

EUCERS Newsletter

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

Issue 87, September/October 2019

Introduction

Dear readers and friends of EUCERS,

It is my great pleasure to welcome you to this edition of the EUCERS newsletter. As always, we present you with two articles concerning the topic of energy security.

In the first article, Julia Epp, a research fellow at the Berlin-based think tank WZB, offers “High Hopes for Hydrogen” and outlines parts of Germany’s “Kopernikus” project.

The second article, by University of Central Lancashire’s Niki J.P. Alford, showcases Japan’s ambition to deliver the first Olympic Games completely powered by renewables.

Coinciding with the 10-year anniversary of EUCERS, that will be celebrated in February 2020, we are adjusting our name to “European Centre for Climate, Energy and Resource Security”.

We would furthermore cordially invite you to our 4th EUCERS-KAS Energy Talk 2019, which will focus on the future of mobility.

As always, please feel free to keep us informed about your research projects and findings as we look to remain at the forefront of new knowledge and innovative ideas.

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

High Hopes for Hydrogen

By Julia Epp

The transformation of the current energy system towards carbon-free energy sources is a central element to meet the goals of the Paris Agreement. Therefore, national governments around the world have invested heavily in decarbonizing the electricity, transport and heating sector. The roll-out of renewable energies, which build the fundament of the new energy system, is the core strategy for a global energy transformation alongside with energy efficiency measures. While many countries have achieved emission cuts in the electricity sector, the heating and transport sector still pose great challenges. Using renewable energy sources in direct electrification processes like heating pumps and battery electric cars are two important technological pathways to decarbonize these two sectors. A parallel pathway, which is gaining increasing attention, is hydrogen and products based on hydrogen.

The main idea behind a so-called “hydrogen economy” and concomitant “Power-to-X” (P2X)-technologies is the usage of renewable electricity (Power) in electrolysis (to) to produce “green” hydrogen and in further processing steps synthesizing fuels or products (X). Examples of these pathways are: gaseous substances such as hydrogen or methane (Power-to-Gas); liquids such as kerosene and methanol for mobility (Power-to-Liquid) and basic chemicals for the chemical industry (Power-to-Chemicals). If renewable energies are used in electrolysis, the synthesized products would be carbon neutral. Additionally, water and CO₂ are needed as feed stock.

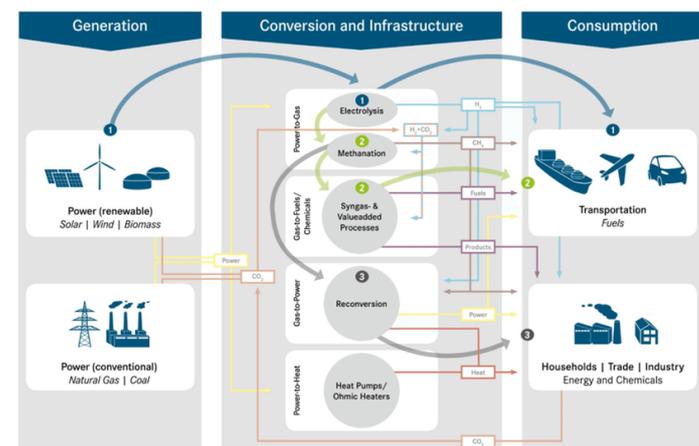


Figure 1: Schematic diagram of the Power-to-X-concept (source: Robinius et al.

Julia Epp studied Political Science at the University of Constance and Integrated Natural Resource Management at the Humboldt University of Berlin. She works as a research fellow at the Berlin Social Science Center (WZB) on the social and political dimensions of the energy transition. Her doctoral thesis examines concepts of linking the electricity, mobility and heating sector in a renewable energy system, in consideration of the contribution of synthetic fuels or products (Power-to-X-technologies)

2018)

Hydrogen applications: advantages and disadvantages

Hydrogen based applications are ordinary interesting solutions for various reasons: First, they are a viable flexibility measure to deal with the volatility of renewables. For example, on windy days wind power generation can overcharge the electricity grid and instead of shutting wind plants down, power-to-gas-plants can be used to produce green hydrogen. Second, hydrogen and methane can store renewable energies over a longer period of time - making it an attractive heating option during winter periods. Third, the chemical sector and heavy-duty transportation, as well as the shipping and aviation sector, depend on hydrogen-based products and fuels to become fossil free. Yet, there is also a disadvantage (which should not be overlooked): The process of synthesizing renewable energies into other products always involves a loss of energy. For example, the energy efficiency of producing hydrogen via conventional electrolysis is around 62 to 70 percent (Diermann 2017). Transporting the hydrogen to a gas station and using it to power a fuel cell car is furthermore associated with additional energy losses. Compared to a battery electric vehicle, only one fourth of the renewable power would end up in the fuel cell car over the whole energy process chain. That is why the large-scale use of hydrogen massively depends on the availability and access of renewable energies.

