

CLINGENDAEL
INTERNATIONAL
ENERGY
PROGRAMME

| CIEP

ANNUAL REPORT 2014



9 June 2015

Affiliated to the Netherlands Institute of International Relations 'Clingendael', CIEP is an independent forum for governments, non-governmental organisations, the private sector, media, politicians and all others interested in changes and developments in the energy sector.

CIEP organises lectures, seminars, conferences and roundtable discussions. In addition, CIEP staff members lecture in a variety of courses and training programmes. CIEP's research, training and activities focus on three themes:

- Regulation of energy markets (oil, gas, electricity) in the European Union;
- International economic and geopolitical aspects of oil and gas markets, particularly with respect to the European Union security of supply; and
- Energy and sustainable development.

CIEP is endorsed by the Dutch Ministry of Economic Affairs, the Dutch Ministry of Foreign Affairs, the Dutch Ministry of Infrastructure and the Environment, BP Europe SE- BP Nederland, Coöperatieve Centrale Raiffeisen-Boerenleenbank B.A. ('Rabobank'), Delta N.V., GDF SUEZ Energie Nederland N.V., GDF SUEZ E&P Nederland B.V., Eneco, EBN B.V., Essent N.V., Esso Nederland B.V., GasTerra B.V., N.V. Nederlandse Gasunie, Heerema Marine Contractors Nederland B.V., ING Commercial Banking, Nederlandse Aardolie Maatschappij B.V., N.V. NUON Energy, TenneT TSO B.V., Oranje-Nassau Energie B.V., Havenbedrijf Rotterdam N.V., Shell Nederland B.V., TAQA Energy B.V., Total E&P Nederland B.V., Koninklijke Vopak N.V. and Wintershall Nederland B.V.

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NEW REALITIES

A new chapter in the Arab Spring and for Europe the Ukraine crisis greatly influenced international energy markets in 2014. The instability in Libya, the advent of ISIS in Syria and Iraq, the consolidation in Egypt, the position of Iran featured in many headlines. But also other countries had difficulty meeting their projected production, such as Sudan and Nigeria. From spring 2013 these disruptions increased from an average of 2 mbd to 3.5 mbd, mainly due to a fall in Libyan supplies. Despite these disruptions, oil prices remained relatively stable between 100-120\$ per barrel. The main reason was that in the same period US oil production increases matched the loss of production elsewhere.

The changes in the oil product flows were dramatic. West African producers of light grade crudes were backed out of the US market. In Europe, refiners could no longer rely on exporting their excess production of gasoline to the North American market and instead found they had to compete head on with American refiners in other markets.

With the US market nearly self-sufficient, apart from sour crudes for blending at the refineries, and European demand depressed, Asia became increasingly a battleground for many producers looking for a market for their oil and oil products. When the balance in world demand and supply changed with a recovery of Libyan supplies, and the growth of American supplies again at record height, the market was in oversupply. Oil prices began to slide, despite the fact that the summer of 2014 was fraught with geopolitical tensions. The weakening of oil prices continued and all eyes began to shift to OPEC to cut back supplies and support the price at the assumed pain threshold of 80-85\$ per barrel. On 27 November OPEC ministers gathered in Vienna but decided not to cut production and instead let the 'market' establish a new equilibrium. OPEC stated that they were unwilling to cut production and allow high cost producers in the market at their expense. A complication for OPEC was that Iraq was not part of the organisation's 30 mbd quatum and would not share the cost of production costs. Some of the slide in prices can be attributed to inter-OPEC competition for market share in a world market with weak demand. The loss of the American market to domestic producers was another major reason for OPEC not to intervene.

The subsequent price slide in December 2014 was substantial. International oil companies began to announce substantial capex cutbacks for 2015, and all eyes turned to the American tight oil producers as the new flexworkers of the world oil market, expecting that the financial structure of many of the shale producers would quickly lead to a reduction in production. Although the number of drill rigs declined sharply, production continued to grow due to a shift to sweet spots. Moreover, tight oil producers in some US shale plays had never enjoyed the \$100 plus world due to infrastructure bottlenecks and efficiency gains were still forthcoming. The quick reduction of world supply did not come and storages began to fill in earnest. This first test of the tight oil industry showed that price elasticity of supply was not as high as believed. Although growth of supply is expected to slow in 2015, the world newly appointed flexworker has shown a different type of flexibility than was anticipated; a flexibility to further reduce cost and work their portfolio.

In Europe, events in Ukraine took center stage. The political and economic crisis in Ukraine had deepened in the winter of 2014. In the chaotic months that followed after the fall of the Yanukovich government, Crimea became a contested part of Russia and east Ukraine became disputed territory between the new Kiev government and insurgents. The US, EU and Russia were on opposite sides in the conflict and several rounds of sanctions followed. Although specific persons and the financial sector were targeted in the ensuing western sanctions, energy relations between Russia and the EU were also affected.

Security of supply and demand has dominated the EU-Russia gas relation with Ukraine in the center. New pipelines circumventing Ukraine were supposed to reduce the transit risk. The construction of the Nord Stream pipeline, as well as investments in reverse flows and interconnectors, did reduce the supply risk in a large part of the EU. The initiatives with regard to the Energy Security Strategy of May and June 2014 and the Energy Union further aim to strengthen the interconnection between member states, allowing gas to flow more freely in the internal market. However, parts of Eastern Europe, and especially South-eastern Europe, remain exposed. Overall, the ongoing crisis in Ukraine has undoubtedly raised further concerns among European policy-makers about dependency on Russian gas.

