

Contested Futures for Coal – Foundations of the Energy Transitions and Regional Challenges

Despite broad agreement in research and global politics about the need of renewable energy in order to reduce greenhouse gas emissions and combat climate change, socio-economic and political efforts towards phasing out of fossil fuels are highly contested. This is reflected in diverse energy trends across countries and regions, but also in different political goals and understandings of ‘clean energy’. As a result, we observe several parallel and sometimes even conflicting energy transitions. Focusing on developments in Europe and Germany in particular, the contributions in this working paper show that energy transitions have different historical and economic foundations and that they bring new regional challenges or even conflicts.

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Although there is a broad agreement among researchers that tackling climate change and global warming requires drastically reducing man-made greenhouse gas emissions, globally phasing out of fossil fuels and moving to renewable energies¹, current trends show that energy transitions remain highly contested. This is, among others, reflected in global energy trends. While the report *Coal 2020* of the International Energy Agency shows that global production and demand in coal slightly decreased in 2019 and 2020, it also predicts that the demand and production in coal will increase worldwide in 2021². In particular, China and India continue to rely on fossil fuels.

The amount of coal has constantly risen in their energy supply over the last two decades³. Accordingly, energy transitions in China and India often associated with increasing the efficiency of fossil energy and with adding renewable and nuclear energy into the national energy mix in order to meet the increasing demands for energy and electricity.

The Paris Agreement and the 2030 Agenda for Sustainable Development, that were adopted in 2015, outline the way for a common and ambitious global effort to tackle climate change and promote sustainability. However, five years later, initiatives for economic and social transitions that are required in order to promote “affordable and clean energy” (Sustainable Development Goal 7) remain fragmented and rare. Progress reports indicate that with a growing global population and increasing needs for cheap energy, immediate economic and social needs of economies tend to outweigh efforts for

¹ IPCC (2018), *Global Warming of 1.5 °C.*, IPCC Special Report, IPCC, <https://www.ipcc.ch/sr15/>.

² IEA (2020), *Coal 2020*, IEA, Paris <https://www.iea.org/reports/coal-2020>

³ IEA (2020), *World Energy Balances 2020*, IEA, Paris: <https://www.iea.org/subscribe-to-data-services/world-energy-balances-and-statistics>

renewable energy transitions in many countries⁴.

As of 2018, only 13.5 percent of the world total energy supply was produced from renewable sources⁵. Nonetheless, it is important to note the efforts of many countries towards increasing the capacities of renewables. For instance, in the European Union and India, the capacity of renewable energies is expected to rise significantly in 2021 despite the Covid-19 crisis and even in Latin America, North Africa and the Middle East capacities of renewables are predicted to recover⁶. In addition, lessons learned from approaches towards 'clean energy' may facilitate a global and sustainable transition towards a carbon-free world (Cash, 2018).

Among the countries, which have already adopted policies for reducing greenhouse gas emissions by phasing out of their production and consumption of fossil fuels, there exist controversial views about what counts as 'clean' and environmentally friendly energy. For instance, while France and Germany both agree on the need for phasing out of coal, Germany also seeks to phase out of nuclear energy until 2022 due to the long-term environmental and economic costs associated with nuclear waste and the high risks linked to the production of nuclear energy. In Germany, the latest amendment of the Atomic Energy Act (adopted in 2011), the Act on the Phase-out of Coal-fired Power Plants (adopted on January 2020) together with the Structural Reinforcement Act for Mining Regions (adopted in August 2019) and the Federal Climate Change Act (adopted in December 2019) define the framework for Germany's transition towards renewable energy. Accordingly, Germany intends to shut down all

nuclear plants by 2022 and to gradually reduce carbon emissions until a complete phase out of coal by 2038 at the latest in order to achieve the objective of a 100% renewable energy mix. In contrast, France highlights the potentials of nuclear energy in times of climate change. The discussion about the civilian application of nuclear energy has emerged out of the military nuclear industry and was therefore always linked to geopolitical concerns for energy autonomy and energy security (Prant, 2017). In the context of climate change, three further arguments are used to support the use of nuclear power:

1. Urgent and increasing needs for energy and electricity cannot be met with renewables alone;
2. Nuclear energy is an affordable low-carbon bridge technology and technical innovation will help resolve current safety and environmental concerns;
3. Nuclear power is required for combatting climate change (Haas and Ajanovic, 2019).

