studies.

582 Heather, *The Evolution of European Traded Gas Hubs*.

583 For more on this topic, see O. Schipperus and M. Mulder, 'The Effectiveness of Policies to Transform a Gas-Exporting Country into a Gas-Transit Country: The Case of The Netherlands', *Energy Policy*, 84 (2015), 117-127.

584 *Gasterra Annual Report* (2011), Gasterra.

585 D. Harris and Y.C. Chou, *Gas Transport Tariffs and the Dutch Gas Market: The Role of Gas Tariff Structures in Maintaining Desirable Features of the Dutch Gas Market* (2017): Report prepared for Gasunie Transport Services B.V., The Brattle Group.

586 *Study on LT-ST markets* (2013): DNV Kema.

587 J. Stern and H. Rogers, 'The Evolution of European Gas Pricing Mechanisms', in M. Hafner and S. Tagliapietra (eds.), *The European Gas Markets* (2017): Palgrave Macmillan.

588 In June 2016, ENI lost an arbitration case against Gasterra. Although details on content are not known in the public domain, ENI had sought a price revision of approximately €2 billion for sales performed by Gasterra as of October 2012. Gasterra had applied a lower price in its long-term contract with ENI as of October 2012. The arbitration tribunal's dismissal of ENI's retroactive price rebate demands resulted in Gasterra's request for arrear payments from ENI that were worth close to €1 billion. Following ENI's refusal to perform such payments, motivated by a different interpretation of the contracts, Gasterra seized ENI's Dutch assets. An agreement was then found in September 2016, when the asset seizure was replaced with a bank guarantee of the same amount, which would remain effective until the formulation of the final award, to be carried out by a new arbitration. For further details, see: *Eni: Statement on the Arbitration with GasTerra and Following Measures Taken by the Company* (2016): Press Release, Eni, 20 July 2016; *GasTerra Starts Arbitration to Collect Euro 918 Million Due by Eni after Final Arbitral Award* (2016): Press Release, Gasterra, 21 July 2016.

589 *Energiebedrijf ENGIE Geeft Vertekend Beeld van Gaswinning in Groningen* (2016): Press Release, Gasterra.

590 *Gasterra Annual Report* (2017), Gasterra.

Among sellers, Russia initially took a particularly outspoken position against changing price indexation.[591] Gazprom introduced hub indexation for the first time in 2010, when a 15% spot component became part of the formula applied to its contract with E.On.[592] Gazprom was then forced by arbitration panels to extend partial hub indexation to other contracts, including its supply contract with RWE. Gazprom initially threatened to reconsider its willingness to sign long-term contracts if these were to become fully hub-linked, even if it is unclear to what extent this might have been an empty threat meant to discourage EU buyers to pursue further renegotiations. A closer look at renegotiation cases proves that non-EU suppliers have been consistently striving to resist structural changes in price formation mechanisms until they could no longer do it. Adaptations thus do not appear voluntary. Notably Russia (but also Qatar and Algeria) have tried to preserve the basic concept of oil-indexation in long-term supply contracts. Gazprom has initially attempted to make price reductions originating from non-structural changes more attractive than those offered with the introduction of partial spot indexation.[593] On some occasions, as in the 2012 Gazprom-E. On deal, suppliers have agreed to one-off price reductions.[594,595,596]

In other cases they have granted long-lasting discounts by adjusting the components of traditional netback formulae, which nonetheless have initially retained their formal characteristics, including oil indexation. Examples of the latter kind include lowering the base price for gas (P_0), modifying the relative influence of different oil products on price formation (α) and lowering the coefficients ($b_{1\text{ and }}b_2$) that set the pass-through rate to these products.[597] There are indications that the earlier price cuts in the Gazprom-Eni and Sonatrach-Edison contracts originated mainly from changes to the P_0, which also applied to Gazprom's German contracts.[598,599,600]

$$P_t = P_o + \alpha \times a_1 \times b_1 (Go_t - Go_o) + (1-\alpha) \times a_2 \times b_2 (HFO_t - HFO_o)$$

Due to confidentiality, it is not always possible to establish the extent to which price reductions have resulted from one-off discounts or to which they have become permanently embedded in the formulae. As previously mentioned, Gazprom has widely resorted to both mechanisms

591 S. Komlev, *Pricing the Invisible Commodity* (2013): Gazprom Export Discussion Paper. For a response, see J. Stern and H. Rogers, *The Transition to Hub-Based Pricing in Continental Europe: a Response to Sergey Komlev of Gazprom Export* (Oxford, 2013): Oxford Energy Comment.

592 C. Belton and E. Crooks, 'Gazprom in Contract Shake Up' (2010): *The Financial Times*, 25 February 2010.

593 As concluded by analysts of Energy Intelligence after a comparison between the prices paid by different utilities after their renegotiations with Gazprom, see WGI, *Energy Intelligence*, 18 April 2012.

594 WGI, *Energy Intelligence*, 4 July 2012.

595 E.On Website, see: http://www.eon.com/en/media/news/press-releases/2012/7/3/eon-reaches-settlement-and-raises-group-outlook-for-2010.html.

596 ICIS Heren, see: http://www.icis.com/resources/news/2012/07/03/9575002/e-on-and-gazprom-settle-natural-gas-long-term-contract-price-dispute/.

597 "A source at Gazprom Export, Gazprom's exporting arm said that the coefficient used to calculate the price of Russian gas exports against the price of a basket of oil products had been changed, allowing for more flexibility in the final bill", quoted in V. Soldatkin, 'Gazprom Adjusts Gas Prices for European Companies' (2012), *Reuters*, 17 January 2012.

598 For Gazprom-Eni: WGI, *Energy Intelligence*, 21 March 2012.

599 For Sonatrach-Edison: WGI, *Energy Intelligence*, 8 May 2013.

600 For Gazprom's German contracts: WGI, *Energy Intelligence*, 3 July 2013.

since 2011-2012, offering discounts on oil-linked sales to a number of Western European importers.[601] Discounts have typically been between 7 and 10%. In many cases they were made retroactive, returning hundreds of millions of euros to the buyers. Central-Eastern European resellers such as Poland's PGNIG and Bulgargaz, which have traditionally paid higher prices than their Western European counterparts, initially obtained larger discounts of up to 15-20%.[602]Another interesting compromise reached by Gazprom with some of its European customers (namely Eni and PGNIG) was the introduction of what Gazprom defines as "indirect spot pricing",[603] consisting of the application of a 'price corridor', the functioning of which is explained in the graph below[604].

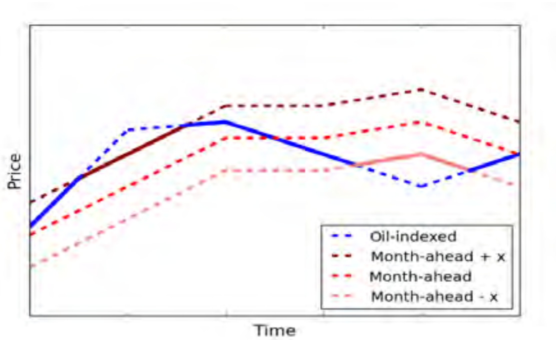


FIGURE 13: FUNCTIONING OF 'PRICE CORRIDORS'. THE SOLID LINE SHOWS THE APPLIED PRICE. WHEN THE PRICE OF OIL-LINKED GAS IS HIGHER THAN THE PRICE OF GAS AT THE HUB (MONTH-AHEAD), THE BUYER WILL PAY A MONTH-AHEAD PRICE WITH A PREMIUM (MONTH-AHEAD + X). WHEN THE PRICE OF OIL-LINKED GAS IS LOWER THAN THE PRICE OF GAS AT THE HUB, THE BUYER WILL PAY A DISCOUNTED MONTH-AHEAD PRICE (MONTH-AHEAD – X). IF THE PRICE OF OIL-LINKED GAS IS WITHIN THE BAND OF MONTH-AHEAD ± X, THE OIL-LINKED PRICE WILL BE APPLIED.

In the course of 2013, pressures for the renegotiation of Russian contracts eased in Northwest Europe. As a matter of fact, price levels in Russian contracts then started to align with TTF hub prices, although the majority of these contracts still formally did not include full hub indexation. In 2014, pressures eased in other countries as well, notably in Italy when, in May, Eni obtained a "landmark deal with Russia's Gazprom that [abandoned] a 50-year old system of indexing gas supplies to oil prices".[605]

A transition occurred from an initial period when oil-indexed formulae were simply tweaked to reflect spot prices to a second phase in which hub indexation became more formally (i.e. structurally), explicitly and directly adopted. It is difficult to establish when this exactly

601 Eni, Gdf, E.On, Wingas, OMV, Sinergie Italiane, Edison, see 'E.On, RWE and PGNiG Last to Complete Gazprom Negotiations' , *Natural Gas Europe*, 20 June 2012.

602 WGI, *Energy Intelligence*, 21 November 2012.

603 *RIA Novosti*, 6 November 2012.

604 "Sources familiar with Gazprom say it is possible to set 'corridors' or fixed points for formula-based price dynamics where the corridor limits are linked to spot prices, but the formula itself does not incorporate a direct link". In WGI, *Energy Intelligence*, 7 November 2012.

605 O. Vukmanovic and S. Jukes, 'Italy's Eni Wins First non Oil-Indexed Gas Feal from Russia', *Reuters*, 23 May 2014.

happened, also because it took place at different times across different regions of Europe, starting in the Northwest and then spreading South and East. It is mostly after 2014 that non-European suppliers started to publicly acknowledge that hybrid or hub indexation had become the leading pricing mechanism in parts of Europe.

In 2016, Germany became almost completely hub-indexed after the successful negotiation of a new agreement between Gazprom and E.ON. Additionally, Russian long-term contracts with both E.ON and RWE were 'de-risked' for the following years.[606] Gazprom's posture towards Italy appeared less straightforward, with indications that the price corridor described above was confirmed as price setting mechanism, with a narrow oil-indexed collar and premiums as well as discounts set by hub indexation. In the same year, ENGIE's contracts with Gazprom became more closely linked to the local PEG Nord hub as a result of new renegotiations. The Netherlands, already almost fully hub-indexed, resolved an ongoing arbitration case with Gazprom where both indexation and flexibility were allegedly under discussion, although no additional details are publicly available.[607,608]

Another noteworthy novelty of 2016 was the adoption of full hub indexation in Sonatrach's supply contracts with ENI. The agreement was largely unexpected: firstly because Algeria had always strongly opposed hub indexation and secondly because the contract was pegged to the Italian PSV (Punto di Scambio Virtuale) rather than to more liquid North-Western European hubs.[609]

In early 2017, Gazprom declared that only 40% of the volumes sold to Europe under long-term contracts were still indexed to oil, whereas hybrid and hub pricing accounted for the remaining 60% - marking a tipping point in the abandonment of oil indexation.[610] After having adopted hub indexation, Gazprom continued to emphasise the importance of maintaining an equilibrium between the interests of buyers and sellers as well as the value of predictability, which was the reason why Gazprom decided to use month- and year- ahead contracts as guidance for hub indexation.[611] Gazprom also said that take-or-pay clauses were maintained, but that if buyers were paying a fully hub-indexed price, they had to purchase all the contracted volumes – with no downward flexibility. This is in line with what Statoil had done years before (see above). Finally, in February 2018, Gazprom indicated that 1/3 of its supplies to Europe were indexed to oil, with another 1/3 being indexed to hub prices and the remaining 1/3 having a hybrid pricing.[612]

606 'E.ON agrees price cut with Gazprom, raises outlook', *Reuters*, 29 March 2016.
607 WGI, *Energy Intelligence*, 18 January 2017.
608 WGI, *Energy Intelligence*, 15 March 2017.
609 WGI, *Energy Intelligence*, January 2017.
610 WGI, *Energy Intelligence*, March 2017.
611 WGI, *Energy Intelligence*, March 2017.
612 Declaration by Medvedev. See 'Russia's Gazprom calls Nord Stream-2 pipeline risks hypothetical', *Reuters*, 6 February 2018.

The result of the process described in the previous paragraphs is that contract prices have gradually been brought in line with spot prices. The graph shows that contract prices converged with hub prices between 2013 and 2014. The conclusion is solid because it is confirmed for three different types of measurement: the average German import price (BAFA), Société Générale's estimate of Gazprom export prices, and the Oxford Institute for Energy Studies' estimate of Gazprom export prices – all converging to NBP levels at the end of the period under examination and diverging from the marker that indicates what price the old formula would have delivered ('Formula-fitted German Border 2001-2008').

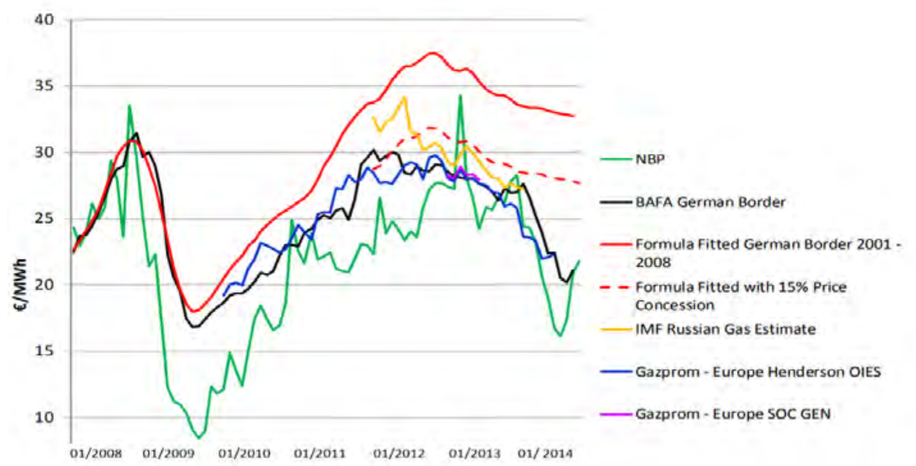


FIGURE 14: NBP AND ESTIMATES OF EUROPEAN OIL-INDEXED CONTRACT PRICES 2008-2014. SOURCE: STERN AND ROGERS (2014)[613], IN TURN BASED ON DATA FROM PLATTS, BAFA, IMF, BROS, HENDERSON.

Convergence with NBP can be used as a proxy for convergence with Continental hub prices because in the last years the British hub and the Continental hub prices have been moving in sync. The graph below shows how convergence between contract prices and hub prices have continued since 2014.

613 Stern and Rogers, *The Dynamics of a Liberalised European Gas Market*.

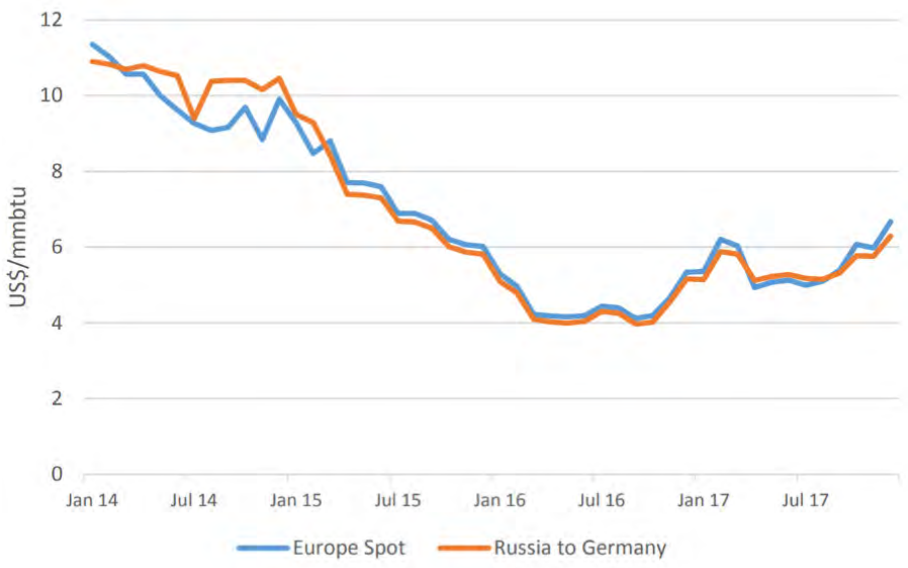


FIGURE 15: EVOLUTION OF THE AVERAGE RUSSIAN GAS PRICE VERSUS THE EUROPEAN SPOT PRICE (2014-2018). SOURCE: HENDERSON AND SHARPLES (2018)614, IN TURN BASED ON ARGUS MEDIA DATA.

The gap has fully closed in 2015 and contract prices have even fallen slightly below hub prices. German import prices are used as a proxy for all core European markets.

Other innovations introduced by long-term contract renegotiations and arbitrations

Apart from introducing hub indexation, renegotiations have introduced other novel elements, bringing additional complexity and diversity to the scene of long-term gas supply contracts in the EU.

For a number of years, when the EU market was oversupplied and buyers tried to minimise the purchase of Russian gas, renegotiations led to the diminution in volumes traded under long-term, oil-linked contracts. Responding to the resellers' difficulty in marketing gas volumes linked to oil prices, some exporters have in fact allowed a reduction of the required minimum offtake. This has been achieved both through one-off derogations to the take-or-pay principle and formal abatements of the Minimum Contracted Quantity (MCQ). In 2012 for instance, the take-or-pay threshold has been lowered from 85% to 75% in the Eni-Gazprom contract[615] and from 90% to 80% in the Bulgargaz-Gazprom contract.[616] In July 2014, Eni publicly reiterated that it had "reached a significant reduction in the minimum offtake requirements" in its

614 J. Henderson and J. Sharples, *Gazprom in Europe: two Anni Mirabiles, but Can it Continue?* (Oxford, 2018): Oxford Institute for Energy Studies.

615 WGI, *Energy Intelligence*, 7 March 2012.

616 WGI, *Energy Intelligence*, 21 November 2012.

contracts.[617] However, Russia has often demanded that these schemes be only temporary, so that the buyer is required to make up for its lower offtake by purchasing more gas in the following years.

Less frequently, deals have involved cuts in annual contracted quantities (ACQs), as in the Sonatrach-Eni deal of March 2013.[618] An important implication of these measures is the increased flexibility provided by some long-term pipeline contracts. This contrasts with the lower flexibility of LNG supplies – where take-or-pay usually amounts to 95 or 100% – and the lower flexibility offered by new hub-linked contracts, such as those with Statoil. The recurrence of buyers' requests to obtain the right to purchase lower-than-contracted volumes diminished after 2014. As contract prices were brought in line with spot prices – reducing the incentive to minimise contract offtake in favour of spot purchases – and, importantly, as EU gas demand recovered, absolute volumes of gas sold under long-term contracts increased again. At the time of writing, there are signs that contracted volumes are nearly fully offtaken by EU importers (also because competitive terms have been introduced)[619].

Finally, tailored provisions favourable to buyers have been introduced in long-term contracts. For instance, Eni and Gazprom now have the right to reopen pricing talks at any time instead of every three years.[620] In today's highly volatile environment, it is indeed important for European buyers to constantly keep supply prices in line with market trends. Engie, for example, has catered to this need by adopting a 'dynamic approach to pricing', which basically implies renegotiating contracts every one or two years.[621] The modification of backward oil indexation periods from the original '12.0.6' structure to '6.0.3'or '3.0.3' structures[622] – another outcome of one of Eni's renegotiations with Gazprom – was a confirmation of the acceleration in the responsiveness of contracts to changes in pricing.[623] The introduction of coal indexation has also been part of the discussion, but there are no confirmed reports that this has materialised in any of the gas supply contracts under renegotiation.[624]

Transformation in contractual structures of renewed and newly signed contracts

Europe's transition towards hub-linked gas pricing has not only been driven by renegotiations and arbitrations, but also by the signing of new contracts and the renewal of existing ones. Statoil signed fully hub-linked supply contracts with EU buyers, including with Centrica in 2011 and Wintershall in 2012.[625]

617 *2014 2Q Results and Strategy Update* (2014), ENI, Speech by CEO Claudio Descalzi, London, 31 July 2014.

618 'Eni, Sonatrach Reach Deals on Gas Supply Contracts', *Argus Media*, 28 May 2013.

619 This conclusion can be drawn by comparing EU's imports of Russian gas (which reached record levels in 2017-2018) with contracted volumes (which have not increased, but rather decreased, in the last years). The fact that offtake under long-term contracts is almost maximised is confirmed by Russia's experimentation of alternative sales vehicles, such as the Electronic Sales Platform (ESP) – infra.

620 'Eni Gets Joker from Gazprom', *Energy Intelligence*, 21 March 2012.

621 'GDF Suez to Renegotiate 80% of European Long-term Gas Supply Contracts by 2013', *Platts*, 9 February 2012.

622 '12.0.6' indicates that the price of gas is indexed to the average price of an assortment of oil products over the previous 12 months, that there is an interval of 0 months between the end of the twelve-month period and the introduction of its average price into the formula, and that the price obtained through this formula will be applied to the gas contract for the next 6 months.

623 Interview conducted by the author.

624 WGI, *Energy Intelligence*, 4 July 2012.

625 'Norway's Statoil Signs Spot-indexed Natural Gas Deal with Wintershall', *ICIS*, 20 November 2012.

With regard to piped gas, the only other entirely new[626] contracts signed in the period under consideration[627] were those underpinning future supply of Azerbaijani gas from Shah Deniz field's second phase of development to various buyers in Bulgaria, Greece and Italy.[628] These contracts were provided with at least partial hub indexation[629], breaking away from oil indexation in a region that, at the time of signing, was still at the beginning of the transition to new pricing mechanisms.[630] While these contracts were initially reported to be fully hub-indexed, later reports pointed that the majority of them – those for sales to the Italian market[631] – would be partly indexed to the PSV, retaining an oil-indexed component.[632] It is probable that the final indexation that will be adopted once gas flows through the Southern Gas Corridor – around 2020-2021 – will depend on the level of liquidity that the Italian hub will have attained by then. In case of insufficient liquidity, there would be an 80% indexation to the TTF and a 20% indexation to oil products.[633] The 'Azerbaijani' contract with GDF Suez, now Engie, was reportedly fully TTF-indexed.[634] Similarly to legacy contracts, however, pricing mechanisms are confidential and full knowledge of all contractual details remains difficult to obtain.

In the period under consideration, a large number of new contracts has been signed for LNG supply. Based on a database that we compiled aggregating data provided by annual GIIGNL reports, specialised press articles and information from company websites, we can conclude that 60 new LNG contracts that are at least partially targeting[635] the European market have been signed since 2009. The Table below contains the inventory.

626 i.e. excluding contract renewals.

627 From 2008 to the time of writing (2019).

628 Axpo Trading AG, Bulgargaz EAD, DEPA Public Gas Corporation of Greece S.A., Enel Trade SpA, E.ON Global Commodities SE, Gas Natural Aprovisionamientos SDG SA (contract transferred to Edison SpA in April 2018), GDF SUEZ S.A. (now Engie), Hera Trading SrL, Shell Energy Europe Limited.

629 Declaration by Elshad Nasirov (SOCAR): "Soon Shah-Deniz consortium will sign first contracts to sell gas to European consumers", *Caspian Oil and Gas*, 28 August 2013.

630 SOCAR Vice-President Elshad Nasirov announced that "the gas price will be calculated on the basis of a long-term price formula based on the hub prices", see 'Soon Shah-Deniz Consortium will Sign First Contracts to Sell Gas to European Consumers', Caspian Oil and Gas, 23 August 2013.

631 8 out of 10 Bcm will be sold in Italy to different buyers (see footnote 215, except Bulgargaz and DEPA), who then have the option to either sell gas to Italian end-users or ship those volumes to other European countries via interconnectors.

632 Theisen, *Natural Gas Pricing in the EU: From Oil Indexation to a Hybrid Pricing System*.

633 'Italian Gas Deals with Azerbaijan to Break Systemic Oil-Link', *Reuters*, 29 April 2014.

634 *Ibid.*

635 The criteria adopted to compile the list were the location of company headquarters and import countries, when available. For example, the contract between Qatargas and Petronas (neither of which is headquartered in Europe) was included in the inventory because it established the UK as delivery point. At the same time, contracts signed by European-headquartered companies in Australia have not been included, because these primarily target Asian markets and it is highly unlikely that they will ever translate into delivered volumes to Europe. Otherwise, contracts signed by European portfolio players in the Atlantic Basin have been considered, even when these did not specify a delivery point. Not all of these contracted volumes will be sold in the European market, but Europe is one of the potential markets that contract parties considered when signing the contracts.

TABLE 1: INVENTORY OF LNG CONTRACTS AT LEAST POTENTIALLY/PARTIALLY TARGETING THE EUROPEAN MARKET SIGNED SINCE 2009

Exporter	Buyer	Importer	ACQ (MTPA)	Duration (years)	Signed	Delivery starts
Cheniere	PGNiG	Poland	1.45	24	2018	2019
Freeport LNG	Trafigura	Not specified	0.5	3	2018	2020
Port Arthur (Sempra)	PGNiG	Poland	2	20	2018	2023
Venture/Plaquemines	PGNiG	Poland	2	20	2018	2023
Calcasieu/Venture	BP	Not specified	2	20	2018	2022
Calcasieu /Venture	Galp	Not specified	1	20	2018	2022
Mozambique (Anad.)	EDF	Not specified	1.2	15	2018	N/A
Cheniere	OMV	Not specified	N/A	N/A	2018	N/A
Qatargas	OMV	Netherlands	1.1	5	2017	2019
Qatargas	Shell	Netherlands/UK	1.1	5	2017	2019
Sabine Pass/Centrica	PGNiG	Poland	9 cargoes	5	2017	2018
Calcasieu/Venture	Edison	Multiple	1	20	2017	2019
Portfolio/Woodside	RWE	Multiple	12 cargoes	2	2017	2018
Qatargas	PGNiG	Poland	2	17	2017	2018
Mozambique Area 4	BP	Multiple	3.3	20	2016	2021
Portfolio/JERA	Centrica	UK	0.5	5	2016	2019
Qatargas	RWE	Multiple	1.1	7.5	2016	2016
Rasgas	EDF	France	2	4	2016	2017
Calcasieu/Venture	Shell	Multiple	1	20	2016	2019
Corpus Chr./Pertam.	Total	Multiple	0.4	15	2016	2020
Angola LNG	EDF	Multiple	Multiple cargoes	2	2016	2016
Portfolio/JERA	EDF	Multiple	1.5	2.5	2016	2018
Portfolio/Koch S&T	LDT	Lithuania	0.13	1	2016	2017
Qatargas	Centrica	UK	2	5	2016	2019
Qatargas	Petronas	UK	1	5	2016	2018
Portfolio/Shell		Malta	0.3	10	2015	2016
Novatek	ENGIE	Not specified	1	23	2015	2018
Novatek	Shell	Not specified	0.9	23	2015	2019
Sabine Pass/Gail	Shell	Not specified	0.5	5	2015	2016
Cheniere	EDF	France	26 cargoes	2	2015	2016
Statoil	Litgas	Lithuania	0.4	5	2014	2014
Cheniere/Corpus Chr.	Endesa	Not specified	1.5	20	2014	2018
Cheniere/Corpus Chr.	Endesa	Not specified	0.75	20	2014	2018
Cheniere/Corpus Chr.	Iberdrola	Not specified	0.76	20	2014	2019
Cheniere/Corpus Chr.	Gas Natural Fenosa	Not specified	1.5	20	2014	2019
Shell	GDF	Not specified	0.4	20	2014	2014

Exporter	Buyer	Importer	ACQ (MTPA)	Duration (years)	Signed	Delivery starts
Cheniere/Corpus Chr.	EDF	Not specified	0.77	20	2014	2019
Cheniere/Corpus Chr.	En. de Portugal	Not specified	0.77	20	2014	2019
Rasgas	E.ON	UK	0.5	3	2014	2014
Qatargas	E.On	Netherlands	1.5	5	2013	2014
Qatargas	Centrica	UK	1.1	5	2013	2014
Qatargas	Petronas	UK	3	4.5	2013	2014
Yamal	Gas Natural Apr.	Europe	2.5	20	2013	2013
Cheniere/Sabine Pass	Centrica	UK	1.8	20	2013	N/A
Kogas/Sabine Pass	Total	Not Specified	0.7	20	2013	2017
Gas Nat.Fenosa portf.	Repsol	Not Specified	0.7	20	2013	2017
Pieridae/Goldboro	E.On	E.ON Portfolio	4.8	20	2013	2020
Rasgas	EDF	Belgium	3.4	15	2012	N/A
Cheniere/Sabine Pass	BG Group	Not Specified	5.5	20	2012	2015
Kogas/Sabine Pass	Total	Not Specified	0.7	20	2012	2017
Cheniere/Sabine Pass	Total	Not Specified	2	20	2012	2018
Iberdrola Portfolio	BP	Spain	0.38	10	2012	2012
Cheniere/Sabine Pass	BG Group	Not specified	3.5	20	2012	2015
Cheniere/Sabine Pass	Gas Natural Fenosa	Not specified	3.5	20	2012	2015
Qatar	Centrica	UK	2.4	3	2011	2011
Iberdrola portfolio	DONG	Netherlands	0.8	10	2010	2011
Iberdrola portfolio	Shell	Spain	0.58	1	2010	2010
Trinidad and Tobago	Gas Natural Apr.	Spain	0.72	5	2009	2009
Algeria	Edison Spa	Italy	0.13	<1 year	2009	2009
Qatar	Edison Spa	Italy	0.13	<1 year	2009	2009

Contracts targeting countries with a predominance of market pricing are mostly hub-indexed, although it cannot be excluded that some retain at least partial oil indexation.[636] New contracts for the supply of US volumes started to be (partially) indexed to the TTF and other European hubs in 2015.[637] This acceleration in the adoption of hub indexation in LNG contracts is not fully reflected in current figures on European LNG price indexation. This is notably the case of the IGU Wholesale Price Survey, whose findings (i.e. that 65% of LNG sold to Europe is oil-indexed, as compared to 30% for pipes) are influenced by legacy contracts, while indexation of expected volumes (i.e. volumes for which contracts have been signed, but deliveries will only start in future) is not accounted for (Figure 16).[638]

636 Non-spot indexing [of LNG] is now very uncommon in European gas markets, cf. A. Williamson, *Changes in Dynamics and Pricing of LNG in the Atlantic Basin* (2018): OMV Gas and Power Presentation at the World Refining Association Conference, Vienna, 29 January 2018.

637 A unit of Cheniere Energy Inc. has struck what is thought to be the first U.S. liquefied natural gas (LNG) supply deal linked to European spot prices, implying confidence in the staying power of low U.S. gas prices, analysts said." In J. Fisher, 'Cheniere Selling LNG to EDF at European Spot Prices', *Natural Gas Intelligence*, 13 August 2015"

638 *Wholesale Gas Price Survey – 2018 Edition* (2018): International Gas Union.

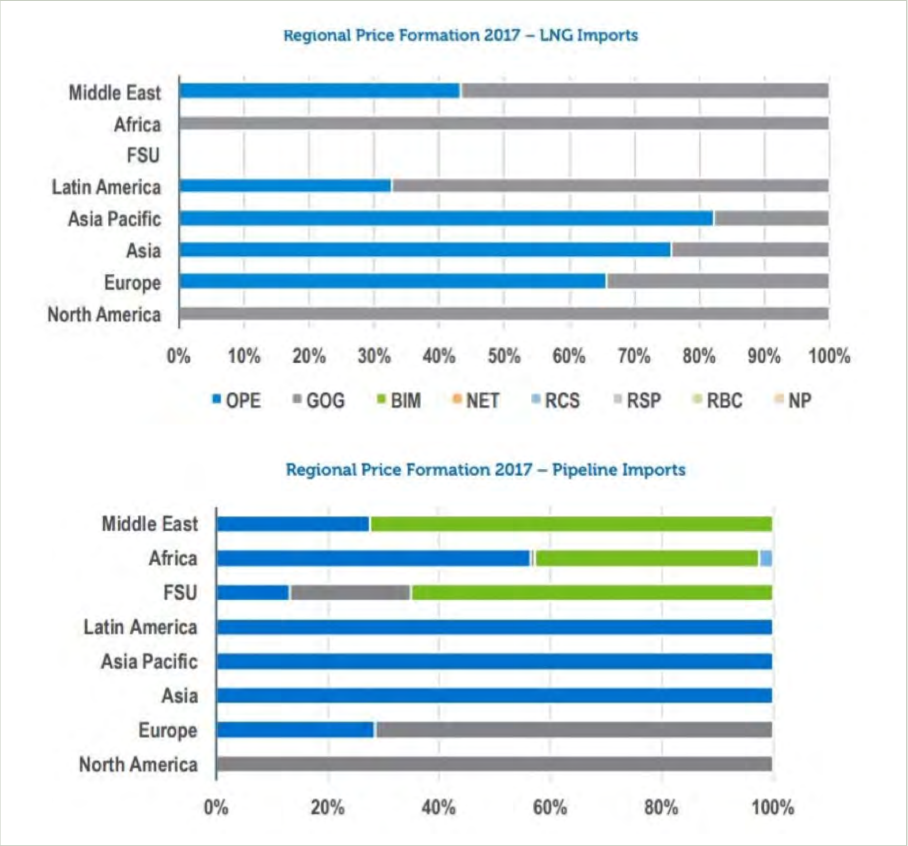


FIGURE 16: REGIONAL PRICE FORMATION OF LNG VS PIPELINE IMPORTS. OPE: OIL PRICE ESCALATION; GOG: GAS-TO-GAS COMPETITION; BIM: BILATERAL MONOPOLY; NET: NETBACK FROM FINAL PRODUCER; RCS: REGULATED COST OF SERVICE; RSP: REGULATED SOCIAL AND POLITICAL; RBC: REGULATED BELOW COST; NP: NO PRICE. SOURCE: IGU WHOLESALE GAS PRICING SURVEY, 2018.

On the other hand, it is true that the main LNG supplier of European hubs, Qatar, defends oil indexation for long-term contracts for a long time, although it sells LNG priced on an NBP basis in the United Kingdom.[639] What is more, renegotiations of LNG supply contracts are less common than in pipeline gas, even if Edison's arbitration success against Rasgas in 2012 has encouraged other European LNG buyers to ask for pricing revisions.[640] Finally, the persistence of substantial levels of oil indexation can be explained by the important relative weight of regions where hub indexation is still relatively marginal (the Iberian peninsula and, increasingly, Poland and Lithuania) in European LNG imports. Globally, despite transformations in global markets, LNG supply is still often sold through long-term contracts priced off crude oil indexes.

639 "[Qatar's Energy Minister] Al-Kaabi said he thought oil indexation was still the optimum choice for both buyers and sellers of gas from Qatar, though QP currently uses a variety of indices for its projects worldwide, such as linking to the US's Henry Hub, the UK's NBP and the Dutch TTF hub". In 'Qatar Petroleum eyes new long-term LNG deals as expansion progresses', *Platts*, 30 September 2019.

640 O. Vukmanovic and S. Jewkes, 'Edison's 450 Mln Euro Discount on Qatari LNG Holds Hope for Europe', *Reuters*, 11 September 2012.

Spot and short-term volumes accounted for 27% of global trade last year, and pure spot supplies – delivered within three months of the transaction date – for around 20%, according to the International Group of Liquefied Natural Gas Importers.[641] This finding seems counterintuitive, given that LNG is described as a form of exchange that brings dynamism to global gas trade, as opposed to pipelines, which keep trade regional and whose asset specificity prevents the transfer of transactions from specific governance structures to the market place.[642] LNG's contribution to the transition towards gas-to-gas competition and competitive pricing thus seems more an indirect than a direct one: by providing European buyers additional leverage, LNG has empowered them vis-à-vis pipeline suppliers. This is powerfully demonstrated by developments in LNG spot exchange at the apex of long-term contract renegotiations (2009-2013). The share of LNG sold to Europe on the spot market or under short-term contracts[643] collapsed in those years due to high demand in Asia. In 2010, 18.7 Bcm of LNG (21% of Europe's LNG net imports) were bought on the spot market or under short-term contracts. In 2012, this figure shrank to less than 10 Bcm (or 15% of Europe's LNG net imports) and plummeted to 2 Bcm in 2013.[644]

Another noticeable change, both between the years prior to 2009 and the period under consideration (2009-2018) and *within* the period under consideration, is a decrease in the average ACQ of newly signed LNG contracts. In other words, contracts tend to be 'smaller' than before, responding to the buyers' need for flexibility and fear of over-contracting. While in 2012 and 2013, six contracts potentially targeting the European market with ACQs above 3 Million Tons Per Annum (MTPA) were signed, only one such contract has been signed ever since, notably BP's offtake contract from Coral LNG. In the period considered, contracts stipulating the delivery of just a few cargoes were concluded by European utilities, namely EDF (with Angola LNG in 2016[645]), RWE (with Woodside[646] in 2017-2018[647]), Lietuvos Dujų Tiekimas (with Koch Supply and Trading in 2016[648]) and PGNiG (with Centrica in 2017[649]).

A trend is observable whereby in contracts in which ACQs are relatively higher, buyers have also obtained the flexibility to sell volumes to multiple countries, rather than to one predetermined import country. This contracting behaviour is explained by uncertainties

641 WGI, *Energy Intelligence*, 6 June 2018 and *Annual Report 2018* (2018): GIIGNL.

642 A.S. Corbeau and D. Ledesma, *LNG Markets in Transition – The Great Reconfiguration* (Oxford, 2016): Oxford Institute for Energy Studies, 2016.

643 Four years or less.

644 Based on GIIGNL data.

645 Chevron has a majority stake in the Angola LNG project. John Rittenhouse, Chief Executive of EDF Trading, commented: "through this agreement, we will be working closely with Angola LNG to optimise the LNG through the European wholesale market", see 'Angola LNG and EDF Trading Enter into a Sales Agreement', *EDF Trading Website*, 2016.

646 Volumes will be supplied free-on-board (FOB) with the primary source being volumes Woodside has contracted from the Corpus Christi LNG Project in Texas, see 'RWE Supply & Trading and Woodside Sign Agreement for Mid-Term LNG Supply', *RWE Website*, 20 December 2018.

647 The mid-sale agreement was signed in 2017, the final contract was signed in 2018.

648 'Lietuvos Dujų Tiekimas Inks LNG Supply Deal With Koch Supply and Trading', *LDT Website*, 2016.

649 "Up to 9 cargoes will be delivered during the term of contract to the President Lech Kaczyński LNG Terminal in Świnoujście, where PGNiG recently booked additional regasification capacity. The primary source of LNG delivered under this contract shall be the North American natural gas liquefaction terminal located at Sabine Pass, Louisiana". In 'PGNiG signed a 5-year contract for LNG with Centrica', *PGNiG Website*, 21 November 2017.

surrounding future European gas demand and the buyers' eagerness to capture arbitrage opportunities. This is in stark contrast with contracting behaviour in Asia, where there are large contracted quantities directed to specific countries. Several non-OECD Asian countries, in fact, are undertaking gasification policies, similarly to those implemented in Europe decades ago. The only meaningful exception in Europe is Poland, to which relatively large volumes of US and Qatari LNG are specifically directed – as demonstrated by PGNiG's arrangements to book regasification capacity in Świnoujście parallel to signing new supply contracts. For strategic and political reasons, Poland is explicitly conducting a campaign to diversify from Russian gas, declaring that it will not renew long-term contracts with Gazprom.[650] PGNiG's CEO Piotr Wozniak expressed the company's resolve to terminate Gazprom imports quite openly by stating "we don't want to have Gazprom as a partner or an affiliate because to us at least in Poland they are not very reliable".[651] The peculiarity of the Polish approach[652], heavily influenced by political considerations, does not change the overall finding that new LNG contracts tend to have lower ACQs.

Another distinctive trend, anticipated above, is the shift of new LNG contracts from 'point-to-point' to 'destination-flexible'. Regardless of the amount of contracted quantities, agreements that do not specify a single delivery point have become more common in the last decade. The reasons – gas demand uncertainty and prospective gains from arbitrage – have been mentioned above. Destination flexibility can be achieved in different ways. One is the 'portfolio approach' adopted by aggregators such as Shell (and, previously, BG Group), ExxonMobil, Total, BP, Chevron, and others. Portfolio players perform the important function of bridging the buyers' request for flexibility and the project developers' need of long-term offtake guarantees. These companies have a diversified pool of supply and access to a large number of regasification terminals in different markets. Even when they are contractually bound to deliver volumes to their clients, they can choose the location from which they source LNG. In the last years, thanks to deepening portfolios, companies like Shell have signed contracts to supply LNG to countries with rising gas demand, such as Kuwait, without clearly earmarking specific volumes in advance. The dimension of their portfolio also allows companies with large balance sheets to take speculative countercyclical investment decisions. A clear example of this was Shell's FID on Kitimat LNG (West Canada) in 2018, which was reached without the usual commitment of most of the output to 15 or 20 year supply contracts.[653] Sometimes, vice versa, portfolio players are not committed to supplying a terminal in particular, and can decide where to ship LNG volumes based on the most economically attractive netbacks. In order to do this, they need redundant regasification capacity. Another source of geographical flexibility derives from contracts that, albeit stipulating a delivery terminal, have been provided with clauses that allow shippers to divert cargoes, such as the flexible contract signed in 2013 by Qatargas and

650 J. Shotter, 'Polish Gas Deal Aims to Break Russian Stranglehold', *The Financial Times,* 8 November 2018.

651 Piotr Wozniak (CEO of PGNiG) quoted in the World Gas Intelligence. In WGI, *Energy Intelligence*, 4 July 2018.

652 The tendency to sign LNG contracts with relatively high ACQs is not the only respect in which PGNiG differs from other European importers, as will be shown in the next paragraphs.

653 Jason Feer, Head of Business Intelligence at Poten & Partners: "What you are essentially seeing is a speculative development, of using a model that has not been traditionally the model for developing big LNG projects in the past. Most LNG projects that went to FID had pre-sold a significant percentage of their output via long-term contracts" in S.N. Malik and N. Obiko Pearson, 'Shell-Led LNG Project Bucks Trend by Not Waiting for Buyers', *Bloomberg*, 1 October 2018.

E.ON for delivery at the Gate terminal in The Netherlands.[654] Finally, the advent of trading houses Gunvor, Trafigura, Vitol and Glencore as LNG players further contributed to reducing the point-to-point nature of LNG trade.[655] Intra-basin portfolio swaps and optimisation agreements, such as the one signed by JERA and EDF, complete the picture.[656]

Finally, from the database of newly signed LNG contracts, it emerges that contract duration tends to become shorter. Already scrutinized in the aftermath of the 2008-2009 events, long-term contracts came under renewed pressure in the post-2014 glutted market. The average duration of newly signed piped gas and LNG contracts decreased to 10-15 years in the period under consideration from 20-25 years prior to 2009[657]. The very understanding of what constitutes a long-term contract has changed.[658] RWE is one of the most explicit market players when it comes to discussing elements of contractual strategy. Andree Stracker, Chief Commercial Officer for RWE Supply & Trading, contends that deals should not run for more than 10 years, also because most end-users signed contracts of maximum two to three years, making it difficult for an importer/mid-streamer (like RWE) to manage risk in case of very long import contracts. Additionally, Stracker advocated to move to somewhat shorter long-term contracts to limit the risk of price disputes, more present in the traditional long-term contracts (i.e. contracts with durations above 20 years) in the current market environment and structure. Arbitration is a very disruptive practice that requires companies to pay substantial arrears overnight, creating a state of uncertainty that is highly harmful for both parties involved (more in Chapter 8).[659] Mirroring these considerations, RWE declared its interest in signing contracts with a maximum duration of 10 years, with review clauses every three years in case of pipeline trade and every five years in case of LNG. This element depends on the tools that are available in the market to manage risks. This strategy is underpinned by the 2-year contract signed by RWE with Woodside and the 7.5-year contract signed with Qatargas.[660] As shown by Table 1, LNG contracts with durations of one to five years are now very common in Europe. It is also important to highlight that the trend towards shorter contracts is due almost exclusively to the new contracts being signed, rather than to renegotiations.

As a matter of fact, in the phase when relations between buyers and sellers were the most distressed (2009-2013), there were no signs of downward modifications to contract duration in renegotiations. In 2017 and 2018, signs that both buyers and sellers were stepping up their efforts to shortening the duration of existing contracts started to emerge, both for piped supplies and LNG. In 2018, RWE was reported to be negotiating contracts with a view to build up a 'risk manageable' portfolio composed of both LNG and piped gas. The company began

654 N. Al Tamimi, *Navigating Uncertainty: Qatar's Response to the Global Gas Boom* (Washington-DC, 2015): Brookings.

655 "The Swiss quartet of Trafigura, Vitol, Glencore and Gunvor are established players — in 2016, they accounted for some 20% of the 75 million tons of LNG traded on spot or short-term contracts. Traders are also sharpening their competitive edge by signing long-term offtake deals with emerging producers and, like LNG portfolio players such as Royal Dutch Shell and Total, investing in LNG import infrastructure, giving themselves more options for placing cargoes" In WGI, *Energy Intelligence,* 4 April 2018.

656 *JERA and EDF Trading to Form an LNG Optimisation and Trading Joint Venture*, Press Release, JERA, 3 July 2018.

657 Franza, *Long-term Gas Import Contracts*.

658 Total's Philippe Sauquet stated that "the buyers' definition of what is long term has changed and the level of those contracts they are willing to sign will not make a lot of projects economic". In WGI, *Energy Intelligence*, 28 November 2018.

659 Andree Stracker (Chief Commercial Officer for RWE Supply and Trading), in WGI, *Energy Intelligence*, 21 May 2018.

660 WGI, *Energy Intelligence*, 15 November 2017.

talks with long-standing trade counterpart Gazprom not only to introduce more spot indexation in existing contracts, but also to shorten such contracts.[661] The second case is Sonatrach, which, at the end of 2017, announced a shift in its export strategy by reducing contract terms to 10-15 years when renewing existing agreements.[662] Contrary to the RWE-Gazprom negotiation, where the initiative came from the buyer, importers of Sonatrach gas expressed their concern at the Algerian company's new approach to contracting. Spanish buyers in particular worry that they will have to return to the market around 2025, when sellers will have gained substantial negotiating power due to the expected tightening in market conditions.[663] Apart from RWE and Sonatrach, however, no other cases of pressures to shorten existing contracts can be clearly identified. Moreover, it should be noted that both companies seized the opportunity of contract expiry to advance their claims.

Furthermore, it should be emphasized that the majority of the expiring long-term contracts were eventually renewed at the height of the renegotiation and arbitration phase (2009-2013). The choice not to renew (either by the supplier or by the buyer) would have entailed entrusting the spot market with transactions previously covered by long-term contracts.[664] An exception to this trend needs to be emphasised. In 2015 – owing to earthquakes in the Dutch province of Groningen – the Dutch government ordered output reductions and indicated that Gasterra should not commit itself to new long-term contracts based on gas from Groningen[665]. Gasterra followed suit, and the 8 Bcm/year contract between Gasterra and Centrica that expired at the end of 2016 was not renewed. Following further output reductions, and the announcement that Groningen gas production would eventually be brought to zero by 2030, Gasterra confirmed that it would not sign any new long-term export contracts.[666] At the time of writing, the strategic question as to whether an aggregator should enter long-term contract to import gas is still debated in the country, and Gasterra linked that question with the declaration that stakeholders should make a decision on whether the company's wholesale function was still required.[667] In 2019, the Dutch government announced that Gasterra will wind down as a gas trading company, even before the expiry of long-term supply contracts. As revealed by an IHS Markit report published in 2018, The Netherlands is in a peculiar position by having virtually no volumes guaranteed by long-term contracts in 2023 and thus relying solely on short-term deals.[668] No other major European gas-consuming country is in a similar situation (Figure 17).

661 WGI, *Energy Intelligence*, 21 March 2018.

662 WGI, *Energy Intelligence*, 25 October 2017.

663 WGI, *Energy Intelligence*, 28 February 2018.

664 One example is Gazprom's long-term supply contract to Turkey through Ukraine, Romania and Bulgaria that expired in 2011 and was not renewed. The main reason why the contract was not renewed is because Russia is now exporting to Turkey through an alternative route. See Franza, *Long-term Gas Import Contracts*.

665 Dutch Economy Minister Henk Kamp quoted by the WGI, *Energy Intelligence*, 4 March 2015.

666 *Gasterra Annual Report* (2017): Gasterra.

667 Gasterra's CEO Annie Krist quoted by the WGI, *Energy Intelligence*, 30 May 2015.

668 S. Blakey and S. Srinivasan, *The Swing in Dutch Gas: From Autonomy to Full Dependence* (2018): IHS Markit Report.

Indeed, new long-term import contracts are still being signed across the EU.[669] First of all, it should be noticed that, particularly in LNG contracting, there is a noticeable difference between the 2012-2014 and the post-2014 market phases. The period between 2012 and 2014 saw a new wave of LNG contracting, including in contracts potentially (and at least partially) targeting the EU market. In the post-Fukushima market phase, started in 2011, Asian buyers became proactive in securing volumes in the long term, and some EU utilities (as well as portfolio players) reacted by following suit.

Share of demand covered by committed LTCs and available domestic production		
Country	Ranking	Coverage in 2023
Spain	1	94%
Italy	2	74%
Germany	3	64%
France	4	63%
United Kingdom	5	48%
Belgium	6	36%
Netherlands	7	0.4%
Source: IHS Markit, GasTerra		© 2018 IHS Markit

FIGURE 17: SHARE OF DEMAND COVERED BY COMMITTED LONG-TERM CONTRACTS AND AVAILABLE DOMESTIC PRODUCTION IN SELECTED EUROPEAN COUNTRIES (SOURCES: IHS MARKIT, GASTERRA).

Depending on their supply portfolio and customers' base, some EU buyers also want to have at least some guaranteed volumes, because – despite growing LNG market liquidity – LNG cargoes are not always readily available.[670] Appetite for long-term contracts (by buyers and suppliers) depends on the specific market phase. After commodity prices crashed in 2014, appetite for long-term contracts diminished both in Asia and in the EU. However, an intensification in long-term LNG contracting has been recorded in 2018, as long-term contracts were needed to underwrite new supply capacity.

Reverting a trend observed in 2015-2017, average contract duration increased in 2018. According to data presented by Cheniere at the 2019 Flame Gas Conference, volumes (ACQ) committed in new gas supply contracts longer than 20 years in duration were 4.8 MTPA in 2015, 6 MTPA in 2016, 3.5 MTPA in 2017, and 16 MTPA in 2018. The ACQ of contracts longer than 5 years in duration was 13.5 MTPA in 2015, 25.7 MTPA in 2016, 20.8 MTPA in 2017 and 28.4 MTPA in 2018. Conversely, volumes committed in new contracts shorter than 5 years declined. From 11.2 MTPA in 2015, they fell to 5 MTPA in 2016, and then stayed relatively constant at 5.8 MTPA in 2017 and 5.4 MTPA in 2018.

669 Andrew Walker, Strategy VP for Cheniere, stated: "Long-term contracts are not dead. We are continuing to sign them, so they don't look dead to us. Eight of our 18 buyers are European, ten if you count trading houses based there". Tom Earl, Chief Commercial Officer of Venture Global LNG, stated: "There is Still a Significant Appetite in Europe and Asia for Long-term Contracts" – both quoted in C. Gentry, 'LNG Long-term Contracts are not Dead, Say US LNG Exporters', *Gastech Insights*, 14 November 2018.

670 Andree Stracke, Chief Commercial Officer (Origination & Supply) RWE Supply & Trading: "In March [2018] prices shot up and LNG was not available at short notice, in the UK, LNG was not available for six days. So we are trying to build some long-term contracts. You need to find the right portfolio between short, medium and long-term contracts", quoted in C. Gentry, 'LNG Long-term Contracts are not Dead, Say US LNG Exporters', *Gastech Insights*, 14 November 2018.

When a guarantee is necessary to move to FID in capital-intensive projects, long-term contracts are still widely adopted. The signing of 25-year contracts between European buyers and Azerbaijan in 2013 shows that when security of demand is needed to finance large infrastructural projects, the duration of new contracts can still be very long – even in a liberalized market. This is in line with the predictions of TCE, as explained in the theory chapter of this book. This is not only true for pipeline projects, but also for LNG, where liquefaction is highly capital intensive. Long-term contracts potentially targeting the European market that proved functional to FIDs are BP's offtake agreement for Coral FLNG in Mozambique and several offtake contracts from Sabine Pass, Corpus Christi and Yamal (Table 1). Moreover, there are newly signed long-term contracts potentially targeting the European market on which *future* FIDs is conditional. These are EDF's contract for volumes from Anadarko-operated Area 4 in Mozambique, E.ON's contract for supply from the Pieridae terminal planned in East Canada, and deals inked with Venture Global(sponsoring projects at Calcasieu and Plaquemines, in the US) by BP, Italy's Edison, Portugal's GALP and Poland's PGNiG.

For similar reasons, long-term contracts are also signed to underpin capital-intensive 'gasification' programmes in receiving markets. The only example of a European country switching to gas from scratch in the last decade is Malta, which built a Floating Storage and Regasification Unit (FSRU) and switched its power plants from fuel oil to natural gas.[671] The Maltese gasification programme has been underpinned by a 10-year contract to be supplied from Shell's portfolio (Table 1).

Moreover, some European countries sign long-term contracts for security of supply and geopolitical reasons. This is clearly the case of Poland and Lithuania, as discussed above. The importers' ability to enter long-term contracts in these countries is also grounded on the possibility to pass through higher costs to their final users – owing to the incomplete liberalisation of those markets.

Suppliers continue to stress the importance of long-term contracts as backbones for international gas trade. Gazprom, in particular, has always been very clear that it views long-term contracts as the key arrangement offering predictability and price signals necessary to invest in new infrastructure. Spot trade is only viewed as an ancillary or complementary activity.[672]

At the same time, transformations are unfolding. While long-term contracts used to be a firm pre-requisite for investment in new capacity, in recent years some investment decisions (including large ones) have been taken in default of long-term contracts. This is the case for LNG Canada, Golden Pass, and Arctic LNG-2, sanctioned in 2019.

671 J. Muenchrath and M. Weissenbacher, *From Oil to Gas: an Analysis of Malta's Power Sector Transition with regard to CO2 Emissions, the Integration of Renewables, and the Role of Energy Storage* (2014): University of Malta.

672 WGI, *Energy Intelligence,* 15 November 2017.

Concluding remarks

All things considered, it is possible to conclude that in spite of mounting pressures and barring specific cases, long-term import contracts are still alive, in the EU and in the rest of the world. Not only are existing long-term contracts not being terminated, but they are also being renewed (with some exceptions) and new long-term contracts are being signed, both for piped gas and LNG supply. This is particularly the case when guarantees are needed for new capital-intensive projects (although some FIDs are now being taken without long-term contract support, with an acceleration of this trend in 2019).

With hindsight, long-term import contracts proved extremely flexible: in spite of deep geopolitical transformations[673] and fundamental changes in energy use, they have sure been bent – yet never broken – in more than 40 years of trade[674]. This observation is relevant in the context of contractual incompleteness, presented in Chapter 3, where we showed how the literature highlighted the importance of flexibility for contract implementation.[675] Flexibility contributed to the resilience of gas contracts between the EU and Russia in the face of major conjunctural transformations.

However, long-term contracts have evolved. Transformations have been deep and far-reaching. The first trend is a more widespread introduction of market pricing, either structurally or *de facto* through 'dynamic adaptation' schemes, of which Gazprom has been a champion. The second trend is shorter average duration, although some 20/25 year-long contracts are still being signed. The third is a diminution in the average ACQ per contract, reflecting fear of over-contracting owing to uncertain demand. Even if LNG is still often sold in long-term oil-indexed contracts, its destination flexibility is an important novelty. The emergence of self-contracting and aggregators has introduced new business models in which LNG trade is effectively subject to short-term dynamics even when there is a long-term contract in place. These novel business models mean that investments are less asset-specific, reducing the strategic need for long-term contracting in line with the findings of long-term contract literature (Chapter 3)

6.2 INCREASE IN HUB EXCHANGE

The introduction of hub indexation and the modification of other terms in long-term import contracts is not the only change in EU-Russia gas trade occurred in the last decade. Another evolution has been a repositioning of Gazprom on EU hubs. Even if Russia still mostly sells gas via long-term contracts, its presence on EU hubs has grown. As a result of changed market fundamentals, EU importers increased offtake from long-term contracts with Gazprom after 2015, bringing it closer to the maximum contracted quantities. This provided an incentive for Gazprom to sell some uncontracted quantities on hubs.

673 Above all, the fall of the USSR.

674 Also according to Gustafson, "recent gas negotiations have shown flexibility and adaptation between Russian sellers and European buyers, and commercial logic has driven significant compromises – particularly on the Russian side, as Gazprom has responded to commercial and regulatory pressures.", Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 4.

675 Masten and Crocker, 'Efficient Adaptation in Long-term Contracts: Take-or-Pay Provisions for Natural Gas' and A. Creti, B. Villeneuve: 'Long-term Contracts and Take-or-pay Clauses in Natural Gas Markets', *Energy Studies Review*, 13:1 (2004), 1-17.

Development of liquid hubs in Europe

EU gas hub trade rose substantially since 2009. The development of EU hubs has been a painstaking process. This process is still, in many ways, ongoing. The EU is not a special case: between the initial stages and maturity, it typically takes between one and two decades for gas trading hubs to emerge. This was the case both in the US and in the UK, which transitioned to market pricing before Continental Europe, setting – in many respects – the example (Section 5.2).

As argued by Heather (2015)[676], the first step for the establishment of a hub is market liberalisation, with the adoption of Third-Party Access to infrastructure to encourage market entry by independents. It can also be necessary to implement regulation that forces incumbents to release capacity and volumes in order to stimulate market activity. The next stage is the implementation of rules that oversee physical trade. Standardised contracts come up first, followed by bilateral deals. The most common bilateral deals are Over-the-Counter (OTC), as opposed to transactions supervised by an exchange. New players become active when bilateral deals are enabled. This is namely the case for brokers, whose key function is to connect buyers and sellers and create trade opportunities. Another fundamental function is performed by PRAs, or Price Reporting Agencies, which report exchanges between buyers and sellers. This is required for transparency. In a transparent market, price discovery can take place, which attracts a larger number of players in the market. Initially, smaller physical players will start trading alongside large incumbents. At a later stage, non-physical players – namely traders with no particular stake in underlying assets – will also become operational on the hub, contributing to its liquidity. For non-physical players to start trading at the hub, a futures market needs to be in place. Future contracts are initially mostly entered by players wishing to hedge risks in their physical portfolios and then by generic financial players that look for profit. As the futures market deepens, a longer forward curve develops, improving the hedging horizon.[677]

When hubs are mature, traded products can be used as indices or benchmarks by market players. A hub is considered liquid when a single trade is not able to move prices. Prices in a mature hub move in relation to market activity and can be volatile. Volatility, which was regarded as something negative before market liberalisation and is still considered negative by some suppliers with traditional business models, such as Gazprom, is instead regarded as an ingredient for successful trading by financial operators. From their perspective, volatility on hubs simply signals that prices are reacting to market activity. Another prerequisite for a well-functioning trading hub is anonymity, which enables both large and small market players to trade alongside each other. Transparency is also a fundamental feature, as it creates confidence in the market by preventing manipulation and market power abuse. The table below summarises the criteria used by the European Federation of Energy Traders (EFET) to assess the good functioning of hubs.

676 Heather, *The Evolution of European Traded Gas Hubs*.

677 Heather, *The Evolution of European Traded Gas Hubs*.

Criteria	Responsible party	Heading 2018
1.a	NRA and/or Ministry	Transparency and consultation
1.b	TSO/Market Area Manager/Market Operator	
2	TSO	Entry-exit system established
3	TSO	Title Transfer
4	TSO	Cashout rules (long short positions imbalances set to zero at the end of the day with payment/receipt of imbalance charge in local currency/MWh)
5	TSO/Market Area Manager/Market Operator	TSO system balancing
6	NRA/Ministry	Licensing and reporting obligations
7	NRA	Resolve market structural and concentration issues (defined role for historical player if flexibility/liquidity is scarce)
8	NRA, TSO or Market Operator	Hub fees (not fees relating to participating on a exchange or trading platform)
9	Market	Establish a reference price at the hub for contract settlement in the event of default
10	Market	Standardised contract
11	Market	Price Reporting Agencies producing daily prices at the hub
12	Market	Voluntary market makers operating at the hub
13	Market	Brokers
14	NRA	Establishment of exchange
15	Market	Hub price becomes reliable and used as benchmark
16.a	Market	Hub spot (shorter than monthly products) liquidity
16.b		Hub forward (monthly products or longer) liquidity

FIGURE 18: CRITERIA FOR ASSESSING THE MATURITY OF A TRADED HUB ACCORDING TO THE EUROPEAN FEDERATION OF ENERGY TRADERS, 2018.