The European gas market has been weak for a number of years, mainly due to weak demand in the electricity sector, and in 2014 the prospect of lower gas prices as a result of oil-linked contracts slowed demand even further. With full storages and a warm winter, demand for gas weakened further. In the fall of 2014, Gazprom announced the abandonment of the Southstream project and instead concluded an agreement for diversion of the pipeline to Turkey, its second most important national market after Germany. With development of the pipeline to Turkey, gas deliveries to western Turkish market would no longer rely on transit through Ukraine. While the gas relation between Russia and the EU was under increasing pressure, Russia concluded a gas export agreement with China in the spring of 2014, developing an important second export market for its gas. The agreement with China was long in the making, and with the increasing smog problems in large Chinese cities, gas demand is expected to grow at the detriment of coal. Also Russia oil exports to Asian markets are increasing. European oil demand is also in decline, and Russia's oil companies are, like the other oil producers, attempting to secure demand in Asia. The slowdown in Chinese economic growth to more mundane proportions has tempered expectations in the short term. Instead, India is now seen as the next large growth market, although differences in institutional and political organisation should be taken into account when transposing the Chinese energy demand phenomenon on India. For Russia, it is important to develop alternative routes to international markets, rather than fix on particular markets.

In 2014, the debate about energy and climate change policy in the EU was on the agenda for the new European Commission. The targets of the 2020 policy in combination with different national methods to meet these targets had greatly influenced the power markets. For 2030 new CO₂ emission targets were formulated and a European wide target for renewables. In addition, the concept of the Energy Union is further developed with more focus on connectivity between the member states. The impact of renewables on the power market continued to make their mark on the business case for many utilities with a large fleet of gas-powered electricity plants. Closures and mothballing of generating capacity continued. The weak European economy did not help either. New business models are investigated, focussing on renewables and energy services rather than conventional production.

Most of the developments mentioned above have been the subject of CIEP papers and events in 2014.

BOARD OF THE FOUNDATION: STICHTING FONDS INSTITUUT CLINGENDAEL (SFIC) IN 2014

Drs. G.H.B. Verberg, chairman
Drs. H.D.A. Haks, treasurer
Mr. W.O. Russell, member
Ir. R. Willems, member
Mw. Mr. I. L. Van Veldhuizen, member
Ir. J.M. van Roost, member
Dr. R. Roborgh, member

The Clingendael International Energy Programme (CIEP) is a project of Stichting Fonds Instituut Clingendael (SFIC) since 1 September 2001. Each project period lasts four years. The year 2014 is the second year of the fourth project period (2013-2016).

CIEP SUPPORTING INSTITUTIONS

In 2014, the following institutions supported CIEP:

BP Europe SE- BP Nederland
Coöperatieve Centrale Raiffeisen-Boerenleenbank B.A. ('Rabobank')
Delta N.V.
Dutch Ministry of Economic Affairs
Dutch Ministry of Foreign Affairs
Dutch Ministry of Infrastructure and the Environment
EBN B.V.
Eneco
Essent N.V.
Esso Nederland B.V.
Havenbedrijf Rotterdam N.V.
Heerema Marine Contractors Nederland B.V.
GasTerra B.V.
GDF SUEZ Energie Nederland N.V.
GDF SUEZ E&P Nederland B.V.
ING Commercial Banking
Koninklijke Vopak N.V.
Nederlandse Aardolie Maatschappij B.V.
N.V. Nederlandse Gasunie
N.V. NUON Energy
Oranje-Nassau Energie B.V.
Shell Nederland B.V.
Taq Energy B.V.
TenneT TSO B.V.
Total E&P Nederland B.V.
Wintershall 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. National energy policy is largely influenced by European and international developments. 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, such as the Gas Group, the Oil Group, and the Fuel Mix Group.

STAFF

In 2014, the CIEP staff comprised the following people:

Coby van der Linde	director	(0.8 fte)
Lucia van Geuns	senior researcher	(0.6 fte) (until 1 September 2014)
Christof van Agt	senior researcher	(1.0 fte) (until 1 Februari 2014)
Pier Stapersma	senior researcher	(1.0 fte)
Koen Groot	researcher	(1.0 fte) (until 1 December 2014)
Sammy Six	researcher	(1.0 fte)
Luca Franza	researcher	(1.0 fte)
Daan Rutten	researcher	(1,0 fte) (from 1 March 2014)
Emma van der Veen	researcher	(1,0 fte) (from 1 May 2014)
Wendy Auf dem Brinke	assistant	(0,8 fte)
Marco Blankestijn	fin. administrator	(0.2 fte)



In addition to the research staff, CIEP had in 2014 four fellows and three associate fellows:

Jacques de Jong	senior research fellow	(0.2 fte)
Dick de Jong	senior research fellow	(0.2 fte)
Luc Werring	senior research fellow	(project basis)
Christian Cleutinx	senior research fellow	(project basis)
Aad Correljé	associate fellow	(0.2 fte)
Pieter Boot	associate fellow	(project basis)
Martien Visser	associate fellow	(project basis)

