

Energy Ethics 2026 Abstracts

Affect 1	3
Affect 2	5
Affect 3	6
Affective Infrastructures, Vital and Extractive: Feeling Our Way through Energy Transition	8
AI and Data Centres	10
Climate Litigation	12
Critical Abstractions: Mediations of Risk, Security, and Expertise in Extractive Landscapes	14
Cultural Infrastructures and Landscapes of Energy	15
Dealing with Rejection: How to Handle Failure in Academia	19
Disassembling Oil Infrastructures in the Canadian Petro-province of Newfoundland and Labrador: Challenges to a Just Transition	19
Economic Forms	21
Emotional Landscapes, Contested Knowledge: Populist Narratives, Climate Leadership, and the Politics of Energy Transformations	23
Energy Analyses by the Global Majority: Diversifying the Conceptual Infrastructure of Energy Humanities and Social Sciences	27
Energy Futures and Foresight	28
Energy Infrastructure and Uncertainty	29
Energy Infrastructures and/as Cultural Heritage: A Comparative Analysis of Two Island Contexts	33
Energy Infrastructures, Markets, and Energy Justice	33
Energy Transition 1	37
Energy Transition 2	39
Energy, War and Politics	41
Expertise 1	43
Expertise 2	45
Extractivist Museums and the Energy Transition: Heritage, Representation, and Environmental Futures	47

From the Parts to the Whole: The Technoscientific Composition and Ethics of Carbon	50
Good Till The Close	54
Governing Ambiguity Across Scales: Legal Environments and Energy Infrastructures in Transition	54
Infrastructure 1	57
Infrastructure 2	59
Infrastructures of Heat: Anthropology, Method, Theory and the Thermal	61
Island Energy vs Energy Islands	62
Just Storage? Batteries and the Challenge of Energy Justice	67
Justice and Energy Transition 1	68
Justice and Energy Transition 2	71
Justice and Energy Transition 3	72
JusticeFirst! Energy transitions and energy justices in marginalized communities	73
Lines, Loops & Tentacles: Poetic Tools for the Polycrisis	78
Literary Approaches to Petro Knowledge	78
Mapping the Corridor of Impact: Affects and Pathways of Energy Transportation Infrastructure	80
Moral Economies of Net Zero Infrastructure	81
Politics of Risk in Contested Energy Futures	85
Realizing Environmental Justice in Ocean Energy: What will it take?	88
Research at the Margins of Justice: the Ethical Dilemmas of Conducting Critical Research on Climate and International Development	89
Research design and codes of practice for maximizing the impact of energy and climate social science	91
Sustaining the Small: Maintenance, Rights, and Responsibilities in Small-Scale Hydropower	92
The many faces of the post-extractivist landscapes of Scotland	95
The Role of Philosophy and Ethics within Energy Transition Discourses	95
Theorising Industrial Decarbonisation: Ethics, Entanglements, and Emerging Futures	101
Transition and Ecologies	106
Uncommoning the Commons: Contesting the Property Related Status of Energy Resources	108
When Grids Fail: The Ambiguous Role of Diesel Generators in Our Fractured Energy Landscapes	109

Affect 1

Sabrina Perić: Women and Infrastructures of Care in Alberta's 20th and 21st c Oil Towns

Popular and academic representations of gender in Canadian oil towns in the 20th and 21st century have tended to focus on men and masculinity primarily, while importantly calling attention to the objectification of women in these settings. While these analyses have been an important recognition of the role of ongoing patriarchal dynamics in industrial settings, they have also often ignored the important and complex work of women in building community and infrastructures of care. This paper is a conceptual attempt to add to the recent literature on affect and infrastructure. While much has been written about the importance of “material infrastructures, including roads and water pipes, electricity lines and pots, oil pipelines and sewage systems [that] are dense social, material, aesthetic, and political formations,” (Anand, Gupta and Appel 2018: 3), I argue that 20th and 21st century energy industries are also reliant on infrastructures sustained by highly durable systems of care that women establish and maintain in order to sustain extractive communities. This paper compares the role and work of women in two different geographic and temporal spaces in Alberta: mid-20th century Leduc and 21st century Fort McMurray. As primary sites of Canada's conventional and unconventional oil extraction, these two towns provide an interesting point of comparison: they both highlight invisible and exploited women's labour in supporting fossil fuel industry, but also demonstrate how labourers and local politicians come to rely on systems and networks of care that women establish and maintain in order to sustain and keep safe their extractive communities. This work includes the regular daily work of feeding, laundering and caring for workers, but also mobilization in times of crisis, such as flood and fire. This paper also explores how affective practices becomes critical in advancing the projects of both settler colonialism and capitalism through care. Drawing on archival sources from the Canadian Energy Museum and Provincial Archives as well as oral histories collected by the Energy Stories Lab, this paper aims to highlight the critical continuities of women's work in oil towns.

Antonella Mazzone: Getting Along with Heat: Menopause, Class, and the Ambiguity of Thermal Life

This paper explores heat as an ambiguous, classed, and embodied infrastructure, moving between atmosphere and physiology, burden and opportunity. Drawing on longitudinal ethnographic research in Rio de Janeiro, I follow the lives of three working-class women street artists: Diolinda, Andreia, and Fernanda, at different stages of menopause, to examine how heat is lived, endured, and mobilised in everyday urban labour.

Among wealthier urban classes, heat is commonly framed as a problem to be managed or escaped through cooling technologies and climate-controlled environments. For my interlocutors, by contrast, heat is something one *gets along with*. It is neither exceptional nor solely pathological, but an everyday condition that structures work, income, and possibility. Heat brings tourists, sustains carnival economies, and enables beach labour; when it rains, work stops. In this sense, heat is not only endured but anticipated and, at times, welcomed.

Yet heat is also deeply intimate. Menopause renders thermal experience turbulent and unpredictable, as internal heat: hot flushes, burning, surges, collides with external atmospheric conditions. These internal motions blur distinctions between body and climate, revealing heat as both within and without. While menopausal women are largely absent from dominant

climatic and health discourses, often eclipsed by a focus on the elderly or pregnant, their bodies make visible heat's contradictory meanings most starkly.

Situating these experiences within infrastructures of exclusion and uneven access to green areas, shade, public toilets, rest, and care, I argue that heat functions as a classed infrastructural force that distributes risk and reward unevenly. Attending ethnographically to menopausal, working-class bodies reveals heat as a material-discursive phenomenon that sustains life and labour even as it intensifies vulnerability. The paper insists on ambiguity as central to understanding heat, not as failure of analysis but as the very condition through which heat is lived, worked, and made meaningful.

Keywords: Heat; gendered labour; ethnography; ambiguity

Kim Dittman: Affective Logics of Participation: Why Energy Planning Misfires in Eastern Germany

Energy transitions are deeply ethical projects: they rely on specific ideas about responsibility, appropriate conduct, and what citizens should feel toward collective futures. Drawing on ethnographic fieldwork in a former lignite region in Eastern Germany, this paper examines why participatory energy planning often misfires; not due to opposition to renewable energy, but due to a mismatch between external expectations of emotional engagement and local affective logics.

In the communities I study, decades of structural transformation have produced affective logics grounded in calmness, measured skepticism, and a strong preference for everyday stability. These are not signs of disengagement; they are ethical practices of relational care that protect social cohesion and personal dignity in contexts repeatedly shaped by external promises of change. By contrast, participatory energy planning typically assumes that positive affect (enthusiasm, activation, empowerment) will motivate engagement. Such assumptions are embedded in the design of workshops, communication strategies, and “positive narratives” meant to support acceptance.

I show ethnographically how these external expectations collide with local affective logics. Appeals to optimism or mobilization may be experienced not as inviting but as intrusive, reproducing the experience of being carried into yet another future designed elsewhere. As a result, people may withdraw or remain silent; not because they reject renewable energy, but because the affective mode of address feels misaligned with local norms of appropriateness, prudence, and care.

The paper argues that participatory energy planning cannot be fully understood through attitudes, information deficits, or procedural design alone. It is shaped by the compatibility (or incompatibility) between the affective logics of governance and those that sustain local life. Recognizing these dynamics is essential for rethinking responsibility, expertise, and the ethics of participation in contemporary energy transitions.

Keywords: affective logics; participation; energy ethics

Affect 2

Jack Nicholls: Landscapes of Loss and Necessity: Emotion, Knowledge, and the Politics of Solar Infrastructure

This paper explores how emotional attachments to landscape, place, and belonging shape the politics of renewable energy transition in rural England, drawing on ethnographic research into community responses to solar farm developments. While renewable infrastructures are often framed through technocratic narratives of necessity and progress, my research demonstrates how energy projects become sites where emotionally charged meanings of place - loss, care, stewardship, and identity - are mobilised.

Through multi-sited fieldwork with residents, planners, developers, and community energy groups, I examine how local actors articulate solar developments as transformations not only of land use but of lived landscapes bound up with memory, heritage, and everyday practice. These attachments frequently animate resistance: solar fields are framed as threats to valued views, pastoral imaginaries, and locally embedded senses of “what this place is”. Such claims are not reducible to aesthetic preference alone; they function as moral and epistemic assertions about who knows the landscape, who bears the burdens of transition, and whose knowledge counts.

At the same time, my analysis shows how these emotional claims around heritage and place attachment intersect with broader struggles over climate knowledge, reason, and responsibility. Developers and planning authorities mobilise scientific expertise and national policy targets to justify projects as rational and unavoidable, often portraying local concerns as emotional or misinformed. This produces an asymmetrical politics of knowledge in which emotion and reason are strategically differentiated, even as both are deeply entangled in practice. The findings suggest that landscapes of energy transition are simultaneously landscapes of heritage and belonging, where the meanings of place are actively reworked through infrastructural change. In this sense, emotional attachments do not merely respond to solar development but help constitute the political terrain on which it unfolds.

Keywords: Emotional landscapes; Contested climate knowledge; Renewable energy politics

Ross Wallace: Solar industrialization, ‘sacrifice zones,’ and new environmental movements: emerging discourses of commonality and critique in Portugal’s energy transition

Abstract: Scholars and activists are increasingly taking up more radical discursive strategies to critique hegemonic green energy transitions, adopting concepts like ‘sacrifice zone’ to characterise places that are expected to bear the burden of hosting large-scale energy infrastructures, but often without receiving any of their benefits. Through a case study of community resistance to a large-scale solar PV project in Alentejo, Portugal, this paper aims to further understand this critique and how it is used in practice. We chart the development of the conflict, analysing the arguments and discursive strategies of the different actors involved. Rather than being driven solely by self-interest or place-attachment, we show how opposition was deeply rooted in experiences of procedural and distributive injustices which were framed through the critical and constructive discourse of ‘sacrifice zone.’ Beyond its role in critical scholarship, our pragmatist perspective thus highlights how this discourse is playing an important role in conflicts over the renewable energy deployment. We show how it has important moral, affective, epistemic, political and spatial features, functioning as a means of

co-producing new knowledge, explaining, resisting and coping with change, and bringing together a diverse and fluid array of groups. As a radical critique of systematic environmental injustices reproduced by state authority, it gains its potency revealing political economic connections between sites of extraction, production, consumption, and waste.

Keywords: sacrifice zone, pragmatism, solar energy

Affect 3

Sarandha Jain: Chemical Governmentality: Manufacturing Politics in Oil Refineries

This paper examines how the technoscientific composition of petroleum products shapes everyday life, government, and ethics. Petroleum products govern human relations not only through ideology or policy but through their chemical composition and material form. What is the technical- chemical work that translates geological formations of oil into sociopolitical formations of human relations? How is governmentality encoded into petroleum products during their manufacturing? This paper develops the concept of “chemical governmentality” to analyze how engineering processes in oil refineries govern sociopolitical life. The engineering of petroleum products inscribes chemical governmentality into them: a mode of governance in which the chemical reworking of matter becomes a material means to manage populations. Differing chemical materializations of petroleum products afford distinct forms of sociality, modes of everyday living, possibilities for illegality, and state-citizen relations. Drawing on ethnographic research in Indian refineries and households, I show how the technical work of separating and stabilizing hydrocarbons – seemingly neutral industrial processes – produces substances that govern people. The paper illustrates how the different chemical makeup and physical characteristics given to fuels in refineries exert dissimilar influences on the social dynamics of their distribution, storage, and usage, leading to significantly different state-citizens relations. Refining processes, product specifications, and testing protocols embed political logics into petroleum products, disciplining consumers through material means, not just through ideological propaganda. My analysis foregrounds chemical infrastructures as an arena where material machinations and technoscientific processes participate in the production of everyday life and government.

Keywords: Oil, Chemicals, Engineering, Materiality, Governmentality

Helena Böhmová: Industrial Heritage as Urgent Repair? The Making of Industrial Heritage in Late Industrialism in Middle German Coal District

Abstract: As Germany continues its coal phase-out policy and restructuring of former industrial regions, institutions dedicated to industrial heritage find themselves entangled in the temporal, affective and political dilemmas of energy transition. Based on multi-sited ethnographic research conducted between 2024 and 2025 in Middle German Coal District in Saxony-Anhalt, Germany, this paper examines how three industrial heritage institutions (a large multipurpose cultural venue, a regional museum, and a heritage network) navigate their position between preserving and re-purposing extractive pasts and participating in post-carbon futures. These institutions operate within what I understand as late industrial spaces, a term inspired by Kim Fortun’s late industrialism (Fortun 2012): a condition in which industrial (infra)structures and sentiments linger even as they are designated to become obsolete. In these spaces, heritage-

making becomes a mode of (urgent) repair - a practice that mediates between the accelerating demands of energy transition and regional structural transformation and the slow temporalities of preservation, memory, and community attachment.

Drawing on ethnographic encounters from the field, institutional materials, and participant observation at industrial heritage events, the paper shows how these institutions act as discursive, affective, and material agents of urgent repair in the Middle German Coal District. I argue that industrial heritage institutions in the region do more than preserve the past - they actively participate in the shaping of post-carbon futures. By mediating tensions between slowness and urgency, loss and reinvention, they reveal how industrial heritage institutions become participants in the politics of transition, generating new possibilities (and also new frictions) for collective life after coal.

Keywords: late industrial spaces, heritage-making, repair, coal-phase-out

Joana Nascimento: Weighed down and blown away: affective tensions and possibilities in Outer Hebridean energy infrastructures

Like other windswept regions around Scotland, the Outer Hebrides have become prime sites for proposed renewable energy infrastructure. Over the last twenty years, proposed wind energy projects have taken on a range of forms in this region, with multinational and foreign-owned commercial projects being developed alongside community-owned ones. However, recent developments in UK government strategy and net zero targets have accelerated plans to develop the energy sector in the region, leading to the rapid proliferation of proposals for industrial-scale wind power projects that prioritise multinational and foreign-owned ventures, and risk sidelining the budding and increasingly vital community energy sector. In a mostly rural archipelago known for its significant scenic, environmental, archaeological, and socio-cultural heritage – but threatened by depopulation, economic fragility, and limited job opportunities – the prospect of an exponential growth in wind power projects has garnered mixed reactions among islanders. As I heard often during my fieldwork in the Outer Hebrides, this has become ‘an emotional topic’.

Building on debates on ‘affective infrastructures’ and considering the potential for infrastructures to generate not only ‘extractive’ but also ‘vital’ possibilities, in this paper I explore some of the social and moral complexities emerging from local engagements with renewable energy projects in the Outer Hebrides. Considering local reactions to externally proposed energy projects, as well as islanders’ active role in creating and maintaining community-owned energy infrastructures, in this paper I suggest the importance of foregrounding subjective, visual and embodied experiences involved in these processes. Doing so while considering their enmeshment in particular regional histories – social, environmental, political-economic – renders visible not only how people relate to local pasts, but also how they are mobilised in the present to imagine, cope with, resist, or work towards possible futures in the context of rapidly changing landscapes of energy generation.

Keywords: affective infrastructures, community organising, sustainable futures

Affective Infrastructures, Vital and Extractive: Feeling Our Way through Energy Transition

Convenors: Laurence Butet-Roch, Isaac Thornley, Alexandra Watt Simpson

Panel Abstract

According to LaDuke and Cowen (2020, 245), infrastructure is not inherently colonial: a pipe can carry fresh water or toxic sludge. The frustrated possibilities of infrastructures can endow them with an affective form of politics. Building on Kai Bosworth's (2023) dual notion of affective infrastructures—physical infrastructures generate specific affects, but affects also undergird political movements—this panel explores forms of affect in the perception of extractive and vital infrastructures, their linkages and their environmental and social reverberations. Our goal is to unravel how energy projects, and the communities and ecosystems they impact, are rendered (in)visible, (il)legible, and ultimately (in)significant through the intervention of various tactics of mediation amid the energy transition. Drawing on Elysia French and Amanda White (2024), who challenge researchers to consider how we might account for the visual and sensorial evidence that is often overlooked by dominant capitalistic-colonial ideologies, we invite inquiries into the role of art, embodiment, psychoanalysis, and visibility in ushering diverse and ambivalent responses to extractive projects—from fervently favourable, to merely acquiescent, moderately skeptical or outright hostile, amongst others—and how these then inform and nurture different political factions and their actions. Infrastructure development is central to decarbonization, but to bring about an energy transition that is radically just will require the mobilization of political affects and social infrastructures of care and environmental knowledge.

This panel asks: What insights can attention to subjective experience, the senses, the body, and the unconscious as important sites of (un)knowing bring to an understanding of shifting perceptions of energy infrastructures? What can a focus on affect reveal about the relationships between desire and energy futurities? How are various feelings about energy infrastructure generated, mediated, and sustained, and what actions do these in turn enable and constrain?

Katie Lawson: Toxic Intimacies: affective artistic strategies and the nuclear-industrial complex

Most energy infrastructure is hidden; it is therefore out of immediate sight and mind for governments and citizens. This distance effectively erases the violence enacted on bodies and environments by industries that are at odds with the realities of dwindling resources amidst the ongoing climate crisis. And yet, the hard truth of resource extraction is not so distant as it might seem, suggesting a dominance—at least in the West—of ignorance and apathy toward industry impacts that are inescapable for communities living with the “slow violence” of mining and oil and gas extraction (Rob Nixon 2013).

