

BEYOND OIL: Prioritising climate action

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Wednesday 20th of October 2021

PARALLEL SESSION 1

Engaging the public

Public perceptions of the who, what, and why of energy transition pathways

[Gisela Böhm, University of Bergen](#)

Public support is a core component of climate action. A broad diversity of potential climate actions exist that may proceed along a multitude of pathways. An important research question is how the public perceives and understands these pathways. The current paper focuses on pathways towards energy transition and investigates how these are cognitively structured. In a survey among Norwegian (N = 106) and German (N = 142) students, we asked respondents to evaluate various energy transition pathways. A facet theoretical analysis of these evaluations indicates that the following three dimensions form the cognitive structure of energy transition pathways: (a) Who is taking the action (i.e., on which level a pathway is located: individual actions, societal actions, technological actions), (b) what kind of action is required (curtailment actions that entail a reduction in consumption versus efficiency actions that entail a replacement of equipment with more energy efficient alternatives), and (c) why an action would be taken (the impact of a pathway on the following domains: the economy, the community, human health, nature, or quality of life in general). We situate the results within the climate psychology literature and discuss implications for communication as well as for political strategies to implement energy transition pathways.

Behavioral change for a socio-economic transition: linking system with individual behavior in complex systems

[Katharina Biely, Delft University of Technology](#)

Behavioral science does usually either look at the individual or the institutional level. Though, recently it has been acknowledged that micro, meso and macro level need to be analyzed in concert to understand transformations. Human behavior gets institutionalized, and institutions support certain behaviors. In order to facilitate the needed deep transformation towards sustainability, the dynamics between the different levels need to be understood. We developed a new conceptual framework that allows understanding how individuals are embedded in the larger socio-economic system. The starting point of the analysis is understanding the current socio-economic system as unsustainable and resilient to change. Factors, mechanisms and processes that constitute the unfortunate resilience of the current socio-economic system are identified by analyzing past socio-economic crisis. Part of this resilience are the mechanisms that reintegrate and realign dissatisfied individuals who would be seeking alternatives. In this context, resilience is the system level successfully providing alternatives to individuals, which only alter the system but inhibit a transformation. Analyzing past socio-economic crisis allows understanding how the system managed to bounce back. These insights can be used to draw conclusions on how to overcome this unfortunate resilience and how to break with the current trajectory.

Power struggle in climate change issues

[Pinar Majidova, University of Aberdeen](#)

Taking into the consideration the immense power that governments possess today their influence on issues such as climate change cannot be neglected. Existing literature proves that policymakers can decisively promote the idea of climate change within society. But, governments tend to ignore or sidestep the problems such as climate change which would hinder their profit maximization goal, as long as there is no outside pressure such as public or media attention\criticism. In this sense, we will analyze the prioritisation of climate change issues from social movement theory's point of view which aims to fight against some perceived injustices especially in energy, transport, or food systems. Being consisted of civil society organizations, public and private sectors, SMT supporters exert pressure on existing regimes through protest marches, blockades, strikes, boycotts, petitions which results in (most of the time) regime decline or withdrawal. Additionally, social movements can change public opinion, consumer preferences, everyday practices and draw more attention to environment related issues. However, the literature review has proved to be scarce on issues such as how and under what

conditions social movements can change everyday practices of people and draw their attention to the problems such as climate change? Also, it has been overtly expressed that success of social movements is largely dependent on the political configuration of the country (level of democracy, the role of judiciary, rule, and law) and this claim makes the SMT if not totally but to a larger extent irrelevant for authoritarian countries and opens up an opportunity for further study.

Empowering Citizen Scientists through Machine Learning Tools for Collective Climate Action

[Thomas Y. Chen, Academy for Mathematics, Science, and Engineering](#)

Citizen science is one of the most potent assets in tackling any issue that faces humanity. While a few scientists, even with their domain-specific knowledge, can ponder a research question for decades, a mass movement of motivated individuals without any specific expertise can tackle a problem in innovative ways and yield novel results relatively quickly. Global climate change is a crisis that faces humanity, threatening biodiversity, human livelihoods, the existence of coastal cities, and much more. Recently, machine learning and artificial intelligence tools, from linear regression to artificial neural networks, have emerged as key assets in understanding and addressing climate change, both in the mitigation and adaptation senses. Because data science is so accessible and algorithms can be trained and tested by anyone with sufficient computer science knowledge, this is an unprecedented opportunity to harness the value in crowdsourcing to develop state-of-the-art models for problems as diverse as energy optimization, transportation optimization, climate prediction, natural disaster assessment, and the remote sensing of agriculture and forestry. Approaches include deep learning-based computer vision algorithms trained on imagery, such as Earth observation satellite imagery and even social media data. At a time when climate action is ever so necessary, having a well-educated populace keen to act themselves to tackle this crisis head on is crucial, and large-scale citizen science projects at the nexus of artificial intelligence and climate change are downstream from that baseline.

Public perspectives on sustainable transport

Pushing low-carbon mobility: A survey experiment on the public acceptance of disruptive policy packages

[Annina Thaller, University of Graz, Austria](#)

Strong and disruptive policy packages will be crucial for enabling societal change to combat anthropogenic climate change and consequently to move beyond oil. This is particularly true for the transport sector, where emissions continue to rise and high carbon lock-in prevails, making voluntary behavior changes very unlikely. Public acceptance is an important influencing factor for the feasibility of implementing passenger transport measures. In a representative online survey conducted in May 2021 (N = 1032), we therefore investigated the acceptance of selected disruptive measures to achieve climate targets among the Austrian population. On the one hand, an experimental group comparison shows that a comprehensive package of measures - consisting of incentives and restrictive measures - leads to an increased acceptance of such restrictions. On the other hand, significant differences between several types of restrictions emerge in a conjoint experiment: Regulatory measures, such as a ban on the registration or use of internal combustion engines and hybrid vehicles, were more favorably evaluated than economic measures, such as increased gasoline or parking prices. Interestingly, study participants preferred the introduction of such driving bans even compared to the implementation of no measures at all. Incentives for different modes of transportation were generally rated positively, provided they did not disadvantage drivers. The most popular incentives were the provision of public transportation according to the potential number of users and

ensuring a minimum service for rural areas. In general, the greatest resistance is to be expected from the most affected groups, such as car drivers, low income groups and rural households. The precise design of various restrictions and incentives should therefore address these groups, for example by integrating compensation mechanisms. Furthermore, transparency plays a key role in communicating the need for such policy packages, and the potential benefits and incentives for behavior change should be clearly explained.

Mind the gap: *Commoning* urban mobility in Bergen, Norway

Devyn Remme, [University of Bergen](#)

It has been claimed that regimes of urban automobility have reached their functional and ideological limits (Enright 2019). Many cities are pursuing policies to restrict private vehicle use and prioritize walking, cycling and public transportation. De-centering automobility may be understood as the first big push to change resource intensive social practices and shift representations of 'the good life' in cities towards the low carbon logics of shared resources. Yet, as the policies seem to be working and cities ratchet them up, the celebratory proclamations of anti-car advocates are dampened by growing resistance. Hence, it is imperative to account for mobility transitions as spaces of conflict over values. The contested agendas to de-prioritize automobility being pursued today constitute political terrains where the logics and contradictions of low carbon urbanism are unfolding.

I present research from Bergen, Norway – the global leader in electric vehicle adoption with strong commitment to displacing automobility. Through multiple qualitative methods, I analyze three interventions aimed at preventing growth in private vehicles: light rail expansion, congestion tolls and car free zones. The aim of this paper is to reflect on the systemic parameters of social inclusion in the context of Bergen's mobility transition and to describe the challenges of applying these insights in practice. I consider social inclusion in the context of shifting norms, practices and provision towards a common urban mobility system. The research foregrounds the challenges of reconciling multiple aspects of social inclusion within urban transformation by applying a 'commoning' approach. This approach critically engages with the strong normative tradition of liberal distributive justice which prioritizes the value of individual choice. 'Commoning' refers to both distributive and procedural justice. I find that different inclusion goals are in tension and identify fundamental

constraints and trade-offs that policy makers and planners face with regards to social inclusion and mobility transitions.

Rebuilding a Bike Kingdom: the Case of a Chinese Bicycle Highway

[Thea Valler, Norwegian University of Science and Technology](#)

During the reform era, bicycles were gradually squeezed out of Chinese cities to make room for the growing car culture. Today, the bicycle is re-emerging as a solution to new challenges, such as air pollution, congestion, and public health. However, rebuilding a bicycle kingdom is not done overnight. In this paper, I take a closer look at one specific measure: constructing an ambitious bicycle highway in a Beijing suburb. The elevated, three-lane bicycle way spans six kilometers, connecting residential areas and a cluster of technology companies. It also serves to reconstruct the image of what is often seen as a sleeping part of the city. This case seeks to shed light on a number of central issues within the Mobilities Transitions literature, the New Mobilities Paradigm, and Mobility Justice. First, while the project has been presented as a bottom-up process, building on public participation, this might rather be a case of gathering public perceptions. Second, built in a relatively affluent area, the constructions play into central equality dimensions. In addition, e-bikes, often seen as a lower-class transport mode, are denied access. Lastly, the case underpins the highly political nature of allocation of space. While the highway does provide cyclists with a convenient commute above street level, it does so without infringing on roads allocated to cars. This paper thus seeks to contribute to the literature on the bumpy road to a low-carbon transport system.

Framing effects on climate policy support: The role of values and ideology

[Mari Helliesen, University of Bergen](#)

Effective climate policy requires fundamental changes in individual citizens' behaviour, and democratic policymakers are largely concerned with what citizens want. Policies designed to solve climate and environmental issues are unlikely to succeed unless they have broad public support. Scholars have argued that messages about politicized issues, including climate change, are most effective when adapted to target subgroups.

