

ANNUAL REPORT 2020



May 2021

CIEP is an independent forum for governments, non-governmental organizations, the private sector, media, politicians and all other parties interested in changes and developments in the energy sector and energy related climate change issues.

CIEP organizes lectures, seminars, conferences and roundtable discussions. In addition, CIEP staff members lecture in a variety of courses and training programs. CIEP also contributes to international and European debates on energy by actively participating in numerous international conferences and expert workshops – where research findings are disseminated and inputs for further research are gathered. CIEP's research, training and activities focus on economic and geopolitical dimensions of international energy and energy transition. CIEP is a partner of the Netherlands Institute of International Relations 'Clingendael'.

In 2021 CIEP is endorsed by The Netherlands Ministry of Economic Affairs and Climate Policy, Air Liquide Industrie B.V., BP Europe SE-BP Belgium/ BP Europe SE-BP Nederland, Coöperatieve Centrale Raiffeisen-Boerenleenbank B.A. ('Rabobank'), ENGIE Energie Nederland N.V., Neptune Energy Netherlands B.V., Eneco Holding N.V., EBN B.V., Esso Nederland B.V., Equinor ASA, GasTerra B.V., N.V. Nederlandse Gasunie, ING Wholesale Banking N.V., Nederlandse Aardolie Maatschappij B.V., Vattenfall NL, TenneT TSO B.V., One-Dyas B.V., Havenbedrijf Rotterdam N.V., RWE Generation NL B.V., Shell Nederland B.V., Uniper Benelux N.V., Koninklijke Vopak N.V., Wintershall Dea Nederland B.V.

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Address	: Clingendael 12, 2597 VH, The Hague, The Netherlands P.O. Box 93080, 2509 AB, The Hague, The Netherlands
Telephone	: +31 70 374 6700
E-mail	: ciep@clingendaelenergy.com

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A ROLLERCOASTER YEAR

The year was over before it had really begun. That is how many people may describe 2020, alluding to the end of normalcy early in January 2020 and the beginning of a disastrous year where many people lost their life and livelihoods due to the Covid-19 pandemic.

2020 was a year in which the wisdom of long supply lines was challenged by the interruptions as a result of the lockdown in China late January 2020. In addition, the wisdom of concentrated production of resources and manufacturing was also challenged. Shortages in medical supplies reminded everyone familiar with energy markets, what the impact of strategic import disruptions can be on society, while at the same time energy people must have been surprised that the energy lessons had not been applied in other critical public services. The geopolitical and geo-economic impact of the pandemic was feeding on the growing unease about China's position as the factory of the world, also in resources and equipment relevant to the energy transition. Prior to the pandemic the EU had already flagged its interest in strategic industries, while in the US the America first policy of the Trump Presidency was supported by both sides of the House.

No country was left untouched by the pandemic, either in that first wave of infections or in the subsequent waves. The limits of the health systems determined largely the level of human interactions and level of mobility, impacting demand for transportation fuels. Many countries went into lockdowns. Airline traffic came to a near standstill when countries decided to impose travel restrictions. Crews of oceangoing vessels were no longer allowed to come on shore and became virtual prisoners, unable to fly home after their contracts were up. Difficulties with repatriation of travellers left people stranded, away from family and homes, while expats all over the world found themselves cut off from their home countries. Countries that economically rely on tourism were badly impacted. Although the summer of 2020 saw some restrictions lifted in the Northern hemisphere, infection rates in warmer (parts of) countries increased and restricted public life. The array of restrictive measures in various countries around the world impacted both economic activity and energy demand.

The lockdown in China and other Asian countries were followed by lockdowns in Europe, the United States, Latin America and Africa, the United States and Europe again and resulted in disrupted supply chains, containers piling up in the wrong harbours and so forth. Nevertheless, apart from shortages in medical supplies, other shortages remained remarkably absent in this first year of the pandemic, although some value chains were stressed and take a while to recover.

Apart from the geopolitical and geo-economic impact of the pandemic, energy markets were affected in many ways. The drop in demand created a very large supply overhang in oil markets and to a lesser extent in gas markets, where demand was already weak due to a warm winter. The impact on the oil value chain was especially interesting. In transportation fuels the large drop in demand for kerosene was unmatched by the drop in demand for other fuels, although they also declined, creating asymmetric demand for oil products produced in refineries. At the same time, demand for certain petrochemical products, for instance plastics for medical protective supplies, was increasing, adding further to the imbalance in demand for refinery output. Although storage can help manage these demand and supply imbalances, and some blending away of products into other products also helps, the refinery mix has been unbalanced for more than a year. These imbalances in the value chain were also reflected in the price developments, from very low to relatively high for other products.

The drop in energy demand required energy producers to cut back in supply. Particularly, OPEC was forced to take dramatic measures together with other oil producing countries (OPEC plus) to support the oil prices to recover. This policy persisted in the rest of the year. Shale production also declined substantially as a result of the very low oil prices in the spring and summer of 2020.

International gas markets were also affected, although the drop in demand was less severe than in oil. LNG had difficulty finding a market in May and June, but due to cold snaps at the end of the year recovered quickly. Upstream companies in oil and gas, small and large, have struggled enormously and many companies are in the process of reducing productions costs, while at the same time shifting their focus on lower carbon portfolios.

The pressure on International Oil Companies to commit to low carbon fuel and feedstock strategies did not abate during 2020. The strategy to deliver these reductions include a portfolio of low-cost oil and gas providing the income to finance the shift into lower carbon energy carriers. The pressure on the energy sector to deliver GHG emission reductions will continue with more countries pledging net zero emissions in 2050.

The flurry of countries publishing hydrogen strategies shows that the year in lockdown was not wasted by governments to shore up their climate policies. They and other stakeholders intend to use the crisis to structurally change their energy economies and include low-carbon energy and feedstocks. Using monies from the Covid-19 Recovery funds is tied to both economic reforms and the Green Deal. New instruments are developed to cover the gap between the price of traditional fuels and technologies and those of low carbon technologies and energy carriers. The carbon contract for difference is such an instrument. In July 2020, gas TSO's published a plan for converting gas transportation infrastructure into hydrogen infrastructure, offering a peek into a future hydrogen market.

At CIEP we worked hard in 2020 on updating the geopolitical scenarios with the new developments. At the same time, we worked at the behest of the Ministry of Economic Affairs and Climate on Hydrogen in Northwest Europe (a joint project of CIEP and IEA). We also worked on how a potential European market for clean electricity and hydrogen could interact. Furthermore, we finalised work on a large study into refining and petrochemicals and routes towards decarbonisation and how far these routes strengthen or weaken existing industrial clusters. Based on this work on industrial decarbonisation, we engaged in a pre-study for Smartport, which will be finalised in 2021.

In 2021, the twentieth anniversary of CIEP, the broad energy and resource transition will be at the forefront of our research and other activities and the impact, both short and longer term, developments have on the international oil and gas markets.

BOARD OF THE FOUNDATION: STICHTING FONDS INSTITUUT CLINGENDAEL (SFIC) IN 2020



Drs. Gertjan Lankhorst, chair



Jeroen van Hoof, RA, treasurer



Mrs. Mr. Ida van Veldhuizen, member



Ir. Joost van Roost, member



Mr. Willem Russell, member



Drs. Dick Scherjon, member (from 1-12-2019)

The Clingendael International Energy Programme (CIEP) is the only project of Stichting Fonds Instituut Clingendael (SFIC) since 1 September 2001. Each CIEP project period lasts four years. 2020 was the last year of the fifth project period (2017-2020) and the sixth, project period will commence on 1 January 2021 until 31-12-2024.

In its meetings in May and November the Board discussed the impact of Covid-19 on CIEP and the chairman was in regular contact with the director on how members of staff were coping.

CIEP SUPPORTING INSTITUTIONS

In 2020, the following institutions supported CIEP:

BP Europe SE- BP Nederland
Coöperatieve Centrale Raiffeisen-Boerenleenbank B.A. ('Rabobank')
Dutch Ministry of Economic Affairs and Climate Change
Dutch Ministry of Foreign Affairs
EBN B.V.
Eneco Holding N.V.
ENGIE Energie Nederland N.V.
Esso Nederland B.V.
Havenbedrijf Rotterdam N.V.
Heerema Marine Contractors Nederland SE
GasTerra B.V.
Neptune Energy Netherlands B.V.
ING Bank N.V.
Koninklijke Vopak N.V.
Nederlandse Aardolie Maatschappij B.V.
N.V. Nederlandse Gasunie
Vattenfall NL
ONE-Dyas B.V.