During 2014, the following students/interns were connected for at least part of the year to CIEP staff:

Daan Rutten	student intern
Diederik Klip	student intern
Robin Peeters	student intern
Marthe van Laarhoven	student intern

Other functions held by CIEP director:

Part-time Professor of Geopolitics and Energy Management,
University of Groningen
Member of Regieteam Topsector Energie
Member of the Supervisory Board of Wintershall Nederland B.V.
(WINL)
Member of the Supervisory Board of Alliander N.V.
Member of the international advisory board of KAPSARC (King
Abdullah Petroleum Study and Research Center) Saudi Arabia

CIEP NETWORK

Many of our activities and studies are conducted in cooperation with partner organisations 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, and, weighing how the project would fit within the CIEP research agenda for that period, we agree to participate or not. 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 organising conferences and conducting joint studies.

18 April 2014, CIEP Energy Lecture by HE Ali Al-Naimi, Minister of Petroleum and Mineral Resources, Saudi Arabia



INTERNAL ORGANISATION

CIEP administers the allocation of staff and budgets to the different activities, research projects and other activities. CIEP uses time registration (BigBen software), which facilitates prioritising time and assets.

CIEP PUBLICATIONS

The following overview highlights a selection of 2014 publications, most of which are available on the CIEP website (www.clingendaelenergy.com/publications). CIEP (associated) staff also published articles in newspapers, scientific journals and other publications not mentioned here. In 2014 CIEP published 9 papers, of which two were studies tasked for the Ministry of Economic Affairs and the Ministry of Infrastructure and Environment respectively. The other publications are a reflection of the public research agenda.

PAPERS



Caspian Oil & Gas; New Perspectives beyond Projects and Pipelines, Christof van Agt, January 2014.

The Iraqi Oil Surge in a New Energy Landscape, Sammy Six and Lucia van Geuns, January 2014.

Natural Gas in the Netherlands; From Cooperation to Competition, Aad Correlje, Coby van der Linde en Theo Westerwoudt, 2003, pdf available January 2014.

Sunset or Sunrise? Electricity Business in Northwest Europe, Pier Stapersma, April 2014.

Security of Supply in the Run-up to the Post-2020 Period, CIEP staff, May 2014.

Reflections on Coordination Mechanisms, CIEP/PBL, Pieter Boot, Jacques de Jong en Nico Hoggervorst, October 2014.

The Changing Market for Energy in Transport, Koen Groot, November 2014

The Energiewende and Germany's Industrial Policy, Daan Rutten, November 2014.

Long-term Gas Import Contracts in Europe, Luca Franza, December 2014

Transition? What Transition? Changing Energy Systems in an Increasingly Carbon Constrained World, study for the Dutch Ministry of Infrastructure & Environment, by researchers of CIEP/Duisenberg School of Finance/Tilburg University and EDHEC, December 2014.

COLUMNS

The 2014 columns in *Energie Actueel* are written by: Coby van der Linde (<http://www.clingendaelenergy.com/columns>), Pieter Boot and Aad Correlje.

ACTIVITIES

CIEP organised 12 events (meetings, training programmes, conferences, etc.) in 2014. See the list of events below, which is also available on <http://www.clingendaelenergy.com/events>; select 2014:

10 March 2014	Masterclass BP Outlook 2035 by Christof Ruhl, chief Economist BP
14 March 2014	Energy Transition, a European Challenge, Peter Terium, CEO RWE
18 April 2014	CIEP Energy Lecture by HE Ali Al-Naimi, Minister of Petroleum and Mineral Resources, Saudi Arabia

22 April 2014	IEA In-depth review Nederlands Energiebeleid presented by Maria van der Hoeven, Executive Director of IEA
16 May 2014	Presentation ExxonMobil Energy Outlook 2040 by William Colton
24 June 2014	Presentation BP Statistical Review of World Energy 2014 by Richard de Caux
4 September 2014	CIEP Gas day
25 November 2014	Belgian Electricity Supply in an EU context
27 November 2014	Presentation of the IEA World Energy Outlook 2014 by Fatih Birol
11 December 2014	CIEP Energy Lecture by HE Piechocinsky, vice-prime minister of Poland
15 December 2014	Energy Transitions across Europe- the future challenge for utilities and governments- Graham Weal, Chief Economist RWE

Presentation of World Energy Outlook 2014 by dr. Fatih Birol, Chief Economist of the IEA



TRAINING

29 May 2014 – The political and economic impact of the shale revolution

25 November 2014 – EU Energy Policy: EU energy policy dilemma's towards 2030

3-5 July 2014 – International Energy Policy (for the Ministry of Foreign Affairs)

CIEP also facilitated a two day training programme for the Diplomatic Institute to the Ministry of Foreign Affairs of the Republic of Bulgaria in Sofia (30 September – 2 October 2014).

CIEP organised several trainings modules on European Energy policy for the Florence School of Regulation (26 March, 6 June, 23 June and 6/7 October 2014) and the Energy Regulatory Regional Association in Budapest (25 June and 23 September 2014).

CIEP also ran a course on Global gas business and European gas supply security at the Energy Master programme of SciecesPo in Paris from January-March 2014.

CIEP also contributed with an energy case to the training of Dutch junior diplomats of Institute Clingendael, numerous lectures in other diplomatic training courses of Institute Clingendael, and to training modules of the Energy Delta Institute in Groningen.