Socio-political variables such as values, ideologies, worldviews and political orientation are important determinants of climate change perceptions and pro-environmental policy support. Research has shown that left-leaning ideological positions and egalitarian values increases support for pro-environmental policies, compared to right-leaning position and individualistic values.

The aim of this study is to measure support for climate policy issues, the effect of framing on support, and the extent to which this effect is conditioned on core values and ideology. The main motivation is to analyse whether climate issues could be addressed and communicated differently to different groups based on their values and ideology – to gain policy support. Or if there is an effective way of framing policy issues for all, independent of values. In addition, I intend to explore to which degree preferences of citizens and representatives align, and whether a conditioned effect of values and ideology on framing differs between citizens and representatives.

I measure the effect of framing on climate policy support among both the general public and elected representatives in Norway, through a novel survey experiment fielded in the Norwegian Citizen Panel (NCP) and the Panel of Elected Representatives (PER). The experiment includes two policy issues, one of which deals with carbon tax on food, and the other concerns the use of public funded bicycle lanes. The frames cover two dimensions, responsibility versus benefit and individual versus collective.

Decarbonizing the energy sector

Conceptualising fossil fuel displacement: Scales and practices of legitimation

[Siddharth Sareen, University of Bergen](#)

As renewable energy sources increasingly outcompete fossil fuels on cost and efficiency, novel questions arise around how, when and where renewables can

displace fossil energy. We need to understand fossil fuel displacement as a socio-political and spatial process. In this paper, we focus particularly on the scales and practices of legitimation through which fossil fuel displacement occurs. We advance an understanding of how such displacement is conditioned by incumbent multi-scalar arrangements, and of how these may be overcome. We suggest that there are different practices of displacement that operate across scale – here conceptualised as discursive, financial, institutional and socio-material – and use them to develop an analysis of solar rollout and fossil phase-out in Portugal. Our analysis surfaces that while renewables have partially displaced fossil fuels both discursively and financially, particularly in small-scale projects, they have not yet displaced the historically large-scale nature of energy generation. Rather, the persistence of fossil fuel geographies and sectoral institutional arrangements keeps the displacements of energy transition at a spatial remove from citizens.

The economics of future oil production

[Erling Moxnes, University of Bergen](#)

IEA's recent report now agrees with what has been known for quite some time that proven reserves of oil are larger than what should be consumed given the goal to halt climate change. Correctly, politicians make the point that there will still be demand for oil. However, they tend to say little about the expected profits of exploration and development of new fields. A very simple dynamic model of the world oil market is used to study the oil price development and the likely future profitability. What happens if all producers rush to produce their oil reserves? Why limits such a rush? What does it take for the oil producers to form a cartel to keep prices high? What will the role of Norway be in such a cartel, and what will be the overall profitability of Norwegian oil production? Finally, is the risk worth taking for oil companies and oil producing countries?

An investigation of the physical and societal limits to hydroelectric power generation and storage in Western Norway

[Rebekka Frøystad, University of Bergen](#)

In the global battle against climate change, the European Union crossed a milestone in 2020 when renewable sources overtook fossil fuels for energy production. As an energy-exporting nation and close neighbor, this affects Norway directly. While our economy has to phase out the extraction of "black gold", it could benefit from the increased demand for energy storage. The growth of renewables is entirely based on intermittent sources such as wind and solar power that require storage. Pumped hydroelectric storage is the only grid-scale power storage solution available today, and Norway holds by far the most expansion potential in Europe. So, can Norway be the "green battery"?

An equally relevant question is: Does Norway want to fill that role as the continent pushes forward? At the national level, the answer is yes, with sustainable development as a top priority and a defining element of international relations, e.g. by making "climate change and security" a thematic area of Norway's 2021-2022 membership in the UN Security Council. However, plans to exploit natural resources face considerable pushback at the regional level. The willingness to create new dams is limited and will likely face a similar opposition as the already ongoing expansion of wind power.

We aim to investigate the physical and societal limits to hydroelectric power generation and storage in Western Norway. Organizing our work as a case study on Folgefonna glacier in Western Norway, we will combine the recently obtained detailed bed topography map with state-of-the-art glacier modeling. This will yield precise estimates for the future of Folgefonna glacier and hydropower generation in the region, including PHS, for all available future climate scenarios. We will then use this detailed information to test the acceptance of new infrastructure projects through survey experiments in the Panel of Elected Representatives.

Accelerating complex and contested technology to meet climate goals: A carbon capture study

[Amber Nordholm, Norwegian University of Science and Technology](#)

The emissions gap is larger than ever, indicating that the world is on track for warming of 3.2°C, well beyond the recommended limit of 1.5-2°C, by the end of the century even with the full implementation of the Paris Agreement[1]. Meeting and exceeding the Paris Agreement targets require bigger and accelerated green shifts in all sectors; especially sectors (e.g. shipping, aviation, steel, cement, and chemicals)

where technology options for reducing emissions are limited[2]. Paradoxically, meeting the material needs for renewable energy sources requires a large-scale ramp-up of electricity use and carbon-heavy steel, concrete, and chemicals manufacturing[2]. Decarbonizing these sectors will largely rely on technologies, such as carbon capture and storage (CCS), that have not yet reached a viable maturity or are in use to a very limited degree[2,3]. Yet CCS is framed as a critical technology for effective decarbonization goals[4,5,6].

The fact that CCS offers the prospect of reconciliation between climate change mitigation and continued use of fossil fuels has raised criticism[7]. CCS also brings incumbent carbon lock-in stakeholders to the climate challenge discussion, such as transnational oil companies, to potentially bridge previously opposing interests. The Norwegian Longship project, for example, is a government-backed CCS initiative that reveals the need for better understanding of political and institutional arrangements between global sector structures and national and sub-national agents. CCS offers an opportunity to examine how to move beyond oil in the low-carbon transition since it intersects fossil fuel regimes and environmental imperatives. This presentation will report on current and upcoming research on accelerating the low-carbon transition through a spatial and techno-political perspective of CCS and facilitate a discussion to critically examine the role of CCS in energy transition strategies. Research methods include semi-structured interviews and a discourse analysis of media and policy hearing responses.

Policy cooperation in the transport sector

Automation Shift for the Energy Shift? An explorative case from Killingøy, Norway

Cecilie Gro Vindal Ødegaard, University of Bergen

Automated technologies, such as self-propelled boats, are supposed to facilitate emission-free and more energy-efficient activities at sea like in offshore, fishing, cruising and freight. In the context of ongoing major initiatives within automated technologies by the offshore industries and the Norwegian Maritime Authority, this paper initiates an exploration of the narratives around these projects from the perspectives of the various actors involved, i.e. national and local authorities, industrial actors, workers and local community. We ask, for instance, what are the narratives developed for the promotion of automated offshore technologies; how are they promoted; how are these narratives responded to; and what is the significance of energy and energy shift for the general promotion of automated offshore technologies? In doing so, the paper will show that in order to understand the impact and possibility of climate action, it is necessary to look at the links between industries, institutions and society – and suggesting that the study of single events (such as the introduction of automated technology) can be a revelatory site for exploring the ethnographic and analytical dimensions of the proclaimed energy shift(s). Connected to the theoretical and methodological ambitions of the research project “Automation shift in the maritime sector of the offshore oil and gas industry: assessing risk and safety, protecting labor.” (ASMOG), aiming to study the effects on society of automated technologies in the maritime sector of the offshore oil and gas industry, the paper looks specifically at the contextual framework that the different partners involved in a “clean tech” project bring to the table. This is facilitated by ASMOG’s strategy for a cooperative and explorative endeavor bringing together different partners and stakeholders; from the industries, local authorities and academia. More specifically, the project brings together various partners working with the case of transforming Killingøy, the subsea base located in Karmøy, into a major national test area for autonomous vessels with a goal to cut emissions and increase safety in

maritime operations. With this case as our point of departure, we discuss the various questions that the project rises rise to, such as: What are the issues and challenges related to access and collaboration raised by this kind of project? How can we explore and understand the relational and socio-cultural dynamics that take place at different levels in this project? And further: considering that automation is presented and promoted in terms of an energy shift, how can the intersections between an ongoing automation shift and the maritime industry be a site for exploring the fast-changing nature of our economies? This paper emphasizes on the relational and socio-cultural dynamics at different levels that are taking place in this project taking into consideration possible collaboration and access issues.

Effects of network membership on green strategies in offshore shipping companies

[Agnete Hessevik, University of Bergen](#)

Within the next thirty years, shipping companies must find their zero-emission route. However, there is no consensus on which technologies and fuels that are the most appropriate to decarbonize shipping. Shipping companies are now navigating in the flows of trends and new technologies and fuels. At the same time, the “cluster trend” raises expectations that “green clusters”, “cleantech clusters” and “green networks” will aid sustainability transitions. This qualitative multiple case study of three Norwegian offshore shipping companies analyzes how membership in green networks affects individual shipping companies’ strategies to reduce greenhouse gas emissions. Process tracing is used to track the case companies’ approach to emission reduction from 2008 to 2020, and whether changes in strategy is linked to network membership. The study shows no major shifts in strategy after joining a network, but I show two ways that network membership may lead to intraorganizational changes. First, membership can lead to incremental changes as shipping companies collect information about new trends and technology. Second, one-on-one guidance and support for writing funding applications from network administrations may lead to the adoption of zero emissions technology or fuels. Membership in green shipping networks is not a main driver for the decarbonization strategy of shipping companies, but nonetheless may contribute to changes in strategy.