RWE Generation NL B.V.
 Shell Nederland B.V.
 Equinor ASA
 TenneT TSO B.V.
 Total E&P Nederland B.V.
 Uniper Benelux N.V.
 Wintershall Dea Nederland B.V.

These institutions are a cross-section of energy sector stakeholders in the Netherlands and beyond. The companies are major international players in their field of expertise. The institutions contribute to CIEP's knowledge base and *vice versa*, especially within the CIEP Advisory Board and the Contact Group. Furthermore, staff members from the institutions participated actively in CIEP brainstorm groups and roundtables.

STAFF

In 2020, the CIEP staff comprised the following employees:

	Coby van der Linde, director, 1.0 fte
	Pier Stapersma, senior researcher, 1.0 fte
	Luca Franza, researcher, 1,0 fte (0,1 fte from 15 March onwards, Associate Fellow)
	Jabbe van Leeuwen, researcher, 1.0 fte
	Kyle Ferriggi, researcher, 1.0 fte
	Jasper Meijering, 1,0 fte
	David Milne, 1,0 fte (from 1-2-2020)
	Wendy Auf dem Brinke, office manager, 0.8 fte
	Marco Blankenstijn, financial administration, 0.2 fte equi.

Other functions held by CIEP director in 2020:

Member of the Wise Person group of the IGU (since 2004).
 Member of the Supervisory Board of Wintershall Dea Nederland B.V. (WDNL) and Wintershall Noordzee B.V (WINL) until 30 June 2020.
 Member of the Supervisory Board of Koole Terminals B.V. (from 1-7-2020 onwards).
 Professor Energy and Geopolitics, Faculty of Arts, University of Groningen (0,1 fte)
 Member of the international advisory board of KAPSARC (King Abdullah Petroleum Study and Research Center), Saudi Arabia.

Member of “begeleidingscommissie speelveldtoets” for EZK.
Member of committee preparing an advisory report on hydrogen, RLI.

Floor van Dam was an intern at CIEP from 1 April 2020 until 1 February 2021 and wrote her master thesis for the TuD and contributed to the activities of CIEP.

In addition to the research staff, senior and associate fellows contributed to CIEP’s work and network:



NETWORK

Many of our activities and studies are conducted in cooperation with partner organizations in the Netherlands and abroad. Over time a wide network of researchers has developed. The intensity of contact depends on the project at hand, but in general many of the contacts continue in other projects. We are also regularly approached to participate in consortia of researchers in which CIEP decides to participate on a case-by-case basis depending on the relevance of the project for the public agenda of that period. The network of energy researchers is global, and each year new partners join the network. Some relations with research and activity partners have become very close and a variety of interactions take place every year, from keeping in touch on current issues to organizing conferences and conducting joint studies. In 2020, because of the pandemic, webinars were organised with partner organizations such as IAI, IEA, and Kapsarc.

INTERNAL ORGANIZATION

CIEP administers the allocation of staff and budgets to the different activities, research projects and other pursuits. CIEP uses time registration, which facilitates prioritizing time and assets. In 2020 only a few events were organized due to the corona pandemic and measures to reduce transmissions of the virus. Instead, more research projects were taken up.

CIEP PUBLICATIONS

The following overview highlights 2020 publications, most of which are available on CIEP's website (www.clingendaelenergy.com/publications). CIEP (associated) staff also published articles elsewhere, which are typically listed under the tab "other work" (www.clingendaelenergy.com/otherwork) when we are permitted to post the contribution. In 2020 CIEP published 1 joint paper with KAPSARC and a contribution to a work on Energy Security in the Mediterranean Countries.

BOOKS

Luca Franza, *The Political-Economic Dimension of Transformations in EU-Russia Gas Trade Mechanisms*, PhD, October 2020.

PAPERS

- Kyle Ferriggi, *Security of Oil Supply in China*, CIEP briefing paper, March 2020.
- Pier Stapersma, *The Complexity of Mapping Fossil Fuel Subsidies*, CIEP Paper, September 2020.
- Pier Stapersma, *Market Coordination of Dynamic Energy Flows: The Future Interplay of Solar & Wind Electricity and Hydrogen Infrastructures*, CIEP Briefing Paper, December 2020.

OTHER WORK

The Path Toward a Hydrogen Economy: How Industry can broaden the use of Hydrogen, October 2020, KAPSARC/CIEP webinar report (<https://www.kapsarc.org/research/publications/the-path-toward-a-hydrogen-economy-how-industry-can-broaden-the-use-of-hydrogen/>)

European Energy Security and the Resilience of Southern Mediterranean Countries, Luca Franza, Coby van der Linde and Pier Stapersma, in *"Projecting Resilience Across the Mediterranean"*, Eugenio Cusumano and Stefan Hofmaier (eds.), Palgrave Macmillan, 2020

COLUMNS

The 2020 columns of Coby van der Linde, Pieter Boot, Aad Correljé and Martien Visser appeared on the Energieforum website and the CIEP website (clingendaelenergy.com/columns). Additionally, Coby van der Linde contributes monthly to the expert section on energy in the Financial Dagblad (FD). These can also be found on the clingendaelenergy.com/columns webpage.

EVENTS/ACTIVITIES

CIEP organized 4 (online) events in 2020 due to the Covid-19 restrictions. Immediately after the lock down, an abundance of online presentations and webinars was offered by many organizations. Although people have quickly grown used to asking questions in Q+A boxes and chat functions, it is not the same as an in-depth discussion in a roundtable or workshop. Moreover, many organizations that were normally behind paywalls offered their content for free during the first lockdown, resulting in a broad offering in public information between March-October 2020. Only when online event paywalls appeared did we begin to organize online public events.

See the list of [online events](#) below, which is also available on clingendaelenergy.com/events; select 2020:

- | | |
|-------------------|--|
| 3 July 2020 | Online Workshop: Hydrogen around the North Sea, in collaboration with EZK/ IEA/IPHE/CEM, meeting of policymakers on hydrogen of Germany, Denmark, Norway, Belgium, Netherlands and UK. |
| 8 and 9 July 2020 | Webinar: The path towards a hydrogen economy; how industry can broaden the use of hydrogen, organized together with KAPSARC |

- | | |
|-----------------|---|
| 19 October 2020 | Open virtual event: In cooperation with the Istituto Affari Internazionali (IAI) and the International Energy Agency (IEA) on <i>'Global Gas: Back to Normal in Sight?'</i> |
| 28 October 2020 | Open virtual event: BP Energy Outlook 2020 presented by William Zimmern, Head of Global Macroeconomics, followed by a response from Prof. dr. Gert Jan Kramer, University of Utrecht and Chair of the Sustainable Industry Lab. |

TRAINING

Due to corona the in situ training days of CIEP (May and November) were cancelled in 2020.

Luca Franza and Coby van der Linde taught the course 'International and European Gas Markets' in the Energy Master Programme of SciencesPo in Paris in January-March 2020.

Coby van der Linde also taught a half-course on energy security at Groningen University in February-March 2020.

CIEP staff also contributed to training programs directed to government officials, diplomats, personnel of international organizations and energy professionals, organized among others by the Clingendael Institute, Energy Academy and the Energy Delta Institute (EDI), and Utrecht University.

All meetings, including teaching at the universities, were online from mid-March onwards.



CIEP MEETINGS

Board Stichting Fonds Instituut Clingendael

26 May 2020 (online)

16 November 2020 (online)

Advisory board

28 October 2020 (online)

Contact group

9 June 2020 (online)

20 October 2020 (online)

WORKING IN AN ONLINE ENVIRONMENT

CIEP had migrated to Microsoft Office in December 2019. This included the Teams function, which initially we did not really know how to appreciate. From mid-March 2020 onwards, when began work at home, we have intensely used Teams for the research projects and to perform all our administrative duties.