CIEP staff also gave various lectures on a wide range of energy topics at conferences and other meetings.

MEETINGS

Gas group: monthly meetings

Oil group: quarterly meetings

Fuelmix group: bi-monthly meetings

Contact Group meetings: 18 March, 10 June, 14 October, 2 December 2014

Advisory Board Meetings: 24 June, 11 December 2014

Board meeting Stichting Fonds Instituut: 13 May, 6 November 2014

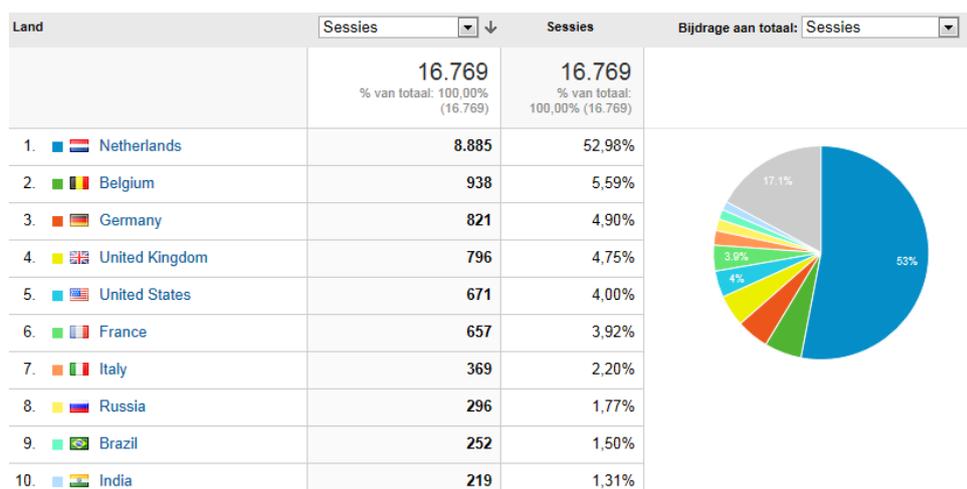
LECTURES, SPEECHES, PRESENTATIONS, MEDIA

During 2014, CIEP staff members gave numerous lectures, speeches, and presentations or chaired sessions during training courses, conferences and seminars. Also CIEP staff in the course of 2014 gave various radio, television and written media interviews.

WEBSITE

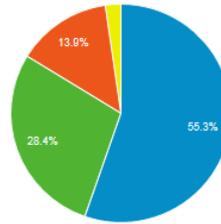
Everything CIEP published or organised from 2001 onwards, could be found at www.clingendaelenergy.com. Internet is an important communication and information dissemination tool for CIEP.

Where do our visitors come from:



How do they reach us:

	16.769 % van totaal: 100,00% (16.769)	16.769 % van totaal: 100,00% (16.769)
1. ■ Organic Search	9.275	55,31%
2. ■ Direct	4.770	28,45%
3. ■ Referral	2.339	13,95%
4. ■ Social	385	2,30%



Unique page visits to our publications in 2014:

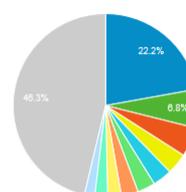
1.	/publications/publication/sunset-or-sunrise-electricity-business-in-northwest-europe	628	7,73%
2.	/publications/publication/security-of-supply-in-the-run-up-to-the-post-2020-period	583	7,18%
3.	/publications/publication/caspian-oil-gas-new-perspectives-beyond-projects-and-pipelines	552	6,80%
4.	/publications/publication/the-iraqi-oil-surge-in-a-new-energy-landscape	541	6,66%
5.	/publications/publication/natural-gas-in-the-netherlands—from-cooperation-to-competition-2003	511	6,29%
6.	/publications/publication/reflections-on-coordination-mechanisms	422	5,20%
7.	/publications/publication/a-regional-eu-energy-policy	420	5,17%
8.	/publications/publication/the-changed-geopolitics-of-energy-and-climate	388	4,78%
9.	/publications/publication/development-strategies-of-the-chinese-natural-gas-market	279	3,44%
10.	/publications/publication/european-power-utilities-under-pressure	260	3,20%
11.	/publications/publication/geopolitics-and-natural-gas	225	2,77%
12.	/publications/publication/the-energievendende-and-germanys-industrial-policy	192	2,36%
13.	/publications/publication/gas-in-east-africa	191	2,35%
14.	/publications/publication/capacity-mechanisms-in-northwest-europe	179	2,20%
15.	/publications/publication/the-changing-market-for-energy-in-transport	158	1,95%
16.	/publications/publication/transition-what-transition	142	1,75%
17.	/publications/publication/natural-gas-in-the-netherlands—from-cooperation-to-competition	136	1,67%
18.	/publications/publication/in-nederland-weten-we-niets-van-schallegas	128	1,58%
19.	/publications/publication/a-cinderella-story-	119	1,47%
20.	/publications/publication/us-refining-dynamics	109	1,34%

Unique page visits for events in 2014:

Rank	Event URL	Visits	Percentage
1.	/events/event/bp-statistical-review-of-world-energy-2014	505	21,34%
2.	/events/event/masterclass-energy-outlook-2035--christof-ruhl--	282	11,91%
3.	/events/event/ciep-gas-day	279	11,79%
4.	/events/event/energy-transitions-across-europe---the-future-challenge-for-utilities-and-governments	208	8,79%
5.	/events/event/ciep-energy-training	160	6,76%
6.	/events/event/energy-transition---a-european-challenge-by-peter-terium-ceo-rwe	128	5,41%
7.	/events/event/exxonmobil-energy-outlook-2040	118	4,99%
8.	/events/event/energy-lecture-by-he-ali-al-naimi	95	4,01%
9.	/events/event/iea-in-depth-review-nederlands-energiebeleid	88	3,72%
10.	/events/event/save-the-date-iea-weo-2014	71	3,00%
11.	/events/event/belgian-electricity-supply-in-an-eu-context	69	2,92%
12.	/events/event/masterclass-energy-outlook-2035--christof-ruehl	53	2,24%
13.	/events/event/ciep-energy-training-eu-energy-policy-dilemmas-towards-2030	47	1,99%
14.	/events/event/presentation-of-world-energy-outlook-2013	38	1,61%
15.	/events/event/iea-weo-2014	37	1,56%
16.	/events/event/ciep-gas-day-2013	32	1,35%
17.	/events/event/eu-energy-policy-kant-meets-machiavelli	23	0,97%
18.	/events/event/seminar-driving-forces-behind-oil-markets	15	0,63%
19.	/events/event/ciep-conference-schengenisation-of-energy-policy	12	0,51%
20.	/events/event/the-political-and-economic-impact-of-the-shale-revolution	9	0,38%

Unique page visits 'overall' in 2014:

Rank	Page	42.059 % van totaal: 100,00% (42.059)	42.059 % van totaal: 100,00% (42.059)
1.	/	9.317	22,15%
2.	/publications	2.846	6,77%
3.	/about_ciep	2.176	5,17%
4.	/about_ciep/staff	1.558	3,70%
5.	/about_ciep/staff/member/coby-van-der-linde	1.423	3,38%
6.	/about_ciep/vacancies	1.318	3,13%
7.	/events	1.236	2,94%
8.	/contact	1.008	2,40%
9.	/training	948	2,25%
10.	/about_ciep/staff/member/lucia-van-geuns	757	1,80%



PROJECTS

In 2014, CIEP continued with the 'envoy' project with the Ministry of Economic Affairs. As part of this project, CIEP collaborated in organising a course on gas development/LNG for a selected group of civil servants from Cyprus.

In 2014 the project geopolitics and natural gas for Task Force 3 of IGU (international Gas Union) continued. In this project CIEP, together with IFRI of France, conducts research and prepares papers and meetings for TF 3 of IGU for the WGC 2015 in Paris. In 2014 thematic papers were finalised. In 2015 CIEP and IFRI will produce their final report.

In May 2014, CIEP, together with researchers from the Duisenberg School of Finance, EDHEC of France and Tilburg University, was tasked by the Ministry of Infrastructure & Environment to research energy system transitions in the context of a question raised in parliament about a potential

'carbon bubble'. The project was finished on 1 September 2014. In December 2014 the report was part of a package of studies which were sent to parliament.

In June 2014, CIEP was awarded a grant from Saudi Aramco to study and collaborate on a project on changing oil and oil product trade flows. Saudi Aramco Overseas liaised with CIEP on this project, which involved collaboration with KAPSARC and OIES. In November a first oil workshop was organised in Riyadh in Saudi Arabia, in 2015 a second one will follow in The Hague. CIEP participated with 4 researchers in the workshop.

CIEP has in collaboration with the Florence School of Regulation of European University institute, the Regional Energy Research Centre of Corvinus University Budapest and the Centre for European Policy Studies in Brussels done a project "Schengenizing European Energy policy". In 2014 this resulted in a number of workshops at the various institutions and a number of publications on the subject of Regional EU Energy Policy?

FINANCES

In 2014, the second year of the fourth CIEP project period 2013-2016, income was higher than in 2013, but costs were also higher, leading to a drawn down of reserves. The overall financial result for 2014 was minus € 36,364.

FINANCIAL OVERVIEW FOR 2014

	2012	2013	2014
Contribution stakeholders	€810.000	€695.000	€715.000
Project income	€215.102	€132.773	€191.841
Other income (interest/book sales)	€17.277	€12.537	€ 3.769
Staff costs	€714.380	€676.944	€651.853
Deprecation cost	€5.506	€4.475	€4.723
Activity costs	€44.924	€40.755	€51.588
Foundation costs	€206.902	€156.444	€206.078
TOTAL RESULT	€70,667	- € 38,308	- €36.364

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ANNEX 1: ABOUT CIEP

Introduction

In September 2001, the Netherlands Institute for International Relations, 'Clingendael', launched the *Clingendael International Energy Programme* (CIEP). 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 liberalisation of the European energy market, which will impact the organisation 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 organisation of courses and training programmes, CIEP makes a fundamental contribution to the public debate on international politics and economic developments in the energy sector (oil, gas and electricity).

Objectives

- To serve as an independent forum for governments, non-governmental organisations, 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 and electricity) and policy-making in the European Union and geopolitics of international energy policy-making and markets.

ANNEX 2 CIEP RESEARCH AGENDA 2014

In the research plan for the period 2013-2016, *Age of Paradox*, the leading theme is managing competing international and national energy interests in two main research areas: *European energy market developments and policy-making* and *Geopolitics of energy policy-making and energy markets*.