Participatory planning for sustainable urban logistics transport

[Rafael Rosales, University of Bergen](#)

Incentivising established actors to cooperate towards energy-efficient transport requires active stakeholder involvement. This applies as much for transport of people as it does for urban logistics, where planning has for the most part been left to the private sector in the past and led to increased tension between road-users. More recently, the public sector has taken a more active role in planning for sustainable urban logistics transport, and research has shown how different forms of involvement of urban logistics stakeholder influences the proposed solutions. However, as urban logistics changes to include new actors and new solutions adapted to citizens' delivery requirements, urban authorities must consider who to involve and how to involve them. This paper examines participatory planning for sustainable urban logistics, considering how new actors and new solutions can be integrated into policy processes related to urban logistics. As urban administrations consider participatory processes, this paper analyses whether participatory workshops as part of standard hearing processes are enough to arrive at solutions for tomorrow's urban transport system. Major urban logistics actors in Norway admit to either complete lack of participation in policy processes or to the use of lobbying with local politicians either directly or through interest organisations, and it is unclear if hearings related to urban logistics consider the interests of citizens as private individuals in their local area. This paper underlines the need for reconciliation between different road-users through new ways of stakeholder involvement related to urban logistics.

PARALLEL SESSION 2

Innovation towards low carbon futures

From collective decision-making to transition agendas: aligning problems, solutions and institutional contexts in demonstrations

Viktor Werner, Linköping University

This paper addresses the process of formation of transition agendas, i.e. a selection of relevant problems that receive considerable attention at a given moment in time (Kingdon, 2011). Environmental concerns constitute so-called "wicked problems" characterized by uncertainty, ambiguity and abundance, meaning that there is never one clear problem to address for society (Kampelmann et al., 2018; Rittel and Webber, 1973). Therefore, priorities of individual actors change over time making their agendas fragile (Elzen et al., 2011). At the same time, agency in transitions is distributed as an individual actor has limited agency and depends on others in realization of their aims (Fischer and Newig, 2016). Thus, collective enactment is essential (Schot and Geels, 2008), or in agenda terms, alignment of multiple actors and their individual agendas.

We argue that demonstration projects serve as arenas for alignment of individual actors' agendas to form a collective project agenda which in turn may influence broader national transition agendas. We conceptualize collective decision-making with the help of the Kingdon (2011) three-stream approach. The three largely

independent streams are conceptualized as (1) problems participants aim to address during the demonstration, (2) solutions or technology configurations participants advocate, and (3) institutional contexts that reflect social norms and values, markets, and legal and political frameworks.

The paper builds on a comparative case study of commercial demonstrations of two technologically distinct solutions to electrify distribution trucks in Stockholm and Gothenburg. The Data was collected via 19 semi-structured interviews with all involved actors and an online reference group meeting.

Our analysis highlights how the selection of technological solutions is entangled with problem representations, institutional contexts and actors' relative power over project agendas. A detailed analysis of agendas of individual actors, their different roles and uneven power, and interdependencies explains why certain combinations of problems and solutions were preferred in each of the projects and how these influences transition agendas in the Swedish transportation sector.

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Confronting the plastic crisis

Geoff Isaac, [University of Technology Sydney](#)

This paper proposes that the multi-level perspective (MLP) model, developed to understand the diffusion of technology, can be applied to effect change in the plastics market. While efforts can be made to decarbonise the energy regime, the plastics regime depends on carbon for its existence. By increasing use of recycled plastics and bioplastics (renewable carbon-based plastics) we can continue to enjoy the benefits offered by fossil-based plastics while significantly reducing the environmental impacts caused by their creation.

A series of exogenous events are causing significant disruption to the fossil-based plastics market. China's National Sword policy is forcing Western countries to confront their own plastic waste challenges and invest in recycling. Governments are developing policy to promote the circular economy (especially in the EU) increasing

demand for recycled plastics in the long term. Growing awareness of the climate emergency, together with growing concern for the environmental damage caused by plastics, is pressuring industry and governments to reduce our use of fossil-based plastics.

These landscape changes are creating disruptions to the entrenched fossil-based socio-technical regime. MLP identifies severe disruptions to the status quo such as these, as creating ideal conditions for niche innovations to breakthrough and challenge the existing regime. By analysing 32 niche experiments with recycled plastics and bioplastics to make chairs, this paper examines the barriers and enablers that confront designers and manufacturers seeking to work with renewable carbon-based plastics. I argue that product designers are ideally placed to scale-out and scale-up demand for renewable-carbon plastics, increasing the impact at systems level. The paper identifies relevant strategies with a proven track record in supporting disruptive technologies to achieve breakthrough. The focus will be to provide a roadmap for designers and manufacturers interested in displacing the incumbent fossil-based regime's monopolistic control of the plastics market.

Assessment of the Clean Energy Strategies of Oil Majors: Words, Dollars and Actions

May Lee, Tohoku University, Japan

International oil and gas majors, the principal suppliers of fossil fuels to the global economy, respond to climate change pressures by pledging numerous strategies, including investment in renewable energy and other low-carbon technologies. With some even proclaiming themselves on the way to a green transition, the question arises: "To what extent are major oil companies actually diversifying to renewables and transitioning to a carbon-neutral company?" Research is limited in this area. While previous research on oil majors has focused on climate denial or on short timeframes, a holistic evaluation of their transition situation through quantitative and qualitative approaches is lacking during a consecutive period. Focusing on two U.S. majors (ExxonMobil and Chevron) and two European counterparts (BP and Shell), this study examines the extent to which companies are transitioning away from conventional fossil fuels from three perspectives: (i) low-carbon related keyword usage in annual reports (words), (ii) capital expenditure in conventional fossil fuels and renewables, profits and exploration activity (dollars), and (iii) business strategies (actions). Data is collected from publicly available documents for the period 2009-

2019. We thus objectively evaluate whether the oil majors are “putting words into action”.

Overall, findings show that dollars and actions are not matching the words. There is a definite increase in the frequency by which terms such as “climate”, “low-carbon” and “transition” (and some 40 others) are occurring, especially for BP and Shell. Yet in all companies, this rise is not matched by the scale of investments in clean energy and the implementation of concrete business strategies to achieve public pledges. Considering that fossil fuels are still the cash engine of each company and much opaqueness remains around the precise scale of low-carbon investments and decarbonization strategies, we conclude that the transition to a post-carbon business model is not occurring.

The Norwegian shipping industry and decarbonization. With a proactive regulatory strategy towards growing global demand for climate technology?

[Thomas M. Sattich, University of Stavanger](#)

The international shipping industry is characterized by a number of paradoxes. Despite its operating across jurisdictions, shipping is one of the most heavily regulated industries worldwide. Notwithstanding this elevated level of regulation, international shipping is one of the biggest sources of CO₂ emissions globally, yet it was not included in the final text of the Paris Agreement. Instead, the International Maritime Organization IMO has set itself a mandate to mitigate emissions. This paper investigates the motives and responses of the Norwegian shipping industry to the challenge of decarbonization. Having technology leadership in low-carbon technology solutions, and consisting of many leading enterprises, the Norwegian shipping industry is playing an instrumental role in pulling the maritime sector worldwide towards CO₂ reduction. Aiming at first-mover advantages, the Norwegian shipping industry is currently following a proactive strategy, meaning it supports and advocates strict environmental regulations. This involves close coordination with national authorities at home. International shipping is, however, characterized by a multitude of regulatory centers, including the International Maritime Organization, the European Union, national governments, organizations, and institutions. Incoherent responses to this complex environment may raise doubts regarding the maturity of low-carbon technology, and thereby undermine the industry’s low-carbon strategy. Using interview data and position papers, the paper follows a qualitative

approach to analyzing the strengths and weaknesses of the industry's pro-active stance towards the multitude of overlapping levels of governance, subsystems and actor networks.

The politics and power struggles of intermediation in shaping niche innovation trajectories: a longitudinal case study on development and uptake of demand response in the UK

Per-Anders Langendahl, Swedish University of Agricultural Sciences

Increases in peak electricity demand combined with uptake of non-dispatchable power generation require new sources of flexibility to balance electricity supply and demand as well as to overcome district network constraints. Demand response initiatives are developing in local energy projects in the UK and elsewhere to create new sources of flexibility in response to such challenges. Here, intermediaries are identified as important actors with capacity to facilitate the emergence of demand side response initiatives as well as to shape its uptake and diffusion. Such intermediaries aggregate knowledge from locally situated projects, create institutional infrastructure, frame and coordinate local project activities as well as broker and manage partnerships with actors outside these to create cosmopolitan knowledge which can underpin the creation of strategic niches. However, such activities are far from straightforward and inevitable but infused with power and politics. Thus drawing on a longitudinal case study of locally situated energy initiatives on a district network in the UK where demand side response has been developed, this contribution investigates the politics and power struggles encountered by intermediaries as such developments move from early situated experimental projects to the creation of strategic niches. It shows that intermediaries navigate the politics of priorities and competing interests in strategic niche management by reflexively adopting various modalities of intermediation. It suggests that modalities of intermediation profoundly affect niche innovation trajectories in terms of direction (e.g. consolidating and growing demand response initiatives) and thus their potential contribution to assist in low carbon transitions.

Space and time dimensions

Policies and measures to prioritize climate action - Can budgeting help and what else is needed?

[Martin Wetterstedt, Uppsala University](#)

Urban responses to climate and energy issues have involved coordination across a variety of sectors, actors and institutions. In recent years, practices named "climate budgeting" have emerged in a number of countries, with promises to address issues of priority setting and trade-offs related to climate goals. Among practitioners, being able to plan, set targets and monitor change is key to institutional action and in this context, we explore two practises of climate budgeting at play today: the Tyndall centre Carbon Budgets, and the Climate Budgets ("Klimabudsjett) as developed in Norway. While the former has provided a method to set national and sub-national targets, the later was developed as a process tool for planning and organising yearly mitigation actions. The presentation will outline the potential for climate action founded in the two approaches, as well as explore the need for further development including more tools and concepts. Close at hand in this work is the current interest in consumption-based emissions accounting, the role of forestry and land-use emissions as well as decision support for mitigation measures.