It is yet unclear which role hydrogen-based products will play in a renewable energy future. The world energy council predicts that until 2050 the need for P2X-products will be equivalent of half of today's oil demand (World Energy council 2018). A global P2X-market isn't established yet. However, countries like Norway and Iceland have already announced strategies to become P2X exporters (id.). China, Japan and Korea have set

ambitious targets for fuel cell cars on the roads (Reuters 2019). And recently, the topic has also gained increasing attention in Germany, where P2X-technologies are becoming a core strategic element for the energy transition (Gielen et al. 2019). Respectively, Germany's largest project on the energy transition – the Kopernikus project - is concerned with exploring the role of P2X in the energy transition (Federal Ministry of Research and Education 2019).

Knowledge and associations of P2X-technologies

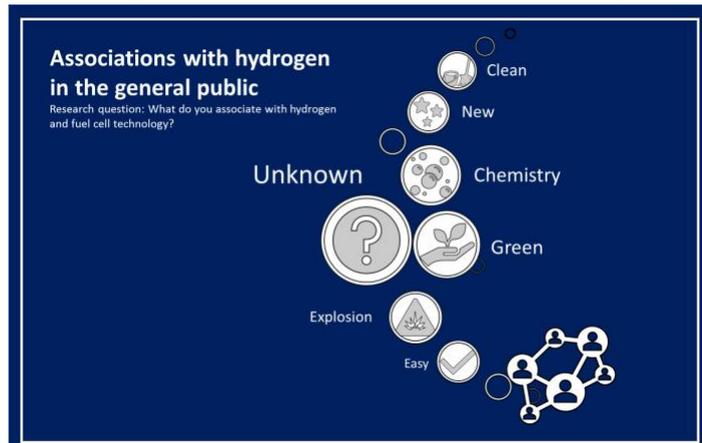


Figure 2: Associations with hydrogen in the general public based on focus group discussions by the WZB in 2018 (source: own illustration)

Within the scope of the Kopernikus project, the Berlin Social Science Center (WZB) examines the social acceptance of the development of hydrogen-based energy systems under special consideration of the application of fuel cell vehicles. As part of the project, the WZB initiated several studies concerning societal knowledge of and associations with P2X- technologies: acceptance and perception within civil society and users, possible development paths for applying hydrogen based-products, discourse analysis and communication studies about technical complexity and socio-ecological criteria concerning the establishment of a global P2X market. The results of these numerous studies were now published in an anthology on the societal perspective of the energy transition. To get an understanding of the results of the research, the following paragraphs will summarize three main findings gained from research in the Kopernikus project:

In 2018, the WZB and WWF Germany conducted a representative study about the knowledge on renewable energies and hydrogen in the general public (Epp & Bellmann 2019). The results showed that only 16% of people had a profound or general idea about hydrogen

as storage technology, while more than 50% of the participants could explain wind and solar power in detail or in general (n=510). Moreover, more than 40% of the participants stated that they had knowledge how battery-electric cars operated, whereas only 20% of them knew about the functioning of fuel cell cars. The same year, the WZB furthermore organized focus groups with the general public discussing the role of hydrogen in the energy transition. The participants of the focus groups were asked to write down adjectives they connected to or associated with the word hydrogen and fuel cell technology. The focus groups showed that most people had no knowledge about hydrogen (figure 2). Participants with knowledge about hydrogen mostly associated it as a chemical product or as environmentally friendly, maybe because they had previous knowledge about fuel cell cars. A third study of the WZB was concerned with the positions of environmental associations towards the promotion and usage of P2X-technologies (Schmidt et al. 2019). The interviews with mobility and energy experts from the large German environmental associations like Friends of the Earth, Nature or Biodiversity Conservation Union indicated that the application of hydrogen and hydrogen-based products is seen critical, especially when it comes to the mobility sector. Battery electric cars are seen as more technological advanced and disposing a higher energy efficiency rate than fuel cell cars. Fuel cell cars have certain advantages as well, like the short amount of time that is needed for fuel-filling (around 5 minutes) and the high range of cars (up to 570 km in the Hyundai Nexa). However, fuel cell cars are significantly more expensive than battery electric cars and they lack refueling infrastructure. At the same time, the usage of P2X fuels in heavy-duty vehicles, trains, shipping and aviation is estimated to become more attractive in the near future, since hydrogen-based products have a higher energy density.

