



Abstracts for Beyond Oil Conference 2019

In order of parallel sessions

Wednesday 16th of October

PARALLEL SESSION 1

1 Politics and futures of abandonment

Carbonscapes disassembled: the dark side of transformation

Tarje Wanvik and Håvard Haarstad

Work on energy transitions has largely focused on green innovation and the diffusion of new socio-economic innovations across space and time. Sustainability transitions are largely understood as the proliferation and upscaling of highly welcomed, new technologies and policy frameworks for a better future. Building on previous work where we highlight the disassembly, instability and rupture involved in energy transition and transformation, we aim to shift focus of conceptualizations energy transformations towards their darker sides: abandonment, loss and disempowerment. In this paper we take point of departure in recent episodes of resistance against climate-motivated transport taxation and regulation in Norway and elsewhere. We argue, firstly, that without taking the dark sides of transformation into account, scholars won't be able to fully comprehend the dynamics of societal change. Second, we claim that abandonment and loss are keys to unlock the complex configurations of protests and apprehension towards sustainability transformations. This acknowledgement paves the way to a more constructive advocacy for sustainable societal transformations involving inclusive dialogue with adversaries of change. Finally, realizing the "dark potential" of change invites a reframing the cultural artefacts and practices of carbon society – turning perceptions of loss into constructive experiences and empowerment, establishing the foundations for what Huber (2018) calls mass democratic movements attuned to the distributional outcomes of energy transition.

How are technologies abandoned? A review and an agenda

Authors: Zahar Koretsky, Harro van Lente

Presenter: Zahar Koretsky

Lowering carbon emissions worldwide is key for a safe, sustainable future on the planet, but it is not happening quickly enough. More attention has been paid on supporting new clean technologies than on abandoning well-established but undesirable technologies, while there is a gap of knowledge on how technologies are abandoned. Such abandoning, or phasing out, has been tried before, in the cases of DDT or inefficient light bulbs, and is similar to how coal and nuclear power are being decommissioned in some countries today. Clearly, phasing-out technologies is not a self-evident reversal of innovation processes, but brings along many empirical, theoretical and practical questions about particular society and technology dynamics and trajectories. In the paper, we systematically review around 150 academic articles and book chapters that address the problem of how to abandon technologies, across the fields of innovation studies, science, technology and society studies (STS), economic and management studies. We discuss the main concepts, approaches and findings; this allows us to formulate a research agenda. We test our findings using the histories of phase-outs of the US cloud seeding technology and Russian "Ural" computer technology. We conclude that social

practice theory is well fit to explain the enactment of phase-outs, provided it is complemented by more structure-oriented approaches.

The Geopolitics of the Energy Transformation (GET2030)

Michael Bradshaw, Professor of Global Energy, Warwick Business School, The University of Warwick, UK. Email: Michael.Bradshaw@wbs.ac.uk

This presentation reports on the outcomes of a scenario planning workshop that took place at the German Institute for International and Security Affairs (SWP) in Berlin late in the 2018. A commentary was subsequently published in Nature (<https://rdcu.be/bzRn3>). The scenarios explore the critical uncertainties and key drivers influencing the relationship between geopolitics and energy system transformation. Four distinct scenarios are presented: Big Green Deal, Dirty Nationalism, Tech Breakthrough and Muddling On. Each results in a different future in terms of the pace of change, international political architecture (inter-state relations) and carbon consequences. The scenarios highlight the fact that geopolitics plays a critical role in determining the pace and nature of decarbonisation and, thus, the capacity to mitigate climate change. This requires new ways of thinking about energy geopolitics. Rather than develop a geopolitics of renewables, we advocate a 'whole systems' approach that considers the interactions between the incumbent fossil fuel system and the emergent low carbon alternative. It is also apparent that the current global governance structure is failing to deliver decarbonisation at pace; thus, a new policy approach is required that acknowledges the complex geopolitical challenges that world faces but reflects that we are living in a time of climate crisis.

The politics of fossil fuel phase out: lessons from Thatcher's disruption of the coal industry

Name: Tae Hoon Kim

Affiliation: Royal Institute of Technology (KTH)

Phasing out fossil fuels is a key challenge in our effort to tackle global warming. Too often, however, the phasing out of fossil fuels been analysed from a teleological outlook that is prevalent in current discussions on energy transition. This outlook tends to focus on technological replacement, with phasing out of established industries seen as a problem of decline management. But phasing out industries also entail disruptive and forceful policies that are far from straightforward.¹ This is particularly the case when the industries in question have entrenched economic, political, and social influences.

The objective of this presentation is to stress the 'stickiness' of fossil fuel phase out. It does this by highlighting the experience of Britain's disruption of its domestic coal industry, from the 1950s to the 1980s. The paper employs a historical methodology and puts particular accent on the politics involved, notably the uneasy relation between numerous British governments and the powerful National Union of Mineworkers (NUM). The NUM was only brought down after Thatcher defeated the miner's strikes in 1984.

The paper concludes by highlighting two takeaways from the British example. First, it took thirty years for Britain to phase out a domestic fuel. Second, the resistance from coal miners was only defeated thanks to Thatcher's iron determination. Taking these into account, two questions arise that are relevant at present. First, how long will it take to phase out fossil fuels, including gas and oil

that are far more in demand? Second, how strong is the political will of governments in tackling the influence of fossil fuel companies, whose outreach is global?

The resilience of sustainability transitions concept: A promising approach to identify, measure and assess transition dynamics

Romano Wyss, PhD

École Polytechnique Fédérale de Lausanne, Switzerland romano.wyss@epfl.ch

The energy transition, and climate change mitigation in general, can be seen as a wicked problem, characterized by the complexity of the matter, the open-endedness of the process(es) and the intractability of the results. Questions of responsibility, power and control are of central importance to understand long-term change processes, and the resistance to them. Yet, current accountability frames fall short of taking into account these aspects.

In our contribution, we introduce the resilience of sustainability transitions (RST) concept as an analytical lens which allows us to identify, measure and assess transition dynamics along the three dimensions of progress, stability and adaptability. We propose to specifically look at drivers and barriers to change. We do this in focusing on relational, institutional and material aspects of the transition, providing a concrete link to specific sustainability measures.

Based on these theory-driven insights, we show how academic engagement with energy transition can help support drivers and overcome barriers to change by providing relevant information to hold decision-makers accountable and unravel hidden, indirect power-relations between actors and institutions. We conclude with a pledge for more engaged research activity, based on sound facts and a clear normative agenda.

2 Legacies and transformational potential of oil

Accelerating transformation – policies between “deep” and “rapid”

Bettina Bluemling

This paper contributes to the conference by juxtaposing “deep” and “rapid” transformations as processes with different underlying rationales. “Deep” transformations are seen as processes supported by (adaptive) behavioural changes that come about through social learning and shifts in norms and values. A number of theories have been proposed to identify under which conditions pro-environmental behaviour change can occur. By reviewing these theories, the paper will show how a “deep transformation” that involves behaviour change, at the same time is very likely to be a slow transformation. This is also because not only change in e.g. the choice of energy is required, but also, to circumvent rebound effects, behaviour that leads to total energy saving. In comparison, “rapid” transformations may best be understood as following, in their extreme, a utilitarian approach, where the means are to some extent justified by overall energy savings. Utilitarian, top-down approaches are very likely to provoke opposition in societies and economies where change in general comes about through the aggregation of individual decisions, i.e. in democracies and market economies. The paper then concludes with the question how policy-making can effectively facilitate a combination of the two.

Are International Oil Companies still a viable bet? Implications for the transition to a low carbon economy

Dr Stefan Andreasson, Queen's University Belfast

This paper attempts to engage critically with the initial premise of this conference, namely that “[s]ociety is inevitably moving beyond oil”. In the longer term, that is true. But the concept of the longer term in this case is quite complicated given the likely acceleration of climate change that will be increasingly difficult to manage. What might not be sufficiently recognised in forward-looking accounts of the embryonic transition to a low carbon economy is that, in 2019, the world is on track to consume approximately 100 million barrels of crude oil per day. Therefore, the paper examines the short- and medium-term exploration and production plans of international oil companies (IOCs) to suggest a cognitive disconnect between the aspiration to transition versus the persistence of investing in what Tim Di Muzio describes as our “petro-market civilization”. Vaclav Smil argues that energy transitions are inevitably slower than we expect: given energy demand growth across the Global South and the willingness of IOCs and investors to continue making substantial investments in the exploration and production of oil and natural gas, an overshoot of the Paris Agreement goals is therefore highly likely. The question, then, is what lessons can be drawn from this conclusion that can be put to good use in the advocacy and support of transition? Thus, the paper offers a corporation-centred account of transition and notably the significant impediments thereto.