With these controversial approaches for phasing out of coal across countries, we are observing an increasingly segmented and competitive market in terms of the global energy mix. Trends indicate several parallel multidimensional and sometimes even conflicting energy transitions across countries. They may involve increased supply of energy with or without renewable resources but also reduced energy demands. As a result, diverse energy transitions include complex interactions of various technologies but also the decline of established business models and political struggles (Markard, 2018) due to persisting social inequalities in energy

⁴ United Nations (2020) The Sustainable Development Goals Report 2020, UN, New York, p. 38, <https://unstats.un.org/sdgs/report/2020/The-Sustainable-Development-Goals-Report-2020.pdf>

⁵ IEA (2020), Renewables Information: Overview, IEA, Paris <https://www.iea.org/reports/renewables-information-overview>

⁶ IEA (2020), Renewables 2020, IEA, Paris <https://www.iea.org/reports/renewables-2020>

transitions (Bartiaux et al., 2019) and new challenges for governance.

Tensions and challenges emerging from the reduction of fossil energy cannot only be observed across countries but also within countries. At the subnational level, regional identity and development are often linked to energy sources. Furthermore, local actors have started to develop and implement their own strategies for realizing energy transitions at the regional or municipal level. This adds to the fragmentation of energy transitions and protest – both, against and for fossil energy and renewable energy (Hoeft et al. 2017).

Contested Futures for Coal

At the international Workshop “Contested futures for Coal”, which was organized as a cooperation of the University of Magdeburg and the Centre Marc Bloch in Berlin on 19 December 2019, the challenges indicated in the previous section were discussed in greater detail. The Workshop brought together researchers studying energy transitions from different disciplinary backgrounds, including political science, geography, history, sociology and economy as well as practitioners from civil society organisations and politics. It was organized along two thematic research-oriented panels and a broader practice-oriented roundtable discussion.

The first panel analysed the Phase-in Coal in European and Global History in the 19th and 20th Century with presentations from Silke Mende (CMB), Jakob Vogel (CMB), Helge Wendt (MPIWG), Thomas Turnbull (MPIWG) and Pao-Yu Oei (TU Berlin). The second panel and the roundtable discussion focused on questions related to the process of phasing-out of coal and pathways for a carbon-free future.



Figure 2 Poster from the International Workshop “Contested futures for Coal”, organized by Ulrike Zeigermann and Gilles Lepasant in December 2019, Design: Juliane Hübner

The workshop started with a discussion on the invention of a tradition related to the new (professional) practices of mining in Germany in the 19th century (Jakob Vogel). After that, the participating scholars and practitioners discussed the historical developments of primary and secondary coal regions in Germany with a presentation from Helge Wendt. Drawing on comparative case studies from Britain, the United States and Germany, Tom Turnbull explained the histographies of coal phase-in arguing that “*history can, in some sense, be told as a story of transitions between different sources of power*” (Turnbull, 2019). He showed that different countries can be characterized by their specific ‘energy profile’ in time. At the end of this historical perspective on coal, Pao-Yu Oei compared the pathways in East and West Germany from 1950 to 1990.

The second panel analysed the question of a phase-out of coal. Presentations from Hannah Schindler (HU Berlin), Zofia Wetmańska (WiseEuropa), Ludger Gailing (IRS Erkner) and Johannes Staemmler (IASS) discussed economic challenges and contested pathways of energy transitions in the 21st century. The first presentation focused on the social and political challenges that Lusatia (German: Lausitz). The region is located in Saxony, Brandenburg and western Poland. Mining has not only a long tradition in the region but it remains also one of the regions in Germany, which are socially and economically highly dependent on coal. Therefore, the report from the so-called ‘Coal Commission’⁷ of the Federal Government, which intended to show a way for an incremental phase-out of coal-based electricity without leaving behind the regions most affected by the required structural changes, has led to social tensions in Lusatia. While some see the potentials from important investments and an energy transition for regional development in Lusatia, others reject the plans for a coal phase-out.