From hope to reality

When the Kopernikus-project started in 2017, the awareness on P2X for the energy transition had been significantly lower (Schmidt et al. 2019). While promoting renewable energies is central to advance the energy transition, the next steps of transforming the energy system will be even more complex: Linking the mobility and heating sector stronger together with the electricity sector poses many technical, regulative, societal and economic issues. P2X technologies have not

experienced high attention in the public discourse yet, but industrial players – particular in the mobility and chemical sector – is heavily investing in P2

X technologies to enhance competitiveness. The role of research in this context is to monitor and evaluate the next steps of the energy transition and translate these developments and their implications for the general public. The detailed studies and results by WZB were published in September 2019 together with the findings of other large German environmental research institutes in the book “Acceptance and political participation in the energy transformation” at Springer focusing on the social dimension of the energy transformation in Germany.

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Schmidt, Anke, Canzler, Weert & Epp, Julia (2019): Welche Rolle kann Wasserstoff in der Energie- und Verkehrswende spielen? Positionen und Einschätzungen von Verbänden zur Akzeptanz von Wasserstoff. In: M. Knodt, C. Fraune, S. Gölz, & K. Langer (Hrsg.), *Akzeptanz und politische Partizipation in der Energietransformation*. Available online at: <https://www.springerprofessional.de/welche-rolle-kann-wasserstoff-in-der-energie-und-verkehrswende-s/17099784>

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How Japan's renewables-powered Olympics could kick off a global race for clean energy

By Niki J.P. Alsford

Japan is aiming to host the [first Olympic Games powered solely by renewable sources](#). If successful, this could help the country carve a new niche in the global order as a champion of climate action and environmental protection – and set off a clean energy race in the process.

As well as committing to 100% renewable power for the 2020 games, Japan's Olympic organising committee plans to offset all unavoidable CO₂ emissions, ensure that all products are sourced according to a strict [sustainability code](#), and use lease and rental services so that 99% of procured goods will be recycled or reused. For example, athletes' uniforms will be made from [recycled fabric](#), and Japanese citizens have donated used electronics from which all [medals](#) will be created.

Games organisers have also committed to [nearly eliminating](#) waste in new constructions, which will be built to strict energy efficiency standards. The [Olympic Village](#) is being designed as a new model for sustainable inner-city housing, with seawater heat pumps, food waste-powered biogas, and nationally sourced timber. And with aims to integrate city and nature. Also being created are [537 hectares](#) of new green space, while existing spaces are being [closed off](#) as nature reserves to protect biodiversity. There are plans to filter rainwater and waste water for use at competition venues.

If such a vision is achieved, Tokyo could significantly raise the bar for future games, which have typically created massive carbon footprints. That of [Rio 2016](#) was larger than the annual emissions of 35 countries.

Tokyo 2020's sustainability focus is important not just for future Olympics, but also for Japan itself. Since the 1990s, global attention on Japan has waned. Once a formidable [economic force](#), the country has been [overshadowed](#) by China's remarkable economic growth. And thanks to the rise of [K-Pop](#) and [TV dramas](#) such as Master's Sun and My Love From the Star, South Korea has now taken up Japan's [former role](#) as the region's cultural vanguard.

Niki J.P. Alsford is a Reader in Asia Pacific Studies and Director of the Asia Pacific Institutes at University of Central Lancashire. He is also Research Associate at the Centre of Taiwan Studies at SOAS, the University in London and Research Fellow at the Ewha Institute of Unification Studies in Seoul, South Korea. He received his PhD from SOAS and his research is grounded in relationalism within the Asia Pacific region. He is a nominated fellow of the Royal Asiatic Society and the Royal Anthropological Institute.

Japan's diplomatic leverage has also declined in recent years. In the early 2000s, the country was an important player in [six-party talks](#) to find a peaceful resolution to security concerns over North Korea's nuclear weapons programme. Other parties continue to play a high-profile role, with North Korean leader Kim Jong-un recently meeting [Trump](#), [Putin](#), and South Korean President [Moon Jae-in](#). Japan, in contrast, now finds [itself on the sidelines](#).

Forging a new path

Taking a lead in clean energy and climate action – a return to the turn of the century, when Japan played a [key role](#) in forging climate consensus – could be the country's opportunity to carve a new geopolitical path. Of course, it's not without competition.