OCEAN LITERACY- Grids Gods & Giants of the North Sea

Author: Dr Nancy Couling, Associate Professor, Bergen School of Architecture

The ecology of oil – complex, interwoven relations between organisms and their environment, both organic & inorganic – has deeply penetrated western European society and space.

Using the case-study of the North Sea, one of the world's most industrialised seas, this paper focuses on the spatial legacy of offshore oil and argues that;

- oil operations have irrevocably transformed the sea into a site of energy production
- wind energy, carbon storage and hydrogen distribution are all alternative sectors ready to step into the sprawling offshore spaces developed for oil, called the “global petroleumscape” by Carola Hein.
- and that in order to capture these developments and postulate their future, the sea space must be integrated into a broader study of processes of extended urbanisation (Brenner & Schmid) across the land-sea threshold.

Climate change is transforming the planetary ocean. In order to comprehend the ocean as a spatial entity not only in terms of its inherent structure and dynamics but also in terms of the changes wrought through human intervention, this paper proposes that academic engagement is also required in the spatial and creative disciplines. What type of “urban” artefact has been produced in the North Sea? How can we explore and critically reflect on it in relation to land-side development? How can we re-cultivate this space beyond oil?

The North Sea has been increasingly colonised for specific sectors but excluded from public involvement. Architecture students at BAS are currently engaged in the project “Explorations in

Ocean Space- from Bergen to the North Sea”, aiming to communicate hidden dimensions of the sea space, to find ways to intervene and to improve Ocean Literacy outside of specialist science.

Beyond Oil: Fiscal transition in large emerging economies

Presenter: Ivetta Gerasimchuk, international Institute for Sustainable Development

Co-authors: Anna Geddes, Joachim Roth, Kjell Kühne, Yuliia Oharenko, Vibhuti Garg, Lourdes Sanchez, Richard Bridle, David Braithwaite and Anissa Suharsono

This presentation draws on IISD’s new publications (see hyperlinks) and work in progress on linkages between energy and fiscal transitions in large emerging economies: Brazil, China, India, Indonesia, Mexico, Russia and South Africa. In these countries, governments receive considerable revenues from oil, be it through royalties and other taxes and charges on oil production, or taxes on its consumption.

As the oil price dropped in 2015, so did many governments’ oil revenues. Some of the governments managed to make up for some of this loss with two types of measures. The first one is reduction of subsidies to oil consumption (e.g. in India and Indonesia). The second is increased taxation of oil consumption (e.g. in India and Mexico). These two types of reform prevent further lock-in of these economies in oil dependence and high-carbon development.

However, all the examined economies also pursue a third way: oil production subsidies and reduction of oil production taxes. These come to oil companies via direct budget transfers, tax breaks, subsidized credit and access to land, water, exploration and production licenses as well as lax pollution control and oil spill and other pollution liabilities. These policies are inconsistent with the objectives of the Paris Agreement, because climate targets can only be met with a mid- and long-term reduction of both consumption and production of fossil fuels. Moreover, this government support often results in immediate loss of budget revenues from oil production and, over the medium term, adds to the risk of stranded assets that won’t be viable without even greater subsidies in a world with declining oil consumption.

The presentation discusses opportunities for fiscal and economic diversification for these large emerging economies, each depending on oil revenues in its unique way. We draw on both government-reported data and evidence from recent reform efforts.

3 Technologies of the transformation

The potential role of hydropower in the transition to low carbon and climate resilient energy pathways

Authors: Sejal Patel, International Institute for Environment and Development (IIED) (sejal.patel@iied.org); Neha Rai, IIED; Clare Shakya, IIED; Stephen Porter, IIED

The current global average grid emissions of 450 g CO₂/kWh is not conducive to meeting the Paris Agreement global warming target of 2 °C, let alone the 1.5 degree recommendation by the recent IPCC special report. A near 90% reduction in grid emissions to 50 g/kWh is required to have any chance of achieving either target¹. Population and economic growth in developing countries will require greater amounts of energy². Despite the existence of various low carbon³ technology options, fossil fuel power generation remains an attractive option for many countries. Achieving the

necessary reduction in average grid emissions requires a large-scale, global transition to low carbon and resilient energy systems. In this paper, we discuss the role that hydropower dams can play in the transition to a just and sustainable future.⁴ We argue that a number of ancillary services provided by hydropower dams hold large underutilised value for the transition. Key amongst these ancillary services are the ability to provide stability to grid systems and the ability to store energy, both of which enable larger proportions of intermittent renewable energies on a grid network. Climate finance is one important source of funding that can support a shift in dam design, operations and broader socio-economics policies, needed to highlight these hitherto undervalued services that can contribute to the needed transformation to low carbon and resilient energy and water systems.

This research is being undertaken under the Future Dams: Design and Assessment of water-energy-food-environment Mega-Systems project: <http://www.futuredams.org/>

Nuclear Awareness: Literary Dimensions

Inna Sukhenko

Affiliation: PhD, “Helsinki University Humanities Program” (Helsinki Environmental Humanities Hub), the University of Helsinki (Finland) Project’s link:

<https://www.helsinki.fi/en/researchgroups/environmental-humanities>

Our dependence on energy against the background of environmental change and climate change agenda results in reconsideration of energy and energetic sources which leads to shaping our societal values, priorities and behaviours. Under such circumstances the discussion of nuclear energy and nuclear-related issues go beyond sciences and engineering and encourages the development of energy-focused researches (which shape energy humanities as an interdisciplinary field for researching energy within humanities and social sciences). Such approach defines how energy and energy-related issues are considered, estimated, accepted and represented in the contemporary energy-dependable society.

Such critical and multidisciplinary reconsideration of nuclear energy can be implemented with the help of nuclear awareness which can be a useful tool for developing the critical societal assessment skills on nuclear energy-related issues in the context of sustainable development and for shaping the social attitude towards nuclear technology, nuclear energy policy and nuclear safety culture. Nuclear awareness can be a base for providing narrative toolkit of the contemporary nuclear discourse in terms of implementing critical thinking skills towards nuclear fiction/non-fiction narrative, regarded as an archive of the Nuclear Anthropocene.

Taking U.S. nuclear fiction (with non-fiction components) as a case study, the presentation intends to show the ways of using the narrative tools, encouraging nuclear awareness as a critical thinking product, stemmed from the knowledge of the nuclear history of humanity, which can demonstrate the transformations of “nuclear energy” concept, influenced by nuclear disasters in the context of the late Cold War, the global nuclear counteraction and beyond. The analyses of Frederik Pohl’s *Chernobyl* (1987), Frank Bergon’s *Temptations of St. Ed and BrotherS* (1993), Andrea White’s *Radiant Girl* (2008), James Reich’s *Bombshell* (2013) can help studying the narrative tools of shaping the critical thinking of the nature of nuclear energy, the nuclear history, the technological aspects of nuclear industry, nuclear threats and the nuclear culture components. Regarding nuclear awareness as a set of critical thinking skills, related to nuclear knowledge, such analysis leads the nuclear debates beyond the oppositional views on nuclear energy, and suggests researching nuclear fiction

as a response of the society to the need of nuclear awareness in the context of the current nuclear discourse.

Are rapid transformations of energy systems sustainable?

Simon Davidson Kurland Department of Space, Earth and Environment, Chalmers University of Technology, Gothenburg, Sweden.

In order to decarbonize society and move beyond oil, it is crucial to rapidly transform fossil fuel-based energy systems to low-carbon alternatives. This implies that large amounts of “green” technologies need to be commissioned, while technologies relying on fossil fuels need to be taken out of use, sometimes before the end of their expected service life.

