

EUCERS Newsletter

Newsletter of the European Centre for Energy and
Resource Security (EUCERS)

Issue 71, January 2018

Introduction

Dear readers and friends of EUCERS,

It is my great pleasure to welcome you to this latest edition of the EUCERS newsletter, in which we present you with two regionally focused articles that.

In the first article, Delft University's Caroline van Calcar and Daniel Scholten take a closer look at the Dutch energy transition.

In the second article, Maciej Hacaga, a PhD candidate at the War Studies University in Warsaw (Poland), outlines the difficulties Poland faces in decarbonising its energy matrix.

I cordially invite the readers to send me your assessment of the impact of these scenarios and discuss possible consequences for European energy and geo-politics.

Furthermore, the newsletter will inform you about the recent activities at EUCERS, including our latest strategy papers on Mexico's energy map and the impact of the Paris Agreement on European gas.

Thank you for your interest in EUCERS and for being part of our community.

Yours faithfully,
Thomas Fröhlich
EUCERS Newsletter Editor

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ARTICLES

The Dutch Energy Transition: Shifting Topology and Fortunes

By *Caroline van Calcar and Daniel Scholten*

The discovery of natural gas in Slochteren in 1959 kick started a major transition in the Dutch energy sector. The move from coal mined in Limburg to natural gas extraction in Groningen had a huge impact on both provinces in particular and the Dutch energy sector in general. After the last of the twelve coal mines in Limburg was shut in 1969, half of the workforce in Limburg was left unemployed, considered unfit, or in early retirement (NOS 2014). Political leverage of Limburg on the overall energy policy also took a hit, considering coal-fired power plants located in other provinces were no longer dependent on coal from Limburg. In Groningen, natural gas created space for thousands of jobs and allowed the region to establish itself as an energy hub, economically, politically, and academically. Gas export revenues also became a welcome addition to the national treasury.

The increasing use of renewable energy sources is set to bring a similar shift in power and heat production topology. Renewable sources are far more abundant and geographically dispersed than today's coal and gas installations and lend themselves more to decentral forms of generation. The question that remains is whether the economic and political implications of this transition will be as severe as those of the transition to natural gas. While we cannot discuss all relevant implications for the energy sector here, we will use electricity production from wind and solar to lift the tip of the veil.

Towards a Renewable Energy Landscape

The last two decades, approximately 87% of electricity in the Netherlands was generated domestically (Wezel 2015). Natural gas and coal account for about 70% and 30% of this production respectively. A quick look at the map of the Netherlands (Figure 1) tells us that the production of electricity from natural gas and coal is essentially located in Groningen and the Maasvlakte (Wikipedia 2018). In turn, the provinces of Groningen and Zuid-Holland hold prominent positions in the Dutch electricity sector.

Caroline van Calcar is a master student in geoscience and remote sensing at TU Delft. She holds a bachelor's degree in systems engineering, policy analysis and management. Caroline is interested in the transition to sustainable energy, and also in monitoring climate change with a focus on the physics of the earth and atmosphere.

Daniel Scholten is Assistant Professor at the faculty of Technology, Policy and Management of Delft University of Technology. He specializes in the geopolitics of renewables and the governance of renewable energy systems. Daniel's PhD (TU Delft, 2012) analyzes the organizational requirements of future energy systems at the TU Delft. He holds degrees in Political Science (Radboud University, 2003) and International and European Relations (University of Amsterdam, 2006, with distinction).

Increasing pressure on coal, the dirtiest of fossil fuels, and depleting domestic natural gas reserves plus concerns about earthquakes in the Groningen region have recently swung the favor of the Ministry of Economic Affairs towards renewable energy sources such as solar, wind, and biomass (NOS 2016). For now, wind (onshore) and biomass (co-generation) have mostly accounted for the rising share of renewable energy sources in the electricity mix, currently at 5.6% (CBS 2015). In the future, solar PV and offshore wind hold great prospects for further growth, with the potential for wind and solar estimated at 42000 MW and 22-90 TWh per year respectively (PVL 2011). The targets are to increase the share of renewable energy to 14% in 2020 and 16% in 2023 according to the National Energy Agreement (SER 2013). More rigorous, the Provinces have set up ambitious structural visions to realize an energy neutral or sustainable society by 2050¹, depending on local potential and possibilities. If executed, even only half-way, renewable energy will change the topology of electricity production (and distribution).