The more a hub is mature, the more trading products it offers. Spot and prompt contracts are used to optimise portfolios ahead of physical delivery. The most widespread contracts are within-day, day-ahead and month-ahead. Front season contracts are also common. On the other hand, the forward curve is used to optimise a portfolio in the longer term (5-10 years), to hedge or for purely speculative objectives. The trading horizon of EU gas hubs increased over time. In mature hubs, traded volumes tend to exceed physical volumes by many times. In practice, this entails that one molecule of gas changes ownership multiple times, making it difficult to trace its origin and final destination. In theory, this dilutes market power.

The development of hubs in Continental Europe was first of all triggered by the decision of domestic gas suppliers to start offering larger volumes on hubs. This was primarily motivated by the policy objective of launching trading hubs. This is the case of The Netherlands, where the government encouraged Gasterra to start offering additional volumes on the TTF. The TTF was inaugurated in 2003 but for years trade remained sluggish. Only when the political commitment to make the Netherlands the 'Gas Roundabout' of Europe became strong, the TTF really took off (gradually). Initial growth around 2007 was slow, but then picked up greatly in 2009 and in following years.[678] While the Belgian Huberator/Zeebrugge hub initially took the lead, its growth then remained flat over time – overtaken by both the TTF and the German NCG. By 2010-2011, TTF had established itself as the leading hub in Continental Europe, although the British NBP was still more important. That was the period when the big round of renegotiations between Gazprom and EU importers took place (Chapter 5). Indexation to TTF

678 Heather, *Continental European Hubs: Are they Fit for Purpose?*.

was used not only in The Netherlands but also in other Western European countries, reflecting the fact that the TTF had become the benchmark.

Besides domestic supply, another trigger for hub development was the increase in spot volumes available as a result of global oversupply, including spot-priced LNG flowing from the UK into Northwest Europe (Section 5.3).

Today, ACER reckons that there are only two mature hubs in Europe: the NBP and the TTF. Both hubs have between one and two hundred market participants, of which more than 40 are active players.[679] In 2017, TTF traded volumes exceeded 2 trillion cubic metres (Tcm), four times the amount of gas consumed in the whole of the EU, and NBP traded volumes were around 1.8 Tcm.[680] In 2016, the churn rate (measuring the ratio between traded volumes and hub throughput) has reached 57 on the TTF and 22 on the NBP, firmly above the threshold of 15 required for a hub to be considered liquid but still far from the churn rates of the Henry Hub in the US and the oil market.

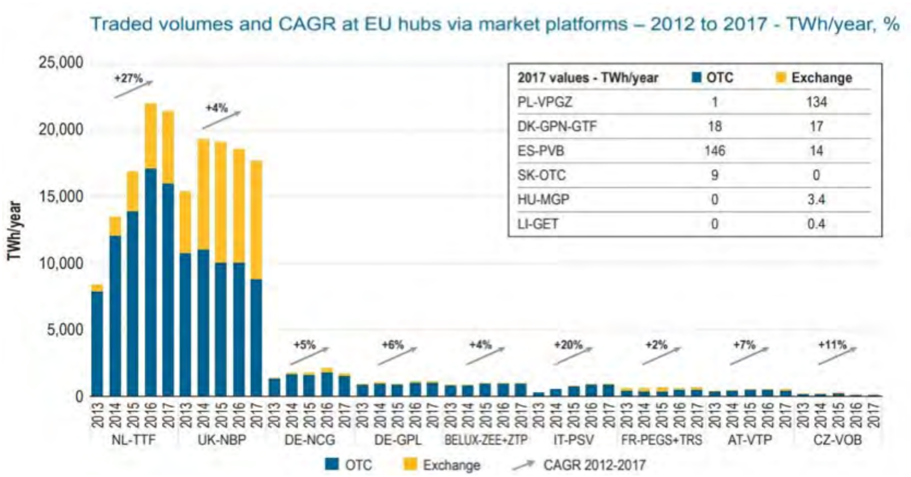


FIGURE 19: TRADED VOLUMES AND COMPOUNDED ANNUAL GROWTH RATE AT EUROPEAN HUBS, OVER-THE-COUNTER (OTC) AND EXCHANGE. SOURCE: AGENCY FOR THE COOPERATION OF ENERGY REGULATORS, GAS MARKET MONITORING REPORT (2018)

A recent important development has been a substantial increase in liquidity in the forward curve. This is relevant for EU-Russia gas trade because it makes hub indexation in long-term contracts less problematic, giving more predictability.[681]

679 P. Heather and B. Petrovich, *European traded gas hubs: an Updated Analysis on Liquidity, Maturity and Barriers to Market Integration* (Oxford, 2015): Oxford Insitute for Energy Studies.

680 *Gas Market Monitoring Report* (2018): Agency for the Cooperation of Energy Regulators (ACER).

681 *Ibid.*

FIGURE 20: AVERAGE TRADING HORIZON IN MONTHS IN SELECTED EUROPEAN HUBS, AGENCY FOR THE COOPERATION OF ENERGY REGULATORS, GAS MARKET MONITORING REPORT (2018)

Gazprom's trade on EU hubs and through the Electronic Sales Platform

Non-EU suppliers only started to offer significant volumes on EU gas hubs at a later stage relative to EU gas producers such as Gasterra, namely when they understood that the EU was determined in changing its gas market architecture and that adaptation of business practices was unavoidable. Non-EU suppliers can have different motivations to offer gas outside of long-term contracts and participate in hub exchange. While in some cases they could simply be interested in making use of hubs for balancing purposes, they could also develop the ambition to become swing suppliers, and influence supply and hub prices (something that, so far, has not occurred on a structural basis). Combinations of various motivations are of course also possible. It should also be highlighted that different non-EU suppliers have different approaches. Some non-EU suppliers found it easier to adhere to the liberalised architecture adopted by importing markets, also thanks to closer cultural and political affinity. This is particularly the case of Norway's Equinor. Conversely, Gazprom and Sonatrach were more reluctant to adapt, even if internal differences can be found within these companies. In Gazprom, for instance, a more 'progressive' group of people – mostly at Gazprom Export – coexists with a more 'conservative' one – particularly strong in Gazprom's Russian operations. More details about Gazprom's possible strategies on EU hubs are provided in the sections below.[682]

Observing the unfolding of developments described in previous sections and feeling the pressure to adapt to the new EU gas market architecture, Gazprom established trading branches that became increasingly active on EU hubs. One of them is Gazprom Marketing and

682 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*.

Trading (GM&T), which has mostly been active on the NBP since 2002. It has been both purchasing and selling gas on the UK hub. The need to source gas from the NBP is also partly rooted in the fact that there is no direct pipeline between Russia and the UK. To a lesser extent, GM&T has also been active on the TTF since 2005. Gazprom is also active in the retail market.[683] According to Gazprom's Annual Reports, in both 2017 and 2018, its subsidiaries sold almost 30 Bcm/y of gas directly to end-users across the EU. Wingas sells gas to large end-users in Germany, the Netherlands, Belgium, Austria, the Czech Republic. GM&T is active in the retail market in the UK, France, The Netherlands and Ireland.[684] It is likely that retail sales in liquid, liberalised markets are mostly performed on the hub.[685]

Additionally, Gazprom has announced the intention to boost its presence on EU hub markets and become stronger in short-term trading besides the traditional long-term contract portfolio.[686] Gazprom Germania has been made the 'umbrella' company for various Gazprom's subsidiaries, which include GM&T (mentioned above), Gazprom Schweiz, Wingas, Vemex and Bosphorus Gas.[687]In 2018, Gazprom announced that it will restructure export operations with the final ambition to create a united international sales division responsible for the entire portfolio of the group. This entails that Gazprom Germania would be consolidated with Gazprom Export in St. Petersburg.[688] The process will take time.

In a press release in 2017, Gazprom's Deputy CEO Alexander Medvedev declared that full-fledged trading operations would ensure growth of revenue from exports of Russian gas.[689] He also did not shy away from declaring the ambition of turning Gazprom into a price-maker one day.[690]

Russia does not only trade on EU hubs: it is also trying to establish a Russian gas hub. An important development in this regard took place in 2014, when SPIMEX, the St.Petersburg International Mercantile Exchange, was launched. SPIMEX could become a reference for Russian wholesale natural gas prices and become an important step in the process of Russian gas market liberalisation (discussed in more detail in Chapter 9). Considering that the exchange is located at the beginning of Nord Stream, it could also become a platform for trading Russian gas exports to the EU. Despite these ambitions, SPIMEX is at the moment far from being an established domestic hub, let alone one for international trade. After all, SPIMEX has only been set up six years ago. From our experience with EU hubs, we know that establishing a liquid trading hub is a painstaking process, which requires decades of hard work and strong political willingness (on political willingness to liberalise the Russian gas market, see Chapter 9). The major obstacles for the development of SPIMEX as a liquid gas trading hub is Gazprom's

683 For an overview and historical account of Gazprom's involvement in the European downstream sector, see A. Bros, *Gazprom in Europe: A Business Doomed to Fail?*

684 'Gazprom — 25 Years in Business 1993–2018', *PJSC Gazprom Annual Report* (2018): Gazprom.

685 'Russia's Role in Supplying the UK Natural Gas Market', *S&P Global Platts*, 28 March 2018.

686 'Gazprom Export Develops New EU Spot Gas Trading Presence', *ICIS Heren*, 25 May 2018.

687 J. Sharples, *Gazprom's Gas Sales via its Electronic Sales Platform (ESP)* (Oxford, 2019): Oxford Institute for Energy Studies.

688 WGI, *Energy Intelligence*, 21 February 2018.

689 Alexander Medvedev quoted in Gazprom's Press Release of 4 July 2017.

690 J. Sharples, 'A Snapshot of Key Developments in the External Relations of the Russian Gas Sector', *The European Geopolitical Forum*, 72 (2017).

persistent dominance as a supplier – compounded by the fact that the largest buyer on SPIMEX is Gazprom's subsidiary Mezhregiongaz. Gazprom also still has a monopoly on exports through pipelines, preventing foreign companies and competitors from using SPIMEX as a trading platform for sales to the EU. After a promising start, volumes exchanged also remain limited.[691]

In 2018, the Electronic Supply Platform (ESP) was launched. This is a new vehicle for Russian spot deliveries, developed after Gazprom had been selling gas at auctions in 2015 and 2016. The ESP differs from SPIMEX in that it is not an exchange, but rather a platform – alternative to long-term contracts – where Gazprom offers physical deliveries. Interestingly, as noticed by Henderson and Moe (2019), the ESP "may be an attempt to pre-empt any efforts by SPIMEX to push its ambitions to become a trading exchange for export sales".[692] The establishment of the ESP could be a very important step in Gazprom's efforts to diversify its trading strategies and definitely shows a change of pace and willingness to adapt to the EU's new gas market architecture. While previous auction sales had been sporadic, and Gazprom's activities on EU hubs involved the sale of non-Russian gas, the ESP has been presented as a new structural vector for trade of gas produced by Gazprom. Volumes are sold via the ESP to both "long-standing partners on existing long-term contracts"[693] and buyers with no long-term contractual commitment towards Gazprom, which are interested in flexible, short-term supplies.[694]

Gazprom's sales through the ESP grew steadily in the second half of 2018 and in the first half of 2019. Volumes then declined in the second half of 2019, after the annual peak reached in August, as competition from flexible LNG mounted. However, volumes remained at relatively high levels[695] even in such phase. A new record was then hit in January 2020, when volumes sold on the ESP reached an all-time high of 2.5 Bcm. Remarkably, this happened as EU gas prices continued to fall and offtake from Russian long-term contracts declined. According to various analysts, large sales on the ESP are a signal that Gazprom engaged in a 'price war' to preserve market share and/or limit the influx of flexible LNG, both from the US and Novatek's Yamal project.[696]

At the time of writing, ESP sales were offered at a discount relative to sales under legacy long-term contracts. According to IHS data, the October 2019 price of ESP-sold volumes was 5$/MMBtu relative to 7$/MMBtu for gas sold under legacy contracts.[697] This is a significant gap. However, as observed by Sharples, these estimates for prices in legacy contracts refer to a

691 J. Henderson et al, *The SPIMEX Gas Exchange: Russian Gas Trading Possibilities* (Oxford, 2018): Oxford Institute for Energy Studies.

692 J. Henderson and A. Moe, *The Globalization of Russian Gas* (Cheltenham, 2019): Edward Elgar.

693 E. Burmistrova, *Changes in the European Gas Landscape, 2019-2020: Review and Expectations* (2019): Speech at the 2019 Berlin Conference on Prosects for Russia-EU Energy Cooperation.

694 Sharples, *Gazprom's Gas Sales via its Electronic Sales Platform (ESP).*

695 If compared to historical volumes sold on the ESP.

696 Sergey Kapitonov (Skolkovo) quoted in A. Toporkov, 'Газпром жертвует ценой ради сохранения своей доли на европейском рынке', *Vedomosti*, 3 February 2020; See also WGI, *Energy Intelligence*, 23 October 2019: "Gazprom boosted ESP sales in the summer when European gas hub prices reached 10-year low levels to cap prices and squeeze its rivals, mainly LNG suppliers". Writing in July 2019, Jack Sharples also said that "the fact that the ESP price is below the LTC price does suggest that Gazprom is prepared to offer gas on the ESP at very competitive prices in a market that is currently oversupplied and where the competition for market share is currently intensifying". In Sharples, *Gazprom's Gas Sales via its Electronic Sales Platform (ESP)*, page 9;

697 IHS Markit data, 2019.

European average: they are therefore influenced by contract prices in regions with less developed gas-to-gas competition and they are still influenced by partial oil indexation (whereas ESP sales recipients are mostly located in Northwest Europe). ESP prices are in fact generally aligned with (or slightly above) Western EU hub prices and only slightly lower than contract prices. Sharples' observation is in line with what we described in previous sections, i.e. that the gap between contract prices and Western EU hub prices has narrowed down significantly.

Sales through the ESP are now a "non-negligible portion"[698] of Russia's gas exports to Europe: ESP sales equated to 5-10% and 10-15% of Gazprom's total gas sales to the EU in the first and second half of 2019 respectively. Germany was the recipient of most ESP-sold volumes throughout the period, followed by Central-Eastern European markets, Italy and The Netherlands. At the time of writing, Gazprom had sold a total of 20 Bcm through the ESP since its launch in 2018.[699]

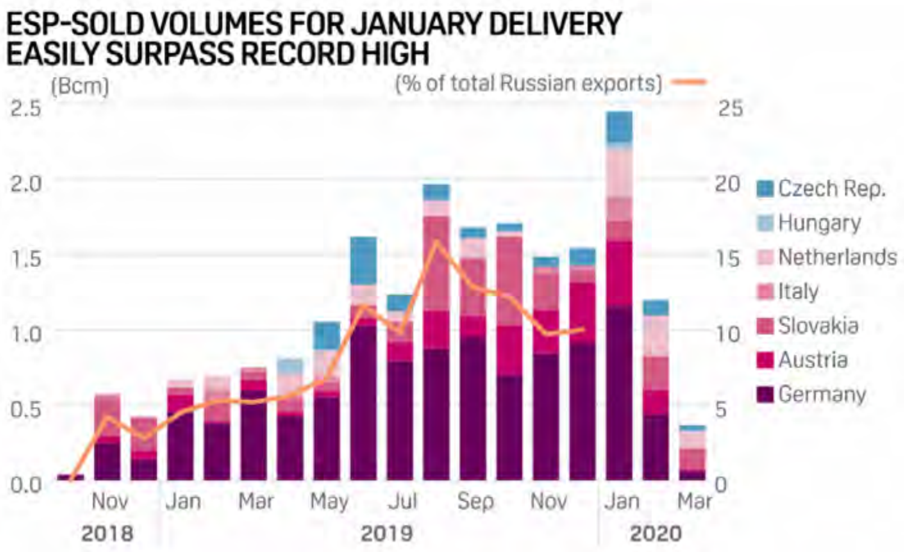


FIGURE 21: VOLUMES SOLD ON THE ELECTRONIC SALES PLATFORM (ESP) BETWEEN 2018 AND MARCH 2020, SOURCE: S&P GLOBAL PLATTS.

Gazprom still stresses that long-term contracts remain the most important vehicle for its sales to Europe, while spot trade is used for residual volumes. Buyers are also mostly tapping ESP-sold gas on a short-term basis.[700]

698 Sharples, *Gazprom's Gas Sales via its Electronic Sales Platform (ESP)*

699 'Russian Gas Sales on Gazprom Export's ESP Slide as January Ends', *S&P Global Platts*, 31 January 2020.

700 Sharples, *Gazprom's Gas Sales via its Electronic Sales Platform (ESP).*

There are various reasons why Gazprom could be interested in trading gas outside of long-term contracts, i.e. on hubs or through the ESP. For starters, Gazprom is interested in using hub trading for portfolio balancing purposes, just like other gas companies. Furthermore, Gazprom has stepped up its presence in hub trading in order to gain experience. Gazprom has an interest in learning how to trade on EU hubs because it cannot be ruled out that, in future, long-term contracts will be downsized or even abandoned, and that hub exchange will become the prevalent mechanism for international gas trade. For Gazprom, it is sensible to be prepared for such a scenario. From this perspective, trading on EU hubs might be a way to gain expertise and insights on how to boost a Russian hub, whose dynamics would be easier to control. As noticed by Sharples, also the ESP is a way for Gazprom to "demonstrate that it continues to adapt to European market conditions without fully conceding that it will simply trade on European hubs"[701].

Besides, Gazprom expressed an interest in avoiding the risk of so-called 'dumping' practices[702] by EU buyers. EU buyers can at least theoretically nominate volumes exceeding the ACQ level and sell excess gas on the spot market to drive the market price down and demand lower contract prices. Gazprom could try to prevent this from happening by changing its approach to supply and establishing a presence on hubs. A possible new approach would be to decide on a case by case basis where to source gas to honour supply contracts (i.e. on hubs or from Gazprom's own production). This portfolio approach might help Gazprom averting oversupply.[703]

Conversely, the ESP is also an instrument of flexibility that Gazprom could use under certain market circumstances (namely when its market share is threatened) to maximise volumes sold in the EU and the utilisation of its capital-intensive pipelines.[704] This is what was happening at the time of writing, when competition from LNG was mounting.

Furthermore, Gazprom might also have long-term strategic objectives. Gazprom´s efforts of integrating down the value chain, which include the establishment of trading divisions in Western Europe, possibly underscore the company´s aim to develop the expertise to sell gas directly in the market.[705] However, this aim has been seemingly put on hold for the time being. Short-term gas sales over hubs are not yet a core business for Gazprom, who still widely supplies its gas under long-term contracts to European wholesalers that, in turn, market it downstream. However, it can be argued that if Gazprom gained further direct access to the market, its need for long-term contracts and wholesale buyers would be reduced.

Given the volumes it supplies to Europe, Gazprom would likely be the most influential hub player if long-term contracts were terminated and most of its gas were traded on hubs. While this is not a problem in periods of oversupply, it might be turn out to be a problem in periods of tightness.

701 *Ibid.*

702 S. Komlev, *Oil Indexation: The Best Remedy for Market Failure in the Natural Gas Industry* (2016): Demian Literary Agency.

703 H. Rogers et al, 'Russia's Strategic Response to an Oversupplied Gas Market', *Timera Energy*, 23 November 2015.

704 Sharples, *Gazprom's Gas Sales via its Electronic Sales Platform (ESP).*

705 *Development of End-User Consumer Sales*, Gazprom Export Website accessed on 5 February 2020.

EU hub price dynamics and Gazprom's strategies

EU hub prices are set by EU gas demand and flexible supplies. In turn, a myriad of factors influences EU gas demand and flexible supplies (including the gas price level itself, in a feedback loop). Only some of the EU's gas supplies are flexible. Domestic EU production, Norwegian gas, and North African as well as Russian piped gas below Minimum Contracted Quantities (MCQs) can be generally considered inflexible, or 'must-flow' volumes: these volumes will largely not react to price changes in the EU. The reason is that these supplies are either captive (they cannot be shipped to an alternative market due to lack of infrastructure) or locked in firm contractual commitments. Of the three main pipeline suppliers to the EU (Norway, Algeria and Russia), Russia is by far the one endowed with the largest flexible volumes. In addition to Russian gas volumes above MCQs, the other major source of flexibility for the EU gas is flexible LNG. The flexibility of Russian gas is exhausted when: a.) EU residual demand is lower than the volumes of Russian gas that the buyers are contractually obliged to purchase; b.) demand is so high that Russia does not have any spare production capacity left to ramp up supplies or c.) transport bottlenecks limit the availability of spare Russian gas for the EU market. The flexibility of LNG is exhausted when flexible cargoes can no longer reach the EU despite a 'call' (expressed through higher prices), which can happen: a.) in a very tight market, where competing buyers have managed to lock destination-fixed volumes; b.) in case EU regasification capacity or connections to EU terminals are fully utilised; c.) as a result of supply shocks or d.) due to shipping scarcity. Additionally, it is also possible that even if both flexible volumes and infrastructure are available, cargoes cannot immediately reach the EU due to shipping times. It can take a few weeks for an LNG cargo to reach EU shores in response to a price spike, a much longer time than piped gas.

In the last decade, there were two market phases in which flexibility in Russian gas supplies to the EU was almost depleted. The first was between 2008 and 2012, in a context of extremely weak EU demand and high oil prices, when buyers minimised their purchase of Russian gas. Buyers did so because Russian gas was oil-indexed, and expensive relative to alternative hub-indexed supplies, such as LNG. When residual demand – defined as demand that buyers were unable to meet with volumes available at hub-linked prices from other suppliers – was lower than the volume of Gazprom gas that the buyers were contractually obliged to purchase, Gazprom had no influence over hub prices. The gap between contract prices and hub-linked prices remained, and buyers merely fulfilled their minimum contractual obligations (at a higher cost). As we also know from hindsight, this situation was clearly unsustainable in the longer term, which led to renegotiations and arbitrations. Under such circumstances, the only supply that was left to influence hub prices was flexible LNG. After 2008-2009, large volumes of LNG became available in Northwest Europe: while individual cargoes were 'price-takers', their aggregate volume exerted a downward pressure on hub prices – thus having a 'price-setting' impact.[706] In this phase, Gazprom learned that it could not effectively protect value (i.e. prices). In the meantime, it also lost market share – the worst combination possible for gross revenues. When, in the same market circumstance described at the beginning of this section, residual demand starts to exceed the volume of Russian gas that the buyers are contractually obliged to purchase, Russian gas sold under long-term contracts becomes the marginal supply, unless

706 This analysis is also confirmed in the *Medium Term Gas Market Report 2014* (Paris, 2014): International Energy Agency (IEA).

flexible LNG volumes outcompete it. As hub prices tend towards the marginal price, Russian volumes have a bigger price-setting role under these circumstances. Economic theory suggests that market prices gravitate towards the marginal cost of supply. If Russian volumes maintain elements of oil indexation, oil indexation thus indirectly influences hub prices under such circumstances.

Another situation in which there were fears that flexibility offered by Russian contracts was about to be depleted was around 2014-2015, when commodity prices fell, and an LNG oversupply was imminent. In that market phase, the EU played the function of 'market of last resort', absorbing flexible LNG cargoes unwanted by other markets (i.e. China and other emerging markets). Demand was so weak and supplies so large that there were concerns that flexible LNG would flood the market of last resort (the EU) until saturation. In such a scenario, to absorb the entire glut, buyers would have minimised Russian gas purchase. Yet, minimisation options are not endless: if buyers had hit the take-or-pay threshold, prices would have collapsed even further, seeking a new floor. This scenario did not materialise in 2016-2018 thanks to supply delays and higher-than-expected absorption of flexible LNG by emerging markets. Arguably, this scenario has represented itself in late 2019-early 2020. The first time that this scenario was presented as possible, in 2014-2015, Gazprom had to consider what to do in case of competition at Short-Run Marginal Cost (SRMC) level. Gazprom, which in the meantime had adopted large shares of hub indexation in its long-term contracts, realised its ability to compete at SRMC levels thanks to low production and shipping costs, compared to US LNG. At the same time, Gazprom lacked an incentive to engage in a full-fledged price war and flood EU hubs unnecessarily (i.e. in default of existential threats to its position in the EU market), as low prices greatly hurt its revenues.

Gazprom's favourite 'strategy' lies in maximising revenues without losing market share in the EU. Gazprom's behaviour on EU hubs has largely responded to this strategy since 2013-2014. Gazprom is mostly a price-taker, with little ability to influence EU hub prices for the time being.

When non-EU LNG demand is high, Gazprom has little to fear from flexible LNG. Non-OECD remains the premium market and attracts most flexible LNG cargoes, while EU hub prices are driven up by high non-OECD (particularly Asian) demand due to cross-basin dynamics and arbitrage. This allows Gazprom to sell large (or relatively large) volumes for high (or relatively high) prices, similarly to the period 2016-2018. The level of prices depends of course on other factors as well, including the general commodity complex, and particularly oil prices. In this case, Gazprom could attempt marginal value-over-volume strategies in case of a very high call for flexible LNG from Asia. Gazprom would have to act very carefully, though, and would have limited room for manoeuvre, due to the risk of losing market share to other buyers: higher EU prices would reduce the EU-Asia gap and thus make EU netbacks more attractive to flexible LNG suppliers).[707]

707 T. Mitrova and T. Boersma, *The Impact of US LNG on Russian Natural Gas Export Policy* (New York, 2018): Columbia Center on Global Energy Policy.

At the same time, high gas prices for a prolonged period might not necessarily be in Gazprom's interest because these would encourage investment from competitors. It can be argued that, for Gazprom, the ideal gas price should be between SRMC of delivering to the EU and LRMC of developing new production. Gazprom should look at the SRMC of supplying the EU, it should look at the LRMC of supplying Asia, as recent developments showed that new liquefaction projects might very well be sanctioned targeting the premium destination but then they might end up supplying another destination, due to changed market conditions at the time of commissioning (in other words, the EU could still receive flexible LNG from projects that were originally intended to supply Asia). It is however questionable whether Gazprom should actively forego revenues in pursuit of this long-term objective (of price containment): in fact, this strategy might not work, as proven by developments in 2019, when many FIDs were made despite extremely low gas prices. It has been argued that Gazprom could create future price uncertainty to dissuade FIDs (similarly to what Saudi Arabia has done in oil markets[708]), but this would require Gazprom to reshuffle its business models even further – and namely eliminate the remarkable predictability offered by its current long-term contracts.[709] Moreover, one of the conditions for Gazprom to be perceived as price-setter, and thus as a player that is able to create uncertainty, would be to have substantial spare capacity (a condition that should not be taken for granted, given recent reports – see Chapter 9).

A conjuncture that not many analysts are taking into account is one of strong, prolonged market tightness (potentially triggered by supply delays or shortages due to low investment) combined with high EU demand in a scenario in which Gazprom further moves in the direction of adopting market indexation and exchange. In such scenario, Gazprom would have a disproportionate influence on EU hubs and would be the main driver of hub prices, as competition from flexible LNG would be missing. Given the relative inelasticity of demand, Gazprom could have significant room for manoeuvre in manipulating prices under such circumstances. This conjuncture is highly unlikely at the time of writing, but it should be at least presented as possible when looking ahead in the long term.

Another topic that does not receive a lot of attention is that, while the EU has strived to stimulate gas-to-gas competition and market pricing, oil prices have continued to exert a strong indirect influence on European hub prices in the past decade. The first reason is that a substantial share of volumes available on hubs are actually residual volumes of long-term contracts that are still partly oil-indexed.[710] In fact, contract swing is still an important source of flexible volumes to European gas markets.

Another link between hub prices and oil prices that emerged in the last years[711] lies in the role of the EU as a residual market for flexible LNG. The amount of flexible LNG available to the EU (which influences EU hub prices) is determined, among other things – yet quite prominently, by Asia's call on LNG. Asian and EU price have in fact been increasingly correlated in the last

708 S. Boussena, 'Prix du Pétrole et Stratégies de l'OPEP', *Revue de l'énergie*, 458 (1994): 246–253.

709 S. Boussena and C. Locatelli, 'Gazprom and the complexity of the EU gas market: a strategy to define', *Post-Communist Economies*, 29:4 (2017): 549-564.

710 'A Framework for Understanding European Hub Pricing', *Timera Energy*, 2013.

711 Particularly after the Fukushima incident.

years. Since oil indexation still plays an important role in Asian LNG pricing, it has an indirect influence on EU hub prices too. When oil prices rise, Asian gas prices will follow, becoming relatively more attractive for cargoes that arbitrate between Asia and the EU. EU gas price will follow too, because of lower availability of spot volumes. Russian contract prices will then rise as a result of the 'dynamic adaptation' approach described in the previous sections.

These observations are confirmed by the evolution in price levels in recent years. As reported by ACER in 2015, "hub price formation is influenced by a variety of factors, of which long-term contracts are a key parameter through the flexibility component of ToP volumes. This fact, together with the point that oil prices have been historically used as indexation elements on European gas long-term contracts, explains why oil and gas hub prices have traditionally been well correlated […]."[712].

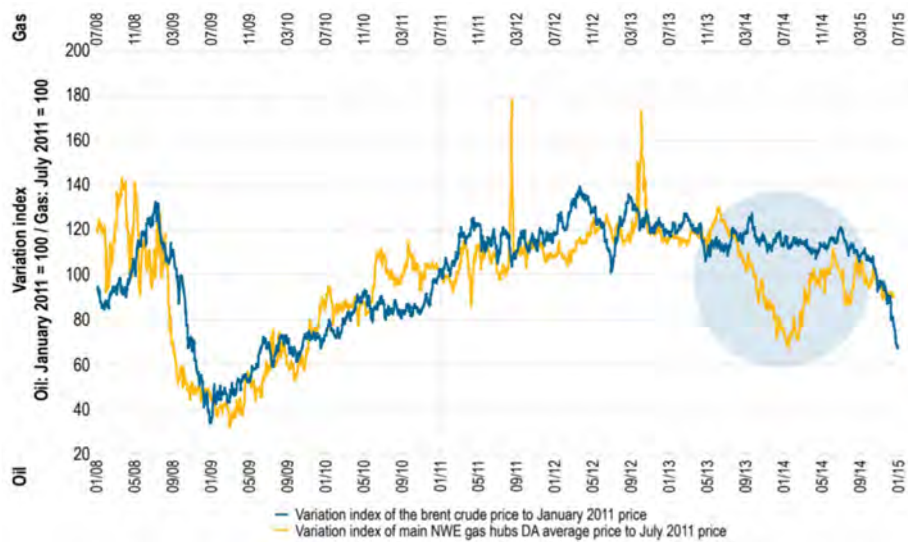


FIGURE 22: PRICE EVOLUTION OF OIL AND GAS HUBS IN EUROPE (2008-2014), AGENCY FOR THE COOPERATION OF ENERGY REGULATORS, 2015.

Academic works have also found a correlation between oil prices and hub prices – even in liberalised gas markets. In 2008, Brown and Yucel found that oil prices might play an important role in directing gas prices in UK and the US: "direct gas-to-gas arbitrage may not be as important, but the extensive pricing of LNG against oil in Europe could mask such arbitrage by statistically reinforcing the relationship between crude oil and natural gas prices".[713] In 2013, Asche et al. made similar findings with regard to Continental Europe.[714]

712 *Gas Market Monitoring Report* (2015): Agency for the Cooperation of Energy Regulators (ACER).

713 S.A. Brown and M. K. Yucel, 'What Drives Natural Gas Prices', *The Energy Journal*, 29:2 (2008), 45-60.

714 F. Asche et al, 'The Relationship between Spot and Contract Gas Prices in Europe', *Energy Economics*, 38 (2013), 212-217.

"The crude oil price is determining all the spot gas prices as well as the contract gas price. Even if most of the gas trading historically has been carried out using long-term contracts, it is not these contract prices but the oil price that leads the spot markets in Europe. […] The dominating role of oil [manifests itself], independently of whether the gas prices are determined in a spot market or by long run contracts. Hence, the liquidity of the oil market and its easier transport ensures that disequilibriums in the energy market are primarily corrected by shifts in the demand and supply for crude oil. The fact that higher LNG trade increases the liquidity of the gas market and in itself foster more market integration […] does not seem to change this basic relationship." (Asche et al., 2013)

Table 1
Correlation matrix.

	Brent	NBP	ZEE	TTF	Contract
Brent	1.000	0.750	0.760	0.875	0.659
NBP	0.750	1.000	0.995	0.895	0.644
ZEE	0.760	0.995	1.000	0.898	0.653
TTF	0.875	0.895	0.898	1.000	0.778
Contract	0.659	0.644	0.653	0.778	1.000

FIGURE 23: CORRELATION BETWEEN EUROPEAN HUB PRICES, CONTRACT PRICES AND BRENT PRICES (ASCHE ET AL., 2013)[715]

Concluding remarks

European traded hubs have continued to develop in the period under consideration in this chapter (2009-2018). Two of them, the British NBP and the Dutch TTF, have reached maturity. Traded volumes are constantly increasing and all measurements of liquidity point to a success story. At the same time, however, throughput (physical) volumes are not increasing as much. While EU domestic suppliers, such as Gasterra in The Netherlands, have offered more and more gas on hubs, external suppliers are still mostly selling through long-term contracts. This is also the case of Gazprom. Volumes of LNG sold on European spot markets have been disappointing until very recently, mostly due to competition from Asian buyers – which purchased most flexible cargoes thanks to higher netbacks.

However, Gazprom's presence on European hubs is growing, in a way that is still not possible to quantify precisely. The establishment of the Electronic Supply Platform (ESP) in 2018 and the fact that offtake from long-term contracts is now close to maximum contracted quantities suggest that Gazprom might further enhance its participation in European hubs. The rationale for Gazprom's involvement in European hub trade is multifaceted. In addition to using hubs for portfolio balancing purposes, Gazprom is probably stepping up its presence on traded

715 *Ibid.*

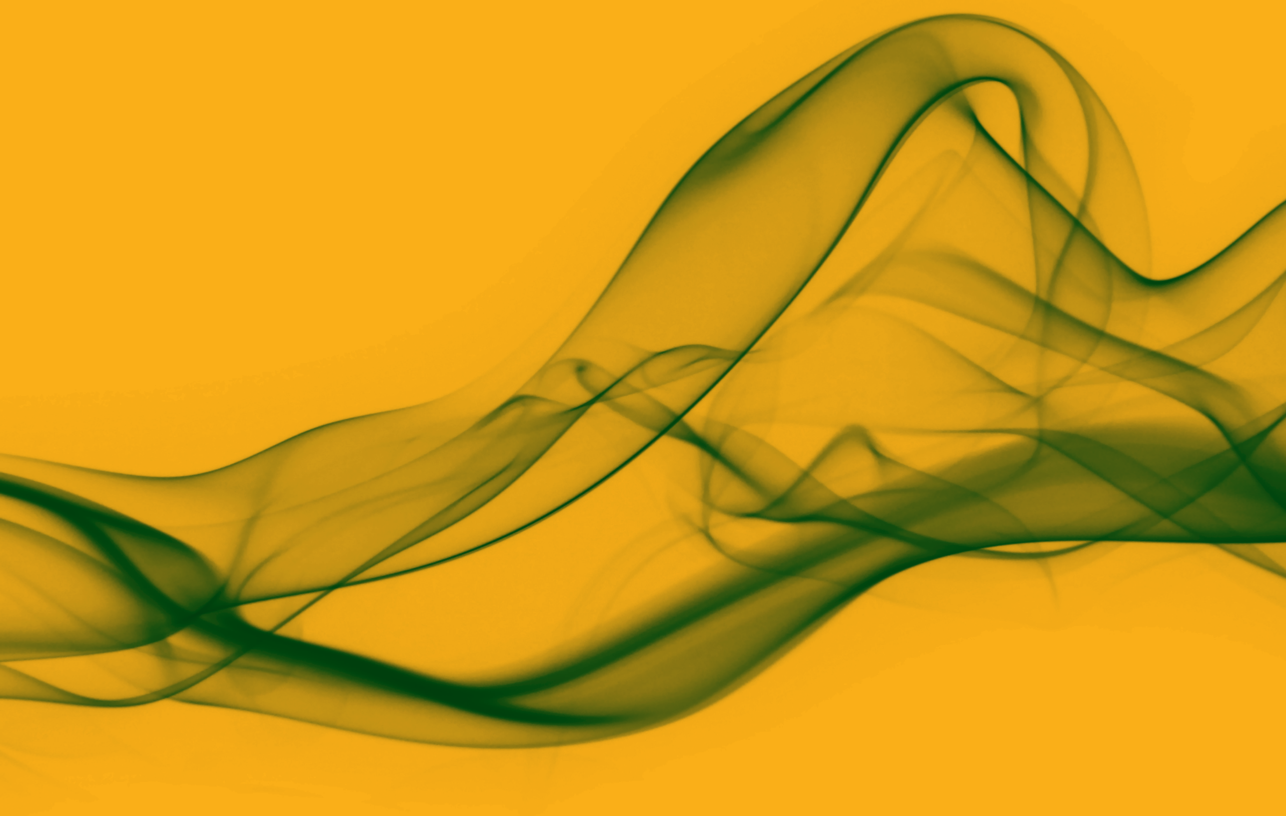
hubs in order to gain experience – also in preparation for an (unlikely) abandonment of long-term contracts. Finally, and most importantly, Gazprom might have an interest in influencing hub prices or at least avoiding dumping practices by European buyers.

Russia's ideal contract price in the present market phase is the maximum contract price achievable without (significant) loss of market share to LNG. This optimal level is clearly influenced by global demand for LNG and Asian LNG contracting behaviour. Gazprom has not engaged in a full-fledged price war and lacks an interest in doing so in default of a downward spiral in prices and a serious threat of displacement. However, Gazprom takes into account the abovementioned optimal contract price when dynamically adapting contract prices to hub prices, as described in the section on renegotiations and arbitrations.

Another important finding is that while Europe has strived to stimulate gas-to-gas competition and develop hubs to pay lower import prices, hub prices still appear heavily influenced by oil prices as gas is part of a global commodity complex.

CHAPTER 7

CONSEQUENCES OF TRANSFORMATIONS IN EU-RUSSIA GAS TRADE FOR EU WHOLESALE GAS PRICE LEVELS AND FOR THE EU GAS IMPORT BILL



CHAPTER 7 – CONSEQUENCES OF TRANSFORMATIONS IN EU-RUSSIA GAS TRADE FOR EU WHOLESALE GAS PRICE LEVELS AND FOR THE EU GAS IMPORT BILL

As argued in Chapters 2 and 3, international relations have become increasingly geo-economical after the end of the Cold War. According to Realists, governments have increasingly made use of economic instruments, instead of military ones, to aggrandize their power vis-à-vis competing States (Luttwak, 1993).[716] Chapter 5 showed how gas market liberalisation and support for transformations in EU-Russia gas trade were deeply rooted in the political and economic context of the 1990s. It was also argued that, while hurting Russia geo-economically in a zero-sum game was certainly not a primary objective behind EU gas market liberalisation, reducing the price of gas imports was one of the key outcomes that EU policy-makers wanted to attain by supporting these processes. Chapter 4 only dealt with considerations around price levels in a concise fashion and insofar as they contributed to forming a fertile ground for liberalisation. Conversely, the principal aim of this chapter is to investigate whether transformations in EU-Russia gas trade – accounted for in Chapters 5 and 6 – affected gas price levels in the EU. An additional aim is to establish what kind of price impact these transformations produced, and whether either the EU or Russia benefitted from them. This will also allow us to establish whether the developments analysed here are relevant from a political-economic perspective, as hypothesized in the theory chapters.

Before assessing whether the objectives related to price levels were met, it is necessary to revert to the context in which they were formulated, to evaluate the extent to which such objectives were well-grounded and realistic. As a matter of fact, evolutions in relative gas prices in liberalised and non-liberalised markets in the late 1990s and early 2000s provide important lessons. They namely help invalidating a number of simplifications that became part of the discourse in support of Continental European gas market liberalisation.

7.1 LESSONS FROM HIGH US GAS PRICES IN 1999-2005 WITH REGARD TO THE IMPACT OF LIBERALISATION ON PRICE LEVELS

As mentioned in Chapter 5, the appeal of gas market liberalisation experiences in the US and in the UK played a very important role in creating support for gas market liberalisation in Continental Europe. This appeal was based on the claim that liberalisation had delivered lower wholesale and retail prices in those two countries. In Chapter 5, it was only shown that gas

716 Luttwak, 'The Coming Global War for Economic Power: There are no Nice Guys on the Battlefield of Geoeconomics'.

price levels were lower in the US and in the UK than in Continental Europe at the time when the first key decisions that would lead to Continental European gas market liberalisation were taken. At that stage, the purpose was to show that the observation of lower prices in liberalised market strengthened the case for liberalisation in Continental Europe. Pro-market forces in the EU were indeed able to underpin their lobbying on what appeared a clear success story. Similarly, parallels between Europe and the US have been drawn until recently, with the implicit idea that Europe should aim at price parity with the US.[717]

As we are now moving to an analysis of the impact of reforms and transformations in gas trade, it is necessary to add a number of *caveats* to this discourse. In fact, observing lower prices in a liberalised market – even over the course of many years – does not constitute a sufficient ground to conclude that liberalisation leads to lower prices.

In this context, it is particularly important to analyse developments in the US in greater detail. The US was taken as a model by proponents of gas market liberalisation because for most of the 1990s it was able to showcase gas prices that were not only remarkably stable, but also measurably lower than in Continental Europe. Most importantly, this did not only apply to retail prices (in the formation of which network costs and taxes play a key role), but also to wholesale prices, the level of which is more illustrative of rents captured by gas producers and importers. Whether the lower wholesale prices observed in the US in the 1990s (and, subsequently, after 2006) were fully attributable to liberalisation is, however, open for discussion.

It is in fact impossible – and not essential for this dissertation – to counterfactually establish how US prices would have developed in default of liberalisation. It is however possible to relativize the benefits of liberalisation and underscore that key factors unrelated to liberalisation concurred to determine US gas prices.

If we extend the time frame for assessing US market developments to the period beyond the 1990s, an important observation that is often overlooked is that liberalisation did not prevent American wholesale prices from rallying in the first half of the 2000s. To reach this observation, we have collected historical BP data on average annual German import prices as reported by the German Federal Office for Economic Affairs and Export Control (BAFA[718]) and compared them with average annual Henry Hub prices. The two prices are good benchmarks for wholesale prices in both countries. The German import price can also be taken as a benchmark for Central-Western Europe. From this comparison, it emerges that while US prices had been 30% lower than in Continental Europe for most of the 1990s[719], they rose above average Continental European prices in 1999 and remained firmly above them until 2005, as shown by Figure 24. US wholesale prices were 11% above German wholesale prices in 1999, 36% higher in 2004 and 51% higher in 2005.[720]

717 B. Terzic, 'Prospects for a Henry Hub in the European Union', *Atlantic Council*, 12 April 2018.

718 Bundesamt für Wirtschaft und Ausfuhrkontrolle in German.

719 BP Statistical Review Historical Data, see Chapter 5.

720 Based on historical data provided by BP Statistical Reviews.

Two elements deserve attention. Firstly, the US price rally that started in 1999 was not a short-lived spike that could be explained by transient factors such as exceptionally cold weather or supply disruptions provoked by natural calamities[721]. Six years are in fact a fairly significant amount of time in gas markets, as they correspond to an average investment cycle. Secondly, it is worth highlighting that in this phase (1999-2005) the US was a fully liberalised gas market while Germany – alongside the rest of Continental Europe – was only starting to liberalise. Unbundling was still underway and the European Commission's sector enquiry on long-term contracts had not yet reached its final conclusions. Both the US and Germany (and Continental Europe as a whole) were net importers of natural gas – although the US was proportionally much less dependent on gas imports than Germany and most European countries[722].

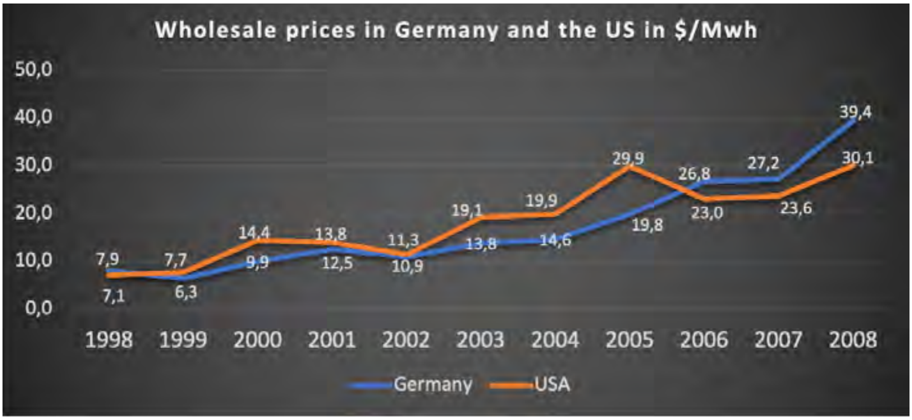


FIGURE 24: AVERAGE ANNUAL WHOLESALE GAS PRICES IN GERMANY AND IN THE UNITED STATES IN US DOLLARS PER MWH (1998-2008). DATA: BP STATISTICAL REVIEWS (HISTORICAL COLLECTION)

In addition to structurally higher gas prices, the early 2000s also saw unprecedented volatility in the US market, with price spikes in the winter heating seasons of 2000-2001, 2002-2003 and 2003-2004. At least the last two of these three price spikes happened in winter seasons with average weather patterns and relatively weak economic activity[723]. A strong consensus emerged that these spikes were rooted in structural supply-demand imbalances in the US gas market[724] and that deregulation favoured volatility.[725]

721 While hurricanes Ivan (2004) and Katrina (2005) provoked disruptions to supply from the Gulf of Mexico, which aggravated the rise in US gas prices, they cannot be pointed out as the most important factors. Gas prices were in fact increasing for structural reasons, as explained later in this chapter.

722 US gas import dependency over the period analysed was around 15%.

723 M. Michot-Foss, *The Role of LNG in North American Natural Gas Supply and Demand* (Austin, 2004): Center for Energy Economics, The University of Texas at Austin.

724 *Ibid.*

725 *Analysis of Changes in Natural Gas Market Prices*, Report to Congressional Committees and Members of Congress (2002): United States General Accounting Office.

The manifestation of this high-price (and high-volatility) phase in the early 2000s shows that liberalised regimes in importing markets are not, *per se*, necessarily conductive to lower (and/or more stable) price levels than in importing markets where liberalisation is only incipient. The aim here is not to argue that liberalisation was *responsible* for higher prices in the US between 1999 and 2005, but rather to emphasize that post-liberalisation US gas prices were not always lower than in Continental Europe.

In addition to high gas prices, another development discredited the reputation of the US deregulated energy market model: the Californian electricity crisis of 2001. While the crisis was the result of a number of factors, flaws in the process of liberalisation contributed to it.[726] When the crisis erupted, California was in fact relying excessively on the spot market for wholesale power procurement, rather than securing the supply of electricity through long-term contracts. Electricity spot prices proved very sensitive to supply and demand conditions, which led to very high volatility. One of the conclusions reached at the time was that spot markets work poorly in times of tight supply and create opportunities to exert market power.[727] Long-term contracts were in fact signed in the aftermath, with a much more central role played by the State of California. The additional connection between the Californian electricity crisis and the storyline presented in this section is that one of the factors behind the Californian crisis was growing reliance on increasingly scarce and expensive natural gas.

The Californian crisis and the reversal in relative prices between the US and Continental Europe coincided with an increasingly cautious approach to liberalisation in Continental Europe in the early 2000s. As described in Chapter 5, a number of partial setbacks took place in the same period, such as watered down versions of ownership unbundling and the introduction of compromises and derogations to general principles.[728] The European Commission also toned down its full-frontal assault to long-term contracts, acknowledging – as explained in the theoretical chapters of this dissertation – that the desirability of long-term contracts needs to be assessed on a case-by-case basis and that, in spite of possible negative effects on competition, long-term contracts can be beneficial to security of supply.[729] As discussed in the theory chapters, the idea that regulation should strike a balance between stimulating investments and precluding the detrimental effects of LTCs on gas-to-gas competition started to gain traction as a compromise between opposed factions. The lessons provided by the Californian crisis favoured this pragmatic solution, which was also adopted because EU institutions were themselves divided on the topic, as proven by the preparatory documents leading to EU energy legislation.[730]

726 C. Weare, *The California Electricity Crisis: Causes and Policy Options* (San Francisco, 2003): Public Policy Institute of California.

727 *Ibid.*

728 *Ibid.*

729 "Long-term contracts will continue to be an important part of the gas supply of Member States and should be maintained as an option for gas supply undertakings in so far as they do not undermine the objective of this Directive and are compatible with the Treaty, including the competition rules. It is therefore necessary to take into account long-term contracts in the planning of supply and transport capacity of natural gas undertakings", Directive 2009/73/EC of the European Parliament and of the Council; 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/ECThird Energy Package.

730 De Hautecloque et al, *From a Reactive to a Proactive EU Regulatory Framework for Long-term Gas Import Contracts*.

An additional element of interest for the comparison between the US and Europe is that the most important factors behind high US gas prices in the 2000s were very high oil prices and a widening gap between gas supply and demand. This is important because it resonates with the conjuncture observed in Europe until 2014, when oil prices and gas import dependency were growing, and between the summer of 2017 and the summer of 2018, when oil prices resumed growth and European gas import dependency further climbed.

With regard to the first factor, it can be observed that, in spite of gas market liberalisation, oil prices maintained an influence on Henry Hub prices, due to 'commodity complex'[731] dynamics, substitution in power generation, and upstream correlation between oil and gas due to associated gas production. In 2003, 26 percent of US natural gas production came from wells that also produced oil, and the share amounted to 50% in neighbouring Mexico, one of the United States' gas suppliers.[732] The US gas price surge in 1999 coincided with skyrocketing oil prices. According to historical data adjusted for inflation, crude oil prices grew from 19.88 $ in January 1999 to 89.90 $ in August 2005. Oil prices continued to increase after 2005, while gas prices decorrelated because of booming domestic shale production, which was in turn largely triggered by high oil prices.

The second element behind high US gas prices in 1999-2005 relates, as mentioned, to US gas market fundamentals. While US gas consumption had already started to exceed domestic production in the late 1980s, higher imports from Canada and downward adaptations to US exports had concurred to keep the American market in balance until the end of the 1990s. Since then, however, neither domestic production nor pipeline imports were able to keep up with the pace of growth in US consumption (Figure 25).

As a result, the US was starting to increasingly rely on LNG to fill the gap between supply and demand, in a phase in which global supplies were tightening (Figure 25). The Qatari LNG projects that would flood the market with flexible cargoes towards the end of the 2000s were not yet fully operational. The US could count on Trinidadian LNG and had to attract cargoes from Algeria, Nigeria, Egypt and countries in the Middle East and South-east Asia.

731 Relating to the observation that the prices of key commodities often move in sync, based on underlying economic conditions, substitution dynamics and other interlinkages.

732 M. Michot-Foss, *The Role of LNG in North American Natural Gas Supply and Demand*.

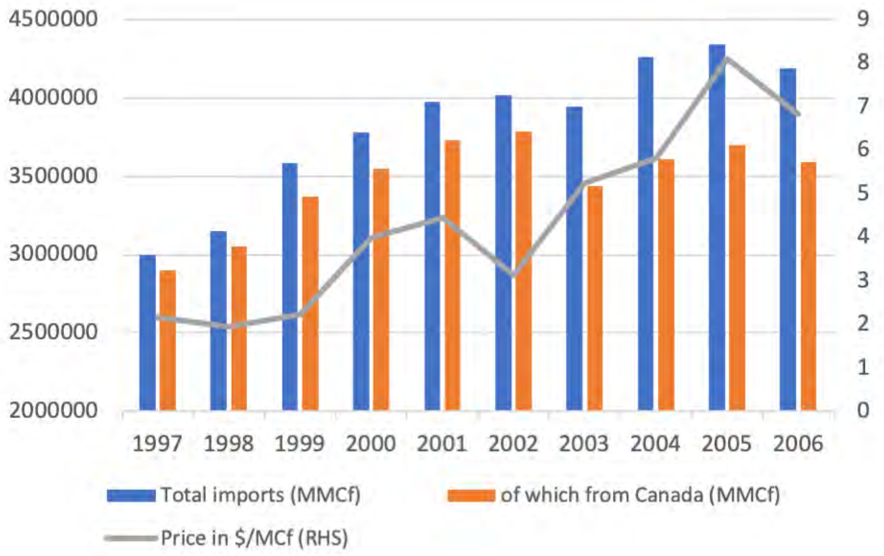


FIGURE 25: TOTAL NATURAL GAS IMPORTS INTO THE UNITED STATES, PIPED GAS IMPORTS FROM CANADA AND AVERAGE ANNUAL IMPORT PRICES IN THE UNITED STATES (1997-2006). IN MILLION CUBIC FEET AND DOLLARS PER THOUSAND CUBIC FEET (RIGHT-HAND SCALE). DATA: US ENERGY INFORMATION ADMINISTRATION (EIA).

To attract cargoes from outside of the Americas, however, the US had to compete with traditionally more import-dependent countries in Asia and Europe, which had secured part of that supply through long-term contracts. The supply-demand gap described above became a feature of the US gas landscape in the course of the 1990s and early 2000s, and was expected to aggravate in the following decades. Unlike in the past, regional imports from Canada and Mexico would not have been able to fill the gap. The US was thus bracing itself for becoming a large LNG importer (Figure 26). Based on this expectation, several regasification terminals were built on the US Atlantic Coast. To get a sense of the prevalent feeling of the day, it is illustrative to look at the 2005 Annual Energy Outlook. The AEO forecasted that US gas imports would double by 2025 and that LNG would cover all of the additional import needs (Figure 26).[733]

733 *Annual Energy Outlook 2005* (Washington-DC, 2005): US Energy Information Administration.

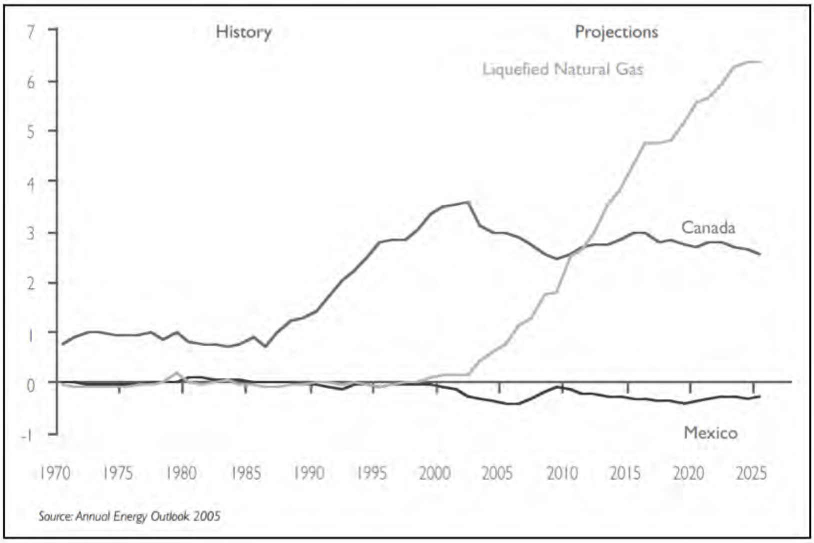


FIGURE 26: AEO 2005 HISTORICAL DATA AND PROJECTIONS TO 2025 RELATED TO EXPECTED GAS IMPORTS INTO THE UNITED STATES: SOURCE: ANNUAL ENERGY OUTLOOK 2005, US ENERGY INFORMATION ADMINISTRATION. UNIT OF MEASURE?

It is interesting to notice that this outlook did take into account technological progress leading to a growth in US unconventional production, which was then at an infant stage. Based on these assumptions, 2025 gas prices under the 'Rapid Technology' scenario[734] were only projected to be 10% lower than in the Reference Case and 17% lower than in the 'Slow Technology' scenario.[735] Gas prices were expected to remain at high levels for many years, thus creating the right economic conditions for the construction of a pipeline that would bring natural gas from Alaska to the contiguous States.

With hindsight, it is evident that none of this ever materialised because of the unexpected boom in unconventional oil and gas production. However, those predictions were well-grounded given data available at that time as well as market signals. Proponents of market liberalisation might argue that the shale revolution was in fact a result of liberalisation – as the rise in shale production could be interpreted as an 'efficient' supply-side reaction to high prices that could be expected in a market with strong competition. This interpretation seems to neglect the fact that the rise in shale production was mostly driven by high oil prices rather than gas prices. As also proven by the high amounts of flared gas, oil was the real prize for private investors in the mid-2000s. Gas extraction only became an interesting proposition tangentially, and later in time. More broadly, the American shale revolution was the unexpected result of an intricate combination of factors. While it is outside the scope of this dissertation to

734 Built on the assumption that sweeping technological innovations would have stimulated shale production

735 J. Kendell, *The 2025 Outlook for Oil and Gas* (2005): The Book of the States, The Council of States Governments.

explain all of these factors in detail, excessively positivistic explanations that give central stage to liberalisation as an enabling factor should be rejected. The fact that the US had a competitive market for the oil and gas service industry and rules that favoured new entrants might have been a necessary condition for the shale revolution. It was not, however, a sufficient one.

Based on the historical analysis and the pre-shale era outlooks presented above, it is possible to argue that – in default of the unexpected expansion in US shale gas production, to which a number of factors exogenous to the gas sector concurred – the US would have become more exposed to LNG and global market prices.[736]

Liberalisation cannot prevent such exposure from being developed. Secondly, a closer analysis of US gas price developments in 1999-2005 has demonstrated that structurally high prices can be observed in mature, liberalised markets, particularly when the supply-demand gap widens, reliance on imports increases, and global market conditions are tight. Furthermore, depending on local and global market fundamentals, prices in liberalised mature markets can be higher than in net importing regions where liberalisation is only incipient. Moreover, an important observation is that the significant price premium paid by the EU relative to the US in the period 2006-2019 is not grounded on different degrees of liberalisation in the two regions. In fact, the availability of abundant domestic shale gas is the primary reason why US gas prices have remained in the 2-4$/MMBtu range for such a long period.[737]

The attraction exerted by low US prices in the 1990s inspired the push for liberalisation in Continental Europe. Based on this, the quest for Henry Hub price levels continued in Europe in the 2000s and 2010s. It would be flawed to extend the original arguments in favour of adopting the US model to the post-2005 reality without taking into account the disruption brought by shale onto the supply-demand balance. The quest of Henry Hub price levels in Europe thus appears to be based on wrong premises. Europe has not been able, nor – arguably – willing, to set in motion an upstream revolution similar to the one that reverted the 1999-2005 high gas price conjuncture in the US. As a result, Europe has not been able and will not be able to obtain Henry Hub price levels by simply liberalising.

When comparing prices across the Atlantic, it is important to point out that the US was – and is until today – a large producer of natural gas, which has certainly had a beneficial effect on price levels. This was particularly the case after 2005, and the effects are still seen today. Without the shale revolution, it is highly doubtful that the US would have been able to permanently revert the trend of growing exposure to imports and growing prices that was observed in the phase between 1999 and 2005.

These observations certainly do not dismantle the case for liberalisation, nor do they disprove that liberalisation might have contributed to reducing wholesale gas prices in the US. They do, however, relativize and contextualise the price-level objectives formulated at the beginning of the liberalisation process in Continental Europe. Similar to the US in the early 2000s, Europe is

736 M. Michot-Foss, *The Role of LNG in North American Natural Gas Supply and Demand*.

737 *The Effects of Shale Gas Production on Natural Gas Prices* (2013): Cornell University, ILR School.

currently exposed to gas imports and global gas market prices and the low gas prices of today might give way to high prices in tight market conditions.

A number of questions still need to be answered. In the next sections, we will look at how price levels have developed as a result of transformations in EU-Russia gas trade, which include the transformations in pricing mechanisms explained in Chapter 6. An attempt will be made to establish to what extent these transformations have shifted gas rents between the EU and Russia, impacted Europe's trade balance, improved European welfare and enhanced European industrial competitiveness. It is also necessary to establish whether all these observable impacts are structural or just contingent.

7.2 COMPARATIVE ANALYSIS OF EUROPEAN WHOLESALE GAS PRICE LEVEL VARIATIONS IN LIGHT OF PRICING MECHANISM TRANSFORMATIONS

This section analyses European wholesale gas price levels in the period comprised between January 2009 and May 2019, the time span within which the transformations in EU-Russia gas trade analysed in Chapters 5 and 6 took place. A close examination of price levels distinguishes this section from the type of study that has been conducted so far, which was primarily associated with price formation (or pricing mechanisms). Price formation relates to the criteria, methods and processes that concur to determine prices applied to a transaction and charged to customers. There can be and, as shown, there have indeed been, greatly diverging views about what pricing mechanisms should be adopted in cross-border gas trade. However, what eventually matters the most for all the stakeholders involved are price levels.[738] These are only partially determined by pricing mechanisms. In fact, pricing mechanisms only contribute to translating evolving supply and demand balances in certain commodity markets (which can be gas markets or oil product markets) into a price level. When pricing mechanisms are conceptually different, but end up delivering the same price level, the debate on pricing mechanisms usually subsides.