In these two themes, both fossil and renewable energies will feature prominently. We will focus on liquid, gaseous and solid fuels, along the entire value chain. The organisation structure of these markets, such as the level of vertical and horizontal integration, investments, trade flows and the intervention in markets by governments, is of particular interest to understand the business models of both International (Oil) Companies (IOCs) and National (Oil) Companies (NOCs) and (European) power and network companies. Moreover, the driving forces of energy policies of key producing and consuming countries are also important to complete the understanding of the complexities of International and European interest seeking. For that reason, the impact on international political and economic relations (and markets) of a more energy self-sufficient United States will be an important part of research in theme two.

In the period 2013-2016, the long-term energy policies, such as the European 2050 Energy Road Map, and the impact on the energy market model and security of supply will be central in the research efforts. In particular, research will focus on how to keep the market attractive for imported (fossil) fuels during the transition to a more renewable energy mix, and the impact this transition has on security of demand and supply (of oil, and natural gas, renewables) and energy diplomacy. The (relative) pricing of energy and externalities and the impact on the merit order in power generation (and investments) will be another important topic, while government instruments to change the energy mix (and fuel mix in the power sector) will feature high on the CIEP agenda. Based on research in the period 2008-2012, we also begin the endeavour to answer the question how transition to a low carbon economy in a mature or stagnating economy is fundamentally different from this same process under the assumption of growing markets (just like liberalisation in a mature energy market is different from liberalisation in a growing energy market). The insights we hope to gain from this more theoretical question will relate to the work of both themes.

The developments in the energy mix of crucial consumer and producer countries (such as US, China, India, Australia, Canada, Middle East and North Africa, Russia) will be an important element in understanding the geopolitics and geo-economics of energy (supply, trade flows, processing, market structure). The impact of the shale gas revolution and other frontier developments on energy policies is another significant factor to consider in the periods research. In both research themes, the international interests and the national interests will be contrasted.

2013 is the first year of this new research agenda.

Research in the first theme 'Europe' is focussed on changing business models of power companies in Europe. First an update of the portfolio of large power companies is on the agenda, followed by a study in how robust incumbent companies have prepared their portfolio's to include low carbon technologies with a view on the changing government incentives on the energy mix. At the same time, CIEP is involved in a study on regional policy cooperation in NW Europe with FSR (Florence),

REKK (Budapest), and CEPS (Brussels). In the Netherlands we collaborate with PBL. This project will be followed by a project on levels of policy-making (regional, at the member state level, EU level) and the proper level of instrumentation in preparation of a study on possible new market designs. These policy questions come forth from a perceived tendency for national energy policy to take (more) precedence over EU policy-making. The competency of the EU member states over the national energy mix in combination with the decarbonisation naturally places the lead in policy-making with national governments. The EU policies and the internal energy market create the framework within which these national policy choices are made. Based on legacy and national (political) preferences, the fuel choices (and shares) and incentives vary among the member states and threaten to re-erect national barriers in the internal energy market. The concentration of wind and solar energy in Germany is, despite the relative small share of these fuels in the total NW European market, already creating problems in transmission and distribution of power, and structurally changing the business models of nuclear, coal and gas-fired power plants. Such concentration of variable fuels was not foreseen in the scenarios, where the growth of fuels is averaged over the member states. Multiple speeds and the bottlenecks they can create have not been studied very thoroughly. The failure of the EU-ETS to produce robust CO₂ prices is also creating perversities in the European markets. Another important strand of research will be the role of gas in the power merit order. In 2012 a study on capacity markets was completed, and additional research on the impact of EU and national policy measures with regard to energy efficiency and renewables on the role of gas in the energy system is developed.

Projects on international energy market developments, the second major theme, focus on oil and natural gas, and some extent coal and renewables. In oil, a study is underway on the impact of tight oil on the US oil market, while a study on the changing structure of the international refining industry and oil trade flows has also been started. The US is projected to import less crude oil in the future and at the same time is importing less oil products. This is impacting both international crude and product markets, but could also affect the geopolitics of oil when the US will be importing less from unstable parts of the world, while both Europe, India and China will import more. The importing countries will seek greater security of supply, but it is not certain that they will do so by supporting multilateral governance of their energy relations.

At the time that crude flows are shifting, also the structure of the world oil refining sector is changing, which is the subject of another project. Refining capacity is expanding in the Middle East and Asia, while capacities in OECD countries are shrinking and oil products flows are changing course. In particular, the export of gasoline to the US from Europe is disappearing, while diesel remains a large import for Europe, changing the recent lucrative business models for the European refining sector. In the European domestic market, oil product markets are projected to decline, partly as a result of efficiency gains in transportation and lower economic growth and partly as a result of fuel switching (LNG, electricity). The European refining industry has thus weakened due to declining petrol exports to the US, and relatively high crude oil prices (compared to the US). The efforts to develop a bio-based economy will also impacting the petrochemical industry, further weakening demand for important parts of the refinery slate without many markets to export these particular products to. The market for transportation fuels in Europe is thus changing, partly as a result of mature market, LNG and bunker, electrical vehicles, changing the business models of European companies. New players, in particular NOC's, enter the European market through purchases of processing assets, hoping to secure demand in this market. Europe may not represent a market with

a growth prospective, in a portfolio of an expanding company, it represent a fairly stable market compared to the more risky growth markets in Asia. Moreover, Rotterdam (and Antwerp) also are attractive hubs for producers such as Russia, from where it can reach world markets more easily than from its own harbours and with less geopolitical risk. The importance of oil for world markets (also for pricing LNG in Asia) is evident from the continued substantial share of oil in the world energy mix, and the expected increased competition between Europe and Asia for oil in the next decades.