Reinventing carbon capture and storage: Political justifications for a new Norwegian strategy in 2014

[Hedda Susanne Molland, University of Bergen](#)

As it concerns one of the most prominent measure in Norwegian climate change policies in the last 15 years, the policy discourse on CCS presents concrete visions of a future Norwegian low emission society. CCS has increasingly been imagined as a win-win solution for the nation's conflicting identities as a petroleum nation and a climate nation. Thus, the technological climate measure represents a focus point for a climate discourse that delineate scope of action, relevant actors, and justified prioritizations in the making of a desirable future society.

In this talk I address two related questions. On an empirical level: 1) How did the CCS policy discourse of the Norwegian Solberg government articulate climate actions and the prioritizations necessary to create a low emission society? On a more overarching and analytical level: 2) How do notions of time, the future and national identity

become part of and shape the particulars of sociotechnical climate action and the discourses that justify them?

My empirical focus is the CCS strategy that the Solberg government presented to the Norwegian Parliament in 2014. I focus on how the government established the necessity and feasibility of developing a full-scale CCS facility by 2020, after the much-publicized failure at the facility Carbon Capture Mongstad. Considering how the 2014 Solberg strategy tied industry, innovation, national identities, and the future together but failed to meet its 2020 target, this talk addresses the imaginative aspects of CCS as climate action and some discursive underpinnings for the more recent government CCS strategy, called Langskip.

Cities' Climate Action: Interlinkages, experiences and planning frameworks

[Subina Shrestha, University of Bergen](#)

Urban areas are increasingly becoming hotspots for climate actions since cities possess the unique ability to address climate change. There are arguments that cities are making mitigation and adaptation plans and actions separately, even though evidence suggests while there are strong interlinkages between them. Needs to integrate mitigation and adaptation simultaneously are often highlighted, and to assess their possible interlinkages. In this context, this paper has addressed three questions: What do prevailing studies tell us about the avenues and extent of linkages- the synergies and trade-offs, between mitigation and adaptation in cities? How have leading cities' climate actions and plans considered those synergies and tradeoffs? What are the available frameworks for integrating mitigation and adaptation into urban climate action planning? Our analysis shows ample synergies and tradeoffs in cities' urban plans, whose extents are dictated by city specific conditions. We find that, these are largely not-considered even in case of leading cities' climate actions and plans, which points towards opportunities to make integrated climate actions. We identified different tools and frameworks that are available for planners and decision-makers to integrate mitigation and adaptation while developing cities' climate action plans. However, such frameworks should be cautiously used to tailor to any particular city's needs and development priorities, and it is important that planners avoid use a "one-size-fits-all" approach. These insights are useful to decision makers for making effective climate action plans.

Time and climate governance: multi-level cooperation as a multi-temporal problem

Simon Neby, University of Bergen

The climate is defined by the average weather over a given period of time. Different periods in the timeline of our understanding of the climate create different points of reference. The development of knowledge takes time and demands for carbon budgeting and estimation of emissions are based on the annual accounting routines. Our youth is voicing the concern that time is running out, pointing to the relationship between generations. Sustainability approaches suggest cyclical perceptions of produced goods, and some view sustainability as such as a perpetual process. Elected officials step in and out of office in predefined cycles, and the production and implementation of regulation and policy follow their own timelines and repeat intervals. Decision-making depends on the timing that creates an opportunity to decide, but decisions also demand long-term follow-up.

At the same time (sic!), the governance of climate issues is a multi-level endeavor marked by both horizontal and vertical complexities that shape our alternatives for action: coordination across levels and sectors is highly necessary in all parts of climate policy, often increasing fragmentation and divergence. This paper argues that whereas there is no question that coordination of political-administrative structures and processes is a necessary aspect of any climate policy, there is a need to develop our understanding of temporality in the coordination of decision, implementation, knowledge and politics. Hence, the paper explores how expanding and explicating our understanding of the temporal dimensions of climate issues can improve climate governance, with a particular focus on the organizational aspects of multi-level climate governance.

Motivations for action

Matters of Concern in the Norwegian Sustainability Transition

Marius Korsnes, Norwegian University of Science and Technology

In January 2020, a report named “Klimakur 2030”, prepared by six government agencies led by the Norwegian Environment Agency, was sent out on a public hearing. The report addressed the challenge of achieving a 50 per cent reduction of greenhouse gases (GHG) from sectors outside of the EU emissions trading system (EU ETS) by 2030 in Norway. The report launched 60 different measures that combined would lead to such a reduction – including measures aiming to reduce or electrify road transport, changing to low-emission technologies in the maritime sector and reducing emissions from agriculture. The report received 1730 responses from various actors: 51 responses from municipalities and regional municipalities, 190 from organisations, businesses, and public institutions, and 1489 responses from individuals. The report findings also reached national primetime media, and particularly the measures relating to meat consumption received attention.

To gain a systematic understanding of “matters of concern” (Latour 2004) in the Norwegian sustainability transition, we studied in detail the responses connected to two measures relating to reduced consumption of red meat (J01) and reduced food waste (J02). The two measures alone represented a potential reduction of 4,4 mill. tons CO₂ – about 10 per cent of the total emission reduction potential from the 60 measures. We found that agriculture is a sensitive and complex topic for Norwegian municipalities. Agriculture and meat are cross-sectoral and address local value creation, employment, biological diversity, food security, self-sufficiency, and climate vulnerability. For instance, several municipalities feared that reducing meat

consumption would lead to a direct loss of agricultural production, thus destroying local value creation. This paper discusses the results from this analysis against a backdrop of achieving a just sustainability transition, wherein achieving a high degree of participation, and ensuring that local livelihoods are considered in a complex mix of matters of concern.

Beyond the spectacle: Extinction Rebellion Norway

[Eleanor Johnson, University of Oslo](#)

In this article we explore the motivations and strategies behind the theatrical protest tactics of climate activist movements Fridays for Future and Extinction Rebellion. Based on a series of interviews with activists from these movements in Norway, our analysis looks beyond the spectacle to uncover individual and group motivations that underpin the highly visual protest tactics observed. We argue that Extinction Rebellion in particular has cultivated an internal belief system and collective practices that could appropriately be understood as analogous to religiosity. Drawing on Durkheim's notion of religious "effervescence", a sort of heightened awareness experienced by individuals undertaking sacred ritual, we discuss how individual motivation, public protest and media performance come together in the climate demonstrations of these movements.

People's expressed motivations for action and change of everyday lifestyle

[Kjersti Fløttum, University of Bergen](#)

This paper will explore what individuals are motivated by when changing or not changing their everyday life in a climate change perspective, and how they express this through language. It is often said that tackling climate change and transitioning towards a low-carbon society require both political and individual action. Multiple voices, especially within politics and non-governmental organizations, have opinions on this matter. However, there are few in-depth studies on what individuals may be motivated by in this ever more important matter. Climate change affects both our personal everyday lifestyle choices and how we perceive of the future of humanity. Based on open-ended survey questions, fielded by the Norwegian Citizen Panel, providing answers freely formulated by 1,077 Norwegian citizens, the aim of this paper is to see how people express their motivation for changing or not changing

their lifestyle to limit harmful climate change consequences linguistically. Through a semi-automated analysis, the material is structured in nine topics, from those motivated to contribute to those claiming they already live a climate-friendly life. Those who are motivated to change their lifestyle do so not for financial but for ethical and environmental reasons. Furthermore, respondents talk about their personal contributions in a societal context, whereas knowledge and fear about climate change bring in the imperative of action at a global scale, implicating humanity as a collective agent. The knowledge provided by this study would be important for communication about the challenges of climate change, in particular for politicians and authorities responsible for deciding what measures to propose and implement. Furthermore, the study provides insight about constraints on and opportunities for climate action as undertaken by individuals.

Portrayals of public concern

Fueling Opposition? Yellow Vests, Urban Elites, and Fuel Taxes

[Michaël Tatham, University of Bergen](#)

The yellow vest movement in France was triggered by a fuel tax increase. The increase was designed to reduce petrol consumption and hence emissions. However, its costs to citizens were unevenly distributed. The yellow vests illustrate how, despite abstract support for public action against climate change, concrete measures need to spread the costs of such policies more evenly across society. Social justice is a requisite for public acceptance and will trump climate concerns when challenged. These tensions are analysed through survey experiments in the least-likely case of Norway. In line with the yellow vest experience, we find that opposition rises with the individual cost of the policy. Different policy cocktails can mitigate opposition, but only to a certain extent. They mostly fall short of bridging

the gap between yellow vests and urban élites. Polarization breeds discontent and erodes support, even for noble causes such as climate change mitigation.

A 'Finite pool of worry'? Changes in climate change worry during the Covid -19 pandemic

Thea Gregersen, University of Bergen

According to the 'finite pool of worry'-hypothesis, people have limited emotional capacity – increased worry for one issue will lead to reduced worry for another. Using data from a longitudinal and representative panel of Norwegian citizens, this presentation explores changes in worry about climate change during the Covid-19 pandemic. Preliminary results show that while the reduction in worry about climate change from January 2020 ($M = 3.35$, $SD = 1.14$) to January 2021 ($M = 3.27$, $SD = 1.15$) is not statistically significant in the general population, changes are detectable in certain sub-groups. The age group born in 1959 or earlier report significantly lower levels of worry about climate change in January 2021 ($M = 3.16$, $SD = 1.33$) compared to January 2020 ($M = 3.30$, $SD = 1.34$). This is also true for women, who show lower levels of climate change worry in January 2021 ($M = 3.45$, $SD = 1.08$) than in January 2020 ($M = 3.55$, $SD = 1.05$). In January 2021, the respondents further reported on their level of worry about getting infected with the coronavirus. The age group born in 1959 or earlier report higher levels of worry about contracting a Covid-19 infection ($M = 2.90$, $SD = 1.34$) compared to those born 1990 or later ($M = 2.57$, $SD = .68$). There is also a statistically significant gender difference, with women ($M = 2.90$, $SD = 1.10$) reporting higher levels of worry for Covid-19 infections than men ($M = 2.64$, $SD = 1.12$). Consequently, in line with the 'finite pool of worry'-hypothesis, the groups most worried about Covid-19 do in fact report lower levels of worry about climate change during the pandemic. These results emphasize the importance of considering possible group effects in addition to reporting results for the general population.