Bilaterals and staff meetings were from then on via Teams. From 1 June until late September, staff worked part-time, according to a strict rotation schedule and protocol (with measures to distance, protective screens around desks, disinfection instructions and ventilation) in the office. Meetings among staff were restricted to outside in the garden with proper distancing guaranteed. No visitors outside the team were allowed in the office or garden to minimize risks and keep the bubble as small

as possible. The rotation schedule implied that everyone worked three days at the office and two at home. After vacations or other short trips, staff had to work at least a full work week at home before being able to return to the office. Fortunately, everyone was able to take a break in this period. Taking turns going on vacation from July onwards also reduced the number of people in the office in this period. Everyone was on average in the opportunity to see each other twice a week in the garden.

From late September 2020 onwards, the work at home measures had to be reinstated as a result of government policy. To prepare for the autumn and winter working at home period we purchased keyboards and camera's and allowed screens to be used at home. We also purchased a license to organise larger online events on the Teams platform (BP Outlook and the IEA Gas report presentations). Staff used on average their private computers, wifi and phones. In line with the CAO for government personell, CIEP also paid a working at home compensation for costs of the home office.

LECTURES, SPEECHES, PRESENTATIONS, MEDIA

During 2020, CIEP staff participated in various expert meetings and project meetings. In addition, CIEP staff members gave numerous lectures, speeches, and presentations or chaired sessions during training courses, conferences and seminars. CIEP staff in 2020 also gave various radio, television and written media interviews. In 2020 many conferences were online and free to attend. CIEP staff used this opportunity to attend many international conferences on various geopolitical and energy transition issues.

MEETINGS 2020

January 2020	<p>RLI advice on Hydrogen - Coby van der Linde, member of the committee to prepare the report (January through to December, various (monthly) meetings).</p> <p>Meetings of the advisory committee 'Speelveldtoets' - Coby van der Linde (meeting from January through June 2020)</p> <p>Various Meetings Industry 2050/Sustainable Industry Lab, UU (Jan-Dec) – Coby van der Linde</p> <p>Expert session on large scale hydrogen, Port of Amsterdam</p>
February 2020	Energy Transition Issues, Dutch Central bank – Coby van der Linde
March 2020	<p>Fourth Arena Session Green H2 value chain - Coby van der Linde</p> <p>PBL - SDG7 paper - David Milne</p>
April 2020	Rabobank sustainability video meeting - Coby van der Linde
May 2020	Post-corona scenario's 'Gemeente Rotterdam' - Coby van der Linde
June 2020	<p>Sustainable Industry Lab (formerly The Industry 2050 Project) - Coby van der Linde, Jabbe van Leeuwen</p> <p>HyChain Kernteam - Coby van der Linde, Jabbe van Leeuwen,</p>

Expertsession 'Industrie/Systeem Zuid Holland' - Coby van der Linde, Jabbe van Leeuwen

September 2020	Digital Roundtable Discussion: "Should GCC national oil companies target net zero emissions by 2050?" HyChain NWO Consortium meeting – 'Kernteam & Industrie partners'; Coby van der Linde, Jabbe van Leeuwen
October 2020	HyChain meeting NWO kernteam - Coby van der Linde, Jabbe van Leeuwen PhD Defense RUG - L. Franza Nordic H2 meeting - Coby van der Linde HyWay 27 – 'Klankbordsessie - Coby van der Linde Meeting exploring Smartport research project 'spatial issues in Port of Rotterdam in the energy transition - Coby van der Linde
November 2020	Meeting Ministry of Economic Affairs on Hydrogen around the North Sea - Jabbe van Leeuwen, Coby van der Linde Meeting exploring Smartport research project 'spatial issues in Port of Rotterdam in the energy transition – Jasper Meijering, Pier Stapersma, Coby van der Linde
December 2020	IEA & CIEP H2 around the North Sea - progress discussion; Coby van der Linde, Jabbe van Leeuwen

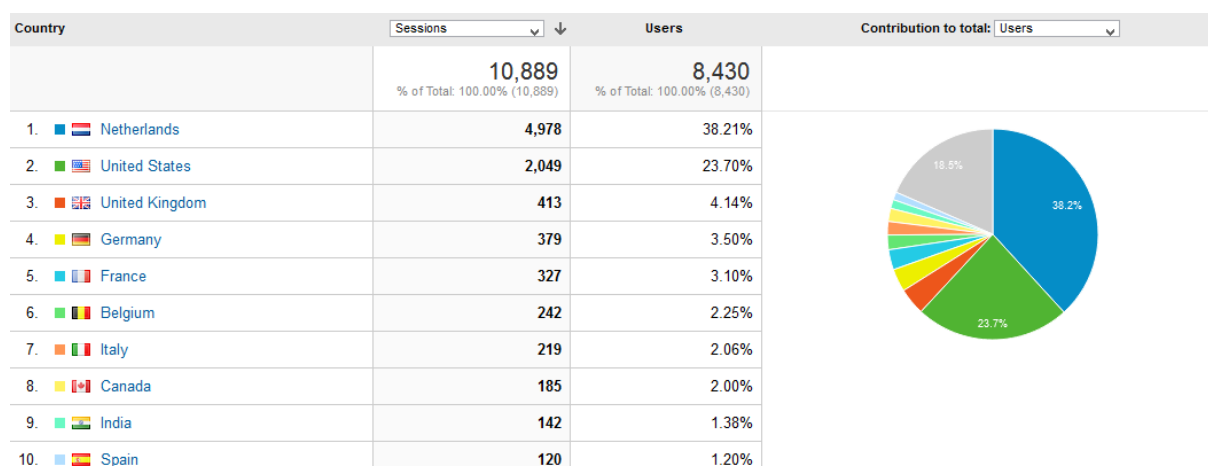
EXTERNAL LECTURES/PRESENTATIONS

In 2020, lectures and presentations were predominantly online. Luca Franza, Pier Stapersma, Kyle Ferriggi taught courses at the Clingendael Academy.
Luca Franza taught in Lausanne (March) and ScPo (Feb-March).
Coby van der Linde taught various masterclasses on hydrogen for EDI, on international energy markets at the University of Utrecht (September), SciencesPo (Jan-Feb), University of Twente (Feb) and Groningen (Feb-March).

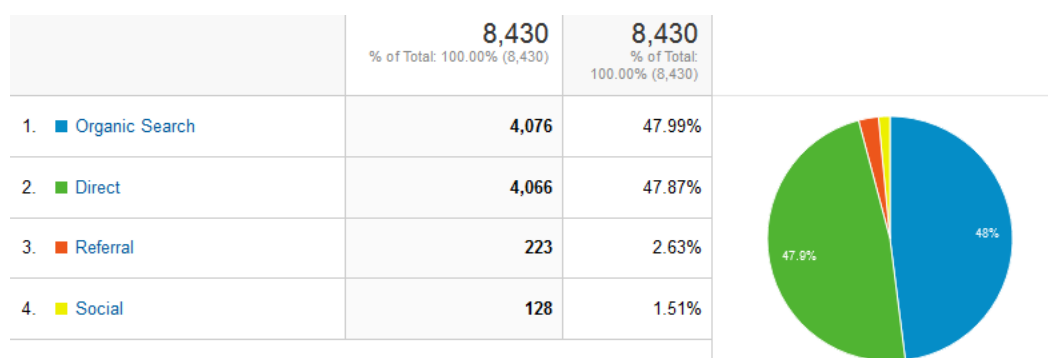
WEBSITE

Everything CIEP published or organised from 2001 onwards, could be found at www.clingendaelenergy.com. Internet is an important communication and information dissemination tool for CIEP.