What role might artists play in contending with these ubiquitous yet largely invisible systems and material dependencies? What artistic strategies for engagement exist beyond the spectacular photojournalistic impulse toward disaster tourism? Why are environmental concerns often framed as separate from post-colonial discourse, given the entanglement of

systems that link the domination, oppression, and possession of human and more-than-human worlds? To explore these questions, I conduct a close reading of recent artworks by Tsēmā Igharas and Erin Siddall, Mary Kavangagh, Bonnie Devine, and Dana Prieto—all artists who contend with various aspects of the Nuclear-Industrial complex while refusing the overtly spectacular imagery of the detonation of nuclear bombs dominates the cultural imaginary. The limits of image-making—of representation—in light of irradiated bodies and material evidence are overcome through a turn to more affective material experimentation, particularly in working with glass and geological specimens.

This paper is rooted in my position as a practicing curator who often works closely with artists to develop site-responsive work, and how we might extend my profession's roles and responsibility from the duty of care to an artwork, artist, or audience to the very landscapes and resources that enable the manifestation of exhibitions.

Filippo Bozzini: Infrastructural dreaming: affective imaginaries, energetic desires and the (in)visuality of green energy transition politics in Argentina.

The energy transition carries projects of energy infrastructures with multiple moral outcomes. This affective formation allows to apprehend rising political momentum of right-wing politics against green energy transitions and climatic agendas. This new political coalition morally frames infrastructural projects fueled by social affective and extractivist energies. Researchers increasingly show the paradox of green extractivism in its intertwined relationship with moral projects of energy transitions. They reveal its infrastructural technical fixation of future making. This focus on materiality of infrastructures and extractivism can benefit from one on the power of political imaginary, affects and unconscious that inform contemporary politics of extractive projects of energy transition. This paper builds from ethnographic research conducted in Argentina since 2023 on energy infrastructures and affective moral politics on lithium. This paper unpacks the Solar Train project – world's second lithium-powered train - that runs in Jujuy's Argentine province where lithium extraction is increasingly developing. It shows the power of feelings and (in)visuality that informs ambivalent railroad infrastructural imaginary. The shiny Solar Train runs alongside the (in)visible decaying national railway infrastructure that vanishes. Its rails are literally eaten by the ground and yet they sustain the unfolding politics of modernity desire, anarcocapitalist dreams and unconscious nightmares of Argentine historicity. This infrastructural project impacts several political communities whose political subjectivities complexify desires and dreams of radical change advanced by Javier Milei. Drawing from ethnographic sensibility on affects and imaginary, this paper provides insights on the complexity of far right greenlash, the unfolding of energy desires, and the ambivalence of political imaginaries in the green energy transition.

Rebecca Macklin: Listening to North Sea Multi-Species Communities in Transition

Along with economic gains, the development of overlapping energy industries in Scotland has brought significant changes to local ecosystems and coastal lifeways (Simchak 2008), and communities are frequently marginalized in decision-making processes (Shapovalova et al.

2023). The original fishing village of Torry, Aberdeen, has been reshaped for the oil industry through the construction of two harbours and related infrastructure. The contested construction of the Energy Transition Zone in St Fittick's Park, a local greenspace dating to the mid-17th Century (Otchere-Darko and Weszkalnys 2025), brings further change. Yell in Shetland has benefitted from the adjacent Sullom Voe oil terminal, yet the decline of oil and arrival of large-scale windfarms raises questions over decision-making processes and the socio-environmental impacts of energy transition. As Roxane Permar documents, the construction of windfarms and related infrastructure causes irreparable damage to "peatlands, flora and fauna", disrupting traditional cultural practices (Permar 2023). Yet, collective ownership models can offer routes to self-determination for communities.

This paper draws on an ongoing, community-based project in Yell and Torry, that explores the lived, affective, and sensory experiences of energy transition and infrastructural development in two North Sea communities, as well as the linkages between them. Placing particular focus on sound, this paper asks how an emphasis on situated and embodied experiences can provide a fuller understanding of the historic and future impacts of energy and infrastructural development, as well as support the recovery of environmental knowledges and at-risk ecocultural practices. The research adopts a multispecies approach, placing human experiences in relation to those of birds and other wildlife equally impacted by infrastructure projects. Sharing sonic archives of place, co-produced with community participants from Yell and Torry in workshops, this paper will offer reflections on how researchers can support community-led initiatives to build the affective and social infrastructures necessary for a just transition.

AI and Data Centres

Amara Doshi: Imagined Futures, Extractive Presents: Techno-Environmental Imaginaries in Generative AI and Video Games

As energy-intensive digital infrastructures expand under the banner of innovation, their deployment in environmental discourse reveals a striking contradiction: technologies dependent on extractive material systems are increasingly mobilized to imagine, represent, or even "solve" ecological crises. This paper examines this contradiction by analyzing two converging industries—generative AI and video games—as sites where divergent techno-environmental imaginaries emerge from shared infrastructural foundations.

Generative AI is increasingly positioned as a tool for climate action: simulating landscapes under threat, optimizing biodiversity strategies, or assisting conservation NGOs. These applications draw on techno-optimist and deterministic ideologies, which frame technological futures as solutions to current crises. This orientation is rooted in Silicon Valley's enduring vision of computation as both progressive and inevitable. Yet the energy and material costs of these systems, from large-scale model training to rare-earth hardware, are often obscured by narratives of ethical innovation.

Video games, while similarly reliant on high-performance computing, global platforms, and perpetual data circulation, frequently engage with ecological themes in more ambivalent ways. Titles such as *Terra Nil* and *Endling: Extinction is Forever* explore environmental collapse or

restoration, often reflecting a self-consciousness about their own digital materiality. Developers and players alike sometimes articulate a critical awareness of these tensions, especially within the independent games space.

Rather than treating GenAI and games as isolated cases, this paper analyzes their intersecting infrastructures and divergent imaginaries, showing how the same digital material base can underwrite both technocratic solutionism and speculative critique. The comparison reveals how ecological presents and futures are culturally produced through distinct technological imaginaries. By foregrounding these tensions, this paper contributes to interdisciplinary discussions on energy ethics, sociotechnical imaginaries, and the future-oriented logics shaping digital technological industries

Keywords: generative AI, video games, techno-environmental imaginaries.

Caleb Wellum: Envisioning A New Economy

Time magazine first announced the arrival of a New Economy in 1983, describing it as a nimble and energy efficient system supported by knowledge and information infrastructures. As suggested by the magazine's cover image of a robot tossing out industrial smokestacks, this new technological and economic infrastructure promised a fresh start after a decade of energy shocks, political division, and economic stagnation. A New Economy offered a future of greener growth through market-driven technological innovation and promised to put to rest the emerging "limits to growth" critique of capitalism. This seductive techno-utopian vision continues to resonate in the present pursuit of AI, renewable energy, and green "abundance."

This paper asks: how did a high tech, post-industrial economy centered on digital infrastructure come to be seen as green? Did this consensus result from taking energy for granted, as energy humanists often insist, or was there an explicit and responsible engagement with the potential energo-economic dynamics of new technological futures? As part of a broader project that is in its early stages, I offer a preliminary exploration of these historical and ethical questions by critically reading early theorists of the post-industrial world, including Marshall McLuhan, Daniel Bell, and Marc Porat. I consider how core concepts in early theorizations of post-industrial societies, such as networks, knowledge, systems, and the post-industrial itself, were developed in relation to broader but often unarticulated energy imaginaries of labour, electricity, and nuclear power. As a result, I raise the question of the political and epistemological entanglement of the New Economy and its infrastructures with petroculture.

Keywords: economy, deindustrialization, forecasting.

Patrick Brodie: A Geopolitical Ecology of AI: The Unequal Exchanges of the Twin Transition

The "twin transition" in Europe represents a range of policy imperatives centred around a co-constituted "green and digital transition," whereby the growth of AI and society-wide decarbonisation are mutually supportive processes. With these imperatives, the US and EU are forming ranks to position themselves as green, digital leaders, as a "green cold war" emerges across the US, its allies (such as the EU), and China. As US monopoly tech companies and their allies in the US government roll back commitments to climate action and net zero, however, the precarious features of an AI-dependent green transition become starkly illuminated.

Through a focus on Ireland, this paper considers the EU's *dependent AI economy* and the ecological and social trade-offs that industrialising AI under current parameters entails. Utilising the analytical lens of Marxist dependency theory, and applying its insights towards a conceptualisation of the unequal ecological and technological exchange that structures AI growth in the capitalist world system, I will demonstrate the unfolding consequences of the infrastructural lock-in of US monopoly tech companies in the AI economy. Ireland represents a case in point, where the expansion of US tech companies' cloud computing requirements has seen at least 22% of the electricity grid directed towards data centres, leading to a growth in overall electricity demand, an increasing integration of US tech interests in the electricity system, and proposals to utilise liquid natural gas from the US to power the digital demands of the twin transition. Ireland's geo-strategic position between the US and the EU, and its status as a platform for investment between the two jurisdictions, demonstrates an extreme case of dependency, whereby independent AI policy is functionally impossible due to the degrees of ecological, economic, and policy contradictions that arise. Drawing on insights from this scenario, this paper argues that we need to analyse the *geopolitical ecology of AI* in order to point out these fundamental contradictions and conceptually de-couple the irreconcilable promises of green/digital eco-modern growth.

Keywords: artificial intelligence, dependency, twin transition

Climate Litigation

Alexandru Gociu: Recent Norwegian Climate Litigation and the Transition to Renewables

Historically, since the oil discovery Norway created a model that aimed at a sustainable development by enacting strict petroleum regulatory framework focused on controlled, slow and safe oil exploitation, but also investing in the transition process to renewable sources of energy. However, there is a paradox as Norway is the 7th largest exporter of emissions. In this context a distinction must be made between weak and strong sustainability. The idea of sustainability embedded in the Norwegian regulatory framework was one where both natural resources and human capital predicated on the use of resources should be maintained long-term, and for future generations ('weak sustainability'). Given the global climate emergency, environmental NGOs promoted in the Norwegian court system the notion of 'strong sustainability' where ecological protection and human capital are not substitutable, and preference is given for the former in a case (People v Arctic Oil) that revolved around whether licensing decisions that do not account for emissions from oil exploration violate Art 112 of the Norwegian Constitution. In 2020 the Supreme Court dismissed the case. In this context on 2024 the Oslo District Court delivered a judgment in new case, the North Sea Fields Case finding the approvals of three oil and gas fields invalid and ruling in favor of a strong sustainability approach and later, on 14 November 2025 the Borgarting Court of Appeal confirmed the judgment during the appeal proceedings. This paper charts the interaction between the concepts of 'weak sustainability' and 'strong sustainability' in recent Norwegian climate litigation, to what extent the new court decision, will speed up the transition process to renewable sources of energy and the abandonment of the 'weak sustainability'.

Keywords: Norway, Climate Litigation, Renewables, Energy Policy

Hannah Tubman: 'Commercially Viable' Lawsuits: The Financial Infrastructures of Global Environmental Litigation

Growing demand for critical minerals underpinning the energy transition is creating unprecedented opportunities and challenges for mining communities. One challenge is environmental pollution. Mining has environmental consequences, ranging from water pollution with acid mine drainage, to air pollution from the release of sulfur dioxide, and soil pollution with the improper disposal of toxic mineral waste. Litigation is one strategy increasingly used to hold mining companies responsible for polluting activities. For instance, a case was filed in the High Court of South Africa against Anglo American South Africa to address decades of lead pollution from the Broken Hill mine in Kabwe, Zambia. Third-party funding (TPF) can be used to make these types of cases possible. Third-party litigation funding is when actors, otherwise uninvolved in a case, provide the financing for litigation. However, according to the litigation funding agreement for the Kabwe case, funding can be revoked if the case is no longer 'commercially viable,' a term also used to describe natural resources. What are the tensions between value (financial returns) and values (justice) when environmental pollution generates investment opportunities? What paths to justice are opened and/or closed when financial and legal infrastructures shape the pursuit of environmental justice? As the energy transition involves a (re)valuation of resources, this paper will analyse the funding arrangements for the Kabwe lawsuit to explore questions about evaluations of harm, the translation of experiences of pollution, and the entanglement of colonial legacies with extractive infrastructures, pollution, and justice.

Keywords: Pollution, environmental justice, litigation

Manos Papageorgiou: "The End of Husbandry": Non-Existent Sheep, Wind Turbines, and Shepherds' Protests in Contemporary Crete

This paper examines the interconnections between the reclassification of grassland and grazing areas as forest land in Crete, the installation of wind turbines, and a farm subsidy scandal that recently emerged around fictitious declarations of sheep and goats for the purposes of European agricultural subsidies. These dynamics unfold during a period marked by intensified agricultural protests and rural mobilisation, as farmers and pastoralists contest subsidy regimes and land-use classifications, and articulate anger at the uneven consequences of energy and environmental policies, which they believe aim to "end husbandry". Drawing on public discourses, digital representations, legislation on subsidies, and critical literature on extractivism and land grabbing, alongside sociological and anthropological approaches and a brief ethnographic inquiry, the paper traces the social, legal, and symbolic connections between "non-existent livestock" and the installation of wind energy infrastructures in areas of Crete. It explores how bureaucratic technologies such as forest maps and subsidy audits reshape access to land, private ownership, and legitimacy, while renewable energy projects are framed as green development and matters of public interest. By situating wind energy development within broader processes of green grabbing, the paper highlights how renewable energy transitions intersect with recent agricultural protests in Crete and raise questions of justice, accountability, and moral economy. In doing so, it contributes to critical debates on the ethical and political dimensions of contemporary energy infrastructures and their contested effects on rural livelihoods and landscapes.

Keywords: Energy infrastructures, European subsidies, forest maps.

Critical Abstractions: Mediations of Risk, Security, and Expertise in Extractive Landscapes

Convenors: Laura Pannekoek, Isabelle Boucher

Panel abstract

Various extractive practices and infrastructures, both in their 'conventional' and 'unconventional' forms, have become widely accepted in the political center as 'critical' for sustainable and economic development. What so-called 'green minerals,' carbon credits, and fossil fuel infrastructures have in common are their perceived criticality for the maintenance and expansion of both energy security as well as high-tech consumer product supply chains and digital economies that depend on them in the face of rising geopolitical tensions and climate change. This mobilization of the 'critical' is an instance of what Kyle Whyte calls 'crisis epistemology' in which colonisation typically imagines some kind of crisis under which devastating impacts on Indigenous peoples and environments are pitched to seem necessary or unavoidable response to that external crisis.

In this moment of overlapping crises and criticalities, the complex environmental and social techniques in extractive landscapes are processed through technoscientific systems to emerge as solutions to legislative choke points between environment and capital. What we term critical abstractions are the outputs of these mediations: models, predictions, forecasts, risk frameworks, etc. As governments are en masse removing regulatory obstacles to smooth the course of infrastructurally realized capital accumulation under the cover of 'criticality', we ask how and through what mechanisms increasingly unregulated extraction is allowed to proceed.

This panel brings together a set of media studies perspectives that ask: how do technologies, expert reports, and financial speculation mediate risk, harm, and repair in extractive landscapes? How is expert knowledge bound up with new spheres of production contributing to the carbon market? How do speculative ecological trials and technoscientific ventures contribute to new (extractive) ways of accumulating 'natural assets'? The first presentation investigates how various abstractions of sustainability such as Environmental, Social, and Governance (ESG) get hardcoded as an AI subsurface modelling input that is aimed at predicting environmental instabilities, social risks, or Indigenous opposition to a potential mining development in order to "de-risk" and streamline mineral developments. Other contributions to this panel discuss how the futures of fossil fuel infrastructures are secured through risk and repair frameworks. In Cape Breton, abandoned coal mines narrate the terms of energy and industrial transition made increasingly 'critical' through frequent appeals to an economy of abandonment. In Assam, speculative finance and selective expertise are mobilized to justify ongoing extraction in an ecologically fragile, protected landscape that was the site of a 2020 oil well leak and fire, while affected communities await compensation and justice. In the Yukon and Northwest Territories, architectural and planning expertise was leveraged to establish certainty surrounding the social, economic, and ecological risks and benefits of a proposed natural gas pipeline in the 1970s during a federal inquiry into its impacts. In each case and as this panel will explore, crisis epistemes and their planning frameworks secure the flow for less regulated and rushed forms of extraction.

Isabelle Boucher: Critical Credits: Venturing into Carbon Dioxide Removal, or How Capital Mediates Uncertainty.

Laura Pannekoek: The Criticality of Critical Minerals: ESGI models and the Production of a Mineral Resource

Jordan B. Kinder: Architecture and Expertise at the Mackenzie Valley Pipeline Inquiry

Ayesha Vemuri: Slow Violence, Slow Justice: Hydrocolonialism and the Politics of Expertise After the Baghjan Blowout

Sarah MacDonell: Coal Folk: The Cultural Afterlives of Extraction

Cultural Infrastructures and Landscapes of Energy

Convenors: Camille-Mary Sharp, Mélanie Louterbach

Panel Abstract

Over the last several decades, cultural practitioners and researchers have increasingly recognized the central role of art, design, and culture in addressing the climate crisis and advancing sustainable praxis. From global policy frameworks to regenerative artmaking and speculative world-building, the belief that we might imagine and represent our way to and through an energy transition now shapes many forms of ecological cultural production. At least seven of the UN Sustainable Development Goals (SDGs) have been explicitly tied to culture (Canadian Commission for UNESCO, 2022), and institutions such as museums are described as “lifeboats” with untapped potential to foster climate justice (Janes, 2024). At the professional level, a growing body of manifestos and design guidelines also aims to cultivate ethical and sustainable creative practice (Centre for Sustainable Curating, 2024; Design as Protest, n.d.).