Adding to the debate on regional conflicts and challenges emerging from the coal phase-out, Zofia Wetmańska analysed the case of Upper Silesia. She discussed not only the specific economic, cultural, and social characteristics of the region, but also the potentials emerging from energy transition processes for sustainable development. Picking up these debates on the social and economic implications of the coal phase-out, Ludger Gailing argued that the coal-phase out cannot be fully understood without conceptualizing the socio-spatial implications. This includes social and economic developments but also

cultural and everyday practices, which are changing in energy transitions. He presented the Territory, Place, Scale, and Network (TPSN) framework and applied it to energy spaces in four German Laender (Bayreuth, Baden-Württemberg, Brandenburg and the Rhineland)⁸.

At the end of the second panel, Hannah Schindler offered an inspiring outlook on the challenges and opportunities of coal transitions by adopting a broader perspective on G20 countries. She argued that political strategies for phasing out of coal “should be economically feasible and just, but also take factors such as development, participation and identity into account” (Schindler, 2019). Hannah Schindler presented insights from Germany but also from Indonesia and South Africa in order to discuss important economic and social considerations in coal transitions.



Figure 3 Panel II: Coal Phase-Out? Socio-Economic Challenges and Contested Pathways in the 21st Century, Photo: Sébastien Vannier, CMB Berlin

The roundtable discussion aimed to bring together research and practice in order to discuss the ‘Contested Futures for Coal’. In his

⁷ The official name is: Federal Government’s Commission “Growth, Structural Change and Employment”. It was created in 2018 and submitted its final report in January 2019 (https://www.bmwi.de/Redaktion/EN/Publikationen/commission-on-growth-structural-change-and-employment.pdf?__blob=publicationFile&v=3). The report entails measures in the energy sector (chapter 4) but also prospects for regional development and energy transitions (chapter 5).

⁸ His research was later published in: Gailing L, Bues A, Kern K, Röhring A. Socio-spatial dimensions in energy transitions: Applying the TPSN framework to case studies in Germany. *Environment and Planning A: Economy and Space*. 2020;52(6):1112-1130.

opening remarks, Uwe Steffen, Head of Division in the Ministry of Economic Affairs and Energy of the State of Brandenburg, explained the current political debate on energy transitions in Brandenburg. A day before the workshop, Tesla had announced its decision to put its new factory for the production of electric cars in Brandenburg, raising hopes for accelerating a fossil-free infrastructure and economic development in the structurally weak region, which is affected by Germany's coal exit. Invited discussants included Rebekka Popp from Third Generation Environmentalism (E3G), Wiebke Witt from Klima-Allianz Deutschland and Gretchen Bakke (IRI THESys). The roundtable discussion addressed mainly the question of regional challenges and opportunities emerging from energy transitions but also the broader question of energy transitions in times of climate change. The debate highlighted that it is only possible to grasp energy transitions if we consider its economic, spatial, political and historic foundations. Taken together, the insightful presentations and debates during the workshop have inspired the outline of this issue of the PoWiNe Working Paper on Contested Futures for Energy Transitions.

Outline of the Issue

This issue is the result of an interdisciplinary effort undertaken by the participating scholars and practitioners from the 'Contested Futures for Coal'-Workshop as well as the students from the 'Conflicts in Energy Transitions' MA course at the university of Magdeburg. Their contributions were organized in a way to reflect, first, the economic and historic foundations of energy transitions and, second, regional challenges and contestations.

Economic and Historical Foundations of Energy Transition

In order to understand the challenges and tensions emerging from today's transitions towards renewable energies, it is inevitable to study the increasing production and demand of energy from a historic perspective. In his contribution to this volume, Jakob Vogel (Chapter 2) shows that mining was not only a way of producing coal energy. It had also cultural implications, including the emergence of folkloric traditions, the identification with and professionalization of the mining profession, new forms of social organization, administration and role of knowledge.