The function of fear

Ida Vikøren Andersen, University of Bergen

In NRK's debate programme "Debatten" (24.9.2019), the organisation Mental Health Youth warned that climate communication appealing to fear causes anxiety among the young. The background of the debate was Greta Thunberg's rhetoric and a survey

showing that the young are considerably more worried about climate change than adults (Aasen et al., 2019).

In this paper, I examine the function of fear and worry in Norwegian youth's utterances about climate change from a rhetorical perspective. To do so, I study open-ended survey questions posed to approximately 400 high school students in 2021 and a selection of debate pieces published in the youth column, Si;D (2016-2020). Both materials are examined through a rhetorical close reading, using reflexive interpretative movements to establish what the texts do rather than what they say.

Rhetorical thought has always emphasised the crucial role of emotions in decision-making. Previous research on the effects of the particular emotion fear suggests that it renders people passive, especially when a way out is not offered (Moser & Dilling, 2007). However, studies also find fear to play a crucial role in people's decisions to change their lifestyle to mitigate the consequences of climate change (Wolrath & Wormbs, 2019).

Preliminary results suggest that the youth's fear is neither irrational nor unproductive. The emotion is of a social and deliberative character; it is directed towards the collective and translated into action.

Cited literature:

Moser, S. C., & Dilling, L. (2007). *Creating a Climate for Change: Communicating Climate Change and Facilitating Social Change* (S. C. Moser & L. Dilling Eds.). Cambridge: Cambridge University Press.

Wolrath, M. S. & Wormbs, N. (2019). *Grounded: Beyond flygskam*. Stockholm: Elf/Fores. Aasen, M., Klemetsen, M., Reed, E. U., & Vatn, A. (2019). *Folk og klima: Nordmenns holdninger til klimaendringer, klimapolitikk og eget ansvar*. CICERO, report 2019:20.

Thursday 21st of October 2021

PARALLEL SESSION 3

Changing systems and infrastructure

Transforming an awareness of energy technologies to personal accountability for climate action; experiences in the virtual classroom through the lens of discursive institutionalism

David Walwyn, University of Pretoria

Universities and other educational actors can play an important role in social change. The application of knowledge acquired by students through their studies can be instrumental in transforming their approaches to the development of socio-economic institutions. However, the link between curriculum content, student awareness and learning, accepting accountability and climate action is tenuous. Students may be exposed to the imperative for climate action, but fail to consider it as a priority or even relevant to their working lives.

In this paper, the experience of working with a group of post-graduate students from the energy sector is discussed and analyzed using a blended theoretical framework based on discursive institutionalism (Schmidt, 2010), which considers the role of ideas, knowledge and discourse in changing the nature of institutions, and the precaution adoption process model (Weinstein, Sandman, & Blalock, 2008), which defines the important stages between awareness and action. Both frameworks are particularly relevant to this context.

It was observed that the cohort held a wide range of perspectives on the core issues of the future of the energy sector and the imperative for an energy transition in response to climate change. Moreover, these views were unchanged by the content of the course or the teaching approach. It is apparent that personal epistemologies are deeply embedded and difficult to change (Singh & Walwyn, 2017). However, the study does suggest ways in which virtual classrooms could be used to support climate action based on alternative teaching approaches (Walwyn & Combrinck, 2021).

Developing EV charging infrastructures in the UK: a window on translocal networks, multiplicity and (in) coherence in local carbon transitions and transformations

Miguel Valdez, [The Open University](#)

The 'green industrial revolution' advocated by the UK government calls for rapid development and deployment of electric vehicle (EV) infrastructures. Since EV charging infrastructures are already a familiar part of cities and highways across the UK, national policies tend to reproduce and upscale what is already familiar instead of imagining different potentially more sustainable infrastructure futures. Moreover, infrastructure development has traditionally been driven by "predict and provide" logics which attempt to meet ever-growing demands for resources with upscaling of existing infrastructure configurations. An alternate approach investigated here is one in which alternative futures are envisioned, potentially reconstituting practices and engendering new infrastructure configurations to support them.

Drawing on the On-Street Residential Induction Charging (OSRIC) project (funded by the UK Government), we investigate this trial of wireless EV charging infrastructure taking place in three UK locations – Redbridge (London), Milton Keynes and Marlow. By working across these sites, we were able to explicate the tensions and contradictions which arise from the need to develop specific locally useful projects while also producing generic, or rather cosmopolitan knowledge to assist in transitions to more sustainable futures. By investigating the actor networks associated with these situated OSRIC demonstrators, we also observed how different interpretations of this technology and different ways to use it are envisioned and arise. In aggregate, our work shows how wireless charging becomes part of different socio-technical constellations in each place but also becomes part (or not) of a coherent national network, thus revealing the labour required to facilitate convergence of local specificities through translocal connectivities.

Orchestrating the Low Carbon Beat: Rhythmanalysis, Energy and Rhythms in Transition

Gordon Walker, [Lancaster University](#)

In this paper, I bring the concepts and tools of rhythmanalysis to bear on the transitions in rhythms and rhythmic relations that are intrinsic to stripping

(hydro)carbon out of energy systems. In the foundational rhythmanalytic writing of Lefebvre and Regulier, energy is positioned centre stage in defining what rhythm is, but little engagement has followed in subsequent scholarship. In a recently published monograph*, I propose a newly energised multidisciplinary rhythmanalysis, which follows the beats and pulses of energy flows in everyday life in order to open up the polyrhythmic and poly-energetic constitution of relations between social, technological, environmental and bodily rhythms. I argue that carbon-based energy systems can be conceived as vast dynamic and rhythmically constituted assemblages, that draw the fossilized temporalities of carbon resources into tightly coordinated rhythms of commodification, combustion and consumption, with increasingly arrhythmic impacts on the expected repetitions of climate and environment. Much has to change in (poly)rhythmic terms, both in making sustainable energy systems and in pursuing modes of de-energisation in everyday life. The governance of multi-sited transitions in rhythms I argue is fundamental to living better with energy and moving 'beyond oil' within temporally recalibrated and de-carbonised techno-energy infrastructures.

*Walker, G (2021) *Energy and Rhythm: Rhythmanalysis for a Low Carbon Future*, Lanham: Rowman and Littlefield.

Expanding Urban Carbonscapes: The Political Paradoxes & Perils of Pipelines, Automobility and Climate Change in/upon Coast Salish Territories (Metro Vancouver)

[David Sadoway, Kwantlen Polytechnic University](#)

This assessment focuses on the political paradoxes and territorial (dis)placements associated with carbon-intensive urban infrastructures primarily in/on unceded Coast Salish First Nations Territories (in 'Metro Vancouver, Canada'). My analysis presents a working framework for analyzing carbon-dependent infrastructures and how their adoption is dramatically reshaping urban polities and morphologies in Western Canada's largest urban-region. I focus upon the 'infrastructural dramas' occurring as urban communities are enrolled into novel carbonscapes and linked socio-economic and cultural dependencies. My approach explores the interplay between recent local urban infrastructure expansions and non-local territorial 'extraction zones'. These trans-scalar entanglements — with extraction, production, trans-shipments to/from illusory or real-world markets — make visible important political fissures and the associated political memes, schemes and dreams inherent in otherwise mundane infrastructure project choices.

My paper will draw largely upon media contents between 2017-21 to narrate two case studies of infrastructural assemblages juxtaposed against the backdrop of wildfires, flooding, drought and extreme weather events: 1) the polycentric politics of the federally-funded TransMountain Pipeline Expansion (TMX) infrastructure being imposed upon Coast Salish First Nations Territories and existing settler-communities in Metro Vancouver; and 2) the trans-local politics of automobility infrastructures associated with urban mobility and shipping networks, also on the same territorial scapes as above.

My analytical framework draws-upon existing work on 'carbonscapes' and 'planetary urbanism' to assess the politics of urban projects and infrastructures, not as traditional modes/models of socio-economic 'growth/decline', but as critical incidents occurring at the same time as the 'climate emergency' is also imperilling the quality of life in many urban-regions. I suggest that these parallel domains — the tacit need for successive rounds of carbon-intensive infrastructural 'expansions', alongside apparent climate change impacts or emergencies at the local level — can serve to either reinforce existing problematic paradoxes, or they can present emergent policy possibilities for the eco-governance of contemporary city-regions.

Breaking with the low carbon transition paradigm? Forming the state-bank nexus

[James Jackson, University of Sheffield and Sheffield Political Economy Research \(SPERI\)](#)

Under Ecological Modernisation, low carbon transitions have historically been defined by a liberal paradigmatic approach to the role of the state and the central bank. The Rio Earth Summit, Kyoto Protocol and Copenhagen Accord all failed to instigate a marked change in state-business relations. In part, this is due to varying degrees of decarbonisation across the global economy. And yet, The Paris Agreement, environmental politics most recent iteration, has revealed the fragility, even inadequacy, of the current approach, as most signatories risk missing their Nationally Determined Contributions (NDCs). This paper shall then interrogate the potential for a state-central bank nexus to exert leverage which may yet see a break with the political economic paradigm.

The advent of the Green New Deal since the Financial Crisis suggests that developed economies may now begin to be diverging from this paradigm. COVID-19 has only brought this break into sharper focus as international Finance Institutions (IFI),

including the World Bank and the International Monetary Fund (IMF) have prescribed a different fiscal policy approach to the most recent economic crisis. Advocating for a more interventionist role for the state represents but one departure from the ideological position which has permeated amongst policymakers and scholars alike. Another is now contested neutrality of central banks. The focus here incidentally centres on how the state-bank nexus may greening monetary policy under the typology of green finance. An array of green financial tool is thus made available, from green bonds, green loans and green quantitative easing (QE). Should economies look to move beyond oil, they must now take seriously the green dualism which now sits at the heart of our present political economy.