However, as recent scholarship and design-based interventions make clear, art and cultural work remain entangled in the material, elemental, and political flows of energy production (Angus, 2024; Sharp, 2024). While traditional museums increasingly reckon with their collections of colonial and extractive spoils, so too are critical spaces of contemporary curation implicated in energy dilemmas— the “limitless energy” of plastics and fossil fuels having been “naturalized, normalized, [and] made invisible and ‘professional’ within contemporary art aesthetics” (Robertson and Davis, 2024: 574). As such, cultural institutions are not merely symbolic spaces but materially embedded actors within energy environments, aligning with what landscape theorist Rania Ghosn (2010) calls “landscapes of energy” and with Carola Hein’s concept of “petroleumsapes” (2022). This panel thus aims to bridge critical work in visual culture and museum studies with landscape studies to help expose and reimagine spatial, cultural, and institutional geographies of energy.

Recognizing that “critique subtracts by design” (Szeman and Diamanti, 2019: 18), this panel turns to artists, designers, and cultural practitioners who move beyond critique to ethically reimagine energy culture. Focusing on the aesthetic, spatial, conceptual, and material reverberations of energy ethics in cultural work, we welcome contributions from visual culture,

museum studies, and landscape and design practices that foreground real-world interventions, precedents, and speculative proposals. We invite discussion around the following questions:

In what ways have artists, activists, and cultural practitioners reclaimed extractive institutions and cultural forms to imagine and materialize alternative energy futures?

How might landscape architecture and design bridge the spatial petroleumscape—the physical infrastructure of energy—with its cultural representations (Hein, 2022)?

How do cultural practitioners navigate institutional entanglements with extraction through practices of knowledge production, storytelling, and representation?

How can localized practices of cultural production reverberate beyond their regional and institutional contexts towards an integrated cultural infrastructure of energy ethics?

Thinking with and through practices such as posthuman museologies, landscape-based storytelling, or repurposed industrial heritage infrastructures, this panel speaks to the Energy Ethics 2026 themes of commons and collectives; crisis, hope and despair; humans and nonhumans; and materiality.

Mélanie Louterbach: Insurgent Geology: Reclaiming the Museum of Natural History in Alaska

This contribution explores how landscape architecture can activate new forms of public geological knowledge along the Trans-Alaska Pipeline System, reframing fossil-fuel infrastructures as potential sites of climate and political resistance. Drawing from the speculative design-research project *Insurgent Geology*, set in a post-oil Alaska in 2051, the work critiques the Museum of Natural History as a neo-colonial institution shaped by extractive and imperial logics, where geological specimens are disconnected from their landscapes of origin, removed from their social, ecological, and political contexts and presented as “neutral” artefacts. The project also challenges the disciplinary foundations of geology—its historical entanglement with extraction and colonial expansion, and its failure to confront the ethical and political dimensions of our relationship with the Earth. It envisions instead an activist and collaborative spatial practice between curators, Gaïa-ologists and landscape architects that repositions geological knowledge within the public realm as a contested, collective, and embodied field of action.

Insurgent Geology calls for alternative geo-social narratives and transforms the Trans-Alaska Pipeline from a symbol of fossil fuel dependency into a distributed outdoor museum for climate justice. Through a series of landscape interventions forming a pilgrimage along the former pipeline infrastructure, the project reconnects the public with the local extractive landscapes of Alaska and reimagines the museum as a “Museum of the Living Earth”—a hybrid indoor–outdoor platform for public engagement, situated environmental learning, and renewed relationships with the land.

Focusing on the third and fourth stops of the pilgrimage, the project reclaims geology as a relational, situated practice. At Site 3—The Outcrop—visitors follow a designed path along a braided river valley toward the exposed Shublik shale formation, once a strategic sampling site for exploration geologists and the source rock of Prudhoe Bay’s oil fields. Returned to Iñupiaq stewardship, the outcrop is reimagined as a site of geological kinship. Visitors encounter Triassic marine microfossils—carbon-based ancestors—and are invited to sense the Earth

through deep time. As climate change alters the valley's hydrology, the river swells and the path is gradually buried and relocated uphill, forming a visible palimpsest of evolving routes and construction techniques. The site becomes a space of co-adaptation between geological processes, society, and design practice.

Zannah Matson, Neil Nunn: Interruptions and Surges: Narrating Energy Impact at Diitiida (the Jordan River Watershed)

The Jordan River was once among the most abundant salmon-supporting ecosystems on south Vancouver Island, and the traditional territory of the Pacheedaht Nation. Today the ecosystem is void of most marine life, with less than 15 salmon returning per year. Three main industries have impacted this river throughout settler history, but perhaps the most destructive industry has been the two hydroelectric dams, which control the flow of the river for the production of hydroelectricity for south Vancouver Island. Despite the impacts of BC Hydro's operations on the Jordan River and its salmon populations, the striking landscape around this watershed often masks the environmental devastation that industry has wrought.

To address these challenges, committed community members have sought to tell a more complete story of the river to a wider audience of residents in the region and tourists through sharable film projects. These efforts seek to clarify otherwise complex cumulative ecological effects, and to contest the powerful "green" narratives advanced by BC Hydro that helps to sustain deeply impactful energy operations. In this paper, we reflect on the process of telling the story of this watershed through film. Weaving together clips from two different film projects--each with different goals and audiences--we consider how film can be used to tell more complete narratives about landscapes shaped by infrastructure and energy. And how these mediums can mobilize community awareness and concern and make legible the often illegible cumulative impacts associated with infrastructures like hydro-electric generation.

Keywords: hydroelectricity, film landscapes, infrastructure

Gertjan Plets, Janna oud Ammerveld: (Re)Curating the Gasscapes of Groningen: From Corporate Museologies to Ecological Repair

This paper theorizes an omnipresent but overlooked type of cultural heritage: gasscapes. Gasscapes are cultural landscapes scarred by contested histories and the impacts of gas extraction. Building on Carola Hein's concept of the petroleumscape, we develop gasscapes as a framework to analyse the material, political and temporal specificities of gas extraction in relation to heritage-making. We unpack gaslands as an important type of heritage through the example of the Groningen gasscape, Europe's largest land-based conventional natural gas field. Following the cessation of extraction in 2024, a range of local heritage initiatives have emerged, underscoring the urgency of curating gasscapes in the aftermath of extraction. Drawing on ethnographic fieldwork and ongoing engagement with grassroots heritage initiatives, the paper explores how the rapid decommissioning of extraction sites creates tensions between erasure and commemoration.

We first evaluate how natural gas has been commemorated to date and how it has been influenced by discourses of climate obstruction pushed by the industry. Subsequently, we provide an overview of grassroots initiatives and a collaborative method we developed with these stakeholders to reinvent the way we memorialise natural gas as industrial heritage. In collaboration with landscape architects, conceptual artists and community members, we organised a series of art projects and open calls that yielded new bio-based approaches to presenting and preserving the legacy of petromodernity for future generations.

Keywords: Natural Gas, Ecological Repair, Petromodernity

Kirsty Robertson: The Museum Without the Museum: Climate Emergency at the Limits of the Institution

How are the legacies of extraction encoded into the very infrastructure of museums? Reworking theorist and disgraced diplomat André Malraux's notion of the "museum without walls," this talk strips away the infrastructure to focus on a number of itinerant and ephemeral artwork/alter-institutions including The Tar Sands Exploration Centre (a converted 1982 Dodge camper van created by Canadian artist Allison Rowe); artist A. Laurie Palmer's Lichen Museum; and The Spore Initiative's Diplomatic Suitcase of the Confluence of European Water Bodies. Can itinerance and ephemerality offer an answer to theorist Macarena Gómez-Barris's question: "What below-the-surface carbon entanglements and other sources of primitive accumulation make the museum even possible?" Throughout, air quality, or "neutral air" in permanent museum spaces is used as a marker to analyze the end state of fossil fuels and other natural resources as they are extracted, refined, burned, manipulated, and transformed into the literal building blocks of museums, often creating collateral streams of profit and pollution that distinctively impact those who collect and those from whom collections are (often) sourced. Through this analysis, I suggest that the carefully controlled exterior and interior environments of museums are connected to a logic of extractivism that threatens to undermine museum work to repair and address past histories and their ongoing climate implications. Here, the museum without walls, reimagined less as a universalizing project of liberal values and more as a countervailing force, models a very different future for museums based on a paradox that intertwines an unsettling of permanence with stillness amidst the vast movement of capital.

Keywords: museums, climate control, extractivism

Camille-Mary Sharp, Aaron Ambroso: Petro-Museologies

Often situated at the heart of extractive landscapes, oil museums are tasked with preserving, interpreting, and communicating the heritage of an energy industry in transition. As cultural institutions, oil museums must not only adapt to a changing climate; they must also respond to shifting societal expectations and museological standards—ones that increasingly call upon the GLAM (Galleries, Libraries, Archives and Museums) sector to be accountable to local communities and their more-than-human neighbours. How are oil museums and their natural and industrial environments mutually constitutive, and how might we harness their practices of heritage-making and cultural production towards sustainable futures? Put otherwise, in what ways are these understudied institutions both shaped by and shapers of the material and immaterial realities of resource extraction, and what can attention to their processes of

knowledge production, representation, and public engagement reveal about the critical possibilities of petro-museology—the works and frameworks unique to oil museums? To answer these questions, this paper will present preliminary findings from the authors’ research at the Oil Museum of Canada, a National Historic Site inaugurated in 1960 in Lambton County to commemorate many of Canada’s extractive “firsts” (first gusher, first commercial well, and first oil company) in a landscape marred by the affective residuals of a once booming industry. Bridging the museum’s history, its objects, and its natural and political entanglements with concepts from critical heritage and museum studies—including postpreservation (DeSilvey, 2017), eco-curating (Cameron, 2023), and toxic heritage (Wollentz et al, 2020; Weinberg and Figueroa, 2023)—this paper seeks to challenge assumptions about the work of oil museums while surfacing them as complicated but productive nodes within the cultural infrastructures of extraction and energy ethics.

Keywords: museums, petroleum heritage, energy futures

Dealing with Rejection: How to Handle Failure in Academia

Benjamin Sovacool

Dealing with rejection is tough, but putting many hours into your research funding bid, paper, or application, only for it to be turned down is an all-too-common experience, and especially difficult to process. But it doesn’t have to be the end of the line for your idea! Rejection is surprisingly common within the academy, and there is nothing ‘wrong’ with experiencing it. Please join us for a talk on ‘Dealing with rejection: how to handle failure in academia’, led by Dr Benjamin Sovacool (Professor of Energy Policy at the Science Policy Research Unit). This should be a valuable session for researchers at all stages across the Arts and Humanities, Economic and Social Sciences, and Physical Sciences. We welcome those just starting out on the research funding journey, to those with more rejections than they care to count.

Disassembling Oil Infrastructures in the Canadian Petro-province of Newfoundland and Labrador: Challenges to a Just Transition

Convenors: Leah Fusco, Angela Carter

Panel Abstract

As a major oil producer, Canada should be a leader in winding down oil extraction. However, Canadian provinces have vowed to dramatically expand oil production. While research and media attention often focuses on Alberta’s tar sands, we focus on the under-studied province of Newfoundland and Labrador (NL), the site of Canada’s only offshore oil production and a region highly dependent on the oil sector. This panel examines the challenges of dismantling the physical, political, regulatory, and social infrastructures that uphold NL as a petro-province. Papers examine 1) the political-economic and cultural dynamics that impede bans on new exploration and future development; 2) political rhetoric/discourse that contorts status quo oil into a climate solution; 3) how the spatial, temporal, and technological overlap of fossil fuel and

renewable industries can hinder transitions; and 4) how new wind-to-hydrogen megaprojects, while positioned as “clean,” reproduce old patterns of inequitable, extractive development.

Leah Fusco and Angela Carter: The stacked energyscapes of Newfoundland and Labrador’s energy transition: Contradictions and continuities of a just transition

Energy transition is underway globally (albeit unevenly). The pace and equity of the global transition will depend partly on how specific places reorganize to support it. In this paper, we examine energy transition in Newfoundland and Labrador (NL), an oil-producing province in Canada. We use a critical energy justice lens to analyze the province’s approach to transition and consider whether it will help or hinder regional and global just energy transition. Despite the climate crisis and the anticipated imminent decline in global oil demand, NL is relying on expanding oil extraction exponentially to achieve socio-economic stability while simultaneously situating this expansion as part of the global energy transition. At the same time, it is pursuing renewable energy projects, largely aimed at producing energy for export and to decarbonize industry, including oil. Some of these projects also have questionable social, economic, and environmental benefits. Thus, despite the increasing language of energy transition in policy documents and more emphasis on new renewable projects, we find that the province’s approach is slowing regional and global just energy transition and perpetuating inequitable social relations of petro-capitalism.

Angela Antle: ‘Low carbon’ oil as climate solution in advanced petrostates?: Canadian and Norwegian political rhetoric on Equinor’s Bay du Nord project

Major oil-producing, rich-world countries have been identified as the jurisdictions that ought to lead the phase-out of oil required to limit global temperature rise. However, advanced petrostates such as Canada and Norway continue to expand production, framing it as both a climate and energy security solution. Here, we unpack the rhetorical strategies used by political actors on both sides of the Atlantic with reference to the case of Equinor’s Bay du Nord oil project, a series of oil discoveries located 500 km off Canada’s most easterly province, Newfoundland and Labrador (NL). Applying Fortin et al.’s (2025) “discursive strategies of climate obstruction” (DISCO) typology, we examine how political leaders in Norway and in NL have justified this project since its announcement in 2013, analyzing debates in both legislatures, speeches, media interviews and social media posts by elected officials, as well as major policy documents from both governments. This comparative work illuminates precisely how mature major oil-producing jurisdictions justify expanding oil production at a time of intensifying oil-fuelled climate crisis when their leadership is instead needed to phase out oil production. Ultimately, by distinguishing the precise rhetorical strategies used to support oil expansion, we provide a map of the primary ideas that must be contested and indeed replaced by researchers and advocates working for climate-aligned energy policy in these countries.

Camille Ouellet-Dallaire: Accounting for socio-ecological impacts of mega wind-to-hydrogen export projects in rural Newfoundland

Western Newfoundland is home to the Mi'kmaq Qalipu Nation and offers some of the best wind profiles to support the production of mega-wind. Communities are small, rural and remote. One major project, lead by World GH2, has proposed two wind farms of unprecedented scale (150 turbines). Sizes of town will double with the influx of male workers, putting a strain on the socio-environmental systems that support local communities. There is a deep tension between the global need for these green energy projects and their potential negative impacts on social justice in local communities. Women are less likely to benefit from a job in these projects. As a result of the decreased carrying capacity of social-ecological services and through their proximity to male-dominated work camps, women will likely see a decrease in their quality of life, an increase in sexual harassment, and reduced access to health and education services. Without commensurable information on these social impacts, a truly just, green, and intersectional transitional is impossible. Drawing from cumulative impact assessment methodologies, this study looks at how to better understand the full scope of impacts by using indicators to capture safe communities and gender equality within these project using example from impact statements from current projects.

Sarah Greene: The next 'beyond oil and gas' Government in Canada?: Assessing the potential for subnational bans on oil and gas extraction

At a time of significant flux in North American climate and energy policy, this article locates potential for advancing supply side climate policy in Canadian provinces or territories. Given that fossil fuels are the leading source of greenhouse gas (GHG) emissions, causing the intensifying climate crisis, there is an urgent need to phase down fossil fuel production. Bans on oil and gas extraction—"keep it in the ground" (KIIG) initiatives—are central in this effort. To date, we have identified conditions enabling KIIG policies in national jurisdictions (Ireland, Denmark, and France). However, in recent years, subnational governments have become focal, with notable leadership from Canada. Québec, in its new role as co-president of the Beyond Oil and Gas Alliance (BOGA), is leading the global effort to encourage other subnational governments to follow its example of banning oil and gas exploration and extraction. Therefore, here, applying the theoretical framework developed in Carter and McKenzie (2020) and refined through subsequent fieldwork on national cases, we assess each of Canada's provinces and territories. We compare opportunities for, and barriers to, enacting KIIG policies, centring the analysis on domestic energy and emissions profiles, the power of incumbent fossil fuel actors and social movements, as well as the depth of cultural affinity with oil and gas development. While there is enormous upheaval and backtracking in climate/energy policy in this moment, this article identifies where there are opportunities—even in a major global oil and gas producing country—to advance phase-out policies needed to prevent a worst-case climate crisis.

Economic Forms

Julius Kob & Julia Kirch Kirkegaard: Economic forms of transition: power-to-x expertise between assetizing and commodifying green hydrogen

Departing from the intersection of valuation studies and political economy in STS, this paper approaches the crucial role of ‘transition expertise’ in the economisation of transition technologies as the primary technoscientific response to the socioecological crisis. Using the case of green hydrogen and ‘power-to-x’ technology, we posit that development of transition technology can be seen as struggles between different forms of expertise in constructing economic forms: green hydrogen ‘after the hype’ faces not only material but also financial constraints, and in competing for such resources, green hydrogen market actors seem to be divided along two trajectories. One prioritises the build-out of integrated green hydrogen infrastructures as rent-producing *assets* (focusing on green hydrogen production, distribution and electrical grid balancing) and another prioritising localised production of hydrogen derivatives (e.g. e-fuels and industrial chemicals) as tradable market *commodities*. Each economic form – commodity and asset – requires different and potentially conflicting sociotechnical configurations to be realised. Based on a combination of expert interviews and observations in the European green hydrogen field – with e.g. technology and project developers, state and transnational agencies, financial institutions, market platforms – we follow struggles in forging economic forms and how struggles between assetization and commodification of green hydrogen take shape in e.g. standards for ‘green’ hydrogen (RFNBO), techno-economic assessments, energy modelling and planning, project finance, public funding and tenders. We discuss how affordances and properties of different economic forms rely on different configurations of expertise and produce different trajectories of transition futures. We find that in contributing to specific constructions of economic forms rather than public energy goods, most types of transition expertise not only further perpetuate market-based technoscience and profit imperatives, but that struggles in realising competing economic forms are likely to hamper a coherent development path for green hydrogen-based decarbonisation altogether, further constricting manoeuvrability in an accelerating socioecological emergency.