In world natural gas markets the impact of the shale gas revolution continues to impact European and Asian markets, while also the prospects of, for instance, Russia to monetise its natural gas reserves have changed. Greater demand for natural gas in Asia, in part because of the nuclear accident in Japan and the expected slow decline in the mix and in part because of growing demand in the coastal areas of China, has redirected a large part of the Middle East LNG to Asian markets rather than the Atlantic ones. A study on the development of US and Chinese natural gas markets are underway. Sluggish economic growth and the precarious position of natural gas in the European power merit order, has impacted demand for natural gas in Europe. Competition from cheap coal from the US (where coal is being backed out by cheap gas in the power sector) is further complicating European gas demand, while the prospect of importing relatively cheap US LNG is still uncertain. An update of an earlier study on world natural gas pricing systems has started.

As part of a follow up of the IGU project on Geopolitics and natural gas, a new project has started and a number of shorter publications on 'hot spots', such as the East and South China Sea, the East Mediterranean, is in preparation, while also developments in major producing and consuming countries will also feature in the studies.

Security of delivery (as part of security of supply) similarly needs researching. With more renewables in the energy mix it is unclear how security of delivery is guaranteed without sufficient back-up systems and without a crisis management system. The capacity mechanism study can be seen as the start of a chain of studies that will investigate the complexities of an interrelated energy system with more variable sources. One could argue that wind and solar energy improve security of supply but not security of delivery. It is possible that security of delivery will become more important in policymaking in Europe and that security of supply, still important policy drivers in China and India, will become less important. What will be the implication for policymaking and for Europe's role in IEF, IEA etc. It is possible that such a project could develop in the course of the year on the back of a project for ELI on security of supply. Much will depend on the progress of other studies and the research capacity

ANNEX 3: AGE OF PARADOX: ENERGY MARKETS AND POLICY-MAKING

CIEP RESEARCH AND ACTIVITY PLAN FOR THE PERIOD 2013-2016

Research focus for the period 2013-2016

In the previous four-year research plan, *Between a Rock and a Hard Place*, CIEP focussed on conflict and cooperation as the leading theme in the three research areas (in short, European energy markets, Security of supply, and renewable energy). In the research plan for the period 2013-2016, *Age of Paradox*, the leading theme is managing competing international and national energy interests in two main research areas: European energy market developments and policy-making and Geopolitics of energy policy-making and energy markets.

In these two themes both fossil and renewable energies will be studied, concentrating on liquid, gaseous and solid fuels, along the entire value chain. The organisation structure of these markets, such as the level of vertical and horizontal integration, investments, trade flows and the intervention in markets by governments, is of particular interest to understand the business models of both International (Oil) Companies (IOCs) and National (Oil) Companies (NOCs) and (European) power companies, while the driving forces of energy policies of key producing and consuming countries are also important to understand the complexity of International and European interest seeking. The impact on international political and economic relations (and markets) of a more energy self-sufficient United States will be an important part of research in theme two.

In the period 2013-2016, the long-term energy policies, such as the European 2050 Energy Road Map, and the impact on the energy market model and security of supply will be central in the research efforts. In particular, research will focus on how to keep the market attractive for imported (fossil) fuels during the transition to a more renewable energy mix, and the impact this transition has on security of demand (of oil, and natural gas) and energy diplomacy. The (relative) pricing of energy and externalities and the impact on the merit order in power generation (and investments) will be another important research area, while government instruments to change the energy mix (and fuel mix in the power sector) will feature high on the research agenda. The developments in the energy mix of crucial consumer and producer countries (such as US, China, India, Australia, Canada, Middle East and North Africa, Russia) will be an important element in understanding the geopolitics and geo-economics of energy. The impact of the shale gas revolution and other frontier developments on energy policies is another important factor to consider in the periods research. In both research themes, the international interests and the national interests will be contrasted.

All studies on oil, gas and renewable markets, and policy-making concerning the energy mix will be bundled in these two research themes. Our main interests are developments in the market for mobility and power generation, while industrial markets and value chain structures are also crucial.

The Gas group, Fuel mix group and Oil group are the main instruments in generating studies for the yearly agendas of the first theme. Theme two is mainly fed from research requests of governments and international institutions, although also the public research agenda cover this theme. Also here, the various brainstorm groups are expected to deliver topics for further research. Research under theme one is often done in smaller research groups, where staff from sponsors complements and/or supports CIEP staff. In theme two, CIEP staff often takes the lead and seek knowledge and discussion from sponsors, often through the brainstorm groups or contact group. Theme one research will have

a greater European (and sometimes Dutch) focus, while theme two will take the global energy scene as its point of departure. The successful formula of the brainstorm groups as the focus of internal discussion for the scope of studies will be unchanged. The composition of the groups gives CIEP a broad sounding board, while cooperation with other institutes prevents CIEP from becoming parochial in its approach. The change from three themes to two is merely a reflection of how integrated the security of supply/demand, environment and markets has become, both from a market and a government perspective.