Clean energy technologies, just as other technologies, tend to grow rapidly in early stages, often exponentially, before some kind of limit occurs and the rate of deployment slows down. This limitation could be pure physical or technological, or based on social or economic aspects of the current socioeconomic system. Some of these limiting factors can be circumvented but doing so could potentially be counterproductive to other aspects of sustainable development.

In the case of solar photovoltaics (PV), the global annual installations appear to have leveled off in recent years. In order for PV to reach large fractions of global power demand, the annual deployment rates need to continue to grow further. By analyzing not only the installed capacity itself, but the growing manufacturing capacity, silicon metal industry, jobs created, and investments made in different parts of the value chain, new insights in how to enable the PV industry to grow in a sustainable way are investigated. Important aspect of further expansion of PV installations is sustainable job creation and financial systems to support a new low-carbon economy.

Assessing the transformative potential of Seeds of Good Anthropocenes: Case comparison using qualitative comparative analysis (QCA)

Author: Aaron Tuckey, MSc (Candidate) Stockholm Resilience Centre; Course coordinator CEMUS, & Research Assistant, Climate Change Leadership Node, Uppsala University

Co-authors: Amanda Jiménez Aceituno, Zuzana Harmáčková, Garry Peterson and Albert Norström, Stockholm Resilience Centre

Achieving sustainability in the Anthropocene requires radical changes to how human societies interact with the environment. A key question is how to find innovative and plausible pathways of development that can contribute to more sustainable futures. The Seeds for Good Anthropocenes project has identified a set of diverse existing initiatives -called “seeds”- that under the right conditions have the potential to catalyze transformations towards more sustainable futures.

However, there is limited existing empirical research into which factors and conditions lead to successful sustainability transformations. Where this does occur, it is mostly limited to individual case studies, including infield studies, and doesn’t analyse which factors emerge across larger datasets. We seek to address this gap through a comparative analysis of cases, using African-related “seeds” as an initial piloting inquiry, to assess which factors may aid transformative potential.

First, we selected a subset of 18 ‘successful’ and ‘unsuccessful’ social-ecological “seeds”, on the basis of their international recognition and the signals of the amplification of their impact. Second, we have developed a theoretical framework for desktop assessments of the transformative potential of social-ecological innovations. For this task we conducted a review of existing theoretical and empirical research which assess which factors and conditions enhance the transformative capacity of social-ecological innovations. Finally, we applied this framework to the selected “seeds”, coding the presence or absence of these factors using publicly available data, to conduct a qualitative comparative analysis (QCA) across cases. This technique determines which system features are emerging amongst successful social-ecological transformations.

This presentation will include an overview of emerging system features as well as reflections upon the usefulness of the theoretical framework and QCA as a tool for such analysis.

PARALLEL SESSION 2

4 Contesting energy futures

[La olja ligge – Let the oil be: Oil and the aesthetic politics of climate activism in Oslo](#)

Emma Arnold, Postdoctoral research fellow, Department of Sociology and Human Geography, University of Oslo

Norsk olje koker kloden – La olja ligge. Norwegian oil is cooking the planet – Let the oil be. This is one of the slogans frequently chanted by Norwegian youth during recent protests demanding political action on the climate crisis. The global climate movement erupted following the warnings of the Intergovernmental Panel on Climate Change in a special report published in October 2018, which gave a timeframe of 12 years to reduce greenhouse gas emissions sufficiently to limit warming to 1.5°C. This global uprising is a ‘movement of movements’ and includes youth protesters inspired by Swedish activist Greta Thunberg and her ‘Fridays for future’ weekly school strikes. It also includes the international movement Extinction Rebellion whose decentralised, holocratic model for climate activism focuses on non-violent direct action. The youth movement and Extinction Rebellion have been active in Norway in different but mostly complementary ways.

This research explores the aesthetic politics of climate activism in Oslo through a combination of visual and urban ethnographic methods to observe and document protests, weekly school strikes, and direct actions in the city. A number of discourses are clearly emerging and a strong narrative around oil is particularly evident. Climate activists in Norway are making very explicit and perhaps unsurprising connections between oil and the climate crisis. Despite different methods and approaches, activists generally converge on the idea that oil is incompatible with averting the climate crisis and ensuring a sustainable future; signalling a major dissonance between large swaths of Norwegian society and the actions and policies of the Norwegian government. What can we learn from these activist movements and their artistic interventions? What role might they play in the move beyond oil? Perhaps it is in this dissonant space that we might find alternative ways forward.

Imagining a Continued Norwegian Petroleum Future: Scenarios, Narratives, Ontologies

Bright Dale, Nordland Research Institute

Two tales are told about the future of energy; that it is unpredictable, but also – importantly – that it can be imagined, assessed, and assumed – based on past and present rationalizations concerning how fossil fuels shapes and has been shaped by historical developments. The first story – that it is unpredictable and impossible to foresee – pays heed to the obvious; that the future most certainly will look different from anything we might imagine. The second story – that the future should and could be planned for, through the use of scenarios and predictions based on statistics, historic developments and (first and foremost) economic evaluations – aims at influencing politics and will therefore potentially (and somewhat paradoxically) influence the way the future is played out. Exemplified then, we can assume that even though The Norwegian Energy giant Equinor accepts that the future is unpredictable, they still obviously aim to influence political choices that in the end will limit the alternative futures imaginable.

In the past, under a relatively stable energy regime where the role of petroleum reigned supreme in international trade, politics and energy production, a relatively small set of variables made future prospects for oil manageable. Today though, the energy sector is at a crossroads, and this paper aims to show how a specific epistemic community promoting extractivist approaches to energy challenges influences policy choices through a ‘closing down’ of debates about potentiality, truth and ‘rational choice’ concerning future energy and development trajectories in Norway. As debates about a green shift in Norwegian economy abound, the scramble to be included as part of the solution is on – and is one the Norwegian petroleum industry intends to win.

This paper present relevant scenarios concerning the future of petroleum – both globally, nationally (for Norway) and regionally (for the North-Norwegian region), followed by a description of the dominant petroleum narrative in Norwegian political and societal discourse.

Arguments concerning the petroleum industry’s position as a part of the solution to global climate change challenges will thus be analyzed, seeking to understand the ontological presuppositions about certain need and desires for the future, first and foremost concerning energy needs and thus energy security, but also notions of how development can be more evenly distributed worldwide, upon which such a construction of truth can be established.

The effects of socio-environmental acceptance on Norway’s renewable energy potential

Marianne Zeyringer, Maren Lervik, Eline Maninno

Section for Energy Systems, Department of Technology Systems, Faculty of Mathematics and Natural Sciences, University of Oslo, Norway

The decarbonisation of power production is key to achieving the Paris Agreement goal. Wind and solar energy have matured and decreased in cost rapidly into cost-effective decarbonisation solutions. However, the location of renewables effects the impact on the environment and the communities they are sited. Thus, socio-environmental constraints can strongly limit the overall capacity potential affecting the technology choices, resulting costs and political feasibilities of reaching the Paris Agreement. Nevertheless, socio-environmental acceptance is usually not considered when studying the transition to a net-zero energy system. Norway has one of the best

wind energy potentials in Europe but recent projects have been facing large opposition. This may be surprising as Norway has very low population density but the right to unspoilt nature is strongly anchored in the Norwegian culture and Sami reindeer herding could be disturbed by wind projects. The Norwegian Water Resources and Energy Directorate (NVE) has recently defined the most suitable areas for wind energy. This framework is currently under consultation and heavily discussed. Offshore wind energy is often seen as a potential solution as socio-environmental opposition is expected to be lower but it is more expensive. However, it is as socio-political decision to choose a more expensive technology, site or mitigation option. A spatially dependent capacity assessment under different socio-environmental scenarios is missing to allow for such discussion. Here, we close this gap by analysing the NVE framework, previous concessions and related opinions, literature, newspaper articles and perform interviews with key stakeholder to design three scenarios of socio-environmental acceptability. We then conduct a GIS analysis to determine the spatially dependent capacity potential per technology and scenario.