Keywords: expertise, green hydrogen technology, economic forms

Matt Schneider: Stranded Asset Cosmopolitics

The stranded asset has in recent decades become a key framework for measuring the expected financial impact of climate in/action: in particular, for projecting the devaluation and decline of fossil capital. Warnings of stranded asset risk have increased in magnitude and momentum among a diverse global network of researchers, climate activists, financial practitioners and regulators, and the Intergovernmental Panel on Climate Change. Despite or because of rhetorics of inevitability through which such warnings have often been voiced (as what will or must happen to meet the 1.5C or 2C targets of the Paris Agreement, e.g.), prominent professionals and scholars have lately cast doubts on the stranded asset as neither an accurate description of the material shape of climate impacts nor a useful theory-of-change to catalyse financial and real-economy transitions.

Drawing from ethnographic and archival research in the UK and Japan, this paper traces some of the constructions, circulations, contestations, and transformations of the stranded asset idea, to map how stranding first came to matter and then seem to not matter so much. Detailing the wide range of ethico-political agendas with which stranded asset concerns have been taken up—to prevent or hasten the destruction of fossil infrastructures (qua asset values) and consequent transformations of social orders and power relations—I argue that the stakes of the stranded asset are not merely balance-sheet values but also the ontological security of the worlds in which such assets are owned, operated, and experienced. Yet, I suggest that

dominant responses to the spectre of stranded assets, whether disavowing stranding risks or attempting to mitigate them in the short term, defer and compound unresolved political-economic problems into a still more uncertain future.

Philip Roscoe & Shona Russell: The ethical infrastructures of nature restoration markets: towards a patrimonial biopolitics of energy

Carbon markets, like all energy systems, depend on feedstock: emissions credits that are bought and sold must be tied to actual (or potential) offsets of carbon sequestered elsewhere. The market therefore involves a series of transformations, not only of carbon but of offset- (or anti-) carbon: from local site to tradeable commodity, to mobile financial asset, to future claims and obligations on the site. These transformations are organized through sociotechnical ‘thinking’ infrastructures (Bowker et al., 2019) that concretize political and economic relations across registers of scale and space. As market imaginaries are mobilised to address ecological issues, the challenge for empirical work is to follow these translations from the local to the global, from the present to the future, in order to understand how ‘markets in the making’ (Callon, 2021) shape social, technical and environmental futures.

Our project follows ongoing market-making work in nature restoration projects in Scotland. Building on existing genealogical exploration of Scottish nature-finance policy (Russell & Roscoe, 2025), we investigate how market infrastructures are assembled in local situations and how these might scale and transform into novel formations of capital.. Taking a ‘market studies’ (Geiger et al., 2024) perspective, our qualitative fieldwork illuminates the work involved in making commodities, organizing market exchange, and tracing the translations that flow *in both directions* along the ‘value chain’ of mobilising financial capital to restore nature via offsets and credits.

Assets require care if they are to maintain their capacity to move value between actors (Callon, Caliskan, & MacKenzie, 2025) and we show how this work is inscribed into market infrastructures, even as they are imagined. We argue that a holistic view of the asset’s life-cycle can show how well-meaning local interventions in local nature restoration might ultimately contribute to global, patrimonial, and even neo-feudal, (bio)politics of energy.

Keywords: markets, nature restoration, biopolitics

Emotional Landscapes, Contested Knowledge: Populist Narratives, Climate Leadership, and the Politics of Energy Transformations

Convenors: Karin Bürkert, Valeska Flor

Panel Abstract

Energy transformations are not only technological processes but deeply cultural and political ones. Across Europe and beyond, infrastructures of energy transitions—whether fossil-based or renewable—are entangled in emotionally charged narratives of loss, identity, and belonging. This panel investigates how emotional attachments to *Heimat*, landscape, and place intersect with the rise of right-wing populist framings and broader contestations over climate knowledge and responsibility, highlighting how such emotionalized narratives not only draw on but actively

produce notions of *Heimat* and belonging—which in turn reinforce these attachments. These dynamics are closely linked to the politics of heritage, where claims to cultural continuity, tradition, and identity are mobilized in the context of energy debates.

We are particularly interested in how energy transformations bring forth emotionalized discourses and practices across different fields—and in how they serve as arenas where fundamental questions around responsibility, reason, and truth are negotiated. We explore how energy projects provoke both resistance and mobilization: in former coal regions such as the Rhineland, communities navigate the trauma of forced displacement and loss of landscape. These experiences are shaped by conflicting knowledge regimes—between industrial progress, ecological urgency, and emotional memory—and give rise to complex negotiations around social legitimacy and climate justice. Similarly, in wind energy regions across Baden-Württemberg, renewable energy infrastructures have become focal points of local protest and civic engagement. Here, emotional attachments to landscape aesthetics and local identity often clash with national and global narratives of ecological necessity, revealing tensions in the politics of scale and belonging.

At stake are not only the infrastructures themselves but the ways in which truths and facts are produced, how people are held responsible, and how reason is discursively articulated—often through and with emotion. At the same time, climate leadership initiatives (e.g. Climate Reality Project) attempt to train and mobilize citizens through specific framings of climate action and knowledge, aiming to bridge the gap between scientific expertise and everyday life. These initiatives also highlight how reason, responsibility, and truth are enacted as social practices, and how emotions function not merely as reactions but as structuring forces within climate discourse.

This panel invites contributions that critically examine these issues and explicitly encourages examples with a global perspective, drawing on empirically grounded, ethnographic research across fields and contexts:

How emotional narratives of *Heimat* and loss shape responses to energy transition projects;

The role of right-wing populist discourse in framing energy transitions as threats to their version of cultural identity;

How local actors produce, negotiate, and contest climate knowledge within programs and protest movements;

Symbolic, aesthetic, and narrative strategies that legitimize or resist energy transformations;

How emotionalized narratives co-produce concepts like *Heimat*, landscape, or cultural identity, reinforcing the attachments they create;

How responsibility, reason, and truth are constituted and challenged in emotionalized energy debates.

We aim to deepen understanding of the emotional and epistemic politics at play in current energy debates, highlighting how memory, identity, and political affect shape the pathways—and obstacles—toward sustainable futures.

Mario Krämer: Experiences and feelings of loss in energy transitions

Transitions from carbon-based and nuclear energy to renewable energy sources are often accompanied by experiences and feelings of loss. These experiences and emotions vary widely according to local contexts and the specific groups affected: with regard to the extension of wind energy, for example, indigenous Sámi in Norway fear the loss of their ways of living with their reindeer, whereas indigenous activists in Oaxaca (Mexico) are afraid to lose their land through land grabbing by (trans)national corporations, and nature conservationists in rural Germany in turn worry about the loss of aesthetic landscapes and more-than-human species. Various groups in different socio-cultural contexts and in varying positions of power do not only experience and feel loss in different ways, but they also employ diverse strategies of coping with loss – or what Reckwitz (2021) refers to as ‘doing loss’: for example, they try to come to terms with it by means of aesthetically and affectively grounded ‘ecological nostalgias’ (Angé/Berliner 2020) or by outright opposition and protest. The paper gives, first, a comparative overview of diverging experiences and feelings of loss in energy transitions in the Global South and North. Second and by zooming in on the German case study, it investigates the interrelations between the perceived loss of aesthetic landscapes, ecological nostalgias and affective notions of ‘Heimat’. The paper moreover explores how those affected by energy transitions deal with experiences and feelings of loss and in how far various forms of ‘doing loss’ produce conflictual and exclusive forms of belonging.

Angeline Marie Letourneau: Emotion and identity as drivers in petro-populist discourses: the case of Albertan Heimat

This paper examines how right-wing populist discourse in Alberta, Canada, strategically frames energy transitions as an existential threat to 'Albertan' cultural identity. Drawing on five years of ethnographic fieldwork, I investigate the central role of petro-populist discourses and notions of colonial masculinities in shaping hegemonic interpretations of national climate targets. My analysis reveals how these narratives portray climate action as an attack on the labor and heritage of 'hard-working Albertans,' a powerful emotional attachment to a specific place and way of life. I argue that these are not merely political arguments but emotionally evocative narratives, deliberately mobilized by industry actors to nationalize a specific, conservative vision of Canadian identity. By exploring how these discourses co-produce and reinforce notions of a threatened Heimat and a contested landscape, this research sheds light on the ethical dimensions of contested knowledge and responsibility. It demonstrates how emotions are not just reactions to, but are constitutive forces within, energy debates, actively challenging climate justice and social legitimacy.

Mariana Riquito: Emotional Landscapes of Resistance: Baldios, Belonging, and Contested Energy Projects in Covas do Barroso

Covas do Barroso, an agricultural village in northern Portugal, is the stage of a conflict over a prospective lithium mining project that has become emblematic of the contested politics of dominant energy transition. This paper focuses on a specific land dispute surrounding the limits of the baldios – collectively owned lands – where Savannah Resources, the owner of the lithium concession, sought to carry out prospecting work on land purchased from a private owner and registered through the new digital cadastral platform. Inhabitants contested both the company's boundaries, which they argued encroached on the baldios, and its right to operate

there, insisting that the baldios belong to “the people” and that their intimate knowledge of the baldio, cultivated across generations, holds greater legitimacy than cadastral maps. The dispute triggered a seven-month blockade of mining machinery, illustrating how energy projects provoke resistance rooted in affective attachments to place, and also how they stage clashes between competing knowledge regimes: technical, legal, and affective. Based on a yearlong ethnographic fieldwork and my ongoing collaborations with this struggle since 2021, the paper examines how emotional narratives and embodied ties to place operate as both analytic and political forces. These attachments are not merely reactions, but structuring forces of socionatural worlds, which are now disputed and contested. It shows how the baldios are enacted simultaneously as legal categories, affective landscapes, and lived territories, and how these multiple enactments mediate negotiations over belonging, responsibility, and legitimacy within contested energy projects.

Keywords: Place; Energy Transition; Affective Attachments; Contested Knowledge; Resistance

Juliane Tomann: Contested Grounds: Remembering Uranium Mining in Eastern Thuringia

Standing in the picturesque market square of Ronneburg, a small town in rural eastern Thuringia there is little indication that uranium ore was once mined in an open pit on its outskirts between 1953 and 1991. During that period, one of Europe’s largest uranium ore deposits was exploited by the Soviet-German stock company Wismut, shifting Ronneburg’s cityscape and identity from a former spa town to a mining community. While uranium ore from the GDR played a crucial role in the development of the Soviet nuclear industry during the Cold War, mining was halted after German reunification. The Federal Ministry of Economy took over the company, transforming it into Wismut GmbH. The company, previously responsible for severe environmental pollution and damage, was now funded by the federal government and tasked with remediating its facilities, mine sites, and devastated landscapes.

While Ronneburg’s open pit was converted into a large-scale landscape park and visible traces of destruction and toxicity vanished, remembering the uranium mining past remains a highly contested issue within the community. Especially because Ronneburg is still in search of a post-mining identity and the community deeply divided by nostalgic recollections of technological progress, environmental destruction and forward looking narratives marginalizing the uranium mining past altogether. In my contribution I will focus on the role of the landscape “scar” at the town’s fringes and explore the role of the so called “New Landscape” in Ronneburg’s identity building process. Analyzing the diverse forms of mnemonic markers which appeared there since its remediation I will examine the ongoing, contested and emotionally charged discourse about Ronneburg’s toxic past.

Frederic Lucas Wrage, Anna-Lisa Klages: Reconstructing a moral economy of land use in rural energy transitions

The expansion of renewable energy is associated with increasing confrontations with renewable energy infrastructure in rural communities. These sometimes result in conflict and perceived injustice that may be seized upon by populist actors. In our contribution, we present results from our ongoing qualitative research, in which we reconstruct the articulation processes of collectively legitimized judgements based on perceived injustices related to land use in the

context of solar projects in Germany. Building on and adapting E. P. Thompson's concept of the Moral Economy, we conceptualize those articulations as an informal mode of normative evaluation, which are in opposition to formal schemes of assessment. In our contribution, we will present a processual model of relationalities and interdependencies, including elements of orientation, role constructions and typical clusters of normative demands. Doing so, we seek to enhance the understandings of conflict trajectories by sensitizing for the structure of normative assessments of oppositional conflict groups based on local experiential knowledge.

Keywords: normative evaluation, injustice, ownership

Energy Analyses by the Global Majority: Diversifying the Conceptual Infrastructure of Energy Humanities and Social Sciences

Convenors: Yu Sang, Asmus Randsløv Rungby

Panel Abstract

An explosion of interest in energy among anthropologists, social scientists, and humanities scholars has changed the citational landscape of energy studies in the last decade. Pioneering figures, such as Leslie White and Laura Nader, paved the way for a vibrant field of discussion, characterized less by individual scholars and more by linguistically and conceptually oriented problematics. These discussions have generated conceptual infrastructures of interconnected terminologies and frameworks to study energy, such as ethics, political economy, futurity, transition, justice, affect, materiality, and biodiversity. While the insights generated through these prisms have proven gratifyingly influential, it is noticeable that they originate in a remarkably narrow range of anglophone powerhouses.

This roundtable uses the device of language diversity to foreground different analyses and problematics of energy, centering influential discourses from beyond this anglophone constituency. Whether it be Bahasa Indonesia discussions on the ethics and national importance of palm oil, South American struggles over gas fields, or Mandarin language debates of solar panel economies, this panel seeks to expand energy research by debating non-anglophone scholarship. We welcome contributions sharing such divergent problematizations, and discourses of energy which could complement or challenge anglophone discussions. We are especially interested in perspectives from Indigenous and global majority scholars. We welcome comparative perspectives, and will orient the roundtable around a set of questions including:

- What are alternatives to current anglophone frameworks and concepts in energy research?
- How could they challenge or complement dominant theoretical debates around energy issues?
- How do global majority perspectives change our sense of energy infra-structure and the possibilities of green transitions?
- How do scholarly vocabularies and frameworks relate to particular political energy projects?

- Methodologically, how could energy research embrace a more multilingual discursive analytical field?
- How can the humanities and social sciences, in particular, contribute to broadening the horizon of energy analysis

Energy Futures and Foresight

Convenors: Simon Önnared & Erin Rizzato Devlin

Panel Abstract

Critical energy infrastructure relies on long planning horizons to account for changing energy demand, security concerns, and long-term sustainability. As such, foresight is required to anticipate emerging threats, manage uncertainty, and steer towards more sustainable futures (Önnared & Bravic, 2024; Sgouridis et al., 2022). However, much of energy system modelling is based on a system as we know it, not accounting for changes in behavioural characteristics nor deeper discontinuities (Kaviani et al., 2023; Heinonen et al., 2017). Concurrently, energy systems around the world stand before unprecedented developments calling for the build out of infrastructure to accommodate wide-scale electrification and enable growing access to clean energy. This spurs vast investments and reinvestments into the infrastructures of energy which will leave their mark long into the future. Not only does the infrastructure of energy bring environmental impacts, but also significant considerations and debates around ethics and justice in their development, maintenance, and decommissioning (O’Sullivan, Golubchikov, & Mehmood, 2020; Standal et al., 2023; Ram et al., 2022).

Hui writes that “power in the twenty-first century lies not in the parliament but in infrastructure” (2020). In this sense, infrastructures may become capable of opening up new ethical and political horizons, integrating new values and commitments, or by contrast they may adhere to the business-as-usual mode of development. Infrastructure in this sense must be understood not only materially, but also as related to ethical, epistemological, political, axiological values and assumptions. In light of this, we call for empirical and conceptual contributions on alternative energy futures and how they may be imagined and achieved using forward-looking methods, with a particular focus on the ethics and justice of such transformations across global-local societies and intergenerational timeframes. Join us for this panel session in this rising field of interdisciplinary studies of energy futures & foresight (Kristóf, [2024](#)).

The panel will discuss and call for papers such as:

Energy degrowth and the ethics of sufficiency.

Alternative infrastructures of energy – from microgrids to supergrids.

Self-sufficiency and energy communities in a (g)local energy system.

Indirect consumption through our built infrastructure – the consumption that ‘we’ cannot control over.

Circularity of the flow of energy.

Future energy systems in techno-utopias/dystopias

Socio-cultural-political-technical-environmental scenarios of long-term energy futures

Emerging threats and opportunities in future energy systems

The future of petrostates and the energies of developing countries.

Decoupling fossil fuels' grasp from renewables by re-imagining the electricity market or global the financial system.

A review of the academic field shows a lack of cohesion (Önnered, *forthcoming*). Foresight is applied for both the protection of fossil interests and the development of renewable energy; horizons beyond 2050 are scarce; and outlooks of continued growth of energy consumption reveal numerous emerging issues (*ibid*). There is a critical need for scholars to develop bespoke scenarios for future energy systems take uphold decent living standards within our planetary boundaries (Wiedmann et al., 2020). As such, this panel seeks to set into motion research on energy futures and foresight imbued with academic values and ethics which addresses the critical issues of the future.

Bryan Yazell: *Mapping the Green Energy Imaginary: Insights from Speculative Climate Fiction and Citizen Science*

David Dundas: *The dual role of fossil-free hydrogen and electricity in delivering the UK target of net zero fossil carbon emissions by 2050*

Erin Rizzato Devlin, Tom Wills: *By what law shall the land be built? Exploring opportunities for social value creation in the the Shetland Islands' renewable future*

Joe Ravetz: *Foresight 3.0 with & for the 'collective energy intelligence': connecting the layers of ethical, political and material challenges*

Manuela G. Hartwig: *Why Do Ethical and Justice Concerns Struggle to Enter Energy Policy? A Futuring Capacity Perspective on Energy Governance in Japan.*

Róisín Kennelly: *Beyond the Grid: Alternative Island Energy Futures and Entanglements with Excess*

Sophie Cogan: *Critical Fusions: Responsible Innovation at the Intersection of AI and Clean Energy*

Simon Önnered: *A Review of Energy Futures and Foresight.*

Energy Infrastructure and Uncertainty

Convenors: Shelley Welton, Conor Harrison

Panel Abstract

The hoped-for energy transition is a project of perhaps unprecedented infrastructure transformation. Success will necessitate the rapid deployment of enormous economic and social resources to construct a remade energy system. Many of the tools that governments are adopting to facilitate this transition are intended to embed “certainty” into transformational investments, from government-led auctions and other price stabilization mechanisms, to

decades-long tax credits and contracting arrangements, to revived experiments in public ownership.