Insulating the price effect of pricing mechanisms from other factors in underlying commodity markets is a complex endeavour. However, in light of the detailed account of pricing transformations given in Chapter 6, a comparative observation of price level developments across Europe provides strong indications on the evolving relation between the two. We have in fact mapped the transition towards hub pricing and indicated when it became prevalent where. Building on this information, it should be possible to check for the effect of pricing on prices, although with great approximation.

While the previous chapters have focussed on price formation, a number of references to price levels have already been made. This has only been done when it was necessary to prove a specific argument. The first reference was made in Chapter 5, where it was argued that market fundamentals in 2008-2009, characterised by oversupply, led to a collapse in European hub prices that was not equally matched by oil-indexed prices. This was identified as one of the most important triggers of the pricing transformations that ensued, as the price gap between

738 'Getting Creative with Long-Term Contract Renegotiation', *Timera Energy*, October 2013.

spot and contracted supplies created a strong incentive to embrace hub-based pricing mechanisms.[739]

The second reference was made in Chapter 6, when it was shown that – through modifications to pricing mechanisms – contract price levels were brought in line with hub price levels in most areas of Western Europe starting in 2013-2014. This was illustrated to explain why renegotiations and arbitrations (revolving around the importers' requests to change pricing mechanisms) diminished in number after 2013-2014.[740]

The third reference was made in the last part of Chapter 5, when a discussion on the drivers of hub prices was presented. We notably showed how, in spite of being described as a fully market-reflective price formation mechanism, hub pricing does not necessarily shelter from the indirect influence of oil prices.

In addition to quantifying price level variations, this section aims to identify the exogenous factors that drove them. This is a necessary step before assessing the causal link between the transformations in contractual clauses, including pricing mechanisms, and price levels, which will be done in the following sections.

The first element that needs to be acknowledged when attempting an analysis of wholesale price developments is that wholesale prices actually differ across Europe, although one of the most clearly observable trends is increasing convergence among them throughout the period analysed. We have collected data for representative wholesale prices between January 2009 and May 2019 from different sources and converted them to the same unit (EUR/Mwh) for comparative purposes.

The most representative price indicators that we have chosen to investigate in this analysis are:

a.) NBP prices – indicative of wholesale prices for the United Kingdom. Until the early to mid-2000s, the NBP was unrivalled in its liquidity, and acted as the propelling hub, or benchmark, for the rest of Europe. Gradually, the Dutch TTF has taken over this role. The NBP remains however a very important hub in the European landscape and the UK gas market is the EU's second largest. Through subsidiaries, Gazprom is active on the NBP, where it buys and sells gas. The entirety of Russian gas sold in the UK – not only at the time of writing (14.3 Bcm)[741], but also for the entire period analysed – was estimated to be sold on an NBP basis (Chapter 6). The NBP prices for which consistent data could be found are monthly averages of day-ahead contract prices. Expressed in pence/therm, the figures have been converted to EUR/Mwh using historical monthly average exchange rates[742];

739 Stern, *The Pricing of Internationally Traded Gas*.

740 Franza, *Long-term Gas Contracts in Europe: The Evolution in Pricing Mechanisms.*

741 Gazprom Annual Delivery Statistics for the year 2018.

742 NBP day-ahead contract prices (monthly averages), published by OFGEM and based on ICIS Heren data – in pence/therm, converted to EUR/Mwh (October 2009-May 2019) – available at: https://www.ofgem.gov.uk/data-portal/gas-prices-day-ahead-contracts-monthly-average-gb

b.) TTF prices – wholesale prices in The Netherlands and, increasingly throughout the period and predominantly after 2010-2011, benchmarks for Northwest and Central-Western European hub prices. Wholesale prices in Belgium and France, for which we did not collect specific data, were, at the time of writing, closely following TTF prices, with only small differentials rooted in transportation costs.743 The vast majority of Russian gas sold in The Netherlands (7.9 Bcm in 2018), Belgium (1.8 Bcm in 2018) and France (12.9 Bcm in 2018) at the time of writing744 was either directly indexed to TTF (possibly on a 'TTF-plus' basis) or indexed to Zeebrugge or PEG, the price level of which was in turn close to being at parity with TTF.745 However, for the first years of the period under consideration, average German import prices (see below) were probably a better proxy for French and Belgian Russian gas imports, given the similar pace of hub indexation penetration in Germany, France and Belgium (Chapter 6). The TTF prices for which we could find comprehensive figures and coverage are unweighted monthly averages of end-of-day prices746;

c.) BAFA prices – average German import prices, reflective of both Norwegian and Russian imports, and, decreasingly over time owing to Groningen production cuts, L-gas imports from The Netherlands. Germany is Gazprom's largest foreign market (58.5 Bcm in 2018)[747] and we assume that the price at which Russian is sold is competitive with the price of other imports (Chapter 6). The BAFA price is thus reflective of Russian gas import prices into Germany. Our assumption seems solid considering that the BAFA is often taken by gas analysts as a proxy for Russian gas sales in the EU as a whole. Unlike NBP and TTF prices, BAFA prices are notionally hybrid. At the beginning of the period under consideration, BAFA prices were predominantly oil-indexed. As explained in Chapters 5 and 6, the indexation of German imports gradually changed to include hub components throughout the period under consideration. The hub component is estimated to have become predominant after 2013 (Chapter 6). At the time of writing, BAFA prices were predominantly hub-linked. These prices are derived from a dataset published by the German Federal Office for Economic Affairs and Export Control, which quotes prices in Euros per terajoule[748];

d.) The average import price of Russian gas into Italy (ITA)[749] – an important indicator given that Italy is Gazprom's second market in the European Union (22.8 Bcm in 2018)[750] and that the country followed a different pricing pathway than the TTF hub area, from which it needs to be distinguished. Similar to the BAFA price, the average import price of Russian gas into Italy is hybrid. Italy transitioned to hub pricing after Northwest Europe

743 From ACER Gas Market Monitoring Reports.

744 All figures derived from Gazprom Annual Delivery Statistics for the year 2018.

745 From ACER Gas Market Monitoring Reports.

746 TTF end-of-day prices (unweighted monthly averages) – originally expressed in EUR/Mwh (January 2009-May 2019), derived from various public sources and graphs based on ICIS Heren data.

747 Gazprom Annual Delivery Statistics for the year 2018.

748 *Aufkommen und Export von Erdgas sowie die Entwicklung der Grenzübergangspreise ab 1991*: Bundesamt für Wirtschaft und Ausfuhrkontrolle, available at: https://www.bafa.de/DE/Energie/Rohstoffe/Erdgas/erdgas_node.html

749 Eurostat COMEXT database (SITC classification of goods – 343 'natural gas, whether or not liquefied').

750 Gazprom Annual Delivery Statistics for the year 2018.

(including Germany) but earlier than most other EU countries (other Southern European countries, South-eastern Europe, Northern Europe and the Baltics). Hub indexation probably became prevalent in Russian gas exports to Italy around 2015-2016, but significant elements of hub indexation were already introduced in 2013-2014. At the time of writing, remaining oil indexation components were mostly notional, although it is possible that oil indexation still exerted some influence through price corridors (Chapter 6). The figures used in this analysis have been calculated from Eurostat COMEXT databases built on customs declarations, indicating gross import values and quantities in 100 kg of gas. We have converted kilograms into megajoules by using a conversion factor of 54.42 MJ/kg – extracted from IEA estimates of the average calorific value of Russian gas imports into the EU.751 Megajoules have then been converted into MWh using the standard rate of 1 MWh to 3600 MJ.

e.) The average import price of Russian gas into Central-Eastern Europe (CEE)[752] – which is an average of Russian gas import prices in the Czech Republic, Hungary, and Slovakia. Data for Austria and Poland are unfortunately not published by the European Commission or other databases. However, collectively, the three abovementioned countries are themselves a large market for Gazprom (19 Bcm in 2018)[753]. Moreover, their average import price could be regarded as an approximate indicator for the region comprised between Western Europe and the peripheral markets of South-eastern Europe and the Baltic Region. Even if other countries in the region might pay different import prices due to transport cost differentials[754], the pace of pricing transformations is comparable to that of the countries included in the sample. Central-Eastern Europe transitioned to hub indexation after Northwest Europe and more or less at the same time as Italy, although different Gazprom contract renegotiations in Italy and Central-Eastern Europe delivered different results in terms of specific clause adaptations. Similar to the average import price of Russian gas into Italy, we calculated the average price in the Czech Republic, Slovakia and Hungary using Eurostat COMEXT data and applying the same conversion criteria.

This selection allows to achieve a comprehensive and workable overview of Russian gas import price levels throughout the period under consideration, deliberately excluding poorly integrated markets such as the Baltic region, South-eastern Europe and the Iberian Peninsula. The Iberian market is not the subject of our analysis because it does not receive Russian gas. Furthermore, focussing on core integrated markets is desirable at this stage because price levels in peripheral markets were heavily influenced by region-specific factors in many of the months for which data were checked. Excluding outliers allows to focus more effectively on developments in core markets. Moreover, poorly integrated markets often trailed price developments in core markets with a time lag, particularly after the European antitrust ruling of May 2018 that allowed customers in peripheral markets to ask for price parity with Western European hubs. Finally, markets in the Baltic region and South-eastern Europe only express a

751 *Energy Statistics Manual* (Paris, 2004): International Energy Agency.

752 Eurostat COMEXT database (SITC classification of goods – 343 'natural gas, whether or not liquefied')

753 Gazprom Annual Delivery Statistics for the Year 2018.

754 ACER Gas Market Monitoring Reports.

fraction of Gazprom's sales to the EU, which means that price developments there have a small impact on the total European import bill and on the broader geo-economic relation with Russia. In fact, the countries for which we collected price figures (or for which the figures that we collected can be regarded as proxies)[755] absorbed 92% of Gazprom's exports to the EU in 2018.

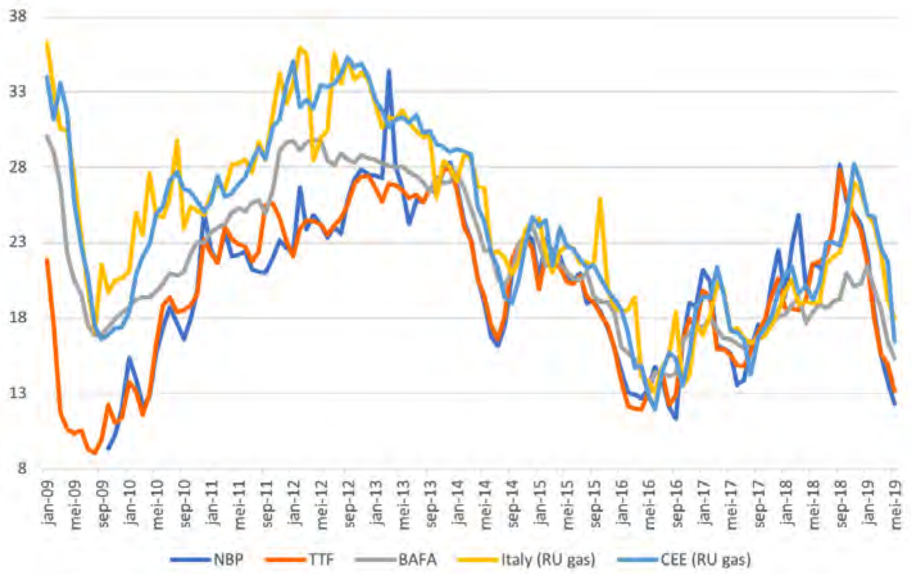


FIGURE 27: EVOLUTION IN SELECTED EUROPEAN WHOLESALE GAS PRICES (JANUARY 2009-MAY 2019), IN EUR/MWH. GRAPH BY THE AUTHOR – SOURCES: EUROSTAT COMEXT, ICIS HEREN, OFGEM, BUNDESAMT FÜR WIRTSCHAFT UND AUSFUHRKONTROLLE.

Wholesale gas price developments year by year – an analysis of the drivers and BAFA-TTF, CEE-TTF and ITA-TTF spreads

From the data collection, it can be observed that both hub prices (NBP, TTF) and Russian contract prices (BAFA, CEE, ITA) fell in 2009. Hub prices fell mostly as a result of the 'perfect storm' sparked by waning EU gas consumption and oversupplied LNG markets. Russian contract prices – then almost exclusively oil-indexed – declined mostly because of the impact that the economic and financial crisis of 2008-2009 had on oil prices, which plummeted at the end of 2008. Lower oil prices filtered through with the typical 6-9-month oil indexation time lag, with the result that the decrease in oil prices at the end of 2008 translated into a decrease in oil-indexed contract prices in mid-2009. In addition to the effect of gas supply and demand developments, oil prices indirectly had a compounding negative effect on the NBP and the TTF, in line with dynamics explained in Chapter 6 and with the observation that commodity prices

755 Russian gas exports to Austria, Belgium, the Czech Republic, France, Germany, Hungary, Italy, The Netherlands, Slovakia, Poland, and the United Kingdom amounted to 164 Bcm in 2018. Gazprom's exports to other EU countries amounted to 14 Bcm in the same year.

can move in sync based on underlying macro-economic conditions, particularly at times of rapid expansion or crisis ('commodity complex' dynamics).[756] Indeed, the economic and financial crisis of 2008-2009 appears to be an important common factor behind both hub and Russian contract price declines in 2009.

The observation of these common traits could lead to think that the incentive to endorse hub pricing should have been marginal. After all, in 2009, hub and contract prices reached their lowest point simultaneously, between August and September (Figure 27). However, Russian contract prices entered the period analysed being 37-66% higher than TTF prices and evolved towards being 66-116% higher in September 2009.[757] In other words, while also plummeting, Russian contract prices in Germany, Italy and Central-Eastern Europe bottomed at a much higher price level than hub prices did. As demonstrated in Chapters 5 and 6, this gap meant that the incentive to move to hub pricing was substantial, even if oil-indexed prices were low[758] in absolute terms.

The following year saw a general price recovery throughout Europe, which unfolded much more sharply in hub prices than in Russian contract prices, leading to a narrowing down of the gap between the two towards the end of the year.[759] The obvious explanation for the faster hub price rally in 2010 is that it reflected recovery in European gas consumption after the 2009 drop[760], which did not affect prices in Russian gas contracts – de-linked from European gas market fundamentals. Another factor was that hub prices actually reflected recovering oil prices faster than Russian contract prices did, due to the time lag in contractual oil indexation. This is also proven by the relative stabilisation of average import prices of Russian gas into Italy in the second half of 2010[761], which reflected the stabilisation of oil prices in the first half of the same year. On a yearly basis, the few Northwest European importers that had already been able to secure at least partial hub-based pricing for their Russian imports[762] realised savings relative to buyers in Italy and Central-Eastern Europe that were stuck with oil indexation, the average annual CEE and ITA prices being 43% and 47% above TTF respectively.

The year 2011 was characterised by relatively stable and high hub prices (21-25 EUR/MWh). The Fukushima incident in Japan, which engendered a very tight LNG market and led to record prices in Asia (up to 50 EUR/MWh)[763], did not lead to an equally tight market in Europe. Stable

756 Price reporting agencies and financial institutions have indicators to measure general commodity market sentiment, such as the Standard and Poors Commodity Index. For references to the 'commodity complex', cf. G. Thiagarajan, 'See a Positive Picture for the Commodity Complex in 2019', *Business Standard*, December 2018 or 'The Commodity Complex is Getting Decimated', *Knowledge Leaders Capital*, July 2015.

757 Eurostat COMEXT and ICIS Heren data.

758 In mid-2009, oil-indexed prices in long-term gas import contracts were certainly low from a historical perspective, and namely if compared with oil-indexed prices in the previous five years.

759 The average spread between TTF and the Russian contract prices included in the dataset (BAFA, CEE and ITA) was 5.66 EUR/MWh in January 2010 and 1.07 EUR/MWh in December 2010.

760 According to Eurostat data, gas consumption in the 28 Member States of the EU rose from 462 Bcm in 2009 to 497 Bcm in 2010. Consumption levels recorded in 2010 have not been seen ever since, in spite of recovery after 2015. Future developments will give indications as to whether 2010 marked the peak of European gas demand.

761 With the exception of a spike in August, Italian average import prices hovered around 24-25 EUR/MWh in the second half of 2010.

762 Based on analysis conducted in previous chapters, only British and Dutch buyers had already successfully forced Gazprom to sell on a hub-price basis in 2010. Back then, partial hub indexation was only starting to make inroads in Germany.

763 Data from the BP Statistical Review 2012.

and high hub prices in 2011 were largely the result of different forces pushing them in opposite directions, and namely an upward influence exerted by global tightness compensated by a downward influence exerted by very weak European demand and abundance of piped gas supplies, particularly from Russia. Europe did not experience tightness in 2011, as is also demonstrated by the fact that European importers were actually minimising contractual offtake, trying to lower take-or-pay thresholds. In this period, gas was not competitive in the European power mix due to very low CO_2 prices in the aftermath of the economic and financial crisis of 2008-2009 and cheap coal supplies. It is important to highlight that gas was not competitive regardless of whether hub or oil-indexed prices were applied. In any case, hub prices remained much more attractive for importers and buyers of gas than oil-indexed prices. While, as said, hub prices were relatively high but stable, Russian contract prices continued on their growth trajectory in 2011, sustained by soaring oil prices (Figure 28). Between January and December, the price of Russian gas imports increased by 23% in Italy, 25% in Germany and 30% in Central-Eastern Europe. In December 2011, Russian contract prices in these three regions were 28-45% higher than TTF.

Continued global gas market tightness contributed to high hub prices in 2012. Both the NBP and the TTF prices continued to grow, reaching 28 EUR/MWh at the end of the year. European gas consumption further declined.[764] While CEE and ITA prices remained stable and high (in the 33-35 EUR/MWh range for most of the time), BAFA prices declined, reflecting the introduction of elements of hub indexation in Gazprom's German contracts.[765]

This trend extended to CEE and ITA prices in 2013, leading to convergence towards the end of the year. A price spike of the NBP in March temporarily brought hub prices above contract price levels. BAFA prices fully converged with TTF prices at the end of the year, indicating that substantial hub indexation had been introduced in Gazprom's German contracts.[766] In spite of progress in updating pricing mechanisms, Europe concluded 2013 with import prices in the range of 27-29 EUR/MWh, more than twice as high as Henry Hub and too high to render gas an affordable alternative to coal in the European power mix.[767] In fact, European gas demand fell for the third consecutive year. It is counterintuitive that, after three years of dwindling gas consumption, European hub prices kept on growing.[768] Lessons drawn from 2013 offered a preview of how European hub prices are influenced by exogenous factors, including Asia's call for flexible LNG volumes and oil prices. While the gradual introduction of hub indexation in 2010-2013 (a phase of extraordinarily high oil prices) helped containing the price of Russian imports relative to the levels at which they would have been bought should oil indexation have been fully applied, new pricing mechanisms had broadly failed to deliver low gas price levels – where 'low' is assessed based on both historical and geographical criteria, and against the background of extremely weak gas consumption and loss of competitiveness to coal.

764 From 449 Bcm to 438 Bcm, according to Eurostat data.

765 For Gazprom's German contracts: WGI, *Energy Intelligence*, 3 July 2013.

766 Stern and Rogers, *The Dynamics of a Liberalised European Gas Market*.

767 "The high-price period (2011–14) gave gas an image of being 'unaffordable' in many countries, certainly in relation to coal given the lack of a meaningful carbon price. Problems with long-term oil-linked contracts required renegotiation (and often international arbitration) to convert to hub-based prices" In J. Stern, *Challenges to the Futures of Gas: Unburnable or Unaffordable?* (Oxford, 2017): Oxford Institute of Energy Studies, page 3.

768 Theisen, *Natural Gas Pricing in the EU: From Oil-Indexation to a Hybrid Pricing System.*

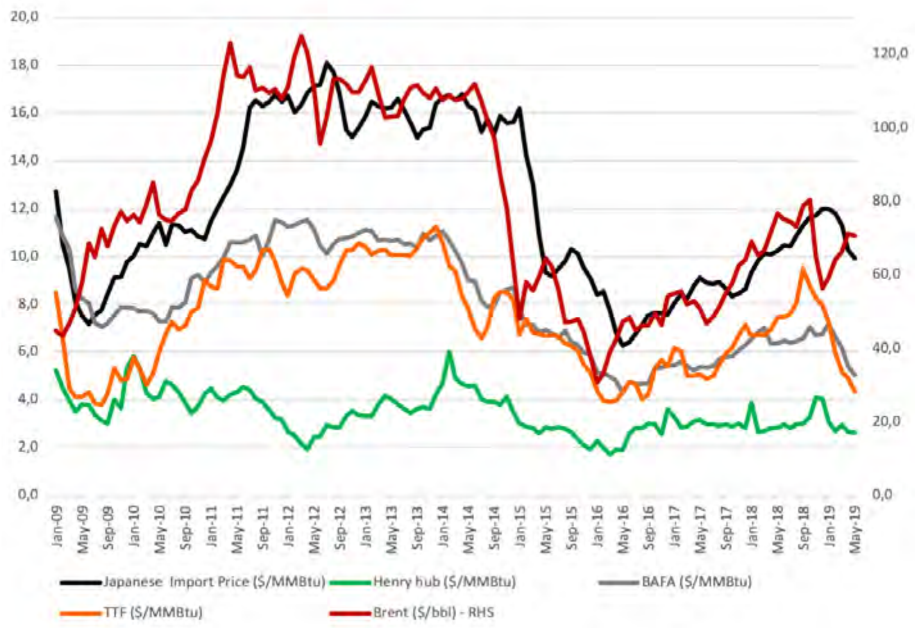


FIGURE 28: COMPARISON BETWEEN KEY EUROPEAN HUB AND CONTRACT PRICE INDICATORS WITH BRENT OIL PRICES, HENRY HUB AND AVERAGE JAPANESE IMPORT PRICES (JANUARY 2009-MAY 2019), IN USD/MMBTU AND USD/BARREL (RIGHT-HAND SCALE). GRAPH BY THE AUTHOR – SOURCES: EIA, WORLD BANK, ICIS HEREN, BUNDESAMT FÜR WIRTSCHAFT UND AUSFUHRKONTROLLE.

In 2014, a combination of falling Asian gas prices and plummeting Brent prices managed to provide Europe with the low gas prices that it had been longing for. A closer look at price developments in 2014 reveals that hub prices started to decline before oil prices did.[769] However, falling oil prices compounded and intensified the decline in gas prices in the second part of the year and in 2015.[770] The initial trigger was a fall in Asian spot prices at the beginning of 2014, on the back of mild weather, record high storage levels, overcontracting in previous quarters, a slowdown in GDP growth, the authorisation of preliminary nuclear restarts in Japan

769 "This year's spring decline in spot LNG prices is not unusual. A similar decline was seen in 2012 and 2013, [but then] Asian demand […] recovered to support prices over the summer period (e.g. to hedge air-conditioning load and the start of preparations for winter). […] A couple of factors that normally provide support at low price levels, are unlikely to help this year. High storage levels will reduce injection demand this summer (caveat the impact of Russian cuts). And gas-fired power plants, which typically increase output as gas prices fall, are currently so far out of merit (vs coal plant) that power sector gas demand will provide little support. As a result, the timing and volume of spot LNG flows into Europe may be very important in determining the extent and duration of the European hub price slump. The structural Asian price premium over Europe is likely to return into next winter. But in the meantime the hub price slump may have further to run. These dynamics are an interesting preview of what will be a much more dynamic global gas market once flexible US LNG exports start to flow later this decade". In 'A Spring Slump in Spot Gas Prices', *Timera Energy*, 19 May 2014.

770 "The dynamism in the gas market since July 2014 is broadly based on three factors. First and foremost, with the spectacular fall of the oil price from USD 120 per barrel Brent to around USD 50 during the second half of 2014, gas prices have declined as well. Although oil and gas are not substitutes for each other, gas prices are linked to oil prices, particularly in Asia and to a lesser extent in Europe". In 'Natural Gas Prices Fall Across the World', *Atradius Economic Research*, November 2015.

and the expectation of new liquefaction plants coming on stream in the following months.[771] In the new global gas market architecture, the expectation of new LNG projects can have effects on prices before plants are actually commissioned, as buyers tend to contract less and reduce their purchase of gas to stock because they feel confident that they will be able to procure cheap spot volumes in the open market. Without major changes in the European supply and demand balance, European hub prices followed Asian spot prices in their descent. The TTF tumbled from a historical high of 29 EUR/MWh in December 2013 to a four-year low of 16.6 EUR/Mwh in July 2014. Oil prices only started to decrease in June – leading to the expectation of declining oil-indexed prices in early 2015 – and collapsed at the end of the year, reaching 58 $/bbl in December. When oil prices started to decline, European hub prices recovered – marking a temporary but significant decorrelation between the two. Russian contract prices in Germany, Italy and Central-Eastern Europe followed NBP and TTF prices, confirming that significant elements of hub indexation had been introduced by then. However, contract prices trailed hub prices with a time lag of approximately two months and bottomed at a higher level (albeit with a much smaller gap than in 2009). Finally, when LNG prices rallied in winter, in line with seasonal dynamics, the expectation of falling oil indexed prices put a cap on LNG spot price recovery. In fact, LNG buyers reduce their offtake in anticipation of falling oil-indexed prices, thereby increasing the availability of flexible LNG on spot markets and compounding the downward trajectory of hub prices.[772] In spite of low prices, and narrowing differentials with Asia, Europe did not import significantly larger volumes of LNG. The lower prices did not help gas consumption in Europe, as coal and CO_2 prices were still too low to trigger switching in the power sector. Finally, albeit with a narrower spread, European hub prices remained significantly higher than Henry Hub prices.

In 2015, while Asian and other international gas prices stabilised, the price of gas sold at European hubs and in long-term contracts with Russia continued to deteriorate. The impact of the mid-2014 oil price collapse finally translated into lower oil-indexed contract prices since early 2015. Pipeline gas imports into Europe increased, as Russian imports gained competitiveness throughout the Continent.[773] European buyers increased nominations in oil-indexed contracts for the first time in years, and started to optimise offtake from contracts within the year based on oil price expectations. Low oil prices masked the price effect of further progress in the adoption of hub indexation in Southern and Central-Eastern Europe. Thanks to low oil prices, oil-indexed prices remained not only at historically low levels, but also near hub price parity – reducing the sense of urgency to seek renegotiations among European importers (Chapter 6). European gas consumption grew by 4% on a yearly basis, increasing for the first time since 2010 due to an improved position of gas in the merit order.[774] Russian contract prices and hub prices showed unprecedented convergence. In 2015, the average annual spread between ITA and the TTF was 2.37 EUR/MWh and the average annual spread between CEE and the TTF was 2.26 EUR/MWh. This amounts to convergence, considering the

771 *Gas Quarterly Report, Q4 2014* (Brussels, 2014): European Commission.

772 *Ibid.*

773 This triggered renewed fears of overreliance on Russian gas, cf. G. Liubov, 'Gazprom's New Strategy of Control: Recapturing the EU Gas Market', *Geopolitical Monitor*, 13 July 2016.

774 *Gas Quarterly Report, Q4 2015* (Brussels, 2015): European Commission.

existence of transportation costs between the TTF hub area and Italy and Central-Eastern Europe. The average annual spread between BAFA and the TTF was only 0.93 EUR/MWh.

In the first half of 2016, both hub and contract prices continued to follow their downward trajectory. Hub prices, however, increased sharply in the last months of the year as a result of maintenance in French nuclear reactors, uncertainty surrounding the future of the Rough storage site in the United Kingdom, cold weather throughout Europe and recovering spot prices in Asia and other emerging markets.[775] The announced LNG glut did not touch Europe in 2016 – as delays in ramp-up acted as a limiting factor on the supply side and as niche markets in the Middle East, Latin America and South Asia absorbed volumes of flexible LNG well beyond expectations. On the other hand, oil-indexed prices reached historically low levels in the summer of 2016, becoming more convenient than hub prices. However, BAFA, CEE and ITA prices mostly followed hub price developments: by 2016, significant hub indexation had in fact been introduced in Russian contracts with Germany, Central-Eastern Europe and Italy (Chapter 6). Low gas prices drove European consumption up and Russian imports grew further by virtue of their reacquired price competitiveness.[776]

In 2017, European gas consumption and imports increased further, reaching the highest level since the peak of 2010. On the back of aggressive coal-to-gas switching, China absorbed most of the new LNG cargoes that were entering the global gas markets, preventing them from reaching European shores.[777] Oil prices recovered, albeit following a fairly smooth trajectory and remaining at lower levels than before 2014. Russian contract prices and hub prices continued to move more or less in sync, with marginal spreads (1-2 EUR/MWh). The average price of gas in Russian contracts with Italy and Central-Eastern Europe even fell below TTF price levels, with negative spreads in 10 out of 12 months, probably rooted in remaining oil indexation. On the other hand, the NBP was characterised by marked volatility and seasonality and became more disconnected from Continental European gas prices, as a result of issues with the Rough storage site.[778]

In 2018, European hub (and contract) prices grew in spite of a slowdown in GDP growth in all the quarters and weakening gas consumption. This was a result of 'commodity complex' dynamics and a heavy influence from higher oil prices.[779] High demand for storage drove prices further up at the beginning of the fall, with September 2018 hub prices reaching the highest levels since 2013 and touching 28 EUR/MWh. These developments appeared counterintuitive: after making efforts to promote market-reflective pricing for years, Europe was being exposed to high hub prices (and thus high contract prices) as a result of high oil prices – and this was happening at a time of extremely well-supplied global gas markets. Additionally, an interesting and unusual development that unfolded in 2018 was the opening of a substantial gap between BAFA prices and hub prices, with average German import prices at a substantial discount to Northwest European hubs in the second quarter (-2.54 EUR/MWh), in the third

775 *Gas Quarterly Report, Q4 2016* (Brussels, 2016): European Commission.

776 'Gazprom Export Volume Data Points to Strong Natural Gas Glows to Europe in September', *S&P Platts*, 16 September 2016.

777 Presentation by Maria Luisa Berlose (Total) at the Platts European Gas Summit, London, 2018.

778 *Gas Quarterly Report, Q4 2016* (Brussels, 2016): European Commission.

779 Presentations by S&P Platts at the Platts European Gas Summit, London, 2018.

quarter (-5.60 EUR/MWh) and in the fourth quarter (-4.44 EUR/MWh). Since there are no indications that German prices structurally decoupled from hub prices, the negative spread between BAFA and TTF could be due to specific arrangements between Gazprom and its German counterparts and mechanisms that smoothen the transmission of hub price movements into hub-indexed contract price movements.

Preoccupations for high European gas prices until September 2018 were dispelled by falling prices in the last quarter of 2018 and in the first months of 2019, triggered by declining Asian spot prices, similarly to 2014.[780] The widely announced LNG glut finally materialised, owing to limited absorption potential in non-OECD Asia. A new, important development was the decoupling of Asian spot prices (such as the JKM marker) from oil prices, which also eliminated the indirect influence of oil prices on European gas hub prices.[781] NBP and TTF prices halved in only nine months, reaching a level of 12-13 EUR/MWh in May 2019 – unseen since 2010. Trust in the merits of hub indexation rebounded[782], although it remains to be seen whether the current phase of decoupling between oil indexation and hub prices (in both Asia and Europe) will last. In the first and second quarters of 2019, Russian contract prices followed hub prices in their downward trajectory, with a limited time lag (1-2 months). At the time of writing, average monthly NBP prices were 12.32 EUR/MWh, TTF prices 13.17 EUR/MWh, BAFA prices 15.35 EUR/MWh, CEE prices 16.45 EUR/MWh and ITA prices 17.98 EUR/Mwh.

Outcomes and limitations of the comparative analysis between hub prices and average prices in Russian gas import contracts

Preliminary conclusions can be drawn from this comparative analysis. Between January 2009 and May 2019, the pricing of Russian gas exports into Europe underwent far-reaching transformations, with hub indexation becoming prevalent in Northwest Europe and making substantial inroads in Italy and Central-Eastern Europe around 2013. From our collection of wholesale price data, it can be observed that during this phase of sweeping transformations, European wholesale gas prices fluctuated considerably rather than following a distinct downward trajectory.

Another important observation is that in spite of the gradual adoption of market-reflective pricing mechanisms, European wholesale prices did not appear to be primarily set by European demand signals. This is related to the fact that oil prices and Asian gas demand exerted a significant influence on both hub prices and Russian contract prices throughout the period analysed. While oil prices ceased to directly set Russian contract prices in most of Europe, they continued to exert an indirect influence on hub prices, and thus on Russian contract prices.

Furthermore, and as a result of the above, the widespread adoption of hub indexation in Russian contracts did not avert prolonged phases of high prices. This was namely the case in

780 'Europe & Asian Gas Prices Slump', *Timera Energy*, 18 February 2019.

781 M. Fulwood, *Are Asian LNG Spot Prices Finally Decoupling from Oil?* (Oxford, 2019): Oxford Institute for Energy Studies.

782 Asian buyers are incentivised to renegotiate their oil-indexed contracts and include hub indexation, similarly to what happened in Europe years ago, see J. Jaganathan, 'Warp factor: Asia's LNG Markets Distorted by Oil Price Surge', *Gas Processing and LNG*, 25 April 2019.

2013, when both hub and contract prices rose and reached 28 EUR/MWh[783] despite the fact that European gas consumption had been dropping since 2010.[784]

Between 2014 and 2017, Europe enjoyed low prices, finally reaping the benefits of competition between LNG and piped gas. While spot prices started to decrease before oil prices did, low oil prices most likely contributed to dampen European gas prices in 2015 and in the following years. The fact that low oil prices coincided with a wave of new LNG projects hides the relative impact of both individual factors on European wholesale gas prices. Since 2013-2014, Russian contract prices and hub prices have been at similar levels in most of Western Europe, with contract prices periodically falling below hub prices at times of low oil prices as a result of remnants of oil indexation. As commodity prices rose again in 2017-2018, European wholesale gas prices followed, against expectations of a glut in global LNG markets.[785] In the last quarter of 2018, due to waning absorption by Asia, abundant LNG supplies eventually led to a global price decline, which also touched Europe.[786] Oil prices and hub prices decoupled in Asia, eliminating an importance source of indirect influence of oil prices on European hub prices. However, there is significant uncertainty around the duration of this phase, as prices are expected to rise again towards the early 2020s due to tightening global LNG markets. No conclusive evaluation can thus be made on the price effect of pricing transformations, as the next years will be crucial to test it at times of tightness.

So far, we observed that transformations in EU-Russia gas trade did not completely eliminate the influence of oil prices, did not provide Europe with Henry Hub price parity, and did not avert phases of high prices.[787] We also suggested that by looking at hub prices and contract prices collectively, fluctuations – rather than a clean downward trajectory – are visible. This does not mean that transformations in EU-Russia gas trade were altogether not beneficial to European importers.

In fact, if we insulate contract prices in the period analysed, it appears that fluctuations took place at a lower price level towards the end of the period. This becomes particularly visible by adding polynomial trendlines[788] to the price curves presented in Figure 29. We adopted polynomial lines with five bends (Order 5) because they visually simplify the fluctuating lines while still displaying a good fit with the dataset.[789] The trendlines help exposing that prices were still subject to cyclical dynamics in the second part of the period, but varied within a narrower band. This is merely an observation of dynamics between January 2009 and May 2019, and does not lead to the conclusion that cyclical price fluctuations now *structurally* take place at lower price levels. In fact, the trend might very well change in future, for instance in case of severe LNG tightness combined with high European demand[790] – as will be argued in

783 On the basis of our dataset, based on ICIS Heren, BAFA and other data.

784 According to Eurostat figures, EU gas consumption fell from 497 Bcm to 430 Bcm between 2010 and 2013.

785 M. Tay, 'Growing LNG Supply Glut Redefining Global Flows, Long-term Contracts: PIRA', *Reuters*, 10 November 2016 and A. Critchlow, 'After Oil, a Glut of Natural Gas may be Next to Flood Energy Markets', *The Telegraph*, 15 March 2015.

786 'Europe & Asian Gas Prices Slump', *Timera Energy*, 18 February 2019.

787 Particularly around 2012-2013, in spite of falling consumption.

788 See B. Albright, 'Mathematical Modelling with Excel', *Jones and Bartlett*, 2011.

789 R^2 of 0.9109 for BAFA, 0.8423 for ITA and 0.8372 for CEE

790 G. Sharma, 'Warnings Of LNG Supply Shortages After 2022 Should Be Taken Seriously', *Forbes*, 31 December 2018.

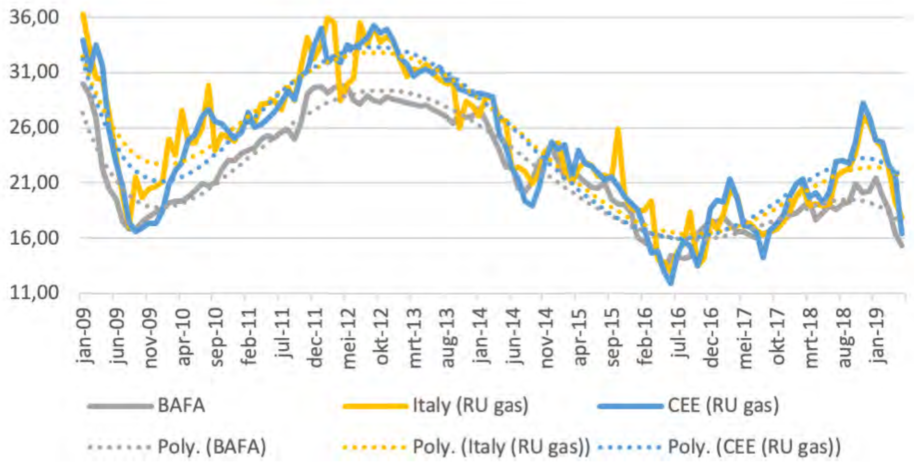


FIGURE 29: POLYNOMIAL TRENDLINES DISPLAYING THE EVOLUTION IN AVERAGE GERMAN IMPORT PRICES AND AVERAGE RUSSIAN GAS CONTRACTS WITH ITALY AND CENTRAL-EASTERN EUROPE (JANUARY 2009-MAY 2019), IN EUR/MWH. GRAPH BY THE AUTHOR – SOURCES: EUROSTAT COMEXT, BUNDESAMT FÜR WIRTSCHAFT UND AUSFUHRKONTROLLE.

other chapters of this dissertation. However, this observation remains relevant because one of the main reasons behind the high Russian contract prices in early 2009 and 2011-2012 – one of the factors responsible for the greater fluctuations in that period – were high oil prices, filtered through oil indexation.

On the basis of the above, the most important contribution of transformations in EU-Russia gas trade is that they led to convergence between Russian contract prices and hub prices, averting repetitions of the harmful spreads experienced in 2009-2014, when Russian contract prices in Central-Eastern Europe, Germany and Italy skyrocketed as a result of high oil prices. If a Central-Eastern European importer had hypothetically sourced Russian gas at TTF prices, it would have saved on average 11.6 EUR/MWh in 2009, 7.4 EUR/MWh in 2010, 5.1 EUR/MWh in 2011, 8.8 EUR/MWh in 2012, 4.1 EUR/MWh in 2013 and 2.5 EUR/MWh in 2014. A German importer would have saved 9.0 EUR/MWh in 2009, 3.6 EUR/MWh in 2010, 2.4 EUR/MWh in 2011, 4.1 EUR/MWh in 2012, 0.9 EUR/MWh in 2013 and 2.0 EUR/MWh in 2014. An Italian importer would have saved 12.9 EUR/MWh in 2009, 8.1 EUR/MWh in 2010, 5.7 EUR/MWh in 2011, 8.4 EUR/MWh in 2012, 3.4 EUR/MWh in 2013 and 3.2 EUR/MWh in 2014.[791]

However, these calculations do not take into account transportation costs and regulatory as well as infrastructural cross-border trade barriers resulting in price differentials between the TTF hub area and Central-Eastern Europe, Germany and Italy. These elements *de facto* prevent importers in Central-Eastern Europe, Germany and Italy from sourcing gas at TTF parity, even in case of full hub indexation in their contracts with Russia. This does not overturn the general observation, particularly for the years between 2009 and 2012, as these price differentials

791 ICIS Heren, Eurostat Comext, Bundesamt für Wirtschaft und Ausfuhrkontrolle.

were, at most, around 1-2 EUR/MWh.[792] Another *caveat* is that the figures are annual averages of monthly spreads, and do not take into account possibilities of within-year procurement optimisation. For these reasons, the savings listed above are only hypothetical.

Furthermore, a number of factors make it impossible to calculate the impact of pricing transformations on the gas import bill on the basis of the comparative analysis contained in this section. These are the oil indexation time lag, the evolving hybrid nature of contract prices and the fact that – due to confidentiality – we only have approximations of the share of hub and oil indexation at a given time. It is in fact impossible to calculate the spread between hub-indexed and oil-indexed price levels on the basis of BAFA-TTF, CEE-TTF, and ITA-TTF spreads, as BAFA, CEE and ITA prices have gradually incorporated hub indexation components.

For this purpose, it is useful to introduce a theoretical indicator that shows how contract prices *would have evolved* if the original oil indexation had been preserved, with no renegotiations nor price/pricing concessions on the part of Gazprom. This theoretical indicator can then be compared with hub and contract prices. The spread will give additional indications on the potential price effect of pricing transformations as well as of savings realised. In any case, a full quantification of the impact on the gas import bill is impossible because we cannot exactly say how much Russian gas *would have been sold* in the past had price conditions been different.

7.3 EUROPEAN WHOLESALE GAS PRICES RELATIVE TO PLATTS' GAS CONTRACT INDICATOR

Because hub indexation gradually made inroads in Russian gas contracts, it is not possible to calculate the spread between hub-indexed and oil-indexed prices based solely on a comparative analysis of TTF prices and Russian average contract prices (BAFA, CEE, ITA). A marker that allows to achieve a significantly better comparison is the Northwest European Gas Contract Indicator (GCI) provided by Platts. This is a theoretical indicator that reveals the resulting price of a model oil-indexed long-term gas import contract in Northwest Europe. It is calculated on the basis of average low sulphur fuel oil and 0.1% gasoil prices for Northwest Europe, converted into EUR/MWh price based on the average dollar-euro exchange rate over a period of six months.[793] The formula gives a 45% weighting to gasoil and a 55% weighting to fuel oil[794], which we consider to be in line with average historical long-term contracts (Chapter 5). The formula also applies a fixed discount factor of 30% to reflect the fact that gas imports contracts set the price of gas below the oil-equivalent price.[795]

While it is possible that single companies may use (or may have used) different contract formulae[796], the indicator is a good proxy for how traditional oil-indexed formulae used to look in the era prior to pricing transformations described in Chapter 6. Importantly, the indicator does not include any discounts accounting for renegotiations. In other words, it shows how

792 ACER Gas Market Monitoring Reports.

793 'Specifications Guide European Natural Gas Assessments and Indices', *S&P Global Platts*, updated 2019.

794 *Ibid.*

795 *Ibid.*

796 *Ibid.*

oil-indexed prices would have developed if the complex, full-fledged renegotiations of the early 2010s described in Chapter 6 had not taken place.

As demonstrated in previous chapters, renegotiated terms were often a compromise by Gazprom to make the contract price reflect hub prices without structurally introducing hub indexation. Renegotiated terms should thus be themselves regarded as an integral part of the process of transitioning to hub pricing. Since our aim is to investigate the monetary impact of the transition to hub pricing, it is important to have a theoretical indicator that insulates oil-indexed prices from all the consequences of the transition to new pricing mechanisms, so that we can compare historical oil-indexed prices with hub-indexed prices. For comparison purposes, we have adopted here the GCI *month-ahead* price. This price takes into account the oil indexation time lag and reflects the period comprised between the previous two to seven months.

One possible limitation of Platts' GCI is that it refers specifically to Northwest Europe. On the basis of the observation that historical long-term contracts had similar structures, clauses and formulae before the advent of hub indexation, and that it was the transition to hub pricing *itself* that engendered substantial divergence among European contract prices[797], the GCI could be regarded as a proxy of prices that historical long-term contracts delivered in other parts of Central-Western Europe, too. However, as will be shown later, Platts' GCI traded at a discount to CEE and ITA for most of 2009 and 2010, showing that Central-Eastern European and Italian importers were charged higher prices than Northwest European importers even when historical long-term oil-indexed contracts were in place. Platts' GCI can thus be regarded as a robust proxy for historical Russian gas contracts with Northwest European importers, but as a less robust and/or discounted proxy for historical Russian gas contracts with Central-Eastern Europe and Italy.

Figure 30 below offers a comparison of the major European hub prices and the Platts GCI, for which we only have data since May 2009 (rather than since January 2009, as in previous datasets). From Figure 30, it is clearly observable that traditional oil-indexed formulae delivered higher prices than hubs in the period comprised between 2009 and May 2016. Throughout this relatively long period, hub prices have thus been clearly advantageous from a buyers' perspective. The premium in oil-indexed contracts was particularly high between 2011 and mid-2014, a period of high oil prices (Figure 28), and up to early 2015, as a result of the oil indexation time lag. Unsurprisingly, the largest gaps are observable at times of diverging tendencies in oil and gas markets (tightness in one coexisting with supply abundance in another).

797 Franza, *Long-term Gas Contracts in Europe*.

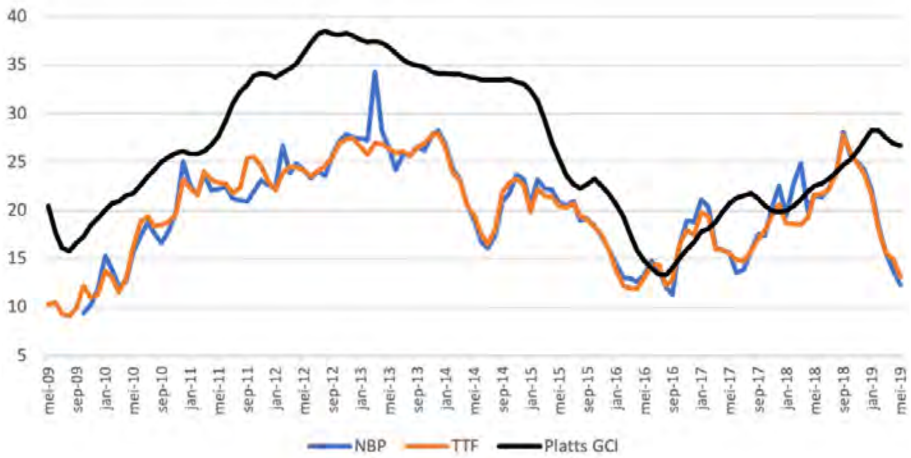


FIGURE 30: EVOLUTION IN NBP AND TTF PRICES, AND COMPARISON WITH PLATTS' GCI (MAY 2009-MAY 2019), IN EUR/MWH. GRAPH BY THE AUTHOR. SOURCES: PLATTS, ICIS HEREN, OFGEM

Figure 31 below presents an alternative visualisation by displaying the spread between Platts' GCI and the TTF in the period analysed. The GCI-TTF spread fluctuated in an approximate band of 5-10 EUR/MWh in the second half of 2009, 3-9 EUR/MWh in 2010, 2-11 EUR/MWh in 2011, 10-14 EUR/MWh in 2012, 6-12 EUR/MWh in 2013, 8-17 EUR/MWh in 2014, 3-13 EUR/MWh in the first half of 2015 and 2-6 EUR/MWh in the second half of 2015.[798] Falling oil-indexed prices and relative tightness in global LNG markets delivered negative spreads in selected periods.[799] In these periods, historical oil-indexed formulae without renegotiations would have delivered prices that were more convenient to buyers than the TTF. Nevertheless, these periods were quite short-lived, and the GCI-TTF spread always remained positive on an annual basis. Even if, as argued, oil prices kept on exerting an indirect influence on hub prices, the conclusion is that the specific dynamics observed in the past decade made TTF prices significantly more convenient for buyers than historical oil-indexed prices. Dutch gas buyers thus realised significant savings on their import bill by switching to TTF early in the period. The same considerations apply to British buyers, as NBP and TTF largely overlapped.

Until a certain point, as has been widely documented so far, Russian gas contracts with importers outside of the core hub areas of The Netherlands and the UK were endowed with the traditional oil-indexed clauses. Reflecting this, prices in such contracts followed Platts' GCI (with a premium) until a certain point, and then diverged as either direct hub indexation or renegotiated terms that *de facto* brought contract prices and hub prices in line were introduced. As is clearly visible from Figure 32, Russian gas contract prices with Germany started to decouple from the trajectory of historical oil-indexed prices in 2010, with an acceleration in divergence in 2011-2012. Russian gas contract prices with Italy and Central-Eastern Europe started to decouple in 2012, with an acceleration in divergence in 2013-2014.

798 ICIS Heren and Platts data.

799 June-July 2016, October 2016-February 2017, December 2017 and September-October 2018.

FIGURE 31: SPREAD BETWEEN THE PLATTS' GAS CONTRACT INDICATOR AND THE TTF PRICE (MAY 2009-MAY 2019), IN EUR/MWH. GRAPH BY THE AUTHOR. SOURCES: PLATTS, ICIS HEREN.

Subsequently, GCI-BAFA, GCI-CEE and GCI-ITA spreads (Figure 32) followed trajectories similar to GCI-TTF and GCI-NBP spreads, including (less) short periods of negative spreads when renegotiated contract prices were higher than the historical contract price indicator[800]. With regard to this, it should once again be taken into account that Platts' GCI refers to historical contracts in Northwest Europe, and not to historical contracts in Central-Eastern Europe or Italy – a limitation to its applicability for comparative purposes.[801] However, this objection loses part of its strength when we analyse the second part of the period under consideration. In fact, as gas market liberalisation advanced and the EU increased its use of antitrust powers, market partitioning and price discrimination by Gazprom became untenable. Therefore, the hypothesis can be made that Gazprom would have been forced to ensure that historical long-term contracts would deliver similar prices in various countries of Europe regardless of the adoption of hub indexation (albeit potentially at higher levels if compared to price levels delivered by hub indexation). Again, similarly to GCI-TTF and GCI-NBP dynamics, a strong decoupling of average prices in Russian gas contracts with Central-Eastern Europe, Germany and Italy from the historical long-term contract indicator can be seen in early 2019 (Figure 32).

800 CEE prices were higher than Platts' GCI prices (i.e. the GCI-CEE spread was negative) in July 2016-September 2016; December 2016-March 2017; January-February 2018 and November 2018. ITA prices were higher than Platts' GCI prices (i.e. the GCI-ITA spread was negative) in October 2015; March 2016; July-September 2016; December 2016; February-April 2017; February 2018 and November 2018. BAFA prices were higher than Platts' GCI prices (i.e. the GCI-BAFA spread was negative) only between June and December 2016.

801 'Specifications Guide European Natural Gas Assessments and Indices', *S&P Global Platts*, updated 2019.

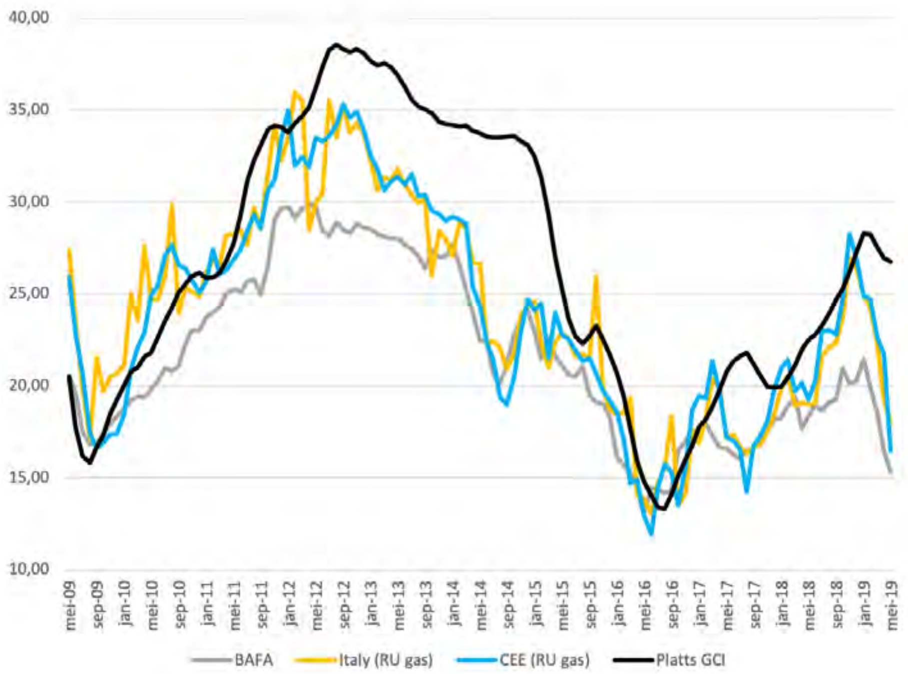


FIGURE 32: EVOLUTION IN NBP AND TTF PRICES, AND COMPARISON WITH PLATTS' GCI (MAY 2009-MAY 2019), IN EUR/MWH. GRAPH BY THE AUTHOR. SOURCES: PLATTS, EUROSTAT COMEXT, BUNDESAMT FÜR WIRTSCHAFT UND AUSFUHRKONTROLLE.

When analysing developments in average prices in Russian gas contracts, the BAFA-TTF, CEE-TTF, ITA-TTF spreads[802] can be interpreted as indicative of the 'opportunity cost' of not having been able to obtain hub-indexed terms earlier. Conversely, the GCI-BAFA, GCI-CEE, GCI-ITA can be interpreted as indicative of the savings realised by having been able to renegotiate historical contractual prices.

7.4 IMPLICATIONS FOR THE EUROPEAN GAS IMPORT BILL

To translate these findings into considerations on potential implications for the European gas import bill, it is necessary to calculate monthly Russian gas import volumes and multiply them by the different wholesale unit prices presented so far. This operation will provide us with an approximation of gross potential savings in moving from oil indexation to hub indexation.

As announced earlier in this chapter, this is only going to be an approximative figure, because we operate under an assumption of inelasticity on the buyers' side. This consists in assuming that – should the spread between hub and contract prices have been different – EU buyers would have not varied the amount of Russian gas imports. This assumption is realistic when we look at periods of low European gas demand, in which EU buyers minimised their offtake

802 Or, in alternative, BAFA-NBP, CEE-NBP, ITA-NBP spreads.

of Russian gas sold under long-term contracts, thus losing the ability to further react to price signals.[803] It is however less realistic for subsequent periods, when European buyers would have had room for more elastic behaviour. It is in fact very likely that if Gazprom had been successful in retaining traditional oil-indexed formulae, less Russian gas would have been imported by Europe. However, there is no way to calculate how much Russian gas European buyers would have bought in the past if pricing conditions and price levels had been different. This is mainly because other variables would have been moving targets. Notably, the price of competing sources of gas (such as LNG, Norwegian gas or North African gas) would have reacted to the European supply-demand balance and European long-term contract offtake behaviour.

To quantify monthly imports throughout the period analysed, we have used the International Energy Agency's Gas Trade Flow (GTF) database[804], insulating imports into the core EU gas markets for which we had calculated average import prices (or proxies thereof) earlier.[805] The country selection is depicted in Figure 33 below. As was mentioned earlier in this chapter, BAFA prices can also be considered adequate proxies for imports into neighbouring countries such as Belgium and France, and CEE prices can be considered proxies for a wider area extending beyond the Czech Republic, Hungary and Slovakia. Coherently with the previous sections, we have thus excluded peripheral countries with limited penetration of hub indexation. As stated earlier, this does not compromise observations on consequences on the EU energy import bill, because our sample countries accounted for 92% of EU gas demand in 2018.

The data coverage goes from January 2010 to December 2018, which is a good overlap with the period analysed in previous sections (which ran from 2009 to May 2019). To calculate monthly Russian gas imports into core EU gas markets, we have calculated flows at the following entry points (Figure 33): Beregdaroc (on the Ukraine-Hungary border), Drozdowicze (on the Ukraine-Poland border), Kondratki (on the Belarus-Poland border), Greifswald (entry point of Nord Stream on the German Baltic coast), Tietierowka (on the Belarus-Poland border), Velke Kapusany (on the Ukraine-Slovakia border) and Wysokoje (on the Belarus-Poland border). This selection thus excludes Russian exports to Bulgaria, Estonia, Greece, Finland, Latvia, Lithuania and Romania – as well as to North Macedonia and Turkey, which are not part of the EU (Figure 33). In fact, the need not to have figures distorted by the inclusion of Turkey (a large buyer of Russian gas not touched by events described in this dissertation) is one of the primary reasons behind our selection.

803 Franza, *Long-term Gas Import Contracts in Europe*

804 Gas Trade Flows: IEA, available at https://www.iea.org/gtf/

805 See the section 'Comparative analysis of European wholesale gas price level variations in light of pricing mechanism transformations'.

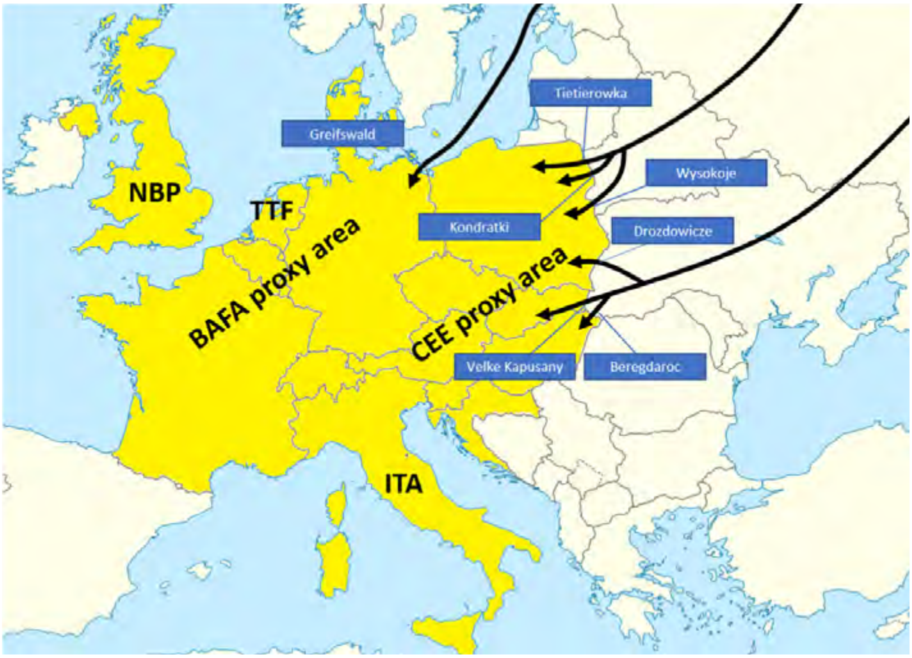


FIGURE 33: CORE EU GAS MARKETS INCLUDED IN THE SELECTION (IN BRIGHT YELLOW), WITH INDICATIONS OF (PROXY) PRICE AREAS (FOR RUSSIAN GAS IMPORTS) AND ENTRY POINTS OF RUSSIAN GAS INTO THIS REGION. MAP BY THE AUTHOR.

An additional issue that needs to be tackled is that, since 2013-2014, Ukraine started to import increasingly significant volumes of Russian gas through Poland, Hungary and Slovakia.[806] These volumes need to be subtracted from the sum of all the Russian gas volumes entering the EU through the abovementioned entry points, otherwise they would be incorrectly counted as Russian gas imports into core EU markets. For this reason, we have calculated the total monthly volumes rerouted from the EU to Ukraine through the following exit points: Beregdaroc (on the Ukraine-Hungary border), Budince (on the Ukraine-Slovakia border) and Hermanowice (on the Ukraine-Poland border).

806 Reverse flows from the EU to Ukraine amounted to approximately 2 bcm in 2013 and 5 bcm in 2014, peaking at 13.8 bcm in 2017. In the meantime, Ukraine has stopped direct imports of Russian gas and has taken active steps to curtail its consumption of natural gas.

For visualisation purposes, only the annual results of this calculation are reported below. These annual figures might not coincide with Gazprom's export delivery statistics[807] or official Eurostat figures due to different methodologies and country selections.