5 Law and regulation in furthering transformation

[Unburnable carbon in protected areas world wide](#)

Kjell Kühne, University of Leeds, Leave it in the Ground Initiative (LINGO)

Under the Paris Agreement, less than 20% of current proven fossil fuel reserves can be extracted and over 80% must stay in the ground. But no government has pledged any reserves to be kept in the ground so far. Given previous commitments of governments (World Conservation Congress resolutions calling to outlaw exploration and extraction in protected areas), fossil fuel reserves in protected areas could be a low-hanging fruit that may pave the way for a new “keep fossil fuels in the ground” framing in global climate change mitigation efforts.

Starting from a publicly available database of protected areas and a proprietary industry database of mining and hydrocarbon concessions, civil society organization WWF Norway has already identified overlaps of protected areas and hydrocarbon and mining concessions worldwide and quantified their geographic extent. Building on this previous work, in this presentation I will introduce a preliminary quantification of the global potential CO₂ emissions from protected areas and discuss methodological issues in estimating the “unburnable carbon” under protected areas and other areas of interest for non-extraction efforts.

In case studies from two countries (e.g. Malawi and Colombia), concrete areas of overlap will be examined. I will evaluate the specific local circumstances, including forces pushing for and against extraction of fossil fuels, pointing towards the instabilities in those carbonscapes.

To conclude, I will chart a way forward for a programme of targeted efforts in pilot countries, with the goal of bringing new “unburnable carbon in protected areas” pledges into the UNFCCC process.

[Climate and Energy: Shaping the Pathway to Low-Carbon Energy Future through International Law](#)

Dr Daria Shapovalova, University of Aberdeen

The causal connection between fossil fuel combustion and climate change is rarely denied in the scientific community. Despite energy production and consumption contributing to over 50% of greenhouse gas emissions, the international climate change regime has largely ignored the need to

change the energy sources as a matter of urgency. Accepting the planetary boundaries in relation to CO₂ concentration limits inevitably requires that globally a third of oil and half of gas reserves would have to remain undeveloped to meet the target of keeping global warming below 2°C. With the growing global population and demand for energy, any limitation on fossil fuel production would have to be substituted with low-carbon alternatives, for which most countries might not have the institutional, financial, or technological capacity. This paper argues that one of the reasons behind the slow progress of international climate change regime is the lack of incorporation into climate change treaties of provisions on energy production and consumption, which account for the majority of anthropogenic greenhouse gas emissions. Through the analysis of the role of energy in the travaux préparatoires, negotiations, and the final texts of the climate treaties, this paper examines the possibility of better integration of energy into international climate governance in the future.

Sector-coupling in the North Sea: decarbonising and creating new value by coupling the energy systems. Seizing a window of opportunity.

Catherine Banet, Associate Professor at the Department of Petroleum and Energy law, Scandinavian Institute of Maritime Law, University of Oslo, Norway

“Sector-coupling” has emerged as a new paradigm in Europe, as the energy systems become increasingly integrated. Both old (natural gas) and new (hydrogen, renewable electricity) energy carriers look at the manner to integrate the decarbonised energy system to play a role in the energy transition. However, sector-coupling remains a concept in the need for a precise content and, importantly, a precise strategy and a framework to grow within.

After having defined the concept, this article will reflect on the opportunities for sector-coupling in the North Sea basin as a practical case study. It will explore how to define and regulate sector-coupling in this particular context, and how sector-coupling can contribute to rapidly move “beyond oil” and create new value. The North Sea is taken as an example because it offers a unique platform for testing the coupling between different sectors such as oil/gas, hydrogen, electricity. It also enables testing solutions for energy storage and enhanced system flexibility. Countries around the North Sea are already well interconnected in terms of infrastructures and are working closely together on common strategies for the future of their energy systems, including infrastructure planning and operation (see e.g. the 2016 North Seas Countries' Offshore Grid Initiative, extended in June 2019, link).

Sector-coupling is subject to several time constraints, and therefore it is urgent to develop more detailed and coordinated strategies around it. To take a few examples: the mature oil and gas provinces are moving towards decommissioning and the opportunity for re-use or re-purposing of installations and depleted fields must be seized; the carbon sequestration projects (CCS) are getting closer to the first testing, with Norway getting closer to a decision on its full scale demonstration project; the electrification of offshore installations has so far developed on a project-by-project basis, but there will soon be a need for an interconnected grid, between projects and between coastal states; the offshore wind grid has developed at a different pace around the North Sea with Denmark, Germany and Scotland taking the lead; solutions for Power to Gas (P2G) - and other P2X (e.g. Power to Liquid, Power to Heat) - as a way to reduce the cost of the decarbonised energy system start to appear; and finally, there is a growing consensus around the important role hydrogen will play in the near future.

Different commercial actors are positioning themselves, such as the partners in the “North Sea Wind Power Hub” (link). International organisations and European institutions start formulating the basis for a common understanding of the concept of sector-coupling (IRENA; European Parliament; ENTSOG). However, few works offer an overall approach from a regulatory perspective across the sectors as the present paper proposes to do.

History and law for accelerating the transition away from fossil fuels.

Ben Franta, Stanford University (Remote session)

New tools and developments are needed to accelerate the transition away from oil and other fossil fuels. One major social, political, legal development in recent years has been the emergence of climate liability lawsuits targeting fossil fuel producers, fueled in part by a rapidly expanding understanding of the degree to which the fossil fuel industry privately knew -- beginning in the 1960s -- about the climate damages that would be caused by its products. These climate liability lawsuits represent a new approach to addressing global warming and confronting the forces of denial, disinformation, and delay, and they are modeled after successful litigation targeting the tobacco industry that began in the 1990s. In this talk, I discuss the state of research into the fossil fuel industry's previously-hidden history of knowledge about global warming and new developments; our increasingly detailed understanding of how climate disinformation and delay has been constructed and continues to operate; the status of climate liability lawsuits and their potential going forward; and pathways in this space toward deep and rapid transformation away from oil and other fossil fuels. I will also discuss the role of academic research in this effort, the importance of particular areas of research for heightened impact, and the potential development of new knowledge infrastructures for organizing and coordinating research.

6 Agents of change

Defining and enforcing ambitious mitigation trajectories for the oil industry

Yann Robiou du Pont, University of Melbourne, Australia

Reaching net-zero emissions implies drastic reduction of the oil and gas production that are yet constantly increasing since the eighties (Le Quéré et al. 2019). Following five IPCC assessment reports and the Paris Agreement, European oil companies have recently disclosed their vision of a sustainable strategy often based on IEA projections. Several Non-Governmental Organisations have considered the efforts of oil companies insufficient and contested, often before the court, either specific drilling projects (Greenpeace Norway v. Government of Norway) or the climate strategies of individual companies (Milieudefensie vs. Shell, 2019 ; Notre Affaire à Tous, 2019).

These disputes raise the question of the responsibilities of fossil fuel companies in leading sustainable transitions. The science-based IPCC reports and the contested IEA strategies provide global decarbonisation strategies but do not inform on the specific roles of fossil fuel companies. The equity principles based individuals rights used to share mitigation effort across countries cannot be applied to companies. This talk aims at discussing metrics to assess companies' ambition in conforming the sustainable transitions, and how these metrics can be used for public policies and courts. How can environmental responsibilities of fossil-fuel companies over indirect (Scope 3) emissions align with principles of effort-sharing applicable to national emissions (Scope 1)?

Trade unions as a force for stability or a force for transformation

Håkon Endresen Normann & Silje Maria Tellmann, Centre for Technology, Innovation and Culture, University of Oslo, Norway.

In this paper, we study the role of trade unions in socio-technical change. Trade unions can have significant influence on policy, and thus societal transformations. The question that we explore in this paper is, when do trade unions represent a force for change and when do they represent a force for stability?

To explore this question, we analyse the Norwegian Confederation of Trade Unions (LO), the largest umbrella organisation for trade unions in Norway. We look specifically at four policy issues that have been central in the Norwegian climate and energy policy debate. These issues are: (1) power interconnectors, (2) electrification of Norwegian offshore petroleum installations, (3) emission cuts in Norway vs. abroad, and (4) opening up of new areas for petroleum exploration.