A politics of disassembly or a politics of reconnection?

A conversation about perspectives

[David Jordhus-Lier & Camilla Houeland, University of Oslo](#)
[Håvard Haarstad, University of Bergen, & Tarje I. Wanvik, Norce](#)

How do we best conceptualise, and understand the nature and strength of the symbiotic relationship between social and material components?

In this conversation, four energy geographers will from their respective analytical and political positions of disassembly or reconnections provide different answers to some of the key questions undergirding our efforts to combat climate change, such as:

- What does a just transition mean for global petroleum extraction?
- How can policies of sustainable consumption be reconciled with existing social contracts at a national scale?

BACKGROUND: In [a 2017 article, Haarstad and Wanvik](#) criticise what they label a 'political economy tradition' within human geography for 'exaggerating the permanence and stability of the energy–society relationship', and argue for the merits of assemblage thinking in acknowledging 'emergent capacities for change'. In [a recent article Jordhus-Lier, Houeland and Ellingvåg \(2021\)](#) critique the portrayal of the

carbon economy as loosely associated, flexibly (re)arranged and easily enacted upon through small-scale radical innovation. Instead, they advocate for a historical materialist approach, based on the concept of alienation, foregrounding people's relationship to nature and to each other through the wage relation and through systems of social reproduction.

Justice implications

Prioritising under contested public perceptions - how policy, regulation, technology and responsible research and innovation frame public perception on climate technologies

[Sigrid Eskeland Schütz, University of Bergen](#)

The need for societies to develop "Beyond oil" arises as fossil fuels continue to exacerbate the climate crisis. The immensely complex process of decarbonizing energy sectors to promote sustainable development is a logical but difficult way forward. Transformative political decisions prioritize different "climate technologies", such as carbon capture usage and storage (CCUS) and wind and solar energy, against the backdrop of uncertain premises and contested public perceptions.

The UN 2030 Agenda for Sustainable Development and its associated Sustainable Development Goals (SDG`s), Universal Values, Principle Two has "Leave no one behind" as a central, transformative promise. Transformation can give rise to an uneven distribution of the burdens amongst winners and losers. The stakes are high: contested and negative public perceptions and fierce opposition from certain stakeholders could impede with development or impact the political prioritization of these technologies. Leaving behind some groups could give rise to unforeseen social unrest and uprisings, as illustrated by the French "yellow vests" movement. Thus, we

need to pay due regard in addressing societal and stakeholders' interest and in how these are framed, shaped, and reformed.

Public perceptions are not static. They change over time across and within stakeholder groups, based on a wide variety of factors, i.e., depending on whether the technology is implemented or whether at a hypothetical stage. The design of research, policy and regulation on climate technologies could be guided by research-based knowledge on how public perceptions among different stakeholders are shaped and continuously change. Investing in Responsible Research and Innovation (RRI) capacities can complement research in the perceptions of the "left behinds" and investments in technology research and innovation, with the added benefit of understanding the combined society-technology prioritization of the technologies for sustainable governance.

The inclusion of justice perspectives in energy systems modelling - A review of current practices and the way ahead

[Oskar Vågerö, University of Oslo](#)

Transitioning into low-carbon energy systems comes with the risk of creating winners and losers both between and within countries. Active engagement in understanding and minimising injustices may prevent existing injustices from becoming greater or for new ones to emerge.

Energy System Models (ESMs) are mathematical representations of an energy system (e.g. national systems), which may be used to generate insight for decision-making and to inform policy. These models contain a high level of techno-economic detail and have up until recently not given much attention to social aspects of energy systems, such as political will, behavioral aspects or social acceptance. By studying justice implications in ESMs there is an opportunity to inform policy-makers on how long-term changes to energy systems may affect different social groups and how to minimise injustices. Understanding the social dimension of energy systems and

energy transitions is imperative if we want to achieve future energy systems that are not only low-carbon but also socially just.

In this study we therefore explore how and to what extent ESMs have included aspects of justice in the past and also what opportunities remain unexplored. We complement the information from a literature review with a two-day workshop where we gather both energy systems modellers and social scientists. A workshop is expected to give a complementary and fuller representation of the current status of the field, reduce positive publication bias and allow for the sharing of nuances and less-developed ideas.

Preliminary results show that most of the existing studies focus on distributional justice, leaving recognition and procedural justice largely unexplored. With additional insight from our workshop we expect to be able to identify clear research gaps and suggestions for future research that help enable the transition to socially just low-carbon energy systems.

Ultimate ends and sustainability action: a conceptual study on human well-being

[Mathias Lindkvist, KTH Royal Institute of Technology](#)

Climate change has impacts, on its own and from measures for mitigating it. Environmental impacts influence humans through our abilities to uphold services such as providing food and through our moral caring for nature. Therefore, a framework on social sustainability can be relevant for addressing the climate challenge and other sustainability issues. Such a framework could help identifying how humans can be affected by different proposed climate actions. We consider, as a first step, an overview of what ultimately can be seen as human well-being, which is strongly connected to aspects of justice. Scholars in ethics, psychology and development studies have for several decades been theorising human well-being. The results so far are typically lists that include elements such as life itself, friendship and religion. This far, however, researchers have only to a limited degree explicitly related the notions of human well-being to the challenges of actions for sustainability. The challenges include aiming to be holistic in the sense of covering a large enough share of the central aspects of human well-being, delays between cause and effect, and using an accessible vocabulary due to the already high complexity of the sustainability issues. In this study, we focus on these and other challenges through a conceptual analysis. The analysis is applied to material collected through a

theoretical literature review, using a snowballing technique. Our starting point is the social sustainability approach social life cycle assessment (SLCA). SLCA has been developed for systematic evaluation of the impacts from a product's production, consumption and waste management on human well-being. The approach clearly aims to support human well-being, but we have identified opportunities to complement SLCA literature on it. We expect to have comprehensive results from the study at the time of the conference.

Appropriating Energy to Serve a Degrowth Society: The Implications of Wind Power for Saepmi and the Convivial Alternative

[Shayan Shokrgozar, University of Bergen](#)

Over three decades since the publication of the Brundtland Report, the world continues to witness changing patterns in forest fires, hurricanes, temperatures, and biodiversity loss at a pace without a previous analogy. These historical events have led some in the public and private sectors to advocate for a "green" future accomplished through a technocratic and bureaucratic process. Drawing upon fieldwork conducted within Saepmi, this presentation investigates the implications of the Fosen Vind Energy project in the Åfjord municipality in western Norway. While the Norwegian Ministry of Climate and Environment and the European Union advocates the expansion of wind energy infrastructures for climate change mitigation, Saami herders confront pastureland dispossession in Saepmi, while conservationists fear the industrialization of nature. This presentation explores how the domestic policies for de-carbonization through "electrifying society" and international agreements for trading energy and climate goals lead to social fragmentation and ecological degradation through infrastructural colonization and green grabbing concerning wind energy development. This presentation discusses the harms resulting from Norway's "energy necropolitics," which following Mbembe determines what value systems and cultural patterns may live or must die. It concludes that the assaults inflicted on the environment by lower-carbon energy infrastructures are not unlike conventional energy sources. These findings demonstrate the need for solutions beyond reform-oriented efforts such as a "just transition," in favor of decolonial Degrowth pathways for confronting ecological depletion and the climate crisis.

The role of policy actors and their perspectives

Attribution of climate mitigation responsibility: a comparison of politicians and citizens

[Runa Falck, University of Bergen](#)

Previous research has identified disagreement regarding who is responsible for climate action as one of the barriers to reach the global climate targets. The present study compares how politicians and citizens attribute responsibility for climate action to different actors. Political decisions have more potential for high-impact mitigation measures than individual ones. Thus, politicians' view of their own responsibility could play an important role when it comes to climate action. Yet, there is limited knowledge about how this group attributes responsibility for climate mitigation.

Data on politicians' attitudes are collected through the Panel of Elected Representatives (wave 5), which is an online panel distributed to all elected representatives at all political levels in Norway. An identically formulated survey item is sent to the Norwegian Citizen Panel (wave 21). This is an online panel where the entire Norwegian population has an equal and known probability of being invited. The respondents in both surveys are asked to what extent they think that individuals, local politicians, national politicians, the global community, and the private business sector are responsible for climate mitigation.

The findings extend insights from prior studies on attribution for climate action among the population by including local and national politicians' attitudes. In particular, they shed light on how politicians on different levels view their role. Preliminary results suggest that just like individuals tend to locate responsibility with national governments, politicians tend to think that the issue of climate change is primarily the responsibility of the global community. The study contributes to our understanding of why substantial climate mitigation is so difficult to achieve.

School as a Key Arena to Promote Climate Action

[Jana Paulina Scheurer, University of Bergen](#)

Norway is an oil nation, its society being generally supportive of the industry. However, there seems to be a rupture between the older and younger generation: Those under 30 are notably more concerned about detrimental effects of climate change (Aasen et al. 2019), and demand changes in politics, challenging their nation's

status as an oil nation. While political and societal changes are without doubt a key factor, also individual action must be taken in order to mitigate climate change. Young people seem to be open for changes, but they need guidance to make effective amendments in their everyday lives. Against this backdrop, which role do Norwegian schools play for making climate action real? This talk argues for school being a major promoter for mobilizing young people to take climate action, with school fulfilling three main functions:

1. Educative: School as a propagator of knowledge about climate change and lifestyle-related topics
2. Practical: School as a training field where to practice climate action
3. Social: School as a social arena for peer interaction and communication about lifestyle-issues

In early 2021, as part of the ongoing CLIMLIFE project, the interdisciplinary LINGCLIM research group, conducted a semi-open survey among high school students in Bergen, Norway. 381 students between the age of 16 and 18 were asked to express their opinion about lifestyle issues related to climate change. The findings of this study will provide the basis for this talk. Besides presenting the above-mentioned key functions of school that become apparent from the study, it will also be highlighted which climate actions young people are willing to take, and which they refuse. The results are both of academic and practical interest for the broader education sector.