Yet the transition is also deeply contested. These contests generate uncertainties that make investment in significant new, long-lived, and in many cases untested infrastructure challenging. As elections produce dramatic swings in climate politics, investors question the durability of policies essential to making bets on clean energy infrastructure profitable. Governments struggle to site infrastructure in the face of mounting local opposition. Regulators flounder in mediating the twinned crises of climate change and energy affordability as they are pitted against one another. Shifting geopolitical alliances upend once stable energy sources and supply chains. Deeper contests arise over whether certain technologies should even count as “clean energy” or may do more harm than good.

This panel will include a range of papers that consider the relationship between uncertainty and energy infrastructure, with the term intended to denote a broad range of potential uncertainties including political, geopolitical, financial, technological, cultural, and epistemological. The core unifying inquiry will be: how should ethical citizens, advocates, policymakers, and scholars grapple with and manage the uncertainties inherent in the clean energy transition?

Sarah Knuth: What Do You Build When You Can't Build Renewables? Strategic Opportunities and Uncertainties in the US Electric Power Grid

As the US renewables transition continues to face extraordinary political headwinds and attendant uncertainties, in this paper I reflect on new strategic questions arising around the broader electric power grid. Under the Biden Administration, expanded incentives under the Inflation Reduction Act encouraged a wave of new renewable generation projects which intensified worsening strains in the country's grid infrastructure. Resulting bottlenecks and project failures prompted growing attention to an underinvested and underprepared grid itself as a source of existential uncertainty for a successful transition. I question how today's obstacles to new renewable generation have shifted the landscape of strategic possibility in the United States, while foregrounding fresh uncertainties and challenges. Namely, what scope is there for transition advocates to prioritise buildout now of grid infrastructures ultimately needed to interconnect renewables? In considering this question, I reflect on recent engaged research in California, as the state faces existential threats to some components of its energy transition strategy—particularly its planned buildout of floating offshore wind—alongside ongoing openings for planned expansion and modernisation of its grid. I highlight three important ways of questioning new uncertainties facing this pivot, all necessary for progressive policy formation. 1) How are uncertainties facing grid transition/s distinctive from those confronting renewable generation projects? I consider organisational and financing challenges particular to the US context, but also shared supply chain bottlenecks with other countries. All, I suggest, are especially critical in connecting grid interventions to affordability benefits on the ground. 2) How do the complex materialities of the grid—transmission, distribution, varying storage technologies and more—matter? 3) How might we place these uncertainties on a broader spectrum of strategic possibility in the United States, from areas where existential challenges

and uncertainties persist to openings where these might be rendered more governable with concrete policy interventions?

Shelley Welton: Climate Change and the Law of Energy Affordability

Politicians across the U.S. political spectrum have elevated energy affordability to the center of their platforms, while “climate change” has become nearly taboo in public discourse. In response, climate advocates have increasingly reframed clean energy investment not as a climate solution, but as a path to lower energy bills. But how certain is this promise? This essay interrogates this question by developing a schematic of the “law of energy affordability” — the complex, multi-layered web of federal and state regulations governing generation, transmission, distribution, and consumer pricing that together determine what households pay. Mapping these determinants along upstream/downstream and ex ante/ex post axes, the essay shows why the uncertainty and complexity of energy affordability render promises that renewable investment will deliver concrete bill reductions tricky to fulfill, at least without wider systematic engagement in energy policy.

The essay then raises broader normative concerns about the affordability pivot. It argues that narrowing climate policy to a pocketbook frame risks shrinking the socially acceptable justifications for climate investment and crowding out narratives of justice, security, and ecological value necessary to sustain the full ambition of decarbonization. Although advocates and policymakers certainly should not abandon the persuasive affordability framing of renewable energy investments, they should be more candid about what renewables can and cannot deliver on affordability, while continuing to articulate the wider moral and economic case for acting on climate change.

Conor Harrison: Financing the AI Boom: Financial capital and uncertainty in the U.S. Data Center Boom

The future shape of the U.S. power grid seems to be increasingly determined by how much energy we can reasonably assume GenAI is going to use. However, an aggregation of demand forecasts by the World Resources Institute shows a range of ‘reasonable’ data center demand scenarios that span from an additional 200 to more than 1,000 terawatt-hours that will be needed on the grid by 2030. At the high-end, this additional demand represents an additional quarter of all U.S. electricity generation from 2023.

Where and how this additional generation gets built has major implications for both electricity affordability and decarbonization in the U.S. Yet in recent months, there are reports that the initial data center building boom might be slowing, in part because of delays in accessing the electricity needed to power them. How can we assess the extent to which this is true? This paper uses financial databases and the reports of equities analysts to trace how the financial sector – the lynchpin of getting large infrastructure projects built – is assessing the speed and likelihood of the electric power buildout tied to various forecasts. In doing so, I aim to provide

evidence for how one sector of capital – finance – calculates and analyzes measures of uncertainty in the rapid but but highly speculative set of announcements that is the data center buildout in the U.S.

Navraj Singh Ghaleigh: No Contract, No Carbon: Managing Carbon and Allocating Risk

The energy transition is increasingly a project of large-scale, interdependent infrastructure built under conditions of deep uncertainty. Carbon capture and storage (CCS) networks exemplify this challenge: they require high upfront investment, long time horizons, and coordination across multiple actors, yet operate within unstable political, regulatory, and technological environments. While climate policy scholarship has focused on regulation, this paper advances a different claim: CCS infrastructure does not sit atop legal arrangements, but is constituted through them. Drawing on legal institutionalism, in which law is understood as constitutive of economic organisation rather than merely ancillary to it, the paper argues that contracts are foundational governance institutions through which carbon is rendered actionable as an economic and regulatory object.

The paper first reframes CCS contracting as a problem of decision-making under uncertainty. Policymakers and market actors seek to render CCS investable through long-term contractual commitments – revenue support agreements, network codes, and risk-sharing mechanisms – that stabilise expectations in volatile policy environments. Drawing on comparative analysis across the United Kingdom, European Union, and United States, the paper shows how contracts embed provisional certainty within fundamentally uncertain systems. This raises a central question: when is it justified to lock in long-term institutional commitments, often backed by public funds and liability frameworks, that may constrain future policy flexibility, redistribute risks to taxpayers and future users, and entrench particular technological pathways, in order to enable present investment?

The core contribution of the paper is to analyse CCS networks as sites of contested risk allocation. Empirical findings indicate that CCS viability depends less on technical feasibility than on how financial, infrastructural, operational, and regulatory risks are structured and absorbed through contract. These include not only familiar risks of stranded assets, commissioning delay, and policy change, but also more granular and contested questions such as CO₂ specification, measurement, and liability, which determine how environmental integrity and operational performance are defined across the value chain.

Across jurisdictions, contractual architectures embody divergent settlements over these questions. State-led models socialise key risks to secure coordination and investment, while market-led systems internalise risk within fragmented bilateral arrangements, often at the expense of integration and scalability. At stake is a distributive question at the heart of the transition: who should bear the costs, uncertainties, and potential failures of building net-zero infrastructure, and on what terms? Taken together, the paper argues that contracts are not ancillary to decarbonisation but constitutive of it: without legal forms capable of allocating risk and stabilising expectations, CCS cannot scale.

Energy Infrastructures and/as Cultural Heritage: A Comparative Analysis of Two Island Contexts

Convenors: Rachel Jekanowski, Giulia Champion

Panel Abstract

Energy transition from fossil fuels is necessary to address climate change, but it is not guaranteed to be sustainable or just. This short panel will examine transitions to renewable energy systems through cultural heritage and imaginaries in two island contexts: Shetland, UK and Newfoundland, Canada. In both areas, fossil fuel developments have had an outsized impact on local cultures (including material and visual cultures and workplace culture) and society; oil infrastructures have also materially reshaped terrestrial and offshore landscapes. As the United Kingdom and Canada seek to develop low-carbon and renewable energy sectors—including wind and green hydrogen—these petroleum-informed cultural norms are coming into tension with technological, socio-economic, and infrastructural elements of this energy transition.

Energy grids do not only power economies, they also have social and cultural impacts (Barrett and Worden 2014; LeMenager 2014; Wilson et al. 2017). Critical energy studies scholarship highlights how energy transitions have cascading effects on politics, social and national identities, labour, art and media, and social movements (Malm 2016; Vemuri and Barney 2022; Jekanowski 2022). Informed by infrastructure studies, the energy humanities, and just transitions scholarship, the presenters in this panel will present preliminary findings from field research undertaken in Shetland and Newfoundland. This is part of a larger research project which the co-convenors are developing between the University of Southampton and Memorial University. Our panel will explore the following research questions:

- What roles do identity and cultural heritage play in imagining and constructing renewable energy infrastructures? How do previous energy infrastructures become part of cultural heritage?
- How is space re-organised by these infrastructures and how does that impact local communities and heritage?
- What are the relationships between energy, enterprise, culture, and identity in island contexts and how does the emergence of new energy paradigms change or entrench these?

Energy Infrastructures, Markets, and Energy Justice

Harriet Thomson, Alana Griffith: Power lines and colonial legacies: Foreign-owned utilities and energy injustices in the Caribbean

This paper explores how historical patterns of colonialism are reproduced through the ownership and governance structures of electricity provision across the Caribbean. Drawing on the concept of energy colonialism (Batel & Devine-Wright, 2016; Müller, 2024), we investigate

the persistence of utility monopolies, licensing regimes that entrench private foreign ownership, and regulatory arrangements that limit local participation. Building from an energy justice workshop jointly convened by the University of the West Indies and the University of Glasgow - with participants from Barbados, Belize, Cuba, and Trinidad and Tobago – we review energy market structures across sixteen Caribbean countries, analysing ownership, pricing, and infrastructure investment trends. We supplement this with case studies of recent utility-scale renewable energy projects, tracing their ownership and financing to assess whether the clean energy transition disrupts or reproduces neocolonial patterns. The paper advances conceptual and ethical reflection on energy infrastructures - not merely as technical systems, but as loci of power, identity, and justice. It contributes to energy ethics debates by questioning whose energy futures are realised - and whose remain suppressed.

Keywords: energy colonialism; green extractivism; Caribbean policy

Don Nonini: What If the Renewable Energy Commons and Capitalism Are Fundamentally Incompatible?

In *Overshoot: How the World Surrendered to Climate Breakdown*, Malm and Carton (2024:169-228) make a striking yet persuasive claim: renewable energy, particularly in its solar, wind and wave forms, is unsuited to be a commodity. They argue that infrastructural technologies of renewable energy (e.g., solar panels, wind turbines, batteries, power lines) can be commoditized through the appropriation of laborers' surplus value, but once "the flow" is tapped, the energy of sun, wind, or ocean waves cannot be commoditized since the production of marginally more such energy requires no labor and thus accumulates no economic value for the capitalist. Since the appropriation of surplus value from laborers during the capitalist production process is the source of capitalist profits, the production of renewable energy cannot be profitable, although its use value for consumers will be great.

The stakes in the debate are high if this argument is correct: there is no way in which fossil capitalism will incorporate renewable energy into its productive repertoire while lowering its greenhouse gas emissions to reduce global warming, and thus mitigate the effects of climate change. Politically, it will do everything possible to make sure that independent renewable energy production and consumption are hobbled.

This paper investigates the implications of this argument for the governance of the commons in renewable energy. For small-scale "distributed systems," locally-scaled renewable energy commons can be self-governing, and fit the criteria for sustainable governance set out by Ostrom et al. (1999). For higher-scale renewable energy commons that offer the main trajectory toward long-term mitigation of climate change, only the efforts of democratic states limiting corporate power can make their infrastructure possible, given the lack of capitalists' incentives for private investment and opposition to energy commons' existence. Commons governance must be polycentric and widely shared at local, regional, state and interstate scales.

Keywords: renewable energy, commons governance, profitability

Dr. Giulia M Mininni, Saska Petrova: Energy precarities: an intersectional approach

The Western Balkans (WB) are progressing their green energy transformations, positioning the region as a potential hub for renewable energy development. However, despite these advancements, the area is significantly affected by energy deprivation. Seeking to align with

European Union regulations, WB countries have introduced legal definitions for energy poverty and vulnerable consumers and have developed National Energy and Climate Plans focusing on vulnerable consumers' protection and promoting energy efficiency through various measures such as subsidies and renewable energy initiatives. Despite these legal frameworks, challenges in implementation persist, including a lack of clear strategies, insufficient data systems, and administrative hurdles.

Energy precarity in the region disproportionately affects vulnerable groups due to socio-structural and political inequities that intersect across gender, status, ethnicity, age, and geography. This precarity is deeply rooted in historical socio-cultural and economic circumstances, yet data coverage and understanding of these issues remain insufficient. The Gender and Precarity at the Energy Frontier (GENERATE) - the UKRI/ERC consolidator project, in collaboration with six local organisations, investigates these intersectional energy precarities, conceptualising energy precarity as politically induced injustice and forms of resistance to systemic exclusion and marginalisation.

Thematic document analysis reveals uneven distribution of energy precarity with notable gendered and ethnic disparities, and spatial inequities, particularly between urban and rural areas. Structural barriers limit access to affordable and clean energy solutions for specific communities, such as women and ethnic minorities, highlighting the need for intersectional and spatially sensitive approaches to ensure inclusive and just energy transformations. Policies for Roma and other ethnic minority communities are standardised, but implementation gaps persist, necessitating systemic changes for equal access to resources and opportunities. EU funding, tied to socio-economic and structural reform progress, can catalyse transformative action to address these issues if supported by targeted interventions.

Sandy Smith-Nonini: Beguiled by the Market: Price Manipulation and Energy Trading in

High natural gas prices since 2021 -- tied to post-pandemic sequelae, extreme weather and the Russian war -- have plagued Europe and to a lesser degree the United States, contributing to energy crises, inflated electric prices, premature deaths and rises in energy poverty. Historically fragile grids have been forensic sites for diagnosing economic and infrastructural anomalies and identifying sites for political intervention and struggle (Nye 2010, Graham and Thrift 2007).

While researching a book –The Energy Permacrisis (Routledge 2026) -- I encountered repeated failures of energy “markets” in standard reform (de-regulated) grids to mitigate abuses which arise during high demand periods, often due to supply constraints or changes in weather that impact demand. Such grids exist in roughly half the US states and across the EU, with varied degrees of oversight amid opaque operations that lack public scrutiny (Isser 2019; Rutledge & Wright 2010)

In this paper I will discuss evidence for three types of market failures: (1) withholding gas supplies by powerful monopolies (Smith-Nonini 2024 -Texas), (2) biased designs for merit-order energy auctions (Grubb 2022, Zakeri et al. 2023 -UK, EU & US), and (3) abuses in balancing (capacity) markets (Finch et al. 2023; Mathis 2024 -UK). In all cases, speculative bidding by traders on behalf of energy firms played a role – potentially aided by insider knowledge and chronically weak regulation (European Court of Auditors 2023).

I will consider reform efforts and persistence of the problems with reference to climate change mitigation, energy justice, studies of rentier capitalism in energy (Hudson 2013, Christophers 2022), and the assertion by Di Muzio & Robbins (2016) that debt routinely functions as a “technology of power.”

Keywords: Electricity, Energy Markets, Regulatory Failures, US/ Europe

Jenni Viitala, Sini Numminen: Fixing infrastructures at the cost of energy justice? The case of electricity transfer fees in Finland

On 26th of December 2011, a storm dubbed Tapani swept across Finland. The next day, another storm named Hannu continued on Tapani's trajectory. Together, the two storms felled approximately 3,5 million cubic metres of trees, causing millions of euros of damage to the electricity infrastructure and leaving thousands of households without electricity amidst the darkest days of the Finnish winter. Moments of breakdown bring visibility to infrastructures (Star 1999), but as we discuss in this paper, infrastructural failures can also have problematic consequences for regional energy justice. Storms like Tapani and Hannu prompted the national government to reform the Energy Market Law in order to improve the reliability of Finland's electricity infrastructure. The reformations, which came into force in 2013, demand electricity companies to invest in more reliable electricity transfer infrastructure, such as subsoil cables. The law set a target that electricity cuts should not exceed 36 hours even in the most sparsely populated areas of Finland.

While the legislative reforms aimed for infrastructural security and regional equality in access to electricity, they failed to account for certain material and market aspects of Finland's electricity infrastructure. In the Finnish energy market, both public and private companies that hold regional monopolies over electricity transfer fees, and the costs of improving the electricity infrastructures have, in large part, been paid by the companies' customers. The policy changes failed to account for how difficult and costly infrastructural reforms are in different regions of Finland, such as in lake-rich and sparsely populated areas. Although the state has tried to cap the electricity transfer fees, in 2025, transfer fees range between 1,71 cents/kWh and 7,03 cents/kWh, and there are nearly tenfold differences in the standing charges paid by households in different parts of Finland.

In this paper, we address the contradiction between the aim to secure energy infrastructures and regional energy justice. Through data collected with households and experts across Finland, the paper examines how high electricity transfer fees have exasperated regional energy poverty particularly in certain sparsely populated areas of Finland. The case highlights the paradoxes of infrastructures as both political, poetic and material structures (Larkin 2013; Star 1999) which can provoke unintended consequences in terms of energy justice (see also Jalas & Numminen 2022).

Yanping Ni: Green Giants and Grinding Gears: The Hidden Circuits of China's Clean Energy Revolution

What happens when the world's largest carbon emitter embraces clean energy? China's electric vehicle (EV) boom presents a paradox. Amidst rapid infrastructural expansion and media spectacle promoting “sustainable mobility,” these electrified, digitalized vehicles have become symbols of a national fantasy reconciling economic growth with ecological modernity.