In the wake of the US' withdrawal from the Paris Agreement in 2017, China is [filling](#) the climate leadership vacuum, and emerging as a [dominant force](#) in international agreements. India – set to be [severely affected](#) by climate breakdown – is attempting to do the [same](#), with both nations investing heavily in [renewable energy](#) and [green technology](#).

But as a technological and vibrant society, Japan is also well-placed to take the lead on climate. It is [third](#) only to China and the US in installed solar power capacity, and solar's share of the Japanese energy mix is more than double that of its rivals. Japanese solar firms are at the forefront of solar panel innovation, having [twice](#) broken efficiency [records](#) in recent years.

The country has also recently [announced](#) goals to achieve zero-carbon steel and transport sectors. Japan's hydrogen industry is [world-leading](#), and it intends to [showcase](#) the fuel at the Olympics by using it

to power the Olympic torches, as well as parts of athletes' village.

As it prepares to host the next G20 summit, Japan has been [vocal](#) in calling for ambitious international climate commitments. Prime Minister Shinzo Abe has made [no secret](#) of his intention for Japan to be a climate leader. Countries have traditionally struggled to decouple economic and emissions growth, but at the World Economic Forum in early 2019, Abe [proclaimed](#) that “spending money on a green Earth and a blue ocean – once deemed costly – is now a growth generator”. If the country can successfully use the Olympics to show this, it could lead to a global technological race for ever-more profitable clean energy.

Use of the Olympics as a platform for political and social purposes is, of course, not without history. Now, with the climate crisis becoming ever more urgent and heavily-reported, the 2020 summer Olympics may well provide the footing for a shift in the climate order. The Olympic movement's [goal](#) is to build a peaceful and better world – what better way than by setting off a clean energy race?

This article was first published at “The Conversation”:
<https://theconversation.com/how-japans-renewables-powered-olympics-could-kick-off-a-global-race-for-clean-energy-115997>

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.

ANNOUNCEMENTS

EUCERS Name Change

Dear friends and members of EUCERS:

We would like to announce that we have changed the name of our centre to the European Centre for Climate, Energy and Resource Security (the acronym remains the same - EUCERS).

This strategic decision was made in order to fully cement climate security issues within our core research focus. Climate change has not only branded itself into the greater public consciousness over the past few years, but its increased manifestations and consequent security implications are becoming a top priority for many governments and institutions around the world - be it the Pentagon, NATO, or the EU, just to name a few.

EUCERS aims to contribute to this global discussion and promote a greater understanding of the security implications arising from climate change and how we may address this daunting challenge. Of course, EUCERS already pivoted towards climate security issues two years ago as demonstrated by the topics of our Energy Talk Series that we jointly organized with the Konrad Adenauer Foundation. Now, we aim to intensify our focus in the months and years ahead and hope our name change adequately reflects this.

Of course, traditional energy and resource security issues, which have comprised the core focus of our centre thus far, will continue to form a centerpiece of our research.

Please note our new website: www.eucers.com.

Our KCL web presence is still under construction and will hopefully be completed by February 2020.

We look forward to working with you on all these issues and appreciate your continued support!

Documentation of the 3rd EUCERS-KAS Energy Talk 2019

On 23 September, the third instalment of 2019's EUCERS/KAS Energy Talk Series took place at King's College London. Within this year's theme, "Pathways to Climate Security", the panellists discussed the topic of "Natural gas and 'green gas': Ideal partners for a low-carbon economy?".

The panel explored the potential contributions and drawbacks of natural gas in global efforts to mitigate threats from climate change whilst attempting to maintain economic competitiveness and energy security.

The panel consisted of Prof. Albert Bressand (Energy & International Governance, UCL), Dr. Timm Kehler (Chairman, Zukunft Erdgas e.V.), Mr. Philipp Offenberg (Adviser, European Political Strategy Centre) and the EUCERS Research Director, Frank Umbach. The panel was chaired by the director of EUCERS, Prof. Friedbert Pflüger.

The presentation of Prof. Bressand can be downloaded here [<https://bit.ly/358BnYz>] and Mr. Offenberg's presentation can be downloaded here [<https://bit.ly/2oVUjsX>].

The recordings of the event are now online. You can listen to the recording or download it here [<https://soundcloud.com/warstudies/event-natural-gas-and-green-gas-ideal-partners-for-a-low-carbon-economy>].

A comprehensive report will be published soon.