Ideally, for the kind of assessment that we aim to make, we should insulate Russian gas monthly imports into single price areas.[808] This is however not possible on the basis of the IEA GTF database. While data for single entry points into e.g. Germany, Italy, France are available, they also include non-Russian gas, and namely Norwegian gas. Moreover, while *annual* Russian gas import data by country are available in other databases (such as historical collections of Gazprom delivery statistics), *monthly* Russian gas import data are not available on a country-level basis.

	2010	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**	**2018**
Beregdaróc	6979	5800	5579	6324	6390	5839	6564	11452	11635
Drozdowicze	3371	3948	3773	3846	3404	3656	4456	4625	3832
Kondratki	27425	27458	28509	34077	34026	33378	34555	34340	34423
Nord Stream	0	649	11272	23525	34027	36019	43668	49397	56762
Tietierowka	72	78	92	91	71	74	77	83	83
Velke Kapusany	66585	68748	49964	52552	30833	37027	47848	52496	50519
Wysokoje	3257	3238	3222	2929	2536	2542	3278	3225	3041
Sum of all entry points	107690	109919	102411	123343	111287	118535	140445	155618	160295
Reversed flows to UKR	0	0	52	2095	4930	10138	10890	13810	10408
Russian imports into core EU	**107690**	**109919**	**102359**	**121248**	**106357**	**108397**	**129555**	**141809**	**149887**

FIGURE 34: ANNUAL SUMS OF MONTHLY RUSSIAN GAS IMPORTS INTO CORE EU COUNTRIES, PER ENTRY POINT, IN MILLION CUBIC METRES. TABLE BY THE AUTHOR - BASED ON THE IEA GTF DATABASE.

807 Available at http://www.gazpromexport.ru/en/statistics/
808 NBP, TTF, ITA, BAFA, CEE.

On the basis of available data, we can calculate the difference in gas import bills under full oil indexation and TTF price levels between 2010 and 2018.

Month	∆ Mln EUR	Month	∆ Mln EUR	Month	∆ Mln EUR	Month	∆ Mln EUR	Month	∆ Mln EUR
Jan. 2010	670	Jan. 2012	1.068	Jan. 2014	854	Jan. 2016	650	Jan. 2018	141
Feb. 2010	722	Feb. 2012	932	Feb. 2014	893	Feb. 2016	672	Feb. 2018	187
Mar. 2010	890	Mar. 2012	761	Mar. 2014	1.034	Mar. 2016	625	Mar. 2018	339
Apr. 2010	789	Apr. 2012	989	Apr. 2014	1.295	Apr. 2016	410	Apr. 2018	364
May 2010	483	May 2012	1.002	May 2014	1.466	May 2016	198	May 2018	117
Jun. 2010	275	Jun. 2012	949	Jun. 2014	1.531	Jun. 2016	-41	Jun. 2018	133
Jul. 2010	295	Jul. 2012	1.073	Jul. 2014	1.470	Jul. 2016	-99	Jul. 2018	119
Aug. 2010	365	Aug. 2012	993	Aug. 2014	1.226	Aug. 2016	99	Aug. 2018	18
Sep. 2010	513	Sep. 2012	1.027	Sep. 2014	825	Sep. 2016	125	Sep. 2018	-374
Oct. 2010	604	Oct. 2012	969	Oct. 2014	781	Oct. 2016	-160	Oct. 2018	-90
Nov. 2010	591	Nov. 2012	865	Nov. 2014	694	Nov. 2016	-238	Nov. 2018	164
Dec. 2010	312	Dec. 2012	1.132	Dec. 2014	726	Dec. 2016	-76	Dec. 2018	424
Jan. 2011	370	Jan. 2013	1.005	Jan. 2015	734	Jan. 2017	-254		
Feb. 2011	383	Feb. 2013	981	Feb. 2015	417	Feb. 2017	-127		
Mar. 2011	221	Mar. 2013	1.040	Mar. 2015	609	Mar. 2017	291		
Apr. 2011	379	Apr. 2013	950	Apr.2015	515	Apr. 2017	447		
May 2011	507	May 2013	981	May 2015	503	May 2017	602		
Jun. 2011	504	Jun. 2013	1.001	Jun. 2015	327	Jun. 2017	717		
Jul. 2011	759	Jul. 2013	970	Jul. 2015	219	Jul. 2017	763		
Aug. 2011	639	Aug. 2013	947	Aug. 2015	257	Aug. 2017	748		
Sep. 2011	515	Sep. 2013	853	Sep. 2015	368	Sep. 2017	462		
Oct. 2011	676	Oct. 2013	798	Oct. 2015	535	Oct. 2017	312		
Nov. 2011	917	Nov. 2013	704	Nov. 2015	378	Nov. 2017	58		
Dec. 2011	1.008	Dec. 2013	739	Dec. 2015	572	Dec. 2017	-85		

FIGURE 35: RUSSIAN GAS IMPORT BILL IN CORE EU MARKETS – DIFFERENCE BETWEEN A SCENARIO IN WHICH RUSSIAN GAS IMPORTS WERE SUBJECT TO FULL OIL INDEXATION ACCORDING TO HISTORICAL FORMULAE AND A SCENARIO IN WHICH THEY WERE AT TTF PARITY.

In other words, we can calculate the sum that would have been paid if TTF parity had been applied and compare it with the sum that would have been paid if historical oil-indexed clauses had been applied. It is important to highlight that these are the two extreme scenarios[809] rather than a loyal representation of realities on the ground. For this purpose, we have taken monthly average Platts' GCI and TTF prices and calculated their spread. We have then

809 Complete TTF parity vs. full status quo

converted the spread into Euros per cubic metres and multiplied the result by the volumes (in cubic metres) imported monthly from Russia.

For example, in the first month of our dataset (January 2010), the Platts' GCI was 20.02 EUR/MWh and the TTF price was 13.76 EUR/MWh. The spread was thus 6.26 EUR/MWh, or 0.0612 EUR/cubic metre. Based on the IEA GTF database, core EU markets imported 10.95 Bcm of Russian gas in that month. Therefore, the delta between the import bill delivered by full oil-indexation according to historical formulae (GCI) and the import bill delivered by TTF price parity in January 2010 was 669.680.034 Euros. This means that if all core EU buyers had been able to obtain Russian gas priced on the TTF in January 2010, they would have saved 669 million Euros relative to a scenario of full oil indexation according to historical formulae.

The total value of the delta between TTF and GCI prices in the period between January 2010 and December 2018 was 61.98 billion Euros. The annual average implied savings from moving away from full indexation to historical oil-indexed formulae to TTF parity prices was 6.87 billion Euros. The period when adopting hub indexation would have resulted in the largest import bill savings was 2012-2014. In fact, the delta was 11.76 billion Euros in 2012, 10.97 billion Euros in 2013 and 12.79 billion Euros in 2014. The delta was also quite high in 2009-2010[810] and in 2015[811]. Conversely, the delta was the lowest in the last three years of the period covered: 2.16 billion Euros in 2016, 3.93 billion Euros in 2017 and 1.54 billion Euros in 2018. This is mostly due to falling oil prices, as explained at length in previous sections. The delta was negative in 10 out of 108 months.[812] In other words, Europe's Russian gas import bill would have been lower with historical oil indexation than TTF price parity in these ten months. Although they are not included in these calculations due to data limitations, the first months of 2019, as seen in previous sections, witnessed the re-opening of a wide GCI-TTF spread and thus of a high delta in potential import bills.

These numbers reveal that the highest savings could have been realised between 2012 and 2014. Moving to hub indexation would have provided the highest return in that period, and indeed this was reflected in an increase in long-term contract renegotiations (and EU antitrust activism[813]). In reality, only some European importing countries had been able to secure large shares of hub indexation by then. Although partial hub indexation had been introduced, oil indexation was still playing an important role in Germany and, more in general, in Northwest European countries outside of The Netherlands and the UK. This prevented them from realising the full savings potential. Italian and Central-Eastern European importers only started to obtain hub-indexed pricing terms towards the end of that period. This means that these importers missed out on important potential savings to be realised from transitioning to hub indexation. In fact, by the time they obtained large shares of hub indexation in their contracts with Russia, the delta had significantly reduced. In any case, the impact on their import bill is still positive.

810 6.51 and 6.88 billion Euros respectively.

811 5.43 billion Euros.

812 June-July 2016, October 2016-February 2017, December 2017, September-October 2018.

813 A. Barker et al., 'Gazprom Raided in EU Antitrust Investigation', *Financial Times*, 27 September 2011.

An alternative calculation can be based on the GCI-BAFA spread. As was explained earlier, the figure of 61.98 billion Euros resulting from the calculations above measured the potential impact on Europe's Russian gas import bill of having adopted TTF rather than full oil indexation. It is not, however, an accurate representation of the savings obtained in reality. In an alternative scenario, we can check for what would have happened to Europe's Russian gas import bill if all of the core EU markets had followed a 'German path' (i.e. paying BAFA prices) rather than sticking to historical oil-indexed formulae. Germany was a relatively early mover in the process of renegotiating long-term contracts, but has had hybrid contract prices for most of the period analysed. Moreover, the BAFA price is often considered as a proxy for Russian gas contract prices to the EU as a whole. This makes BAFA prices more reflective of reality on the ground across the EU than TTF prices, which are rather reflective of the best possible scenario for EU buyers.

From our calculations, it emerges that if all of the core EU markets had paid BAFA prices rather than GCI prices between 2010 and 2018, the savings on the Russian gas import bill would have been 50.76 billion Euros. Similar to what has been observed in the previous scenario, the largest deltas are in the period 2012-2014. An interesting difference is that very large savings[814] would have also been realised in 2018. This is reflective of the discount of BAFA prices vis-à-vis TTF prices in 2018. Annual deltas are reported below. The average annual saving under this scenario was 5.64 billion Euros, 1.23 billion Euros less than in the previous one based on GCI-TTF spreads.

Year	Δ import bill with BAFA prices vs GCI prices, EUR
2010	2.610.551.885
2011	4.268.763.095
2012	7.699.210.105
2013	9.950.712.224
2014	10.553.710.103
2015	4.480.575.577
2016	791.474.136
2017	4.384.839.106
2018	6.021.666.520

FIGURE 36: RUSSIAN GAS IMPORT BILL IN CORE EU MARKETS – DIFFERENCE BETWEEN A SCENARIO IN WHICH RUSSIAN GAS IMPORTS WERE SUBJECT TO FULL OIL INDEXATION ACCORDING TO HISTORICAL FORMULAE AND A SCENARIO IN WHICH THEY WERE IN LINE WITH AVERAGE GERMAN IMPORT PRICES.

Finally, we can calculate the delta between the European Russian gas import bill under full oil indexation and the European Russian gas import bill based under contract prices in Italy and Central-Eastern Europe.

814 6.02 billion Euros

Year	Δ import bill with ITA prices vs GCI prices, EUR	Year	Δ import bill with CEE prices vs GCI prices, EUR
2010	-1.919.676.273	2010	-1.063.720.325
2011	802.634.984	2011	1.504.848.588
2012	3.388.605.359	2012	2.986.910.278
2013	7.045.082.137	2013	6.286.307.503
2014	9.181.404.541	2014	9.831.047.802
2015	2.805.399.987	2015	3.081.900.844
2016	37.001.125	2016	848.317.024
2017	3.468.661.472	2017	2.962.489.574
2018	2.492.380.654	2018	1.196.978.818

FIGURE 37: RUSSIAN GAS IMPORT BILL IN CORE EU MARKETS – DIFFERENCE BETWEEN A SCENARIO IN WHICH RUSSIAN GAS IMPORTS WERE SUBJECT TO FULL OIL INDEXATION ACCORDING TO HISTORICAL FORMULAE AND A SCENARIO IN WHICH THEY WERE IN LINE WITH AVERAGE GERMAN IMPORT PRICES.

As has been shown above, Italy and Central-Eastern Europe did obtain hub-indexed terms over time, but with a delay vis-à-vis Northwest Europe. Therefore, making a calculation on the basis of these prices for a geographical area that includes Northwest European countries means greatly underestimating import bill savings (just like the first calculation based on GCI-TTF spreads meant greatly overestimating them). In both cases, the highest deltas can be observed for 2013 and 2014. The total delta for the period between 2010 and 2018 is 27.30 and 27.64 billion Euros for ITA and CEE prices respectively. Average annual delta were 3.03 billion Euros and 3.07 billion Euros respectively.[815]

Concluding remarks on implications for the European import bill

These findings allow us to: 1.) demonstrate that the transition to hub pricing is a development that has at least some geo-economic significance, by virtue of its impact on Europe's gas import bill; 2.) confirm that, in the period when it happened, there was a geo-economic incentive for the EU to adapt pricing mechanisms in long-term gas contracts with Russia; 3.) put forward the hypothesis that, so far, the adoption of hub indexation resulted in a lower bill for gas imports from Russia, in a range of 3.03-6.87 billion Euros per year; 4.) show that import bill savings fluctuate greatly, as a result of the key influence exerted by underlying (global) market conditions as well as oil price levels; 5.) establish that, in about 10% of the months analysed, importers would have actually been better off with oil indexation, and that this mostly happened when oil prices were low while hub prices were driven up by high Asian demand, which dried up LNG flexible cargo availability.

However, we could not exactly calculate the savings resulting from the transition away from oil indexation and the analysis presented above has a number of limitations: (1) Platts' GCI refers to Northwest Europe, and not to Italy or Central-Eastern Europe. This is an issue particularly for

815 The negative delta in 2010 is due to the fact that Platts' GCI refers to Northwestern Europe and a decade ago buyers in Italy and Central-Eastern Europe paid a premium in oil-indexed long-term contracts relative to Northwestern European buyers.

the year 2010, when GCI-CEE and GCI-ITA spreads were negative; (2) if Gazprom had hypothetically been able to stick to historical oil-indexed formulae throughout the period analysed, imports of Russian gas would have been lower, with the result that gross savings would have been lower, particularly when demand recovered after 2014 and EU buyers regained the ability to discriminate offtake on the basis of prices; (3) it was not possible to obtain an accurate breakdown of monthly Russian gas imports per country or price area, which forced us to make calculations under hypothetical scenarios in which all of the core EU markets would pay TTF, BAFA or CEE/ITA prices. While the second issue is not easy to solve, further research could improve these findings and elaborate more precise calculations by introducing a GCI for countries outside of Northwest Europe and monthly Russian gas imports per country (or price area).

In previous sections, we had concluded that the adoption of hub indexation had not led to a clear downward trajectory in European wholesale gas prices. European prices remained well above Henry Hub and the adoption of hub indexation did not avert phases of high prices, not fully justified by underlying European gas demand developments. The findings of this section allow us to conclude that, if oil indexation had been maintained, European wholesale gas prices would have been even higher.

One important question remains to be answered: how important are these developments in relation to Europe's overall import bill?

7.5 THE ROLE OF RUSSIAN GAS IN EUROPE'S ENERGY IMPORT BILL

In the last decade, European foreign energy policy has been focussed on the gas relation with Russia.[816] Other countries and energy carriers have received considerably less attention, in spite of geopolitical turmoil spreading to many hydrocarbon-producing regions. Finding ways to limit exposure to Russian gas has almost become a synonym with energy security. The EU has intensified its rhetoric to diversify away from Russian gas, and the entire dossier has been progressively securitised, particularly after the events that unfolded in Ukraine after 2014, which – it is worth reminding – did not lead to disruptions of Russian gas supplies to Europe.

The United States are also actively lobbying for reducing Russian gas imports into Europe, namely by opposing Nord Stream 2 and promoting US LNG imports instead. President Trump has also motivated American opposition to Nord Stream 2 on geo-economic grounds. He notably stated that European countries like Germany should not be involved in projects that will end up enriching Russia. According to his interpretation, this amounts to transferring rents to a geopolitical rival – a threat to core Western interests. He also denounced what he regards as an apparent contradiction: the US spends significant amounts of money to protect Western allies from Russia, therefore Western allies should not transfer rents to Russia by means of gas trade.[817]

816 A. Judge and T. Maltby, 'European Energy Union? Caught Between Securitisation and Riskification', *European Journal of International Security*, 2:2 (2017); Franza, L. 'Bone of Contention or Instrument of Peace? The Role of Gas in the EU's Relations with Suppliers', *Clingendael Spectator*, 72 (2018).

817 R. Chilcote, 'Trump Scolded Germany for Buying Gas from Russia. Here's What we Know', *PBS*, 11 July 2018.

As we have established in the last sections, the transition to hub pricing was a geo-economically significant development, by virtue of its impact on the Russian gas import bill. However, does this justify the dominance of Russian gas in European foreign energy policy? And does this justify American objections to European gas trade with Russia on geo-economic grounds? In order to answer these questions, it is necessary to put things in perspective and compare the monetary weight of Russian gas with the monetary weight of other energy carriers and other countries.

For this purpose, we have extracted data from Eurostat. Reflecting mounting preoccupations for Russian gas imports, the Commission has recently published a short report on the monetary value of energy imports into Europe, singling out Russian gas imports.[818] This report covers the period comprised between 2012 and the first semester of 2018. We have used the Eurostat database to extract data for the missing periods (2010, 2011 and the second half of 2018).[819] A limitation of that database is that part of Russian gas imports are listed as confidential trade. Their value can however be derived by applying the average ratio between the value of Russian gas imports and the total value of gas imports taken from years when comprehensive data is available. According to these calculations, the value of Russian gas imports was 31.4 billion Euros in 2010, 36.1 billion Euros in 2011, 34.1 billion Euros in 2012, 36 billion Euros in 2013, 30 billion Euros in 2014, 26.3 billion Euros in 2015, 20.8 billion Euros in 2016, 23.8 billion Euros in 2017 and 30.4 billion Euros in 2018. This is an average of 29.9 billion Euros per year. Fluctuations in the value of Russian gas imports were quite large throughout the period, and the lowest values were recorded between 2015 and 2017, when oil prices were low and the spread between traditional oil-indexed contracts and hub prices were minimal. Ironically (from the perspective of politicians who are fearful of overreliance on Russian gas), those were the years when Gazprom sold record volumes to Europe. Oil price developments greatly influenced the value of Russian gas imports into Europe throughout the period, both directly and increasingly through their indirect influence on hub prices, according to the dynamics explained so far.

The total value of gas imports into the EU was 74.2 billion Euros in 2010, 90.3 billion Euros in 2011, 93.7 billion Euros in 2012, 85.6 billion Euros in 2013, 71.1 billion Euros in 2014, 64 billion Euros in 2015, 50 billion Euros in 2016, 57.3 billion Euros in 2017 and 71.4 billion Euros in 2018. The share of Russian gas imports in total gas imports value remained fairly constant throughout the period, between 36% and 43%

While ca. 30 billion Euros per year or 40% of total gas import value might seem a lot, this figure pales in comparison with the value of oil imports.

We calculated the value of oil imports by using the same Eurostat database. The value of total crude oil imports into the EU averaged 244.2 billion Euros per year between 2010 and 2018. If oil products are added, the oil import bill averaged 311.4 billion Euros per year. Russia earned

818 'EU Imports of Energy Products – Recent Developments', available at https://ec.europa.eu/eurostat/statistics-explained/pdfscache/46126.pdf

819 International trade in goods, SITC – Eurostat.

a large share of this money, almost exactly one third. On average, Russian oil imports to the EU were worth 103.8 billion Euros per year between 2010 and 2018. Absolute fluctuations in the oil import bill were much larger than fluctuations in the gas import bill, ranging from a lowest point of 193 billion Euros in 2016 to a highest of 421.7 billion Euros in 2012. Figure 38 below provides a visualisation of the period comprised between 2012 and 2018, distinguishing between Russian and non-Russian gas, oil, oil products and coal.

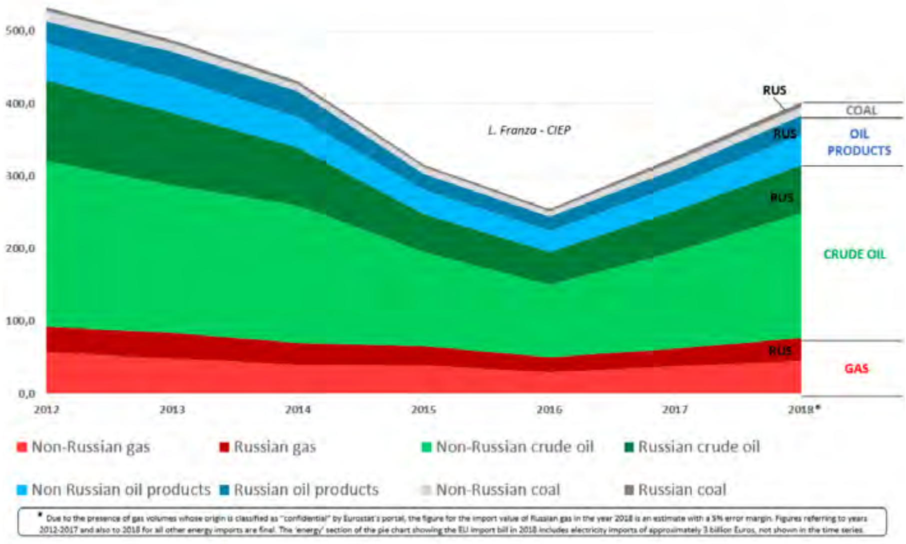


FIGURE 38: MONETARY VALUE OF ENERGY IMPORTS INTO THE EU (2012-2018), RUSSIAN AND NON-RUSSIAN, IN BILLION EUR. GRAPH BY THE AUTHOR BASED ON EUROSTAT DATA.

In the last year covered in our analysis, 2018, the EU's total energy import bill amounted to 399.1 billion Euros. Oil product and crude oil imports amounted to 237.3 billion Euros, gas imports amounted to 71.4 billion Euros, coal imports to 17.7 billion Euros and electricity imports to 3.3 billion Euros.

Gas thus represented 17.9% of the EU's total energy import bill, and Russian gas a mere 7.6%.

Russian gas does not, therefore, appear to be the main driver of the EU energy import bill. This entails that the focus of the foreign energy policy discourse on Russian gas does not appear to be justified on geo-economic grounds. It is outside the scope of this dissertation to discuss whether it is justified on more purely geopolitical grounds. From a geo-economic perspective, oil imports (including from Russia) have a much bigger weight. Fluctuations in oil prices greatly affect the energy import bill and overall trade balance of the EU, to the extent that any other developments are overshadowed. This also applies to the transition to hub pricing in long-term gas import contracts. The savings realised thanks to contract renegotiations are certainly not irrelevant and can be regarded as something positive for the EU. However, they do not seem to have greatly affected Europe's overall energy import bill, let alone the overall trade balance. This needs to be remembered when weighing benefits and negative repercussions of transformations in EU-Russia gas trade, which will be discussed in the next chapters.

7.6 ARE FINDINGS RELEVANT FROM AN IPE PERSPECTIVE?

In this chapter, we conducted a political-economic analysis and looked beyond the 'private ordering' dimension of gas contracts by assessing them from the perspective of inter-State relations and cross-border monetary movements. We also highlighted the geo-economic ambitions of Europe in promoting hub indexation, and discussed to what extent they were met so far.

More generally, so far in the dissertation it has been demonstrated that European gas market liberalization and, more specifically, the adoption of hub pricing in long-term gas import contracts, had both a geo-economic rationale and geo-economic consequences, among others. Not only Chapter 7, but also Chapters 5 and 6 looked beyond the 'private ordering' dimension of long-term gas import contracts, considering instead their political-economic, public dimension. This approach is the opposite of a reductionist understanding of contracts as mere business arrangements between individual companies. Clearly, different approaches to the study of contracts, revolving more around their commercial relevance for individual firms, could also have scientific value and lead to noteworthy insights. However, limiting the discussion on international gas contracts to their 'private ordering' dimension would be too narrow an approach, and important insights would be missed.

Given the politically charged history of EU-Russia gas trade, the characteristics of the gas industry, the strategic value of natural gas for both the EU and Russia, and the significant amounts of money at stake in the gas business, gas contracts are not only privately, but also publicly (and therefore politically) relevant. As a result, politics and economics are equally important lenses to understand long-term gas import contracts and the broader political-economic impact of their transformations. This makes the approach of this and previous chapters essentially coherent with International Political Economy (IPE).

As discussed in Chapter 2, IPE is a loosely defined discipline because it is split in several schools of thought. As Cohen (2014) suggested, somewhat provocatively, there is so much disagreement in the field that the only statement with which IPE scholars would collectively agree is that their discipline has something to do with 'politics' and 'economics' in an 'international setting'.[820] A more structured definition is provided by Gilpin (1975), according to whom IPE could be defined as the study of 'reciprocal and dynamic interaction in international relations between pursuit of wealth and pursuit of power'.[821] The pursuit of wealth (or profit) refers to the realm of economics, while the pursuit of power is ascribed to the realm of politics (in fact, discussions on the nature of power dominate academic discussions in political science). By 'reciprocal', Gilpin meant that neither economics nor politics should

820 B. Cohen, *Advanced Introduction to International Political Economy*, 2nd edition (Cheltenham, 2019): Edward Edgard.

821 Gilpin, *The Political Economy of International Relations.*

take precedence, as they mutually influence each other. Profits lead to power and power leads to profits. By 'dynamic', Gilpin wanted to highlight that things change. Rather than on grand theorisations of world structures, which are bulky and thus more static and less subject to change, the focus should be on transformative elements.

The approach to long-term gas import contracts of Chapters 5, 6 and 7 is coherent with all of Gilpin's qualifications of IPE. As a matter of fact, in order to study how transformations in long-term contracts affected the political balance between Europe and Russia ('power'), we chose to investigate the monetary impact ('wealth') of these transformations, by measuring their impact on the European import bill in Chapter 7. The underlying assumption is that power is aggrandized through the accumulation of wealth. As shown in Chapter 2, the realisation that the distribution of resources is ultimately at the heart of politics is perhaps the key tenet of IPE. An example of the centrality of distributional outcomes is provided by Harold Laswell's work 'Politics: Who Gets What, When, How?'[822].

Previously, in Chapter 5, the *vice versa* was showed, i.e. how an essentially political process (liberalization and political bargaining) led to the transformation of the way in which economic transactions are conducted. In fact, in Chapter 5, the role of political institutions such as the Directorate-General for Competition and other branches of the European Union was highlighted. This confers to the dissertation that element of 'reciprocity' between politics and economics that Gilpin, Strange and other IPE scholars valued so dearly (Chapter 2). Indeed, in Chapters 2 and 3, emphasis was put on the fact that a genuinely politico-economic approach should not rank political and economically variables hierarchically, but rather treat them as equally important (Stoddard, 2013).[823] Finally, the dissertation is inherently 'dynamic' because contracts have been analysed over a period of ten years. Transformation is, in fact, the ultimate subject of analysis.

The interactions between domestic and international factors and their effect on economic policies and outcomes are at the centre of IPE's analysis. Frieden and Martin (2002)[824] referred to this as the 'international-domestic frontier' and indicated the 'domestic political economy *of* foreign economic policy' as a key area of investigation for IPE. One of the resulting observations is that economic measures taken domestically have a great impact on international economic transactions. This, once again, resonates in this dissertation: in fact, Chapter 5, 6, and 7 demonstrated that an important way in which the European Union altered its external gas trade balance with Russia was to aggressively push for internal gas market reform. From this perspective, this dissertation can be regarded as an analysis of international distributional effects of national economic policies, in line with Frieden and Marten's plea. As a matter of fact, one of the mantras of EU energy policy-making is that the establishment of a well-functioning *internal* market is the best insurance against *external* security of supply risks. The underlying conviction in Brussels is that the EU can aim to draw new rules of the game in trade

822 Lasswell, *Politics: Who Gets What, When, How.*

823 Stoddard, 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-economic Alternative'.

824 J. Frieden and L.L. Martin, 'International Political Economy: Global and Domesic Interactions', in I. Katnelson and H. Milner (eds.), *Political Science: The State of the Discipline* (New York, 2002): W.W. Norton

by virtue of its leverage as a market of 500 million people. Conversely, the EU's external engagement is relatively limited, and often confined to political calls for diversification and largely symbolic gestures. The EU does not take an active role in the construction of politically-charged gas projects. After three decades of heated discussions, grand announcements and the political plan to build a Southern Gas Corridor that would cut Europe's dependency on Russia, Europe will finally receive 10 Bcm per year through the Trans-Adriatic Pipeline. This is, to say the least, a modest result. With regard to LNG, the most effective measure taken by the EU was to support the construction of regasification terminals. This was, once again, an intervention within its borders. This is to show that the EU has mostly pursued its foreign economic (energy) policy interests through internal intervention.

Chapters 5, 6 and 7 demonstrated how a process (gas market liberalization) that had started internally, and that initially targeted European incumbents – which were in fact opposed to it – ended up having international repercussions. As renegotiations started to be successful, European companies changed their stance and their interests generally realigned with those of the European Commission and national governments. In fact, it can even be argued that, in their negotiations with Gazprom, European midstreamers benefitted by having their hands tied by EU energy law. In line with the Schelling conjecture[825], this arguably gave them more bargaining power. In fact, Gazprom ascertained that it was beyond the control of European gas importers to change the gas market rules that essentially forced them to ask for hub pricing to avoid bankruptcy. Another element that Frieden and Marten (2002) underlined is that, when analysing the international-domestic frontier, it is important to recognise feedback effects at both levels, or, in other words, to simultaneously understand the mutual causation between domestic and international factors. As mentioned in Chapter 2, IPE generally calls for dismantling a strict analytical separation between international and domestic spheres. As was also stated in Chapter 2, IPE believes that States contribute to creating economic structures of production, but are in turn shaped by processes that unfold within such structures. While Chapters 5, 6 and 7 mostly focussed on the *external* impact of internal market reforms, Chapter 9 will assess whether changes in international trade (with the EU) are likely to affect changes in the domestic Russian market, for instance by changing Gazprom's posture within Russia, or by changing the Russian government's demands to Gazprom with regard to its socio-economic function.

With regard to methodology, the approach adopted in Chapter 7 can be characterised as empirical, or hypothetico-deductionist, in the sense that the hypothesis that – by virtue of its scale – the spread of hub indexation must have produced at least some political-economic consequences was first formulated, and then verified through a quantitative analysis. Furthermore, after a number of qualitative observations, it was also possible to intuitively hypothesise that the political-economic consequences of transformations in contracts were globally favourable to Europe in the period between 2009 and 2019. Again, this hypothesis has then been tested and confirmed by a quantitative analysis in the second part of Chapter 7.

825 According to the Schelling conjecture, negotiators can often benefit from having their hands tied. If a legislature must ratify an international agreement and if the legislature will only approve a narrow range of agreements, the negotiator can use this fact as bargaining leverage. Therefore, negotiators might see advantages in being bound by a legislature. From J. Frieden and L.L. Martin, *Internationl Political Economy: the State of the Sub-Discipline* (2001): Harvard University Press.

In terms of coverage, the focus was on the monetary impact of the abovementioned transformations on European countries, rather than on Russia, individual companies, EU-Russia relations or the trade system (regime) as a whole.

Therefore, it can be concluded that Chapter 7 has a positivist-empiricist, State-centric approach – typical in many ways of the American school of IPE. As a matter of fact, according to Cohen's taxonomy, the American school of IPE is characterized by the believe that knowledge is best obtained by appealing to objective observation and the systematic evaluation of evidence. Instead of the grand conceptualizations found in British IPE, American IPE focusses on 'mid-level theories', while the system has characteristics that are not questioned. Normative concerns are usually downplayed, and American IPE mostly aims to describe the reality rather than to offer judgements. Conjectures are based on deductive reasoning, and then tested for accuracy (hypothetico-deductivism), with a preference for quantitative methods.[826] Moreover, sovereign States take central role as both actors and units of analysis in American IPE: similar to IR, the State is regarded as the primary *locus* of authority.[827] State behaviour is thus a fundamental area of enquiry, and one of the principal aims is to understand the role of national policies in the global economy. Also, it can be argued that Chapter 7 embraces a Realist perspective, as its foundational hypothesis essentially rests on the zero-sum assumption that either the EU or Russia would benefit from new pricing mechanisms; postulates that the geo-economic benefit can be quantified, albeit approximatively, by calculating the impact on the import bill; and operates under the assumption that power is aggrandized by a rise in national income. This is opposed to the Liberalist emphasis of mutual gains, compromises, negotiations and normativity.

Far from being value-neutral or historically inexorable as is sometimes argued or assumed by neoclassical economists, promoting free market principles in gas trade (and, more specifically, pricing) was a deliberate, political-economic choice made by the EU in the 1990s. This deliberate choice led to far-reaching transformations in long-term gas import contracts, the backbone of EU-Russia gas trade for decades. These contracts were essentially rooted in both politics and economics, as shown in Chapter 5, as was EU-Russia gas trade more broadly. As a result of these far-reaching transformations, the trade balance between the EU and Russia has also undergone some changes. While these should not be overestimated, particularly because the impact of oil trade on the overall trade balance is much larger, it is possible to conclude that, in the last decade, the EU benefitted monetarily from them. This observation leads to the conclusion that, via the external effect of domestic reforms, the EU has so far been successful in cross-border value redistribution. In line with Goldthau et al.[828], while not targeting Russia exclusively or specifically (EU incumbents were the first 'victims' of market restructuring), these domestic reforms had an external impact. States attempt to shape the international economic order in a way that profits them, and the EU is no stranger to this game.

826 Cohen, *Advanced Introduction to International Political Economy*

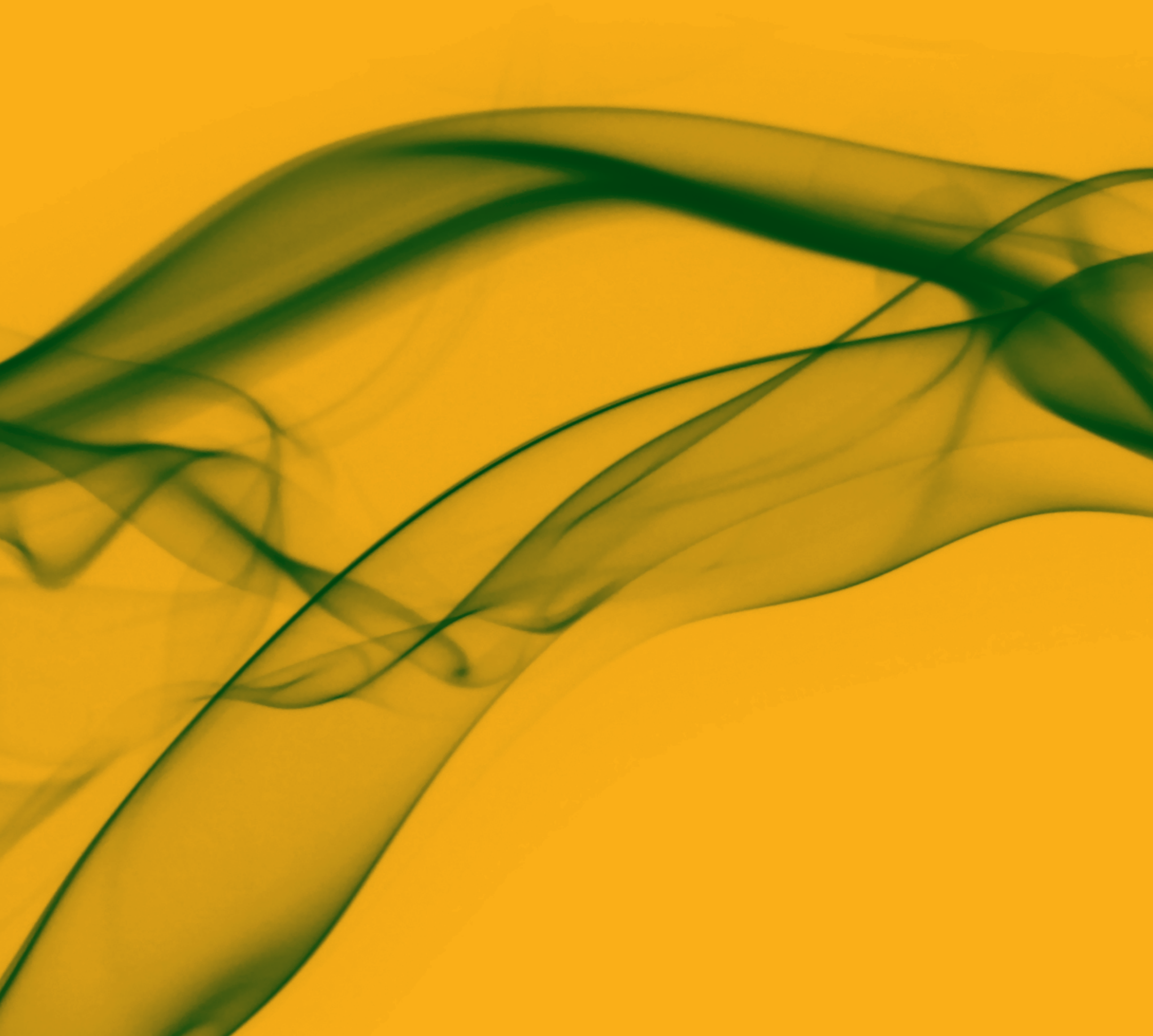
827 *Ibid.*

828 A. Goldthau et al, 'Regulatory or Market Power Europe? EU Leadership Models for International Energy Governance'.

This is in fact one of the ways in which the EU can exert its power most effectively, in default of a strong military. The EU has not hidden and is not hiding its ambitions of spreading the gas-to-gas competition model beyond its borders, both to favour liberalization and the adoption of market-based pricing in supplying countries like Russia and to inspire reform in other importing countries, namely in East Asia, to keep global gas markets as 'open' as possible.

CHAPTER 8

LOOKING BEYOND THE GAS IMPORT BILL SAVINGS: IMPACT ON THE RELATIONAL NATURE OF EU-RUSSIA TRADE, INVESTMENTS AND SECURITY OF SUPPLY



CHAPTER 8 – LOOKING BEYOND THE GAS IMPORT BILL SAVINGS: IMPACT ON THE RELATIONAL NATURE OF EU-RUSSIA TRADE, INVESTMENTS AND SECURITY OF SUPPLY

8.1 INTRODUCTION

Chapter 7 showed that the introduction of hub indexation in long-term gas contracts with Gazprom allowed the EU to pay lower import prices than she would have paid if oil indexation had been applied between 2009 and 2019. It also found that these savings are relatively marginal when compared to the EU's overall energy import bill, and even more so when compared to its total trade balance.

However, the findings of Chapter 7 are insufficient to derive the conclusion that the transformations described in Chapters 5 and 6 produced long-term benefits for the EU from a political-economic perspective. The findings of Chapter 7 cannot be considered conclusive for two main sets of reasons.

The first reason why it would be premature for the EU to 'claim victory' is that the impact of the transformations in EU-Russia gas trade modes on security of gas supply is still unknown. \\\. A deterioration in EU-Russia trade relations and security of supply might, in turn, produce negative political-economic consequences for both the EU and Russia.

Secondly, the monetary assessment provided in Chapter 7 only covers a specific period of time. Economic reforms sometimes lead to one distributional outcome in the short term and to a different one in the long term. The length of the time span within which a measurement is done matters, and impacts on the findings. This could also very well be the case for gas market liberalisation and the introduction of hub indexation. The finding that the EU realised savings between 2009 and 2019 does not offer guarantees against high gas prices in future. In fact, the measurement performed in Chapter 7 does not offer conclusive evidence as to whether the positive effect of new EU-Russia gas trade terms on the EU is structural or rather contingent to the specific phase analysed. Is it possible that the gas import bill gains observed in Chapter 7 evaporate if gas market conditions change, namely with a shift from oversupply to tightness? This question is also relevant for security of supply, a notion that is usually expanded so as to include 'affordability' as a criterion.[829] Cynical remarks such as 'security of supply is not an issue, because if Europe pays the highest price, gas will always come' are occasionally raised in the gas community. Such remarks completely neglect the macro-economic dimension of international gas trade, and seem to go against the most widely accepted definitions of security of supply.

Transaction Cost Economics (TCE) literature, reviewed in Chapter 3, offers valuable insights on the importance of relational elements in long-term contracts, which need to be understood to investigate the security of supply effects of trade transformations. TCE also gives valuable insights on the link between contract types and investment, which is key to understand the longer-term distributional outcome of transformations in gas trade terms and the affordability dimension of security of supply. As has been explained in Chapter 3, TCE is a valuable alternative lens to neo-classical economics because it contemplates the possibility that real-life transactions take place in imperfect market settings. It has also been explained that natural gas markets are far from being 'perfect markets' in neoclassical economic terms, given the natural monopoly characteristics of gas infrastructure and oligopolistic external gas supply. In fact, the development of well-functioning hubs increases the number of market interactions, but the oligopolistic structure of the European market may leave space for strategic behaviour (Del Valle et al., 2017)[830]

In Chapter 9, notions from other branches of New Institutional Economics, also reviewed in Chapter 3[831], will be applied to explain why EU market liberalisation and the adoption of hub pricing are unlikely to generate deep change in Russia, in spite of Western neoliberal policy transfer ambitions, i.e. ambitions to project the free-market, gas-to-gas competition model onto exporting countries (Chapter 5).

This Chapter aims to complement Chapter 7 not only in terms of content, but also from a methodological perspective. In fact, it lends an ear to the pleas made by IPE scholars, particularly those of the British School, to avoid excessive positivism and empiricism in analysing international political-economic issues (Chapter 2). The use of TCE and other NIE notions is also a way to take on board calls for interdisciplinarity, equally made by British IPE scholars. NIE and IPE have a lot of commonalities. As indicated by Richter (2005), a key tenet for various NIE schools is the assertion that (political) institutions are crucial, and that the emphasis should be on the need to study the relationship between economic activity and the

829 Only very narrow definitions of security of supply exclusively consider physical deliverability as a criterion. Most definitions include a reference to an 'acceptable' or 'affordable' price level as a criterion to achieve security of supply. The IEA notably defines energy security as "the uninterrupted availability of energy sources at an affordable price" and states that "lack of energy security is […] linked to the negative economic and social impacts of either physical unavailability of energy, or prices that are not competitive or are overly volatile". The IEA defines the acceptation of security of supply that includes affordability considerations as 'long-term', as opposed to 'short-term' security of supply which focusses on operational issues ("long-term energy security mainly deals with timely investments to supply energy in line with economic developments and sustainable environmental needs"). See https://www.iea.org/topics/energysecurity/whatisenergysecurity/.

830 A. del Valle et al, 'A Fundamental Analysis on the Implementation and Development of Virtual Natural Gas Hubs', *Energy Economics*, 67 (2017), 520-532.

831 Institutional path dependence, institutional complementarity, governance inseparability and the logic of appropriateness.

institutional and political environment.[832] At the basis of both IPE and NIE there is the recognition that institutions have key distributional effects and that political choices influence economic outcomes.

Besides complementing the positivist-empiricist approach of Chapter 7 with a more qualitative-critical approach, this Chapter also offers an alternative to the zero-sum, Realist, Mercantilist undertone of Chapter 7, by looking beyond the easily measurable monetary savings that have been achieved between 2009 and 2019 through the gradual adoption of hub pricing. It also complements it by adopting a more normative perspective, as it highlights the importance of mutual trade dependence between Europe and Russia, and the potential risks of undermining historical long-term contracts. Generally speaking, it looks at the so-called 'Big Picture' of IPE (Cohen 2014)[833], by taking into account international gas market developments, the structure and some key characteristics of the natural gas sector, security of supply and the global trend of rising mercantilism.

8.2 IMPACT OF THE TRANSFORMATIONS IN EU-RUSSIA GAS TRADE TERMS ON EU-RUSSIA TRADE RELATIONS

Long-term gas contracts between Gazprom and European buyers have been the linchpin of EU-Russia gas trade for decades (Chapter 5). Hence, the transformations that they have undergone (Chapter 6) are likely to have far-reaching implications on the overall EU-Russia gas trade relation. This opinion is shared by Skalamera (2016), who studied how EU gas market reforms and increasingly diverging views on gas trade led to the end of a shared common governance structure between the EU and Russia, and the beginning of a highly fragmented governance architecture.[834] As observed by Gustafson (2020), at the beginning of the 1990s the Russians were playing in the EU gas market under one set of rules and understandings and were then faced with overarching transformations in the 2010s. They had not anticipated these transformations, and for a long time they did not understand and accept them[835].

One of the reasons why transformations undergone by gas contracts have a bearing on EU-Russia gas trade relations at large is that, as set forth in Chapter 5, those contracts were not designed as temporary business arrangements, whose structure could be easily transformed and replaced with an alternative one with little consequences for the parties involved. As explained in Chapter 5, given their complex design, altering one element required compensation by simultaneously altering other elements. A balance of interests needed to be re-established inside and outside contracts every time a modification was introduced. Making alterations '*à la carte*' was discouraged by the contracts' original design.

Relational features were rooted in historical contracts: as argued in Chapter 5, long-term gas import contracts were an essential component of the gas-for-pipes deals, which were in turn intended to boost mutual trust between Western Europe and the Soviet Union – an essentially political objective. Relational contracts have been defined by Gibbons and Henderson (2012)

832 Richter, 'The New Institutional Economics, Its Start, Its Meaning, Its Prospects'.

833 Cohen, *Advanced Introduction to International Political Economy*.

834 Skalamera, 'Invisible but not Indivisible: Russia, the European Union, and the Importance of Hidden Governance'.

835 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*.

as forms of "collaboration sustained by the shadow of the future as opposed to formal contracts enforced by courts". [836] The notion that relational contracts can be commonly found in economic organisation and are crucial to govern certain economic transactions is an established one. Relational contracts have been studied in numerous disciplines, including sociology, since Macaulay (1963)[837] analysed informal relationships between firms; anthropology, since Geertz (1962, 1978)[838] studied the importance of credit associations and bazar economies; and political science, where Ostrom (1990)[839] applied the notion of relational contracts to examine communities of resource users. Several scholars also investigated the strategic importance of long productive relationships between firms, including Dyer (1997)[840], Dyer and Singh (1998)[841], Poppo and Zenger (2002)[842] and Gulati and Nickerson (2008)[843].[844]

These relational contracts have had significant political-economic relevance. These deals were the result of both high-level political coordination and far-sighted commercial considerations on how to organise a trade relation that should have lasted for at least two decades in order to pay back the initial investments. In fact, those contracts delivered the long-term assurances needed by both parties to allocate highly idiosyncratic investments, through a resilient yet delicate risk balance. For decades, the perception on both sides was that long-term contracts allowed fair, or at least mutually acceptable, risk sharing. The risk profile of entire company portfolios was thus structured around them.

Strong relations between executives accompanied and complemented long-term contracts, sustaining trade throughout decades: "the contracts between them were long-term affairs […] negotiated by career professionals who came to know and respect one another as fellow members of a 'Gas Club' that put business first and ideology second (Gustafson 2020)."[845] The managerial mindset and *modus operandi* were deeply influenced by the existence and the features of long-term import contracts. The point-to-point, de-risked and pass-through business model was the one with which most senior executives were comfortable, and its subversion implied a significant shift in mindset (and competences) to which not everybody

836 R. Gibbons and R. Henderson, 'Relational Contracts and Organizational Capabilities', *Organization Science*, 23:5 (2012).

837 S. Macaulay,'Non-contractual Relations in Business: A Preliminary Study', *American Sociology Review*, 28:1 (1963).

838 C. Geertz, 'The Rotating Credit Association: A Middle Rung in Development', *Economic Development and Cultural Change*, 10:3 (1962) and C. Geertz, 'The Bazaar Economy: Information and Search in Peasant Marketing', *American Economic Review*, 68:2 (1978).

839 E. Ostrom, *Governing the Commons: The Evolution of Institutions for Collective Action* (Cambridge, 1990): Cambridge University Press, 1990.

840 J.H. Dyer, 'Effective Interfirm Collaboration: How Firms Minimize Transaction Costs and Maximize Transaction Value', *Strategic Management*, 18:7 (1997), 535-556

841 J.H. Dyer and H. Singh, 'The Relational View: Cooperative Strategy and Sources of Interorganizational Competitive Advantage', *Academy of Management Review*, 23:4 (1998) 660-679.

842 L. Poppo and T. Zenger, 'Do Formal Contracts and Relational Governance Function as Substitutes or Complements?', *Strategic Management Journal*, 23:8 (2002), 707-725.

843 R. Gulati and J.A. Nickerson, 'Interorganizational Trust, Governance Choice, and Exchange Performance', *Organization Science*, 19:5 (2008), 669-806.

844 Gibbons and Henderson, 'Relational Contracts and Organizational Capabilities'.

845 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 2.

was ready to adapt. Some, particularly in Gazprom, but also among European executives (Skalamera, 2016)[846], are still not ready (or able) to let go of the old business model.[847]

Arguably, the long-term commercial relation between the Russian and the European gas industry built around historical relational contracts cemented stability in EU-Russia gas trade for decades (Skalamera, 2016).[848]

As narrated by Gustafson (2020): "A generation of men emerged in the West European countries who specialized in the negotiation and renegotiation of these contracts on the other side of the table from the Soviet negotiators […] Burkhard Bergmann at Ruhrgas, Yves Cousin at Gaz de France, Domenico Dispenza at SNAM, James Alcock at British Gas […] their relationship with their Soviet […] counterparts took on a character that was moulded by trust and tension that were intrinsic in such enormous deals. And with that came the awareness that there was a vital political dimension to the deals they struck – above all to the importance of producing something that was commercially solid in a climate that was politically fragile"[849]

Thanks to the fact that midstream companies could pass through additional supply procurement costs to end-users, they and Gazprom found it easy to maintain a relation that was mutually profitable, until exogenous disturbance[850] came in the form of new EU energy law, mandating the end of destination clauses and subsequently stricter rules against market partitioning. There was also the mutual, tacit incentive to keep natural gas at an 'acceptable' price so that it would not be displaced by competing fuels in Europe. Another relational element is that Gazprom eventually nurtured an interest in the survival of its Western European partners. First of all, Gazprom executives valued the relation they had with their Western European counterparts, cemented through personal contacts and *quid-pro-quo* (not always easy to track, and often intangible exchange). Secondly, Gazprom strategically needed midstreamers for market access. In the most intense phase of long-term contract renegotiations in the early 2010s, it can be argued that – in spite of everything – Gazprom shared an interest to avoid that European midstreamers would go bankrupt and that this consideration, together with threats of adverse arbitration rulings, convinced Gazprom to offer relief before it was forced to do so by arbitration panels. In fact, contrary to mainstream hostile portrayals by mass

846 "Many in Europe (especially the regulators) wished essentially for natural gas markets that would resemble oil markets: liquid, interconnected, and dominated by spot pricing. […] Many European executives,together with Gazprom, wondered if Europeans ought to be more careful what they wished for". In Skalamera, 'Invisible but not Indivisible: Russia, the European Union, and the Importance of Hidden Governance', page 29.

847 On the conservatism of Gazprom's business model, see A. Aslund, *Russia's Crony Capitalism: The Path from Market Economy to Kleptocracy* (New Haven-CT, 2019): Yale University Press.

848 "These relationships allowed gas to flow, unhindered, throughout the Cold War as well as during the collapse of the Russian state in the 1990s and its later restoration." ". In Skalamera, 'Invisible but not Indivisible: Russia, the European Union, and the Importance of Hidden Governance', page 29.

849 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 86.

850 According to the perception of the gas industry in the period when EU gas market reforms were introduced. Skalamera (2016) noticed how both EU Member States and EU energy firms have fiercely opposed DG Competition's proposals of banning long-term contracts. Skalamera noticed also that the rivalry is mostly between Member States backed by energy firms on the one hand and the EU institutions on the other hand, rather than between Member States and energy firms. As it was concluded in previous chapters of this book, the process of EU gas market liberalisation was met with strong opposition inside of Europe too. Cf. Skalamera, 'Invisible but not Indivisible: Russia, the European Union, and the Importance of Hidden Governance'.

media and politicians, on multiple occasions Gazprom has adopted substantial self-restraint in its gas dealings in Europe.[851]

Channels between large companies, such as Shell, ENI, and RWE on the one hand and Gazprom on the other remained open even when the official governmental channels were frozen, owing to deteriorated political relations. Skalamera (2016) refers to this as the 'hidden level' of governance in EU-Russia energy relations.[852] At times when Western and Russian governments were at loggerheads, European companies continued to work closely with Gazprom by not only trading gas, but also by signing joint-ventures and financing Gazprom-led projects. Intangible agreements and *quid-pro-quo* have been important features of the commercial relation between EU buyers of Russian gas and Gazprom, possibly involving also long-term contract clauses.[853] In the pre-liberalisation era, there were of course occasional renegotiations and arbitrations, but not to the extent seen in the early 2010s (Chapter 5).

Even if Gazprom and European partners still engage in joint projects, as proven by collaboration on Nord Stream 2, which continues in spite of political opposition, the changes occurred in the European gas market provoked an erosion of the old established consensus between them. They also eroded the feeling that supplying European consumers was a somewhat 'shared responsibility'. Gazprom experienced EU gas market liberalisation and the projection of free-market principles onto long-term contracts as an external imposition. In line with North (1991), institutional change occurred in this context did not emerge spontaneously to create and nurture the market, but reflected the interests of those players in a position to put it in place.[854] The new market architecture encourages short-term gain rather than sacrificing current value for the sake of a greater gain to be made in future. It does not assign a particular value to a solid long-term relation. In fact, open market exchange is the most impersonal type of exchange.

Nowadays, Gazprom and European buyers constantly have to interpret each other's steps and are increasingly wary of possible zero-sum strategic moves. These include the possibility that Gazprom might use its oligopolistic position to manipulate spot prices and the risk that European buyers might dump volumes on the spot market to reduce prices. For years, Gazprom's reluctance to embrace the new trade terms was based on the argument that conducting trade mostly on (oligopolistic) hubs could lead to politicisation and a deterioration of the relation, as Europe could have suspected (and accused) Gazprom of manipulation.

851 A number of papers emphasise that while crises make headlines, averted crises do not. In reality, Gazprom adopts substantial self-restraint in its gas dealings with Europe, including in the Ukraine dossier. See namely Stulberg, 'Out of Gas? Russia, Ukraine, Europe and the Changing Geopolitics of Natural Gas'.

852 According to Skalamera (2016), The EU-RU energy relation is defined not only by the macro level (EU-RU direct cooperation) or the meso level (internal negotiations in the EU) but also by the "hidden level" (ties between Gazprom and EU energy firms). I Cf. Skalamera, 'Invisible but not Indivisible: Russia, the European Union, and the Importance of Hidden Governance'.

853 The room for manoeuvre enjoyed by the parties to a relational contract allows them to elaborate relation-specific arrangements as long as the risk balance is preserved. Although it is not officially documented, it is conceivable that Russian offers to access Russian upstream or Russian requests to support a Russian pipeline project within the EU could have been linked to the introduction of price premiums or discounts in long-term contracts with EU counterparts. Schemes of this type become more difficult to implement when the contract price is set by the market, as the parties lose the ability to tweak pricing mechanisms.

854 D.C. North, 'Institutions', *Journal of Economic Perpsectives*, 5:1 (1991), 97-112.

The way in which relations between Gazprom and Europe has evolved is a far cry from the original notion of planning a sector together, which used to be prevalent in the 1970s at the time of the gas-for-pipes deal. Conflictuality, confrontation and mutual distrust increased, at least in part as a result of more and more diverging views on how to organise gas trade. As argued by Finon and Locatelli (2007), liberalisation has eroded the traditional relationship of mutual trust between the EU and Russia.[855] Since the refusal to ratify the Energy Charter, Russia has been opposing the idea of bringing its legislation in line with the pro-market paradigm promoted by the EU. Pressures by the Commission to either break long-term contracts or radically change some of their key clauses were identified by Finon and Locatelli (2007) as one of the strongest symptoms of the fact that Russia and the EU became completely at cross purposes.[856] Finon and Locatelli also found that given Russia's opposition to the new European paradigm, a dominant position in the European market of a company controlled by the Russian government automatically makes supplies from Russia a political issue, prompting concerns that long-term contracts might have become unstable.[857] As Gustafson (2020), sharply and expressively puts it "economic relations that had initially supported cooperation and partnership became causes of discord and conflict".[858] Of course, the broader context of deterioration in EU-Russia relations also played a role in eroding mutual trust. A contextualisation has been provided in Chapter 5, but a detailed account of all the steps that led to a deterioration in EU-Russia political relations this lies outside the scope of this book.

The first sign of the abovementioned growing conflictuality is the sharp increase in the number of arbitrations between Gazprom and European importers (Chapter 6). Besides being a sign of instability in itself, resorting to arbitration has tangible commercial consequences, which create further uncertainty and frictions. In Chapter 3, we wrote that Williamson (1975) proved that price adjustments are more contentious than quantity adjustments in long-term contract renegotiations.[859] This does not refer to price relief through a pre-determined formula, but rather to more structural adjustments (such as moving from oil indexation to hub indexation). Even when a settlement is reached, the new equilibrium may only last for a few months before a novel situation arises that requires further arbitration. In fact, the principle has been established that buyers can ask for a price review if they are not able to economically market the gas they import.[860] This raises important questions, such as if – irrespective of market conditions – the importer should always be entitled to make a net profit on the gas that it resells and – in the affirmative – at what level this profit should be set. No consensus has been reached. Furthermore, arbitration panels are urged to take utmost account of prices in comparable contracts. This also raises fundamental questions, such as whether this entails comparing LNG contract prices with pipeline contract prices and term prices with spot prices.[861] This lingering uncertainty can contribute to creating a climate of constant negotiation.

855 D. Finon and C. Locatelli, 'Russian and European Gas Interdependence. Can Market Forces Balance out Geopolitics?', *Energy Policy*, 36:1 (2008), 423-442.

856 *Ibid.*

857 *Ibid.*

858 Gustafson, *The Bridge: Natural Gas in a Redivided Europe*, page 3.

859 Williamson, *Market and Hierarchies: Analysis and Antitrust Implications, a Study in the Economics of Internal Organization.*

860 J. William Rowley, *The Guide to Energy Arbitrations* (2017): Global Arbitration Review, 2017.

861 *Ibid.*

So far, the effect of arbitrations on the European gas industry has been extensive. It has been calculated that around 100 Bcm of annual contracted quantities became subject to renegotiations and that billions of euros have been in dispute in the period analysed in previous chapters.[862] Whereas the majority of reimbursement claims received an award, a significant number of claims have been rejected. The result of renegotiations has greatly impinged on the income statements of key European gas players.[863] In fact, some companies have been forced to reimburse billions of euros to their trade partners overnight. In some instances, assets were seized in case of non-payment.[864] In the expectation of adverse arbitral rulings, sizeable funds need to be set aside and withheld from potentially profit-making activities. Arbitrations typically result in third-party determinations to revise the contract price or pricing mechanism applicable between the parties, which are likely to have remarkable commercial consequences. These may not be entirely anticipated by the tribunal. Even well-informed arbitrators are not always experts in the creation and adjustment of price formulae, and are not necessarily familiar with the relational nuances of the wider commercial relationship at stake.[865]

Also, the time frame for resolving a trade dispute expands significantly when there is an arbitration. Unless the parties agree beforehand to a fast-track arbitral process, this typically takes several months, if not years, to reach a conclusion.[866] To be sure, the two parties will continue to make efforts to settle the dispute ahead of a final ruling and, if successful, these efforts may shorten this time. Early settlement is however not guaranteed. Moreover, arbitrations can lead to a more detailed and formal disclosure of grievances held by the litigants than would occur in negotiations. Going to arbitration often expands the number of legal issues that need to be addressed.[867] In fact, threatened by overarching financial consequences, companies involved in arbitral processes usually resort to large law firms with specific sectoral expertise. Specialised arbitration lawyers can identify arguments in favour of their clients that were originally outside of the arbitration's scope, thereby expanding it. Furthermore, the two companies exchange a much larger volume of submissions, annexes, reports and evidence in arbitrations than in regular negotiations – further increasing the number of issues that are litigated. The disclosure process may also lead to orders requiring further disclosure of documents that the parties might not otherwise have exchanged, exacerbating the potential for an extensive set of matters requiring determination by the panel.[868]

Gas arbitrations have features that distinguish them from other arbitrations. The commercial importance of disputes in gas trade is in fact usually more predominant than in other sectors, because even a minor alteration of the contract price, when multiplied by the large volumes contracted over several years, can generate massive financial effects on both buyers and

862 *Dispute Resolution in Gas: Experience Matters* (2017): Team Consult.

863 *Ibid.*

864 *GasTerra seizes Eni Assets in Arbitration Dispute* (2016): Gas Strategies, 22 July 2016.