THIS IS WHERE OUR VISITORS CAME FROM IN 2020:



THIS IS HOW THEY REACHED US IN 2020:



UNIQUE PAGE VISITS TO OUR PUBLICATIONS IN 2020:

Page	Unique Pageviews	Pageviews
	4,711 % of Total: 23.13% (20,368)	5,232 % of Total: 19.99% (26,179)
1. /publications/publication/van-onzichtbare-naar-meer-zichtbare-hand-waterstof-en-elektriciteit-	451	9.90%
2. /publications/publication/security-of-oil-supply-in-china	329	7.49%
3. /publications/publication/the-european-refining-sector-a-diversity-of-markets	322	6.84%
4. /publications/publication/the-potential-contribution-of-gas-to-a-low-carbon-future	307	6.40%
5. /publications/publication/refinery-2050-refining-the-clean-molecule	299	6.27%
6. /publications/publication/outlook-for-eu-gas-demand-and-import-needs-to-2025	230	4.97%
7. /publications/publication/international-approaches-to-clean-molecules-five-cases-on-hydrogen	205	4.19%
8. /publications/publication/europes-energy-relations-between-legacy-and-transformation	185	3.84%
9. /publications/publication/outlook-for-lng-imports-into-the-eu-to-2025	177	3.86%
10. /publications/publication/developments-in-eu-russia-gas-relations	140	3.02%
11. /publications/publication/long-term-gas-import-contracts-in-europe	135	2.83%
12. /publications/publication/outlook-for-russian-pipeline-gas-imports-into-the-eu-to-2025	126	2.96%
13. /publications/publication/market-coordination-of-dynamic-energy-flows	112	2.37%
14. /publications/publication/the-complexity-of-mapping-fossil-fuel-subsidies	109	2.39%
15. /publications/publication/long-term-prospects-for-northwest-european-refining	96	1.99%
16. /publications/publication/from-south-stream-to-turk-stream	86	1.74%
17. /publications/publication/speaking-notes-integrated-energy-system-transition	81	1.68%
18. /publications/publication/looking-under-the-hood-of-the-dutch-energy-system	76	1.51%
19. /publications/publication/the-transition-of-the-residential-heating-system	75	1.70%
20. /publications/publication/the-new-dimensions-of-geopolitics	71	1.43%

UNIQUE PAGE VISITS FOR EVENTS IN 2020:

Page	Unique Pageviews	Pageviews
	539 % of Total: 2.65% (20,368)	612 % of Total: 2.34% (26,179)
1. /events/event/bp-energy-outlook-with-a-focus-on-europe	110	23.53%
2. /events/event/ciep-energy-lecture-mckinseys-2019-global-energy-perspective-reference-case	81	14.38%
3. /events/event/presentation-of-weo-2019	56	9.97%
4. /events/event/ciep-nogepa-gas-day	49	8.82%
5. /events/event/infrastructure-outlook-2050	30	4.90%
6. /events/event/global-gas-back-to-normal-in-sight	28	6.21%
7. /events/event/ciep-nogepa-gas-day-2018	19	3.59%
8. /events/event/-the-role-of-hydrogen-in-low-temperature-heating-the-case-of-nw-england-and-potential-in-the-ne-therlands	15	2.61%
9. /events/event/the-political-and-economic-impact-of-the-shale-revolution	13	2.12%
10. /events/event/hydrogen-around-the-north-sea	12	1.96%
11. /events/event/save-the-date-ciep-nogepa-gas-day	11	1.80%
12. /events/event/bp-statistical-review-of-world-energy	7	1.31%
13. /events/event/the-path-toward-a-hydrogen-economy-how-industry-can-broaden-the-use-of-hydrogen	7	1.80%
14. /events/event/ciep-energy-lecture-by-dolf-gielen-irena-on-hydrogen-from-renewable-power	6	0.98%
15. /events/event/exxonmobil-outlook-for-energy-a-view-to-2040	6	0.98%
16. /events/event/YnAtZW5lcm	6	0.98%
17. /events/event/northwest-europe-in-the-global-gas-market	5	0.82%
18. /events/event/presentatie-over-energie-rapport	5	0.82%
19. /events/event/presentation-of-the-2016-world-energy-outlook	5	0.82%
20. /events/event/save-the-date-ciep-nogepa-gas-day#menu_footer	5	0.82%

UNIQUE PAGE VISITS 'OVERALL' IN 2020:

Page	Pageviews	Pageviews	Contribution to total: Pageviews
	26,179 % of Total: 100.00% (26,179)	26,179 % of Total: 100.00% (26,179)	
1. /	5,804	22.17%	
2. /publications	2,586	9.88%	
3. /about_us/staff	1,618	6.18%	
4. /about_us	1,357	5.18%	
5. /about_us/staff/member/coby-van-der-linde	987	3.77%	
6. /events	772	2.95%	
7. /about_us/vacancies	632	2.41%	
8. /publications/publication/van-onzichtbare-naar-meer-zichtbare-hand-waterstof-en-elektriciteit	518	1.98%	
9. /columns	461	1.76%	
10. /contact	408	1.56%	

PROJECTS

In 2020, we finalised work on a project for the ministry of EZK on fossil fuel subsidies (which was shared by the Minister with Parliament in September 2020) and started work on a joint project with the IEA for the same ministry on Hydrogen in Northwest Europe. We participated in a project of the ISPT on a Carbon Model and worked on a tender with various university and research institution parties on a large hydrogen project (TNO, TuD, KUB). We also had preparatory meetings on a project for Smartport which would run mainly in the first part of 2021.

FINANCES

2020 was the last year of the fifth project period (2017 to the end of 2020). Income was lower and costs were higher compared to 2019. In 2020, we combined a, due to the Covid-19 pandemic smaller, planned expansion of staff with a smaller project portfolio, with the aim to complete the fifth project period public research agenda in 2020 within budget. The Covid-19 pandemic impacted spending on travel from March 2020 onwards, while we invested in a safer workplace. In 2020, the housing and accountant costs increased substantially. In general, the foundation costs increased, while our costs on public activities declined.

Over the entire project period (2017-2020), an amount of €78.452 remained of the public agenda reserve. This amount will remain in the Destination Public Reserves, a facility to balance spending over the various project years. It has been decided that this amount will be transferred to the sixth project period funding of the public agenda.

The overall financial result for 2020 was a loss of €75.237.

	2020	2019
Contribution stakeholders	€ 650.000	€ 677.200
Project income	€ 29.477	€ 147.489
Other income or cost	-€ 1.596	-€ 778
Staff costs	€ 612.735	€ 568.592
Deprecation cost	€ 4.626	€ 5.198
Public activity costs	€ 14.262	€ 28.800
Foundation costs	€ 123.301	€ 106.012
Profit Taxes (Paid or return)	-€ 1.806	€ 7.211
TOTAL RESULT	-€ 75.237	€ 108.098
Liquidity	€ 1.170.933	€ 1.286.925
Foundation Capital (CIEP)		
CIEP reserves	€ 986.728	€ 982.538
Destination Public Reserves	€ 78.452	€ 157.879



ANNEX 1 ABOUT CIEP

INTRODUCTION

In September 2001, the *Clingendael International Energy Programme* (CIEP) was founded under the Foundation Stichting Fonds Instituut Clingendael. Supported by twelve institutions from the public and private sectors, CIEP participates in and seeks to make significant and substantive contributions to the public debates on national and international developments in the energy sector. After the initial period 2001-2004, CIEP continued largely on the same footing as the previous years based on the plan and estimated budget as described in the document *CIEP 2005-2008, Towards a European Forum* and agreed upon by the Board of Stichting Fonds Clingendael and seventeen participating institutions.

The main reasons for initiating CIEP were:

1. The need for a forum to discuss developments in the European energy markets, e.g. the liberalization of the European energy market, which will impact the organization of the market, government energy policies and strategies of companies operating in the energy sector. These changes in the internal European market take place against the backdrop of an expanding European Union, increased dependency on imported fossil fuels and efforts to address environmental concerns;
2. The concerns raised in public debates about security of supply and a growing import dependency, not only for European Union member states but also for other major consumer regions. These concerns will influence the policy options and choices of both consumers and producers. The political and economic developments in, for instance, the United States, Russia, the Middle East, the Caspian Sea region, and Asia, are therefore important in assessing the developments in the European energy situation.

MISSION

Through research, the publication of studies, information releases (particularly through the media and internet) and the organization of courses and training programs, CIEP makes a fundamental contribution to the public debate on international politics and economic developments in the energy sector (oil, gas, renewables and electricity).

OBJECTIVES

- To serve as an independent forum for governments, non-governmental organizations, the business community, politics, the academic world, the media and other stakeholders or interested parties.
- To gather and develop information and knowledge about international political and economic developments in the energy sector on the basis of research, supported by a documentation system.
- To propagate information and knowledge about international political and economic developments in the energy sector by means of seminars, conferences, lectures, courses, publications and information releases via the media.
- To initiate discussions about current events and future developments relevant to the energy sector, energy policy, legislation and the relationship between the government and the private sector.