Wind and solar electricity can be generated throughout the Netherlands. Nevertheless, wind speeds are most favorable near the coast and on the North Sea and wind farms require large open spaces. In turn, the Ministry of Infrastructure and Environment of the Netherlands has designated several areas onshore and in

¹ Flevoland is the most ambitious province with the aim to be already energy neutral in 2020 (Natuur en Milieufederatie Flevoland 2014).

the Dutch North Sea as locations for wind farms (Ministerie van Infrastructuur en Milieu & Ministerie van Economische Zaken 2014), though it remains to be seen in how far onshore projects will continue in the face of offshore competition. Solar radiation intensity is also strongest along the coastal areas, but its real potential depends on the availability of roof surface in urban areas and the space for solar farms in rural areas. For example, 62% of 800000 buildings in Noord-Holland appear suitable for solar power which provides opportunities for a fully renewable electricity supply by 2050 (Provincie Noord-Holland 2016). Government policy provides feed-in tariffs ('saldierungsregeling'); realization is essentially left to the initiative of individual households, cooperatives, and businesses.

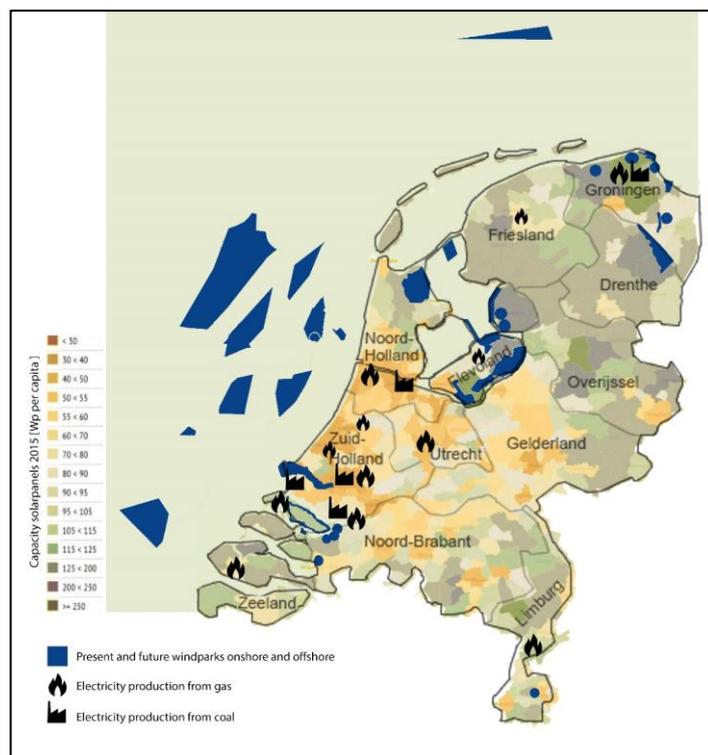


Figure 1: Map of The Netherlands including present and future wind parks (Ministerie van Infrastructuur en Milieu & Ministerie van Economische Zaken, 2014), current electricity production from gas and coal (Wikipedia, 2018) and the current capacity from solar panels (Segelaar 2015).

Shifting Economic and Political Fortunes

The transition to renewable energy implies a major overhaul of the Dutch energy map. Electricity generation moves from the key facilities in Groningen and the Maasvlakte to a more diverse set of provinces and producers, though this deconcentrating differs between wind and solar. Regarding wind, the coastal provinces dominate; Groningen and Zuid-Holland (Maasvlakte) maintain a strong position in the electricity sector,

harboring both onshore and offshore potential, while Flevoland (onshore), Noord-Holland (offshore and onshore) and Zeeland (offshore and onshore) represent new production sites. Production stays dominated by big companies considering the scale of wind parks and expertise needed for offshore activities. Solar PV based generation implies a much more widely dispersed pattern as households, cooperatives, and companies become the producers in urban areas, next to a few solar farms in more rural areas. Solar markets will hence be shaped by a broader variety of actors than wind. Considering the mid-west of the Netherlands, the Randstad area is the most urbanized, most solar related activity is likely to take place there.