865 D. Schwartz, *The Energy Regulation and Markets Review* (2018): Wilmer Hales.

866 *Ibid.*

867 *Ibid.*

868 *Ibid.*

sellers.[869] A distinctive feature of gas contract trade disputes relative to traditional disputes is that the former ones typically[870] do not involve allegations of wrong-doing or contractual breach. In other sectors, arbitrations are usually triggered by accusations that one party has engaged in deliberate contract breach, or failed to fulfil one of its contractual obligations. In gas trade disputes, key to the resolution is the commercial context in which the arbitration takes place. This requires arbitrators to adopt an intrinsically commercial approach, rather than a purely legal one. Arbitrators have to take into account that gas contracts are relational, and that the ultimate objective is to maintain a long-term relation. It also requires additional involvement by experts as well as the parties. Another specific feature is the recurring nature of gas arbitrations within the boundaries of a single contract, given the need to update prices to underlying market developments. This raises specific issues related to confidentiality as well as the binding nature of previous determinations.[871] Because the ultimate objective is to maintain a long-term relation, arbitration panels have the imperative to find a mutually acceptable solution that is commercially sustainable for both parties for a reasonable amount of time. This is different from other arbitrations in which the primary task of the arbitrator is to apply both general and contract law, and redress or compensate the wrongdoing.[872]

Arbitrations themselves became a part of the business model of some companies, and an 'arbitration industry' – determined to keep itself alive – emerged.[873] The fact that results of arbitrations varied significantly is partly due to the fact that each arbitration depends on specific clauses, contractual history, and the degree of maturity in the underlying gas market. In part, however, it depends on the quality of the arbitration team. Both the strategy of the parties and the quality of their claims matter. Legal briefs and reports have to be high-quality as well as effectively tailor-made to the individual cases.[874] Due to the need for high quality legal advice, the proliferation of arbitration entails high legal costs, which most gas companies are willing to incur because the rewards – and the penalties – are also remarkable. The hefty cost of the arbitration 'machinery', in terms of lawyers' fees, employees' time and foregone value because of funds set aside for reimbursement, should thus be discounted from the gains derived by lowering Europe's gas import bill through hub indexation (Chapter 7).

In conclusion, the proliferation of arbitrations as an instrument to resolve an ever-increasing number of disputes imposes a large administrative burden for all the parties involved. While being apparently recognised as an effective and reliable method to settle disputes, arbitrations are time-consuming and expensive processes that can bring unwanted clamour. Moreover, they often entail overnight repayments, which can be destabilising on balance sheets and counterproductive for investment planning. Besides being a sign of growing conflictuality themselves, arbitrations also lead to further uncertainty in the gas sector. When legal disputes become the norm in a sector, the consensual/relational aspect of trade is clearly compromised.

869 M. Levy, *Gas Price Review Arbitrations: Certain Distinctive Characteristics* (2017): Global Arbitration Review.

870 We are referring here to renegotiations and arbitrations of international gas trade contracts between European buyers and Gazprom. Contract renegotiations between Ukraine and Gazprom are different.

871 Levy, Gas Price Review Arbitrations: Certain Distinctive Characteristics

872 *Ibid.*

873 Seminar attended by the author at the law firm Loyens and Loeff (Rotterdam Office), 2016.

874 *Dispute Resolution in Gas: Experience Matters*.

The observation that relations between Gazprom and EU importers became more conflictual underpins Williamson's (1975) finding that price adjustments are the most contentious adjustments in a long-term contract renegotiation (Chapter 3).

There are two possible objections to the line of reasoning presented above: 1.) that gas arbitrations have not proliferated *because of* the adoption of hub indexation; 2.) that the proliferation of gas arbitrations is behind us. In the next sections, these objections will be dealt with by investigating whether it is true that arbitrations have structurally increased because of pressures to introduce hub indexation and whether the increase in arbitrations at the beginning of the 2010s was a one-off phenomenon, or something that is there to stay. The answer to these questions is important in order to establish what should be expected in future, as well as to establish the casual link between transformations in contracts and the negative relational consequences sketched above. In Europe, it could be argued that price reviews became unnecessary when pricing formulae were linked to hubs, because contract prices will always reflect market price, eliminating risks of divergence.[875] This would mean that price-related disputes would gradually fade, as hub indexation made inroads in large parts of Europe (Chapters 5 and 6).

However, this claim has already been proven partially wrong, as there have been recent arbitration cases even in Western Europe, after hub indexation had become prevalent (see Chapter 6 for a chronological account). One factor to take into account is that even when contract prices are hub-linked, there is always the possibility that hub prices and the price in the market of the end user will diverge, particularly because of the destination flexibility provided by LNG (where the hub to which gas volumes are indexed could be geographically distant from the end-user market). This might trigger price review disputes.[876] Others adopt a moderate point of view, arguing that while arbitrations will not disappear, they will become more rare, due to the combination of widespread hub indexation in long-term contracts, lower oil prices relative to the period 2010-2014) and the expected rise of Henry Hub-based contracts.[877] However, oil price volatility is impacting on the incentive to go to arbitration on pricing. Industry surveys have shown that, in the context of prolonged low oil prices, senior oil and gas executives hold the expectation that claims and disputes will actually almost inevitably rise – as a consequence of squeezed industry margins. The most widely indicated causes for disputes to emerge were insolvency by counterparties and contract breach, or even termination.[878]

Based on empirical data, it can be observed that while it is true that the number of renegotiations and arbitrations diminished relative to the peak period of 2010-2014, both new renegotiations and arbitration cases were launched afterwards. Importantly, this did not only happen in markets where gas-to-gas competition and hub indexation were absent, but also in core Western European markets.

875 H. Stebbing and M. Plaistowe, *The Transformation of the Global Gas Industry – Is This the End for Price Review Arbitrations?* (2018): Norton Rose Fulbright.

876 *Ibid.*

877 *Energy Arbitrations* (2016): Clyde and Co.

878 *Ibid.*

In 2016, Gasterra initiated arbitration against Gazprom's export unit and sought a price review for gas imported through a long-term contract.[879] Even if the case was then dropped before a final ruling in 2017, it is important to highlight that the arbitration was initiated at a time when hub indexation was already predominant in The Netherlands (Chapter 6). Apparently, this did not shelter parties from the need to resort to an arbitral panel.

The year before, Shell filed an arbitration suit with the Geneva Court of International Arbitration to revise the contract price for Russian gas supplies. The arbitration case was about a contract signed in 2009 through which Gazprom committed to supply 1.2 Bcm of gas per year to Shell in Europe (via Germany) in exchange for 1 MTPA of LNG from Sakhalin 2.[880] The arbitration was only terminated in 2018.[881]

Again, in 2016, Poland's PGNIG filed a new arbitration against Gazprom at the Arbitration Court in Stockholm for supplies under the 1996 Yamal Contract, running until 2022 and covering the delivery of 10 Bcm with a 'high-level *take-or-pay* clause and a formula linked to oil'. PGNIG subsequently declared that it would not renew the contract.[882]

Finally, Gazprom filed an arbitration claim against Uniper as recently as in 2018. The last litigation between Gazprom and Uniper's predecessor E.On had taken place only two years before. An agreement had been reached in March to adjust contract prices for subsequent years, after which both companies dropped their claims. In accordance with the agreement, E.On reimbursed Gazprom 800 million euros but also released some of the provisions recorded in previous years. It emerged that the provisions only applied to 2016 and 2017 but not 2018, whereby the decision to reopen arbitration.[883]

These recent arbitration cases, conducted outside of the peak renegotiation period of 2010-2014 and at a time when hub indexation had already become prevalent in Central and Western Europe, point to the fact that not all pricing issues have been solved. As Gazprom put it when commenting its arbitration against Uniper, 'the application for an arbitration in order to resolve a contractual dispute is a standard practice foreseen in […] contracts'.[884] In conclusion, arbitrations – which, as argued, have a number of destabilising consequences on relational EU-Russia gas trade – seem to have become standard practice in trade between the EU and Russia.

The developments described so far can be regarded as undermining confidence between the parties, a key element of relational contracts. Apart from Williamson's seminal work (Chapter 3), relational contracts were one of the forms of organising transactions studied by Ring (1992)

879 K. Gilblom, 'Dutch Take On Gazprom in Battle Over Europe's Oil-Linked Gas', *Bloomberg*, 18 May 2016.

880 'Details of Shell Energy Europe's Gazprom Suit Revealed', *Interfax*, 16 September 2015.

881 R. Finans, 'Gazprom: Arbitration Case over Gas Prices against Ørsted and other Players has Closed', *Energy Wacth*, 16 May 2018.

882 'Gazprom Plays for Time as it Challenges Partial Award of the Arbitration Court in Stockholm Issued in Favour of PGNiG', *PGNIG,* 2 October 2018.

883 *Interfax*, 14 February 2018.

884 "Gazprom Export LLC confirms that Uniper has been notified of the start of arbitration proceedings, seeking a review of gas prices supplied under the contract with Uniper, starting February 1, 2018. Settling the contract dispute in arbitration is standard practice and is provided for in such contracts". Cf. 'Gazprom Seeks Arbitration in Claim against Uniper over Gas Price', *Reuters*, 14 February 2018.

and Ring and van de Ven (1994).[885] As we discussed in Chapter 3, they argued that relational control will take place when a transaction involves high risk but also a high level of confidence.

Based on what has been said so far, it is possible to conclude that the level of risk remains quite high in EU-Russia gas trade. While it is true that legacy pipelines have been paid back – thereby reducing the original risk that billions of euros in investment would never be recouped – it is evident that path dependency *de facto* obliges Russia to market most of its gas to Europe. This is because Russia does not enjoy viable diversification options that are comparable in volume absorption potential. In fact, China and LNG are not such, for the time being. The reverse relation also holds true: while Europe currently has access to relatively diversified sources of gas, losing Russia as a supplier would not only result in soaring import prices, but also in physical scarcity when the current global gas oversupply gives way to tightness. At the same time, uncertainty reigns in the European gas sector and EU-Russia gas trade is constantly disturbed by politics. High confidence, which used to compensate for high risk and create the conditions for a relational organisation of trade, has also been partially eroded – as explained at the beginning of this chapter.

Following the scheme by Ring and van de Ven (1992), this erosion of confidence undermines the relational nature of EU-Russia gas trade. Based on their taxonomy, presented above, there does not appear to be a viable alternative. A 'hierarchical' trade relation – found in high-risk, low-confidence settings – does not in fact seem applicable to gas trade between the EU and Russia. Bolton et al. (1994)[886] found that while a short-term, 'neo-classical' organisation of contractual relations prevailed in the United States, other successful countries (namely Japan) saw a prevalence of relational organisation. They also demonstrated that relational organisation decreases the transaction costs of the contracting parties, in line with TCE's core teachings (Chapter 3). As discussed in Chapter 3, Campbell and Harris (1993)[887] showed that the parties to a long-term contract want to preserve and develop the relationship as long as confidence is intact, the usefulness of the business relationship is superior to what can be offered by others and both parties need to keep on investing in the relationship.

Providing an exact assessment of the level of confidence between Gazprom and its EU partners is impossible, as this is not a quantifiable concept. Moreover, the degree of mutual confidence depends on what EU partner is considered – with the lowest levels of confidence probably seen in contracts between Gazprom and Eastern European importers, and the highest in contracts between Gazprom and companies from large Western European Member States. Generally speaking, Gazprom is regarded as a reliable supplier by European companies. Gazprom executives also tend to have a different opinion of Brussels-based EU institutions (usually negative) and of specific EU governments and companies. In any case, as explained at length in the previous chapters and reiterated at the beginning of this chapter, mutual confidence has been dented by the latest developments.

885 Ring, 'Structuring Cooperative Relationships Between Organizations'; Ring and Van de Ven, 'Developmental Processes of Cooperative Interorganizational Relationships'.

886 M.K. Bolton et al, 'The Organization of Innovation in the United States and Japan: Neoclassical and Relational Contracting', *Journal of Management Studies*, 31:5 (1994), 653-679.

887 Campbell and Harris, 'Flexibility in Long-term Contractual Relationships: The Role of Cooperation'.

When it comes to the usefulness of the business relationship, Ring's and van de Ven's second condition, there is no doubt that both Gazprom and most European companies still find it beneficial to conduct trade. As said, this relationship is not easy to replace by either Gazprom or its European trade partners owing to path dependency dynamics. Gazprom is still able to offer very low marginal cost supply to Europe, also thanks to legacy infrastructure. On the other hand, Gazprom needs Europe to absorb the bulk of its supply. The company has been slow in developing LNG and, while the 38-Bcm Power of Siberia will open up China's market, Beijing's own quest for diversified gas supplies and energy policy uncertainties (*infra*) act as limiting factors for further Sino-Russian trade expansion.

With regard to the third condition, it can be argued that several EU companies and Gazprom continue to invest in their mutual relationship, in spite of the deterioration in the climate for trade and the hostile geopolitical climate. Long-term gas import contracts are still being renewed as of 2019 (e.g. between Gazprom and Austria's OMV), and many of them run until the mid-2030s. The fact that long-term contracts survived price adjustment requests – the most contentious elements in a renegotiation – is also explained by Williamson's (1975)[888] observation that when requests to change the price or pricing terms relates to exogenous, relevant and verifiable events, they are less likely to disrupt the contractual relation. In Chapter 5 we demonstrated that exogenous, relevant and verifiable events were at the basis of EU importers' price renegotiation requests. Furthermore, with regard to the continued relations between Gazprom and EU importers, it is important to highlight that Gazprom and Shell work jointly on Sakhalin 2, an LNG terminal in the Russian Far East, and the Anglo-Dutch company nurtures a long-standing interest in Russian upstream, particularly unconventional gas. Gazprom and BASF's subsidiary Wintershall have worked closely for decades, and since 2015 Gazprom fully controls Wingas, WIEH and WIEE, previously established as joint ventures with Wintershall. Gazprom also has a close working relationship with Saipem, ENI's former subsidiary, which is providing engineering service for Gazprom-led projects. Finally, and perhaps most significantly, Gazprom enjoys financial support from five Western partners (Uniper, Wintershall, Engie, OMV and Shell) in the Nord Stream 2 project – which is illustrative of the solidity of the partnership, given strong Western political pressures to abandon the project.

On the other hand, however, examples of reluctance to renew relational commitments can also be found. Some projects have been cancelled. For instance, Shell withdrew from Baltic LNG in April 2019, and Gazprom unilaterally terminated South Stream in 2014, much to the surprise, and irritation, of partners ENI, EDF and Wintershall (as well as contractors, and notably abovementioned Saipem, which brought Gazprom to arbitration). Moreover, not all European companies renewed long-term contracts with Russia. Gazprom also largely disengaged from the European downstream market, choosing to deliver gas at the border without seeking further vertical integration. Finally, there is reluctance in Russia to assign upstream acreage to European companies.

888 Williamson, *Market and Hierarchies: Analysis and Antitrust Implications, a Study in the Economics of Internal Organization*.

In conclusion, increasingly diverging views on how to price natural gas – stemming from radically different political-economic paradigms – compromised the long-standing trade relation between Gazprom and European partners. This observation is in line with Boussena and Locatelli (2013), who suggested that disagreements and misunderstandings about the regulatory framework resulted in the EU and Russia drifting further apart, long before the latest crisis in Ukraine crisis broke out[889]. EU-Russia gas trade, traditionally organised around contracts with a marked relational nature, has been increasingly organised along competitive lines. A larger number of transactions are now assigned to open-market exchange and, more significantly (from both a volumetric and monetary perspective), open-market transactions set prices in long-term contracts.

While the regime governing EU-Russia gas trade is essentially 'hybrid', in the sense that long-term contracts endure and trade is still to some extent relational, Gazprom and European partners became increasingly wary of each other's moves and uncertain about future prospects for mutual trade. Unlike the import bill savings measured in Chapter 7, the long-term damage to the trade relation is impossible to quantify. Taking into account long-term relational damage is essential to sketch a complete picture of the political-economic impact of gas pricing transformations on EU and Russia. It is possible that the impact of the deterioration in the trade relation will be felt more acutely by Europe when today's buyers' market gives way to a sellers' market. As the definition itself suggests, sellers have the upper hand in a sellers' market. It remains to be seen to what extent Gazprom will be willing and able to exploit this re-acquired leverage to its advantage. In the next sections we will continue to investigate consequences of EU-Russia gas trade transformations. As explained in the introductory paragraphs of this chapter, a comprehensive assessment cannot neglect the consequences of gas trade term transformations on investments.

8.3 IMPACT OF THE TRANSFORMATION OF EU-RUSSIA GAS TRADE TERMS ON NEW GAS INVESTMENTS

Planning investments in the gas sector has always been complex because projects across the entire value chain tend to be capital-intensive, and it takes a relatively long time to build them as well as to pay back the initial investment.[890] Formulating robust predictions on gas demand is important to avoid stranded assets. However, accurately forecasting demand in a specific country or region is difficult. This arguably became increasingly difficult in the last decade as the complexity of the energy system increased, and global gas markets became more and more interconnected. Difficulties in forecasting gas demand, coupled with the fact that liberalisation empowered end users to source gas on spot markets, makes gas market players reluctant to enter into long-term commitments. In default of long-term guarantees by prospective buyers, making an investment becomes even more difficult for the supplier. In this section, the major factors of uncertainty – which might obstruct the formulation of accurate demand forecasts and investments – will be highlighted. It will also be demonstrated that

889 S. Boussena and C. Locatelli, 'Energy Institutional and Organizational Changes in the EU and Russia, Revisiting Gas Relations', *Energy Policy*, 55 (2013), 180-189.

890 In the last section of this chapter, it will be assessed how these elements (capital intensity, lead time, and pay-back time) have evolved over time.

uncertainty has increased, particularly relative to the time when the first Russian gas investments to supply Europe were made.

Gas competes with other energy carriers, particularly coal and renewables in power generation as well as oil products in industrial uses, heating and, more marginally, transportation. Price fluctuations of competing fuels can greatly impact the attractiveness of gas as a source of energy and, ultimately, the level of gas consumption. Besides coal-to-gas and oil-to-gas competition, the large-scale introduction of zero-marginal cost renewables created new challenges, as gas has been pushed towards the right-hand side of the cost curve in the merit order. The pace of introduction of new renewable capacity and their future load factors are decisive elements that will concur to set future gas demand, in Europe and elsewhere. As will be discussed later in this section, there is substantial uncertainty about the future pace of the energy transition.

Uncertainty deriving from the growing influence of China and other non-OECD countries on the global gas market balance

On the one hand, global gas market interconnectedness can be regarded as a factor that stimulates investment because it reduces asset specificity, thereby reducing the need to underpin investment with long-term contracts. This is line with TCE predictions presented in Chapter 3. However, on the other hand, global interconnectedness also increases complexity – which adds further uncertainty in the sector and makes it difficult to come up with robust forecasts on supply and demand in a specific jurisdiction, thus potentially discouraging investment on gas projects targeted to a specific country or region. Events as detached from day-to-day European gas market operations as a natural disaster in Japan, an attack on a Middle Eastern oil installation, or a coal supply crunch in China can have important repercussions on relative commodity pricing and thus on European gas consumption.

At the time of writing, the fact that destination-flexible LNG originating from liquefaction plants that had received investment on the basis of plans to supply other markets is actually being imported by European countries is creating a sense of safety in Europe. This sense of safety is well-grounded in current market conditions, where Europe is a market of last resort, or 'sink market'. However, the influx of destination-flexible LNG (and the prospect that destination-flexible LNG will make up an increasingly high share of Europe's gas import mix) makes supplies to Europe much more dependent on global market dynamics. This means that, if global markets tighten, Europe runs the risk of being undersupplied unless it locks in some volumes in point-to-point agreements.

In turn, global market dynamics are increasingly dependent on Asian consumption and import patterns, as well as Asian contracting behaviour. In the 'Asian century'[891], the engine of gas consumption growth will be located outside of Europe's borders, with the result that most investment decisions will be made on the basis of developments (and expectations thereof)

891 V. Romei and J. Reed, 'The Asian Century is About to Begin', *The Financial Times*, 26 March 2019.

outside of Europe. In China, the share of gas in the primary energy mix is only 7.4%[892], while in India it is 6%[893]. In both countries, the share of gas is well below the global average of 24%.[894] With economic development, energy needs become more sophisticated and energy mix diversification takes place. Emerging countries gradually move up the 'energy ladder' as they develop economically.[895] This entails that the room for gas consumption growth in China, India and other emerging economies in South and South-east Asia is very large. Gas consumption in these countries has already started to grow and there are prospects for further growth.[896]

LNG is already predominantly exported to Asia. In 2018, 76% of global LNG exports went to Asia, while Europe only represented 15% of demand. [897] This trend is expected to intensify further in future. Besides, LNG will increasingly become the driving force behind global gas markets. The share of LNG in internationally traded gas is expected to overtake that of piped gas around 2025 and reach 60% by 2040. Almost 90% of all additional volumes traded over long distances between today and 2040 will be in the form of LNG.[898] Europe will also increasingly rely on LNG as a source of external gas supply (Figure 39).

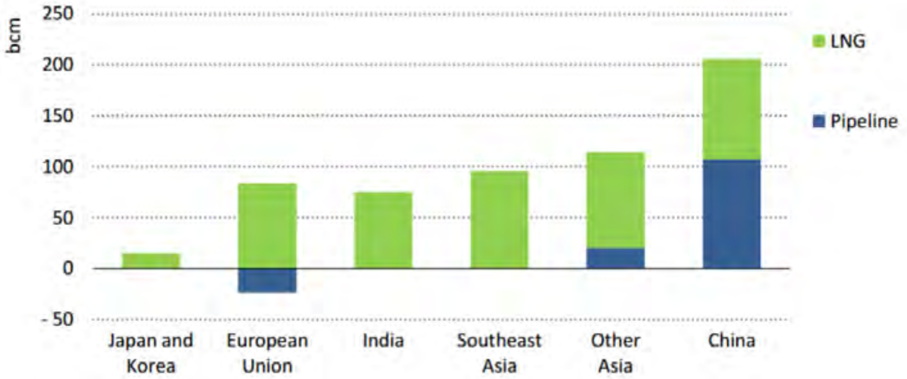


FIGURE 39: CHANGE IN GAS IMPORTS BY SELECTED REGION AND TRANSPORT MODE IN THE NEW POLICIES SCENARIO, 2016-2040 (WEO 2017)

892 BP Statistical Review 2019, special dossier on China with figures referring to the year 2018. https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-china-insights.pdf

893 BP Statistical Review 2019, special dossier on India with figures referring to the year 2017. https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/energy-outlook/bp-energy-outlook-2019-country-insight-india.pdf

894 BP Statistical Review 2018: https://www.bp.com/en/global/corporate/energy-economics/statistical-review-of-world-energy/primary-energy.html

895 "Since international attention focused on the importance of energy for continued economic growth, a body of literature has centered on comparisons of energy use for countries at different levels of development. This literature has shown that as development proceeds, not only does energy consumption increase but also the mix of fuels relied upon changes. In its cross-sectional form, this work shows that wealthier countries will rely more heavily on petroleum and electricity than poorer countries. Poorer countries rely more heavily on biomass fuels". In R.H. Hosier and J. Dowd, 'Household Fuel Choice in Zimbabwe', *Resources and Energy*, 9:4 (1987): 347-361.

896 *World Energy Outlook* (Paris, 2018): International Energy Agency (IEA).

897 *Global Gas and LNG Outlook to 2035* (2018): McKinsey.

898 *World Energy Outlook* (Paris, 2017): International Energy Agency (IEA).

This indicates that the global gas market will increasingly be driven by Asia, and that gas supplies to Europe will increasingly be influenced by events in Asia. The prospect of supplying emerging countries in Asia will be the catalyst for new gas investment worldwide. Within Asia, the real engines of growth will be emerging economies, rather than mature economies such as Japan, Korea, and Taiwan, where gas consumption is expected to remain stable. China will play a particularly important role.

Since 2000, China's annual gas consumption growth rate averaged a staggering 13%, reaching 18% in 2018.[899] China increased its LNG imports by more than 50% in 2018 relative to 2017,[900] absorbing as much as 55% of the world's LNG demand growth last year.[901] According to McKinsey's long-term outlook, Chinese gas demand will grow by 322 Bcm between 2016 and 2035, representing 47% of global gas demand growth over the period. In all other emerging economies in Asia, Latin America, Africa and the Middle East combined, McKinsey predicts that gas demand will grow by 327 Bcm in the same period. In comparison, in the OECD region, gas demand will only grow by 42 Bcm between 2016 and 2035.[902] The IEA also projects fast-growing gas demand in China (+400 Bcm by 2040), particularly in the industrial sector, although the position of China in the non-OECD grouping is not as overriding as in McKinsey's scenario.[903] In the IEA's projections, Asian gas consumption will grow by 740 Bcm.[904] Apart from China, an important growing demand centre is going to be India (+5.2% demand growth on a yearly basis).[905]

The Middle East will also consume more and more gas, but – unlike China and India – it will be able to produce a lot of its needs domestically. In the same period, the EU's gas consumption is expected to remain stable, or to decline slightly.[906]

Chinese domestic gas production has not been growing sufficiently fast to fulfil rising demand needs, meaning that the country is increasingly exposed to imports. Gas import dependency is a growing political concern in China.[907] The country is wary of its mounting dependence on hydrocarbons, and the discussion on gas import dependency is interlinked with the discussion on growing dependency on oil imports. The country might more easily accept to become increasingly dependent on gas imports if it managed to at least restrain its dependency on oil imports, but an escalating reliance on both would be regarded as particularly untenable.

899 BP Statistical Review 2019, special dossier on China with figures referring to the year 2018. https://www.bp.com/content/dam/bp/business-sites/en/global/corporate/pdfs/energy-economics/statistical-review/bp-stats-review-2019-china-insights.pdf

900 *Global Gas and LNG Outlook to 2035* (2018): McKinsey.

901 "China is a growing contributor to LNG trade development: in 2014 the country accounted for 20% of the total increase in LNG imports, then 43% in 2017 amd 55% in 2018 (or 21.5 bcm out of a global increase of 39.6 bcm)" in *Gas 2019: Analysis and Forecasts to 2024*, (Paris, 2017): International Energy Agency (IEA), page 116.

902 *Global Gas Demand Outlook: the Medium to Long-term Perspective* (2019): presentation by Ole Rolser (McKinsey), May 2019 (Flame Conference)

903 *World Energy Outlook* (Paris, 2017): International Energy Agency (IEA).

904 *Ibid.*

905 *Ibid.*

906 *Ibid.*

907 S. O' Sullivan, *China: Growing Import Volumes of LNG Highlight China's Rising Energy Import Dependency* (Oxford, 2019): Oxford Institute for Energy Studies.

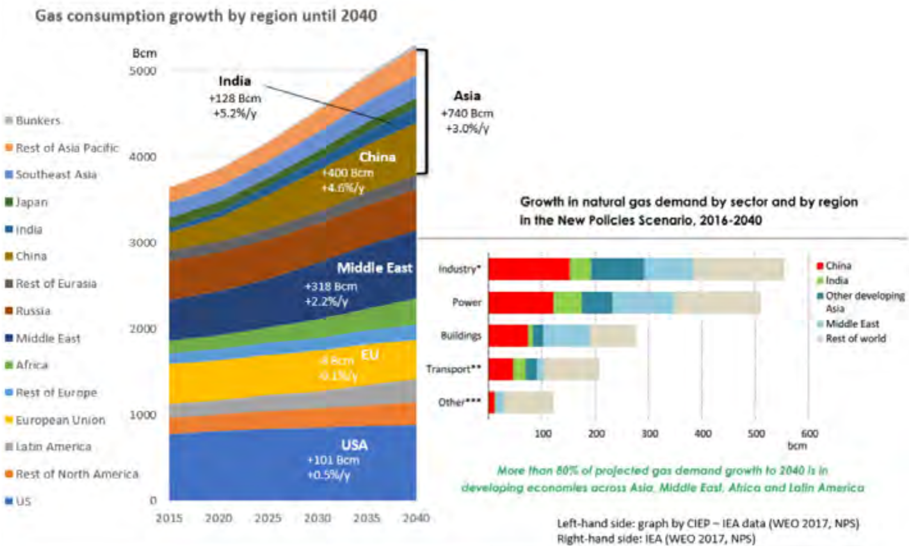


FIGURE 40: GAS CONSUMPTION GROWTH BY REGION AND BY SECTOR TO 2040, WORLD ENERGY OUTLOOK 2017 (NPS)

Recent evolutions in the global geopolitical context are not helping to ease China's energy security concerns. The unstable geopolitical situation in the Middle East is particularly concerning for Beijing.[908] Even if the September 2019 attacks on Saudi Arabian energy infrastructure in Abqaiq hit oil processing facilities, they increased general anxiety on energy import dependency, which also impacted gas.[909] In fact, the Strait of Hormuz is an important chokepoint not only for oil but also for gas, particularly for the Asia-Pacific region. Qatar – blessed with the world's third largest gas reserves (concentrated in the giant North Field), low production costs and limited domestic needs – would be able to reassure China about its ability to supply large LNG volumes in the long term. However, Qatar exports also depend on transit via the Strait of Hormuz. Iran – a country with the world's largest gas reserves and significant technical know-how in gas production – would also be an attractive long-term supplier. Nevertheless, geopolitics is once again a complicating factor. The re-introduction of US sanctions on Iran – which led to a shrinkage in Iranian oil exports to China – casts a shadow on Iran's long-term ability to exploit its full potential as an energy supplier to China.[910]

Furthermore, tit-for-tat trade tariffs between the US and China – resulting from the US' recent mercantilist turn under the Trump Administration – limit the scope for US-China LNG trade. This is a major foregone opportunity. In fact, the extraordinary pace at which China's LNG import needs have been growing (and are projected to grow in future), resonates on the supply side with soaring US gas production and exports (past and projected). US gas production

908 H. Alhasan, 'Big Asian Players too Quiet on Threats to Gulf Security', *Asia Times*, 30 September 2019.
909 O' Sullivan, *China: Growing Import Volumes of LNG Highlight China's Rising Energy Import Dependency*
910 V. Hari, 'New Alliances not a Silver Bullet for Energy Security in China and India', *Nikkei Asian Review*, 2 October 2019.

has been growing substantially since the mid-2000s, and will keep on growing at least until the mid-2020s.[911] The largest basin (and largest contributor to US output growth so far) has been the Appalachian Basin in the US Northeast, where dry gas is produced. Production is expected to further increase in this basin in future as improvements in interconnection – with new infrastructure being built – will create room for additional production growth. Another promising dry gas play is Haynesville, which had peaked but then recovered, in part thanks to higher gas prices but also thanks to productivity gains – demonstrating the resilience and innovative capability of US upstream. Unlike dry gas, production of associated gas – such as in Eagle Ford and in the Permian Basin – depends quite crucially on the oil price. Moreover, the Permian basin production is still hampered by a lack of pipeline take-away capacity.[912] When oil prices increased in 2017-2018 (and thus oil production increased), substantial gas flaring and negative prices were observed in those basins, owing to insufficient infrastructure to evacuate the gas. However, associated gas production is expected to grow in the next years, as more oil wells currently under construction will be completed and new pipeline capacity will become operational.[913] In conclusion, shale and tight oil production is expected to grow for a number of years and peak around 2025.[914] However, developments in the US surprised energy analysts before, and it is possible that some unexpected developments (new discoveries, further cost savings or new financing schemes) might prolong the growth trajectory of US unconventional production beyond what is currently foreseen.

In the meantime, the US is certainly going to launch more and more LNG projects. Several US projects under construction will start operation before 2021: Cameron LNG (3 trains); Freeport LNG (3 trains); Elba Island (with a number of small scale units); Sabine Pass (Train 5) and Corpus Christi (Trains 2 and 3).[915] In addition, a number of US projects received FID in the last year: Golden Pass (with an FID received in February 2019, and expected to start in 2024); Calcasieu LNG (with construction started in April 2019, and expected to deliver gas to world's markets in 2022); and Sabine Pass' Train 6. Moreover, additional FIDs are expected. In conclusion, this translates into the expectation that the US will become the world's top LNG exporter by 2025 – surpassing both Qatar and Australia. Approximately 80% of the new liquefaction capacity due to be commissioned worldwide in the next 5 years will be coming from the US. The US will not only account for 40% of global gas production growth to 2025 (+150 Bcm); but it will also make up as much as two thirds of global LNG trade growth to 2024.[916]

Supply from Australia and Russia presents fewer geopolitical challenges for China. However, geopolitical instability in the Middle East and geo-economic tensions with the United States amplify Beijing's energy dependency concerns, and might deter Chinese policy-makers to support higher gas consumption. This is going to be more likely if Chinese domestic gas production fails to rise as quickly as planned. Plans to expand domestic gas production hinge

911 *Gas 2019: Analysis and Forecasts to 2024*, IEA.
912 *Ibid.*
913 *Ibid.*
914 *World Energy Outlook 2017*, IEA.
915 *Gas 2019: Analysis and Forecasts to 2024*, IEA.
916 *Gas 2019: Analysis and Forecasts to 2024*, IEA.

quite critically on unconventional production. While – based on an assessment of available resources – the potential for unconventional gas production in China is remarkable, uncertainty reigns.[917] China lacks key enabling conditions that led to successful unconventional gas production in the US, such as a highly competitive oil service industry and redundant infrastructure. Moreover, geology might turn out to be less favourable than previously thought. Assessments of unconventional gas resources are based on the presence of shale rock formation. However, these assessments do not always tell much about the commercial or technical viability of extracting hydrocarbons from such formations. Because of the abovementioned concerns about energy import dependency, China's appetite for gas imports will also depend on whether China will be able to reach a balance between imported and domestically produced gas. Once again, it is difficult to exactly predict the implications of lower or higher domestic gas production in China. On the one hand, higher domestic production would limit the need for gas imports. On the other hand, however, it could be claimed that if domestic production is high, Chinese policy-makers will be less reluctant to support additional use of natural gas in the energy mix, which could lead to higher imports in the longer term. Another factor of uncertainty is related to China's weakening economic growth.[918] Energy demand is in general still very sensitive to GDP growth variations. If GDP growth – which is difficult to forecast – turns out to be even lower than expected, China's energy demand growth will also slow down. Natural gas might be hit comparatively more than coal, as it is more expensive and needs to be imported. If China enters a phase of macro-economic uncertainty, incentives to use domestic coal will increase – even if this will go to the detriment of climate and air-quality improvement objectives.

The fact that future gas demand in China will be so dependent on policies – and politics – is a key contributor to uncertainty in global gas markets. Political support for gas might weaken if gas loses its attractiveness from an affordability and security of supply perspective, for instance as a result of some of the macro-economic and geopolitical developments discussed above. The success of current gas market reforms in China is also a key factor to watch. Severe gas shortages in the winter of 2018 rang an alarm bell in Beijing.[919] The government has learned the hard way that there are limitations to the pace of gas adoption – in spite of strong political ambitions related to the 'Blue Skies' policy. Infrastructural bottlenecks are one aspect that needs to be solved. Some of these bottlenecks have been solved, or are about to be solved. Pipelines that bring gas from Southern Chinese LNG terminals to the rest of the country have been built in recent years. Moreover, a lot of additional regasification terminals are being built.[920]

However, it will be important to coordinate demand growth with the construction of additional infrastructure: if demand growth outpaces infrastructure development, China will face major problems. The government's plan to build a national pipeline company and unbundle transmission lines from other segments of the gas sector cannot be ignored when talking about infrastructural developments. This plan is part of a wider programme of reforms aimed

917 A. Forbes, 'Chinese Shale Struggles to Get Moving', *Petroleum Economist*, 30 April 2019.

918 D. Weinland et al, 'Slowing Chinese Growth Delivers Blow to Global Economy', *The Financial Times*, 18 October 2019.

919 'As China Gas Crisis Deepens, Factories, Homes Lose Supply', *Reuters*, 13 December 2017.

920 *Gas 2019: Analysis and Forecasts to 2024,* IEA.

at eliminating some of today's distortions present in China's gas sector.[921] One of the key ambitions is to develop a national hub. In fact, China (similarly to other Asian countries) aims to have its own natural gas hub to break away from dependence on foreign hub indexation (namely Henry Hub) or oil indexation. Some of the steps taken so far include the establishment of platforms for gas exchange in Shanghai and Chongqing and a reform of city gas prices – which have been changed from cost-plus to netback, favouring a convergence between non-residential and residential prices.[922] The fact that residential prices have finally started to increase as a result of reforms is important because LNG-importing companies in China used to incur financial losses since they had to buy LNG on the global market for high prices, but could only sell it at low prices domestically. The increase in domestic prices thus helps addressing a distortion. On the other hand, the abovementioned efforts to unbundle transmission from production are met with resistance from incumbents – because transmission is where incumbents often make revenues.[923] The political willingness to introduce market-oriented reform in China's gas sector is there, but challenges remain as internal resistance is high and only a handful of successful gas hubs have been established around the world – and all of them in countries with sizeable gas production (the US, the UK and The Netherlands).

In conclusion, significant uncertainty limits the ability to come up with robust predictions on future Chinese gas demand, import needs and buying behaviour. Based on policy announcements and independent forecasts, a widening of China's import gap is guaranteed. The question is how large this import gap will be.

China's growing importance in global LNG markets, and, in turn, the growing importance of LNG in global gas markets, will make European gas supply more and more dependent on developments in China. China is such a large country – and such a prospective large gas importer – that a single policy decision in Beijing could have a large volume and price impact on gas markets, and supplies to Europe.[924] A key observation is that if China grows increasingly uncomfortable with its gas import dependency and with the geopolitical as well as geo-economic context, it might be tempted to return to point-to-point long-term contracts. This will be more likely if global gas markets shift from oversupply to tightness – as it is widely expected to happen in the first half of the 2020s.

If the size of the 'open' LNG market shrinks because of political interference (such as the trade war with the US), the pool of available supplies to China will also shrink – creating further incentives to secure supplies by means of long-term contracts. This might in turn limit the availability of flexible supplies available for Europe, which, in the meantime, will have further transitioned towards a model based on shorter term trade and gas-to-gas competition – in which flexible LNG (or the availability thereof, in case of need) will play a central role. Even if China increased its spot LNG imports by 75% in 2018[925] and the share of spot procurement

921 S. O'Sullivan, *China's Long March to Gas Price Freedom: Price Reform in the People's Republic* (Oxford, 2018): Oxford Institute for Energy Studies.

922 D. Sandalow et al., *A Natural Gas Giant Awakens: China's Quest for Blue Skies Shapes Global Markets* (New York, 2018): Columbia, SIPA.

923 WGI, *Energy Intelligence*, 28 November 2018.

924 Sandalow et al, *A Natural Gas Giant Awakens: China's Quest for Blue Skies Shapes Global Markets*

925 *Gas 2019: Analysis and Forecasts to 2024,* IEA.

grew – reaching one quarter of total LNG imports[926] - Chinese buyers also signed a lot of new medium and long-term contracts in 2018 and in the first half of 2019 with the aim to diversify supply. This might be an early indication of what has been said above with regard to Chinese contracting behaviour.

This section has focussed on China because the country is expected to have a disproportionately high impact on LNG markets in future (by being expected to absorb as much gas as all other non-OECD countries combined) and thus on flexible volumes available for Europe. However, it is worth to keep in mind that other non-OECD countries are also growing in importance, including India, Pakistan, Bangladesh and countries in South-east Asia, Latin America and the Middle East. Demand from some of these so-called 'niche' markets played a crucial role in absorbing the new wave of LNG supply that came on stream between 2015 and 2018, postponing the advent of oversupply by one or two years. This development, which was largely unforeseen, also delayed the fall in European gas prices – showing the importance of developments in non-European markets for Europe's gas supply and import bill.

Uncertainty deriving from energy transition policies

The issue that is being discussed in this Chapter is uncertainty, and more specifically the increasing difficulty in forecasting Europe's gas import needs. This makes it difficult to plan new gas investments, as European gas market players are reluctant to make long-term commitments.

In the previous section, the focus has been on policies outside of Europe, and namely in China. Clearly, policies inside of Europe can also have a major impact on European gas demand. CO_2 prices, for instance, can be decisive in setting coal-to-gas switching levels, as observed by comparing recent power sector gas burn in the United Kingdom, where a carbon price floor was introduced by policy, and Continental Europe, where such carbon price floor was absent. Renewables subsidy schemes, coal phaseouts, nuclear phaseouts, and air quality or other sector-specific regulations also heavily affect gas consumption levels, and will continue to do so in future. A recurrent complaint by the gas industry is that policies are not providing the long-term guidelines needed to invest. One important factor is the indecisiveness with which policy-makers around the world, but perhaps more markedly in Europe than elsewhere, deal with the role of gas in the energy transition. In most EU countries, it is perceived as politically unpalatable to bet on gas as a cornerstone of decarbonisation. To the contrary, there tends to be political opposition to natural gas, in part because it is still a fossil fuel (in spite of lower CO_2 emissions than coal and other environmental properties), in part because of public opposition to domestic production and finally because of perceived over-reliance on Russia as a supplier.

At the same time, in spite of at least one decade of more or less overt political hostility, EU's gas consumption has not (yet) structurally declined and European import needs have actually increased as a result of lower domestic production, caused by natural output decline as well as political decisions to phase out production from Slochteren in The Netherlands. There is a clear mismatch between the political discourse, which refuses to portray gas as part of the solution

926 *Ibid.*

to fight climate change, and the reality on the ground (stable gas demand and growing imports). The signal sent to energy market operators by policy-makers, particularly at the EU level, is that we either will or *should* use less gas in the years to come.

Gas demand scenarios published by the European Commission are often very bearish, particularly if compared to other scenarios by industry associations, private sector operators, independent observers and other international bodies. The fact that the European Commission is not only an energy watchdog, but also a key decision-making actor, cannot be neglected. If a crucial decision-maker consistently sketches a future energy mix where gas consumption falls, investors will be discouraged to mobilise the resources that are necessary to guarantee future supplies of gas.

Uncertainty is rife because while the EU's final policy objective is carbon neutrality by 2050, the transition phase might turn out to last longer than anticipated. A number of pathways to decarbonisation rely heavily on deep electrification. While consumption of wind and solar energy will definitely grow in case of deep electrification, the medium-term impact of deep electrification on gas consumption is not straightforward. Studies have shown that gas demand might actually increase by 2030 in a deep electrification scenario as a result of higher burn in power generation, where the contribution of coal and nuclear will gradually decline in several European countries and storage is unable to meet all the flexibility requirements.[927] The variability of renewable energy sources, high cost of seasonal storage in batteries, and in general high system adaptation costs, will be important stumbling blocks for deep electrification. In the longer term, new technologies might be found that reduce the call on natural gas to back up variable renewables. For this reason, it is very difficult to estimate to what extent electrification will deepen, when deep electrification will be achieved, and what role gas will have in a deeply electrified energy system. Since its inception, the European energy transition discourse has been focussing on clean power generation technologies. Perhaps more importantly, public financial funding, regulatory support, and private investments have also been disproportionately allotted to electricity generation from wind and solar. Impressive results have been achieved in terms of abating the cost of newly installed capacity. This is what made headlines – creating the false impression among the public opinion (but also among non-specialised policy-makers) that the rate of penetration of wind and solar in our energy mixes could grow indefinitely.

However, in the last years, there is growing awareness in Europe that there are limitations to deep electrification. The discussion has gradually shifted from installation costs to system costs. It is becoming increasingly clear, and accepted, that there is no silver bullet solution for decarbonisation. Integrated energy solutions are being proposed, in which natural gas could assume an important role. In this context, awareness is growing that molecules will need to be decarbonised as well. Even in its most optimistic scenario, the association of European power producers (Eurelectric) projects a 60% electrification of the energy mix by 2050.[928] In a number

927 J.G. Moraga and M. Mulder, *Electrification of Heating and Transport: A Scenario Analysis up to 2050* (Groningen, 2018): CEER Policy Papers, no.2

928 *Where Does Change Start if the Future is Already Decided?* (2019): Ernst and Young and Eurelectric.

of applications, such as high-temperature heating, aviation and heavy-duty vehicles, electrification is particularly complex and/or costly, and energy use is better served by molecules. Molecules are also important feedstocks for a number of industrial products. Moreover, molecules are more efficient than electrons in storing energy and transporting it across long distances.

The debate on clean molecules, at least in Europe, has started to focus on hydrogen in the last years. Hydrogen is a promising energy carrier for the future, as it could act as the 'missing link' in the energy transition. Its molecules can be stored and transported relatively easily, and employed in virtually all types of energy uses, from power generation to heating and transportation. Clean hydrogen can be produced in multiple ways, including from natural gas. The European gas industry sees hydrogen as an opportunity to reinvent itself in a deep decarbonisation scenario. Hydrogen could also enable the continuation of international molecule trade and – provided that they decarbonise their output – countries with a competitive advantage in molecule exports such as Russia could transform into hydrogen exporters to Europe. There are also proposals to use natural gas pipelines such as Nord Stream 2 to transport hydrogen. Even if one were sceptical about hydrogen produced from natural gas, the European gas industry could still capture opportunities in green hydrogen, produced for instance through electrolysis. This is notably because gas expertise and assets would still be needed for the midstream segment (storage and transportation). Whatever pathway is chosen, translating prospects of hydrogen taking central stage in decarbonisation into accurate forecasts for gas demand is very difficult. The gas industry thinks that hydrogen would provide them with opportunities to maintain a business model in a deeply decarbonised Europe. However, it is very complex to foresee what role the gas industry would exactly assume, and how much gas demand there will be, where gas demand will be located, and what kind of investment is going to be needed.

In conclusion, European policy-makers provide extremely limited guidance to market players in the gas sector on how to plan their long-term investment. The declared objective to deepen decarbonisation, backed by European policy-makers, creates additional uncertainty. While there is still potential room for gas (or 'gases', possibly in different forms from today's natural gas) or gas infrastructure in Europe's future energy mix, challenges do exist – and developing exact forecasts on gas consumption is extremely difficult. The consideration of the time frame is also important: while it is likely that additional investment will be needed on gas production and distribution geared towards European consumers in the medium term (10-15 years), gas consumption is expected to decline more significantly beyond that time horizon as deep decarbonisation takes root.

Concluding remarks on the rise in uncertainty in the gas sector

Investing in the gas sector is difficult because projects are capital-intensive and investments have a long pay-back time, while it is difficult to forecast long-term gas demand. To an extent, uncertainty is inherent, and investors have always had to cope with uncertainty, but the last sections showed that uncertainty has increased in the last decade.

The first reason is that the transformations in gas trade modes described in Chapter 5 and 6 meant that Gazprom and its EU partners adopted increasingly divergent views on how to organise gas trade. This dented the relational aspects of EU-Russia gas trade, increasing conflictuality. Arbitrations are a sign of this conflictuality, and in turn they further increased uncertainty, with possible negative repercussions on investments. The approach of jointly planning a 'gas economy' and sharing responsibility for supplying gas to consumers is no longer applicable. Today, Gazprom and its EU partners continue to cooperate on a number of projects and their relations are often better than relations between the EU and the Russian government. However, Gazprom and the buyers of its gas grew increasingly wary of each other's moves, and the level of trust has been eroded. Once again, this increases uncertainty with regard to the future continuation of EU-Russia gas trade.

The second reason is that global markets are more and more interconnected, thanks to the growing importance of flexible LNG – which represents an increasingly high share of internationally traded gas. Flexible LNG has a number of positive effects on security of supply because, by reducing asset specificity, it can be regarded as a stimulus to investments in default of long-term commitments. However, the rising importance of non-OECD Asia as an offtaker in global LNG markets makes Europe a market of last resort.

This is an asset for Europe at times of oversupply (such as in 2019), but undercontracting might pose security of supply challenges in the longer term. There is consensus around the notion that China and other non-OECD Asian countries will increasingly be the catalyst of future LNG market growth. Nevertheless, there is significant uncertainty on the size of the import gap of these countries that will have to be filled by flexible LNG.

The size of this import gap will be decisive to determine how much flexible LNG will eventually flow to Europe. The danger for European security of supply is that Europe's pipeline gas suppliers – namely Russia – will refrain from investing in new supply as a result of the European energy transition discourse that gas will (or needs to) be phased out. The recent transformations in gas trade do not encourage the signature of long-term contracts in Europe. Relying only on flexible LNG, particularly in a tight market, could pose significant security of supply risks.

On the basis of what has been said, the desirable course of action – from a purely Realist, self-serving European political perspective – would be to inflate future import needs in order to encourage Russia and other suppliers to invest now. What is observed is the contrary: in Europe, there is a clear mismatch between the political discourse, which refuses to portray gas as part of the solution to fight climate change, and the reality on the ground – where gas demand is stable and imports are growing.

By understating its future energy import needs and discouraging the signature of new long-term contracts, Europe is pursuing a risky security of supply strategy (or not pursuing a strategy at all). Gazprom is faced with major unknowns when looking at its future position in Europe and Europe's gas needs. How far-reaching will Europe's push for decarbonisation be? Given the objective of decarbonisation, what future do European governments envisage for gas? Is it possible that gas will still feature in large quantities in Europe's energy mix, in spite of hostility by politicians? Provided that gas continues to play an important role in the future energy mix of Europe, will political hostility to Russian gas limit Russian gas sales in Europe? To what extent will Europe try (and be able) to stretch its regulation – particularly under lobbying from the US, Poland and other Eastern European countries – in order to prevent a higher Russian market share?

So far, Russia has confirmed its interest in supplying Europe. The efforts behind Nord Stream 2 and continued investments on fields located in Western Siberia are evidence of this. However, there is significant uncertainty as to whether the questions above will induce a shift in Russia's mindset and investment behaviour (Chapter 9).

The role of contracts in coping with uncertainty

The observations of the previous sections can be complemented by notions derived from Transaction Cost Economics (TCE), as this discipline provides valuable insights on the relation between contracting and uncertainty (Chapter 3). Contracting behaviour is one of the factors that shape the positioning of an actor – be it a company or a country[929] – in coping with the high degree of uncertainty that characterises transactions in the gas sector. Different actors have different approaches to contracting based on the kind of portfolio that they aim to build, and especially based on how much risk they are willing to take.

A distinctive feature of TCE is that it diverges from neoclassical economics in a number of key tenets. What is relevant to emphasize at this stage is that neoclassical economics does not account for uncertainty: economic actors are assumed to have access to perfect information. They are thus able to set up contracts that can foresee all future eventualities and are easy to implement. Under the perfect market conditions assumed by neoclassical economics, contracts are actually not indispensable as transactions can be entrusted to the 'open market', which is assumed to be fully efficient and free from manipulation. A neoclassical economic approach to the subject of analysis would not attempt to complement the findings of Chapter 7 by considering the frictions that characterise EU-Russia gas trade; the importance of intangible relational aspects of EU-Russia gas trade; and the long-term impact of the transition to shorter term trade and hub indexation on investments, gas prices and security of supply. Furthermore, a neoclassical economic approach would not account for the imperfect functioning of European gas markets, which are still characterised by oligopolistic dynamics, due in part to concentrated external supply.

TCE postulates that, as opposed to theoretical perfect market situations, information is not perfect and transaction costs do exist in real-world economic exchanges. TCE regards long-term contracts as a 'special governance structure' (as opposed to 'simple' market exchange) that can lower transaction costs for certain transactions. Therefore, from this perspective, long-term contracts are an instrument that can be employed to cope with uncertainty, bounded rationality (the limited ability to understand reality and implications of economic

929 It is worth reminding that in spite of the fact that companies sign long-term contracts for gas imports in Europe, State influence is still decisive. The signature of long-term contracts is still considered highly strategic from a national perspective, and domiciled companies can be strongly encouraged (or discouraged) by national governments to sign new long-term contracts.

choices), and opportunism. Long-term contracts increase the efficiency of capital investment decisions because of the information they yield. They are key instruments as they help parties creating order where there would otherwise be chaos, mitigating strategic problems (Parsons).

In particular, long-term relational contracts – the type of historical contracts between Gazprom and its EU partners – are the most suitable governance structure for transactions (conducted under the abovementioned conditions of uncertainty, bounded rationality and opportunism) that are recurrent and entail a highly idiosyncratic investment. Idiosyncratic investment is asset-specific investment, as opposed to non-specific investment (which is allocated on production of highly fungible goods, i.e. not specifically bound to a customer or market). In previous chapters, it was shown that EU-Russia gas contracts are long-term relational contracts and investment in the gas sector is highly idiosyncratic – even if idiosyncrasy is arguably diminishing (*infra*).

In sum, one of the key functions of long-term gas contracts is to provide guarantees for investments. The question that needs to be answered at this stage is whether the significant transformations undergone by long-term import contracts (Chapters 5 and 6) have negatively impacted on gas investments, particularly with regard to new supplies to Europe. For the purpose of illustrating the importance of long-term contracts, some of the considerations included in the next sections will be based on imagining an extreme scenario where long-term contracts are absent. These considerations are then softened and contextualised, as long-term contracts are not being terminated in actuality, even if they are certainly not thriving and even if they have been modified profoundly (Chapters 5 and 6).

On the basis of TCE theory, one would conclude that investments would be endangered by a demise of long-term relational contracts in a sector where there is still substantial asset specificity. One line of argument would be that a partial or full demise of long-term relational contracts leads to the aggravation of the so-called ‘hold-up problem’. The hold-up problem arises when parties to a transaction have to allocate noncontractible relation-specific investments ahead of the transaction, and when specific elements such as quality, quantity as well as time and point of delivery cannot be firmly determined beforehand. In this situation, both parties would benefit the most from cooperation but end up not cooperating because they fear that – by doing so – they would provide the other party with additional bargaining power, which would worsen their own position. Signing a contract that solves the hold-up problem is impossible due to unforeseeable external factors, lack of trust, quality problems and asymmetry of information between the parties. The hold-up problem leads to economic costs for both parties as well as risks of underinvestment. Based on the findings of Chapter 8 so far, it can be argued that 1.) the erosion of relational features in EU-Russia gas contracts; 2.) the increasingly limited ability to foresee external factors (uncertainty) and arguably 3.) the increasing asymmetry of information between the parties (related to the ambiguity in Europe’s plans for decarbonisation, but also the importance of policy decisions in China for global gas demand, and China’s reluctance to share energy data) accentuate the hold-up problem in Europe’s gas trade relations with its external partners.

According to some of the long-term contract literature reviewed in Chapter 3, by encouraging asset-specific investments with long pay-back times, long-term contracts contribute to keeping marginal costs of production low. As a result, they also contribute to keep spot prices at a lower level, because spot prices tend to converge towards the marginal costs of production (or delivery) in the longer term. A partial or full demise of long-term contracts might therefore discourage investments on large projects with economies of scale and low unit costs of production, leading to higher spot prices in the long term – with negative political-economic consequences for Europe.

Long-term contracts have also been praised for providing information about future production capabilities and costs. Neuhoff and von Hirschausen[930], for instance, observed that without long-term contracts, exporting countries would have an incentive to overstate their future production capability in order to keep demand in importing countries high and competing investments low. If actual production were to be lower than announced, exporting countries would then benefit from higher prices. To the contrary, if all the volumes were locked in long-term contracts, suppliers would have the strongest incentive to produce all contracted amounts, because otherwise they would have to purchase gas on the spot (in what would then be a tight market, i.e. with high spot prices) in order to honour their long-term commitments.

Furthermore, if importers are proactive in procurement and adopt a forward-looking strategy, long-term contracting can also favour supply diversification, thus further precluding the exertion of market power by potentially dominant suppliers. The EU publicly supports the plan to diversify away from Russian gas by calling for the development of upstream projects in – and construction of pipelines from – Azerbaijan, Turkmenistan, Northern Iraq and the East Mediterranean. However, the EU is *de facto* thwarting this plan by creating conditions that discourage the signature of new long-term contracts, such as ambiguity about the future role of gas in the energy mix and the very transformations in EU-Russia gas trade analysed here. In fact, the new European gas market architecture reassures buyers that they can always purchase gas on the spot, thereby removing incentives to commit in the long term. This is also because now there is no real price differentiation, as long-term contract prices are indexed to spot prices. Plans to import gas from countries in the Caspian and the Middle East are even more capital-intensive than plans to expand imports from Russia, as Russia can build on legacy infrastructure and know-how. Projects from the Caspian and the Middle East would therefore need to be underpinned by long-term contracts and particularly strong guarantees. This is proven by the fact that, except for gas from Azerbaijan's Shah Deniz 2, none of the plans to import gas via the Southern Gas Corridor are expected to materialise soon, in spite of the perceived political urgency to reduce dependency on Russian gas. Furthermore, TANAP and TAP – the pipelines through which Azerbaijani gas will reach Europe from 2020 – have been underpinned by 25-year supply contracts. By frustrating piped gas diversification, the recent transformations in gas trade might thus lead to the unintended consequence of reducing pipeline gas-to-gas competition in the long term.

930 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

In the previous four paragraphs, the importance of long-term contracts was highlighted by comparing two extreme situations: one in which long-term contracts are signed and one in which there is a full or partial demise of long-term contracts.

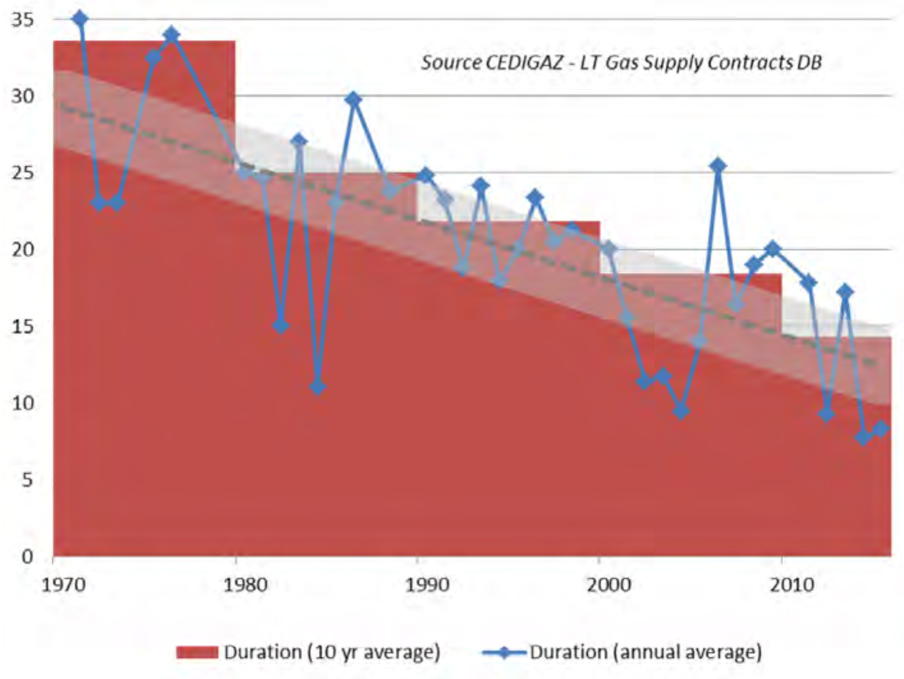


FIGURE 41: EVOLUTION IN LONG-TERM GAS CONTRACT DURATION IN EUROPE (1970-2015) – SOURCE: CEDIGAZ

However, one of the key conclusions of Chapter 6 was that long-term contracts between Russia and Europe have undergone deep transformations, but are still alive. It is a common misconception of the recent transformations in EU-Russia gas trade to argue that long-term contracts are dead. The fact that not many long-term contracts have been terminated needs to be taken into account when analysing the importance of long-term contracts through the lens of TCE.

In any case, previous chapters found that contracts have been transformed deeply (see also Figure 41 above). For instance, as explained earlier in Chapter 8, some of the relational characteristics of historical long-term contracts have been lost. As explained at length in Chapter 5 and at the beginning of Chapter 8, long-term gas contracts are complex risk allocation mechanisms, where every component matters and contributes to the overall risk balance, making it difficult and/or unsustainable to modify them *à la carte*. For instance, Masten and Crocker[931] highlighted the importance of take-or-pay clauses in averting violation

931 Masten and Crocker, 'Efficient Adaptation in Long-term Contracts: Take-or-Pay Provisions for Natural Gas'.

and expensive renegotiations. If it is true that volumetric flexibility has been clawed back from long-term contracts when hub indexation has been introduced (Chapter 5), it is legitimate to raise the question as to whether current long-term contracts are in balance – or whether further readjustments (including radical ones) will be needed soon.

Moreover, and perhaps more importantly, the establishment of a new gas market architecture based on gas-to-gas competition (of which the transformation in EU-Russia gas trade is a manifestation), does not encourage the signature of long-term contracts (Figures 42 and 43 below show that, in future, "guaranteed" volumes to Europe will shrink). Furthermore, there is a sentiment that the transition is in flux and that, gradually, long-term contracts will become shorter and shorter in duration, and that their pricing mechanisms will increasingly be driven by market dynamics.