RESEARCH AND ACTIVITIES

CIEP's research and activities focus on energy markets (oil, gas, renewables and electricity) and policymaking in the European Union and geopolitics of international energy policymaking and markets.

ANNEX 2 - TWENTY YEARS CIEP: POSITIONING FOR THE FUTURE

CHANGING CONTEXT

CIEP officially started on 1 September 2001, ten days before the geopolitical landscape changed dramatically with the Al-Qaida attacks on the US, the subsequent interventions in Iraq and Afghanistan and the rise of China as an economic and increasingly also geopolitical superpower. The upcoming sixth project period and twentieth anniversary of CIEP in 2021 starts under the cloud of the Sars-CoV-2 pandemic and mounting geopolitical and geo-economic tensions, which will determine the restructuring of international political and economic relations in the years to come.

In 2001, we were looking back on a very eventful previous decade, starting with the First Gulf War and the collapse of the Soviet Union, both of which events changed physical oil and natural gas flows in the world. The collapse of the Soviet Union and the subsequent economic restructuring process had released a lot of oil and natural gas to international markets, particularly to West Europe, which was keen to diversify away from the Middle East after the First Gulf War. Relatively low oil and natural gas prices characterized the 1990s and apart from large investments in Sakhalin and Kashagan, most 'oil exploration' took place on Wall Street. Moreover, the ability to transport Liquefied Natural Gas (LNG) competitively over longer distances opened up the stranded natural gas reserves of the Persian Gulf. While geopolitical engagement in regime change in Iraq was ongoing, the vast natural gas reserves of Qatar were developed for world gas markets. At that time, the United States expected to quickly need imported natural gas and began to build LNG terminals to import LNG from world markets. By 2008 the US expected to see its import dependency in natural gas increase to 30% of domestic demand, while oil import dependency was also increasing. This prospect drove many international oil and natural gas developments in that decade. Due to the shale gas revolution the US never became this foreseen substantial importer, and instead is now a larger exporter. LNG looking for an alternative market came in handy when Japan was struck by the tsunami in 2011 and needed LNG to compensate for the loss in nuclear power. Later, LNG began to find its way to China. Thus, gas flows developed for the US market fueled natural gas demand in Asia instead.

In the past twenty years we have seen oil prices rise from lows in the late 1990s-early 2000s to sky high in nominal terms in 2008 and fall dramatically in 2014 and 2020. In the last decade, the US changed from the largest importer to an exporter of crude and oil products due to the shale oil revolution. Moreover, NGLs (Natural Gas Liquids) are playing an increasingly important role in shaping oil and chemical industries in the world. The role of largest oil importer of the world was passed on to China, which also impacts the producer-consumer relations in the world. In those twenty years we also witnessed a rapid growth in LNG demand and supply, with an expansion of LNG exporting and importing countries, LNG flows and new business models. Previously regional markets became more integrated as a result of LNG growth and price differentials between the North America, European and Asian markets became much smaller after 2014.

Climate change policy and the impact on the energy sector also underwent great changes in that period. The Kyoto Protocol was a first big step in the late 1990s but ran eventually aground for various reasons. The structure of obligations focused mainly on the OECD countries, who did have a large legacy in CO₂ emissions, but the agreed system did not take the emergence of new large emitters into account. With a more dynamic set up with regard to the category countries belonged to this problem might have been addressed differently. The US had to use power politics to enforce the required changes to also hold China responsible for its steeply rising emissions, while the US was also reluctant itself. A second issue that stood in the way of the Kyoto Protocol's success was the top down nature of the agreement and was replaced eventually in 2015 with the Paris Agreement by a

more bottom up approach of National Determined Contributions. The issue with this approach is that it un-levels the international playing field during the long period of reducing GHG emissions in the economy. The subsequent diversity of national measures and decarbonization pathways requires an institution to develop a trustworthy system of measuring and controls. The confidence in the execution and validity of the declared NDCs then can underpin the process. Although the institutional developments are important, also markets play an important role. The cost decreases in solar and wind energy have greatly impacted their introduction in the energy economy around the world, while the price reductions in natural gas, have helped to replace many coal-fired powerplants. Solar and wind also have the advantage that it can be considered domestic energy production, even if the equipment has to be imported. Domestic support schemes and innovations resulted in the growth of renewable energy.

Electrification is becoming more and more applicable in various energy demand sectors, among which mobility and heating. The 2015 Paris Agreement on climate change has incentivized governments to push harder for technologies and policies to reduce CO₂ emissions. In the past twenty years, the world of energy had changed dramatically, but the CO₂ emission reduction is far from adequate to reach the 2050 climate goals. Solar and wind have matured as new electricity production sources and capacities are expanding fast as costs come down. This also applies to offshore wind and as a result the North Sea is again poised to become a substantial source of energy in the future. While electrification is on the rise, storage and transportation of energy becomes important again. Currently, hydrogen, which is already a well-known industrial gas in industrial clusters in the NW European economy, is incentivized to grow beyond the industrial clients to include the power sector, residential heating sectors and mobility. Also, hydrogen could be used for storage of variable energy production from solar and wind and transportation over larger distances in both new and converted natural gas pipelines. Energy system transition requires balancing between the new sources and different demand patterns. Energy transition also implies that the system will be hybrid for some time and that both old and new must be able to satisfy demand. Managing growth of the one and decline of the other is not often considered in studies, even though for system stability and satisfying certain demand it is very important.

Another major change in the international world of energy is the fact that the OECD countries are no longer the largest energy consumer country group and have been surpassed by new consumers in Asia. The share of the OECD countries was until the late 1990s more than 80% of global energy demand. As such the OECD countries were an important counterpart to producing countries, exemplified by the International Energy Agency (IEA) and the Organization of Petroleum Exporting Countries (OPEC). After confrontational years in the 1970s and 1980s, OPEC and the IEA began to collaborate in the producer-consumer dialogue in the 1990s. This later led to the establishment of the International Energy Forum, with its secretariat in Riyadh, where more producer and consumer countries collaborate than represented by OPEC and IEA. Since 2008/2009, the energy work in the G-20 has been increasingly using the knowledge of IEA, OPEC and IEF to underpin energy governance. Many countries that function in the IEA, OPEC and IEF governance structures are also a member of IRENA.

The changing governance structure in the past twenty years reflect the change in energy demand in the world. Energy demand in OECD countries grows relatively little and are mature energy markets, while demand is increasing rapidly elsewhere in the world. The share of energy demand of OECD countries has declined from a high more than 80% of global demand to less than 50%. The political prominence in energy matters of OECD countries has changed accordingly. Growth in energy markets is driven by Asian demand and as a result the focus of producing countries has shifted as well. China has surpassed the US and EU as largest oil importer and natural gas imports are increasing as well. China is already by far the largest importer of coal. Moreover, China is a large investor and manufacturer of solar panels and wind turbines. Chinese (state) energy companies invest in all sorts

of energy projects/companies, conventional and renewables) all over the world, mainly through the Belt & Road Initiative.

World oil and gas supply were also greatly influenced by the shale revolution in the US. It changed the US from a very large oil and gas importing country into an exporter and changed both the oil and natural gas flows in the world. Shale production broke through after many years of trying to improve the technology and a period of relatively high oil and natural gas prices between 2003-2008 helped investment efforts in this direction. Also, wind and solar energy matured due to support schemes and large efficiency gains, changing the energy mix in many countries. Solar and wind have the added advantage, once the capital goods have been imported and installed, that it become domestic energy production. In a period of growing import dependencies of some countries and growing geopolitical uncertainties these energy technologies benefit.

The traction that hydrogen is receiving lately in various countries is telling. The expansion of solar and wind energy has stimulated further energy system stability thinking. Although electrification of part of energy demand, batteries and using smart systems can manage some of the issues surrounding integration of variable production, the discussion about integrated energy system transition and decarbonizing industry also emphasized the need for a clean molecular solution. In the EU the push is to speed up the development of so-called green hydrogen is clear, but in other countries combinations of green and blue hydrogen are developed as well. In many countries, hydrogen production, storage and transport solutions are being developed and are providing a glimpse of a potential future of hydrogen economies and hydrogen as a tradeable. This will also impact the energy relations and energy trade flows in the future with new producers and exporters joining traditional energy exporting countries.