Employment only partly shifts along with production. Wind turbines and solar panels need to be built and maintained, but not constantly operated like power plants that require continuous resource input. This has two effects. First, a settled labor force is not required, as know-how, materials, skilled labor, and semi-finished products can be attracted from anywhere during the construction and maintenance of wind turbines and PV panels. Consequently, employment is geographically decoupled from production, i.e. more decentralized. Nevertheless, the use of harbors for offshore activities will attract activity there thus coastal provinces may hence be expected to gain more than the rest. Second, employment opportunities in the private sector are likely to drop. Self-provision via PV panels foregoes the need for a dedicated workforce to generate power. Then again, it could be that ancillary services for wind and solar are larger than those for power plants; storage technologies to handle intermittency are a case in point.

Concerning revenues, much remains unclear. Provinces earn money via permitting, taxing used space and dividends from regional network companies of which they hold shares. Installing new turbines and solar farms gives opportunities to generate revenues, but less traffic over the regional grid once households and businesses have partly become self-sufficient diminishes them. It seems hence that provinces with onshore wind parks that deliver electricity to consumers via the regional grid are most certain to retain revenues (Flevoland and Groningen).

Different Transition, Different Implications

The transition from coal to gas had a large impact on a few locations. In contrast, the transition from fossil fuels to renewables will have a smaller impact across many provinces. The decentralization of electricity generation levels the political leverage provinces have over national energy policy, though some coastal provinces, mostly Flevoland, Zuid-Holland, Noord-Holland still have a more prominent position than those inland, such as Limburg, Noord-Brabant, Gelderland, though biomass could boost the latter's position. Employment decouples from generation geographically, though offshore wind ambitions are likely to strengthen coastal provinces' position, and become less as solar PV self-provision shifts emphasis from big companies to households and businesses. The national government and the provinces should be aware of these changes and prepare for them. Back in the 1960s, governmental institutions such as Statistics Netherlands were purposefully located in Limburg to compensate for job losses there. Such policy might not be necessary now, as the speed of the energy transition is much lower, but situating storage facilities, other contributory energy services, and new heat infrastructure installations in provinces with fewer wind opportunities could be a way of compensating these areas.

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Polish lignite at a cross-roads

By Maciej Hacaga

In December 2017, the General Directorate for Environmental Protection of Poland decided to reject the application for the new Ościsłowo open-pit lignite mine¹. The application is now up for re-consideration by the Regional Directorate for Environmental Protection in Poznań. This will slow down (or possibly block²) the development of a mine that is necessary for the operation of the Pątnów power station. This is yet another escalation in an ongoing debate over what the future will bring for the Polish lignite industry.

To put the lignite problem in perspective, let us consider its two main consumers in Europe – Germany and Poland. In 2015, lignite generated 23.9% of electricity in Germany³, compared to 32.1% in Poland⁴ with the former producing 178.1m tonnes⁵ and the latter only 63.1 m tonnes⁶.

There are⁷ five open-pit mines in Poland, working on nine coal deposits, covering an area of 145 km²⁸. Three of these power plants belong to the privately owned ZE PAK S.A. (Zespół Elektrowni Pątnów–Adamów–Konin Spółka Akcyjna)⁹ while the other two are in possession of state-controlled PGE GiEK S.A. (PGE Górnictwo i Energetyka Konwencjonalna Spółka Akcyjna)¹⁰.