Literature

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Research to support the goals: Publishing trends in climate action and energy transitions

Marta Lorenz, [University of Bergen](#)

The UNs sustainable development goals are important framework for driving prioritisation of climate action (SDG 13) and energy transitions (SDG 7). They affect academia, with some wishing to align their research and education to support the goals. Universities also have related strategic research priorities, such as "Climate and Energy transitions" at UiB.

Once a priority has been set, it can be interesting to see what happens. Is there more research on climate action and energy transitions than previously? In which topics? Is this research regularly picked up by the media? Is this research being used in energy innovation or climate policy, thus supporting prioritisation of climate action? To answer such questions fully one needs to take varied approaches, but bibliometric analysis can give us some insight.

Here we would like to present a bibliometric study of publication trends in climate action and energy transition research in Norway and Europe, showing changes over time, thematic focus and usage. This work is based on two studies; the first identifies scholarly publications related to the SDGs using a method based on targets and indicators; the second was developed to identify publications related to UiBs "Climate and energy transitions" priority area. We would also like to briefly present a new project, where Norwegian research related to the SDGs will be made more accessible to a broad public.

Can scientific communication help mobilize public support for climate action?

Rouven Doran, University of Bergen

According to Intergovernmental Panel on Climate Change's (IPCC) special report on 1.5°C global warming, the remaining window for action to prevent the most severe consequences from current climate change projections is closing at a rapid pace. Coinciding with the publication of the report in the second half of 2018, there has been a vibrant public debate about what could possibly be done to accomplish the long-term goal of net zero emissions.

The current presentation employs data from the Norwegian Citizen Panel (NCP) Wave 15 to explore the role of scientific communication in mobilizing public support for climate action in Norway. Respondents were asked about the extent to which they support or oppose a selection of measures directed at tackling climate change. This included radical action against climate change, public money to renewable energy, a law demanding money from frequent flyers, as well as a carbon tax on high-emission food items. In addition to exploring the relative importance of having heard about the IPCC special report on 1.5°C global warming, the analyses also considered possible associations with demographics such as age, gender, and education.

The reported findings will be discussed in relation to media coverage addressing scientific information about the risks of continuous global warming, especially in the context of youth-led climate movements such as Fridays for Future.

PARALLEL SESSION 4

Power and energy justice

There's no easy way to get off a moving train: beyond the ruse of 'net-zero'

[Kevin Anderson, joint appointment: Universities of Manchester, Uppsala and Bergen](#)

The Paris Agreement requires signatories to cut emissions commensurate with their 'fair' contribution to staying 'well below 2°C ... and pursuing ...1.5°C.' The established strategy to deliver on this and earlier climate covenants has relied primarily on price mechanisms and light regulation. As this approach has failed to stem rising emissions, so the prospect of assorted 'carbon dioxide removal' (CDR) methods has become normalised. Within 'developed' nations, this inter-generational rescheduling of responsibility is increasingly accompanied by an intra-generational transfer of the mitigation burden to 'developing' nations, all disguised behind the mask of net-zero.

Whilst ostensibly net-zero offers an appealing framing for guiding mitigation, the different forms of substitution embedded within it are increasingly being used to weaken current and proposed mitigation policies. Although net-zero readily facilitates

such misuse by unscrupulous advisors and policy makers, even when used honestly, the physical, chemical and temporal characteristics of different greenhouse gases from different sources make simple substitution between them deeply problematic.

This presentation will provide a critique of 'net zero', arguing that it is a dangerously misleading basis for informing mitigation strategies. It will then proceed to offer a provisional series of separate targets focused on different emission sources and sinks, as well as different suites of greenhouse gases. What differentiates this target framework from net-zero, is that substitution between them would not be permitted. Consequently, such targets have the potential to provide a much clearer and Paris-compliant pathway for the different sources of emissions, without either the uncertainty of ongoing and variable levels of substitution or the scope for misleading political manipulation.

Oil Ancestors: building agency through role play

[Fereshteh Toosi, Florida International University](#)

In this talk, I will share about my creative research project Oil Ancestors, a triptych of interactive performances about the cultural history of oil and the global petroleumscape. How can live art create a sense of urgency about our deep entanglements with oil? What role do ephemeral artistic experiences have in making climate action a priority?

This immersive theater forges links between individual, institutional and societal change by situating the participant in a form of light role play. The audience is confronted by a future being who is curious and attempts to hold us accountable. Oil Ancestors asks the audience to directly confront and reflect on complex and intimate questions about power and responsibility in an era of rapid social and geological change.

Oil Ancestors was inspired by my experience as a first-generation immigrant of Iranian and Azeri heritage. Petroleum imperialism has defined the contemporary relationship between my ancestral homeland and the US. The legacy of armed conflict and resource extraction also impacts many Caribbean, South, and Central American countries that are represented among the immigrant diaspora in Miami, where I live now. Furthermore, oil money funded the vacation fantasies that brought railroads to South Florida. Swamp and limestone were transformed under the cruel labor systems of convict leasing and debt bondage.

Just transitions and solidarity on the ground: community perspective in Asia

[Akiko Hiratsuka-Sasaki, Institute for Global Environmental Strategies \(IGES\)](#)

Transitioning to a low-carbon society is an urgent task, but in reality, it cannot be achieved without ensuring justice for all affected by the transition. Prioritisation of climate actions should be thus considered alongside justice and equity. This presentation will focus on just transitions and the roles of solidarity in the context of local communities in Asia.

Just transition has gained momentum since its inclusion in the 2015 Paris Agreement and has been highlighted especially under the recent multiple crises. As the Silesia Declaration at COP24 underlined the importance of solidarity in gaining public support for climate actions, solidarity is another keyword in achieving a decarbonised society. Whereas justice concerns individual rights, solidarity is a relational concept seeking for reciprocity and non-hierarchical relationships. Why solidarity matters in just transitions and prioritisation of climate issues? Is solidarity just rhetoric, or does it have certain functions in the pursuit of justice? The current just transition-related policies mainly focus on the fossil fuel industries and are led by national governments seeking to a coal phase-out. For instance, countries like Germany and Canada have set policies to close coal-related industries, and at the same time provide support and compensation to affected communities, businesses, and workers. While the national initiatives are important, a bottom-up approach is also required at the local side to build sustainable and resilient communities not to be dependent on subsidies. In this context, solidaristic initiatives such as community-based social enterprises or cooperatives might be valuable to build non-hierarchical relationships between the national government, local authorities and communities and also to bring reciprocity within the communities.

Performing justice(s): A systematic review of justice framings in sustainability transitions research

[Krisjanis Rudus, Norwegian University of Science and Technology](#)

Over the years, sustainability transitions have evolved into a complex field that aims to not only address the decarbonization of industries and individual practices but simultaneously build long-term pathways for a more equitable and just life for the

global population undergoing this shift. The latter dimension – justice in sustainability transitions – has gained a growing momentum in social science research over the last years. Experts in the field have gained increasing evidence that, without careful attention, transitions towards more sustainable living systems can produce new injustices or perpetuate the asymmetric power relations and susceptibilities that the current fossil fuel-based system produces.

Justice, therefore, serves as a crucial lens for enabling a more equitable planetary future. However, despite the growing scholarly attention, divergences exist in what ‘justice’ means and how it is enacted across different sectors – also within academia. On top of that, the current justice research has been criticized for only tacitly engaging with the conceptualizations of the notion.

Currently, only a few studies in the field of sustainability transitions have tried to investigate the ways justice is framed. In response to the issues at stake, this review paper aims to map and analyze the various framings of justice in sustainability transitions literature over the period from 2011 - 2021. Apart from a general overview, this paper also offers reflections on the implications various forms of justice enactment can have on society. This is especially important as constructing the notion of justice from a particular worldview showcases specific value ranking, potentially represented in future policy.

By uncovering the different ontologies represented, the review contributes to a better operationalization of the most adequate and context-specific framing of justice for research and policy purposes and invites to critically reflect on the current gaps in understanding the justice phenomenon in sustainability transitions research.

Exploring Intermediary Practices in Hybrid Community Energy Groups

[Karl Gallagher, The Open University](#)

Although the role of community energy groups in the transitions to low carbon energy systems is widely accepted, the constitution and effectiveness of such groups in opening transition pathways toward more sustainable futures is unclear. On one hand, there are top down community energy groups in which powerful actor coalitions, including incumbents from energy and allied sectors, design and implement community initiatives. These initiatives offer scalability but fail to engender community support or community cohesion and problems of trust among participants often arise. On the other, there are grassroots community energy groups

in which actors come together around a matter of concern, such as sustainability and develop energy low carbon initiatives. However as these initiatives are situated in small communities they have limited potential for scalability and authority which hinders their ability to affect transitions.

In order to escape this dichotomy of 'done to' or 'done by' local communities and resolve issues of scalability, this contribution investigates 'hybrid' community energy groups. Such groups may hold considerable potential to affect transitions to low carbon electricity systems because although various organisations from the public, private and third sectors act as intermediaries to offer access to key resources such as technical advice, policy advocacy and staff time to help set up such energy initiatives, the initiatives are 'owned' by the local communities in which they are embedded. Thus, a hybrid approach moves community energy groups from a focus on isolated activities to a more networked approach. However, little is known about how organisations can develop effective intermediary practices in hybrid communities and realise their potential for upscaling and low carbon transitions. Drawing on a literature review focused on intermediary practices and transitions, this contribution highlights several specific lacunae associated with hybrid communities, such as the role intermediaries may play in (re)developing actor networks and empowering community actors.