Yet behind this glossy transition lies a different reality. While state narratives champion “ecological civilization,” my extensive ethnographic research across Shanghai’s EV ecosystem—design studios, carshops, battery stations, and industrial events—reveals how frontline actors articulate their experiences through the viral concept of “involution” (neijuan/juan). Originally developed by Kant and Geertz, and recently by Xiang Biao, involution has evolved from scholarly concept to lived reality, operating as both shorthand and framework for workers’ daily navigation of the green transition. By taking EV actors’ testimonies as critique from below, this paper explores these critical tensions: the disposability paradox, where an industry promoting sustainability thrives on planned obsolescence and material excess; the phenomenon of militarized production, where supply chain “wars” reproduce the very “Made in China” dynamics the sector claims to overcome; the green branding that obscures new forms of labor exploitation and social exclusion. This study challenges celebratory, top-down, statistics-obsessed analyses of China’s energy transition by centering the lived experiences of those powering its EV miracle. This study seeks to contribute to critical energy studies, research on technopolitics, and global debates about justice in sustainability transition.

keywords: electrification, automobility, China

Energy Transition 1

Danyi Zhou: Frozen Batteries, Burning Transitions: Taxi Drivers, EV Infrastructures, and Energy Ethics in Northeast China

As experimental infrastructures within China’s energy transition, electric vehicle (EV) taxis and battery swap stations are situated at the converging currents of political commitments, transnational visions, technological innovation, and everyday practices, forming a nexus where culture and materiality are entangled. Within this assemblage, taxi drivers’ labour mediates and sustains the operation of infrastructure, materialising the ethical and political dimensions of energy transition in the interstices between technological systems and daily life. This paper conceptualises taxi drivers as frontline nodes of energy infrastructure and examines how the tensions inherent in energy transition are sensed, negotiated, and redefined through embodied experience. Attending to the boundedness, territoriality, and implicit policy assumptions of infrastructure, my fieldwork centers on Northeast China, where the cold climate functions as a constitutive rather than external condition of infrastructural life. I employ an experimental ethnographic approach that draws on polyphonic and fragmented narratives to illuminate the sustaining role of invisible labour in fragile infrastructures. This analysis focuses on the temporal burdens, bodily exertions, and improvisational strategies that shape drivers’ engagements with electric taxis and battery swapping stations. The interplay of these perceptual dimensions and material details offers insight into this unfolding experiment and transformation, and traces the entanglements of historical, political-economic, and social forces. My research further exposes frictions across multiple boundaries: the asymmetry between public and private in practice; spatial imbalances between regional and national scales; and the temporal nonlinearity of collective memory and future imagination. At stake in these lived negotiations is the undermining of the inclusivity, publicness, and technological optimism promised by the energy transition, revealing its concealed consequences. In response to these vulnerabilities and asymmetries, the paper calls for rethinking energy justice through an ethics of care—one that acknowledges suffering, responds to precarity, and redistributes responsibility and response-ability across the frontlines of transition.

Keywords: Labor; Ethics of Care; Energy Justice

Eeva Kesküla, Joanna Kitsnik, Riste Lehari: Energy Infrastructures of Skill: Reskilling and "Estonianisation" in Ida-Virumaa's Green Transition

This paper examines the process of "Green Transition" in Estonia's carbon-intensive Ida-Virumaa region by conceptualising educational institutions and local enterprises as contested political infrastructures. Based on interviews with policymakers, educators, and workers' representatives, we argue that the phasing out of oil shale—the fossil fuel legacy that defined the region's industrial modernity—is not merely a technical decarbonization but an attempt to reconfigure social and cultural values.

In Ida-Virumaa, the local vocational and applied higher education institutions function as a critical infrastructure for the "Just Transition," tasked with converting the industrial Russian-speaking workforce into "green," entrepreneurial subjects. However, this infrastructural repurposing is inseparable from a geopolitical project of "Estonianisation". The simultaneous enforcement of Estonian-language tuition in vocational education creates distinct barriers, transforming educational infrastructure into a site of exclusion where linguistic capability becomes a prerequisite for accessing the "green economy".

We demonstrate that these infrastructures favour a specific neoliberal vision of the flexible, multilingual subject while marginalising the values of stability associated with the Soviet industrial legacy. Local enterprises and unions perceive this shift not as a promise of "green jobs," but as the creation of "labourless landscapes" and misery, and they resist the transition to expanding Small and Medium Enterprises (SMEs). By analysing the friction between EU policy mandates and local realities, this paper highlights how the infrastructures of transition can reproduce historical injustices and deepen centre-periphery divides. Ultimately, we ask what is at stake when the infrastructures of energy transition serve as vehicles for nationalist integration, risking the alienation of the very communities they aim to "up-skill".

Keywords: Cultural Shift in Energy Transition, Vocational Education and green skills, Contested Infrastructures of Skill

Joohee Lee & Hana Kim: New energy landscapes, old infrastructure narratives: State-led renewable futures in South Korea

This paper examines the ethical tensions that arise when renewable energy futures are pursued through centralized, state-led infrastructure planning. Using narrative policy analysis [1-3], we show how infrastructural logics inherited from fossil-fuel-based development continue to structure renewable imaginaries, drawing on South Korea's energy transition policies proposed by recent administrations. Historically, energy systems in South Korea emerged through industrial-scale development coordinated by the state. While recent policy agendas promote renewable energy communities and citizen participation, these initiatives are increasingly linked to large-scale infrastructural projects, such as the "Energy Expressway" construction plan, which involves a nationwide high-voltage transmission expansion envisioned through the 2040s [4]. Earlier conflicts surrounding projects like the Miryang transmission lines [5] revealed how such infrastructural logics generated ethical contestation over the unequal ramifications of state-led energy landscapes. Analytically, we pay attention to how policy narratives and

storytelling work to align two seemingly contesting energy imaginaries, namely the national energy super grid and bottom-up rural renewable energy projects. Based on our qualitative coding analysis of selected policy documents, we argue that current policies rely on ‘old’ infrastructure narratives that frame large-scale, national-level integration as a technical imperative even in the pursuit of ‘new’ decentralized and just energy futures. These narratives reconfigure long-standing urban-rural divides by presenting rural renewable development as a form of empowerment, while simultaneously positioning rural areas as infrastructural sites serving national demand, thereby echoing earlier patterns of inequality. By highlighting the ambivalence observed in infrastructure narratives in South Korea’s energy transition efforts, this contribution seeks to enrich debates in energy ethics and political ecology on how decentralization is (re)imagined and (re)interpreted under strong state infrastructural power. While grounded in the South Korean case, the findings speak to broader dilemmas facing state-led renewable transitions worldwide.

Keywords: Energy infrastructure; state-led renewable transitions; narrative policy analysis

Energy Transition 2

Julia Kirch Kirkegaard, Tom Cronin: Rendering decarbonized futures ‘good’ – the case of green hydrogen and energy islands

There is a rising sense of urgency in the European energy transition, where concerns for climate change are increasingly in tension with ever-shifting geopolitical landscapes. Concerns for security, resilience, and competitiveness have rocketed to the top of the agenda. For example, the EU’s recent Grids Package and visions of so-called ‘Energy Highways’ (forming a hyper-connected energy system) claim higher robustness, energy independence, and industrial effectiveness. Key to this are cheap, green electrons and molecules powering Europe’s industrial base. Two technologies stand out: a) offshore meshed grids with renewable energy hubs/”islands”, utilizing high-voltage direct current technology and cables, b) Power-to-X producing green hydrogen from renewable energy and transporting it via pipelines to industrial centers. Using document (e.g. policy) analysis and expert interviews with Transmission System Operators, government agencies, developers, financiers, manufacturers, scientists, communities, and NGOs, we map contestations over what has been rendered a ‘good’ (i.e., ethical, sustainable, moral, see e.g. Asdal et al. 2021) ‘decarbonised economy’. With the shifting networks of expertise over the past 25 years around energy islands and green hydrogen, we study how justification tools of e.g. energy scenarios and socio-economic calculations have shaped what is construed a desirable (‘good’), and apparently inevitable, industrial decarbonization. We explore the agency of certain (techno-economic) forms of knowledge to render particular infrastructural futures of hyper-interconnectivity with momentum, contributing to the emergent cross-disciplinary literature on the ethical stakes of industrial decarbonization. We find that increasingly – under the guise of required accelerated upscaling - incumbent fossil fuel actors are rendered ‘low-carbon’. We stress the need to understand the agency of certain forms of expertise in shaping *for whom* and *for what* particular energy futures are made ‘good’, and with what implications for not only whose concerns are included or excluded but also for the ethical legitimacy of energy transitions.

Key words: networks of expertise, industrial decarbonization, energy islands & power-to-x

Roopali Phadke: Battery Life: The Futures of Energy Storage

Batteries are transforming how electricity grids meet the growing storage needs from renewables, transportation and data infrastructures. Battery energy storage systems (BESS) are one of the fastest growing parts of the energy sector. McKinsey & Company forecasts that the global BESS market will double by 2030, reaching between \$120 and \$150 billion. The utility-scale battery market in Europe is surging, from 11 gigawatts installed in 2024 to a projected 16 gigawatts in 2025.

Despite massive defunding of renewable energy in the U.S., the Trump Administration has signaled continued support for batteries by preserving tax credits for BESS through 2033. The American Clean Power Association announced a \$100 billion commitment from the energy storage industry to invest in American-made grid batteries.

While money is flowing from government and private capital, there are three interlocked challenges for the BESS industry as it attempts to ramp up in the U.S. First, there is a shortage of critical minerals supplies to feed domestic battery manufacturing. Second, there is rapid development of battery technologies away from lithium and cobalt toward new chemistries (sand, sodium, iron phosphate) that overcome the physical and social constraints of critical minerals. Lastly, given this lack of technological closure, it is no surprise there is little support among communities to host BESS given a track record of environmental pollution. From coast to coast, there are moratoria in place blocking the development of BESS.

These three interlocked challenges create barriers for this industry to scale up in the ways government and industry imagine. This paper presentation will assess the forms of battery technologies and place politics that demonstrate a commitment to local societal values while providing the broadest benefits to global society. The research is based on interviews with battery scientists, companies, and interviews and participant observation at proposed BESS facilities.

Keywords: batteries, storage, social license

Will Niver: Indigenous Sovereignty and the Inflation Reduction Act

The Inflation Reduction Act (IRA), enacted in August 2022, was arguably the single largest climate and energy investment in United States history. The law was projected to “have a profound effect across industries in the next decade and beyond” and prompted UK and EU policymakers to respond with their own sets of industrial policies (Meyer, 2022). In recognition of generations of chronic underinvestment, the IRA also set aside \$720 million specifically for Tribal nations and implemented numerous programs to benefit Indigenous communities (The White House, 2023). However, with a sense of ambivalence shared by many community groups, NDN Collective – an Indigenous-led activist and advocacy organization – described the IRA’s passage as bittersweet. The organization lauded the IRA’s ambition but warned that the act will also “create even more sacrifice zones that will disproportionately impact the lands and water of Indigenous and Black communities” (NDN Collective, 2022).

This paper presents a systematic literature review of peer-reviewed work summarizing research addressing Indigenous participation within U.S. energy systems, emphasizing historic barriers to participation. The paper then presents those barriers alongside specific sections of the IRA that ostensibly addressed many of them. The paper argues that even though the IRA lowered barriers

for Tribal governments to benefit from the energy sector, the IRA may have ultimately undermined Indigenous sovereignty. The surging demand for minerals like lithium, copper, iron, and aluminum – critical for nationwide electrification – places even greater pressure on places like Chích'il Bit Dagoteel, or Oak Flat, Arizona, a sacred site where the San Carlos Apache Tribe opposes a copper mine (Welch, 2017). The paper highlights other sacred and ancestral sites that were threatened by development spurred by the IRA's uncapped tax credits, arguing that the IRA catalyzed a new wave of land acquisition and the build-out of infrastructure serving as "colonial beachheads" (Curley, 2021).

Keywords: Indigenous sovereignty; colonialism; industrial policy

Energy, War and Politics

Denys Sultanhaliiev: Nuclear Infrastructure Under Occupation: The Zaporizhzhia NPP and Human Rights in Armed Conflict

Russia's occupation of the Zaporizhzhia Nuclear Power Plant offers an unprecedented case study in the weaponization of civilian infrastructure. Truth Hounds' report *Seizing Power* (2025) documents systematic torture of personnel refusing collaboration, restrictions on movement, and coercive exploitation of irreplaceable technical knowledge. These practices reveal a mechanism of control that operates not through destruction but through capture, converting specialized expertise into leverage and making human infrastructure the primary instrument of occupation.

What Ukraine's experience reveals is a structural paradox inherent to nuclear energy under armed conflict. Nuclear facilities demand continuity of personnel, maintenance, and procedural standards that conflict systematically degrades. Yet nuclear energy provides approximately half of Ukraine's electricity generation, making it indispensable precisely when conventional infrastructure fails under sustained attack. The same properties that make nuclear facilities valuable as a reserve of resilience, their concentration, output stability, and operational inertia, also make them exceptional targets, potential instruments of radiological threat, and sites of acute dependency. What ensures energy security in peacetime becomes, under conditions of war, simultaneously a lifeline and a source of systemic vulnerability.

This ambivalence runs deeper than a contingent feature of wartime conditions. What makes nuclear energy resilient, its concentration, irreplaceability, and operational inertia, is structurally identical to what makes it susceptible to weaponization. The concept of the *pharmakon*, elaborated in the philosophy of technology to describe how the same mechanism can act simultaneously as remedy and poison, offers a productive lens here. In an era of cascading crises, this dual logic becomes increasingly legible: nuclear energy as a reserve of resilience precisely where other infrastructure fails, and as a source of acute vulnerability for the same reasons.

Jenna Imad Harb & Kirsty Anantharajah: Colonial grids, exhausted bodies: Humanitarian energy's politics and temporal entanglements

Humanitarian crises reverberate globally, impacting basic yet essential infrastructures that sustain lives, especially energy infrastructures. This is true in Lebanon, where decades of

conflict, refugee influxes, and corrupt government have exacerbated a state of prolonged polycrisis. Such conditions have led to unreliable, costly, and dysfunctional energy infrastructures that have stifled access to electricity and fuel across the country. Drawing upon a multisited ethnography of aid workers' adaptations to overlapping crises, this article centres empirical data on the experiences of humanitarians in Lebanon as they navigate, make sense of, and feel the effects of energy deprivation. Data are analysed using insights from science and technology studies (STS), particularly postcolonial technoscience's attention to colonial entanglements with material infrastructures and bodies. In combining these perspectives, our article advances two claims about humanitarian energy. First, material energy infrastructures, which are required for everyday humanitarian action, are intrinsically political. They are used as political weapons in longstanding settler colonial contestations and are tied to ongoing postcolonial power formations, political dysfunction, and donor dependency. Second, these infrastructures are experienced in the present through embodied reactions like heat and fatigue and affective orientations like hope and hopelessness. Our findings reveal humanitarian energy's "postcolonial entanglements," signalling formative temporal connections between pasts, presents, and futures. This paper therefore marks an empirical and theoretical contribution to humanitarian energy studies. It demonstrates how STS illuminates postcolonial, temporal, and embodied dimensions of energy crisis, while offering empirical insights into humanitarian actors' experiences of energy deprivation.

Keywords: Humanitarian energy, postcolonial entanglements, energy infrastructure

Yaara Paran, Odelia Oshri, Itay Fischendler, Einat Datner: War-Driven Transitions: Renewable Energy Expansion Under Populist Governance in Israel

The rise of populists to power around the world alongside the growing salience of climate issues in global and local politics results, in many cases, in a hindered transition to renewable energy. However, as geopolitics grow more turbulent, it is evident that wars and crises complicate the relationship between populism and renewables, creating a range of possible populist reactions: from opposition to renewables to conditional support. Current literature rarely discusses this simultaneous intersection between populism, renewable energy and crises, and remains inconclusive regarding its outcomes and their enabling conditions. We address this gap by focusing on the conditions under which right-wing populists support renewable energy development.

The Case of the TKUMA region of south-western Israel following the October 7, 2023 attack and during the ongoing war in Gaza provides a recent example of this intersection: renewable energy promoted in reaction to a national security crisis, under long-term right-wing populist rule, and with minimal contestation. In order to explain this outcome, we compile a multi-perspective account of events affecting renewable energy in the region, before and during the war based on data from interviews, media coverage, policy documents, discourse analysis of planning records and official transcripts. We then identify four conditions that enabled the populist support of renewables in the region, and trace the processes in which they shaped support for renewables. First, political obligation to renewables development was anchored before the war in national energy targets, strategic plans, and land allocation. Second, the crisis of war was strategically reframed to align renewables initiatives with security-driven goals, highlighting their urgency and creating an unusual window of opportunity for policy advancement. Third, a diverse electorate affected by the crisis justified a variety of renewable solutions. Fourth, the low salience of energy issues in local politics limited contestation and enabled positional flexibility for populists.

This study enhances the debate within environmental populism literature on the conditions under which renewable energy initiatives receive political and financial backing under populist rule. It also expands existing framings of ecopopulism by showing how it can be used to influence a right-wing populist government.

Keywords: Populism, Transition, Crisis

Expertise 1

Anugrah Yulianto Rachman: Cooling The Kampung: Collective Energy Infrastructure and Governmentality in Urban Surabaya

Urban-village, hereafter will be called *kampung*, areas in Surabaya, Indonesia, increasingly face rising urban temperatures, with Urban Heat Islands (UHIs) becoming one of the most directly felt impacts for urban residents. In response to this challenge, a joint research project between the Center for Southeast Asian Studies (CSEAS) and Daikin Industries Ltd. initiated the development of passive and active cooling technologies in a neighbourhood public space, *Balai Rukun Warga (RW) 04 Ketandan*, Surabaya. This project was carried out collaboratively with local residents through ethnographic research, positioning the *Balai* as both a site of experimentation and everyday collective life.

The project integrates cooling technologies grounded in local knowledge, including understandings of wind direction, ventilation openings, cross-ventilation, and the strategic use of energy-efficient active cooling systems such as air conditioners and fans. The *Balai RW* has long functioned as a shared public space for diverse activities, including kindergarten classes, Qur'anic education, youth organisation meetings, a public library, and community health services. Building on this existing role, the project seeks to transform the *Balai* into a form of collective energy infrastructure within the *kampung*.

Central to this transformation is the reconfiguration of cooling as a shared responsibility. Active cooling systems, particularly air conditioning, are implemented through a subscription-based smart AC system using Internet of Things (IoT) technology. Residents who wish to use air conditioning collectively contribute to electricity costs, with contribution levels calculated based on patterns of use. Excessive cooling practices—such as setting temperatures too low—result in higher shared fees, encouraging moderation and collective accountability. These arrangements operate not simply as technical solutions, but as mechanisms through which new norms of energy awareness and restraint are institutionalised.