¹ The General Directorate for Environmental Protection, Decyzja w sprawie odkrywki Ościsłowo wraca do pierwszej instancji, 2017, <<https://www.gdos.gov.pl/decyzja-w-sprawie-odkrywki-oscislowo-wraca-do-pierwszej-instancji>>

² Foundation „Development YES - Open Pit Mines NO”, Generalna Dyrekcja Ochrony Środowiska potwierdza szkodliwość planowanej odkrywki Ościsłowo. ZE PAK liczy na cud, 2017, <http://odkrywka.info/odkrywka_info/wp-content/uploads/2017/12/2017-12-06-GDOS-potwierdza-szkodliwosc-odkrywek.pdf>

³ Euracoal, Germany, <<https://euracoal.eu/info/country-profiles/germany/>>

⁴ Euracoal, Poland, <<https://euracoal.eu/info/country-profiles/poland/>>

⁵ Euracoal, Germany, <<https://euracoal.eu/info/country-profiles/germany/>>

⁶ Euracoal, Poland, <<https://euracoal.eu/info/country-profiles/poland/>>

⁷ Polish Geological Institute – NRI, Węgiel brunatny - podstawowe informacje, <<https://www.pgi.gov.pl/psg-1/psg-2/informacja-i-szkolenia/wiadomosci-surowcowe/9786-wegiel-brunatny.html#ydobycie>>

⁸ Kasztelewicz, Z., and M. Ptak, Rekultywacja terenów pogórnich w kopalniach surowców skalnych., Prace naukowe Instytutu Górnictwa Politechniki Wrocławskiej. Studia i materiały, 2011, <<http://www.miningscience.pwr.edu.pl/Reclamation-of-post-mining-terrains-in-polish-quarries,59919,0,2.html>>

⁹ Zespół Elektrowni Pątnów - Adamów - Konin SA, <<http://zepak.com.pl/en/>>

¹⁰ <<https://www.gkpg.pl/investor-relations/PGE-Group/Who-we-are>>

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Lignite's share in overall Polish coal reserves is about 23%¹¹.

The future of the Polish lignite industry was hotly debated in 2017. On the one hand, representatives from the industry, academia and unions prepared “the program for the brown coal mining sector in Poland”¹², that was presented in May 2017. It underlines lignite's role for the Polish power generation sector and argues that to maintain the current potential of lignite in the future it is necessary to develop three new deposits until 2030 and three more until 2050. A successful launch of these fields would enable the production of electricity from lignite at a level of approximately 25% of projected electricity demand in 2050.

Therefore, unsurprisingly, in July 2017 deputy minister of the Ministry of Energy Tobiszowski expressed his clear conviction about a positive decision on the development of the Złoczew deposit. This is one of the three mines projected to be developed until 2030, which is needed to supply the Bełchatów power plan - with 5.42 MW t of installed capacity the world's largest lignite fired power plant. The other tempting argument in favour of further development of this deposit is that the construction of a nuclear power plant to replace Bełchatow might take too long to ensure continuous electricity supply¹³.

The structure of lignite-fired power generation in Poland

	ZE PAK S.A.	PGE GiEK S.A.
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¹¹ BP Statistical Review of World Energy, 2017, <<https://www.bp.com/content/dam/bp/en/corporate/pdf/energy-economics/statistical-review-2017/bp-statistical-review-of-world-energy-2017-coal.pdf>>

¹² The 2016 annual report of ZE PAK S.A., <http://ri.zepak.com.pl/upload/aggregate/ZEPAK_2016-R_consolidated_report_fin.pdf>

¹³ The PGE 2016 Integrated Report, <<http://raportzintegrowany2016.gkpg.pl/en/responsibility/pge-capital-markets/ownership-structure>>

	(Zespół Elektrowni Pątnów–Adamów–Konin Spółka Akcyjna)	(PGE Górnictwo i Energetyka Konwencjonalna Spółka Akcyjna)
Ownership structure	51,55% of shares privately owned by Zygmunt Solorz Żak ¹⁴	57.39% of shares state-owned ¹⁵
Power plants¹⁶	Adamów – 600MW Konin – 143MW Pątnów – 1664MW The Adamów facility was closed in January 2018 ^{17,18} .	Turów – 1488MW Bełchatów – 5298 MW
Contested open-pit mines mentioned in this piece	Lignite from the Oscislowo deposit is projected to supply the Pątnów power plant	Lignite from the Żłoczew deposit is projected to supply the Bełchatów power plant