For our data, we collect evidence from public hearings, official statements, media records, and summaries from the Ordinary Congress of the Norwegian Confederation of Trade Unions.

The analysis follows two steps. First, we map the positions of the trade unions on the four identified policy issues. We do this mapping at three levels. First, we map the positions adopted by the different trade unions, and the tensions and compromises that emerge over time. Second, we map the official position of LO on the four issues. Finally, we analyse the relations between the trade unions with the broader society over time. An important part of this exercise will be to study how the developments at these three levels interact.

In a second step of the analysis, we explore the conditions under which trade unions represent a force for stability or change. We do this by assessing the interests (e.g. which employment groups the trade unions represent) and which arguments the different trade unions use. For the latter, we distinguish between economic and climate related arguments.

Fuel subsidies reform for climate change, labour resistance and the need for social welfare mitigation

Camilla Houeland, Postdoctoral Fellow, Department of sociology and human geography, University of Oslo

Fossil fuel subsidies are a key contributor to climate change and local air pollution. Despite repeated efforts to eliminate the fuel subsidies, such reforms often fail (Skovgaard & van Asselt, 2018). Fuel price increases have provoked popular – and often labour led – resistance across continents. Labour typically resist fuel subsidy reforms (Scobie, 2018).

This paper will reflect over the role of trade unions, and the reasons for resistance against fuel subsidy reforms. I will do so based on the findings from a case study of the role of the unions in the historically large popular protests in 2012 against fuel subsidy removal in Nigeria (Houeland, 2017), combined with a desk study of other country experiences in the Global South. Only in the last two years, we have seen mass mobilisations of popular protests sparked from fuel price reforms in Zimbabwe, The Sudan, South Sudan, and Brazil.

While the World Bank emphasises that the middle classes is the prime beneficiary of fuel subsidies because they are the largest consumers of fossil fuels, this paper shows that the poor and workers are disproportionately, and negatively affected by subsidy reform. Importantly, the pressure to remove fuel subsidies precedes the climate argument, and is associated with an anti-labour and liberalist agenda. Fuel subsidy removal can challenge employment in formal and informal sector (Gass & Echeverria, 2017; Houeland, 2017). A price increase in fuel sparks inflation and reduces real wages. Where labour's traditional bargaining power is weak and the state provides little social security, protesting to protect low fuel price has worked as an alternative tool for labour to ensure benefits to members and citizens. Thus, fuel subsidy reforms needs to be carefully, and socially mitigated to ensure just transition, and to get labour engaged.

The role of second-order agent in the implementation of oil and gas companies' duties of decarbonisation and reparation

Marco Grasso, University of Milan-Bicocca – Milan, Italy

By indiscriminately flooding the global economy with fossil fuels, oil and gas companies are the driving force behind the current carbon-intensive socio-economic system. Yet, they have somehow managed to dodge the bullet, so to speak, they have adroitly avoided being condemned, in some case even recognised, for their role in it. A novel, more effective approach to dealing with the disastrous consequences of climate change should call attention to the significant role oil and gas companies have played in engendering the climate problem and on placing a burden on them to urgently help redress the situation accordingly. In this regard, previous work of the author explored the role that the oil and gas industry has – either directly through emissions or indirectly through denial – played in climate change (Grasso 2019b); and, based on these and other morally relevant facts, developed a normative framework to establish their responsibilities in relation to climate change and to shape the consequent duties of decarbonisation and of reparation (Grasso and Vladimirova, 2019; Grasso, 2019a).

This paper, by and large, investigates the awkward and controversial relation between oil and gas companies, the 'industry regime', and the socio-political context. The objective of the analysis is to set the stage for the implementation of the duties of decarbonisation and reparation (as developed in Grasso and Vladimirova, 2019; and Grasso, 2019a).

Since it is extremely unlikely that oil and gas companies comply with these duties on a voluntary basis, the oil and gas industry needs to be 'destabilized'. The conceptualisation of industry destabilization must pay particular attention to societal and environmental problems and cultural and political responses. The article argues that in this context a number of agents have secondorder responsibilities, i.e. the responsibilities to ensure that oil and gas companies (the first-order agents) meet the duties of decarbonisation and reparation imposed on them by their first-order responsibilities. In particular, this article intends to explore the role and possibilities of a number of second-order agents – e.g. charismatic individuals, social movements, economic actors, and sub-national political actors – in favouring oil and gas companies' achievement of their duties of decarbonisation and reparation and thus in the eventual practical implementation of such duties.

Thursday, 17th of October

PARALLEL SESSION 3

7 Citizen engagement with transformation

How people recollect and communicate climate change narratives: The role of worldviews

Böhm, Gisela (University of Bergen, Norway; Gisela.Boehm@uib.no; presenting author)

Pfister, Hans-Rüdiger (Leuphana University Lüneburg, Germany; pfister@uni-lueneburg.de)

Salway, Andrew (University of Sussex, UK; A.J.Salway@sussex.ac.uk)

Fløttum, Kjersti (University of Bergen, Norway; Kjersti.Flottum@uib.no)

Recent research has demonstrated that climate change perceptions are strongly related to worldviews (Guber, 2013; Jones, 2014). Drawing on theories of reconstructive memory (Bartlett, 1932) and cultural theory (Douglas & Wildavsky, 1982), we assume that the recollection and communication of climate change information is affected by one's own worldview as well as by the worldview of one's target audience. In an experimental study (N=266), participants read a narrative (600 words) about three politicians, each described as holding a specific worldview (individualistic/free market oriented, hierarchical/technology-oriented, egalitarian/ecology-oriented), who tried to mitigate climate change problems. After two time intervals (1 day, 1 week), participants retold the narrative to a hypothetical person as audience who was characterized as either an individualist, hierarchist, or egalitarian (or a neutral control condition). The retellings were recorded in free text format; additionally, the participants' worldview was assessed and participants were clustered into four corresponding groups. Results show that retellings are selectively reconstructed according to the worldview of the participant, becoming more compatible over time, as well as targeted to the audience's worldview. More specifically, participants holding a more egalitarian worldview reconstruct the narrative in a less distorted way than do individualists and hierarchists. Furthermore, a target audience with an explicit worldview leads to more distorted retellings than a neutral audience (control condition). No interaction was found between the worldviews of the participant and the audience. Results indicate how the perception and communication of climate change are shaped by fundamental underlying beliefs such as worldview. By that, they demonstrate motivated aspects of how people recollect and communicate information about climate change, which might help explain effects such as polarization.

Individuals' opinions about lifestyle in a climate change perspective

Kjersti Fløttum and Runa Falck Langaas, Department of foreign languages, University of Bergen

Abstract: Climate change concerns many aspects of our lives and affects how we think about different important questions – from our personal lifestyle choices to how we perceive of the future of humanity. With a point of departure in a survey undertaken through the Norwegian Citizen Panel/DIGSSCORE, University of Bergen, based on an open-ended question providing answers freely formulated by 4,044 citizens, the aim of this paper is to generate knowledge of people's opinions about their responsibilities to limit harmful climate change. Through both a semi-automated topic analysis and manual coding of the answers, accompanied by a linguistic discourse analysis, we have

found that the material can be structured in seven to eight different topics, spanning from a general attitude that all must contribute and take responsibility to more specific listings of numerous concrete measures that “we can undertake”. The analysis also shows that the respondents call for a clearer responsibility taken by politicians and request that politicians and authorities guide and help citizens to make the best climate-friendly choices in their everyday life. The paper concludes that more knowledge on the motivations that people resort to in their lifestyle choices is needed.

[Predictors of worry about climate change across Europe](#)

Thea Gregersen^{1,2}, Rouven Doran¹, Gisela Böhm^{1,3}, Endre Tvinnereim^{2,4}

¹Department of Psychosocial Science, University of Bergen, Bergen, Norway

²Centre for climate and energy transformation (CET), University of Bergen, Bergen, Norway

³Inland Norway University of Applied Sciences, Lillehammer, Norway

⁴Department of Administration and Organization Theory, University of Bergen, Bergen, Norway

Introduction: The presentation outlines the relative importance and interactions of different predictors of worry about climate change, based on data from the European Social Survey (ESS).