EUCERS ON THE ROAD

29.10.2019 London, UK	Our Associate Director Thomas spoke at the Windsor Energy Group's (WEG) expert panel on "Threats to global energy arteries – growing risks in the MENA region and South China Sea"
15.10.2019 London, UK	Our Research Associate Simon spoke at PS21's discussion on 'A Green New Deal? International initiatives to reduce emissions'.
11.10.2019 Sydney, Australia	Our Director Friedbert spoke at a panel discussion at the Breakfast Forum on "Current Energy Policy Challenges for Australia and Germany".
09.10.2019 Wellington, New Zealand	Friedbert spoke at a roundtable discussion in cooperation with the NZ Institute of International Affairs, the NZ Energy Efficiency and Conservation Authority and the NZ Business Energy on "The New Zealand - Germany Energy Trilemma Dialogues: Balancing Energy Security, Affordability & Environment Sustainability".
09.10.2019 Wellington, New Zealand	Our Research Director Frank spoke at the same roundtable discussion on "The New Zealand-German Energy Trilemma dialogues. Balancing Energy Security, Affordability and Environmental Sustainability".
07.10.2019 Auckland, New Zealand	Friedbert chaired a CEO Roundtable on the topic of "Renewable Energy & Energy Efficiency" in cooperation with the German New Zealand Chamber of Commerce.
07.10.2019 Auckland, New Zealand	Frank spoke at the same roundtable on "Renewable Energy and Energy Efficiency".
02.10.2019 Luxembourg	Frank gave a cyber security training seminar at the European Parliament on "The Security Union: Cybersecurity", organized by the European Institute of Public Administration (EIPA) for the European Parliament.
26.09.2019 Rheine, Germany	Frank gave a talk on „Deutsche und internationale Klimaschutzpolitik am Scheideweg – Provinzialistische Klimahysterie versus Herausforderungen einer effizienten Klimaschutzpolitik“ („German and international Climate Policies at Crossroads – Provincial Climate Hysteria versus Challenges of an Efficient Climate Protection Policy“) at the Gesellschaft für Sicherheitspolitik e.V.
24.09.2019 Oberammergau, Germany	Frank gave a seminar on "Geopolitics of Energy" and "Global and Regional Energy Developments" during the Energy

Security Strategic Awareness Course at the NATO-School.

EUCERS IN THE MEDIA

Our Research Director, Frank Umbach, was interviewed by Hessischer Rundfunk 2-Der Tag (HR2-Der Tag) to the escalation at the Persian Gulf after the Iranian air attacks on critical oil infrastructures of Saudi Arabia and the implications for the world oil supply security and the EU energy foreign policies:

<https://www.hr2.de/podcasts/der-tag/schnell-noch-tanken-eskalation-am-golf,podcast-episode-57532.html>

Our Research Director, Frank Umbach, was interviewed by Swiss Radio Station Schweitzer Rundfunk (SRF), „Polen gewinnt vor EU-Gericht im Streit über Opal-Gasleitung“ („Poland Wins at EU-Court in Conflict about the OPAL-Gas Pipeline“)

<https://www.srf.ch/sendungen/echo-der-zeit/von-der-leyen-praesentiert-die-neue-eu-kommission>, and, <https://www.srf.ch/play/radio/popupaudioplayer?id=3aa853ee-78a7-4abe-a7b0-df54f86bc68b&startTime=294.296>

PUBLICATIONS

Umbach, Frank “Focus Germany: Relations with China in Perspective”, Geopolitical Intelligence Service (GIS), 8 October 2019, 6 pp.

(<https://www.gisreportsonline.com/focus-germany-relations-with-china-in-perspective,economy,2995.html>).

②— “Dynamiken auf dem globalen LNG-Markt und strategische Perspektiven für den LNG-Import in Deutschland und Europa” („Dynamics on the Global LNG-Market and the Strategic Perspectives for LNG-Imports in Germany and Europe“), Energiewirtschaftliche Tagesfragen, September 2019, S. 54-60 (in German).

— “Kritische Rohstoffe: Die Rückkehr der Frage der Versorgungssicherheit auf die internationale Agenda“ („Critical Raw Materials: The Return of Supply Security onto the International Agenda“), in: Europäische Sicherheit & Technik (ES&T), September 2019, pp. 52-55.

— “Effects of the Russian-Ukrainian Conflict on Russia and International Oil Markets”, in: “Current Oil Market. Developments and Their Impacts on the GCC”, Emirates Centre”, Emirate Center for Strategic Studies and Research (ECCSR), Abu Dhabi, 2019, pp. 87-118.

SOCIAL MEDIA



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