However, researchers associated with the pro-coal side tend to underplay social and environmental impacts¹⁹ of lignite mining, that are regularly raised by opponents of lignite. Firstly – protection of cultural heritage. Ancient tombs have recently been discovered in an area planned to be developed²⁰. People will be forced to move out of their homes, which might not be an unsurmountable issue if residents will be appropriately compensated, like the residents of the German village of Immerath. Secondly, profits for local societies may be elusive. The richest commune in Poland²¹ is right behind the

¹⁴ Widera, Marek, Zbigniew Kasztelewicz, and Miranda Ptak., *Lignite mining and electricity generation in Poland: The current state and future prospects.*, Energy Policy, 2016, <<https://www.sciencedirect.com/science/article/pii/S030142151630043X>>

¹⁵ ZE PAK S.A., <<http://zepak.com.pl/en/about-us/company-overview.html>>

¹⁶ Foundation „Development YES - Open Pit Mines NO”, 2018, *2018 begins with the closure of one of Europe’s most polluting coal plants.*, <<http://rozwojtak-odkrywkinie.pl/index.php/en/welcome/news/2018-begins-with-the-closure-of-one-of-europe-s-most-polluting-coal-plants>>

¹⁷ *Program dla sektora górnictwa węgla brunatnego w Polsce*, 2017, <[http://orka.sejm.gov.pl/opinie8.nsf/nazwa/390_20170705/\\$file/390_20170705.pdf](http://orka.sejm.gov.pl/opinie8.nsf/nazwa/390_20170705/$file/390_20170705.pdf)>

¹⁸ Jakóbk, W., *Is it too late for nuclear energy? A report announcing the battle*, 2017, <<http://biznesalert.com/late-nuclear-energy-report-announcing-battle/>>

¹⁹ Widera, Marek, Zbigniew Kasztelewicz, and Miranda Ptak., *Lignite mining and electricity generation in Poland: The current state and future prospects.*, Energy Policy, 2016, <<https://www.sciencedirect.com/science/article/pii/S030142151630043X>>

²⁰ Ciobanu, C., 2017, *Will Discovery of Ancient Tombs in Poland Halt a Proposed Coal Mine?*, <www.ancient-origins.net/news-history-archaeology/will-discovery-ancient-tombs-poland-halt-proposed-coal-mine-007655>

²¹ *Kleszczów, Łódź Voivodeship – Wikipedia*, 2018, <https://en.wikipedia.org/wiki/Kleszcz%C3%B3w,_%C5%81%C3%B3d%C5%BA_Voivodeship>

Bełchatów power plant but studies argue that job creation is questionable while losses in agriculture are certain²². Thirdly, air quality is getting worse. Together with Romanian coal, Polish and German coal are responsible²³ for more than half of total health impacts originating from coal in the EU. Poland is leading the rankings of premature deaths and health costs caused by coal²⁴. Low quality of air pushed Polish activists²⁵ to file a complaint with the European Union²⁶ against national and local authorities for failing to fight lethal levels of smog in early 2017.

Last, but not least, local environmental issues remain at the forefront of the debate as Polish energy companies have been struggling with this topic for a long time. The existing open-pit mine Tomisławice is the subject of a long ongoing investigation for its violation of EU environmental directives. The European Commission has raised that issue several times over the recent years - in 2010²⁷, in 2012²⁸, and in June 2017²⁹. Moreover, in early 2017, ZE PAK failed³⁰ to secure an environmental assessment for the planned construction of an open-pit mine in Oscislowo. Its status is on hold as the General Directorate for Environmental Protection ordered its regional office to reconsider the application, as mentioned at the beginning.