The world of energy also changed as a result of geopolitical events. The 2003 intervention in Iraq changed the long period of oversupply on international oil markets in the 1990s in a period of tighter markets because the constraints in supply also coincided with a substantial increase in oil import demand as a result of rapid economic growth in China. Moreover, China has driven oil, natural gas, and coal demand for the past twenty years. China surpassed the EU and US in CO₂ emissions, became the largest oil importer and is underway to also become a large natural gas importer. Moreover, it also is a very large producer of solar panels. The geopolitical and geo-economic importance of China has become very large indeed. The idea that integrating the Chinese economy into the world system would turn them into a so-called 'rule follower' has become more and more undone by China's creation of alternative institutions that compete for influence and impact with the UN institutions. In past few years, the conflicts over climate, trade, currency policy, intellectual property rights but also Iran, North Korea, South China Sea, Taiwan, Hong Kong have been mounting.

The current Sars-CoV-2 crisis, causing Covid-19, is the latest source of conflict between the US and China. The virus originated in China and a lack of transparency caused a rift between countries about the human and economic toll. China at the same time claims supremacy in handling the crisis over the liberal democracies. The discontinuity of value chains relying on Chinese goods has woken up many policymakers, particularly in medical supplies, which may spill over into other strategic goods and energy technologies. Such a development could strengthen certain parts of the decarbonization policies of countries in an attempt to reduce the dependence on strategic energy imports. The health crisis could also incentivize policymakers to rely less on long and complicated global supply lines and instead promote shorter and more regional/domestic supplies, particularly if they converge with climate change policies. The EU announced new policies with regard to strategic industries in the fall of 2019. Also, the EU Green Deal, presented in December 2019, may become a fertile breeding ground for strategic economic planning and investing to grow.

The disruption in value chains, starting in China and later in Europe and North America and elsewhere has increased the awareness of interdependency and the geo-economic consequences of such dependency in a world less trusting. The impact of the pandemic on international energy markets has been profound, to say the least, and the geo-economic and geopolitical consequences will be further unfolding in the years to come. Oil and gas prices rapidly dropped when demand in certain sectors declined, oil and natural gas investment projects were suspended, and wells closed in or production capped. At this point in time it is unclear how countries will come out of their respective lockdowns and to which extent and at what speed some normalcy can be achieved. Many people lost their jobs and many incomes have been seriously impacted. The political and economic resilience of countries around the world is severely tested and geopolitical tensions, already on the rise in the years before 2020, have deepened in the pandemic. Some people see opportunities for the renewable energy sector (both electricity and clean molecules) to expand more rapidly, others see these investments arrested, as more short-term issues and sometimes survival of the firm or the nation demands attention. As the V-shaped recovery or a milder U-shaped recovery in 2020 becomes unrealistic for all affected countries, the pandemic, perhaps more than the 2008-2009 Financial crisis did, will restructure the world economy and international energy markets and value chains. In some countries, government support may help speed up the decarbonization process, but in others it might slow down due to a lack of government funding. The post-Paris government policy developments in the EU member states, in part stimulated by the EU Green Deal has resulted in a strategic reorientation of European oil and gas companies to include low carbon value chain development in their portfolios.

In this document we want to highlight some of these changes and the work CIEP has done in terms of events and research, how CIEP has evolved with the changing energy discussion over the years and the way CIEP wants to position itself in the next few years as a small but nimble energy think tank, based in the Netherlands, but interested and engaged in EU and global energy matters.

ROLE

The idea in 2001 was to create a small think tank that would do its own independent research in order to engage in informed discussions in the Netherlands, the EU and in the world. From the outset it was clear that CIEP aimed to be a small but responsive think tank, picking relevant topics that were either not covered or covered insufficiently balanced in public policy debates. The idea was also to connect public knowledge of governments and companies that does not easily find its way to the public debate because it is seen as biased. CIEP wanted to be a platform where such knowledge could be shared and improve the quality and rationality of the public debate.

CIEP sees that the role of a small but nimble think tank on (international) energy and energy transition is as important as in 2001, not because there are no groups/institutions involved in energy and energy transition issues, but because many promote or lobby for certain outcomes or technology choices. CIEP wants to remain an independent platform and a critical sounding board on developments in energy and energy transition by using its international focus to learn from developments elsewhere and provide a context for energy developments in NW Europe and beyond.

EVOLUTION OF EXPERTISE

The first ten years of CIEP were dominated by developments in international energy markets, mainly in oil and natural gas markets. The rising demand of China and the impact on oil & gas energy trade flows, the development of energy mixes of large energy consumers, the geography of supply and demand, the expansion of LNG, concerns about security of supply, the role of Russia and the Middle

East in energy markets, liberalization of energy markets and changing regulation in various jurisdictions and the development of energy and climate governance and its impact on policy-making. In the past ten years, the impact of shale oil and natural gas, the rise of solar and wind and the impact on incumbent electricity producers, the increasing policy contrast between the drive for EU liberalization of (conventional) energy markets and national climate change policies, strategies of state-owned companies and international companies, the development of energy technologies and the impact of climate change policies on energy market organization. Increasingly, we also debate the social impact of energy policies and the impact of government intervention in the energy sector on the economic structure of countries. Another issue that also has CIEP's attention is the dynamics of energy technologies encroaching on each other demand and the impact this has on the organization of value chains.

CIEP studies these topics at the international level, but also very much at the EU level. The point of departure has always been the NW European energy market and policymaking. Even when we studied the US, the Middle East, China and Russia, we were interested in the potential impact on NW EU or the lessons that could be drawn for NW Europe.

We expect the areas of expertise needs to remain largely the same, with more focus on industrial and energy system issues and the integration of new energy technologies in existing systems. Despite a certain drive to manage import dependency and focus on domestic (low carbon) energy systems, international trade in energy will continue to play a prominent role. Moreover, the changes in national energy mixes and energy trade flows will have a profound (international) economic and political impact. The developments in other geographies remains highly relevant for (the speed of) change in NW Europe.

PUBLIC AGENDA STUDIES

Most studies at CIEP were done as part of the public agenda. The liberalization of the EU energy market has been a rich ground for research over the years. In addition to the development of the internal energy market in the EU, international oil and gas markets and EU energy policymaking took center stage. Increasingly our studies also dealt with changing value chains, new market structures and how legacy energy systems can evolve to include low carbon energy technologies. Recently CIEP has focused on energy system transition and the role of industry. CIEP also actively follows energy developments in the main consumer markets outside the EU (China, Japan, US), and main producing countries (Russia, Middle East, US). We have also researched developments of company strategies, both in the power markets as in oil and natural gas, and analyzed developments in conversion industries, such as refining, petrochemicals, energy transportation and transmission. We have also looked at capacity markets in the electricity sector, inter fuel competition, CCS and energy and climate change policies.

Since 2001, we have published 226 papers and articles for the public agenda, of which 135 Research Papers, 71 Briefing Papers, 8 Books and 13 External reports. Most of the papers dealt with policymaking (124), often in combination with oil (67), natural gas (74) and electricity market developments (40) and Hydrogen (3). All these publications are available on the website www.clingendaelenergy.com. We also published in academic journals and book collections, mainly related to earlier CIEP publications, most of which articles or chapters could not be made available separately on the CIEP website.

We expect that the public agenda will be increasingly filled with issues related to energy transition, both expansion of solar, wind and hydrogen, and with managing stagnation of demand for oil and natural gas and later decline while having to continue the energy services they provide. New energy value chains will be developed and will raise new questions with regard to their integration into the energy system. These developments will impact on the energy market structures, investments, energy trade, type of stakeholders, strategy, industry but also increasingly the distribution of costs and benefits of the energy system and new issues in security of supply.

PROJECT STUDIES

All project studies are published on our website, with the exception of book projects where publishers disallow it. Sometimes the studies are published with a delay to allow the policymaking process to follow its course to parliament. Projects where study results cannot be shared are not accepted. Moreover, the topics of the project research should strengthen the public agenda of CIEP.