Methods: Specifically, multilevel models are used to examine associations between climate change beliefs, political ideology, and worry about climate change whilst controlling for cross-country variation.

Results: Preliminary results suggest that the most important factor for individual citizens’ worry were belief in anthropogenic causes of climate change, followed by beliefs that climate change will have negative impacts. Locating oneself closer to the ‘left’ rather than the ‘right’ of the political spectrum also had a significant association with worry, but the effect were small in general, and in comparison, to the other variables. The strength of the relationship between political ideology and worry about climate change further differs across countries. Political ideology moderated associations between climate change beliefs and worry about climate change. A relatively small part of the variance in worry were attributable to differences between countries. Some of the cross-country variation was explained by country-average political ideology.

Discussion: Implications of the research findings with regard to climate communications and interventions are noted; with a particular focus on the interplay between various predictors of worry about climate change across Europe.

[A national survey study on the relationship between cultural worldviews and mental models for environmental causation.](#)

Petter Risholm, University of Bergen

Risk-perception research has shown that subjective factors influence how the risk attached to climate change is perceived and evaluated (Slovic, 1987). One line of research has shown that risk-perception related to climate change is influenced by cultural worldviews (Xue, Hine, Loi,

Thorsteinsson, & Phillips, 2014). Another line of research has shown that mental models of physical processes influence climate change related risk-perception (Bostrom et al., 2012). The present survey (N = 613) is motivated by the question of how culture is related to perception of nature, and if this influences risk-perception related to climate change. The cultural theory of risk perception provides a theoretical framework which describe how cultural worldviews and mental models of environmental causation interact and influence risk-perception related to climate change. It was hypothesized a bidirectional relationship between the egalitarian worldview and the mental model of nature as fragile, and the individualist worldview and a mental model of nature as robust. Only moderate support was found for a bidirectional relationship between egalitarianism and the fragile mental model.

8 Transformation in an urban context

[Roots of transition: Urban Agriculture and the enabling of Ecological Habitus](#)

James Ribeiro Duthie, University of Tasmania, School of PhD Candidate (Environmental Studies), MEnvMan (Sustainable Development), MSD (International Development)

This paper employs Bourdieu's Theory of practice and the concept of ecological habitus to explore drivers of and barriers to increased ecological understandings and behaviour. Utilizing urban agriculture (UA) as a vehicle for researching ecological habitus. The paper focuses on the outcomes of UA for practitioners, their ways-of-being, how they perceive their environment and their relationship with it. The exploration of relationship between UA and the development of ecological habitus provides valuable insights for those wishing to develop innovations in sustainability transitions that apply far beyond the areas of food and urban studies. The concept of habitus sheds light on the ways in which insights, understandings, appreciations, changes in behaviour and values may occur. As an ecological habitus this system of often pre-cognitive reasoning and feeling manifests as an ecological sens-pratique or logic of practice that reflects the particular social-environmental relationships in which the holder is embedded. This paper draws on PhD research, the methods included two interviews with each of 38 participants from across two Australian cities, garden visits and participant-elicited photography. Participants experienced UA as promoting place making and as a space of connection and anchoring. UA engagement drove changes in ways-of-being and ways of perceiving that indicated the development of ecological habitus. Ecological habitus was expressed as changes to many aspects of practitioners' lives including consumer behaviour, diet, sense of place and community and a desire to live in an ecologically appropriate manner. Understandings of how and why such deep seated changes to people's ways-of-being, behaviour and how they perceive their world take place, holds great value for those wishing to better understand the drivers and barriers to the changes required for sustainability transitions. Such understandings allow researchers and policy makers to better develop and design more effective, efficient and longer lasting innovations for sustainability transformations.

[Abstract Beyond Oil: Governing climate change through climate budgets](#)

Stina Ellevseth Oseland and Jakob Grandin

Avoiding catastrophic climate change calls for rapid and deep cuts in greenhouse gas emissions in all sectors. While climate change has predominantly been governed as a global problem which calls for global solutions, the Paris framework underlines the important role of local actors such as

municipalities in the climate transformation. Hence, it is important to assess how climate change can be rendered governable at those more local scales. Climate budgets, pio-neered by Oslo and now adopted by municipalities all over Norway, may be one such govern-ance tool. Climate budgets can be understood as an operationalization of climate action plans by integrating the goals and implications into the overarching municipal financial budget process. They are presented as an "innovation in governance", where a maximum emissions volume for the city is proposed, and the budget contains the measures and instruments needed to stay inside this emissions cap. By linking the climate goals and emissions to the municipal budget, a pro-cess of mainstreaming climate issues cross sectorally is started and a vision of the profound changes needed is brought forward (Oseland 2019). In this paper, we examine the process through which climate budgets as a governance tool have been mobilised across Norwegian municipalities, and the local dynamics of developing such plans. Building on empirical cases from the four largest Norwegian cities; Oslo, Stavanger, Trondheim and Bergen, we assess and compare whether and how these budgets are used as a tool to accelerate climate action.

Beyond Oil 2019 - Deep and Rapid transformations

Abstract – “Accounting for mainstreaming? Comparing Swedish and Norwegian approaches to municipal Carbon Budgets

[Governing for low-carbon everyday? Expanding low-carbon urban governance approaches](#)

Contributing Author:

Kristin Kjærås, Centre for Climate and Energy Transformations (CET), University in Bergen

Jesse Schrage, Centre for Climate and Energy Transformations (CET), University in Bergen

Today, governing for low-carbon cities has taken a central role in understanding the social, economic, political and infrastructural determinants of low-carbon ideals. In terms of processes internal to urban governance the literature has been characterized by a focus on experimentation, multi-level forms of governance and trans-local policy formulations as potential sources for informing and articulating local responses. In parallel, we have observed a selective amalgamation of ecological goals in the ‘greening’ of urban governance. In terms of content, hegemonic ideals of compactness, walkability and connectedness through public transportation, have been harnessed by many cities as anchors of any climate-friendly strategy.

The relevance of these urban solutions in regards to the consumption of everyday life remains however insufficient. And it is to counter and complement such green agenda that this paper proposes to carve out a space for exploring how the literature on everyday life can provide a more accurate vocabulary for low-carbon governance.

In this article, we begin by characterizing the approach that has been predominant in low-carbon urban policy interventions for then, in a second part propose a way to re-think how a low-carbon everyday can be more accurately captured and governed. This paper is a theoretical contribution to emerging literature on climate urban governance and proposes to extend current analytical

perspectives so as to include the way in which the dynamic, fragmented and relational mechanisms of everyday plays out in steering for low-carbon urban futures.

Siting conflicts about renewable energy installations in Germany: what role for one's own back yard?

Gerhard Fuchs, University of Stuttgart

In the debate about the transition towards Low-Carbon Energy Systems not only conflicts between political parties, between incumbent and challenger actors in the field of energy policy can be observed and analyzed. Spatially situated conflicts about the siting of EE installations and/or local conflicts about the extension of the grid infrastructure also grow in number and significance. Sometimes these conflicts are analyzed in terms of the general interest in the development of energy transitions vs. more or less selfish not in my backyard sentiments. Actual conflicts, however, present a more complicated picture, highlighting the impression that there is not "one" transition, but transitions in themselves are contentious, conflict-ridden endeavors and the situation in concrete places where conflicts about EE installations etc. arise, mirrors this impression.

The paper will analyze four actual conflicts in the realm of electricity generation and distribution in Germany. The aim of the paper is to show that protest events are not single-issue items but instead they are embedded in longer event chains. The highlighted protest instances also illustrate the point that in the German electricity transition there is not one clear-cut line of conflict, but various conflict lines are overlapping. In some cases in fact the overall outlook of the system of electricity production and distribution is at stake, in other cases the energy issue is used to prolong and re-fight existing conflicts, in still other cases we are mainly dealing with local grievances addressed to the far away authorities. Far from de-railing the electricity transition the conflicts also signal, that the transition has become part of everyday practices and conflicts. None of the conflicts studied is "representative" in any statistical sense, but they show the working of different mechanisms in the conflicts linked to the transition. The landscape issue e.g. is not a uniform one but plays out differently and is of varying importance in the individual constellations. Thus it is also obvious that the protest events have not been randomly selected, but with the aim in mind to highlight different protest constellations.