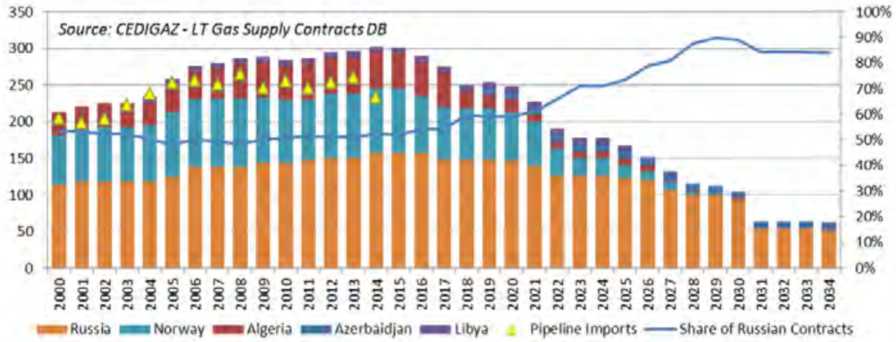


FIGURE 42: LONG-TERM GAS CONTRACTS IN EUROPE, BY SUPPLIER, WITH SHARE OF RUSSIA ON TOTAL LTCS, 2000-2034. SOURCE – CEDIGAZ 2015.

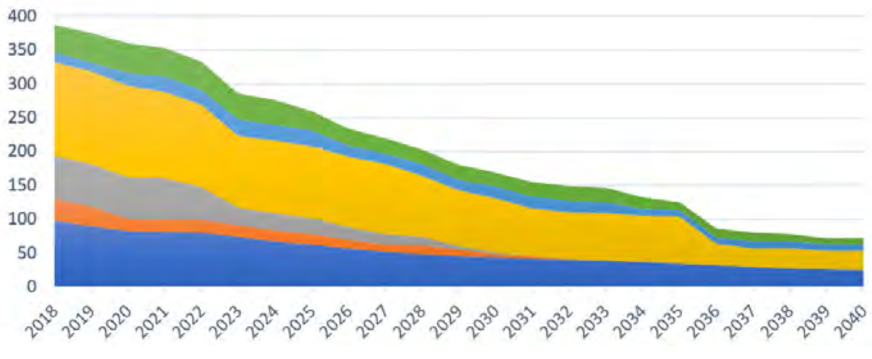


FIGURE 43: "GUARANTEED" SOURCES OF GAS FOR EUROPE 2018-2040: INDIGENOUS GAS AND SUPPLY CONTRACTED LONG-TERM – IN BCM, NOVATEK

As explained above, capital-intensive greenfield projects usually require the signature of long-term contracts upfront, covering the majority (if not the entirety) of the expected output. At the same time, incentives to sign long-term contracts in Europe are limited. The presence of fast-growing demand centres in Asia and elsewhere (Latin America, Middle East) is solving this conundrum on behalf of Europe with regard to LNG (while the conundrum is not solved for piped gas, as explained above). In fact, capital-intensive greenfield LNG projects are still being developed thanks to the catalyst role played by Asian importers, who still sign long-term contracts. Europe benefits from Asia's catalyst role by being in a position to receive marginal destination-flexible volumes. It is true that some new investments on LNG projects have been allocated without long-term contract coverage. This is the case of FIDs on LNG Canada, Tortue and Golden Pass.[932] However, this type of 'speculative' investment decisions remain the exception.

The predictions of TCE (Chapter 3)[933] are confirmed by a comparison of recent figures on new long-term contract signatures and investment decisions. The two still go hand in hand (see Figures 44 and 45), in spite of the gradual commoditization of LNG.

In 2014, more than 30 Bcm/y in new LNG capacity were sanctioned worldwide, mostly in the US. That represented the tail of the previous wave of LNG FIDs on projects that are currently coming on stream today. In the same year, total LNG contract volumes were 600 MT and were predominantly project-linked, while average contractual duration was just below 12 years. Total LNG contract volumes fell below 400 MT in 2015, below 300 MT in 2016 and down to 200 MT in 2017. Annual contract duration fell below 9 years in 2015, and down to approximately 6 years in 2016 and 2017. Less final investment decisions were taken. Projects with a capacity of 20 Bcm/y were sanctioned in 2015, and total sanctioned capacity fell well below 10 Bcm/y in 2016 and 2017. The only investment decision made in 2017 concerned LNG from Mozambique (Coral FLNG). In the period 2015-2017, when very few contracts were signed, concerns that weak investment would result in a supply crunch reached their peak. The expected market tightness in the early 2020s is a legacy of that period.

In 2018, the decline in new long-term contract signatures was reversed, driven by the need of guarantees to underpin new investment decisions. Gross LNG contracted volumes grew back to almost 600 MT in 2018. Average contract duration also increased to around 13 years.

This comparison essentially confirms the correlation between the signature of new long-term contracts and the sanctioning of new investments, in line with the predictions of TCE. Furthermore, it reveals a revival in long-term contracts in 2018. This strengthens our hypothe-

932 *Gas 2019: Analysis and Forecasts to 2024*, IEA.

933 Neuhoff and Von Hirschhausen observed that contract duration was diminishing over time, in line with the predictions of TCE theory that growing maturity of transportation infrastructure and higher competition would lead to such an outcome. Neumann and Von Hirschhausen found that a number of factors were reducing the appetite (and need) for long-term contracts, such as decreasing capital intensity (particularly for liquefaction technologies in LNG), the lower asset-specificity of gas investments (both upstream and downstream) and the development of spot markets with an ever-increasing number of participants (and thus more numerous opportunities for trading). The notion that a decrease in asset specificity lowers the efficiency gains brought by long-term contracting was already put forward by Doane and Spulber (1994). Along similar lines, Hartley and Brito (2001) demostrated that the duration of long-term contracts is likely to diminish when: a.) capital expenditures are decreasing, b.) the discount rate is increasing; c.) transport costs are falling; d.) there is a larger number of players in the market. Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas; Hartley and Brito, *New Energy Technologies in the Natural Gas Sectors*; Doane and Spulber, 'Open Access and the Evolution of the US Spot Market for Natural Gas'.

sis – put forward earlier in Chapter 8 – that Asian buyers might lock additional volumes in long-term contracts in future (thereby potentially threatening the EU's ambition to rely on free-flowing LNG for its security of supply).

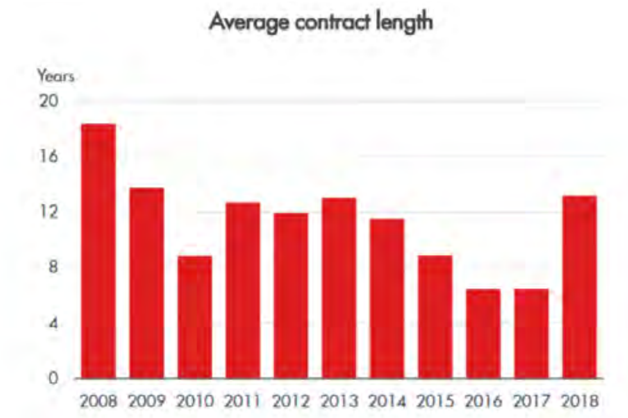


FIGURE 44: AVERAGE CONTRACT LENGTH, SHOWING A RECOVERY IN 2018 – SHELL

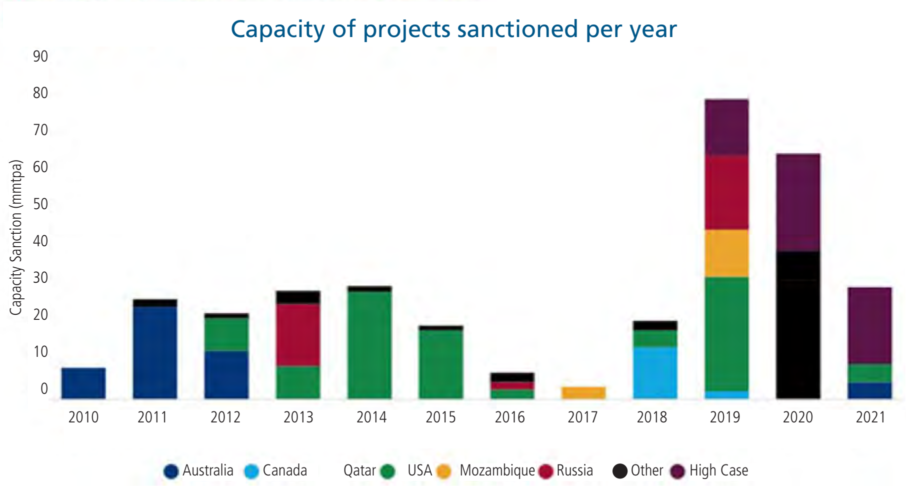


FIGURE 45: CAPACITY OF PROJECTS SANCTIONED PER YEAR, SHOWING A RECOVERY IN FID IN 2018 (AND 2019) – WOODMACKENZIE

Most of the time, it is forgotten that – since the liberalised gas-to-gas competition model has been in place – Europe has not experienced a combination of prolonged global market tightness and fast-rising internal consumption. In fact, when global markets were tight, such as in the aftermath of Fukushima, European demand was in decline. Conversely, when

European demand recovered in 2014, a new wave of LNG came on stream. Tighter market conditions in the early 2020s, paired with growing EU import needs, might completely change the underlying conditions of the assessment presented in Chapter 7. If it emerges that the transition to hub pricing and shorter-term trade is hampering investments in gas, prices might increase substantially in future following the dynamics of a typical commodity cycle. Theoretically, future price increases could be so high as to potentially erase all the gains realised so far. Some elements suggesting that the new contract models are not always conductive to new investment have already emerged in the past years.

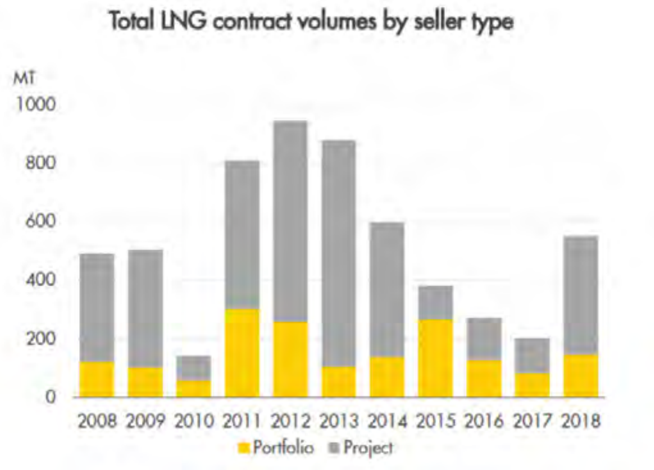


FIGURE 46: TOTAL LNG CONTRACTED VOLUMES BY SELLER TYPE (PROJECT-LINKED VS PORTFOLIO PLAYERS) – SHELL

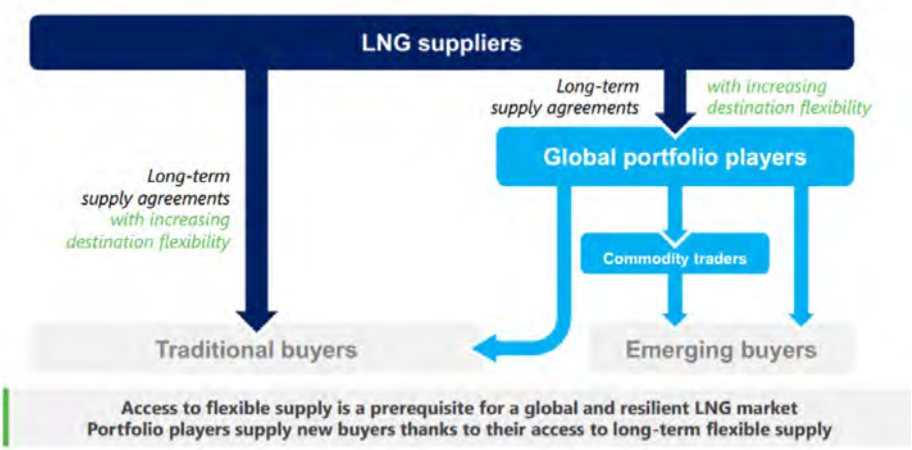


FIGURE 47: LONG-TERM AGREEMENTS STILL EXIST – THEY HAVE BEEN MOVED MORE UPSTREAM IN THE VALUE CHAIN. SOURCE: IEA

While Europe is increasingly relying on a 'market only' approach to security of supply, buyers in emerging Asia are still signing a lot of long-term contracts (Figure 48 below), enabling FIDs (Figure 49).

Structure of term contracts in emerging Asian LNG buyers and imported LNG volume (2005-18)

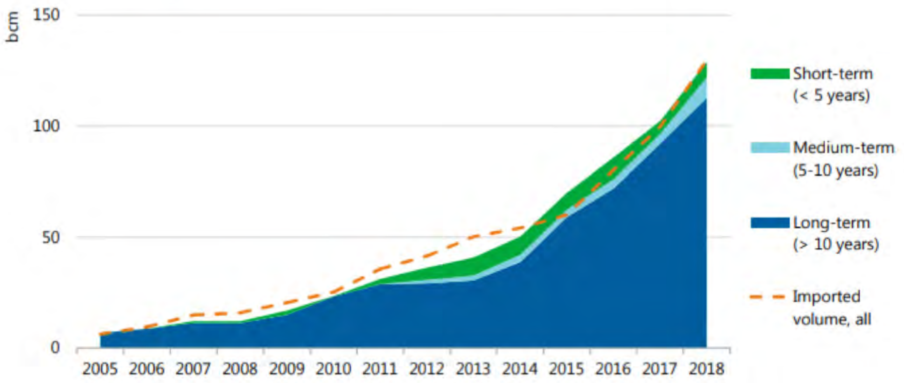


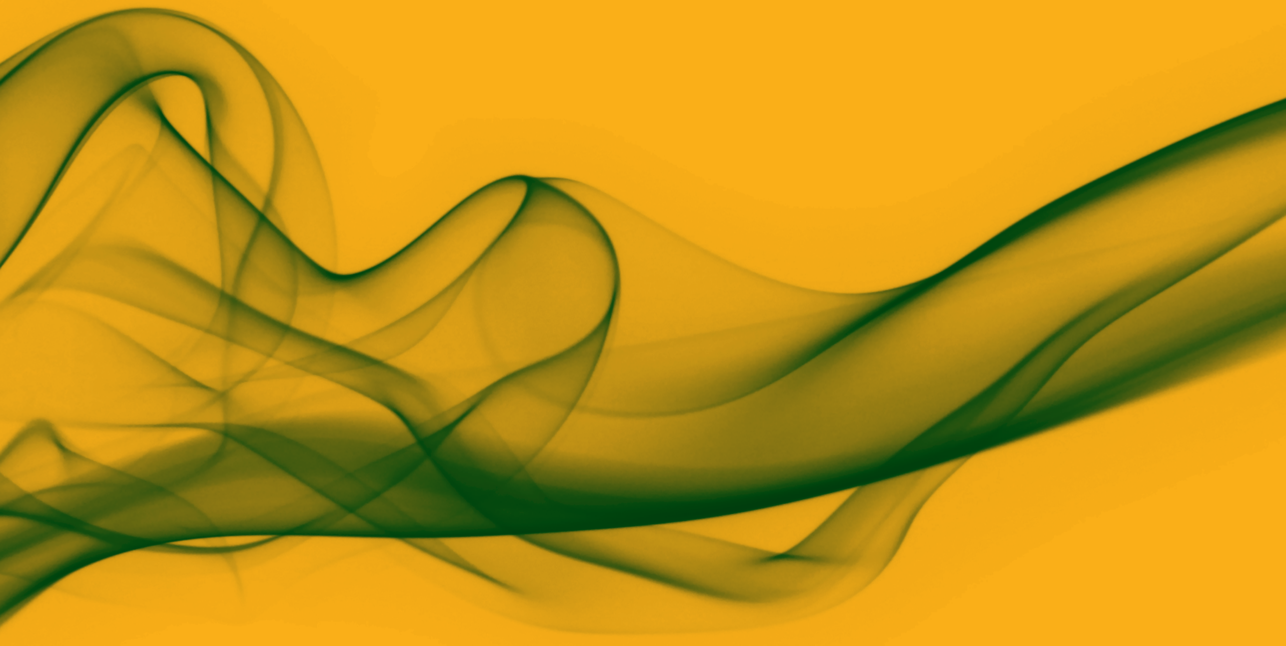
FIGURE 48: SHOWING THAT THERE HAS BEEN A REVIVAL OF LONG-TERM CONTRACTING IN ASIA – IEA

FID-enabling contracts by signing year and structuring model (2014-19)

FIGURE 49: FID-ENABLING CONTRACTS BY SIGNING YEARS AND STRUCTURING MODEL (2014-2018) – IEA

CHAPTER 9

THE POLITICAL-ECONOMIC IMPACT OF TRANSFORMATIONS IN EU-RUSSIA GAS TRADE TERMS ON RUSSIA



CHAPTER 9 – THE POLITICAL-ECONOMIC IMPACT OF TRANSFORMATIONS IN EU-RUSSIA GAS TRADE TERMS ON RUSSIA

Chapter 9 investigates the impact of transformations in EU-Russia gas trade on Russia. Some valuable conclusions can already be drawn from previous chapters, which dealt with the consequences of such transformations for the EU and for EU-Russia gas trade relations, insofar as those conclusions can be applied in a specular fashion to Russia. This notably applies to the finding that the transformations in EU-Russia gas trade resulted in a lower cost of importing Russian gas for the EU in the period between 2009 and 2019 (Chapter 7). More precisely, the cost resulted lower than it would have been if previous contractual conditions, namely oil indexation, had been applied. The specular implication of this finding is that the transformations in EU-Russia gas trade negatively impacted on the value that Russia extracted from its gas exports to the EU between 2009 and 2019 by the same amount.

This loss is reflected in Gazprom's net sales revenues, which are determined by volumes and price levels. As was acknowledged in Chapter 7, price level variations are only partly determined by changes in pricing mechanisms. Moreover, the volumes that Gazprom markets in the EU are also affected by price levels (and thus, indirectly, by pricing mechanisms). Therefore, in line with what has been said about the EU's gas import bill, it is not possible to exactly quantify Gazprom's monetary loss deriving from the transformations in question because it is not possible to establish how much Russian gas EU importers would have bought if gas had been priced differently. As we will see in this Chapter, Gazprom's market share has indeed benefitted from Gazprom's adaptations to new pricing mechanisms in the EU after 2013-2014. In any case, the hypothesis that Gazprom's net sales revenues have suffered from the transformations in EU-Russia gas trade holds, and is indeed proven by the specular application to Gazprom of evidence presented in Chapter 7, then showing a lower import bill for the EU.

This still does not allow us to adequately appreciate the relevance of the transformations in question for Gazprom's overall financial position. In other words, those transformations now need to be contextualised from a supplier's perspective. In this Chapter, we will examine the evolution in Gazprom's net sales revenues in the 'Far Abroad'[934] and we will assess such

934 A regional grouping used in Gazprom's financial statements and annual reports. This grouping mostly overlaps with the EU, with a number of differences: Lithuania, Latvia and Estonia are excluded, while Turkey and other non-EU countries that had never been part of the Soviet Union are included. Overall, EU countries express 85-90% of Gazprom's sales and revenues in the Far Abroad, depending on the year. For this reason, we regard figures related to the Far Abroad as highly illustrative of the EU market and we adopt them as a proxy in this Chapter. This is also to ensure internal consistency. In fact, the aim is to work with official figures provided by Gazprom, and Gazprom only rarely provides figures referred to the EU as a block.

evolution against broader considerations about Gazprom's financial performance, which is affected by numerous other variables besides EU gas pricing and sales revenues in the EU.

This Chapter does not attempt to quantitatively isolate the impact of transformations described here on Gazprom's financial performance from the impact of other variables. The aim of this Chapter is to provide useful insights by studying whether transformations in EU-Russia gas trade terms have taken place in an already challenging environment for Gazprom, or whether those transformations have been the only (or main) challenge that the Russian gas giant has been facing in the last decade. We will also take the pulse of the evolution in the company's dependency on the European market as a source of revenue. A further step is to shift our focus from Gazprom to the Russian State, by considering the macro-economic and fiscal importance of gas revenues (and especially of Gazprom's gas revenues in the EU).

The reduction in value extracted by Russia from exports to the EU – estimated in Chapter 7 – is only part of the story. Chapter 8 showed that the findings of Chapter 7 do not allow us to conclude that the political-economic impact of transformations in EU-Russia gas trade is conclusively and univocally positive for the EU. There are multiple reasons for this.

Firstly, there are signs that the transformations in question might have permanently changed relations between Gazprom and EU importing companies. While cooperation is still ongoing on a number of projects, the gradual transition to market-based exchange dimmed some relational features of exchange between Gazprom and EU importers. In this chapter on Russia, further reflections on how this is changing Gazprom's strategies in Europe will be presented. How is Gazprom adjusting to the new way of conducting business in the European gas market? Are there other metrics to be considered beyond net sales revenues?

Secondly, it was maintained that the impact of transformations in EU-Russia gas trade on both affordability and security of supply should be assessed in a long-term perspective. This is mainly because, since those transformations have started, the EU gas market has never experienced prolonged tightness in combination with global gas market tightness. Does adopting a long-term perspective change our interpretation of the impact of those transformations? Chapter 8 has covered the issue of long-term investments in global LNG in relation with the evolution in gas contracting and with a view to assess the resilience of European security of supply. Is it possible to add something about the impact of recent transformations in EU-Russia gas trade terms on gas investments within Russia?

Finally, we have highlighted in previous chapters that the EU has wished to transfer its new gas market model, revolving around the principle of gas-to-gas competition, onto supplying countries such as Russia. Now that the transition to a model based on gas-to-gas competition is fundamentally complete in Western Europe, how can we assess the possibility of change in the Russian gas market? Is the Russian gas market moving towards liberalization as well? Will the EU's neo-liberal policy transfer attempt be successful in the field of gas market legislation? Or will two different gas architectures coexist across EU-Russia borders?

9.1 GAZPROM'S FINANCIAL PERFORMANCE

The transformations in EU-Russia gas trade, and particularly the introduction of hub indexation in long-term import contracts, lowered the price of Gazprom's gas in the EU between 2009 and 2019 (Chapter 7). Gazprom staunchly opposed those transformations, and then reluctantly accepted them in gradual steps.

Those transformations unfolded in a difficult period for Gazprom, as they coincided with: 1.) increased domestic competition from independent gas producers; 2.) a phase of global gas oversupply, and greater competition between LNG and piped gas; 3.) rising political hostility to Russian gas in the EU, leading to a more selective and politically-charged use of EU energy regulations against Gazprom; 4.) lower sales to Former Soviet Union countries; 5.) higher taxation levels imposed by the Russian government, particularly on gas extraction.

Furthermore, in the period under consideration, Gazprom has undertaken several costly pipeline projects simultaneously, such as Power of Siberia, Nord Stream 2 and Turk Stream, at least in part as a result of pressures by its major shareholder – the Russian State.

Gazprom's revenues in various markets and other financial metrics are analysed in the next sections in order to contextualise the transformations in EU-Russia gas trade described in previous chapters and appreciate factors that influence Gazprom's strategic positioning on the EU gas market in a more comprehensive manner.

Evolution in Gazprom's revenues in the Far Abroad, Russia and the FSU region

In rouble terms, Gazprom's sales revenues in the Far Abroad net of excise tax and customs duties have actually increased in the last decade (Figure 50).

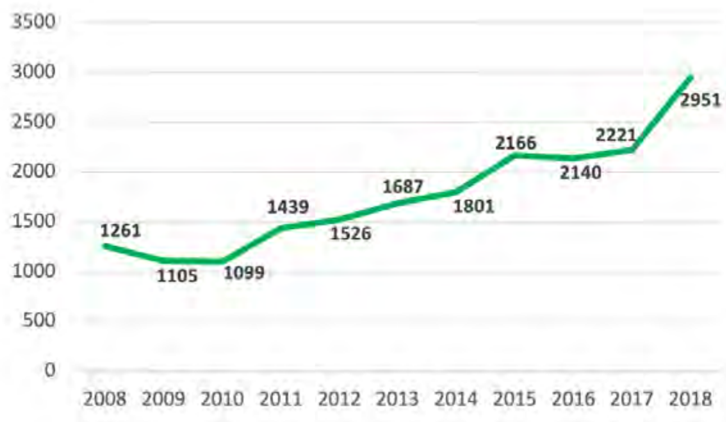


FIGURE 50: GAZPROM'S NET SALES REVENUE IN THE FAR ABROAD, NET OF EXCISE TAX AND CUSTOM DUTIES, IN BILLIONS OF RUSSIAN ROUBLES (SOURCE: GAZPROM ANNUAL REPORTS 2008-2018)

However, when the severe depreciation of the Russian rouble since 2014-2015 is taken into account, the picture changes considerably (Figure 51). In dollar terms, Gazprom's net sales revenue in the Far Abroad fell during the global economic and financial crisis and then rose substantially between 2010 and 2013, at the height of the phase of long-term contract renegotiations and arbitrations with EU customers (Chapters 6 and 7), reaching a peak of 52.9 billion dollars in 2013.[935]

Since then, revenues have declined substantially, in line with falling gas prices in the EU, reaching a low of 32 billion dollars in 2016.[936] Afterwards, revenues resumed growth as a result of larger export volumes and recovering prices. The most recent decline in EU gas prices in Q4 2018-2019 is not yet reflected by these figures, which have been compiled by the author from Gazprom's Annual Reports.

FIGURE 51: GAZPROM'S NET SALES REVENUE IN THE FAR ABROAD, NET OF EXCISE TAX AND CUSTOM DUTIES, IN BILLIONS OF US DOLLARS – YEARLY AVERAGE EXCHANGE RATES HAVE BEEN USED FOR CONVERSION. SOURCE: GAZPROM ANNUAL REPORTS 2008-2018.

One of the most important observations is that, in the period analysed, record high sales did not translate into record high revenues. In 2012, for instance, Gazprom made 49 billion dollars from sales to the Far Abroad with a market share of only 25.4% (151 Bcm), while in 2016 it made 32 billion dollars with a market share of 33.1% (228 Bcm).[937]

While of course the best situation for Gazprom would be a combination of high sales volumes/ market share and high prices, this can only materialise when gas-to-gas competition is limited and/or demand is very high. Unfortunately for Gazprom, this conjuncture has not taken place (for a time sufficiently long to be observable) in the period analysed, meaning that Gazprom was often presented with a trade-off between volumes/market share and price. The phase of

935 Gazprom Annual Reports 2008-2018.

936 *Ibid.*

937 *Ibid.*

high sales revenues in the Far Abroad between 2010 and 2013 coincided with a historically low market share for Gazprom. Gazprom followed a 'value-over-volume' approach in that phase. However, Gazprom largely failed to defend value, as discussed in previous chapters. Faced with the unavoidable introduction of hub indexation since the early 2010s and with the fall in commodity prices in 2014, Gazprom was forced to adjust its strategy and try to defend volume instead, thereby taking a longer-term view consisting of protecting its market in the EU.

However, if we were to generalise, and focus on the short-term only, in the period analysed, low prices have hurt Gazprom's revenues more than low volumes. This might be one of the reasons why the company tried to defend value for as long as it could – although a number of observers (at home and abroad)[938] criticised Gazprom for not having adapted more quickly to the new reality on European gas markets. In 2017 and 2018, Gazprom had a tasting of the ideal conjuncture described above (historically high market share as well as historically high prices, or at least certainly recovering from the 2014-2016 dip). The reason was high absorption of flexible LNG volumes in China and other emerging markets in Asia, the Middle East and Latin America, limiting gas-to-gas competition in the EU and determining an increase in EU gas prices – the EU being the 'market of last resort'. However, that phase came to an end in the last quarter of 2018. This is not reflected in the graphs presented in this section and is not yet accounted for in Gazprom's Annual Report for 2019, which still needed to be published at the time of writing. New LNG capacity coming on stream and lower growth rates in emerging markets determined a situation of gas oversupply globally. More flexible LNG – in search of an outlet – started to flow to the EU and compete with Russian gas. EU gas prices decreased again. This is going to translate into lower sales revenues in the Far Abroad for Gazprom in 2019.[939]

Gazprom is not only facing challenges in the EU, but also in its other markets. Throughout the period analysed, Gazprom has had to cope with sluggish sales to the Russian market (Figure 52), because of a combination of weak domestic consumption due to poor (or negative, depending on the year) GDP growth and increased competition from domestic independent producers.[940]

Novatek – mostly known internationally for its successful Yamal LNG project, in partnership with Total, CNPC and the Silk Road Project – is a fast-growing Russian private company and has remarkably expanded its domestic operations in the course of last decade. In 2018, it produced 69 Bcm of gas in Russia, an increase of 8.5% relative to 2017.[941] Its main fields are in the Yamalo-Nenets region, similar to Gazprom. Novatek has consolidated its position in the Eastern part of the historical gas-producing basin of Nadym-Pur-Taz by tapping additional fields and building new processing facilities. It supplies gas to large industrial users and power generators in 39 regions across Russia, often through Gazprom's pipeline network. It is

938 A. Konoplyanik, 'Russian Gas at European Energy Market: Why Adaptation is Inevitable', *Energy Strategy Review*, 1:1 (2012), 42-56; Mitrova and Boersma, *The Impact of US LNG on Russian Natural Gas Export Policy*.

939 T. Paraskova, 'European Gas Prices Plunge to 10-Year Low', *Oil Price*, 4 September 2019.

940 A. Vavilov, *Gazprom: An Energy Giant and Its Challenges in Europe*.

941 T. Mitrova et al, Основные элементы и возможные сценарии дерегулирования цен на газ в России и реформирования газового рынка (2019): Skolkovo and OIES.

particularly strong around the industrial city of Chelyabinsk, where it also owns parts of the transmission grids.[942] Novatek is a private company and is often referred to as an independent gas producer. Through businessmen Leonid Mikhelson and Gennady Timchenko, however, Novatek maintains close political ties with the Kremlin. It currently enjoys a good reputation at home and abroad because it can showcase its Yamal LNG success story. This might increases Novatek's leverage in discussions on Russian gas market reform.

The other main independent gas producer in Russia is Rosneft, whose core business is oil. Rosneft's key figure is CEO Igor Sechin, a close ally of Vladimir Putin and a member of the *siloviki* faction who also served as Deputy Prime Minister of the Russian Federation until 2012. It is the most Eastern-oriented of Russia's large hydrocarbon companies, with key oil assets and significant gas potential in Eastern Siberia. Its current gas production (63.2 Bcm in 2018) mostly originates from Western Siberia and in the Ural region. Rosneft mostly delivers gas in the Sverdlovsk oblast.

The growth of independent gas producers eroded Gazprom's market share in the Russian market. Between 2010 and 2017, Gazprom's share in domestic production fell from 78% to 68%, and its share in domestic deliveries fell from 69% to 46%.[943] Today, more than half of total deliveries to the Russian domestic market are therefore performed by independent gas producers.

Moreover, sales to Former Soviet Union countries, historically priced higher than domestic sales (albeit lower than sales to the lucrative 'Far Abroad' market), also declined in the last decade – mostly as a result of the deterioration in Russia-Ukraine relations and the economic crisis in Ukraine where gas consumption and (direct) imports of Russian gas fell (Figure 52). In 2011, Gazprom sold as much as 44 Bcm to Ukraine. Between 2016 and 2018, Gazprom's gas sales to Ukraine averaged 2.5 Bcm per year.[944] Discussions about a resumption of direct sales of Russian gas into Ukraine (without going through EU pipelines via Germany and Central-Eastern Europe) are ongoing as part of the negotiations between Russia and Ukraine on gas transit.[945] It is however premature to count on such progress, given the high degree of uncertainty surrounding those negotiations.

As a result of the developments investigated above, revenues from sales to the domestic market and FSU countries also declined, not helped by the fact that domestic gas prices in Russia – which had been growing until 2014 in line with policy efforts to reduce their gap with export prices – stagnated in rouble terms (and fell in dollar terms). For the purpose of comparison, revenues from sales in the Far Abroad, Russia and the FSU countries are expressed in dollar terms below (Figure 53). As shown by the graph, revenues from sales in Russia and particularly in the Former Soviet Union have declined comparatively more than revenues from sales in the Far Abroad. The recovery in 2017-2018 (which still does not bring sales revenues in US dollars terms close to pre-crisis levels) is mostly driven by sales in the Far Abroad.

942 *Ibid.*

943 Mitrova and Boersma, *The Impact of US LNG on Russian Natural Gas Export Policy*.

944 Gazprom website, see: https://www.gazprom.com/about/marketing/cis-baltia/

945 'Russia's Gazprom Focused on New Direct Gas Sales Deal with Ukraine: CEO', *S&P Global Platts*, 9 September 2019.

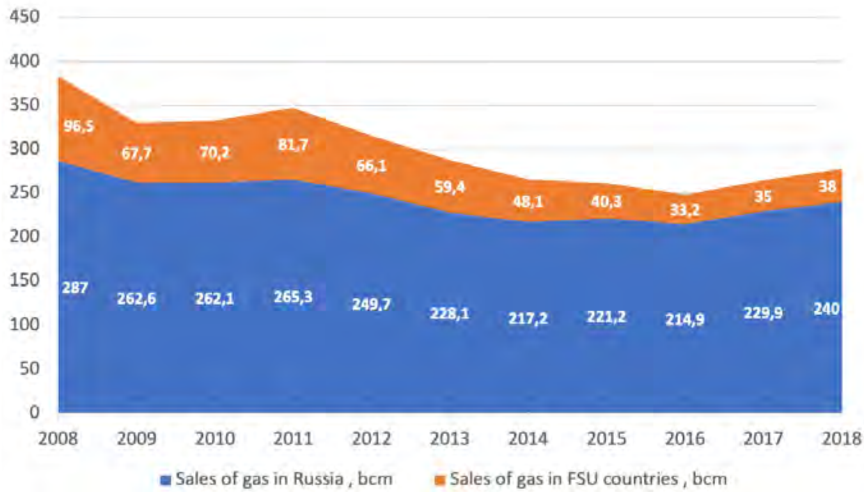


FIGURE 52: GAZPROM'S GAS SALES IN RUSSIA AND FSU COUNTRIES, IN BILLION CUBIC METRES. SOURCES: GAZPROM ANNUAL REPORTS 2008-2018

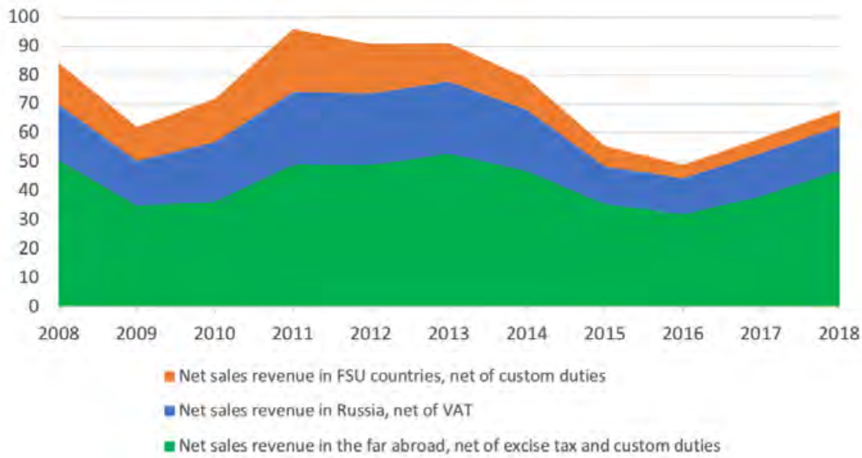


FIGURE 53: GAZPROM'S NET SALES REVENUE BY REGION, IN BILLION US DOLLARS. SOURCES: GAZPROM ANNUAL REPORTS 2008-2018.

The figures presented above show that Gazprom is highly dependent on revenues from sales to the Far Abroad (and thus the EU). Furthermore, it is also possible to observe that Gazprom's dependency on the Far Abroad as a source of sales revenues has increased in the period under observation. In 2010, the net revenues extracted by Gazprom from sales in Russia and the Former Soviet Union were approximately the same as net revenues extracted in the Far Abroad. In 2018, almost 70% of Gazprom's total net sales revenues originated from the Far Abroad (Figure 54).[946]

946 Gazprom Annual Reports 2008-2018.

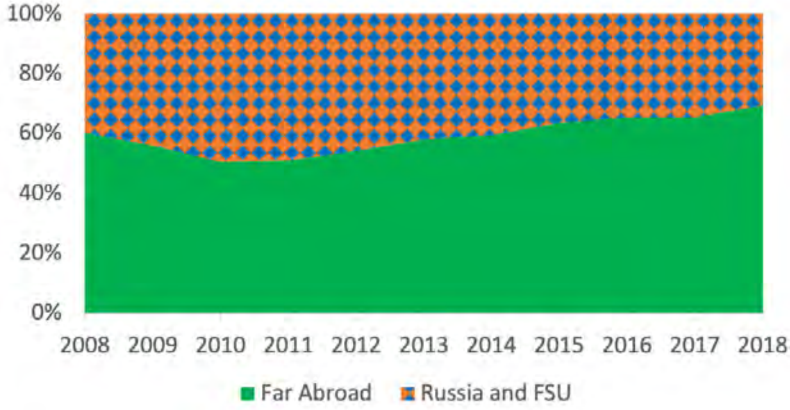


FIGURE 54: SHARE OF GAZPROM'S NET SALES REVENUES BY REGION. SOURCE: GAZPROM ANNUAL REPORTS (2008-2018)

This goes in the opposite direction of long-standing Russian government proposals to increase profitability of the domestic market, diversify sources of gas revenues and reduce dependency on the EU gas market.[947] When EU gas prices fell in 2014, regulated wholesale Russian gas prices were still rising and it seemed possible to achieve structural European netback parity.[948] However, the plan to increase Russian gas prices and reduce their gap with EU gas prices became more and more complicated to implement because of the harsh economic crisis in Russia. Additionally, EU gas prices recovered in 2017 (although they have then decreased again at the end of 2018 and during 2019).

Gazprom's average gas selling prices in the Far Abroad used to be 3-4 times higher than its average gas selling prices in Russia between 2008 and 2012. After decreasing in 2013-2014 and in 2016-2017, the ratio resumed growth and again surpassed 3 in 2018.[949] Moreover, as will be discussed later, Gazprom incurs significant costs to supply Russian customers and is required to perform socio-economic functions in the domestic market – which further exacerbates its dependency on exports to the EU as a source of profit.[950]

In conclusion, Gazprom is increasingly dependent on revenues from sales in the EU, where prices are under pressure due to the influx of flexible LNG. Competition from LNG will also put Gazprom's sales volumes in the EU under pressure, although Gazprom is well positioned to defend its market share thanks to its short-run marginal costs. EU gas prices are set to recover in the early 2020s as the current wave of new LNG supply is absorbed by global markets.

947 On the objective of increasing domestic Russian prices, see for instance Godzimirski, J., "Russian Energy in a Changing World", Routledge, 2016. The target was also transposed into law: "in May 2007, the Russian authorities introduced Resolution No.333 which enshrined the export netback target into law", see Henderson, *The SPIMEX Gas Exchange: Russian Gas Trading Possibilities*.

948 Henderson, *The SPIMEX Gas Exchange: Russian Gas Trading Possibilities*.

949 Gazprom Annual Reports 2008-2018.

950 A. Spanjer, 'Russian Gas Price Reform and the EU–Russia Gas Relationship: Incentives, Consequences and European Security of Supply', *Energy Policy*, 35:5 (2007), 2889-2898.

Gazprom might be able to extract significant revenues from exports to the EU once markets tighten. However, a new wave of FIDs has taken place in 2018-2019, potentially (albeit not undoubtedly) leading to a new phase of low prices in the second half of the 2020s. A lot will depend on demand, not only in the EU but also in the rest of the world, and particularly in non-OECD Asia. While Gazprom's market share in the EU will most likely remain high in the next decade, there is a much more significant uncertainty about Gazprom's future sales revenues in the EU. Nonetheless, it is important to emphasise that Gazprom's dependency on revenues from sales in the EU will be softened by the launch of Power of Siberia at the end of 2019 and the ramp-up in gas sales to China, with full capacity (38 Bcm per year) being reached in the mid-2020s. The EU will still be the most important source of revenues for Gazprom even after Power of Siberia becomes fully operational in the mid-2020s, as its capacity will be about one fifth of Gazprom's current sales to the EU.

Reflections on Gazprom's long-term financial sustainability in view of high investment needs

In spite of historically high exports to the EU, Gazprom is going through a delicate financial phase, although it would be premature to ring the alarm bell at this stage. In any case, the various challenges that the company is facing at home and abroad (among which lower sales revenues in the EU) are starting to be reflected in its financial performance. One of the most worrisome elements that stand out when analysing Gazprom's financial structure is its low market valuation.

This is particularly noteworthy because Gazprom is of the largest gas companies in the world in terms of both gas reserves and production. This allows it to take long-term views, comparatively more than its Western competitors.[951] However, in spite of this advantage, Gazprom's market valuation is very low relative to the industry's average. As a result, Gazprom's gas reserves are 'painfully cheap', at 0.7 U.S. dollars per barrel of oil equivalent in 2015. This is 11 times lower than ExxonMobil's, for instance.[952] Before the economic and financial crisis of 2008-2009, the Russian government had the objective of making Gazprom the largest publicly traded company in the world. At the time, Gazprom's market capitalisation was projected to hit 1 trillion dollars by 2014 from around 300 billion dollars in 2007.[953] Instead, it fell to a mere 55 billion dollars in 2014 and never recovered since then. In 2018, Gazprom's market capitalisation was only 52 billion dollars (Figure 55).[954] A report by Sberbank published in 2018 highlighted how low Gazprom's market valuation is compared to its assets.[955] The report calculated that the Net Present Value (NPV) from legacy upstream activities alone would be 160 billion dollars. It should be highlighted that the report is extremely critical about Gazprom. The report notably accuses Gazprom of choosing 'value-destroying' projects to enrich contractors owned by politically well-connected oligarchs, and asserts that the company should be broken up to unlock maximum value. This is an illustrative example of how Gazprom

951 V. Kreyndel, 'Value and Performance: Gazprom from the Corporate Governance and Finance Perspective' in Vavilov, *Gazprom: An Energy Giant and Its Challenges in Europe*.

952 *Ibid.*

953 *Ibid.*

954 Gazprom website: https://www.gazprom.com/investors/stock/

955 A. Fak and A. Kotelnikova, *Tickling Giants* (2018): Sberbank.

is coming under increased scrutiny within Russia, a topic that will be discussed more in depth later in this Chapter. Even if the Sberbank report might itself be driven by a specific agenda not deprived of political interests (that of dismantling Gazprom), it is right in highlighting that Gazprom's market valuation is low in comparison with asset value.

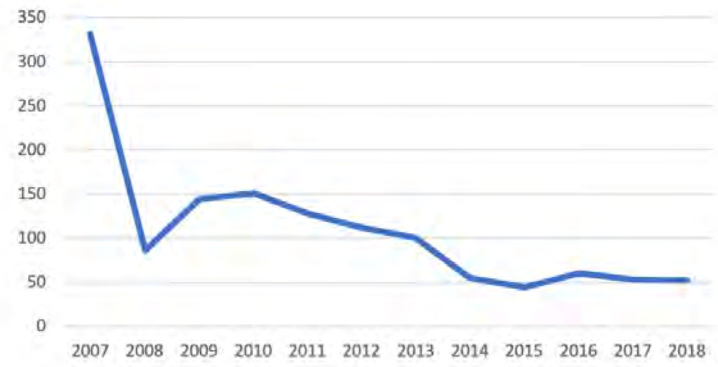


FIGURE 55: GAZPROM'S MARKET CAPITALISATION IN BILLION USD (2007-2018). SOURCE: GAZPROM

Why is market valuation so low? Based on Shleifer and Vishny (1997)[956], Black (2001)[957] and Atanasov et al. (2008)[958], Kreyndel (2015) argues that Gazprom's ownership structure and governance have a negative impact on its attractiveness to investors and thus market valuation. Kreyndel observes that Gazprom minority shareholders rights are not adequately safeguarded, and that the majority shareholder (the government) is perceived as prone to promote its interest to the detriment of other shareholders.[959]

Regardless of whether accountability is really lacking or political interference is really taking place, the perception that these are problems affecting Gazprom has a bearing on its market valuation. Furthermore, the Russian government has been intensifying its efforts to extract additional rents from Gazprom through export duties and especially royalties. In fact, the Mineral Resources Extraction Tax (MRET) applied to Gazprom has been rising substantially in recent years (*infra*). At the same time, Gazprom embarked on highly capital-intensive pipeline projects such as Nord Stream 2, Turk Stream and Power of Siberia. In our opinion, these projects – while also being promoted for geopolitical reasons – also have a strategic commercial rationale[960], as they either allow Gazprom to avoid transit fees (in case of Nord Stream 2 and Turk Stream) or to penetrate the world's fastest growing gas market (in case of Power of Siberia). However, it cannot be denied that there is significant uncertainty about the future utilisation of these pipelines. In the EU, there is high geopolitical risk and uncertainty about

956 A. Shleifer and R. Vishny, "A Survey of Corporate Governance", *Journal of Finance*, 52:2 (1997), 737-783.

957 B. Black, 'The Corporate Governance Behaviour And Market Value of Russian Firms', *Emerging Markets Review*, 2 (2001), 89-108.

958 V. Atanasov et al, *Unbundling and Measuring Tunneling* (2008): Law and Economics Research Paper, University of Texas School of Law.

959 Kreyndel, 'Value and Performance: Gazprom from the Corporate Governance and Finance Perspective'.

960 On strategic value, see T. Smeenk, *Russian Gas to Europe: Creating Access and Choice. Underpinning Russia's Exit Strategy with Gazprom's Infrastructure Investments* (Groningen, 2010): PhD Dissertation, RUG University of Groningen.

long-term demand due to decarbonisation ambitions[961]. With regard to Power of Siberia, the most serious doubts are about the long-term sustainability of underlying supply contract terms.[962]

For these reasons, these pipeline projects do not dissipate uncertainty about the company's long-term future earnings and long-term financial sustainability. These pipeline projects are financially ambitious, particularly in light of growing upstream and domestic midstream investment needs. As a matter of fact, substantial investments will be needed inside of Russia to avoid a decline in Gazprom's production and transportation capacity.

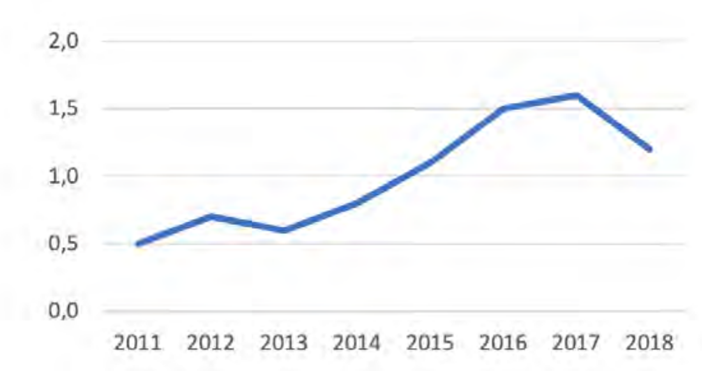


FIGURE 56: GAZPROM'S NET DEBT/EBITDA RATIO (2011-2018)

At the moment, Gazprom has relatively healthy balance sheets and a relatively low level of indebtment. Its debt/EBITDA ratio, at 1.2, is still comfortably below the threat level (a ratio of 3 or more). The debt-to-equity ratio is also low (0.27).[963] However, the ratio has been increasing in the last years (Figure 56).[964] Another negative trend is the decline in Gazprom's free cash flow. After generating positive free cash flows for 17 years, Gazprom saw negative free cash flows in 2017 and 2018 (Figure 57).[965] Operating cash flow decreased substantially between 2013 and 2017, while capital investment did not decline as much, also because of the abovementioned investments in Nord Stream 2, Turk Stream, and Power of Siberia.

As mentioned, Gazprom will be required to allocate significant investments in future. Until 2022, international pipelines to Turkey, the EU and China will absorb around half of Gazprom's new CAPEX, followed by maintenance of legacy pipelines and upstream fields. The Sberbank report points out that CAPEX on new upstream in the Yamal peninsula might turn out to be higher than projected today, potentially changing the picture below.[966]

961 Mostly in the case of Nord Stream 2 and Turk Stream.
962 Mostly in the case of contracts with China.
963 Mitrova and Boersma, *The Impact of US LNG on Russian Natural Gas Export Policy*.
964 Kreyndel, 'Value and Performance: Gazprom from the Corporate Governance and Finance Perspective'.
965 Gazprom Annual Reports 2008-2018.
966 Fak and Kotelnikova, *Tickling Giants*

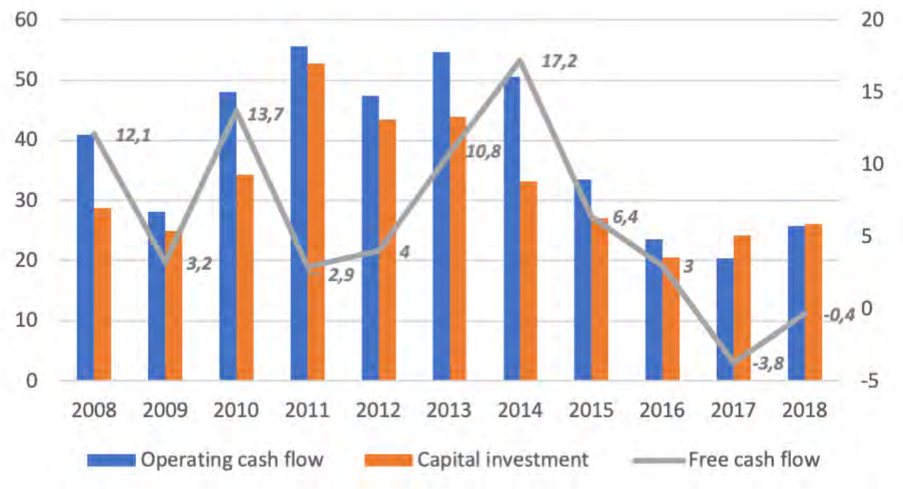


FIGURE 57: GAZPROM'S OPERATING CASH FLOW, CAPITAL INVESTMENT AND FREE CASH FLOW (2008-2018)

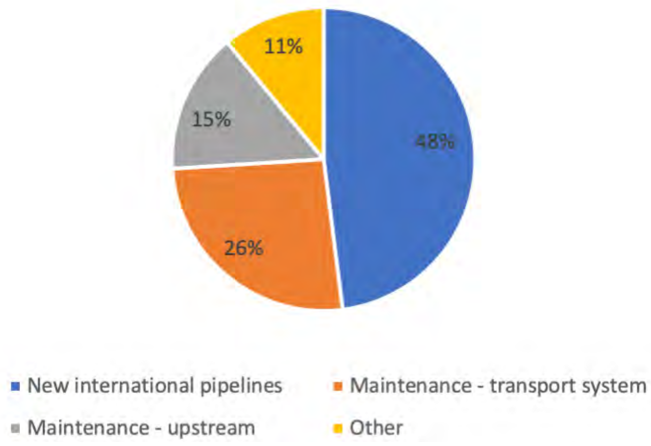


FIGURE 58: GAZPROM'S PROJECTED INVESTMENTS IN 2018-2022, SHARE BY TYPE OF ACTIVITY – SBERBANK AND GAZPROM FIGURES

In the longer term, however, sizeable investments on legacy trunk pipelines will also have to be allocated. Low domestic gas prices historically limited the availability of resources to invest in upgrading Russian infrastructure, leading to chronic problems such as leakage and large amounts of gas being used to power the compressor stations.[967] With regard to the midstream sector, it is also worth highlighting that the average age of Gazprom's trunk pipelines has

967 I. Nazarov, 'Overview of the Russian Natural Gas Industry', in A. Vavilov (ed.), *Gazprom: An Energy Giant and Its Challenges in Europe* (2015): Palgrave Macmillan.

increased substantially. In 2017, almost 60% of Gazprom's trunk pipelines were 31 years or older, compared to 23% in 2007.[968] Although there is no clear rule with regard to the age at which a pipeline should be replaced, Sberbank assesses that a significant share of the older trunk lines will be updated in the next 15 years.[969] This could require up to 250 billion dollars in upgrade investment, or 15-20 billion dollars per year. Sberbank points out that this would not generate any revenue for shareholders, aggravating market valuation issues mentioned above.[970]

Large upstream investments might also be needed soon. This notion has not yet fully sunk in among gas experts, because Gazprom has enjoyed spare production capacity for most of the 2010s.[971] Until the 2000s, Gazprom was predominantly producing gas from Soviet-era legacy fields in the Nadym-Pur-Taz basin, where production started to decline by the tune of 20 Bcm per year in the early 2000s. In order to avert a decline in production, Gazprom commissioned new fields in the same region (the most important one being Zapolyarnoe) and, at a later stage, inaugurated new production sites further north, in the Yamal peninsula. Gazprom's investment on the supergiant field of Bovanenko, in the Yamal peninsula, has been a huge financial effort. This was also a forward-looking, risky, and – one might say – partly speculative investment.[972] In the EU, it is not sufficiently recognised that it is also thanks to Gazprom's long-term vision that EU import needs would remain high that the EU benefitted from abundant supply throughout the 2010s. This contributed to creating a situation in which the EU could enjoy low gas prices, generated by strong competition between flexible LNG and Russian piped gas, often around Short-Run Marginal Cost (SRMC) levels. When the EU 'claims victory' and asserts that the decrease in gas prices after 2013 was a result of market liberalisation, it only tells part of the story. The story of Bovanenko shows that investments enabling gas-to-gas competition and correct market functioning in the EU were taken in a different 'institutional' setting, valuing long-term vision. The presence of LTCs to honour running well into the 2030s partly underpinned such investments (thus bringing this case study in line with TCE teachings).

Today, however, the production decline in mature fields continues. Gazprom's production is drifting further north and drilling has to take place at increasingly higher depths. It is calculated that around 40% of Russia's total proven reserves are difficult to exploit, due to difficult climate conditions, lack of infrastructure, geographical remoteness or specific gas quality (such as gas with high helium content).[973] This still leaves plenty of easier gas available for extraction, but the trend towards higher production costs is unambiguous.[974]

968 Fak and Kotelnikova, *Tickling Giants*

969 Fak and Kotelnikova, *Tickling Giants*

970 Fak and Kotelnikova, *Tickling Giants*

971 V. Yermakov, *Shrinking Surplus: the Outlook for Russia's Spare Gas Productive Capacity* (Oxford, 2018): Oxford Institute for Energy Studies.

972 Investment was only partly speculative because Russian gas supplies to the EU are still partly underpinned by long-term contracts that run well into the 2020s and 2030s.

973 Nazarov, 'Overview of the Russian Natural Gas Industry'

974 V. Yermakov and D. Kirova, *Gas and Taxes: The Impact of Russia's Tinkering with Upstream Gas Taxes on State Revenues and Decline Rates of Legacy Gas Fields* (Oxford, 2017): Oxford Institute for Energy Studies

Spare production capacity is diminishing. In 2015, Gazprom declared that they were endowed with a spare production capacity of 180 Bcm, referring to gas volumes that could be brought online quickly at SRMC if EU demand increased.[975] While this figure was disputed, there was consensus that Gazprom was endowed with significant spare production capacity. Until March 2018, the Oxford Institute for Energy Studies (OIES) estimated Gazprom's spare production capacity at around 80 Bcm, still a significant amount for the EU gas market.[976] However, in December 2018, a new report by Yermakov showed that spare production capacity had decreased significantly.[977] An important reason was that the EU had started to import larger volumes of Russian gas. The report by Yermakov showed that spare capacity from the Zapolyarnoe field had fallen from 40 Bcm in 2016 to 10 Bcm at the end of 2018 and that there was no spare capacity left at Bovanenko.[978] Taking into account spare capacity in other fields, the report estimated total Gazprom spare production capacity at 40 Bcm at the end of 2018.[979] Independent gas producers have sizeable gas reserves that could be monetised but they don't have proper spare production capacity (i.e. capacity that can be brought on stream fast at SRMC). As a result of all of the above, the availability of Russian gas to meet peak demand has decreased. In the next years, Gazprom will bring online additional production capacity in Bovanenko and production is also going to start at Kharasavey. How this will translate into 'spare' production capacity will depend on demand, both domestically and abroad. In the longer term, additional investment will be needed. The report by Yermakov, highlighting that Gazprom (and Russian) spare production capacity is lower than expected, calls for a new appraisal of Gazprom's upstream investment needs.[980] As long as it was widely believed that Gazprom could increase its shipments to the EU at a push of a button, the perceived urgency for investments on new production capacity on behalf of Gazprom was low. This is changing.

Transformations in EU-Russia gas trade occurred in a delicate phase for Gazprom. The reduction in net sales revenues in the EU is not a welcome development, particularly because Gazprom will need to allocate substantial investments in new upstream production and domestic pipelines, while it has so far concentrated its investments on Nord Stream 2, Turk Stream and Power of Siberia. While we believe that these pipelines have a strategic commercial rational alongside a geopolitical one[981], it is true there are significant uncertainties surrounding them. A deterioration in some key financial indicators suggests that Gazprom's room for manoeuvre is limited. The company, which feels mounting competitive pressure in the domestic market, is coming under increased scrutiny in Russia.

975 Henderson and Sharples, *Gazprom in Europe – two Anni Mirabiles, but can it Continue?*.

976 Henderson and Sharples, *Gazprom in Europe – two Anni Mirabiles, but can it Continue?*.

977 Yermakov, *Shrinking Surplus: the Outlook for Russia's Spare Gas Productive Capacity*

978 *Ibid.*

979 *Ibid.*

980 *Ibid.*

981 Smeenk, *Russian Gas to Europe: Creating Access and Choice.*

9.2 THE RELEVANCE OF VARIATIONS IN GAZPROM'S GAS REVENUES IN THE EU FOR RUSSIA'S EXPORTS, GDP AND FEDERAL BUDGET

This section reflects on the evolving importance of Gazprom's gas sales revenues in the EU for Russia. A brief contextualisation is needed to fully appreciate the importance of gas revenues for Russia's economy and federal budget, and understand why this topic is perceived as increasingly relevant from a political-economic perspective.

Russia's economy is largely dependent on the exploitation of natural resources.[982] The diversified economic structure that had existed for decades crumbled in the 1990s with the collapse of the Soviet Union, due to Russia's sudden exposure to global competition. As a result of partial de-industrialisation, the correlation between the country's economic performance and variations in global prices of natural resources deepened. Thanks to high prices, oil and gas have been one of the engines of the extraordinary economic growth undergone by Russia in the 2000s[983], a decade in which the country redeemed itself from the despair of the 1990s. In 1998, Russia's GDP was only 55% of what it had been a decade before.[984] By 2006, it had already gone back to the level seen prior to the collapse of the Soviet Union. Until 2008, economic growth in Russia outpaced average growth in G20 emerging markets.[985] Oil and gas were a key source of much needed hard currency, and – as one of the country's most coveted assets – they were also the catalysts of renewed international investors' interest in Russia, even if the government protected them as strategic resources and consolidated the role of the State in the sector. Revenues from oil and gas played a very important role in allowing Russia to pay off its external debt, which in turn helped the country to reduce its political dependence on international creditors.

Regained economic prosperity coincided with Vladimir Putin's rise to power. Promising to restore Russia's place amongst great powers and redress the 'decade of humiliation' suffered in the 1990s, Putin capitalised on high oil and gas prices to give back pride to its citizens.[986] This, together with a hard-line approach towards Chechnya, cemented consensus around his presidency. It also allowed Putin to embrace the rhetoric that the time when Russia was passively accepting neo-liberal advice from the West and privatising key economic sectors at any cost was over, and that a 'Russian way' to economic prosperity based on State Capitalism

982 C. Gaddy and B.Ickes, *Russia's Dependence on Resources* (Oxford, 2013): The Oxford Handbook of the Russian Economy.

983 According to the IMF (2019), "most of the drivers behind Russia's extraordinary growth performance during 2003–08 cannot be replicated. The large initial efficiency gains from Russia's transformation into a market economy, the benefits from achieving macroeconomic stability, and favorable external conditions including the commodity-price boom of the early 2000s are factors that are either one-off or exogenous to Russia." – IMF Article IV Consultation Report, August 2019.

984 From World Bank's National Accounts data. Figures are expressed at constant 2010 US dollars. Only data for key years reflecting statements made in the main text are mentioned in this footnote. In 1989, Russia's GDP was 1.46 trillion US dollars, falling to 1.345 trillion US dollars in 1991 (first full year of independence of the Russian Federation). In 1998, it was 813 billion US dollars. In 2006, it had grown to 1.387 trillion US dollars and in 2008 it reached 1.583 trillion US dollars. After declining in 2009, Russia's GDP resumed growth, but at much weaker rates than in the 2000s. In 2018, Russia's GDP was 1.722 trillion US dollars.