Helge Wendt (Chapter 3) adds to the analysis on the foundations of today's debate on fossil energy by adopting a global history perspective. He shows that the coal phase-in was a long-term and complex process, which contributed not only to diverse primary coal regions but also to various secondary coal regions outside the coal basin. He argues that these secondary coal regions should be included in the historiography of industrialized mining because the organization of technology, work and knowledge regarding coal in one region affected their partners in other regions.

In his contribution on the shrinking geographies of coal, Gilles Lepessant (Chapter 3) examines the economic foundations of energy transitions. He examines the trends that are affecting coal's geography at the global, European and regional level and shows that Coal's geography is declining at a very different pace around the world. He contrasts Asia, which remains a key consumer and supplier of fossil energy, and European countries, which have either phased-out coal or have committed to do so.

Regional Challenges in Energy Transitions

With the ‘spatial turn’ in energy studies (Bridge 2018, p. 12) researchers have focused on the varying relationships between the energy and society across different regions. In his contribution to this issue, Ludger Gailing shows that energy regions differ regarding their socio-material infrastructure and visions of the future. He finds that there are overlaps between ‘old energy regions’ based on fossil energy and ‘new energy regions’ focusing on renewable energies. This may lead to social conflicts. Analysing the case of the mining region between Aachen and Cologne in Germany, however, Ludger Gailing demonstrates how dispositions of renewable energies can also be integrated in ‘old energy regions’ in ‘preventive’ transformation processes (Chapter 4).

In Chapter five, Gilles Lepasant studies how coal has shaped regional and social identities and the European industrial geography. He shows that the historical process of phasing-out of coal can be considered a threat to the regional economy and people’s identity as it has led to high rates of unemployment and an emigration of young and skilled people. Hence, Gilles Lepasant argues that the challenge is to develop diverse pathways for local energy transitions that allow European regions to link their specific needs for regional development with new approaches focusing on renewable energy transitions.

Zofia Wetmańska and colleagues study the case of Silesia, where coal has shaped the economic development and local identity of the region since the 18th century. Despite the gradual phase-out of coal mining and change towards modern manufacturing and services, many challenges remain. The authors argue that the year 2021 is important to define future transition pathways for the region with the preparation of Territorial Just Transition Plan, and the development of the Polish mining restructuring strategy.

In Chapter six, Uwe Steffen presents the challenges and potentials emerging from an energy transition from fossil energy to renewable energies in the former coal region in Brandenburg. He discusses the role of the national Structural Reinforcement Act for Mining Regions (adopted in August 2019) for Lusatia and Brandenburg, and the strategies of the regional government in order to link the coal phase-out with regional development.

Energy Transitions in Higher Education

At the university of Magdeburg, the debates on coal and energy transitions from the 2019 workshop have led to a new MA seminar for students in Peace and Conflict Studies, European Studies and the Social Sciences, conceptualized and offered by Ulrike Zeigermann and Michael Böcher. The aim of the seminar “Conflicts in Energy Transitions”, which was first offered in Summer 2020, is to examine tensions in energy transitions.

Central areas of conflicts in energy transitions include, but are not limited to social acceptance (vs. protest) and decision-making processes for handling diverse political goals, contested knowledge and norms at the intersection of energy policy, technological innovation and societal transformation. In energy transitions, (violent) conflicts occur both at the local and regional level, and at the global level. These conflicts in energy transitions involve and affect diverse actors, including political decision-makers but also administrations, businesses, civil society organizations and citizens. In the first introductory part of the seminar, students discuss such theoretical aspects of energy transitions based on literature review. They are asked to choose one energy source to analyse in greater depths potential conflicting public goals and forms of social protest.

Drawing on the initial literature review and the comparison of different case studies on energy sources, part two of the seminar engages with regional and international conflicts related to energy transitions. In part three of the seminar, students are exploring specific challenges in energy transitions, including the role of marginal groups, stakeholder participations and diverse pathways. The latter also entails a discussion on the contested role of nuclear power in future energy policy.