Structures and Institutions for Climate Justice

The climate justice discourse and accountable low carbon energy transition.

[Renee Neven-Scharnigg, University of Stavanger](#)

Sustainability transitions have often been studied from the perspective of divestment away from fossil fuel and how opportunities for Renewable Energy Technologies have been created structurally. The perspective has often been at a more macro scale, such as an international or state level. There has been little research on how the perceived political acceptability can influence the political economy in which Renewable Energy Technologies (RET) like solar power can flourish. Research around this topic has gained prominence since the 'Gilets Jaune' protests in France which started in 2018 and have lasted until 2020. During this time, a part of the population demonstrated for months as they perceived that the burden of a low carbon transition was going to be placed on the poorest in society. This paper aims to do a review of the literature on how climate justice has been perceived to influence the decision-makers and accountability relations to low carbon energy targets. By doing so an account of the state of the knowledge on how accountability effects influence decision making on a granular level. Simultaneously this paper will give an account on the current knowledge on institutional change in low carbon energy transitions and on evolution of the concept of accountability as applied in relations renewable energy technologies.

Three decades of rising emissions: and now for something completely different?

[Isak Stoddard, Uppsala University](#)

Responding to this year's conference theme, and building on a recently completed paper by Stoddard et al. (in press), this contribution begins with the question: Despite three decades of political efforts and a wealth of research on the causes and catastrophic impacts of climate change, how come global carbon dioxide emissions have continued to rise and are 60% higher today than they were in 1990? Exploring

this rise through nine thematic lenses—covering issues of climate governance, the fossil fuel industry, geopolitics, economics, mitigation modeling, energy systems, inequity, lifestyles and social imaginaries— draws out multifaceted reasons for the pervasive failure to bring down global emissions in line with international commitments. By resituating climate mitigation (and the lack thereof) in a more systemic landscape, the scale and rate of ongoing climate disruption can be understood not only as a problem to be prioritized, but also as a symptom of a particularly dogmatic political-economic hegemony. We therefore argue that prioritizing climate action involves a direct challenge to the various forms of power constituting this hegemony: from strong vested interests and ideologies of control, through to the enabling role of narrow techno-economic expertise and the entrenched practices, mindsets and allure of high carbon lifestyles. Synthesizing the various impediments to mitigation reveals how delivering on the commitments enshrined in the Paris Agreement now requires an urgent and unprecedented transformation away from the dominant development paradigm and its carbon and energy-intensive incumbencies.

Reference:

Stoddard I, Anderson K, Capstick S, Carton W, Depledge J, Facer K, Gough C, Hache F, Hoolohan C, Hultman M, Hällström N, Kartha S, Klinsky S, Kuchler M, Lövbrand E, Nasiritousi N, Newell P, Peters GP, Sokona Y, Stirling A, Stilwell M, Spash C, Williams M (2021) Three decades of climate mitigation: why haven't we bent the global emissions curve? *Annual Review of Environment and Resources*, Volume 46. In press.

Mobilizing varieties of capitalism for sustainability transitions: A return to strategic interactions

[Bradley Loewen, Norwegian University of Science and Technology](#)

Despite convergence to global capitalism today, significant variation exists amongst capitalist economies. The varieties of capitalism (VoC) approach has been influential in comparative political economy, while rising interest in the role of the state in shaping socio-technical outcomes has brought it further into the mainstream. This paper constitutes a review of VoC in the sustainability transitions research (STR) literature and proposes an application for studying the energy transition, focusing on the role of state intervention, stakeholder interaction and coordination in driving transition. The call for attention to VoC rises from several directions within STR: as a political strand in need of further research; as the need to better understand the effect of capitalism in transitions; and as a neo-institutionalist approach concerning institutions and agents in innovation studies. Yet, use of VoC to date has been relatively shallow, suggesting a need for deeper engagement with the approach and

emphasis on its interdisciplinarity. Beyond providing the basic national archetypes of liberal and coordinated market economies most commonly used by researchers, VoC offers a lens for analyzing socio-technical regimes and potential transition pathways affecting actors and institutions in multiple ST dimensions, linking individual, institutional and societal change. Review of the literature suggests that mobilizing VoC for STR may require further concept development to expand its analytical usefulness, while a return in focus to its underlying elements could enable analyses of capitalism to penetrate beyond the landscape level. Despite typical delegation to political economy, VoC is highly interdisciplinary and amenable to social scientists especially interested in structure-agency problems and power relations in transitions and sets crucial context for policymakers. As a strategy for moving VoC forward in STR, it is recommended to place it at the core of empirical studies taking institutions, stakeholder interactions and sector coordination seriously.

Practical Energy Citizenship

Thor Øivind Jensen, University of Bergen

At the 2017 Beyond Oil conference we presented the paper Children of the Anthropocene – Nature, Energy, Citizenship. The paper was rather general and this time it is more focused and give space to tools, policies and institutions that may help consumers in taking climate responsibility with energy as platform.

After a short introduction on consumer responsibilities the main discussion will compare “energy” with “food” as platform for creating status as actor on linking the household sphere with political change. Keywords in the discussion are technology, regulation, alienation, education and mobilization.

From the start, both energy (fire) and food were linked tightly to household skills and knowledge, being close and relevant to consumers and gradually developing into market and regulation relations. The close link to living conditions is also making them topics of protest and riots. The turning point is electricity around 1900. Food remains linked to households and gradually more industrial and market arenas, while energy takes a qualitative new form, first with light then heating and cooking. Energy in electricity form is then centralized, standardized and very alienated and heavily influenced by state-level political decisions. The climate challenge is rapidly mixing into food knowledge, marketing and debates, while energy faces the problems at the consumer level.

However, the situation today is marked by rapid change in energy technologies, both in production (solar, wind) and monitoring (smart metering, distributed production). The institutional setup is, however, rooted in the old technologies and production-side interests, making consumer mobilization difficult with limited transparency. The last part of the paper will discuss the present dilemmas where technology and values at the consumer side opens up for mobilization and actor (citizenship) status, but public (state and local) organization and production patterns makes this difficult.

Institutional perspectives on climate action

How much health can a tonne of carbon buy?

[Anand Bhopal, University of Bergen](#)

Healthcare contributes around 4 - 5% of global carbon emissions, which is more than sectors such as aviation and shipping. The Paris Agreement calls for all sectors to take actions to reduce emissions – currently healthcare emissions are rising.

In this paper we consider healthcare carbon emissions from the perspective of resource scarcity drawing on established priority setting principles used to aid the allocation of scarce financial resources. 'Where scholars once asked 'How much health can a million dollars buy?', we now explore another source of resource scarcity: carbon.

Our aim is to identify optimal emissions pathways which protect and improve health while decreasing emissions overall.

We analyse the relationship between healthcare and carbon emissions in three domains: 1) the absolute relationship between healthcare carbon emissions and health outcomes, including life expectancy, 2) carbon emissions and disability-adjusted life year (DALY) averted from specific healthcare interventions, and 3)

marginal carbon emission impacts of different approaches to clinical care, including potential trade-offs between the healthcare quality and climate agendas.

At present, rapid improvements in health can be achieved with low carbon emissions at the health system level. Highly specialised healthcare is increasingly expensive and carbon intensive. Regional comparisons show that high-income countries per capita emissions are four times greater than in lower-middle income countries and 70 times greater than low-income countries.

The majority of healthcare carbon emissions occur in high-income countries and the absolute emissions attributable to healthcare is growing. Steps can be taken to reduce carbon emissions without reducing quality of care at the individual patient, health system and international levels. Healthcare is an overlooked source of global carbon emissions which can take steps to reduce its carbon footprint.

Linking and translating climate action across scales: a relational approach for understanding faith-based climate action

[Bregje van Veelen, Uppsala University](#)

The multi-scalar and complex nature of climate change requires action at multiple scales, by different actors, who engage in climate action in a variety of ways. This increasingly varied landscape also raises questions, however, on how these actors and their actions can be linked up or coordinated. This paper seeks to address this question by focusing on a type of actor that has not received much attention in the literature on climate governance: that of faith-based organisations. Because the engagement of religious organisations tends to be less conspicuous, its presence may not be as readily apparent despite these organisations' deep commitment and "reach" – including into as yet untapped constituencies.

Through a relational approach that speaks to recent research in STS and Geography, this paper analyses the ways in which Christian churches both enable new climate subjects to emerge by requesting others to take action, but also position themselves as multi-scalar climate subjects in the process. In doing so, this paper demonstrates that faith-based climate action is not a singular project with uniform logics, goals, and normativities embedded in it, but is a set of projects, characterised by plurality, and at times contradictions. Through focusing on organisations that operate at multiple scales we highlight the challenges of this

multiplicity for linking climate action; and the importance of the 'translation work' undertaken by these multiscale organisations in negotiating this.

Expanding environmental impact assessment to atmospheric harms: court debates

Catalina Vallejo, University of Bergen

This paper explores climate court cases concerning environmental impact assessment (EIA) in the global context with a focus on European courts. We seek to analyze their potential to drive climate transformation. Since the first cases of climate litigation in the early 1990s, jurisprudence has moved from rejecting almost all claims for lack of standing and documented harms, to decisions in favor of climate protection. This change has been possible due to the increasing use of IPCC reports as legal proof, the Paris Agreement as a legally binding commitment, and new legal arguments connecting climate change and human rights. We see that courts have tended to adapt existing legal frameworks to make them workable for climate issues instead of creating precedent-breaking rulings. Consequently, we see a possible normalization or routinization of climate adjudication, which has the advantage of being less prone to backlash and vulnerabilities than more spectacular, precedent-breaking cases. One example of this normalization is the litigation of climate change through EIA litigation. The potential of these cases in the post-Paris- Agreement context is poorly understood and should be further studied and tested. This article proposes a model for doing so.

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