Most of the project studies were either on assignment for the Ministry of Economic Affairs (now EZK) or at the encouragement of the ministry, such as security of supply in energy transition, energy governance, regional cooperation studies and integrated energy system transition. All these projects were policy oriented. A project for the ministry of Infrastructure and Environment dealt with the carbon bubble discussion, which we followed up with another paper as part of the public agenda. Recently we have delivered expertise on behalf of EZK to the IEA for the Hydrogen study for the G-20 and are organizing for the ministry a regional roundtable to develop hydrogen markets in the North Sea region. Another project for EZK was a study into the discourse on fossil fuel subsidies, akin to the G-20 studies.

In 2004, CIEP did a large study on security of supply in the EU for DGENER and in 2011 we contributed to a study on EU LNG. In the period 2009-2012, we also contributed in the Polinares consortium (EU policy on natural resources), where we were responsible for part of the work packages, mainly dealing with geopolitical and geo-economic energy scenarios. Polinares was financed out of the seventh framework programme EU and was a study into the scarcity of energy and resources.

In 2011 we wrote a book on the history of the International Energy Forum (IEF) with Bassam Fattouh of the Oxford Institute for Energy Studies.

CIEP contributed various studies to the World Gas Conferences of the International Gas Union (IGU) in the period since 2006, on EU natural gas markets, gas market regulation, geopolitics and natural gas (2012, 2015; last one with IFRI) and a gas4power scenario in which carbon emissions from the power sector are declining fast through a global phase out of coal use for power generation, facilitated by the use of natural gas and new gases such as hydrogen and biogas. All studies were published on our website.

In 2018/2019 CIEP was involved in the Rotterdam-Moerdijk climate table and the Rotterdam table and helped develop and write parts of the reports on industrial energy transition strategies and capabilities.

Based on public agenda research into the refining industry, we did a study in decarbonization options for refineries for Fuels Europe, Brussels.

On a personal level, Coby van der Linde has served many years in the Energie Raad (Dutch Energy Council from 2004-2014), two advisory committees of the Raad voor de Leefomgeving (RLI) on

energy transition and hydrogen, a commission on natural gas production in Groningen for Onderzoeksraad voor Veiligheid and other supervisory committees on policy evaluations and studies for EZK. She has also been a wise person of the IGU since 2003.

Columns and expert contributions, currently monthly in the Dutch business paper *Financieel Dagblad*, have been part of CIEP work since 2004, most of which are available through the CIEP website.

The project portfolio depends very much on the expertise developed in the public research agenda. Moreover, CIEP's flexibility to quickly rearrange work and dedicate time to a project has been crucial. The expertise in refining and natural gas, the energy system and integration issues, and transition as a dynamic process rather than a new static state or linear development but also in value chain development and understanding of the geopolitics of energy and climate have helped to be awarded projects.

COMMUNICATION

In 2001, social media did not exist and most of the policy debates were conducted in public gatherings, which we organized in various formats both prior to conducting a CIEP study as well as using a study to launch a debate. In 2019, not only public energy policy debates seem to take place mainly in social media, but also politics have adopted social media as their communication channel. Apart from the fact that not all stakeholders are participating in social media debates, the technology has also shaped the debates. The limits of the messages have removed much if not most nuance out of the energy discussion, while algorithms rather than our own critical thinking select information for us.

CIEP was asked in recent years why we did not actively participate in the social media discussions, since all sorts of stakeholders (government, companies and NGO's) were active on that front. We decided for two reasons not to engage on any of the social media (apart from announcing new papers): 1. The lack of nuance, well-founded argumentation and facts in many of the online debates; 2. The amount of time and skill to manage the online debate by a small team; and 3. the position of trusted and upright think tank where ideas could be developed and not immediately shared in the public space. CIEP aimed to be the evenhanded stakeholder in the debate that based its communications on solid research and wanted to refrain from yes-no discussions where the nuance and complexity of issues would be lost. Moreover, in earlier discussions the advisory board instructed us to stay ahead of the policy and political debate curve on energy and not actively participate in current political debates on energy. As a result, CIEP has been able to build a reputation of doing solid work serving discussions rather than becoming a stakeholder in discussions. An additional advantage of this position is that CIEP has a reduced risk of becoming 'cancelled' and inadvertently harm the reputation of institutions supporting us.

Since 2001, many radio and television (including web) interviews were given where CIEP was asked for its expert view. These interviews always attempted to explain the complexity and the various positions. Often the interviews are event related. Interestingly, the number of informal meetings and presentations for organizations or other groupings increased. The latter has become even more prominent after the media storm on the climate tables and the wish to understand the discussions. A variety of concerned stakeholders/citizens request us for a presentation and discussion in the comfort of their own chosen groups. In these session, more nuanced discussions and dilemmas can be discussed. Moreover, the international and EU context that is often missing in the social media is a very welcome addition to these discussions.

CIEP managed to stay relevant in many discussions. We measure our impact through continued policy engagement, evaluating the energy and policy discourse over longer periods of time, supplemented by indicators such as invitations to speak, participate and contribute to policy papers, (international) seminars and conferences, and the direct downloads of our papers on the CIEP website. Over time CIEP studies have been repeatedly quoted or referred to in international journals and reports (on natural gas viz wind, refining studies), and some found their way to policymaking documents (integrated energy transition issues, hydrogen). One of the CIEP catch phrases in that stuck is 'clean molecules'. CIEP anticipated on the developments by focusing research increasingly more on new value chains (solar, wind, hydrogen) both in an international and NW European context and by focusing on integrated energy system transition and the role of industry and clean molecules in energy transition. This is highly relevant also in Dutch discussions but also in the countries around the North Sea and beyond. At the same time, international market developments and policymaking continued as core areas of research to understand developments elsewhere.

In the next few years, we do not see the CIEP communication strategy change much. We are trying to publish much shorter papers and visualize the insights from our studies to cater for a public that is not interested in reading long analytical texts. We are interested in developing all types of communication that is not too labor intense and can easily be kept up to date by a small team. With regard to the current SARS-CoV-2-crisis and the limitations of organizing events as long as there is no vaccine, we intend to focus on organizing some virtual events and discussions around research themes with the intention to continue such virtual gatherings as a normal part of the CIEP activities, also after the current crisis is over. In the future we envision a mixture of both physical and virtual meetings as part of the CIEP communication and activities.

STAFF

The team with which we developed the expertise was initially a mixture of political scientists and (political) economists. In the last couple of years, also technical energy system expertise has been added to the mixture. CIEP works mostly with recently graduated researchers that usually find employment in the energy sector after 2-3 years of CIEP experience. The fellows and more experienced researchers have played an important role in fast tracking these junior researchers in their expertise and played a crucial role in developing and concluding studies. The CIEP team has always been a mixture of Dutch and other EU member state nationals. The working language has been English from the beginning and will remain so.

The first ten years the availability of very experienced people retired from companies and policymaking (but which were still at the cutting edge of their field and were willing to take up a role as mentor and research initiators) was larger. The mixture of junior researchers paired with experienced professionals bringing a vast network of people was crucial in building a solid reputation. The development to retire people later (from about 58 years to closer to 65-67) has changed the function and availability to mentor and lead discussions of some of the fellows. Currently, most fellows work with CIEP on a project basis.

Since 2001, we have had a total of 29 junior researchers and 5 senior researchers employed. With the exception of two junior researchers, all have continued a career in energy or energy-related sectors. Most junior researchers are interested in a job where they can deepen and broaden their knowledge about energy and energy systems and markets but are often not interested in pursuing an academic career. Some like to make a combination and opt to do their PhD research at CIEP. CIEP employed two PhD candidates in the past (2010) and recently facilitated a PhD project of a staff member, whose public defense is scheduled for 8 October 2020. All three PhD's have been/will be

defended at the University of Groningen, where the director has been a part-time professor supported by Gasunie since 2004.

CIEP also had 30 interns of which 7 were hired after graduation as junior researcher.