Drawing on Foucault's concept of governmentality, this paper analyses how the *Balai RW* functions as a collective energy infrastructure in which energy use is governed through everyday practices and moral reasoning.

Keyword: Collective energy infrastructure, governmentality, and urban-village.

Henriette Rutjes: Contested Visual Regimes in (Re-)Mining Contexts of the German Ore Mountains

Amid intensifying debates on energy transitions, visualizations have become key instruments through which actors articulate competing imaginaries of sustainability, justice, and future

energy infrastructures. In the German Ore Mountains, where new extractive projects and the reprocessing of underground deposits of so called “energy minerals and metals” are promoted as contributions to Net Zero ambitions, mining companies, civil society groups, and local opponents all deploy distinct visual regimes to frame the stakes of contested mining landscapes.

Drawing on comparative visual methodologies from reconstructive social research -particularly documentary image interpretation as developed by Bohnsack (2008, 2009) - this paper examines how different visual strategies reveal or obscure power relations and (in)justice claims in mining and remining contexts. Corporate actors increasingly rely on technologically advanced 3D subsurface models to depict mining as minimally invasive and aligned with the policy narratives of “sustainable mining” as well as “mining for sustainability” (Ayeh & Rutjes, forthcoming). These abstractions present environmental and social impacts as negligible, distancing planned interventions from the lived realities of nearby communities and ecologically sensitive areas. Local critics describe such representations as “planning from outer space,” emphasizing how they mask situated vulnerabilities.

By contrast, citizen initiatives mobilize ground-level and close-up visualizations to reconstruct the potential transformations of landscapes and to foreground concerns about environmental degradation, social disruption, and unequal burdens. These counter-visuals re-embed mining proposals within everyday geographies, highlighting dimensions of justice that corporate imagery sidelines.

The paper argues that visual regimes, while inherently simplifying complex socio-material processes, play a decisive role in shaping ethical imaginations of energy infrastructures. Through a critical analysis of how visual foci confer legitimacy, and affective resonance, the paper asks: Which representations empower which actors? Which dimensions of environmental and social justice become visible-or are strategically rendered invisible-in the visual politics of contemporary energy transitions?

Keywords: visual regimes, extractive infrastructures, justice

Mallory James: Illiberal arts: Relating inherited and performed ethics frameworks to the governance of Australian carbon engineering research

Industrial decarbonization projects with high media visibility position engineers as characters in public life, eventually raising the question of what kinds of knowledge and which ethical commitments infuse their plans and actions. But knowledge and ethical commitments in engineering are not merely personal or idiosyncratic: they are also highly governed by legal and financial rules, the deep cuts of interdisciplinarity manifested in workplace organization, and expectations of corporate privacy. What kinds of engineering vocations are unfolding in these socio-politically confined spaces?

In this paper, I draw from preliminary fieldwork in Queensland between 2013 and 2016 and fourteen months of dissertation fieldwork in the vicinities of Melbourne, Victoria, Australia between 2017 and 2018 to describe the specific ethical and epistemic vulnerabilities and agencies felt by engineering research knowledge workers advancing industrial decarbonization projects in Australian carbon capture and storage (CCS) research and development. The paper uses what was explained to me and demonstrated in practice regarding the multiple layers of

governance felt by 21st century decarbonization engineers and engineering researchers. From this, I consider why the activities of communicating an Australian industrial decarbonization project could be termed “illiberal arts.”

Engineering research industries author and contribute to many discussions of industrial decarbonization. By exploring the modalities of ethics and knowledge their policies and practices cultivate, this paper contributes to describing engineering-based modes of inaccessibility and bounded accountability that inform climate mitigation.

Keywords: liberalism, engineering policy, workplace ethics

Expertise 2

Rebekka Nordal Thomsen: Contesting green hydrogen - Struggles of expertise and valuation

Green hydrogen is often framed as a Swiss army knife of the European energy transition – a versatile solution to stabilize grids, decarbonize hard-to-abate sectors such as steel production, shipping and aviation, while also securing economic growth. Despite these promises, the envisioned “hydrogen economy” faces significant setbacks, including a wave of project cancellations, lack of offtake-agreements and regulatory uncertainty. This raises the question of how the value and purpose of green hydrogen is negotiated among experts and stakeholders. On the backdrop of these challenges, this paper asks: How is the purpose and value of hydrogen qualified and contested across different networks of expertise? Based on ethnographic fieldwork at industry conferences, expert interviews and policy and scenario-building documents, I focus on the Danish context, where green hydrogen and related power-to-X technology has been foregrounded in national energy strategies to accelerate decarbonization, resilience and economic growth. Drawing on concepts from science and technology studies (STS) on valuation and expertise, I show that expectations towards green hydrogen are not neutral nor merely technical. They are deeply entangled with normative visions of what constitutes a ‘good’ energy transition. Dominant expectations towards green hydrogen are problematized as a business-as-usual approach that risks neglecting concerns over energy efficiency and sufficiency, in pursuit of market-making. Consequently, I argue for reconfiguring expectations towards green hydrogen to incorporate a broader range of societal voices and concerns.

Keywords: Green hydrogen, expertise, valuation practices

Serena Saligari & Rihab Khalid: Ethics, epistemics, and everyday infrastructures: investigating gender equity and social inclusion in e-cooking transitions in the Global South

This paper explores the ethical and epistemic dimensions of electric cooking (e-Cooking) as an emerging infrastructure for just energy transitions in the Global South. Drawing on early findings from the JustGESI initiative, we examine how existing grid and off-grid electricity infrastructures in Mozambique, Malawi, Tanzania and Ethiopia are being leveraged to expand access to clean cooking through e-Cooking appliances, while confronting entrenched gendered and social inequalities. Central to our analysis is an understanding of how epistemic frameworks (the assumptions about whose knowledge, expertise, and lived experience count in energy planning) and ethical frameworks (the norms and values that shape ideas of fairness, responsibility, and

care) inform decisions around infrastructure design, capacity building, and community engagement.

By drawing on a detailed review of each country's energy and cooking landscape, in addition to semi-structured interviews with energy professionals, we trace the entanglements of public policy, international development initiatives, corporate social responsibility, and community mobilisation within e-cooking programmes. Preliminary findings indicate that despite growing policy support for e-cooking, gendered labour dynamics, perceptions of appliances, affordability concerns, and institutional biases continue to shape uptake and strategic planning. Drawing on initial insights from co-designing and initiating e-cooking projects on the ground, we highlight how affective and moral economies, encompassing hope, trust, obligation, and empowerment circulate among women, marginalised groups, and institutional actors. These dynamics make visible the negotiations, frictions, and possibilities of energy justice in practice.

We argue that transforming electric infrastructure for clean cooking is not merely a technical upgrade but an ethical and political reconfiguration of energy citizenship. Recognising and addressing epistemic and ethical injustices in energy system design and implementation, specifically in terms of who is recognised as a knowledgeable user, responsible energy citizen, or deserving beneficiary, is key to developing more just and inclusive energy futures.

Keywords: electric cooking, gender equality and social inclusion (GESI), energy justice

James Adams: "The problem is when you're successful": Ethics, Infrastructure, and Energy Transition in Austin, Texas

This paper develops what I will call an immanent anthropology of the ethics of a prominent figure of Austin's sustainability transition efforts. Over several decades, Duncan has served as a member of Austin City Council, founder of the city's Resource Management Department, senior executive at Austin's municipal utility, and an architect of early energy efficiency and green building programs. A defining feature of Duncan's ethical orientation is that it is rarely articulated in overtly moral terms. Instead, ethics appear operationally, as inseparable from the infrastructures, planning practices, accounting mechanisms, and regulatory architectures through which his work unfolds. Across his career, Duncan repeatedly frames energy governance as the continuous management of what appear as inevitable tensions between incompatible goals: equity versus efficiency, reliability versus decarbonization, innovation versus system stability, or environmental success versus infrastructural strain. Instead of reifying these tensions as contextual constraints on his ethical reasoning, this paper works through Duncan's own articulation of these tensions, their emergence, and their consequences, to show how the same syntax that renders an intervention legible as a "solution," at one scale, necessarily produces new objects, constraints, and apparent contradictions at another. Duncan's ethics, then, are enacted not by resolving these tensions, but by producing and stabilizing the incommensurabilities that his analytic cuts continually bring into view.

Keywords: Energy Transition, Ethics, Scale

Extractivist Museums and the Energy Transition: Heritage, Representation, and Environmental Futures

Convenors: Anya Kuteleva, Andrei Rogatchevski

Panel Abstract

This panel investigates how extractivist museums—institutions grounded in the material and cultural legacies of mining, oil, gas, and other resource-based industries—navigate their complex role as stewards of industrial heritage while engaging with contemporary demands for environmental accountability and participation in energy transition discourse. As energy systems undergo rapid transformation in response to climate change, public investment, and policy shifts, these museums face critical questions about their ethical responsibilities, narrative authority, and role in shaping collective imaginaries of energy futures.

In recent years, debates around energy transitions have intensified, and the rise of renewables has brought new ethical and political dilemmas linked to extraction, capital flows, and colonial legacies. Simultaneously, social scientists, artists, and museum professionals are increasingly implicated in large-scale infrastructure projects, public engagement efforts, and critiques of techno-solutionism. Museums, as visible cultural institutions, thus sit at a critical nexus where energy's histories, presents, and futures converge.

The panel will feature between four and five presentations. The long-panel format will allow for an in-depth engagement with individual case studies, comparative perspectives, and broader conceptual frameworks. We welcome both academic and practice-based contributions. Papers will explore topics including:

Narratives of extraction and identity: How have museums historically framed extractivist industries as part of national or regional identity, and how are these narratives evolving amid climate anxiety and political contestation?

Museums as discursive infrastructures: In what ways do museums serve as platforms—or battlegrounds—for energy transition storytelling and debate?

Ethics of heritage and preservation: How do institutions reconcile the valorisation of industrial heritage with its environmental and social costs?

Educational and affective strategies: How are museums using interpretation, design, and pedagogy to communicate complex energy histories and ethics?

Politics of representation: Who is included or excluded in exhibitions of extractive pasts and energy futures? How are race, gender, class, and Indigenous knowledge addressed or silenced?

Global and local entanglements: How do geopolitical and regional contexts shape museum narratives of extraction and transition?

This panel makes a timely contribution to the *Energy Ethics 2026* agenda by examining museums not only as sites of memory and learning but as active participants in energy

infrastructures—material, symbolic, and affective. It speaks directly to conference themes including expertise, ethics, representation, public engagement, and the entanglement of humans and nonhumans in infrastructures of energy. By foregrounding the role of cultural institutions in mediating extractive legacies and imagining post-carbon futures, this panel opens new interdisciplinary conversations about energy, justice, and responsibility in the Anthropocene.

Mariel Kieval: Fossil Fuel Narratives and National Identity in Kazakhstan's Museums

In the heart of Aytrau, Kazakhstan sits a small museum dedicated to the city's history. As a legacy of Soviet industrialization and fossil exploration, the museum is full of geological survey relics and art depicting nearby oil rigs and refineries. Across the country, the Central State Museum in Almaty boasts of the long history of TengizChevroil, detailing its vital socioeconomic impacts and demonstrating the important relationship of the industry and state. As a petrostate, Kazakhstan's economy is deeply intertwined with the success of its extractive fossil industry, and so is its culture. As the state government touts its commitment to the Paris Agreement and invites investments from foreign companies and international financial institutions into its growing renewable industry to aid its energy transition, its state-funded museums reveal the entrenchment of petroculture in its national identity and actively shape and enforce the perception of fossil fuels as integral to it. This research draws on visual and digital ethnographic data to analyze the pervasiveness of Kazakhstan's petroculture in society to understand how shifts in cultural imaginaries and identity lag behind state-driven transition narratives.

Jennifer Long: Petro-Nostalgia: Curating Oil, Settler Belonging, and Climate Ambivalence in Alberta, Canada

Alberta is Canada's highest-emitting province and home to the its most intensive fossil fuel infrastructure (Environment and Climate Change Canada, 2025), including the infamous Athabasca oil sands. Despite national commitments to meet its Paris Agreement targets, Alberta continues to expand oil and gas production with strong provincial support and federal complicity (Corkal et al., 2023; Government of Canada, 2024).

This paper examines how museums in municipalities historically and currently tied to oil and gas (Cold Lake, Bonnyville, Leduc, Fort McMurray, and Diamond Valley), curate Alberta's industrial heritage while negotiating, often uneasily, the pressures of energy transition.

Drawing on ethnographic fieldwork and interviews with curators and museum staff, I argue that these institutions function as discursive infrastructures: they materialize the cultural legacies of extractive capitalism (Stensrud & Hylland Eriksen, 2019) and shape settler imaginaries of energy futures (Mackey, 2016). In Cold Lake and Bonnyville, oil and gas technology, pioneer histories, and military expertise dominate exhibits, while Indigenous sovereignty and environmental harm are marginalized. In Leduc and Diamond Valley, museums acknowledge energy diversification, yet oil retains ideological centrality. At Fort McMurray's Oil Sands Discovery Centre, technological spectacle displaces ecological critique. Across these sites, fossil fuel development is rarely framed as a political, ecological, or moral dilemma; rather, it is celebrated as central to Alberta's identity and economic viability. This celebration is underwritten by petro-nostalgia (Tweksbury, 2021), a longing for unbridled extraction and consumption in an era of hegemonic white supremacy, masculinity, and settler-colonial nationalism.

Building on critical ethnography (Smith & High, 2017) and settler colonial critique (LeMenager, 2014; Yusoff, 2018), I ask: whose knowledge is institutionalized, whose is erased, and what ethical responsibilities do museums bear in the Anthropocene? This paper joins the conversation on the active role of museums as mediators of extractive legacies through their temporal contradictions and engagement with (or lack thereof) ethical conundrums.

Andrei Rogatchevski: Resource Extraction Sites as Museums

An illustrated comparative analysis of museum-like displays and/or forms of public engagements at the following either closed or still operating mines is attempted: the graphite mine in Český Krumlov (Czech Republic); the Bergtatt marble mines near Eide in Western Norway; and the National Coal Mining Museum in Wakefield, West Yorkshire, UK.

The chief issues addressed are: 1) in what way do the extraction means and material, as well as the perceived target audience, influence the nature of the sites' exhibits designed for public consumption? and 2) what, if anything, do all these different mines-cum-museums in various countries have in common, and why?

Anya Kuteleva: Oil in Museums: Petromelancholia and Temporal Narratives of Energy Transition

This paper examines how oil museums and exhibitions mediate complex temporal relationships in the age of energy transition. Drawing on Michel Foucault's concept of heterotopia and employing Critical Discourse Analysis (CDA), it analyzes how museums in Azerbaijan, Canada, China, Kazakhstan, Scotland, and Russia navigate tensions between past, present, and future narratives of oil. My focus is on how representations of time—from the early twentieth century era of oil discovery and industrial expansion to imagined futures—shape understandings of agency and responsibility in the context of climate change, discursively enabling or constraining society's capacity to imagine and enact post-oil futures.

My cases span liberal capitalist democracies, post-socialist states, and authoritarian resource economies, as well as both long-established and more recent oil-producing regions. This diversity allows me to trace how distinct historical trajectories and governance systems shape the ways oil is remembered, justified, and projected into the future. My analysis also highlights the complex interplay between local and global modernities. More broadly, it invites reflection on the limitations of mainstream energy-transition discourses, which often privilege universal, technocratic solutions while overlooking cultural, historical, and geopolitical diversity.

Patricia Widener: Narrating Energy's Impacts: In Promotion, Avoidance, Nostalgia, Defense and Diversion

This talk presents how energy production centers, oil and coal museums, and public museums in towns of extraction promote employment, science, and technology, construct local extractivist identities, foster nostalgia for oil discovery and wealth for residents and visitors, defend oil-derived products for the consumer, and/or entertain visitors with wildlife observations or nature-based activities. This assessment is based on visits to 21 fossil fuel and renewable energy museums, exhibits, or educational centers in Aotearoa New Zealand, Florida, Louisiana, Norway, Oklahoma, Scotland, and Texas between 2012 and 2024. These exhibition

spaces are in addition to open-aired or unhoused artefacts or promotional displays in outdoor public spaces. By comparing across these sites and holding constant that the sites are one of historic or contemporary energy extraction or production, I find that energy narratives varied based on location, energy mix, type of extractive activity or energy production, and the industry's history in the community. While the majority of places highlighted the skills, technological advancements, and employment opportunities, the human and environmental risks were minimized or avoided. On occasion, the visitor was reminded of the importance of the product to their everyday lives. Inheritance and frontier museums fostered nostalgia for oil discovery and the arrival of oil-funded amenities into communities. Offshore oil museums and aquarium exhibitions also normalized offshore extraction, while other sites of energy extraction or production naturalized their industrial sites with wildlife viewing platforms or hiking trails.

Christina Sydorko: Challenging the Traditional Narrative in Educational Programs

The Oil Museum of Canada strives to create educational programs that present the history of the petroleum industry from the 1800s with the green pivot that is currently taking place in the local industry. We look at the case study that is the development of the oil industry in 1858 and the environmental and social consequences that the local population lived through. However, energy use is in a state of constant evolution and oil companies have become energy companies investing in hydrogen, solar, and wind power. To address these renewable energy topics, we deliver drop-in programs on Professional Activity Days when students have a day off from school and in-school programs. We often talk about how people lived in the Stone Age, the Bronze Age, or the Iron Age, and about how we are now firmly entrenched in the petrochemical age. We want students to understand how petroleum fits in their lives and how they use petroleum products, whether disposal or reusable. We also challenge them to think of ways they can reduce, reuse, and rethink their spending and travel habits.

We need to challenge society's thoughts about oil and the environment. Our student-based educational programs use pedagogical scaffolding to help students understand and analyze complex concepts such as energy infrastructure and consumption as related to economics and the environment. Our adult programs can rely on lived experiences to start discussions on these topics and challenge ideas. The Oil Museum of Canada is a safe non-judgmental space to explore ideas around fossil fuels and aid in the formulation of such ideas through conversation.