Explanation new set up of research agenda for the period 2013-2016

In the previous two project periods (2004-2008; 2009-2012) we had subdivided the research into three main themes: the European energy markets; the geopolitics of energy supply and demand (security of supply and demand issues); and the low carbon energy mix. Increasingly, these three themes have become harder to separate from each other in the research projects. In markets for liquid fuels, biofuels have gained more market share in the market for transportation fuels, while in electricity generation, low carbon energy sources, such as hydro and nuclear, have been joined by biomass, wind, solar. In the heating and cooling sector, geothermal is gaining ground. Also in statistical data, renewable fuels are becoming more integrated, which makes it more natural to include all the fuels in the energy mix in our research agenda.

The introduction of these new fuels is policy driven and sometimes also (geo)politically or strategically driven. With the introduction of renewables into the national energy mixes, the role of the government in the energy sector is bound to expand in the coming period. Also, the current era of liberalisation in the OECD countries seems to have come to an end, at least in terms of its drive, also in the energy sector. As such, the emphasis of policy-making is now shifting to how liberalised energy markets can be regulated to allow for the introduction of renewable fuels. This is a main issue in Europe, in other economies, such as the US, the ample supply of natural gas has recently changed the energy landscape radically. Very often renewables are also seen or presented in the context of diversification of the energy mix and as such also part of the security of supply agenda. This very much depends on the domestic renewable potential of economies or regions. Imported renewables do not always create more security of supply, particularly not when the imports originate in one or two exporting countries and when the share of renewables in the energy mix becomes very large. Also renewable markets do not represent the same liquidity as for instance oil or to a lesser extent natural gas and coal, requiring different risk management tools for market participants. The intermittent nature of many of the renewable resources also implies that more complicated balancing services are required and that storage of electricity becomes a critical precondition. The inclusion of more renewables in the energy mix will pose new energy policy challenges that sometimes are underestimated. Availability of water, access to minerals and storage are examples. Connectivity also plays a major role. With European integration currently under stress, there should be concern about the internal market and the assumptions on which many market players have approached the European energy market in the past few years.

The incentives to manage the energy mix are different for various countries, depending on the main energy policy concern. In the US, the incentives to stimulate new fuels into the energy mix are mainly security driven and are focussed on reducing oil import dependency. The prospect of increasing oil imports, the concentration of conventional reserves in the Middle East, and the rising prices

stimulated the development of biofuels. Yet, also other issues influence the choice of governments to stimulate some fuels over others. In the US the agricultural sector faced declining government subsidies, in part because of WTO negotiations and in part because of fiscal concerns. The stimulation of corn-based biofuels can be seen as a way to reintroduce certain farm subsidies for hard-pressed American states. Also political arguments play a role. In general, there is a big difference in main policy drivers among states with and without sufficient fossil fuels resources, and those with renewable potential. The introduction of shale gas in the energy mix of the US has changed the strategic outlook of the country from being increasingly import-dependent to a country with substantial domestic resources, also in a carbon poorer mix. The main concern continues to be oil security, with a different geographical focus.

In China, the main focus is also on security of oil supply and the development of oil prices. Although China is rapidly becoming a main producer of windmills and solar panels, based on relatively cheap labour and the availability of rare earth inputs, the place of coal in the Chinese energy mix will remain very large indeed. Due to the geographical shift in economic (industrial) activity to the Asian economies, carbon and energy intensity of economic growth began to climb again after decades of declining. Given the growing import dependency of China, but also of India and other emerging markets, stimulation of domestic resources, fossil or renewable, will be deemed crucial to manage the balance of payments and the internal economy. The emerging economies have so far prioritised economic growth over sustainability, but this could change in the coming decades. In the coming years, China will still be poised on economic growth and will subsequently have to handle its increasing call on imported energy. Diversification to source and origin and energy efficiency will be the main policy instruments it can deploy, but the concentration of resources and limited access to foreign resources for investment will limit the effectiveness of the diversification policy.

With domestic oil and gas resources maturing or declining, the import dependency will increase. This also played a major role in discussions in the current project period. The dependence on Russian gas became a major (political) issue, not in the least because of the larger dependency of the new member states on one supplier and concentrated transit routes. Where west European countries were able to manage their dependency in gas with LNG supplies, and alternative routes, the east has fewer options. Shale could develop into an important tool of security of supply for this region, but west Europe is less favourably poised to develop this option. The natural gas discussion will continue to be important in the coming years, not in the least that natural gas provides emission advantages that coal with biomass cannot provide and with CCS on a commercial basis some years away. With a relatively declining carbon footprint (because of growing footprints of emerging markets) Europe must carve out a no regret energy strategy, which does not impair its economic competitiveness. A non-fossil strategy in an open world economy is more difficult when other competitors make other choices and the ability to finance such a strategy is constrained. The medium term problems could be too large to leap frog into the envisaged 2050 low carbon world without other main economies making similar commitments. At the same time, the governance costs of international energy may become much higher and geopolitically very different, forcing Europe to make hard choices. The European climate and energy discussion remain crucial for future energy market developments, just like international market developments in oil and gas will remain important drivers.