CIEP will continue to bring insights from different disciplines together in studying energy and energy transition. Although some believe that international developments and markets will become less important in a future where (domestic) solar and wind dominate our energy systems, we think that energy trade will remain very important, particularly when new opportunities for trade in clean energy emerge. At the same time, we will learn more about the limitations to and/or the externalities of renewables in densely populated regions. The geopolitics and geo-economics of new energy technologies are also important and exploring futures with less open economic models helps us understand the potential impact on investment, value chain development and new energy services, while understanding access to energy and affordability also remain important.

HOW CIEP CAN STAY RELEVANT AS A SMALL ENERGY THINK TANK IN/FROM THE NETHERLANDS

The energy transition based on the 2030 policy of the EU will imply a period of substantial changes in the energy systems in the NW European market and will impact the incumbent energy stakeholders and introduce new ones. In such a period of change, a think tank focused on international and EU energy markets and policymaking is useful. The interaction between the energy systems and policies of member states, that all adopt national oriented plans, can lead to unexpected side-effects. These can be positive and negative. The EU Green Deal and the national decarbonization plans will, just like the earlier 2020 policy, be an incentive to research the various aspects of the new EU policy framework, the impact on the national policies, markets and companies.

In a period where it may seem that knowledge of international energy markets is less and knowledge about national energy transition policies is more important, CIEP can show the relevance of the impact of cross border market developments, the impact of choices of some countries on the policy space of others and combining that with applied knowledge of specific energy sector dynamics. Moreover, the diversity of institutions involved with CIEP stimulates a sort of engagement that is different from other research or think tank organizations connected to a specific part of the energy sector or policy area. As a result, CIEP is stimulated to always think out of the box and focus more on idea or problem development than on the details of a certain technology, rule or aspect of the market, which other institutions cover adequately. At the same time, the cost of having a CIEP is shared among a number of institutions and is relatively low compared to other types of knowledge centers.

CIEP also actively participates in the newly established Sustainable Industry Lab of the University of Utrecht and in the application of a large hydrogen research project consortium led by TUDelft and TNO (HyChain5). Each year we jointly organize a seminar or webinar with KAPSARC. The last one was on hydrogen and the circular economy in July 2020 and participants joined from all continents.

THE AGENDA IN THE PROJECT PERIOD 2021 UNTIL THE END OF 2024

The energy system transition in NW Europe continues to be a main focal point for research. CIEP wants to build on the knowledge and insights gained from the work on international oil and natural gas markets, the refining industry, the petrochemical industry and hydrogen studies. CIEP research was enriched in the project period 2017-2020 by participation in roundtable talks, policy development sessions, advisory sessions and collaboration with other institutions such as the

University of Utrecht, TNO and others. We would like to continue our research agenda in the same vein.

CIEP is already exploring the potential business models and market designs for hydrogen and a power system with growing shares of variable renewables and conversion potentials. Other questions arise looking forward. Will investments along the various renewable power and molecule value chains materialize under the current market design and policy conditions or is a rethink required to deliver on the ambitious goals for 2030 and 2050? What can be learned from other EU member states and third countries? Can for instance geothermal technologies provide solutions in reducing CO₂ emissions in parts of Europe where hydrogen or other low carbon technologies are less obvious? What sort of applied economic/sectoral knowledge is lacking in our policy assessments? In which sectors of energy demand do competitive end-user prices for energy matter and in which sectors to a lesser extent, provided the international trade and finance system remains open? What would be the impact on energy system transition in NW Europe of an increasingly less open international economy? What would be the impact of a further decoupling of the US and China for the strategic development of supply chains for existing and new clean technologies, the collaboration on climate change issues and energy trade and finance? How does energy system transition impact the social contract of EU member states?

CIEP has always taken the NW European energy markets as its point of departure, and the work on energy system transition will not deviate from that. Regional collaboration among countries around the North Sea to create/integrate the market for clean power and molecules (hydrogen, green gases) is an integral part of the CIEP research effort. Comparing national policy hurdles and opportunities, company projects and market developments in addition to understanding the dynamic industrial logic of decarbonization pathways and the conditions for success and failure are part of this effort. This work needs to be continued in the project period 2021-2024.

Internationally, we are very interested in the development of the energy mix in China and India, because the energy mix choices in these two countries will largely determine the carbon space towards 2050 and the deepness and timing of world decarbonization required. In the US, relatively low natural gas prices have retired coal plants at a respectable rate, but China and India are still adding new plants to the coal plant fleet. In the case of China these additions are at home and elsewhere through the Belt & Road program. Many questions remain unanswered on the proposed climate change policies of China, despite the speech of President Xi Jinping to aim for carbon neutrality in 2060. Both China and India have booked in vast expansions of tree planting as mitigating measures. Concerns about biodiversity and the ability to measure and assess the programmes might become crucial. Can a larger role for natural gas in India and China, in conjunction with renewable energy technologies, help reduce or at least manage their growth of emissions in the power and industrial sectors, particularly when also combined at some point with CCUS technologies? In how far can LNG trade facilitate these developments and depoliticize gas relations in an era of more geopolitical tensions? Or will a greater share of natural gas in the energy mix lead to further politicization of gas trade relations? What will be the impact of the Covid-19 pandemic on the ability of governments to steer their economy towards lower carbon growth?

The geopolitical and geo-economic tensions have been rising since 2008-2009 with the growing strength of the Chinese economy. The western idea that China would easily conform with the mores of the international political and economic order once integrated in the international (economic) institutions has been disappointing. Instead, China has actively built up its own set of institutions in trade and finance to manage its international bilateral economic relations and as a result is encountering more and more push back from the United States. Currently, the world is engaged in a rivalrous period, where the continuation of the ruleset of open markets is far from clear. Energy markets will also be impacted by this rivalry as security of energy supply chains and diversification to

source and geography gains importance. Energy system transition plays an important role here because it can offer an opportunity to recalibrate security of supply issues in energy importing countries.

Also, in the international relations realm many questions come to the fore. Will the geopolitics of energy transition play out as envisaged by IRENA? Is not security of supply a still stronger driver for changing the energy system than climate change and if this is true, what is the prospect of reaching zero-net emissions by 2050? Will the Paris Agreement hold, or will a new approach be negotiated after a future disappointment on its effectiveness, as happened before with Kyoto? What are the consequences of developing a hydrogen economy on international political and economic relations? Who will be the new players in the world energy markets, the traditional energy companies of today that have successfully embraced the new technologies and developed new markets, new players that challenge the incumbents or a hybrid? What is the impact of global energy transition on financial markets and the monetary system (where oil trade in US dollars is still very large) and the possibility that hydrogen might not be traded in dollars? What is the impact of the current monetary financing as a result of the pandemic on energy markets and energy policies in the coming ten years? What is the impact of the Sars-CoV-2 pandemic on energy transition plans and investments? The range of topics that could become part of the discourse in the next decade is long and all to some extent imply geopolitical and geo-economic structures changing.

In the past twenty years we have discovered how important the context is in which energy market and energy system transition developments take place. The function of small group of researchers that question developments outside the realm of the opinion of the day and is interested in the medium term (5-10 years) ahead is as relevant today as it was in 2001. CIEP's line of questioning can help others involved in other parts of the energy knowledge value chain to understand the (political and economic) complexity of changing energy systems and markets.

KEYWORDS FOR THE RESEARCH AGENDA IN THE COMING PROJECT PERIOD

1. Energy and Resource System Transition in NW Europe:
 - a. with a special focus on reducing the carbon footprint of industry or clean molecules (building on the refinery and organic chemistry studies)
 - b. The integration of renewables into the energy system (building on the integrated energy transition, hydrogen and policy collaboration around the North Sea projects)
 - c. Development of Governance/market organization and stakeholder roles in relation to the Green Deal and national member state policies (building on the integrated energy transition, hydrogen, policy/regional collaboration, electricity and natural gas projects)
 - d. The impact on the energy system/governance of declining oil and gas demand and managing the security of supply during the transition process – (building on oil and natural gas market development and SoS policy projects)
2. Developments in International energy markets
 - a. International oil and natural gas markets (building on twenty years of projects)
 - b. Energy and resource transition in Asia and North America (building on China and US projects)

- c. The impact of energy and climate change policies on energy trade (relations); current and potentially new producing countries (building on projects on the GCC countries, natural gas and oil projects (Russia/Middle East - US))
- d. Geopolitics of energy
(transition)- (building on
previous scenario work (2004,
2012, 2019/20))

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