Combining theoretical and empirical perspectives, the modules of this seminar are organized in a way to study how different actors and societies are affected by current changes in energy-security landscapes and how they deal with environmental and energy conflicts. The objective of the course is to engage students with the multidimensional and multi-level challenges. At the end of the seminar, they are expected to be able to apply key concepts to empirical cases and current situations in multi-level energy governance, to critically reflect on problem structures and the role of key actors and institutions at different levels, distinguish different positions in the literature on energy transitions, analyse energy policies and evaluate policy instruments in regard to their likely intended and unintended effects.

The seminar is organized as a twelve-week online course. This means that students work independently through various reading and learning materials provided on the e-learning platform Moodle. They complete the creative course works for each part in a certain time frame but asynchronously in their own time. At the end of each part, a virtual meeting is organized via zoom to discuss questions and the results of the learning activities. The main arguments from these discussions in groups and in the plenary were noted as a digital protocol (e.g., figure 4). In addition, an online knowledge-sharing forum serves to discuss

organizational or content-related questions, news, interesting events or other issues linked to the seminar topic. With their feedback in the virtual seminar meetings after each part and a structured anonymous evaluation at the end of the seminar, the students help to improve the course.

What are possible pathways for energy transitions?	What are challenges related to the diverse energy transitions?	Who are marginalised groups in energy transitions?	What kind of conflicts can emerge from energy transitions (and where)?
'Dirty nationalism'	Too high costs to make the usage of hydrogen power (using fossil fuels instead of renewable energies)	future generations	costs of energy for poorer groups arise
Decentralized & Centralized Mix (SuperSmart Grid). Reconciliation between different approaches	CO2 emissions from energy use/production/consumption	Indigenous group that can be displaced due to land usage for BE	geopolitical tensions, international conflicts
Energy mix: "muddling on"	fair distribution of losses and benefits from a transition	Women are especially affected by household energy transition	on a local/personal level: demand to give up socialized ways of behaviour
Breakthrough of new technologies, today unknown	Complex governance architecture	most of headquarters of energy governance institutions in the global north - so all in the south without leading power are marginalized by that	Inequality that leads to grievances
Renewable Energy Transition	Average 10% (and to global temperature)	Voicelless from current structures of power	conflicts about energy related resources
Nuclear Power	Nuclear waste disposal	Safety problems	Foreign policy implications (Energy security vs. foreign security considerations)
	Access to energy, distribution of energy	Use of land - Food or Energy?	Use of uranium as a weapon

Figure 4 Results of a group work on 'Diverse Pathways and New Directions in Energy Transitions' collected with Padlet, 25 June 2020

Djamila Jabra, a MA student in Peace and Conflict Studies at the University of Magdeburg, who participated in the course in the summer term 2020, discusses the content, methods and didactic approach of the course. In her contribution (Chapter 7), she reflects her experience from the online seminar and explains the different thematic modules on conflicts in energy transitions. Djamila Jabra also presents her course work on nuclear energy.

Outlook

According to Hoesung Lee, Chair of the Intergovernmental Panel on Climate Change, and Dr Fatih Birol, Executive Director of the International Energy Agency, “*Energy is at the heart of the solution to the climate challenge*” as it accounts for over two-thirds of global greenhouse gas emissions (Lee and Birol, 2020). With current challenges emerging from the Covid-19 pandemic and tendencies towards increasing societal polarization and populisms, both energy transitions and climate change mitigation are at risk (e.g., Radke et al. 2019). At the same time, Lee and Birol argue that the recovery plans that governments are pursuing offer an opportunity to foster “*ambitious, near-term reductions in emissions and accelerating investment in the full range of clean and sustainable energy technologies necessary to get all the way to net zero*” (Lee and Birol, 2020). This issue offers a collection of insightful pieces of thought “*Denkanstöße*” that may inspire future reflections in research and practice on the coal phase-out at the national and regional level and energy transitions in a broader sense.

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