²² Foundation „Development YES - Open Pit Mines NO”, *WHAT ZE PAK?!*, 2017, <<http://rozwojtak-odkrywkinie.pl/index.php/en/welcome/news/what-ze-pak>>

²³ Health and Environment Alliance, 2013, *Coal’s unpaid health bill*, <<http://www.env-health.org/policies/climate-and-energy/coal-s-unpaid-health-bill-220/>>

²⁴ Health and Environment Alliance, 2016, *Europe’s Dark Cloud*, <<http://www.env-health.org/policies/climate-and-energy/europe-s-dark-cloud/>>

²⁵ Reuters Editorial, 2017, *Activists to complain to EU over Poland’s choking air pollution*, <<https://www.reuters.com/article/poland-environment/activists-to-complain-to-eu-over-polands-choking-air-pollution-idUSL5N1FV2UE>>

²⁶ *Polish activists complain to EU about toxic smog*, 2017, <<https://phys.org/news/2017-02-activists-eu-toxic-smog.html>>

²⁷ Greenpeace, 2010, *Miażdżąca ocena Komisji Europejskiej w sprawie odkrywki "Tomisławice"*, <<http://www.greenpeace.org/poland/pl/wydarzenia/polska/komisja-ocenia-odkrywke-tomislawice/>>

²⁸ European Commission, 2012, *Press release - Environment: Commission urges Poland to comply with nature protection rules*, <http://europa.eu/rapid/press-release_IP-12-70_en.htm>

²⁹ European Commission, 2017, *Press release - June infringements package: key decisions*. <http://europa.eu/rapid/press-release_MEMO-17-1577_en.htm>

³⁰ ZE PAK SA, 2017, *Current report no. 3/2017 - Decision of the Regional Director of Environmental Protection in Poznan on the Oscislowo opencast*. <<http://ri.zepak.com.pl/en/reports/current-reports/1033-decision-of-the-regional-director-of-environmental-protection-in-poznan-on-the-oscislowo-opencast.html>>

Lignite-based power plants indisputably generate a number of residues and large amounts of emissions to all layers of environment. However, the recently adopted Best Alternative Techniques (BAT) Conclusions significantly tighten emission standards. Some experts even argue that “BAT conclusions are a real revolution for Poland’s energy sector”³¹. The seriousness of the conclusions is backed by the call of PKEE³² (the Polish Electricity Association) for temporary exceptions for Polish plants to meet the emission limits. Moreover, Polish power generation companies already paid significant costs to adapt to the standards already introduced. Hence, lignite is getting cleaner - and more expensive.

One recent paper stresses the biased nature of the discussion about the role of lignite in Poland and called³³ for a debate based on a socio-economic cost-benefit-analysis. The recent expansion of an open-pit mine in Germany, that resulted in the demolition of a seven hundred years old village, exemplifies the fact not only Poland grapples with the problems arising from energy transitions. The key question therefore is, whether the overall cost of lignite mining, including externalities, is higher compared to the cost of the large-scale installation of renewables including subsidies. Certainly, the former will get more expensive over time while the cost of the latter will diminish. But there is a point to be made that the phase out of lignite is being rushed. As each technology brings benefits and costs, a more balanced perspective is needed, one that will take national circumstances into account. If Germany is unable to make an immediate transition to renewables and continues to rely heavily on lignite, how could one expect Poland to achieve de-carbonisation at this pace?

The heat of the lignite debate distracts from the more important aspect of electricity production. For the last two hundred years increasing energy consumption has been coupled with economic growth. Poland’s electricity is projected to increase by 55% by 2030, compared to 2006³⁴. Some countries have seen small successes in decoupling their economic growth from increases in energy consumption. There is too much focus on the supply side compared to demand. Despite recent global progress, some scholars argue compellingly that decoupling may be a delusion³⁵. They show that neither fuel substitution (from fossil fuels to renewables) nor efficiency can sustain modern lifestyle indefinitely. This suggests that a shift away from an economic model dependent on growth as the solution. Otherwise, no number of windmills will prevent reaching limits of growth³⁶.

DISCLAIMER

The views expressed in this Newsletter are strictly those of the authors and do not necessarily reflect those of the European Centre for Energy and Resource Security (EUCERS), its affiliates or King’s College London.