985 IMF Article IV Consultation Report, August 2019.

986 S. Karaganov, 'The Watershed Year: Interim Results', *Russia in Global Affairs*, 4 (2014). It has also been claimed that the argument of humiliation is used by Russian nationalists to justify their aggressive stance towards the West. According to Shevtsova "Sergei Karaganov has made it his mission to alert the West to the 'Weimar syndrome' Western policies have created inside Russia" in L. Shevstova, Humiliation as a Tool of Blackmail, *Brookings*, 2 June 2015.

was preferable.[987],[988] Analysing the merits of this rhetoric lies outside the scope of this book. What is useful to highlight here is that the experience of such a contrast between the 1990s and the 2000s undermined the popularity of Western neo-liberal economic policies among Russian policy-makers and public opinion, although there are still some supporters of neoliberalism within Russia.[989] It would be possible of course to argue that the difficulties experienced by Russia in the 1990s were not caused by neo-liberalism itself but rather by the way in which privatisations were carried out in a country with weak rule of law. The purpose is not to debate whether neo-liberal economic policies were fit for Russia. The purpose is to contextualise Putin's rise to power and explain why Russian public opinion was receptive to a change of pace in economic policy. Understanding the profound effect of the 1990s crisis on the Russian population is useful to understand why neo-liberal policies, seen as instruments of the West, were met with increasing distrust (Belyi, 2009).[990] This is particularly in oil and gas – regarded as strategic sectors for the nation (Chapter 8) and even part of the national identity (Oldfield 2017[991]; Aalto et al. 2012[992]).

The 2008-2009 economic and financial crisis, and then weaker commodity prices after 2014 – as well as Western sanctions – brought the pathway of economic growth seen in the 2000s to a halt.[993]

In Western circles, the combination of Russia's economic growth in the 2000s and a resurgence of geopolitical divergences (mostly linked to Russia's opposition to EU and NATO expansions and Western military interventions in the Middle East)[994] reinforced the rhetoric that oil and gas were strengthening an increasingly adversarial Russia vis-à-vis the West. As discussed in Chapter 7, Western geopolitical concerns with regards to Russian energy concentrated on natural gas rather than oil. This is partly due to the fact that natural gas is mostly transported by pipelines and is thus more difficult to replace than oil in case of disruptions – although, due to quality issues, the argument that oil flows are more easily substituted by virtue of the international oil market's higher liquidity and depth rests on shaky grounds. Besides, the

987 V. Putin, 'Нам нужна новая экономика', *Vedomosti*, 30 January 2012. In this open letter to the Russian newspaper 'Vedomosti', Vladimir Putin explained his economic vision for Russia. Putin asserted that the objective should be to gradually reduce the role of the State in the economy. However, he also stated that privatisations in the 1990s had been a mistake, at least in the way and timing in which they had been conducted. He also defended the right of the State to intervene in the Yukos case, and – when talking about Gazprom – he emphasised the fact that the gas sector has characteristics of a natural monopoly, and limited himself to express a preference that Gazprom would divest from non-core activities (e.g. media holdings). He did not call for a liberalisation of the energy sector and stressed that the State has a role in making Russia competitive on a global scale. The term 'State Capitalism' does not feature in the open letter. Instead, it is a Western interpretation of Putin's economic vision. See D. Busvine, 'Putin Puts State Capitalism First for Russia', *Reuters*, 30 January 2012.

988 I. Bremmer, *The End of the Free Market* (New York, 2010): Portfolio.

989 Y. Primakov, *Russia's Problems: Why Neoliberal Policy Is Unacceptable Today*, Valdai Discussion Club, 27 January 2014.

990 A. Belyi, *A Russian Perspective on the Energy Charter Treaty* (Madrid: 2009), Real Instituto Elcano

991 J. Oldfield, *Russian Nature: Exploring the Environmental Consequences of Societal Change* (London, 2017): Routledge.

992 P. Aalto et al, 'How are Russian Energy Policies Formulated? Linking the Actors and Structures of Energy Policy, in P. Aalto (eds.), *Russia's Energy Policies: National, Interregional and Global Levels* (Cheltenham, 2012): Edward Elgar, 20-42.

993 "Analytical work based on economic models finds that sanctions, lower oil prices, and financial market and policy responses, explain about half the slowdown [of Russia's economy] compared to expectations. […]The remaining differences between the October 2013 WEO projection and the actual growth of Russia could result from other factors, such as the structural problems in the domestic economy or forecasting errors.", IMF Article IV Consultation Report, August 2019.

994 'Nato's Enlargement and Russia's Humiliation', *Whitehall Papers*, 71:1 (2008), 40-68.

emphasis on gas is partly justified by the 2006 and 2009 disruptions of Russian gas supplies to the EU via Ukraine. However, as argued in Chapter 7, this emphasis on gas is not fully justified in geo-economic terms. From a geo-economic perspective, it would mostly be oil (if anything) that strengthened Russia relative to the West in the 2000s. Therefore, the fact that transformations in EU-Russia gas trade dented Gazprom's sales revenues in the EU between 2009 and 2019 should not be excessively characterised as a key development for redressing Russia's increased defiance of the West.

Gas revenues are much lower than oil revenues. Of course, this does not mean that gas revenues are unimportant, nor does it mean that Gazprom is unimportant for the Russian State. To the contrary, Gazprom is one of Russia's largest taxpayers.[995] The Russian government regards gas as an important source of revenues, and it also scrutinises Gazprom's management based on its ability to deliver revenues to State coffers. Our comparison between oil and gas revenues is not meant to suggest that the Russian government is not (or should not) be interested in the evolution of Gazprom's net sales revenues in the EU. Instead, it is meant to put claims that the purchase of Russian gas enriches an increasingly adversarial government into the right perspective. These claims are inflated.

In the next sections, a number of different indicators will be presented which collectively shed light on the evolving role played by gas, and more specifically by Gazprom's gas exports to the EU, in Russia's economy. The first element to assess is the importance of gas (and Gazprom's gas sales to the EU) as an export. The latest data published by the IMF illustrates that gas represented around 11% of Russia's total export value in 2018 (a value of 49 billion dollars out of 443 billion dollars in total exports), as shown in Figure 59.[996]

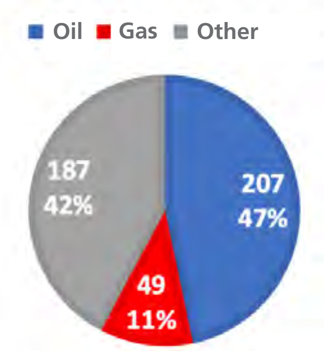


FIGURE 59: RUSSIAN EXPORTS (OIL, GAS AND OTHER) IN VALUE (BILLION USD) AND %.
SOURCE: IMF (2018)

995 According to research by RBC Group, Gazprom Group (which also produces oil) is Russia's second taxpayer, after Rosneft and preceding Lukoil. In 2016, Gazprom paid 1168 billion rubles in taxes, equivalent to approximately 10% of total corporate taxes paid to the Russian government in the same year, see 'Исследование РБК: крупнейшие налогоплательщики России', *RBC Group*, 15 August 2017. In 2018, Gazprom was confirmed as Russia's second taxpayer (with approximately 1800 billion rubles), see 'Треть доходов бюджетной системы России оказалась связана с нефтью и газом', *RBC Group*, 22 August 2019.

996 The value of Russia's gas exports grew from 31.2 billion US dollars in 2016 to 38.7 billion US dollars in 2017 and 49.1 billion US dollars in 2018. In 2018, the value of total energy exports was 256.3 billion US dollars, while total non-energy exports were 186.8 billion US dollars.

Based on data from the BP Statistical Review, we derive that approximately 71% of Russian gas exports were sold to the EU in the same year (Figure 60). Europe (including Turkey and other non-EU countries) is also the most important outlet for Russian oil (Figure 60), even if Russian oil exports are more diversified than gas exports, particularly as a result of increased exports to China in the second half of the 2010s. Gas exports will also be more diversified in future, possibly catching up with oil, thanks to Russian LNG exports and the inauguration of Power of Siberia. It is important to bear in mind that this number refers to volumes, rather than value.

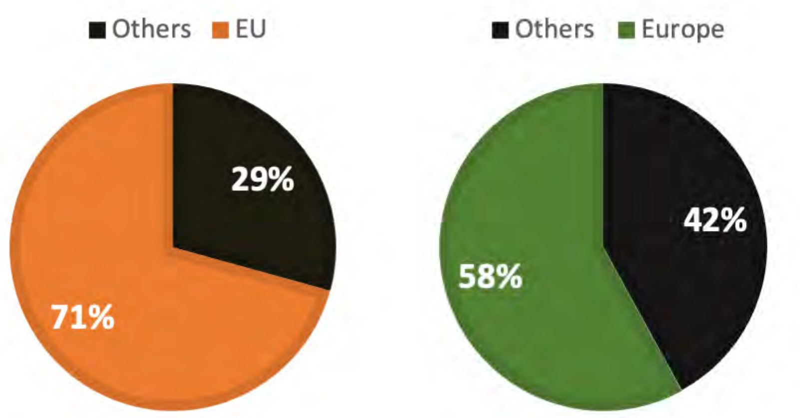


FIGURE 60: RUSSIAN NATURAL GAS (LEFT) AND OIL (RIGHT) EXPORTS BY DESTINATION (VOLUMES – %). SOURCE: BP STATISTICAL REVIEW 2019. FIGURES FOR GAS REFER TO THE EU28, FIGURES FOR PETROLEUM INCLUDE TURKEY AND OTHER EUROPEAN COUNTRIES.

Data on the EU's energy import bill presented in Chapter 7 made a distinction between Russian and non-Russian oil and gas, thus approximating the value of Russia's exports to the EU by fuel. Those figures thus complement information presented in this section. Based on those figures, extracted from the Eurostat database, we concluded that the value of Russian gas exports to the EU in 2018 was approximately 36.1 billion dollars, equivalent to 73.7% of the total export value of Russian gas. This roughly matches the share of the EU in Russian gas exports in volumetric terms (71%), with the difference being explained by higher average selling prices in the EU than in FSU countries. Based on the data presented above, we therefore conclude that in 2018, the value of Russian gas exports to the EU was around 8% of Russia's total export value. It is important to emphasise that this number refers to gas exports from Russia as a whole, and does not insulate Gazprom's exports. In 2018, Novatek and its Yamal LNG partners were already shipping some gas to the EU as LNG. However, the liquefaction plant in the Yamal peninsula was still in a ramp up phase, and Asian demand was still strong in the first half of the year. GIIGNL reports that only limited quantities of Novatek LNG reached the EU in 2018 (6 Bcm).[997] This means that more than 96% of Russian gas exports to the EU were executed by Gazprom, in light of the fact that Gazprom holds a monopoly on pipeline

997 GIIGNL Annual Report on the LNG Industry, 2019.

exports. The value of Gazprom's gas exports to the EU can thus be estimated to be just short of 8% of Russia's total export value in 2018. This is, undoubtedly, a significant share from a trade perspective. It is thus understandable that developments regarded as threats to such an export value – such as far-reaching modifications to oil-indexed long-term contracts – rang an alarm bell in Russia. Additional assessments and comparisons allow to build a more comprehensive picture of the macro-economic value of Gazprom's gas exports to the EU.

It is also possible to extract data on Gazprom's total net sales revenues and net sales revenues in the Far Abroad from Gazprom's annual reports, and compare them with Russia's GDP. In 2018, Gazprom's total net sales revenues (both in Russia and abroad) amounted to 4.1% of Russia's nominal GDP (67.7 billion US dollars out of 1658 billion US dollars). Within the period analysed (2008-2018), Gazprom's total net sales revenues oscillated between 3.7% and 5.1% of nominal GDP. Gazprom's net sales revenues in the Far Abroad amounted to 2.8% of Russia's nominal GDP in 2018 (47 billion US dollars out of 1658 billion US dollars). Within the period analysed (2008-2018), they oscillated between 2.2% and 3.1% of nominal GDP. This is certainly not a negligible share. A comparable figure immediately comes to mind, at least if one is well-versed in gas market developments: the significance of gas transportation fees for the Ukrainian economy (also 2-3% of GDP).

Zooming out from Gazprom's activities in the EU, other measurements of the importance of natural gas for Russia's GDP are available. One of them is the percentage of natural gas rents in GDP, assessed by the World Bank. These rents are calculated as the difference between the value of a country's natural gas production at world prices and total costs of production. It is important to bear in mind that this includes gas held by independent gas producers, and not only by Gazprom. In 2017, the last year for which data is available, Russia's natural gas rents were estimated to be 2.6% of GDP. In comparison, they were 3.7% in Qatar, 2.2% in Algeria, 2.1% in Norway, and 1.7% in Iran. Russia's natural gas rents are at a historically low level and have decreased considerably in the last decade. They were 4.6% and 4.9% of GDP in 2008 and 2009 respectively, and then reached 1.9% of GDP in 2016 – before partly recovering in 2017. The limitation of this measurement is that the actual prices at which gas is sold could be quite different from the average world price, as there is no global gas market but rather regional markets with numerous price formation mechanisms.[998]

Another indicator of the weight of natural gas in the Russian economy, albeit a more abstract one, is the value of underground gas resources relative to GDP. In 2017, for the first time, the Ministry of Natural Resources and Ecology estimated the value of Russia's mineral resources. The value of oil reserves amounted to 39.6 trillion roubles, the value of gas to 11.3 trillion roubles and the value of coal to 2 trillion roubles. Including iron ores, diamonds, gold and others, the total value of all mineral resources amounted to 55.2 trillion roubles, 60% of Russian GDP. The value of natural gas resources amounted to 12.3% of Russia's GDP in 2017. The assessment only considers reserves estimated in terms of subsoil plots for which a valid exploration license has been issued and for which there is a technical design and other documentation approved for the execution of works. This means that the volume considered

998 World Bank data, available at: https://data.worldbank.org/indicator/NY.GDP.NGAS.RT.ZS

by the estimate is smaller than the total volume of explored reserves. With regard to valuation, the assessment considers potential revenues associated with the exploitation of resources by using as main indicator the value of discounted net cash flows. This measurement has limitations because it provides a theoretical indicator of the value that *could* be extracted from reserves that *could* be exploited.[999]

The last element that we are going to assess is the weight of natural gas in the State's budget, an issue that is possibly even more relevant to Realist geopolitical narratives (Chapter 4) than its weight in exports and GDP. The role of Gazprom as a taxpayer has already been touched upon earlier in this chapter. Additionally, the Russian Ministry of Finance publishes concise historical series about non-oil and gas and oil and gas revenues. From these historical series, it is possible to derive that the average share of oil and gas revenues in the federal budget in the period 2008-2018 was 45.5%. The share decreased in 2009, probably as a result of lower commodity prices provoked by the economic and financial crisis, then grew every year until peaking in 2014 (51.3%), and subsequently fell in 2015 and 2016 and recovered in 2017 and 2018 (46.4%), again broadly following commodity price movements. In absolute terms, the total federal budget decreased in 2009, 2015 and 2016, while it increased in all other years (at least in roubles). Non-oil-and-gas revenues increased in 2015 and 2016 (while they fell – albeit not as sharply as oil-and-gas revenues – in 2009, in a context of generalised economic crisis), but not enough to counter the negative effect of lower oil-and-gas revenues. All in all, this is a picture of high reliance of the budget of the Russian Federation on (fairly volatile) oil and gas revenues. What is the role of gas specifically?

Interesting findings emerge by digging a little deeper into detailed data published by the Federal Treasury (Федеральное казначейство). This data allows to distinguish between crude oil, oil products and natural gas (amongst others). Furthermore, it allows to study in what way the Russian government is deriving revenues from these various commodities, and how this has changed in recent years. For oil, we collected data on upstream taxes, fees and regular payments for natural resource exploitation[1000], crude oil export duties[1001] and oil product export duties[1002]. For natural gas, we collected data on upstream taxes, fees and regular payments for natural resource exploitation[1003] and export duties[1004]. These are by far the main budget items for oil and gas revenues in the federal budget, as they collectively account for 98.5-100% of total oil and gas revenues, depending on the year.

Three main findings stand out from the analysis of oil and gas revenues in the Russian federal budget in the period 2009-2018: 1.) once again, the share of tax revenues from oil (both crude and oil products) is much higher than the share of tax revenues from gas; 2.) gas revenues in the federal budget have been growing every year since 2010 in absolute (rouble)

999 '55 триллионов в запасе: как власти оценили все природные ресурсы России', *RBC Group*, 14 March 2019

1000 Budget item: Нефть (налоги, сборы и регулярные платежи за пользование природными ресурсами).

1001 Budget item: Вывозные таможенные пошлины на нефть сырую.

1002 Budget item: Вывозные таможенные пошлины на товары, выработанные из нефти.

1003 Budget item: Газ горючий природный из всех видов месторождений углеводородного сырья (налоги, сборы и регулярные платежи за пользование природными ресурсами).

1004 Budget item: Вывозные таможенные пошлины на газ природный.

terms, and every year since 2010 except for one (2014) in relative terms (i.e. as a share of total budget revenues); 3.) the Russian government has increasingly extracted gas revenues through the Mineral Resources Extraction Tax (MRET), rather than through export duties. Revenues from both taxes have grown throughout the period, but revenues from upstream taxes have increased comparatively more.

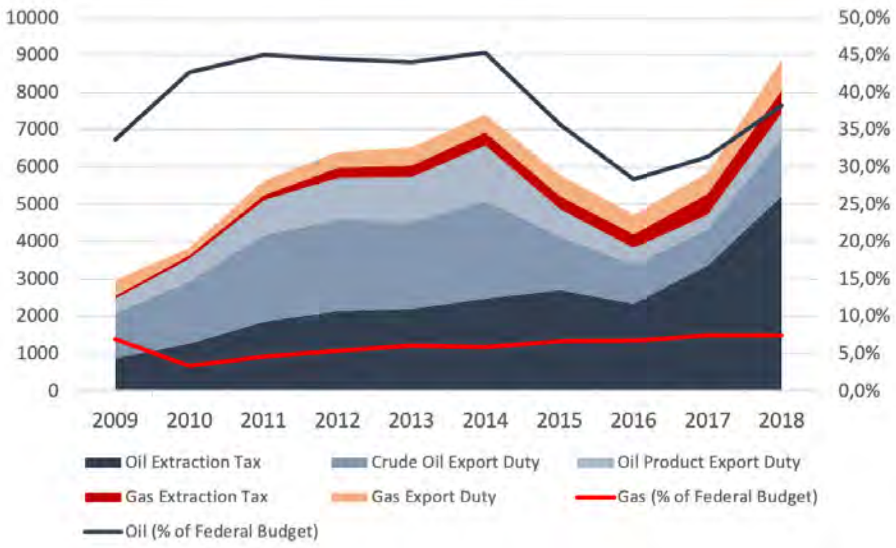


FIGURE 61: OIL AND GAS REVENUES IN THE RUSSIAN FEDERAL BUDGET (2009-2018) IN BILLION ROUBLES (LEFT-HAND SIDE SCALE) AND PERCENTAGE SHARE (RIGHT-HAND SIDE SCALE). SOURCE: RUSSIAN FEDERAL TREASURY

Taxes on gas production and exports generated 6.9% of federal budget revenues in 2009, 3.3% in 2010, 4.6% in 2011, 5.4% in 2012, 6.1% in 2013, 5.8% in 2014, 6.6% in 2015, 6.7% in 2016 and 7.4% in 2017 and 2018. With a 68% share in Russian gas production, a monopoly on pipeline exports (which represent 90% of Russia's total gas exports), and a share of approximately 60% of Russian LNG exports[1005] in 2018, Gazprom remains by far the largest upstream player as well as exporter of Russian gas. Gazprom thus provides the bulk of gas tax revenues to the federal budget.

Gazprom's fiscal contribution is actually higher than what would be a reflection of the abovementioned shares in production and exports. First of all, Gazprom has been paying a higher MRET than its competitors since 2012. This was initially the case because of a specific rate that explicitly applied to Gazprom, and then because of the introduction of a complex

1005 In 2018, through its liquefaction terminal on Sakhalin, Gazprom still exported the majority (approximately 60%) of Russian LNG volumes. Novatek's Yamal LNG terminal was in fact not yet fully operational then. While Train 1 (5.5 MTPA) was already operational by the beginning of the year, Train 2 (5.5 MTPA) only started in July 2018 and Train 3 (5.5 MTPA) in December 2018.

MRET formula in 2014 favouring non-legacy fields, which still *de facto* taxes Gazprom more heavily than its competitors, which are also exempted from some of the coefficients. Based on an elaboration of data by the Moscow Higher School of Economics, the difference between the MRET charged to Gazprom and the MRET charged to independent gas producers was 258 roubles/Mcm in 2012, 229 roubles/Mcm in 2013, 247 roubles/Mcm in 2014, 131 roubles/Mcm in 2015, 176 roubles/Mcm in 2016 and 361 roubles/Mcm in 2017. At the same time, the current taxation regime leaves Gazprom a lot of room for manoeuvre to minimise the taxes it actually pays, namely by operating through Joint Ventures in which it is a minority shareholder and by shifting production to fields with lower MRET rates. This is creating distortions in the upstream, accelerating the decline rates of legacy fields with sizeable sunk costs and low overall costs, backbone of Russia's competitiveness in global markets.[1006]

Novatek's Yamal LNG received an exemption from MRET and it should be emphasised that exports of LNG are exempt from export duties, as the Russian government has been encouraging gas export source diversification.

The issue of natural gas taxation has become more and more pressing in recent years in Russia, and there is a strong connection between taxation policy proposals and developments in the lucrative EU market, including transformations in EU-Russia gas trade. In fact, the decline in EU gas prices, partly caused or at least aggravated by the introduction of hub indexation, has intensified the confrontation between Russian gas companies (especially Gazprom) and the Russian government on how to distribute gas rents. The Russian government was concerned about reduced tax revenues in the period 2014-2017, although the decline was mostly triggered by lower revenues from oil and oil products (due to lower oil prices) rather than natural gas. Even if tax revenues increased again in 2017 and 2018 with the recovery in commodity prices, the concern is a long term one, as the Russian government fears that lower fossil fuel consumption due to decarbonisation in importing countries and intense competition (namely from US shale oil and gas) might result in low commodity prices and thus low tax revenues in the long term.

Before the reform, Russian gas companies were charged a fixed fee for natural gas produced, at a rate that was set at a low level reflecting low regulated domestic gas prices in Russia. Gas rents have been historically shared by the State with domestic industries and households through low gas prices. When the Russian government increased regulated domestic gas prices in the second half of the 2000s, it started to regard tax revenues from the MRET as too low and studied ways to adapt taxation. Essentially, the Russian government aimed to redress a situation in which it had given away rents to Gazprom.[1007]

1006 Yermakov and Kirova, *Gas and Taxes: The Impact of Russia's Tinkering with Upstream Gas Taxes on State Revenues and Decline Rates of Legacy Gas Fields*.

1007 *Ibid.*

Conclusions on the macro-economic relevance of Gazprom's gas sales revenues in the EU

In conclusion, Gazprom remains Russia's second taxpayer and continues to be regarded by the Russian government as an important source of rents. EU gas price weakness, rooted in market fundamentals and partly also in the transformations in EU-Russia gas trade terms studied in this book, have intensified the debate on how to distribute gas rents between Gazprom and the Russian government. The Russian government has been fearing a reduction in gas tax revenues due to low EU gas prices, particularly after price declines in 2014 and late 2018. In order to recover rents that had been given away to Gazprom as a result of spikes in regulated gas prices, the Russian government had actually been increasing the MRET since 2012, the impact of which Gazprom is trying to minimise – for instance by switching some of its production to new fields, with potentially distortive effects. Gas tax revenues have continued to increase in the period under consideration, mostly as a result of a higher MRET rather than export duties.

Additional fiscal pressure comes at a difficult time for Gazprom, which is confronted with lower prices and increased political hostility in its 'cash cow' market (the EU), increased domestic competition from independent gas producers, lower sales to Former Soviet Union countries and high capital expenditures on pipeline projects surrounded by uncertainty. Transformations in EU-Russia gas trade are relevant in this discussion because – so far – they had a negative effect on Gazprom's sales revenues in the EU. The fact that Gazprom enjoys a monopoly on piped gas exports to the lucrative EU market has been a cornerstone of Russia's gas market architecture, including issues of taxation. If this market loses a lot of its lucrativeness, repercussions on Gazprom's position in the Russian gas market architecture are possible. However, as we observed in previous chapters, it would be premature to conclude that the transformations in EU-Russia gas trade have taken away Gazprom's rents for ever. In future, Gazprom might be presented with opportunities in tight markets that are difficult to fully appreciate today.

Gas revenues play an important role in the federal budget of Russia (7.4% in 2018), although this is significantly smaller than the role played by oil revenues. Therefore, the geo-economic emphasis on gas as a source of rents for the Russian State – leading to the argument that the purchase of Russian gas by the EU enriches and empowers an increasingly adversarial Russia (Chapter 4) – does not seem justified. In a specular way, this also proves that the transformations in EU-Russia gas trade terms, and particularly the introduction of hub indexation, have only a limited positive impact for the EU in terms of geo-economic balance of power between the EU and Russia.

As a result of a worsening financial performance, Gazprom is under increased scrutiny within Russia.[1008] Not only independent gas producers, but also high-ranking Russian officials have publicly criticised Gazprom's management. The company is under extreme pressure to perform well and deliver value to its home country. The company's current Key Performance Indicator (KPI) is how much natural gas it is able to sell to the EU, since Gazprom is not in a position to

1008 Mitrova and Boersma, *The Impact of US LNG on Russian Natural Gas Export Policy*.

play value-over-volume strategies, at least for the time being.[1009] The Russian government is keen to defend volumes and market share in the face of growing competition from US LNG in particular.

Independent gas producers and reformers in the Russian government are also seizing the opportunity presented by this phase of weakness for Gazprom to step up calls to strip Gazprom of some of its privileges. Independent gas producers are particularly vocal in requesting to terminate Gazprom's pipeline export monopoly. In this last section, we will examine how the transformations described so far relate to the topic of Russian gas market liberalisation. Reform in the Russian gas sector is something that the EU has been wishing to see for a long time, in order to diminish its reliance on a single Russian gas company and increase its negotiating power. Indeed, as discussed in previous chapters and explained in additional detail in the next section, the EU's actions in support of hub indexation and gas-to-gas competition also have extraterritorial ambitions, and can be regarded as a component of a wider process of neo-liberal policy transfer attempt towards Russia.

9.3 PROSPECTS FOR RUSSIAN GAS MARKET LIBERALISATION

A finalistic undertone that liberalisation would be adopted everywhere by virtue of its better records in delivering economic efficiency was present in the EU gas market liberalisation narrative (Chapter 5). This was a facet of the 'end-of-history' mindset widespread in the 1990s, a decade when there was a lot of self-confidence in the universal applicability of the Western socio-economic model. Since then, the EU has been projecting its power as a 'regulatory state', by attempting to extend its neo-liberal norms well beyond its borders, including in the field of energy (Goldthau and Sitter 2015).[1010] This also resonates in Damro's notion of the EU as a 'market power'.[1011] As is convincingly explained by Goldthau and Sitter, the EU's power to influence external energy suppliers can either automatically result from the mere size of the EU's market – functioning through non-coercive mechanisms, or it can be deliberately targeted to a specific country, with a marked extraterritorial impact through regulatory and sanctioning authority.[1012] The EU has been exerting both forms of power in energy ('a soft power with a hard edge').[1013] In the 1990s and in the 2000s, the EU notably attempted to export free-market principles to energy supplying countries through a formal institutional channel, the Energy Charter. Russia's refusal to ratify the Energy Charter Treaty did not stop EU endeavours to extend the reach of neo-liberal energy norms, but it became clearer to the EU that Russia would not voluntarily imitate the EU's model because it found it attractive.

The Energy Community, for instance, is an organisation that transfers the EU energy *acquis* to countries of the European neighbourhood, including countries that serve as transit routes for Russian gas. It thus have an extraterritorial impact on Russian gas imports directed to the EU. Another example of extraterritorial reach is provided by recent attempts to extend the

1009 *Ibid.*

1010 A. Goldthau and N. Sitter, 'Soft Power with a Hard Edge: EU Policy Tools and Energy Security', *Review of International Political Economy*, 22:5 (2015), 941-065.

1011 C. Damro, 'Market power Europe', *Journal of European Public Policy*, 19:5 (2012), 682-699.

1012 Goldthau and Sitter, 'Soft Power with a Hard Edge: EU Policy Tools and Energy Security'.

1013 *Ibid.*

application of Third Energy Package provisions to pipelines in Russia. The European Commission tried to obtain a special mandate from the EU Council to negotiate with Russia on a legal regime applicable to Nord Stream 2 – including sections of the pipeline located outside of the EU. One of the desired outcomes of the application of Third Energy Package provisions on third party access to Nord Stream 2 was to compel a decision by Russia to lift Gazprom's export monopoly. Another way in which the EU arguably tried to persuade Russia to increase the number of its gas export vehicles was to bring the Russian monopolist's marketing activities in the EU under additional scrutiny, especially through antitrust investigations. This view is reflected, for instance, in Riley (2012), who argues that Russia should use the antitrust case to liberalise pipeline exports.[1014]

Inducing Russia to change its approach to gas trade was also one of the desired objectives of introducing hub indexation in long-term supply contracts, although not the primary one (Chapter 5). Considerations about the impact of new pricing mechanisms on gas exporting countries – such as their ability to exert market power and capture rents – definitely played a major role. EU regulators were and are well aware that Gazprom's position and choices in the EU influence its position and choices in the domestic market, and vice versa. In light of this, the introduction of hub indexation in long-term supply contracts can also be seen as a component of the wider process of neo-liberal policy transfer and regulatory state power projection promoted by the EU in energy.

The rationale is understandable and builds on links between Gazprom's activities in the EU and its activities elsewhere. A plausible expectation was that by gaining familiarity with hub exchange and gas-to-gas competition in its EU marketing activities, Gazprom would become open to the idea of overhauling its entire business model, including in Russia. The managerial mindset, corporate structure and type of skills and workforce needed in a liberalised market differ from those needed in a market that is not liberalised. The notion was that the changes introduced by EU gas market liberalisation might filter into Gazprom's activities in Russia, too, and soften Gazprom's opposition to proposed market reforms.

With hindsight, as has also been established by previous chapters, we know that the recent transformations in EU-Russia gas trade have not resulted in a termination of long-term supply contracts. However, in the 2000s, it was still regarded as possible that long-term contracts might be abandoned as instrument of trade altogether, creating conditions for new Russian entrants to take part in a fully contestable EU market. In a way, the idea that one day the EU would benefit from Russian gas-to-gas competition has come true. Russian gas-to-gas competition is materialising in the form of competition between Gazprom's pipeline gas

1014 "As a matter of enlightened self-interest, the Kremlin should be seeking to use the Gazprom case to force change within the company and in the broader Russian gas market. Leaving Gazprom as the dominant player in the exploration, production, wholesale and retail levels of the market, combined with its export and pipeline monopoly is not good for Russian economic development or for Russian consumers. The Kremlin should be giving serious consideration to negotiating a Commitment Decision with DG Competition that puts pressure on Gazprom to face up to liberalisation. This would involve as part of the decision accepting the unbundling rules; selling or isolating downstream assets from supply operations and providing more gas into existing hubs. Internally, the case should be made to liberalise the market in order to keep prices low domestically and enable Russian gas to be competitive on the European market". In A.J. Riley, *Commission V. Gazprom: The Antitrust Clash of the Decade?* (Brussels: 2012), Centre for European Policy Studies Brief, page 13.

exports and Novatek's LNG exports. Nonetheless, there is still no Russian gas-to-gas competition in pipeline exports. Another rationale was that Russia – confronted with the demise of traditional trade – would be pushed to overhaul its entire gas market architecture to establish a Russian trading hub, in order to avoid depending on EU gas hubs as price setters.

Based on what has been said above, the notion that the liberalisation of EU gas markets and the introduction of hub indexation in long-term supply contracts would trigger Russian gas market liberalisation has a plausible rationale.

However, it appears to neglect strong institutional complementarities, logic of appropriateness and path dependence in Russia's gas market structure. This section will show how these dynamics thwart prospects for a Western-style gas market liberalisation in Russia. As announced in Chapter 3, before promoting institutional change in Russia's gas sector – it needs to be established whether the proposed changes are compatible with the other institutions in place in the country.

An important element that Western observers particularly seem to underestimate is that the prosperity of entire industrial sectors in Russia depends on reliable and affordable supplies of natural gas. These sectors include power generation, iron and steel production and fertilisers production, amongst others. Perhaps even more importantly, natural gas plays a key social function in Russia, as a source of heat for residential customers in a country which is often exposed to extremely low temperatures. The economic, social and human cost of a gas supply disruption in Russia would be massive, arguably higher than in most EU countries. This 'social' dimension of the gas sector has another facet. As argued earlier in Chapter 9, the gas industry is in effect part of the national identity in Russia (Oldfield 2017[1015]; Aalto et al. 2012[1016]). After experiencing despair and uncertainty in the 1990s, the Russian public opinion witnessed an economic and geopolitical renaissance of their country in the 2000s, also enabled by high gas (and oil) prices and framed by Putin as an outcome of his successful defence of strategic Russian (energy) interests against self-serving Western advice. Neo-liberal recipes thus started to be seen with increased distrust and scepticism. As argued in Chapter 3, NIE reminds us of the importance of social values as grounds for the development and enforcement of norms. As argued by Belyi, who has specifically discussed EU-Russia gas relations, social values confer legitimacy to norms and determine their acceptance by agents.[1017] A widespread acceptance of extant norms is indeed a fundamental prerequisite in a system of economic governability. Institutions are in fact only effective when there is a sufficient degree of acceptance of norms – in other words, when norms are 'internalized' by agents. This concept is captured by the notion of 'logic of appropriateness'.[1018] External influence – for instance through 'epistemic communities'[1019] such as think-tanks – can contribute to altering social values in another country, but this process usually takes time. Russia did not have time to internalize neo-liberal norms that are still perceived as an imposition from the West. It would be short-sighted for the

1015 Oldfield, *Russian Nature: Exploring the Environmental Consequences of Societal Change*.

1016 Aalto et al, 'How are Russian energy policies formulated? Linking the actors and structures of energy policy'.

1017 Belyi, *Transnational Gas Markets and the EU-Russia Energy Relations.*

1018 March and Olsen, *The Logic of Appropriateness.*

1019 Haas, 'Introduction: Epistemic Communities and International Policy Coordination'.

EU to attempt to impose reforms regardless of perceptions within Russia. New norms would need to be internalized by agents in Russia and therefore they would need to be aligned with social values in that country.

The Russian State perceives it as highly risky to promote deep transformations in the gas sector, and adopts extra caution because of the strategic socio-economic nature of natural gas. Given the negative experience with shock therapies in the 1990s in other fields of the economy, a 'shock therapy' is not palatable in gas markets. As Chang's critique to neoliberal institutional transfers[1020] argues, even if an institution fosters growth when implemented in a certain dosage, it may encumber economic growth when implemented in a larger dosage. Moreover, the same institution in the same dosage may be good for one country but bad for another. Thirdly, even in the same dosage and country, the same institution may promote growth in one phase (of economic development, or of a market cycle) but not in another. Indeed, reputable pro-market observers within Russia[1021] support nuanced solutions that are compromises between the two extreme solutions of a complete monopoly and a fully Anglo-Saxon style liberalisation. An example of a nuanced solution for the Russian gas market would be a hybrid system with elements of market competition, but continued heavy participation by the State and preservation of partly regulated prices.[1022]

Copying Western liberalisation models is not a viable course of action because it would be crucial to take into account the peculiarities of the Russian gas sector, the potentially higher risks deriving from a failure and the implications of a reform for current complementarities, i.e. the elaborate checks and balances that ensure risk allocation between the various stakeholders in the Russian gas landscape. Given the intricate *quid pro quo* that takes place between the Russian government, Gazprom, and independent gas producers, it is impossible to cherry-pick areas to (deeply) reform while leaving other areas unreformed. This resonates in the concept of 'institutional complementarity' introduced in Chapter 3. Notably Aoki exposed the existence of 'institutional complementarities', dynamics of interdependence whereby institutions tend to hang together in systems, making it difficult to change one institution without changing other institutions at the same time. [1023]

Some of Russia's institutional features also limit the room for manoeuvre of proposed reforms. Rule of law is, in fact, not as solid as in the EU. Property and shareholder rights are not always adequately guaranteed, and a strong regulatory model based on an independent regulator might not be as viable as in the EU. In a liberalised market, it is crucial to guarantee the watchdog's independence in order to prevent market manipulation and tacit collusion. Furthermore, Russian capitalism is often characterised by patronage and cronyism. The absence of strong mechanisms to cope with the externalities deriving from the pursuit of particularistic interests increases the potentially negative consequences of gas sector decentralisation. Along these lines, applying a framework of 'institutional complementarity'

1020 Chang, 'Institutions and Economic Development: Theory, Policy and History'.

1021 Mitrova et al, Основные элементы и возможные сценарии дерегулирования цен на газ в России и реформирования газового рынка.

1022 *Ibid.*

1023 Aoki, *Toward a Comparative Institutional Analysis*.

Locatelli argued that Russian gas reforms mimicking unbundling and a complete break-up of vertical integration as implemented in the EU have never been credible because of their incompatibility with Russia's institutional environment.[1024]

Corporate mindset is also an obstacle. As argued earlier in this chapter, the managerial mindset, corporate structure and type of skills and workforce needed in a liberalised market differ from those needed in a market that is not liberalised. While Russia is a multi-faceted country and while there certainly are reformers in Russia, too, there is also a lot of resistance to change, including within Gazprom. This resonates with arguments put forward by Unruh[1025], who found that technical-industrial complexes propagate path dependencies in energy. Numerous elements concur to create inertia in energy systems: specialised skills in business practices; the preference for investment in incremental adaptations within a known trajectory and compatible to the extant business model rather than revolutionary changes; the presence of complementary underlying assets; financial risk aversion; the presence of specific institutions engaged in self-survival endeavours; and laws that tend to protect incumbents. Russian company executives often lobby against change out of a simple fear of the unknown.

Setting aside international developments (that were investigated at length in previous chapters), the Russian gas sector is facing a number of challenges, and most importantly decline of production in mature fields – with investment in new fields stagnating, if not declining[1026]; deterioration of gas infrastructure – with the bulk of new investment being directed to export pipelines, rather than domestic ones; and widespread inefficiencies – with losses, flaring and wasteful consumption.[1027] By reducing Gazprom's gas revenues in the EU, recent transformations in EU-Russia gas trade have compounded these challenges. While it could be argued that liberalisation is needed precisely because there are pressing issues to be solved, it could also be argued *a contrario* that due to the presence of important challenges, extra caution should be adopted in implementing far-reaching reforms with potentially distortive consequences.

When approaching the issue of Russian gas market liberalisation, Western observers tend to focus on desired effects on reliability and affordability of Russian gas supplies for Western markets. If a Russian perspective is adopted, it becomes clear that this is a very partial selection. As shown in Chapter 3, the way in which economic transactions are governed is the product of a certain phase and circumstances, including changing interests (North, 2005).[1028] On this basis, finalistic, dogmatic market liberal views that the adoption of free market paradigms is an unavoidable and desirable result for every society or economy should be rejected. The institutions of our time and geography are not necessarily the 'best' in absolute terms – one of

1024 Locatelli, *The Russian Gas Industry: Challenges to the Gazprom Model.*

1025 Unruh, 'Understanding Carbon Lock-in'.

1026 Cumulative investment allocated by Gazprom Group in Russian gas production was 257 billion rubles in 2013, 255 billion rubles in 2014, 220 billion rubles in 2015, 232 billion rubles in 2016 and 217 billion rubles in 2017. Source: Gazprom.

1027 *Energy Policies Beyond IEA Countries: Russia 2014* (Paris, 2014): International Energy Agency.

1028 North, 'Understanding the Process of Economic Change'.

the implications being that due to high political and economic transaction costs, 'inefficient' institutions may persist for long periods of time[1029],[1030].

Indeed, priorities are different when you look at the matter of Russian gas market liberalisation from a Russian viewpoint. This helps understanding why promoting reform in the Russian gas sector is so complex. A prospective gas market reform should help Russia improving efficiency in gas production, distribution, and use; enable the continuation of the gasification programme (in the West, it is sometimes neglected that gas still does not reach every community in Russia, and that the Russian government has legitimate ambitions to promote universal energy access); guarantee stable and reliable supplies to Russian industries and households, particularly in peak demand periods during winter (flexibility needs are remarkable); not compromise social policies and affordability of gas prices; deliver revenues to the Russian federal budget; not create additional distortions in the taxation regime; stimulate innovation and open new opportunities for gas that are positive from a commercial and environmental perspective, such as small scale LNG.[1031]

Apart from neglecting Russian priorities, Western calls for lifting Gazprom's pipeline export monopoly neglect that the pipeline export monopoly cannot be lifted without taking other complementary measures. This is due to a complex entanglement of benefits and duties in the Russian gas sector. Too often, the focus is on Gazprom's privileges. However, at a closer look, it becomes clear that Gazprom needs to perform a lot of socio-economic functions at home.

First of all, Gazprom has obligations to satisfy domestic demand peaks. It should not be forgotten that peaks are very pronounced in Russia due to weather, making it expensive satisfy demand at all times. The share of Gazprom's supplies to internal market thus has pronounced seasonal patterns, much more than its competitors. Gazprom argues that the preferential use of storage facilities that it enjoys is necessary to perform this function. Gazprom is also ultimately responsible for security of delivery, and thus defends the notion that there is public support to its investment in infrastructure, production, storage and distribution. Gazprom claims that the tariff paid by Gazprom's subsidiaries to access pipelines (which are controlled by Gazprom) is actually higher than the tariffs charged to independent gas producers. It also laments that the tariffs charged to use the main trunklines are too low, compromising Gazprom's ability to guarantee continued investments for their maintenance and thus ultimately guarantee security of delivery. Furthermore, it should be emphasised that Gazprom incurs losses for deliveries to residential customers in 53 out of 69 regions in Russia, because price indexation is lower than inflation. In comparison, independent producers only make losses in 9 regions. Independents deliver a higher share of their gas to the Central Federal District and the Ural region, where costs of delivery are low thanks to proximity to production centres. Besides, Gazprom bears the ultimate responsibility for gasification, and in Russia, gasification of rural areas is still only around 60%. It is often uneconomical to make huge investments on infrastructure to supply sparsely populated areas. Furthermore, as has been

1029 North, 'Institutions, Institutional Change and Economic Performance'.

1030 Richter, 'The New Institutional Economics, Its Start, Its Meaning, Its Prospects'.

1031 Mitrova et al, Основные элементы и возможные сценарии дерегулирования цен на газ в России и реформирования газового рынка.

showed in previous sections, Gazprom pays a higher Mineral Extraction Tax than independent gas producers, and fiscal pressure on Gazprom has been increasing more than fiscal pressure on independent gas producers. Finally, Gazprom's wholesale prices for industrial users are regulated, while independent gas producers are not bound to charge a specific price. As a result, Gazprom is losing market share because independent gas producers offer small discounts. Independent gas producers thus oppose the end of regulated wholesale prices for Gazprom because these are in their interest. Conversely, they push for third party access to domestic pipelines and storage[1032], where Gazprom has a dominant position, export netback parity in Russian gas prices[1033] and especially the termination of Gazprom's pipeline export monopoly to gain access to lucrative markets abroad. Pro-market reformers call for an unbundling of Gazprom, which they regard as key to any effort to increase regulation and market functioning, given that at the moment there is asymmetry of information. According to them this would entails that, lacking transparency, Gazprom can hide information about profitability and cost of production and thus manipulate the regulator.

What has been said so far serves the purpose of showing that Gazprom has a cumbersome legacy of commitments, towards EU importers, the Russian State, and, ultimately, the Russian population. These commitments limit its room for manoeuvre. As explained in Chapter 3, old firms tend to be more encumbered with past commitments, and this constrains their ability to switch or differentiate their internal governance mechanisms.[1034] The fact that Gazprom performs social-economic functions in Russia influences its posture at home and abroad, and makes it difficult for the Russian government to lift the pipeline export monopoly without altering other aspects of domestic gas market organisation. As argued by Argyres' and Libeskind's strand of TCE, the characteristics of isolated transactions can be insufficient to explain the boundaries of a firm. The governance of existing transactions, but also of new transactions in which firms seek to engage, is profoundly influenced by the governance of other transactions in which the firm is already engaged. This is referred to as 'governance inseparability of transactions'.[1035]

Some progress has been made in recent years in terms of reforms, but – all in all – it appears to be limited. First of all, a gas market exchange (SPIMEX) has been established in 2014. However, traded volumes decreased from 20.7 Bcm in 2017 to 15.1 Bcm in 2018. Moreover, Gazprom's share as a trader on SPIMEX increased. While Gazprom was trading 56-64% of SPIMEX volumes in 2015-2016, reached 89% (13.4 Bcm) in 2018.[1036] Concentration is high, the spot price still fluctuates around non-market driven prices, and there is very limited liquidity. Secondly, the ESP has been launched as an alternative vehicle to export gas to the EU (Chapter

1032 Rules for non discriminatory access to infrastructure have been drafted by FAS, the Russian antitrust authority, but prospects for their adoption in legislation still appear slim, see Mitrova et al, Основные элементы и возможные сценарии дерегулирования цен на газ в России и реформирования газового рынка.

1033 It is politically difficult to pave the way for a remarkable increase in domestic gas prices, because Russia is in difficult economic conditions and an increase in prices might be detrimental.

1034 Argyres and Liebeskind, 'Contractual Commitments, Bargaining Power, and Governance Inseparability: Incorporating History into Transaction Cost Theory'.

1035 *Ibid.*

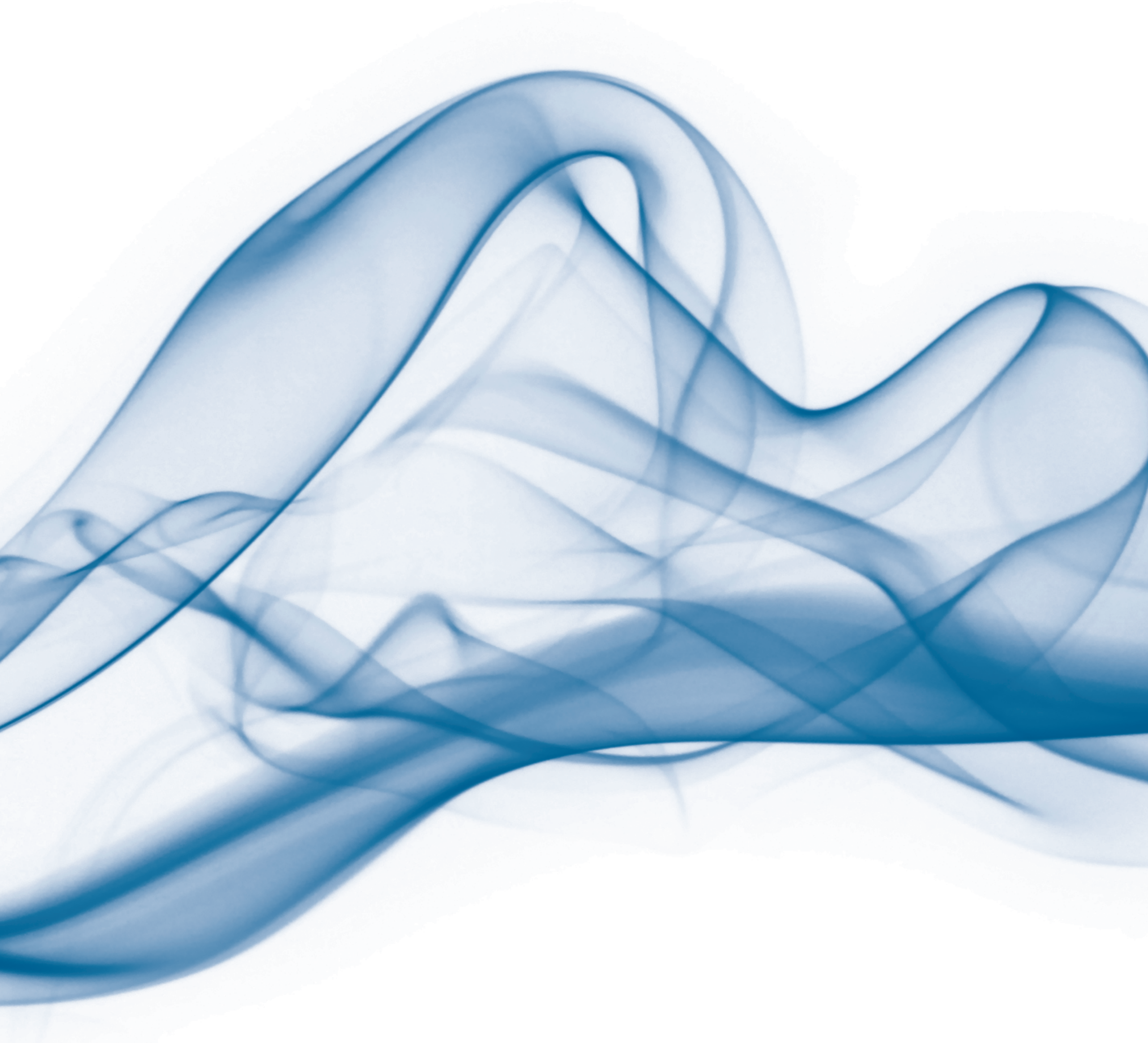
1036 Mitrova et al, Основные элементы и возможные сценарии дерегулирования цен на газ в России и реформирования газового рынка.

6). Thirdly, LNG prices for certain domestic uses have been deregulated. Fourthly, LNG exports have been liberalised. Pipelines are no longer the only way to access lucrative foreign markets, as Russia is becoming an important LNG exporter, particularly thanks to Novatek's successes in the Yamal peninsula. The lack of export outlets remains particularly painful for Rosneft in East Siberia, where the company has to flare gas because it lacks outlets.

Conclusions on prospects for Russian gas market liberalisation

In conclusion, the link between Gazprom's activities in the EU and its activities in the domestic market is strong. Essentially, Gazprom (increasingly) needs to make revenues in the EU to continue performing socio-economic functions in Russia. The company defends its right to a pipeline export monopoly on this ground. The fact that sales revenues in the EU are under pressure, in part as a result of recent transformations in EU-Russia gas trade, arguably makes it more difficult for Gazprom to perform such socio-economic functions at home. However, the fact that Gazprom is under pressure in the EU is also strengthening Gazprom's opponents, who are bringing the gas giant under unprecedented scrutiny. This situation might not be permanent. As we argued on multiple occasions in this book, the final verdict on who benefits from recent transformations in EU-Russia gas trade cannot be issued because the new architecture has not yet been tested in conditions of prolonged market tightness.

The EU is not a neutral spectator. In this book, it has been argued that the EU's actions in support of hub indexation and gas-to-gas competition also have extraterritorial ambitions, and can be regarded as a component of a wider process of neo-liberal policy transfer attempt towards Russia. In the last section of this chapter, notions such as institutional complementarity, logic of appropriateness, governance inseparability and path dependence helped us demonstrating why it is difficult to induce deep reforms in the Russian gas market. At least for the time being, it is therefore more likely that two different gas architectures will continue to coexist across EU-Russia borders.



CHAPTER 10

CONCLUSIONS

CHAPTER 10 – CONCLUSIONS

In this book, we have analysed the features and the implications of transformations in natural gas trade mechanisms between the EU and Russia. We have focussed particularly on the shift from long-term, oil-indexed, point-to-point contractual schemes towards shorter term, destination-flexible gas trade with hub-based pricing. Our analysis has only covered import contracts, excluding capacity and retail contracts.

Our aim has been to show that the transformations in trade mechanisms had a political-economic dimension, in addition to a private dimension involving contractual and commercial implications for EU importing companies and Gazprom. Accordingly, we have resorted to a combination of notions and theories originating from International Political Economy (IPE), New Institutional Economics (NIE) and Transaction Cost Economics (TCE) – after having observed that the perfect market conditions assumed by neoclassical economics are usually not found in EU-Russia gas trade (Chapters 2 and 3).

TCE is a useful framework of analysis because it helps explaining the logic and rationale of long-term contracting in gas trade. Notions from post-Williamson contract literature have been employed to explain the changing logic and rationale of long-term contracting in EU-Russia gas trade over various phases, as both the gas sector and the surrounding context changed from the 1970s to today. However, Williamsonian literature mostly looks at contracts as elements of private ordering and thus focusses on the level of exchange between firms. In our thesis, contracts are studied at an additional level, that of interactions between the State and the firm. For this reason, we have included other NIE authors such as North[1037] and Spiller[1038], who studied the broader institutional environment and the public dimension of contracts (although mostly at a domestic level). In order to properly investigate the international dimension, we have integrated TCE/NIE with IPE. Neither a strict logic of Realism – interpreting gas as Russia's political weapon and liberalisation as the EU's geo-economic tool of coercion aimed at hurting Russia – nor a strict logic of Liberalism – interpreting gas market liberalisation as a politically neutral, win-win process, allow us to capture the complexity of the topic. Conversely, the discipline of IPE represents a useful analytical framework because it allows to account for the international dimension of long-term gas contracts while postulating the equal coexistence of economics and politics, without regarding one as subordinate to the other.

We have shown that the origins of gas trade between Western Europe and the Soviet Union were rooted in a combination of co-constituted[1039] political and economic objectives (Chapter

1037 North, *Institutions, Institutional Change and Economic Performance*.

1038 Spiller, 'Transaction Cost Regulation'.

1039 Stoddard observed a significant overlap, if not co-constitution, of economic and security objectives in EU energy policy-making, cf. Stoddard (2013), 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-Economic Alternative'.

5). The design of historical long-term contracts, highly relational in nature, responded to geopolitical, economic and commercial objectives. They were designed to minimise and manage conflict – which was essential to the notion that trade interdependence should promote distension – distribute trade gains and cross-border rents between Western Europe and the Soviet Union[1040], and ensure the viability of capital-intensive, asset-specific investment allocated in conditions of bounded rationality and uncertainty – in line with the findings of TCE, particularly by Williamson (1975 and 1979)[1041] and Klein et al. (1978)[1042]. We have also shown that historical contracts were a cornerstone of Euro-Soviet gas relations, and constituted the 'institutional environment' (North, 1990)[1043] in which gas trade was conducted, making up for the lack of formal institutions governing gas trade.

The EU's unilateral attempt to entrust market-based mechanisms with a more central role since the 1990s amounted to an attempt to promote institutional change. It altered the equilibrium that had been achieved by carefully designing historical contracts so that they would allocate risk fairly between the parties. We have operated on the basis of the hypothesis that, given the importance of contracts for gas trade, and the importance of gas trade for EU-Russia relations, transforming the institutional environment of EU-Russia gas trade could not occur without significant political-economic repercussions.

We have found that the EU did not push for transformations in gas trade mechanisms with the primary objective of hurting Russia pursuant to a zero-sum geo-economic rationale (Chapter 5). This is in line with our rejection of radical Realist interpretations of EU-Russia gas relations (Chapter 4). Instead, EU gas market liberalisation was one occurrence of a broader paradigm shift (Goldthau, 2012)[1044] that went far beyond relations with Russia and natural gas trade. Nonetheless, we have argued that liberalisation had collateral geo-economic objectives vis-à-vis Russia in addition to the main objective of promoting EU citizens' welfare, and that – regardless of the EU's underlying intentions – liberalisation had important political-economic connotations and repercussions.

Moreover, liberalising a market is a political act: even in its more neutral manifestations, EU gas market liberalisation has neither been completely value-free nor fully impartial. EU gas market liberalisation had an inherent consumer bias (Goldthau and Sitter, 2018).[1045] Since, between

1040 On the interpretation of long-term contracts as instruments to distribute trade gains between contracting parties, cf. Masten, and Crocker, 'Efficient Adaptation in Long-term Contracts: Take-or-Pay Provisions for Natural Gas'; Crocker and Masten, 'Mitigating Contractual Hazards: Unilateral Options and Contractual Length'; Mulherin, 'Complexity in Long-Term Contracts: An Analysis of Natural Gas Contractual Provisions'; Intepreting the pricing mechanism in gas contracts as a way to divide the rents associated with the production, transportation and marketing of gas between Russia and EU buyers: Chyong, *Markets and Long-term Contracts: the Case of Russian Gas Supplies to Europe*.

1041 Williamson, 'Market and Hierarchies: Analysis and Antitrust Implications, a Study in the Economics of Internal Organization' and Williamson 'Transaction Cost Economics: the Governance of Contractual Relations'.

1042 Klein et al, 'Vertical Integration, Appropriate Rents and the Competitive Contracting Process'.

1043 The term 'institutional arrangements' was used by North in 1990 as opposed to 'institutional environment'. The 'institutional environment' is made up of the fundamental political, economic, social and legal institutions of a system – while institutional arrangements are circumscribed understandings (for example, an agreement between two organisations) – see North, *Institutions, Institutional Change and Economic Performance*.

1044 On changing energy paradigms, cf. Goldthau, 'From the State to the Market and Back: Policy Implications of Changing Energy Paradigms'.

1045 For an explanation of this concept related to EU-Russia gas relations in a recent publication, cf. Goldthau and Sitter, 'Regulatory or Market Power Europe? EU Leadership Models for International Energy Governance'.

the EU and Russia, it is clear that the EU is the consumer and Russia the supplier, we have emphasised that liberalisation had an inherent bias in favour of the EU.

The EU – bolstered by an 'end-of-history' (Fukuyama, 1992)[1046] mindset at the end of the Cold War – engaged in a neo-liberal policy transfer attempt by pressuring Russia to adopt the new pro-market paradigm. While it is possible that its proponents genuinely thought that liberalisation would also be in Russia's interest, namely by means of liberalisation's potential to dent rents and break resource curse dynamics (Chapter 2 and Stoddard, 2013)[1047], Russian grievances and concerns received little attention in the EU, gradually generating mistrust. Furthermore, the expansion of the energy *acquis* occurred in a historical context in which the borders of the EU and NATO were being expanded towards Russia's immediate neighbourhood, casting further doubts about the benevolence of the West's intentions. The Lisbon Strategy made it explicit that the EU saw itself as an economic superpower in global affairs and articulated ways to further increase this economic clout. We have shown that the EU engaged in 'milieu shaping', an attempt to shape a benign international milieu to pursue its own economic and security interests (Hyde-Price, 2008)[1048], taking advantage of its leverage vis-à-vis a weakened Russia and exerting 'structural power' (Strange, 1987 and 1988)[1049].

Governance structures mirror the interests of the group that have the power to alter the rules (Williamson, 1979)[1050]: in fact, market-based pricing and other aspects of liberalisation were promoted in a historical phase where the EU was strong and Russia weak. Even if hurting Russia geo-economically was not their primary objective, EU policy-makers knew that the transition to market-based pricing would entail a cross-border rent redistribution between the EU and Russia. While economists tend to focus on supply and demand as determinants of commodity prices, we emphasised the importance of governance of commodity trade as a key determinant of commodity prices (Mommer, 2000).[1051] In addition to energy companies and fossil-fuel producing countries, the governments of importing countries also have vested interests in rents generated by fossil fuels. It can therefore be argued that, thanks to gas market liberalisation and the introduction of market-based pricing in international trade, EU governments could boost their citizens' welfare by means of lower end-user prices without foregoing rents by means of taxation – targeting the producer's rents instead.

We have also found that liberalisation was a necessary but not sufficient condition to trigger transformations in EU-Russia gas trade mechanisms (Chapter 5). In addition to policy, both structural and conjunctural changes in gas markets put historical oil-indexed long-term

1046 The expression refers to the world view put forward in Francis Fukuyama's famous book published in 1992, cf. Fukuyama, *The End of History and the Last Man*.

1047 Stoddard argued that the fact that the EU imports gas from Russia might aggravate and prolong resource curse dynamics in the latter country: "Transnational interdependence across Eurasia presents risks for diverse actors with different demands for energy outcomes, yet the continuing transnational flows of capital from importers to exporters (in the absence of political reform) can exacerbate the very resource curse trends that deepen this diversity"; cf. Stoddard (2013), 'Reconsidering the Ontological Foundations of International Energy Affairs: Realist Geopolitics, Market Liberalism and a Politico-Economic Alternative'. In Chapter 2, we have presented the argument that attacking gas rents might be seen as helping pursuing the objective of limiting Russia's dependence on gas.