Organizing for a transformation the Norwegian Maritime Sector

Agnete Hessevik^{1,2}

¹Department of Administration and Organization Theory, University of Bergen, Bergen, Norway

²Centre for climate and energy transformation (CET), University of Bergen, Bergen, Norway

In April 2018, international shipping got it's own climate agreement. The International Maritime Organization set the goal to reduce the GHG emissions from shipping by 50% within 2050. While emissions from international shipping still is difficult to regulate directly by individual states, industry actors in the Norwegian maritime sector have mobilized in networks to push for a transformation towards low- and zero emission shipping. This study seeks to show how industry initiated networks tie together companies, industry associations, research institutions and public organizations, in order to pool resources and knowledges to be able to develop new solutions and influence public governance. The analysis is based on documents and interviews with members of the cluster organization NCE Maritime CleanTech and the Green Shipping Program. The data show that the

networks gain strength through the different kinds of resources that the members bring into the networks. The general picture is that industry associations bring in lobbying experience, public organizations contribute with detailed knowledge about the political and administrative system, and maritime sector companies bring in technological expertise. In addition, member organizations, but also individuals, bring in valuable relations to decision makers. The presentation will show how these kinds of resources are put to use in the network arenas, which seems to create momentum to contribute to a more rapid transformation of the Norwegian shipping sector.

Electromobility at semi-peripheries of Europe: visions, actors and prospects for a rapid technological change

Authors: Aleksandra Lis (PhD), Rafał Szymanowski (PhD) Adam Mickiewicz University in Poznań, Poland

A conservative government of Poland announced its program for development of electro mobility in 2017 with a bold goal of 1 million EVs driving on Polish roads by 2025. This idea for a rapid change in private and public transport systems came with a vision of an innovative, green and prosperous society. However, the most spectacular achievement of its implementation so far was a gala ceremony where awards for the best design of a Polish EV were handed in. This paper examines the types of stakeholders involved in the Polish project of electromobility, visions of a socio-technical change behind it, financing, infrastructure and transfers of know-how. We analyze the evolving change in terms of relations between niche, regime and landscape actors, paying particular attention to the development of markets for EVs and electro-mobility as a broader set of services. For this reason, we examine the development of private and public mobility – an e-car versus an e-bus project – asking whether Polish electromobility will ultimately boil down to the electrification of urban public transportation, and not much more. We also examine whether electromobility in Poland is linked to other types of innovations in transportation: shared or autonomous mobility. The analysis is based on a desk research and 15 expert interviews carried out in 2019 with main actors involved in the Polish project of electromobility: government officials, business representatives, and policy experts from various research and think tank institutions. The proposed paper aims at exploring the potential for a rapid change in mobility patterns in a semi-peripheral country where currently the share of used diesel cars in private ownership is one of the highest in Europe.

Electric vehicles in Norway from novelty to controversy and acceptance

Endre Tvinnereim, Gregory Ferguson-Cradler

The transportation sector accounts for one of the highest shares of greenhouse gas (GHG) emissions globally, and a transition away from fossil fuels is required to reach globally agreed temperature goals for this century. Electrification constitutes one likely option for such a transition, yet public acceptance remains a major barrier. While past research has produced some knowledge about conditions for early adoption, less is known about acceptance in the context of mass-market penetration. Furthermore, existing research is limited by survey design and unrepresentative data sets drawn from social media. We address these problems using a novel online survey approach combining open-ended and fixed-response questions, and derive overall sentiment toward electric vehicles (EVs) by population segments as well as sentiments connected with individual words. We

then apply these sentiment scores to produce a sentiment index, which we then apply to longitudinal Twitter data.

Our results implies high overall support for electrification of personal cars, but concerns related to the environment (notably the production and disposal of batteries) around distributional effects (rich/poor, rural/urban) need to be addressed. Furthermore, we find opinions on electric vehicles expressed via Twitter to be significantly more negative than in representative sampling. Finally, our combination of open-ended survey questions and social media constitutes a promising avenue for research in other domains such as public health and immigration.

Between the private and public: New Mobility solutions in urban China

Thea Valler, PhD Candidate, Department of Interdisciplinary Studies of Culture (KULT), Norwegian University of Science and Technology (NTNU)

When considering speed of transition there is really no one beyond or beside China, the urban transport sector being no exception. Yet, the speed of change can naturally not be equated with sustainability, and questions has rightfully been raised regarding the decarbonisation potential of new mobility solutions in urban China. This study take a closer look at a somewhat unusual trajectory of transformations in the transport sector, namely the boom of mobile application based, shared transport, and regulators struggling to keep up. More or less over night, Chinese cities where covered in colourful bikes, totalling x in 20xx. While the increase in ride hailing does not have the same eye-striking effect, it too has had major impact on how urban Chinese travel. Faced with millions of new, often young, cyclists, to what extent are Beijing authorities tapping into the decarbonising potential of changing travel habits? Further, rapid growth in ride hailing run the risk of increased consumption of fossil fuel intensive transport. Ride hailing companies are both welcomed as a much-needed source of transport data, but also subject to increasingly strict requirements for drivers and vehicles. In other words, these new companies represent both opportunities and regulatory challenges. The companies in turn, are constantly negotiating government relations, trying to prove their worth to the authorities, who can make them prosper or perish with a regulatory stroke. Through interviews with employees in new mobility companies, consultants, academics and actors involved in urban planning, this study takes a qualitative approach to new mobility solutions in Beijing. Still, the user perceptive is not lost, the study also include in-depth interviews with users from different social layers. Against the backdrop of perspectives from Science and Technology Studies (STS) and sustainability transition perspectives, the study explores decarbonisation strategies in a transport structure increasingly dominated by private actors.

PARALLEL SESSION 4

10 Energy poverty and security

[Enabling sustainable energy transitions: Practices of legitimation and accountable governance \(book talk\)](#)

Siddharth Sareen (Geography / CET / SVT, UiB)

This book reframes sustainable energy transitions as being a matter of resolving accountability crises. It demonstrates how the empirical study of several practices of legitimation can analytically

deconstruct energy transitions. A typology of these practices and the dimensions where they play out helps determine whether energy transitions contribute to sustainability.

Opening with the real-world challenge of climate change which requires sustainable energy transitions, the introduction argues that this presents a crisis of accountability legitimated through certain practices. Subsequent chapters traverse a wide range of cases: urban energy transitions in Germany, forestland conflicts in Indonesia, urban carbon emission targets in Norway, transport electrification in the Nordic region, and biodiversity conservation and carbon markets in the USA. A concluding synthesis extracts various dimensions from these cases wherein practices of legitimation construct specific accountability relations. The authors reflect that such an approach focused on accountable governance is essential to enable sustainable energy transitions.

Rural Communities and the Coming Energy Transition

Jeffrey B. Jacquet – The Ohio State University, United States.

Darrick Evensen – University of Edinburgh, U.K.

Max Woodworth – The Ohio State University, United States

Thomas Measham – CSIRO, Australia

Rural communities and regions across the globe remain in position to be most harmed by the coming transition away from fossil fuel based energy sources. Already vulnerable from decades of population loss and economic concentration and decline, rural communities globally appear unlikely to benefit from a switch away from coal and oil based energy industries and towards a renewable and 100% electrified smart energy grid. At minimum, a reordering across rural populations is likely to occur as the locations and processes of the energy industry are transformed. Potential opportunities do exist for rural populations who are able to remedy the otherwise deleterious effects from fossil fuel production and higher energy costs compared to their urban counterparts. But absent comprehensive policy to aid rural communities in navigating the coming energy transition, these rural places appear in poor position to reap many benefits.

Providing examples from general statistics and specific in-country case studies, this paper provides an overview of the geographic and economic forces that influence transition experiences in rural communities in the United States, Australia, China, and the UK. In particular, we focus on rural communities historically dependent on coal production and examine cultural, economic and political factors that may mediate transition experiences. Finally, we employ a cross-country comparison across these nations to examine the efficacy of national and local-levels policies aimed at managing the impacts of this transition.