³¹ Schnell, C., 2017, *Schnell: Winter package? BAT conclusions are a real revolution for Poland’s energy sector.*, <<http://biznesalert.com/schnell-winter-package-bat-conclusions-real-revolution-polands-energy-sector/>>

³² Editorial, 2017, *Battling the BAT. Poland may postpone the sentence for coal.*, <<http://biznesalert.com/battling-bat-poland-may-postpone-sentence-coal/>>

³³ Badera J., Pazderski L., 2017, *Effects of lignite surface mining on local communities: controversies and areas of negotiation*, Environmental & Socio-economic Studies. <<https://www.degruyter.com/view/j/environ.2017.5.issue-3/environ-2017-0014/environ-2017-0014.xml>>

³⁴ *Prognoza Zapotrzebowania Na Paliwa I Energję Do 2030 Roku. Załącznik 2. do „Polityki energetycznej Polski do 2030 roku”*, 2009, <<http://www.me.gov.pl/files/upload/8134/Prognoza%20zapotrzebowania%20na%20paliwa%20i%20energje-ost.pdf>>

³⁵ James Ward et al., 2017, *The decoupling delusion: rethinking growth and sustainability*, <<https://theconversation.com/the-decoupling-delusion-rethinking-growth-and-sustainability-71996>>

³⁶ Meadows DH, Meadows DL, Randers J, Behrens W., 1972, *The Limits to Growth*, Universe Books: New York.

ANNOUNCEMENTS

EUCERS Strategy Papers No. 15 and No. 16 published

EUCERS is delighted to announce the publication of the two newest Strategy Papers published together with the Konrad Adenauer Foundation. The two papers are the work of our Konrad Adenauer Foundation Fellows at EUCERS of 2016/17.

In Strategy Paper 15, Alexandra-Maria Bocse analyses the Paris agreement and its impact on the European gas industry. Pablo D. Necochea Porras analyses new challenges and opportunities of the energy reform in Mexico in EUCERS Strategy Paper No.16.

Follow the link below for EUCERS Strategy Paper No. 15: The Paris agreement: And its impact on the European gas industry.

<https://www.kcl.ac.uk/sspp/departments/warstudies/research/groups/eucers/pubs/strategy-paper-15.pdf>

Follow the link below for EUCERS Strategy Paper No.16: Mexico: Redrawing the Global Energy Map through its Energy Reform New Challenges & Opportunities.

<https://www.kcl.ac.uk/sspp/departments/warstudies/research/groups/eucers/pubs/strategy-paper-16.pdf>

1st EUCERS/KAS Energy Talk 2018:
Global climate policy in the wake of the US withdrawal from the Paris Agreement: Security challenges

07. March 2018, 14-16:00 followed by a reception ♦ War Studies Meeting Room ♦ Strand Campus ♦ King's College London ♦ WC2R 2LS

The first energy talk in our new series on "Climate Change and Security" jointly hosted by Konrad Adenauer Foundation in London and EUCERS focuses on 'Global climate policy in the wake of the US withdrawal: Security challenges'. We will welcome Peter Mather, Group Regional President, Europe & Head of Country, UK, BP plc as keynote speaker. A full programme will be distributed in the coming weeks.

This introductory talk questions, what is the future of global climate policy since the entry into force of the Paris Agreement and the US' subsequent withdrawal and what this means for security challenges associated with climate change? Has the US withdrawal dampened global climate

action or has it (unwittingly) increased the momentum from a variety of different actors to act on climate change? Additionally, this talk links climate change to threats to global security and examine how governments, multinational corporations and international organisations have responded. If, as the intergovernmental and corporate sector argue, less carbon intensive sources of energy will begin to replace fossil fuels by mid-century, what will this mean for energy security around the world? The first of four talks taking place in 2018, it will define this year's focus on security concerns surrounding climate change.

In order to attend the event please RSVP with your name and affiliation to: carola.logan@kcl.ac.uk.

EUCERS ON THE ROAD

Our team represents EUCERS at various conferences and events all over the world. This section gives a regular update and overview of conferences and interview contributions by EUCERS Director Professor Dr Friedbert Pflüger, Research Director Dr Frank Umbach and Associate Director Dr Adnan Vatansever, as well as by our Research Associates.

25-26.01.2018 Luxembourg	Frank conducted the training course "The Security Union: Cybersecurity" for employees of the European Parliament, organized by the European Parliament and the European Institute for Public Administration (EIPA)
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PUBLICATIONS

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