1048 Hyde-Price, 'A Tragic Actor? A realist perspective on Ethical Power Europe'.

1049 Strange, *The Persistent Myth of Lost Hegemony* and Strange, *States and Markets - An Introduction to International Political Economy.*

1050 Williamson, 'Transaction Cost Economics: the Governance of Contractual Relations'.

1051 Mommer, *The Governance of International Oil: Changing Rules of the Game*.

contracts under pressure. With regard to structural changes, we have emphasised the importance of the fact that the asset specificity of the European gas investment stock diminished in the 1990s and 2000s. The long-term contract literature identifies this as one of the grounds on which long-term contracts tend to give way to shorter-term contracts (Neuhoff and Von Hirschhausen, 2006).[1052] On a global level, both pipelines and LNG investments became subject to significant reductions in their capital intensiveness thanks to technological progress.[1053] Lower capital intensiveness leads to lower risks and limits the 'hold-up' problem (for an application of this notion to EU-Russia gas relations, cf. Chyong, 2015)[1054]. Another global trend that added pressure to historical long-term contracts has been the growth of LNG trade. LNG investment is less asset-specific than pipeline investment owing to the liquid nature of LNG and its destination flexibility. Access to flexible LNG and an increasing number of trade counterparts contributed to changing the underlying structural conditions under which the historical long-term contracts had thrived.[1055] This is in line with Doane's and Spulber's (1994) finding[1056] that asset specificity lowers the efficiency gains bought by long-term contracts. Finally, the fact that direct competition between gas and oil products declined substantially over the years cast doubts on the continuing rationale of oil indexation.

In addition to these structural changes and liberalisation, the specific market conjuncture that emerged in 2008-2009 was a key trigger for transformations in EU-Russia gas trade mechanisms (Chapter 5). In those years, gas oversupply created an unsustainable situation whereby EU importers were committed to buy expensive gas from Gazprom but had to compete with cheap spot-priced gas in the end-user market. As a result, renegotiation and arbitration cases skyrocketed in number (Franza, 2014).[1057] This has been one of the key vehicles of transformation in EU-Russia gas trade mechanisms. This finding challenges deterministic claims that pro-market reforms are destined to prevail everywhere. Instead, we have emphasised that the likelihood that such reforms are implemented and their effectiveness in delivering the expected results are linked to specific market conditions. This finding also entails that, should the underlying market circumstances radically change, setbacks could occur.

This helps answering one of the research questions put forward in the introduction, related to whether a new stable equilibrium has been reached or further adaptations should be expected. We have argued that, in light of the structural changes described earlier, historical oil-indexed long-term contracts will most likely not make a comeback. However, there could be a return to more long-term contracting (albeit in different forms from the past), in line with Neuhoff's and

1052 Neuhoff and Von Hirschhausen, 'Long-term Contracts and Asset Specificity Revisited'. Writing in the mid-2000s, Neuhoff and Von Hirschhausen noted that asset specificity of gas investments was diminishing. In the upstream, contracts stopped being field-specific and assumed a portfolio dimension. Similarly, investments stopped being contract-specific, meaning that a specific field could be exploited to serve various contracts. In the midstream, most of the long pipelines had been established by then. Newer projects only required smaller capacity expansions. In the downstream, distribution infrastructure had similarly been largely established, meaning that no large investments from scratch were required.

1053 Cornot Gandolphe, *The Challenges of Further Cost Reductions for New Supply Options*; Jensen, 'The LNG Revolution'.

1054 Chyong, *Markets and Long-term Contracts: the Case of Russian Gas Supplies to Europe*.

1055 Neuhoff and Von Hirschhausen, 'Long-term Contracts and Asset Specificity Revisited'; Jensen, 'The LNG Revolution'.

1056 Doane and Spulber, 'Open Access and the Evolution of the US Spot Market for Natural Gas'.

1057 Franza, *Long-term Gas Import Contracts in Europe*.

Von Hirschhausen's (2005)[1058] finding that long-term contracts make cyclical comebacks (Chapter 3). Indeed, in Chapter 8, we have demonstrated that – after a phase in which contract duration and volumes locked in long-term contracts had been declining globally – there has been a new increase in 2018 as new investment on LNG was allocated. Moreover, in case of a radical change in underlying market conditions, the pace of the transition towards market pricing could be slowed down or stopped in regions where it is not yet complete. This is the case of some Southern and Eastern Member States of the EU but also of non-OECD Asia, whose contracting behaviour will have a bearing on the availability of flexible supply for the EU market (Chapter 8 and below).

In Chapter 6, our detailed analysis of contractual provisions (updating Franza, 2014)[1059] has demonstrated that long-term gas import contracts in the EU – including contracts with Gazprom – have been deeply transformed. The first transformation has been a widespread introduction of hub indexation, initially through dynamic adaptation schemes, preferred by Gazprom. These included the introduction of price collars and partial hub indexation, one-off discounts, a relaxation of limitations to review pricing terms and a relaxation of take-or-pay thresholds. As the transition matured, the transformation became more structural – namely leading to the introduction of full, direct hub indexation. We have also accounted for the temporal and geographical dimensions of the transition, which started in North-Western Europe and subsequently expanded towards Southern and Eastern Europe. The second trend has been a shortening of the average duration, although some very long[1060] supply contracts have still been signed in the last decade. The third has been a diminution in the average Annual Contracted Quantity (ACQ) per contract over the last decade, reflecting fears of over-contracting owing to uncertain prospects for demand. Even if LNG is still often sold in the EU under long-term oil-indexed contracts, its destination flexibility is an important novelty. The emergence of self-contracting and aggregators has introduced new business models in which LNG trade is effectively subject to some short-term dynamics even when there is a long-term contract in place. As was mentioned earlier, these novel business models mean that investments are less asset-specific, reducing the strategic need for long-term contracting.

All in all, we have concluded that despite having been deeply transformed, long-term gas import contracts are still alive, in the EU and in the rest of the world (Chapter 6). In EU-Russia gas trade, long-term contractual coverage will remain extensive throughout the 2020s. Not only are existing long-term contracts not being terminated, but they are also being renewed (with some notable exceptions). New long-term contracts are being signed, both for piped gas and LNG supply. This is particularly the case when guarantees are needed for new capital-intensive projects, although some Final Investment Decisions (FIDs) are now being taken without long-term contract support, with an acceleration of this trend in 2019. However, the absolute supremacy of long-term contracts as a vehicle for international gas trade has been called into question. Long-term contracts have been weakened and further adjustments in gas business models have been made more possible by the transformations described in this book.

1058 Neuhoff and Von Hirschhausen, 'Long-term vs Short-term Contracts: A European Perspective on Natural Gas'.

1059 Franza, *Long-term Gas Import Contracts in Europe.*

1060 Contracts with a duration of 20-25 years.

Transformations in EU-Russia gas trade mechanisms did not only unfold through changes to long-term contracts. Another aspect of such transformations is Gazprom's more visible presence on spot markets (Sharples and Henderson, 2019).[1061] Gazprom's involvement in spot trade has been growing, in a way that is still not possible to quantify precisely. The establishment of the Electronic Supply Platform (ESP) in 2018 and the fact that offtake from long-term contracts is now close to maximum contracted quantities suggest that Gazprom aims to further enhance its participation in spot trade to sell larger volumes of gas to the EU. The rationale for Gazprom's involvement in EU spot trade is multifaceted. In addition to using hubs for balancing purposes, Gazprom has stepped up its presence in order to gain experience in a form of trade that is expected to further grow in importance. Gazprom might also nurture an interest in influencing EU hub prices under certain circumstances (Mitrova and Boersma, 2018).[1062] While in the current market phase Gazprom is mostly a price-taker, its ability to influence hub prices could improve in future, in case of prolonged phases of market tightness. As a major gas supplier, Gazprom could also play with uncertainty in case it further adapts current business model (Boussena and Locatelli, 2017).[1063] At the moment, the prevalence of long-term contract coverage provides guarantees and price discovery, which make a pricing strategy based on uncertainty difficult to implement.

In the current market phase, Gazprom's ideal gas price in the EU is the maximum achievable without significant loss of market share to LNG. This optimal level is clearly influenced by a number of factors, including factors that are exogenous to EU-Russia trade, such as global demand for LNG and contracting behaviour in emerging markets. Gazprom has not engaged in a full-fledged price war so far, and lacks an interest in doing so in default of a downward spiral in prices and a serious threat of displacement. Gazprom takes into account the abovementioned optimal contract price when dynamically adapting contract prices to hub prices, as described in the section on renegotiations and arbitrations. Another important finding is that while the EU has strived to stimulate gas-to-gas competition and develop well-functioning hubs to get rid of oil indexation and pay lower import prices, hub prices are often still (indirectly) influenced by oil prices – depending on the market phase (Chapter 6).

In addition to describing the transformations undergone by EU-Russia gas trade mechanisms in the last decade, we have also assessed their political-economic impact (Chapter 7). For this purpose, we have conducted an observation of the evolution of EU gas price levels throughout the period in which the transformations in trade mechanisms unfolded. In doing so, we have discussed the numerous factors that concur to influence price levels. Our analysis has confirmed that transformations in EU-Russia gas trade did not completely eliminate the influence of oil prices, and has demonstrated that such transformations did not provide the EU with the Henry Hub price parity that some of the proponents of liberalisation had been striving for, and did not avert phases of high gas prices in the last decade. No clear downward price trajectory resulted from our first analysis, which showed price fluctuations instead. The first time that gas prices declined significantly in the period considered, helping gas in its

1061 Sharples, *Gazprom's Gas Sales via its Electronic Sales Platform (ESP)*.

1062 Mitrova and Boersma, 'The Impact of US LNG on Russian Natural Gas Export Policy'.

1063 Boussena and Locatelli, 'Gazprom and the Complexity of the EU Gas Market: a Strategy to Define'.

competition with coal, was when (all) commodity prices crashed in 2014. However, we have recognised that this analysis presented severe limitations, notably because it did not allow us to insulate the pricing effect. For this reason, a more quantitative analysis has been conducted. Even with a quantitative analysis, establishing the exact impact of the adoption of hub indexation on price levels has proved impossible.

Nonetheless, by analysing the spread between EU gas hub prices and a proxy value indicating the theoretical price of gas in historical oil-indexed contracts (Platts' Gas Contract Indicator, GCI), we have been able to establish that the adoption of hub indexation resulted in savings for the EU, and we have been able to at least indicate the order of magnitude of such savings. We have estimated the savings to fall somewhere between 3.03 and 6.87 billion euros per year on average between 2009 and 2018. The existence of a (wide) range depends on the fact that our calculation rested on several assumptions and approximations, motivated among other things by the lack of precise figures on the price indexation of actual sales – this being an element covered by industrial secret.

We have acknowledged a number of additional limitations in our approach, the most noteworthy ones being that: 1.) the Platts' GCI indicators covers Northwest Europe, and not Italy or Central-Eastern Europe; 2.) if Gazprom had hypothetically been able to stick to historical oil-indexed formulae throughout the period analysed, imports of Russian gas would have been lower, with the result that gross savings for the EU would have been lower, particularly when demand recovered after 2014 and EU buyers regained the ability to discriminate offtake on the basis of prices; 3.) it was not possible to obtain an accurate breakdown of monthly Russian gas imports per price area, which forced us to make calculations under hypothetical scenarios in which all of the core EU markets would pay Title Transfer Facility (TTF), German average import (BAFA) or Central-Eastern European (CEE) and Italian average import (ITA) prices. Hopefully, future research can address some of these shortcomings through better access to data.

In order to translate these findings in political-economic terms, we have also calculated the EU's energy import bill between 2010 and 2018. We have confirmed and emphasised the observation (already known) that Russian gas, and gas in general, are not, by far, the main driver of the EU energy import bill. Russian gas imports accounted for 7.4% of the EU's energy import value on average between 2012-2018 (and total gas imports accounted for 18.3%). This entails that the focus of the EU's foreign energy policy discourse on Russian gas is not justified on political-economic grounds. We have suggested that it was outside the scope of this dissertation to discuss whether it is justified on purely geopolitical grounds. From a political-economic perspective, oil imports (including from Russia) have a much bigger weight (77.7% of the EU's import bill on average in the period 2012-2018). Fluctuations in oil prices greatly affect the energy import bill and overall trade balance of the EU, overshadowing other commodity market developments, including effects of the transition to hub pricing in long-term gas import contracts. The savings realised thanks to contract renegotiations are certainly not irrelevant and can be regarded a positive development for the EU. However, they have not greatly affected the EU's overall energy import bill (which ranged between 254 to 533 billion euros per year approximately between 2012 and 2018), let alone the overall trade balance of the EU.

In addition to assessing the consequences that the transformations in EU-Russia gas trade mechanisms have already generated, we have also assessed factors that could produce different consequences in future (Chapter 8). In the past decade, the adoption of hub indexation allowed the EU to save money on its gas imports. However, we have also identified possible negative repercussions of transformations in EU-Russia gas trade mechanisms both in terms of affordability and security of supply.

We have found that the way in which gas relations between the EU and Russia have evolved in the last decade is a far cry from the original notion of planning a sector together that inspired the original gas-for-pipes deals. Long-term commercial relations between the Russian and the EU gas industry built around historical relational contracts had cemented stability in EU-Russia gas trade for decades. Channels between large EU and Russian gas companies – the 'hidden level' of EU-Russia gas governance according to Skalamera (2016)[1064] – remained open even when the official governmental channels were frozen.

In the last decade, conflictuality, confrontation and mutual distrust have risen as a result of increasingly diverging views on how to organise gas trade. Arbitrations have proliferated. These are time-consuming, expensive processes, which can destabilise balance sheets and are counterproductive for investment planning. Besides being a sign of growing conflictuality themselves, arbitrations also lead to further uncertainty in the gas sector. When legal disputes become the norm in a sector, the consensual and relational aspects of trade are clearly compromised. We have concluded that Gazprom and its EU trade counterparts have become increasingly wary of each other's moves, and uncertain about future prospects for mutual trade. Unlike import bill savings, the long-term damage to the EU-Russia gas trade relation is impossible to translate into quantitative variables. We have suggested that the impact of the deterioration in the trade relation will be felt more acutely by the EU when today's buyers' market gives way to a sellers' market, potentially posing risks for the EU's security of supply.

A related theme is the possible long-term impact of transformations in EU-Russia gas trade mechanisms on investments. As was concluded in Chapter 6, long-term gas import contracts are still alive. This could explain why we have not yet found clear indications of declining gas investments in Russia.[1065] However, long-term contracts have been weakened by the transformations described here, and it is possible that further adjustments will take place, particularly now that Gazprom is increasingly trading on the spot market. We have warned against the risk that the current architecture discourages the signature of long-term contracts, with the risk that this will lead to underinvestment in future.

One of TCE's central teachings is that long-term contracts are an important instrument to cope with uncertainty. In Chapter 8, we have shown that uncertainty is mounting, particularly when it comes to projecting the EU's future gas import needs. We have emphasised two reasons: the ambition of decarbonisation (and the major challenges it is faced with) and the EU's growing

1064 Skalamera, 'Invisible but not Indivisible: Russia, the European Union, and the Importance of Hidden Governance'.

1065 While, at the same time, we have demonstrated that TCE's predictions on the correlation between guarantees offered by long-term contracts and the level of investments are still largely valid in today's market, although this correlation has been weakened by a decline in asset specificity.

exposure to global gas dynamics, especially to gas demand and contracting behaviour in non-OECD Asia.

The rising importance of non-OECD Asia as an offtaker in global LNG markets makes the EU a market of last resort. While this is beneficial for the EU at times of oversupply, undercontracting might pose security of supply challenges in the longer term. There is significant uncertainty on the size of the import gap of non-OECD Asia that will have to be filled by flexible LNG. The size of non-OECD Asia's import gap will be decisive to determine how much flexible LNG will eventually flow to the EU. Relying solely on flexible LNG, particularly in a tight market, could pose significant security of supply risks. To be sure, the presence of fast-growing demand centres in non-OECD Asia is positive for the EU in that it provides support for new investment in LNG which, if the EU were the sole potential offtaker, might never take place. However, non-OECD Asian buyers might decide to lock large volumes in long-term contracts in future, potentially threatening the EU's ambition to rely on free-flowing LNG for its security of supply.

On the basis of what has been said, the desirable course of action – from a EU perspective – would be to inflate future EU import need projections in order to encourage Russia and other suppliers to invest now. What is observed is the contrary: a clear mismatch between the political discourse, which refuses to portray gas as part of the solution to fight climate change, and the reality on the ground – where gas demand is stable and imports are growing. By understating its future energy import needs and discouraging the signature of new long-term contracts, the EU is pursuing a risky security of supply strategy (or not pursuing a strategy at all). Gazprom is faced with major unknowns when looking at its future position in the EU and at the EU's gas needs.

Finally, we have assessed the impact of recent transformations in EU-Russia gas trade mechanisms on Gazprom (Chapter 9). The results of the quantitative analysis conducted in Chapter 7 with reference to the EU have been transposed and applied to Gazprom, with the implication that the value that Gazprom extracted from gas exports to the EU decreased by 3.03-6.87 billion Euros per year between 2009 and 2018. We have also emphasised that, in the period analysed, record high sales to the EU did not translate into record high revenues for Gazprom. Generally, low EU prices hurt Gazprom's revenues more than small volumes. Clearly, the ideal conjuncture for Gazprom would be a combination of large sales volumes and high prices. This can materialise when gas-to-gas competition is limited and/or import demand is very high. Unfortunately for Gazprom, this conjuncture has not materialised for prolonged periods in the last decade, meaning that Gazprom has usually been presented with a trade-off between volumes and price. Gazprom's strategy has gradually shifted from value to volume protection in the last decade.

These transformations have occurred in a difficult phase for Gazprom, marked by increased domestic competition from independent gas producers, lower sales to Former Soviet Union countries and a rise in taxation levels imposed by the Russian government. We have found that Gazprom has become even more dependent on revenues from sales to the Far Abroad in the period under observation. This goes in the opposite direction of long-standing Russian government proposals to increase profitability of the domestic market, diversify sources of gas revenues and reduce dependency on the EU gas market.[1066]

Gazprom is going through a delicate phase, although it would be premature to ring the alarm bell at this stage because Gazprom has relatively healthy balance sheets and a relatively low level of indebtment. However, its market valuation is low relative to the industry's average and some financial indicators have worsened. As a result, Gazprom has come under increased scrutiny in Russia, where many competing players would like to see a lift of its pipeline export monopoly. Gazprom has been accused of pursuing 'value-destroying' projects to enrich contractors (Fak and Kotelnikova, 2018).[1067] The Russian government has been intensifying its efforts to extract additional rents from Gazprom through export duties and especially royalties. In fact, the Mineral Resources Extraction Tax (MRET) applied to Gazprom has been rising substantially in recent years (Yermakov and Kirova, 2017).[1068] At the same time, Gazprom has embarked on highly capital-intensive pipeline projects such as Nord Stream 2, Turk Stream and Power of Siberia. While we do see a commercial rationale behind these projects, besides a geopolitical one, we also recognise that there is significant uncertainty about the future utilisation of these pipelines.

All of the above compounds concerns about the company's long-term financial sustainability. This is potentially serious because, in the long term, sizeable investments on legacy trunk pipelines inside of Russia and upstream investments will have to be allocated. As long as it was widely believed that Gazprom could increase its shipments to the EU at a push of a button, the perceived urgency for investments on new production capacity on behalf of Gazprom was low. This perception has changed since 2018. In that year, a report revealed that Russian spare production capacity had diminished (Yermakov, 2018).[1069] Production decline in mature fields continues. Gazprom's production is drifting further north and drilling has to take place at increasingly higher depths.

In the second part of Chapter 9, we have reflected on the evolving importance of Gazprom's gas sales revenues in the EU for Russia, from a more political-economic perspective. The combination of Russia's economic growth in the 2000s and a resurgence of geopolitical divergences reinforced the rhetoric that oil and gas were strengthening an increasingly adversarial Russia vis-à-vis the West. We have observed that, from a geo-economic perspective, it would mostly be oil (if anything) that strengthened Russia relative to the West in the 2000s. The fact that transformations in EU-Russia gas trade dented Gazprom's sales revenues in the EU between 2009 and 2018 should not be excessively characterised as a key development for redressing Russia's increased defiance of the West.

1066 On the objective of increasing domestic Russian prices, see for instance Godzimirski, *Russian Energy in a Changing World*. The target was also transposed into law: "in May 2007, the Russian authorities introduced Resolution No.333 which enshrined the export netback target into law", cf. Henderson et al, *The SPIMEX Gas Exchange: Russian Gas Trading Possibilities*.

1067 Fak and Kotelnikova, *Tickling Giants*.

1068 Yermakov and Kirova, *Gas and Taxes: The Impact of Russia's Tinkering with Upstream Gas Taxes on State Revenues and Decline Rates of Legacy Gas Fields*.

1069 Yermakov, *Shrinking Surplus: the Outlook for Russia's Spare Gas Productive Capacity*.

Of course, this does not mean that gas revenues are unimportant, nor does it mean that Gazprom is unimportant for Russia. We have estimated the value of Gazprom's gas exports to the EU to be just short of 8% of Russia's total export value in 2018. Gazprom's net sales revenues in the Far Abroad amounted to 2.8% of Russia's nominal GDP in 2018. Within the period analysed (2008-2018), they oscillated between 2.2% and 3.1% of nominal GDP.

The Russian government regards gas as an important source of revenues, and it also scrutinises Gazprom's management based on its ability to deliver revenues to State coffers. We have found that taxes on gas production and exports generated 6.9% of federal budget revenues in 2009, 3.3% in 2010, 4.6% in 2011, 5.4% in 2012, 6.1% in 2013, 5.8% in 2014, 6.6% in 2015, 6.7% in 2016 and 7.4% in 2017 and 2018. With a 68% share in Russian gas production, a monopoly on pipeline exports (which represent 90% of Russia's total gas exports), and a share of approximately 60% of Russian LNG exports[1070] in 2018, Gazprom remains by far the largest upstream player as well as exporter of Russian gas. Gazprom provides the bulk of gas tax revenues to the federal budget.

Gazprom has been paying a higher MRET than its competitors since 2012. Novatek's Yamal LNG received an exemption from MRET and it should be emphasised that exports of LNG are exempt from export duties, as the Russian government has been encouraging gas export source diversification. The issue of natural gas taxation has become more and more pressing in recent years in Russia, and there is a strong connection between taxation policy proposals and developments in the EU market, including transformations in EU-Russia gas trade. In fact, the decline in EU gas prices, partly caused or at least aggravated by the introduction of hub indexation, has intensified the confrontation between Russian gas companies (especially Gazprom) and the Russian government on how to distribute gas rents.

The Russian government was concerned about reduced hydrocarbon tax revenues in the period 2014-2017. Even if tax revenues increased again in 2017 and 2018 with the recovery in commodity prices, the concern is a long term one, as the Russian government fears that lower fossil fuel consumption due to decarbonisation in importing countries and intense competition (namely from US shale oil and gas) might result in low commodity prices and thus low tax revenues in the long term.

Before the tax reform, Russian gas companies were charged a fixed fee for natural gas produced, at a rate that was set at a low level reflecting low regulated domestic gas prices in Russia. Gas rents have been historically shared by the State with domestic industries and households through low gas prices. When the Russian government increased regulated domestic gas prices in the second half of the 2000s, it started to regard tax revenues from the MRET as too low and studied ways to adapt taxation. Essentially, the Russian government aimed to redress a situation in which it felt it had given away rents to Gazprom.[1071]

1070 In 2018, through its liquefaction terminal on Sakhalin, Gazprom still exported the majority (approximately 60%) of Russian LNG volumes. Novatek's Yamal LNG terminal was in fact not yet fully operational then. While Train 1 (5.5 MTPA) was already operational by the beginning of the year, Train 2 (5.5 MTPA) only started in July 2018 and Train 3 (5.5 MTPA) in December 2018.

1071 Yermakov and Kirova, *Gas and Taxes: The Impact of Russia's Tinkering with Upstream Gas Taxes on State Revenues and Decline Rates of Legacy Gas Fields*.

Finally, we have assessed prospects for gas market liberalisation in Russia. As mentioned, we have studied how the EU has been projecting its power as a 'regulatory state', by attempting to extend its neo-liberal norms well beyond its borders, including in the field of energy (Goldthau and Sitter, 2015).[1072] Inducing Russia to change its approach to gas trade was also one of the desired objectives of introducing hub indexation in long-term supply contracts, although not the primary one (Chapter 5).

In Chapter 9, we have shown how the notion that the liberalisation of EU gas markets (and the introduction of hub indexation in long-term supply contracts) would trigger Russian gas market liberalisation neglects the presence of institutional complementarities, logic of appropriateness and path dependence in Russia's gas market structure.

An important element that is sometimes forgotten in the West is that the economic, social and human cost of a gas supply disruption in Russia would be hefty, arguably higher than in most EU countries. Overarching reforms of the gas sector thus need to be carefully thought of. This 'social' dimension of the gas sector has another facet. As argued earlier in Chapter 9, the gas industry is, in effect, part of the national identity in Russia (Oldfield, 2017[1073]; Aalto et al., 2012[1074]).

After experiencing despair and uncertainty in the 1990s, the Russian public opinion witnessed an economic and geopolitical renaissance of their country in the 2000s, also enabled by high gas (and oil) prices and framed by Putin as an outcome of his successful defence of strategic Russian (energy) interests against self-serving Western advice. Neo-liberal recipes started to be seen with increased distrust and scepticism. By presenting the notion of 'logic of appropriateness' (March and Olsen, 2009)[1075], we have argued that institutions are only effective when there is a sufficient degree of acceptance of norms – in other words, when norms are 'internalized' by agents. Given the context sketched above, Russia did not have time to internalize neo-liberal norms that are still perceived as an imposition from the West. It would be short-sighted for the EU to attempt to impose reforms regardless of perceptions within Russia. New norms would need to be internalized by agents in Russia and therefore they would need to be aligned with social values in that country.

We have also unveiled the complexity of reforming the Russian gas market: given the intricate *quid pro quo* that takes place between the Russian government, Gazprom, and independent gas producers, it is impossible to cherry-pick areas to (deeply) reform while leaving other areas unreformed. This resonates in the concept of 'institutional complementarity' introduced in Chapter 3. Notably, Aoki (2001)[1076] exposed the existence of 'institutional complementarities', dynamics of interdependence whereby institutions tend to hang together in systems, making it difficult to change one institution without changing other institutions at the same time. Some of Russia's institutional features limit the room for manoeuvre of proposed reforms. Rule

1072 Goldthau and Sitter, 'Soft Power with a Hard Edge: EU Policy Tools and Energy Security'.

1073 Oldfield, *Russian Nature: Exploring the Environmental Consequences of Societal Change.*

1074 Aalto et al, 'How are Russian energy policies formulated? Linking the actors and structures of energy policy'

1075 March and Olsen, *The Logic of Appropriateness*

1076 Aoki, *Toward a Comparative Institutional Analysis*.

of law is, in fact, not as solid as in the EU. Property and shareholder rights are not always adequately guaranteed, and a strong regulatory model based on an independent regulator might not be as viable as in the EU.

Furthermore, Russian capitalism is often characterised by patronage and cronyism. The absence of strong mechanisms to cope with the externalities deriving from the pursuit of particularistic interests increases the potentially negative consequences of gas sector decentralisation. Along these lines, applying a framework of 'institutional complementarity', we have supported Locatelli's (2013)[1077] argument that Russian gas reforms mimicking unbundling and a complete break-up of vertical integration as implemented in the EU have never been credible because of their incompatibility with Russia's institutional environment. Corporate mindset is also an obstacle. While Russia is a multi-faceted country and while there certainly are reformers in Russia, too, there is also a lot of resistance to change, including within Gazprom. This resonates with arguments put forward by Unruh (2000)[1078], who found that technical-industrial complexes propagate path dependencies in energy.

Western calls for lifting Gazprom's pipeline export monopoly neglect that the pipeline export monopoly cannot be lifted without taking other complementary measures. This is due to a complex entanglement of benefits and duties in the Russian gas sector. Too often, the focus is on Gazprom's privileges. However, at a closer look, it becomes clear that Gazprom needs to perform a lot of socio-economic functions at home. Gazprom has a cumbersome legacy of commitments, towards EU importers, the Russian State, and, ultimately, the Russian population.

These commitments limit its room for manoeuvre. As argued by Argyres and Libeskind (1998)[1079], the characteristics of isolated transactions can be insufficient to explain the boundaries of a firm. The governance of existing transactions, but also of new transactions in which firms seek to engage, is profoundly influenced by the governance of other transactions in which the firm is already engaged. This is referred to as 'governance inseparability of transactions'. For all the reasons mentioned above, there are limited prospects for an overarching liberalisation of the Russian gas market.

10.1 FINAL REMARKS

In this book we have adopted an eclectic approach, by combining qualitative and quantitative analysis and by making use of a combination of TCE, NIE and IPE to explain the political-economic dimensions of changes in EU-Russia gas trade mechanisms. TCE is suitable to explain the choice of long-term contracting at the onset of gas trade between the Soviet Union and Western Europe. Contract literature also helps explaining why long-term contracts came under pressure when asset specificity in the gas sector diminished in the 1990s and 2000s. Furthermore, incomplete contract literature helps us understanding the rationale and characteristics of long-term contract renegotiations, showing how they were triggered by a

1077 Locatelli, 'The Russian Gas Industry: Challenges to the Gazprom Model'.

1078 Unruh, 'Understanding Carbon Lock-in'.

1079 Argyres and Liebeskind, 'Contractual Commitments, Bargaining Power, and Governance Inseparability: Incorporating History into Transaction Cost Theory'.

shift in bargaining power due to exogenous transformations, how they focussed on price levels, how trade-offs between price concessions and other terms were organised, and perhaps most importantly how the built-in flexibility of long-term gas supply contracts turned out to be a key feature for their survival. TCE also helps shedding light on very recent developments, namely higher contract duration and ACQ per contract recorded in 2018, when new LNG FIDs were made.

Relational contract literature helps us appreciating the long-term damage to the relational nature of EU-Russia gas contracts, whose effects might be felt in the long term and potentially offset the short-term benefits so far enjoyed by the EU. Moreover, TCE allows us to argue that the weakening of long-term contracts resulting from the transformations in EU-Russia gas trade mechanisms may lead to underinvestment in future, potentially threatening security of supply and affordability of gas in the EU. We suggest that long-term contracts are still needed because uncertainty remains high and the trend towards lower asset specificity observed so far is not necessarily going to continue indefinitely and lead to a fully liquid and traded global gas market.

IPE provides the most suitable analytical framework to study the international political-economic dimensions of changes in gas trade mechanisms and the impact it had on the EU, on Russia, and on EU-Russia relations. It allows to show how a political process like liberalisation influenced the economic rules of the game, and how in turn these altered the relative economic (and political) power of two countries, or one bloc of countries (the EU) and a country (Russia) in this case.

IPE helps understanding how the EU exerted its structural power and shaped the milieu in which gas was traded in its own favour. Liberalisation, far from being a politically neutral process, had an inherent consumer bias. Since – in the context of EU-Russia relations – the EU is the consumer, liberalisation had an inherent EU bias. While liberalisation and the introduction of hub indexation can be interpreted as a neoliberal policy transfer attempt, IPE helps us rejecting the radical Realist/geo-economic argument that the EU promoted gas market liberalisation primarily to hurt Russia.

Finally, NIE notions of logic of appropriateness and institutional complementarity allowed us to show that EU-style gas market liberalisation is not likely to materialise in Russia, and that perhaps it is not even desirable.

The most likely outcome of the entire process of transformation described in this work is that two different institutional environments will continue to coexist on the two sides of the EU-Russia borders. So far, the transformations in EU-Russia gas trade mechanisms have benefitted the EU, allowing it to save money on imports. Gazprom’s revenues have been dented, in a phase where the company faces other challenges both in Russia and in export markets. However, the negative impact on Russian macro-economic indicators and federal budget has been limited. We have concluded that the geo-economic argument that gas trade with Russia empowers Russia’s aggressive geopolitical stance towards the West is weak. The last word on who will benefit from transformations in EU-Russia gas trade mechanisms is not said. Here, we have argued that – should certain circumstances arise in future – the transformations in EU-Russia gas trade mechanisms might actually turn out to be detrimental for the affordability and security of gas supplies to the EU.

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SAMENVATTING

Dit boek onderzoekt de kenmerken en de politiek-economische implicaties van de veranderingen in aardgas handelsmechanismen tussen de EU en Rusland. De focus ligt op de verschuiving van lange-termijn, olie-geïndexeerde, punt-tot-punt contractuele overeenkomsten naar korte-termijncontracten met een flexibele bestemming en marktprijzen. Het analytisch raamwerk wordt gevormd door Internationale Politieke Economie (IPE), Nieuwe Institutionele Economie (NIE) en transactiekosten economie (TCE). TCE biedt een bruikbaar raamwerk omdat het de logica en rationale verklaart van lange-termijn contracten, maar in de Williamson literatuur wordt naar contracten gekeken als onderdeel van private schikking. Om contracten te bestuderen op een aanvullend niveau, dat van de interactie tussen de Staat en het bedrijf, zijn de noties en bevindingen van North en Spiller ook meegenomen. Deze auteurs bestuurden de publieke dimensie van contracten op binnenlands niveau. Om de internationale dimensies van contracten goed te bestuderen, is IPE geïntegreerd met TCE/NIE. Een bijkomend voordeel van IPE is dat het economische en politieke variabelen als even belangrijk en nauw verweven beschouwd.

De oorsprong van de aardgashandel tussen West-Europa en de Sovjet-Unie komt voort uit een combinatie van samengestelde politieke en economische doelen (Hoofdstuk 5). Het ontwerp van de traditionele lange-termijn contracten, zeer relationeel van karakter, was een antwoord op geopolitieke, economische en commerciële oogmerken. Deze waren ontworpen om conflicten te minimaliseren en te beheersen en de voordelen van handel en de grensoverschrijdende winsten te verdelen tussen west Europa en de Sovjet Unie en het garanderen van de haalbaarheid van kapitaalintensieve, activa-specifieke investeringen in een omgeving van beperkte rationaliteit en onzekerheid – in lijn met bevindingen van TCE, in het bijzonder Williamson (1975 en 1979) en Klein et al. (1978). De traditionele contracten waren een hoeksteen van de Euro-Sovjet gasrelaties en vormden de ‘institutionele omgeving’ (North, 1990) in welke de gashandel werd bedreven.

De unilaterale poging van de EU om markt gebaseerde mechanismen een meer centrale rol te geven in de jaren negentig, bleef niet zonder politieke-economische repercussies voor de gashandel en de institutionele omgeving van de EU-Rusland gashandel. De EU streefde niet naar veranderingen in de mechanismen van de gashandel met de bedoeling om Rusland te schaden. De EU-liberalisering van de gasmarkt was daarentegen een gebeurtenis van een paradigma verandering (Goldthau, 2012) dat verder strekte dan gas en Rusland. Niettemin had de liberalisering bijkomende geo-economische bedoelingen met betrekking tot Rusland (cf. Lissabon-strategie). De EU-gasmarkt liberalisering was niet geheel waardevrij noch volledig neutraal. Het liberaliseringsproces had een inherente consumenten vooringenomenheid (Goldthau en Sitter, 2018) en dus een inherente vooringenomenheid voor de EU. De EU committeerde zich aan een neo-liberale beleidsverandering door Rusland onder druk te zetten het nieuwe pro-markt paradigma te accepteren, zonder te luisteren naar Russische bezwaren.

In bredere zin was de EU bezig met het ‘scheppen van een omgeving’ in een poging om een goedgezinde internationale omgeving te creëren voor de eigen economische en veiligheidsbelangen (Hyde-Price, 2008), waarbij voordeel werd behaald ten opzichte van een verzwakt Rusland en er ‘structurele macht kon worden uitgeoefend (Strange, 1987 en 1988). Governancestructuren weerspiegelen de belangen van de groep die de bevoegdheid heeft om de regels te wijzigen (Williamson, 1979) en zijn tevens een belangrijke determinant van de grondstoffenprijzen (Mommer, 2000). Marktgebaseerde prijzen werden bevorderd in een historische fase waarin de EU sterk en Rusland zwak was. De overgang naar marktgebaseerde prijzen impliceerde een grensoverschrijdende herverdeling van de economische rente tussen de EU en Rusland. De EU-regeringen zouden het welzijn van hun burgers kunnen vergroten door middel van lagere eindgebruikersprijzen, zonder vermindering van opbrengsten die door middel van belastingen werden verkregen. Dit zou ten koste gaan van de opbrengsten van de producent.

Liberalisering was een noodzakelijke maar onvoldoende voorwaarde om de veranderingen in de gashandelsmechanismen tussen de EU en Rusland te veroorzaken (Hoofdstuk 5). Zowel structurele als conjuncturele veranderingen op de gasmarkten zetten de traditionele oliegeindexeerde langetermijncontracten onder druk. De specificiteit van activa van zowel de Europese als de bestaande gasinvesteringen was in de jaren negentig en 2000 afgenomen (Neuhoff en Von Hirschhausen, 2006), waardoor de efficiëntieverbeteringen van langlopende contracten verminderde (Doane en Spulber, 1994). Lagere kapitaalintensiteit leidt tot lagere risico's en beperkt het 'hold-up'-probleem (Chyong, 2015). Naast deze structurele veranderingen heeft het gasoveraanbod aan het einde van de jaren 2000 een situatie gecreëerd waarin EU-importeurs zich ertoe hadden verplicht duur gas van Gazprom te kopen, terwijl ze op de eindgebruikersmarkt moesten concurreren met goedkoper spot-priced gas. Als gevolg hiervan stegen heronderhandelings- en arbitragezaken flink (Franza, 2014).

De constatering dat het succes van de liberalisering van de gasmarkt afhangt van specifieke marktfundamenten houdt ook in dat, mochten de onderliggende marktomstandigheden veranderen, er tegenslagen kunnen optreden. In ieder geval zullen traditionele oliegeindexeerde langetermijncontracten, gezien de eerder beschreven structurele veranderingen, hoogstwaarschijnlijk niet terugkeren. Er zou echter wel een terugkeer kunnen komen naar meer langdurige contractering (zij het in verschillende vormen dan in het verleden). Dit is in overeenstemming met de vaststelling van Neuhoff en Von Hirschhausen (2005) dat langetermijncontracten cyclische comebacks maken (Hoofdstuk 3). Uit Hoofdstuk 8 blijkt namelijk dat in 2018 dergelijke contractering toenam toen investeringen in nieuwe LNG-capaciteit moesten worden gerealiseerd. Bovendien zou het tempo van de overgang naar marktprijzen kunnen worden vertraagd of gestopt in regio's waar het proces nog niet voltooid is. Dit is het geval voor sommige zuidelijke en oostelijke lidstaten van de EU, maar ook van niet-OESO-Azië. Het contracteringsgedrag aldaar zal van invloed zijn op de beschikbaarheid van flexibel aanbod voor de EU-markt (Hoofdstuk 8 en hierna).

Hoofdstuk 6 bevat een gedetailleerde analyse van contractuele bepalingen waaruit blijkt dat de langetermijncontracten voor de invoer van gas in de EU – inclusief contracten met Gazprom – sterk zijn getransformeerd. De eerste transformatie is een wijdverbreide invoering van hub-indexatie, aanvankelijk door middel van dynamische aanpassingsschema's die door Gazprom werden geprefereerd. Deze omvatten de invoering van prijsbanden en gedeeltelijke hub-indexatie, eenmalige kortingen, een versoepeling van de beperkingen om de prijsvoorwaarden te herzien en een versoepeling van de take-or-pay-drempels. Naarmate de overgang vorderde, werd de verandering structureler van aard en leidde tot de invoering van volledige, directe hub-indexering. Hoofdstuk 6 houdt ook rekening met de tijdelijke en geografische dimensies van deze overgang die begon in Noordwest-Europa en zich vervolgens uitbreidde naar Zuid- en Oost-Europa. De tweede trend is een verkorting van de gemiddelde duur van contracten, hoewel in de afgelopen tien jaar er nog steeds lange leveringscontracten zijn ondertekend. De derde is een vermindering van de gemiddelde jaarlijkse gecontracteerde hoeveelheid (ACQ) per contract in de afgelopen tien jaar als gevolg van angst voor overcontractering vanwege onzekere vooruitzichten van de gasvraag.

Hoewel LNG in de EU nog vaak wordt verkocht in het kader van langlopende oliegeindexeerde contracten, is de flexibiliteit van de bestemming een belangrijke nieuwigheid. De opkomst van zelfcontractering en aggregators heeft nieuwe bedrijfsmodellen geïntroduceerd waardoor de LNG-handel effectief onderhevig is aan enige dynamiek op korte termijn, zelfs wanneer er een langetermijncontract bestaat. Deze nieuwe bedrijfsmodellen betekenen dat investeringen minder activa-specifiek zijn, waardoor de strategische behoefte aan langetermijn contracten vermindert. Langlopende gasinvoercontracten blijven van kracht, zij het getransformeerd. In de gashandel tussen de EU en Rusland zal de lange-termijn contractuele dekking gedurende de jaren 2020 uitgebreid blijven. Er worden nieuwe langetermijncontracten getekend, zowel voor de levering van pijpleidinggas als voor LNG. Dit is met name het geval wanneer garanties nodig zijn voor nieuwe kapitaalintensieve projecten, hoewel sommige definitieve investeringsbeslissingen (FID's) nu worden genomen zonder de ondersteuning van langetermijn contracten. Hoewel er in 2019 een versnelling van deze trend was, zijn langetermijncontracten over het geheel genomen afgezwakt.

Transformaties in de gashandelsmechanismen tussen de EU en Rusland ontvouwen zich niet alleen door veranderingen in langetermijncontracten. Een ander aspect van deze transformaties is Gazprom's meer zichtbare aanwezigheid op spotmarkten (Sharples en Henderson, 2019). De betrokkenheid van Gazprom bij spothandel is toegenomen op een manier die nog steeds niet precies kan worden gekwantificeerd. De oprichting van het Electronic Supply Platform (ESP) in 2018 en het feit dat de afname op basis van langlopende contracten nu bijna de maximaal gecontracteerde hoeveelheden heeft bereikt, wijzen erop dat Gazprom zijn deelname aan spothandel verder wil vergroten om grotere hoeveelheden gas aan de EU te verkopen. De reden voor de betrokkenheid van Gazprom bij de spothandel in de EU is veelzijdig. Gazprom heeft niet alleen de hubs gebruikt voor balanceringsdoeleinden, maar ook zijn aanwezigheid opgevoerd om ervaring op te doen in een vorm van handel die naar verwachting nog belangrijker zal worden. Gazprom zou er ook belang bij kunnen hebben om onder bepaalde omstandigheden de EU-hubprijzen te beïnvloeden (Mitrova en Boersma, 2018). Terwijl Gazprom in de huidige marktfase meestal een prijsnemer is, zou zijn vermogen om de hubprijzen te beïnvloeden in de toekomst kunnen verbeteren bij een langdurige periode van marktschaarste. Als grote gasleverancier zou Gazprom ook met onzekerheid kunnen spelen als het het huidige bedrijfsmodel verder aanpast (Boussena en Locatelli, 2017). Op dit moment biedt de prevalentie van langetermijncontractdekking garanties en prijsontdekking waardoor een prijsstrategie op basis van onzekerheid moeilijk te implementeren is.

In de huidige marktfase is de ideale gasprijs voor Gazprom in de EU het maximaal haalbare zonder een aanzienlijk verlies van marktaandeel aan LNG. Dit optimale niveau wordt duidelijk beïnvloed door een aantal factoren, waaronder factoren die exogeen zijn voor de handel tussen de EU en Rusland zoals de wereldwijde vraag naar LNG en het contracteergedrag in opkomende markten. Gazprom heeft zich tot nu toe niet gewaagd aan een volwaardige prijzenoorlog en heeft er geen belang bij om dit te doen bij gevaar voor een neerwaartse spiraal in de prijzen en een risico op vervanging. Gazprom houdt rekening met de bovengenoemde optimale contractprijs bij het dynamisch aanpassen van contractprijzen aan de hubprijzen, zoals beschreven in het gedeelte over heronderhandelingen en arbitrages. Een andere belangrijke bevinding is dat de EU zich weliswaar heeft gericht op het stimuleren van de gas-tot-gas concurrentie en de ontwikkeling van goed functionerende hubs om van de olie-indexering af te komen en lagere invoerprijzen te betalen, maar dat de hubprijzen vaak nog (indirect) worden beïnvloed door de olieprijzen – afhankelijk van de marktfase (Hoofdstuk 6).

Naast een beschrijving van de transformaties die de gashandelsmechanismen tussen de EU en Rusland in het afgelopen decennium hebben ondergaan, is ook de politiek-economische impact ervan beoordeeld (Hoofdstuk 7). Daartoe is een waarneming uitgevoerd van de ontwikkeling van de gasprijsniveaus in de EU gedurende de periode waarin de transformaties in de handelsmechanismen zich hebben voltrokken. De analyse heeft bevestigd dat transformaties in de gashandel tussen de EU en Rusland de invloed van de olieprijzen niet volledig hebben geëlimineerd. Verder is aangetoond dat dergelijke transformaties de EU niet de prijspariteit met de Henry Hub hebben opgeleverd waar sommige voorstanders van liberalisering naar hadden gestreefd en dat de afgelopen tien jaar perioden van hoge gasprijzen niet zijn afgewend. Uit de analyse bleek dat er prijsschommelingen waren. De eerste keer dat de gasprijzen in de beoordelingsperiode aanzienlijk daalden, waardoor gas werd geholpen in de concurrentie met steenkool, was toen (alle) grondstoffenprijzen in 2014 daalden. Deze analyse vertoont echter aanzienlijke beperkingen, met name omdat het prijseffect niet kon worden geïsoleerd. Daarom is een meer kwantitatieve analyse uitgevoerd. Zelfs met een kwantitatieve analyse is het onmogelijk gebleken om de exacte impact van de invoering van hub-indexatie op de prijsniveaus vast te stellen.

Uit de kwantitatieve analyse bleek dat de invoering van hub-indexering heeft geleid tot besparingen voor de EU en dat een orde van grootte van dergelijke besparingen kan worden aangegeven (tussen 2009 en 2018 gemiddeld tussen de 3,03 en 6,87 miljard euro per jaar). De berekening berust op verschillende aannames en benaderingen, mede ingegeven door het ontbreken van precieze cijfers over de prijsindexering van de werkelijke verkoop – dit is een element dat onder het bedrijfsgeheim valt. Om deze bevindingen in politiek-economische termen te vertalen, hebben we de energie-importrekening van de EU tussen 2010 en 2018 berekend. We constateren dat Russisch gas en gas in het algemeen verreweg niet de belangrijkste component is van de EU-energie-importrekening. De Russische gasinvoer was tussen 2012 en 2018 gemiddeld goed voor 7,4% van de energie-invoerwaarde van de EU (en de totale invoer van gas was goed voor 18,3%). De nadruk van het buitenlands energiebeleid van de EU op Russisch gas is dus niet gerechtvaardigd om politiek-economische redenen. Schommelingen in de olieprijzen hebben een grote invloed op de energie-importrekening en de totale handelsbalans van de EU, waardoor andere ontwikkelingen op de grondstoffenmarkt worden overschaduwd, met inbegrip van de effecten van de overgang naar hubprijzen in langlopende gasinvoercontracten. De besparingen die dankzij heronderhandelingen over gascontract worden gerealiseerd, zijn zeker niet irrelevant en kunnen worden beschouwd als een positieve ontwikkeling voor de EU. Zij hebben echter geen grote gevolgen gehad voor de totale energie-invoerrekening van de EU (die tussen 2012 en 2018 tussen 254 en 533 miljard euro per jaar bedroeg), laat staan de totale handelsbalans van de EU.

Naast onmiddellijke besparingen kunnen transformaties in gashandelsmechanismen tussen de EU en Rusland ook negatieve gevolgen hebben voor de EU, zowel wat betreft betaalbaarheid als leveringszekerheid. De manier waarop de gasbetrekkingen tussen de EU en Rusland zich in de afgelopen tien jaar hebben ontwikkeld, is verre van de oorspronkelijke notie van het samen plannen van een sector die de oorspronkelijke gas-for-pipes-deals inspireerde. In de afgelopen tien jaar zijn conflicten, confrontaties en het wederzijds wantrouwen toegenomen als gevolg van de steeds uiteenlopendere opvattingen over de organisatie van de gashandel. Arbitrages hebben zich verspreid. Dit zijn tijdrovende, dure processen, die de balansen kunnen destabiliseren en contraproductief zijn voor investeringsplanning. Naast een teken van conflict, kunnen arbitrages ook tot verdere onzekerheid in de gassector leiden. Gazprom en zijn handelstegenhangers in de EU zijn steeds meer op hun hoede voor elkaars bewegingen en onzekerder geworden over de toekomstperspectieven van de wederzijdse handel. In tegenstelling tot besparingen op de invoerrekening is de langetermijnschade aan de gashandel tussen de EU en Rusland onmogelijk te vertalen in kwantitatieve variabelen. De gevolgen van de verslechtering van de handelsrelatie zullen door de EU scherper worden gevoeld wanneer de huidige kopersmarkt plaatsmaakt voor een verkopersmarkt, wat mogelijk risico's oplevert voor de leveringszekerheidvan de EU.

Een gerelateerd onderwerp is de mogelijke langetermijnimpact van transformaties in de gashandelsmechanismen tussen de EU en Rusland op investeringen. Zoals in Hoofdstuk 6 is geconcludeerd, bestaan langetermijncontracten voor de invoer van gas nog steeds. Dit zou kunnen verklaren waarom er geen duidelijke aanwijzingen zijn voor afnemende gasinvesteringen in Rusland. De langlopende contracten zijn echter verzwakt door de in dit proefschrift beschreven transformaties en het is mogelijk dat verdere aanpassingen zullen plaatsvinden, vooral nu Gazprom steeds meer handelt op de spotmarkt. Het risico bestaat dat de huidige architectuur de ondertekening van langetermijncontracten ontmoedigt, met het risico dat dit in de toekomst tot onderinvestering zal leiden. Een van de centrale lessen van TCE is dat langlopende contracten een belangrijk instrument zijn om onzekerheid het hoofd te bieden. Hoofdstuk 8 laat zien dat de onzekerheid toeneemt, vooral als het gaat om het voorspellen van de toekomstige gasinvoerbehoeften van de EU. Er zijn twee onzekerheden nader onderzocht: de klimaatambities van de EU (en de grote uitdagingen waarmee zij wordt geconfronteerd) en de toenemende blootstelling van de EU aan de wereldwijde gasdynamiek, met name aan de vraag naar gas en het contracterende gedrag in niet-OESO-Azië.

Het toenemende belang van niet-OESO-Azië als off-taker op de mondiale LNG-markten maakt de EU tot een markt van 'last resort'. Hoewel dit gunstig is voor de EU in tijden van overaanbod, kan ondercontractering op langere termijn uitdagingen op het gebied van leveringszekerheid opleveren. Er bestaat grote onzekerheid over de omvang van de importkloof in Azië buiten de OESO die moet worden opgevuld met flexibel LNG. De omvang van de importkloof van niet-OESO Azië zal beslissend zijn om te bepalen hoeveel flexibel LNG uiteindelijk naar de EU zal stromen. Alleen vertrouwen op flexibel LNG, met name in een krappe markt, kan aanzienlijke risico's op het gebied van leveringszekerheid met zich meebrengen. De aanwezigheid van snelgroeiende vraagcentra in niet-OESO-Azië is positief voor de EU omdat zij steun verleent aan nieuwe investeringen in LNG die, als de EU de enige potentiële afnemer zou zijn, waarschijnlijk nooit zouden plaatsvinden. Aziatische afnemers van buiten de OESO zouden echter kunnen besluiten om in de toekomst grote volumes in langlopende contracten vast te leggen, wat de ambitie van de EU om voor haar leveringszekerheid op vrij stromend LNG te vertrouwen in gevaar kan brengen. Door haar toekomstige energie-invoerbehoeften te onderbouwen en de ondertekening van nieuwe langetermijncontracten te ontmoedigen, volgt de EU een riskante strategie voor leveringszekerheid (of volgt zij helemaal geen strategie).

Ten slotte is de impact van recente transformaties in de gashandelsmechanismen tussen de EU en Rusland op Gazprom geanalyseerd (Hoofdstuk 9). Lage EU-prijzen hebben ongetwijfeld de inkomsten van Gazprom geschaad. Het is duidelijk dat de ideale situatie voor Gazprom een combinatie van grote verkoopvolumes en hoge prijzen zou zijn. Dit kan zich voordoen wanneer de gas-to-gas concurrentie beperkt is en/of de vraag naar invoer zeer hoog is. In de praktijk is Gazprom de afgelopen tien jaar geconfronteerd met een compromis tussen volumes en prijzen. Haar strategie is geleidelijk verschoven van waarde naar volumebescherming. De in dit proefschrift beschreven transformaties hebben plaatsgevonden in een moeilijke fase voor Gazprom welke gekenmerkt wordt door toegenomen binnenlandse concurrentie van onafhankelijke gasproducenten, lagere verkopen aan landen van de voormalige Sovjet-Unie en een stijging van belastingniveaus opgelegd door de Russische regering. Gazprom is in de observatieperiode nog afhankelijker geworden van inkomsten uit de verkoop aan het zogenaamde 'Far Abroad'. Dit gaat in de tegenovergestelde richting van reeds lang bestaande Russische regeringsvoorstellen om de winstgevendheid van de binnenlandse markt te verhogen, de bronnen van gasinkomsten te diversifiëren en de afhankelijkheid van de gasmarkt in de EU te verminderen.

Gazprom heeft nog steeds een relatief gezonde balans en een laag schuldenlastniveau. De marktwaardering is echter laag in verhouding tot het gemiddelde van de bedrijfstak en sommige financiële indicatoren zijn verslechterd. Als gevolg daarvan is Gazprom onder verscherpt toezicht komen te staan in Rusland, waar veel concurrerende spelers graag zouden zien dat het exportmonopolie wordt opgeheven. Gazprom wordt beschuldigd van het nastreven van 'waardevernietigende' projecten om aannemers te verrijken (Fak en Kotelnikova, 2018). De Russische regering heeft haar inspanningen om extra opbrengsten uit Gazprom te genereren geïntensiveerd door middel van exportrechten en voornamelijk royalty's (Yermakov en Kirova, 2017). Tegelijkertijd is Gazprom begonnen met zeer kapitaalintensieve pijpleidingprojecten zoals Nord Stream 2, Turk Stream en Power of Siberia. Hoewel er – naast geopolitieke – ook commerciële beweegredenen achter deze projecten zitten, is er grote onzekerheid over het toekomstige gebruik van deze pijpleidingen. De kwesties hier opgesomd benadrukken de zorgen over de lange termijn financiele duurzaamheid van het bedrijf. Zolang algemeen werd aangenomen dat Gazprom haar leveranties naar de EU met een "druk op de knop" zou kunnen verhogen, was de vermeende urgentie voor investeringen in nieuwe productiecapaciteit voor Gazprom laag. Deze perceptie is veranderd sinds 2018, toen uit een rapport bleek dat de Russische reserveproductiecapaciteit was afgenomen (Yermakov, 2018). De productiedaling in volwassen velden zet door en de productie van Gazprom verschuift verder naar het noorden van het land en er moet op steeds grotere diepten worden geboord.

Het tweede deel van Hoofdstuk 9 reflecteert vanuit Russische politiek-economische belangen de gasverkoopopbrengsten van Gazprom in de EU. De combinatie van de economische groei van Rusland in de jaren 2000 en een heropleving van geopolitieke verschillen versterkten de retoriek dat olie en gas een steeds vijandiger Rusland ten opzichte van het Westen opleverde. Hierbij zij opgemerkt dat, vanuit een geo-economisch perspectief, het meestal olie was die Rusland met betrekking tot het Westen in de jaren '00 versterkte. Het feit dat transformaties in de gashandel tussen de EU en Rusland tussen 2009 en 2018 de verkoopinkomsten van Gazprom in de EU hebben verminderd, was geen belangrijke ontwikkeling genoeg om het toegenomen verzet van Rusland tegen het Westen te herstellen. Vanuit macro-economisch en fiscaal oogpunt zijn de inkomsten van Gazprom in de EU zeker niet te verwaarlozen. Geschat wordt dat de waarde van de gasexport van Gazprom naar de EU in 2018 slechts 8% van de totale exportwaarde van Rusland bedroeg. De netto-omzet van Gazprom in het ‘Far Abroad’ bedroeg in 2018 2,8% van het nominale bbp van Rusland. In de geanalyseerde periode (2008-2018) schommelden zij tussen 2,2% en 3,1% van het nominale BBP. De Russische regering beschouwt gas als een belangrijke bron van inkomsten en zij beoordeelt ook het management van Gazprom op basis van haar vermogen om inkomsten te genereren voor de staatskas. Belastingen op gasproductie en -export genereerden in 2018 7,5% van de federale begrotingsinkomsten. Met een aandeel van 68% in de Russische gasproductie, een monopolie op de export van pijpleidingen (die 90% van de totale Russische gasexport vertegenwoordigen) en een aandeel van ongeveer 60% van de Russische LNG-export in 2018, blijft Gazprom veruit de grootste upstream-speler en exporteur van Russisch gas en levert daarmee het grootste deel van de inkomsten uit gasbelasting aan de federale begroting.

Ten slotte zijn de vooruitzichten voor de liberalisering van de gasmarkt in Rusland bestudeerd. Het idee dat de liberalisering van de gasmarkten in de EU en aspecten van de gashandel tussen de EU en Rusland tot de Russische liberalisering van de gasmarkt zou leiden, verwaarloost de aanwezigheid van logica van geschiktheid, institutionele complementariteit en pad-afhankelijkheid. Door de notie van "logica van geschiktheid" (Maart en Olsen, 2009) voor te stellen, wordt aangevoerd dat instellingen alleen effectief zijn wanneer er voldoende mate van acceptatie van normen is – met andere woorden, wanneer normen door agenten worden "geïnternaliseerd". Rusland had geen tijd om neoliberale normen te internaliseren die nog steeds als opgelegd vanuit het Westen worden ervaren. Hoofdstuk 9 onthult enkele van de complexiteiten van de hervorming van de Russische gasmarkt. Gezien de ingewikkelde *quid pro quo* die plaatsvindt tussen de Russische regering, Gazprom, en onafhankelijke gasproducenten, is het moeilijk om bepaalde aspecten van de gasmarktorganisatie grondig te transformeren, terwijl andere gebieden niet hervormd blijven. Dit resoneert in het begrip "institutionele complementariteit" dat in Hoofdstuk 3 is geïntroduceerd. Met name Aoki (2001) onthulde het bestaan van dynamiek van onderlinge afhankelijkheid waarbij instellingen de neiging hebben om samen te hangen in systemen waardoor het moeilijk is om één instelling te veranderen zonder tegelijkertijd de andere instelling te veranderen. Sommige institutionele kenmerken van Rusland beperken de speelruimte van de voorgestelde hervormingen. Door een kader van "institutionele complementariteit" toe te passen hebben we het argument van Locatelli (2013) onderschreven dat Russische gashervormingen die de ontvlechting nabootsen en een volledige uiteenvallen van verticale integratie zoals die in de EU wordt toegepast, nooit geloofwaardig zijn geweest vanwege hun onverenigbaarheid met het institutionele klimaat van Rusland.

Het aandringen op de opheffing van Gazprom's pijpleiding export monopolie ontkent dat daarvoor aanvullende maatregelen nodig zou zijn. Dit is te wijten aan een complexe verstrengeling van uitkeringen en plichten in Rusland waarbij Gazprom belangrijke sociaal-economische functies moet vervullen. Gazprom heeft een omslachtige erfenis van verbintenissen, jegens EU-importeurs, de Russische staat en uiteindelijk de Russische bevolking. Deze verbintenissen beperken de speelruimte. Zoals Argyres en Libeskind (1998) hebben betoogd, kunnen de kenmerken van geïsoleerde transacties onvoldoende zijn om de grenzen van een onderneming te verklaren. Het beheer van bestaande transacties, maar ook van nieuwe transacties waarin ondernemingen zich willen begeven, wordt sterk beïnvloed door het beheer van andere transacties waarin de onderneming reeds actief is. Dit wordt "governance inseperability of transactions" genoemd. De conclusie is dat er beperkte vooruitzichten zijn voor een overkoepelende liberalisering van de Russische gassector.

This book investigates the political-economic implications of changes in EU-Russia gas trade mechanisms resorting to qualitative and quantitative tools and combining Transaction Cost Economics (TCE), New Institutional Economics (NIE), and International Political Economy (IPE). Transformations in EU-Russia gas trade mechanisms have benefitted the EU and Gazprom's revenues have been dented. However, the negative impact on Russian economy and federal budget has been limited. The last word is not said: should certain circumstances arise in future, these transformations might turn out to be detrimental for the affordability and security of gas supplies to the EU.

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