Energy poverty policy in the EU: A cross-sectional analysis

Chersoni G., Eurac Research, Institute for Renewable Energy - Department of Economics and Statistics, University of Turin

Fontana M., Despina Big Data Lab - Department of Economics and Statistics, University of Turin

Giaccaria S., European Commission. Joint Research Centre, Directorate C Energy, Transport and Climate

Nava C., Despina Big Data Lab - Department of Economics and Political sciences - University of Aosta Valley

The developments of an energy system that provides affordable and appropriate energy supply has important equity and justice implication. The combination of higher energy prices, low income and low residential energy efficiency has seen the rise of domestic energy deprivation throughout the EU. The complexities associated in measuring energy poverty incidence and the character pertaining to the specific multidimensional nature of the problem underline the policy difficulties to tackle the issue effectively. In addition, the spatial access disparities to infrastructure and services prevent to define a single solution. Energy renovation address the essence of the problem, but the material and socio-economic inequalities differentiating EU countries demand for a case specific study to define effective policy approaches.

We aim to compare the effectiveness of income support schemes and energy efficiency incentives on households energy poverty status, analyzing fuel poverty across EU (EU 28 plus Iceland and Norway), exploiting the data from the Second Consumer Market survey (DG Consumer and Transport, 2015). Energy poor households are characterized as the percentages of family that suffered from electricity arrears. This measure overcome some of the main weakness of the EU-SILC based arrears indicator (i.e. sampling method and inclusion of water bills) and allows performing a large cross-comparative analysis. The hypothesis that reducing energy inefficiency relieves energy poverty in the long run is tested using a logistic regression model with explanatory variable selected based on existing literature on fuel poverty drivers.

The cross-comparative study analyses the synergies between energy efficiency improvements, fuel poor outcomes and context specific factors. Results of this work define key features of fuel poverty, enabling to inform policy-makers on the effectiveness of different policy measures among European countries.

[Anticipating More than Black Outs? Sociotechnical Imaginaries of Energy Security in Finland](#)

Sakari Höysniemi, Doctoral candidate, Environmental policy, University of Helsinki

Securing energy supply and decarbonisation of energy system could be considered as one of the key targets of energy policy. Both of these targets operate under anticipatory logics, but close to an antagonism, securing against threats or enabling change. That is, the process of anticipation could be categorized between undesired and desired futures or between management of continuity and change. We take Finland as a case study, as it on one hand has performed well in energy security in terms of having versatile energy mix. It is, however, carbon-intensive and optimized for energy trade with Russian Federation, although through the rationale of security of supply any given fuel could be purchased elsewhere in an emergency situation. Based on data consisting of 30 expert interviews, governmental and corporate strategies and scenarios, this article assesses how the imaginary of energy security is attained vis-à-vis climate change mitigation policies, namely energy transition. The results indicate that energy security in Finland is in the process of reframing due to strengthening of climate policy targets and due to increased hope for technological innovation. A closure is not yet achieved on how to achieve both secure and decarbonized energy system. Rather, the scope and context of energy security in terms of acceptability of certain technologies and policy measures is broadening spatially and temporally and is putting pressure to rethink anticipatory logics.

Keywords: Energy security, Energy transition, Sociotechnical imaginaries, Anticipation, Energy policy, Finland

11 Energy justice and equity

Michael LaBelle, Associate Professor and Jean Monnet, Chair in Energy and Innovation Strategies
Central European University

Department of Environmental Sciences and Policy

Department of Economics and Business

[The Geography of Energy Cultures in Energy Justice](#)

This article develops a critical assessment of the role of culture in energy transitions through the lens of energy justice. It identifies the importance of developing a more comprehensive understanding of energy culture to inform energy justice. The foundation of ‘cultural geography’ and ‘geopolitics of culture’ are reviewed to effectively tie modern cultural geography and the identification power relations in cultural relations to periods of energy transitions. The development and role that technology plays in fermenting cultures of energy will be evaluating in terms of an energy justice perspective that looks at the equitable diffusion and access to energy technologies and resources. Important to this examination of energy practices, are prices and types of natural resources. The discipline of geography is used as a basis for a critical assessment of the creation of energy cultures. Drawing on the ‘geographies of culture’ approach and ‘cultural geography’ a critical reflection is developed on the role of geography in identifying the role of culture informing how energy justice can provide a spatial assessment of universal and interpretations of equitable energy systems.

[Energy Equality policies for a just energy transition: social innovations actors’ insights](#)

Energy Equality policies for a just energy transition: social innovations actors’ insights

Giuseppe Pellegrini Masini, Postdoctoral fellow, NTNU Norwegian University of science and technology, Trondheim

E-mail: giuseppe.p.masini@ntnu.no

The SMARTEES project[1] is a large H2020 research consortium investigating drives and barriers towards sustainable energy local innovations ongoing in several European cities, whose focus is on energy poverty, urban regeneration, sustainable mobility and islands’ renewables. One of the strands of research in this projects looks at whether energy social innovations can improve “energy equality” and “energy justice” and how the local policies can address these principles facilitating the energy transition.

Towards that aim, we have carried out semi-structured interviews with social innovations’ actors in several city cases. The preliminary findings will be presented highlighting the current institutional and social drives and barriers for sustainable energy social innovations, the suitability of energy social innovations to address “energy equality” and whether policies can be engineered to promote this principle. Contextual variables and their influence on the attitudes and urban residents, will be discussed along with implications for future research developments.

[1] URL: <http://local-social-innovation.eu/>

Interspecies Energy Justice: Bringing the Nonhuman World into the Energy Transition Debate

Giovanni Frigo

Institute for Technology Assessment and Systems Analysis (ITAS)

Karlsruhe Institute of Technology (KIT)

Developing a moral concern for the nonhuman world has been the crux of many scholars in environmental ethics. In the field of environmental justice (EJ), some authors have proposed to move beyond anthropocentric views by considering the well-being of animals and plants, and even of entire ecosystems (e.g. Plumwood 2002). The terms interspecies justice appropriately captures the attempt to extend moral considerability to those beings and entities that are other-than-human. Rather surprisingly, however, such reflections have remained within the EJ scholarship and failed to influence the emerging field of energy justice (EneJ), that is a key component of the energy transition. In this paper, I contend that by being mostly preoccupied with the goal of “humanizing the sociotechnical transition” (Jenkins et al. 2018), EneJ remains fundamentally anthropocentric and therefore shortsighted in light of the ecological dimensions of the energy transition. In fact, the expansion and modification of energy systems does not affect only human lives but also the well-being of non-human beings and ecosystems. Given that energy transition, global climate change, resources scarcity and biodiversity loss are in many ways intertwined issues, I argue that interspecies justice should be brought into the discussion about how to deeply and rapidly move “beyond oil”. This theoretical update can lead to radical changes in the ways public policy is envisioned, intersectionality is thought, and activism is justified and carried out.

Carbon budgets, Equity and Rapid Transformations towards Paris Compliant Futures

Isak Stoddard, Centre for Environment and Development Studies at Uppsala University and SLU

Kevin Anderson, Uppsala University and University of Manchester

The rapidly dwindling global carbon budget commensurate with the temperature commitments in the Paris Agreement reveals a challenge beyond anything thus far countenanced by any industrialised nation. Even ‘climate progressive’ nations, such as Sweden and the UK, have climate policy frameworks that overshoot their ‘Paris-compliant’ carbon budgets by a factor of, at the very least, two. Decades of inaction, accompanied with an unwavering belief in market mechanisms and speculative negative emissions technologies, has turned climate change into a question of fundamental societal change, with equity embedded at its core. This conclusion is not drawn from moral philosophy or political ideology, but is rather a quantitative result of the cumulative nature of carbon emissions, the highly unequal distribution of carbon emissions and the temperature commitments enshrined in the Paris Agreement. The resources and labour used to furnish the high-carbon consumption lifestyles of the ‘relative few’ need to be rapidly reallocated to deliver the physical infrastructural change implied by a zero CO₂ energy society by 2035-40. This conference submission aims to begin sketching out the deeper philosophical dimensions of such a rapid and deep transformation of industrialised societies, and what the practical implications may be.

Conference themes that this contribution connects to: Rapid and Deep Transformations, Academic Engagement.