From the Parts to the Whole: The Technoscientific Composition and Ethics of Carbon

Convenors: Andrea Cavina, Lara Mezzapelle

Since the 1992 Earth Summit, broad international consensus has grown around the urgent need of mitigating climate change by reducing anthropogenic greenhouse gas (GHG) emissions, primarily carbon dioxide (CO₂). Despite decades of decarbonization efforts, however, atmospheric GHG concentrations continue to rise. Meanwhile, practices of 'green extractivism' reify the maxim that 'everything must change so that everything can stay the same.' Beyond economic imperatives and geopolitical dynamics, this panel explores a deeper explanatory layer: the technoscientific, onto-epistemological assumptions embedded in the science, policy,

and public discourse on decarbonization. Both fossil-based and green extractivist logics indeed rely on reductionist, materialist ontologies that disregard the complexity and interdependence of Earth systems. These offer simple and comparable metrics but risk distorting reality, fostering an illusion of certainty that can be more dangerous than uncertainty itself. Examples include the treatment of CO₂—or worse, CO₂-equivalents—as another waste product to be abated and sequestered, the emphasis on supply-side technological solutions instead of demand-side societal ones, and the replacement of old-growth forests with monocultures for bioenergy and materials under the assumptions that numerical equivalence is all that matters. Conversely, “systemist” approaches attempt to account for complexity but often presuppose already assembled systems that can be managed or optimised, ignoring the messy, ongoing work of composing and negotiating values, needs, and relations among diverse human and non-human actors. Caught between overly narrow and overly abstract framings, even ethically driven efforts can yield perverse outcomes—or the mere appearance of progress. This panel invites critical contributions that challenge both reductionist and systemist paradigms and explore how technoscience not only describes but actively participates in composing the world. We welcome empirical and theoretical work—especially from anthropology, science and technology studies, and human geography—that examines how decarbonization is performed, negotiated, institutionalised, and contested in theory and in practice.

Keywords: Composition; Decarbonization; Ethics; Reductionism; Systemism; Technoscience.

Andrea Cavina: The Mutual Composition of Science, Technology, and Biochar

Within rapidly evolving carbon dioxide removal (CDR) strategies, biochar—a carbon-rich material produced from biomass and mainly applied to soils—is increasingly promoted as durable carbon removal. While there is broad consensus that part of biochar degrades and part is more recalcitrant, disagreement persists over how much carbon remains in soils and for how long. Assessments necessarily rely on modelling choices, boundary conditions, and extrapolations from limited empirical evidence. Yet, these are not merely technical procedures: they distribute responsibility across space and time, define precautionary thresholds, and shape which climate futures can legitimately be promised in the present.

Drawing on Science and Technology Studies (S&TS), this paper examines two contrasting positions. One emphasises the intrinsic chemical stability of biochar to infer millennial permanence (static, enduring state of being). In doing so, it black-boxes heterogeneous actors and operations into “inert carbon,” a stabilised object of calculation well-aligned with regulatory and market interests. In contrast, the other position seeks to reopen the box by investigating extrinsic and dynamic biochar-soil interactions. This approach assumes no fraction to be demonstrably inert, but only temporarily more persistent (active, continuous, or obstinate action), while foregrounding socio-ecological relations and co-benefits.

The paper reframes this scientific controversy as a diplomatic struggle over who and what is entitled to participate in defining biochar and its permanence/persistence. Rather than asking which position is correct, it examines how consensus is constructed under conditions of scientific underdetermination and policy pressure. Settling the controversy indeed requires not only more data, but the adoption of a shared approach, which in turn defines which

methodologies and forms of evidence, and which relations and agencies are allowed to count. What is at stake, therefore, goes beyond biochar's removal potential: it concerns the onto-epistemological and ethical paradigms through which carbon is defined, measured, valued, commensurated, and governed.

Keywords: Biochar Permanence/Persistence; Ethics; Mutual Composition; Onto-Epistemology; Science and Technology Studies (S&TS).

Lara Mezzapelle: Art and Myth as Meta-Paradigmatic Mirrors: Imagining a Living Science

Drawing on my background as an artist and PhD fellow working at the intersection of cultural imaginaries and environmentalism, I propose a creative introduction that weaves together art and myth to invite a meta-paradigmatic reflection on the epistemic structures that both influence and are shaped by technoscience. Art, approached as a mirror of reality, allows us to question how different ways of “focusing” the world generate partial representations, risking the loss of the vitality and complexity of what they seek to describe. Reductionist and systemic approaches generate knowledge, yet they can also consolidate the idea that the world is an object observable and governable from the outside.

Within technoscientific domains, such a stance may foster a hyper-Promethean conviction: that the environmental crisis can be solved primarily through further technological solutions, without questioning the ontological and epistemological paradigms that have contributed to its emergence—thus risking the repetition of the very patterns that produced it.

Through mythological archetypes that warn against anthropocentric hubris, the intervention aims to show how the culture/nature polarization is mirrored in the science/world divide, nurturing an imaginary in which the human being conceives of itself as a demiurgic subject external to the relational fabric of reality.

The ecological crisis thus emerges not only as a technical issue, but as a problem of interpretive frameworks and imaginaries that ground our ethics and orient our ways of inhabiting the world. It therefore becomes necessary to interrogate the ontoepistemological dimension of science, recognizing it as an integral part of the living, multifaceted, and interdependent coexistence we call reality.

Keywords: Anthropocentrism; Nature-Culture Divide; Onto-epistemology; Cultural Imaginaries; HyperPrometheanism.

George Papam: Durable Carbon: Blue carbon and the socio-epistemic constitution of permanence in biological carbon sinks

Amid the growing focus of climate policy on Carbon Dioxide Removal (CDR), soils and sediments in blue carbon ecosystems—mangroves, saltmarshes, and seagrasses—have come to the spotlight, not only because of their increased sequestration capacity, but also for the comparatively long timescales of carbon storage they are assumed to provide. Long

overshadowed by quantitative questions of capture, the temporality of carbon storage has recently gained attention in the the CDR discourse.

A paradigmatic case of technoscientific abstraction, the framing of “blue carbon removal” obscures a set of critical tensions. First, the temporality of storage remains deeply contested: the carbon dynamics of watery, sediment-rich ecosystems are poorly understood and raise persistent problems of precision, double counting, and additionality that exceed those encountered in received examples of forest-based carbon accounting. Second, the durability of carbon storage cannot be reduced to geotechnical or biophysical capacity alone; it is actively produced through epistemic, institutional, and social practices of restoration, conservation, and maintenance. Third, the category of blue carbon homogenises ecologically and socially distinct ecosystems, despite the likelihood that each requires different modes of stewardship to sustain long-term storage.

Focusing empirically on seagrass ecosystems in Greece, this paper examines how temporal assumptions about carbon storage are negotiated in European Union policy and emerging carbon markets. Drawing on policy document analysis and interviews with seagrass scientists, policy consultants, and carbon market actors, it explores how storage is valued as a distinct ecosystem service, and asks what forms of authority and responsibility are implied therein.

Keywords: Blue Carbon; Carbon Storage; Permanence; Carbon Temporality; Seagrasses.

Antoine Hardy: “When there’s no other option, we’ll find a way to do it.” Science, carbon frictions, and quantification.

During my four-year Ph.D. program in Science and Technology Studies, from 2020 to 2024, I studied French scientists who organized to quantify greenhouse gas emissions from laboratories. With a group named Labos 1.5, their goal was to identify the areas with the highest emissions and reduce them. The data they produced was analyzed to contribute to the growing body of literature examining the CO₂-equivalent of research activities over the past decade. In the context of Labos 1point5's efforts, decarbonization is understood as both a local phenomenon – the quantification of laboratories' CO₂-equivalent by people who voluntarily dedicate time to it – and a national one. This group, whose members are primarily life and earth scientists, initiated a national effort with support from the primary national research organization (CNRS) and several publications of editorials in major French newspapers. They aimed to challenge “scientific productivism” and advocate for an “environmental ethics of research.”

In my talk, I will demonstrate that a more comprehensive understanding of decarbonization is possible by moving beyond the systemic and reductionist lenses. In my fieldwork, decarbonization embeds the local within larger social structures and redefines the systemic within local singularities. Based on my qualitative materials, such as 85 interviews, observations of meetings and working groups, and exchanges on an online forum, I will follow decarbonization through interactions. Through a close examination of the activities of individuals who have quantified their laboratories' CO₂-equivalent, I identified four types of what I call carbon friction: misalignment, embedding, requalification, and hierarchization.

These carbon frictions demonstrate how decarbonization is contested and negotiated and how, through its redefinition, it affects the values of scientific work itself.

Keywords: Quantification; Science; Carbon Friction; Laboratories; Carbon Footprint.

Good Till The Close

Participatory creative workshop, drop-in; Rebecca Sharp.

Working with tarot, poetry, individual and group participation, *Good Till The Close* (GTC) is a ‘fortune-telling’, poem-generating game with inbuilt obsolescence; taking its name from the stock market term for ‘an order given to a futures broker that stays live until filled, or until the close of the market, whichever is sooner’.

GTC was first designed and co-presented by Rebecca Sharp (poet and interdisciplinary artist who also works with tarot) and Elodie Laügt (Centre for Poetic Innovation, School of Modern Languages, St Andrews) for EE2023 *Financing the Future* – which explored ‘visions of and expectations for the future’, ‘relations of obligation and indebtedness’, and addressed the question ‘When should we prioritise investing in the distant future rather than focussing on the present?’

The workshop’s organisation draws from links between oil and financial forecasting, and the speculative, interrogative practice of tarot card reading. Playing with ideas of *currency*, you will be invited to interact with tarot cards within a guided process designed to explore present action and future speculation; individual and collective agency; the expression of simultaneous seen and unseen narratives; the visualisation and handling of time, and various forms of transaction.

Through the workshop, we will create a **collective tarot reading (in fact, two), and a collective poem**. Participation is drop-in, but you may have to wait if it’s busy – if you’re able to stay to experience the full process and outcome, that will be of value. CEE will also share the outcome to participants after the conference.

Governing Ambiguity Across Scales: Legal Environments and Energy Infrastructures in Transition

Convenors: Magdalena Dąbkowska, Hilman S. Fathoni

Panel Abstract

Traditionally, infrastructure is understood as physical systems—roads, bridges, water pipes, and similar networks (Kanoi et al. 2022). Yet such a view tends to obscure the complex and often ambiguous processes through which infrastructures come into being, persist, or decay. While much social science research focuses on the historical emergence of large-scale energy systems, less attention has been paid to how they change over time and into the future.

Even when stalled or abandoned, infrastructures shape people’s anticipations, expectations, and memories (e.g., Fathoni 2025; Yarrow, 2017), blurring the line between presence and

absence, function and failure. The coordination of technological systems and organizational structures—spanning human and non-human actors—often unfolds through disjointed or opaque processes (Lammer and Thiemann 2023). Once established, infrastructures tend to recede into the background, rendering invisible not only the affective labor that sustains them but also the legal, political, and regulatory arrangements that make them possible (Star and Ruhleder 1996; Star 1999).

In this session, we are interested in exploring how these ambiguous and uncertain characters surrounding energy infrastructure are governed across different scales, in a way that tends to defy the rigid binary between local and global (e.g., McFarlane, 2025). Infrastructures are not merely technical artifacts; they are deeply entangled with regulatory, economic, cultural, and organizational elements (Turner 2016). We respond to the burgeoning scholarly discussions that examine how such affective and ambivalent dynamics around infrastructure-making processes play a role in the day-to-day formation of subjectivities, and what this means for enacting infrastructural politics (e.g., Lesutis and Kaika, 2024; Knox, 2017; Lesutis, 2024). We also intend to take this conversation further by exploring the ethical and moral dilemmas arising from this interscalar attempt to govern ambiguities surrounding energy infrastructure.

Emily Hite: Speculative Infrastructures and the Uneven Production of Space

This paper examines how speculative hydropower projects, promoted as climate mitigation strategies, operate as sites where the production of space and place, and thus power, unfolds across scales. Prior to being built, projects such as the Diquís Dam in Costa Rica materialize through images, maps, and bureaucratic plans that simultaneously shape physical landscapes and people's connection to place and sense of belonging. Framed as “clean” solutions to global climate targets, these projects function as both promises of progress and spectral threats of erasure. Drawing on Lefebvre's triad of spatial production, I analyze how conceived spaces of global climate governance (e.g., UNFCCC COP meetings) intersect with the perceived spaces of hydropower development (e.g., carbon markets and hydropower blueprints) and the lived spaces of Indigenous and local resistance (e.g., community rituals, advocacy, and acts of defiance).

These intersections illuminate how speculative infrastructures transform territories long before concrete is poured, reconfiguring relationships to land, water, and futurity itself. In this framework, hydropower acts as a catalyst for understanding the friction between conflicting future imaginaries, real and imagined transformations of space, and the affective geographies of loss, resistance, and marginalization.

By situating analysis across conceived, perceived, and lived spaces, this paper argues that hydropower's spectral presence reveals the ambiguity of climate governance as a terrain of contestation: where images of sustainability reorder territories, obscure structural injustice, discipline dissent, and reproduce slow forms of violence, while also opening opportunities for the assertion of alternative knowledge, ethics, and spatial imaginaries. In doing so, I demonstrate how examining the uneven production of space offers a critical lens for understanding the ethical, political, and material stakes of energy infrastructure, and the contested futures that emerge in its shadow.

Taru Salmenkari: Ambiguity as a tool in the Chinese green energy transition

Chinese green energy and zero-carbon policies rely on the Chinese innovation policy model, in which the state sets targets and builds facilitative infrastructures but leaves concrete innovations and their application in the production process and commercial products to private companies. This system is built on ambiguity when target-setting leaves it open to local governments and the private sector to decide how the target will be reached. The system encourages competition but also collaboration, cross-sector networking, and the sharing of information and best practices. It connects different types of actors, each left to do what they can do best. Its innovation policy has made China into a leader in green energy technologies and in their application and has shown that China is able to decouple economic growth from fossil energy use. This paper introduces ambiguity as a tool for innovation and policy making in the Chinese green energy transition using examples related to physical energy infrastructures and equipments.

Although ambiguity has proved very productive, it is wasteful, causes unintended consequences, and leaves spaces for carbon intensive outliers to hide in shadows. My anthropological observation in Chinese climate forums organised by business associations and NGOs reveals the constant work to reduce ambiguity and gaps. NGOs deal with concrete waste left in the countryside from outdated and broken renewable energy installations, which are outcomes of the learning-by-doing approach that used to flood markets with cheap low-quality energy equipments before the development of more advanced technologies. Business associations are involved in policy processes to reduce ambiguity of lacking standards and regulations on which to base investment decisions, while the government wants later regulation based on experimentation and successful technological standards. Businesses need to cope with unintended problems with always new innovations. For example, when China doubled its renewable energy production within a single year 2023 with the consequence of overburdening the grid, the business sector intensified explorations of decentralised energy production and storage and the integration of energy production into products and production processes. Moreover, ambiguity in policy making means that stakeholders are not predetermined. Consequently, Chinese NGOs have established themselves among the advocates of decentralised renewable energy production for their own reasons to promote rural progress and social equality. With green energy transformation, China is in the midst of building a new energy system and infrastructure with new technologies that reduce specific ambiguities but constantly create new ones in a cycle that speeds up innovation. Ambiguity as an energy policy tool is not likely to go away, as it boosts innovation and facilitates collaboration across sectors to identify and solve ambiguities related to technologies, policies, global markets, and social and environmental consequences.

Sophie Adams: What is the grid? The meaning of connectivity in a decentralised energy system

The deployment of distributed energy technologies to address climate change risks in the energy system is altering what it means to be connected to the electricity grid. These technologies, which include rooftop solar and household batteries, promise clean, resilient and

independent energy supply in the face of extreme weather-related grid outages, the urgency of decarbonisation and rising electricity prices. In Australia, where these challenges are experienced ever more acutely, diverse configurations of distributed energy technologies are emerging through evolving relations and negotiations among multiple publics, the state and other actors, each variously seeking to replace, invert or reinforce the grid. These configurations range from community microgrid programs funded by governments to the installation of stand-alone power systems in households in vulnerable edge-of-grid locations by network operators, among others. Based on interviews with households about their engagement with such arrangements, this paper probes the increasingly differentiated and ambiguous meanings of grid connectivity – which now appears in ‘virtual’ and ‘partial’ forms alongside that of the traditional grid – and examines the shifting distributions of risks, costs and benefits accompanying them.

Hilman S. Fathoni: Ambiguous modernity: the elusive promise of universal electricity access in Indonesia

In this presentation, I examine the ambiguities surrounding the sustainable development pursuit of eradicating energy poverty, taking Indonesia as an empirical case study. Within the past decade or so, the government of Indonesia in collaboration with multiple stakeholders across different levels of governance have been proactively supporting many initiatives to accelerate the country’s rural electrification progress, including through the deployment of small-scale renewable infrastructures. Underpinning these developmentalist pursuits is what I argue as the ambiguous attempt of governing ambiguity - the one that taps into the generative as well as reductive qualities of being ambiguous. In this mode of governance, the state seeks to position itself as the panacea to the energy access problem that plagues its rural populace, yet also revealing its own shortcomings in the process. Rather than solving these contradictions, the state interventions tend to perpetuate them, and as a result, the objective of ensuring universal electricity provision becomes possible and impossible at the same time. Yet, such a pursuit of modernity continues to enchant people, including myself as somebody who has been skeptical of its very promise.

Infrastructure 1

Radjev & Anju Chhillar: Degrowth in Indian Agriculture: Irrigation strategy as Energy Problem in North-West India

India’s northwest region has been a critical factor in achieving food security. Haryana, a province lying in northwest and driver of Green Revolution during 1960s exemplifies the catastrophic convergence of energy subsidies and groundwater depletion. As India's second-largest rice producer, Haryana withdraws groundwater at 137% of annual extractable resources. Recent Central Ground Water Board (CGWB) assessment of 2024 categorized more than 60% of Haryana as water stressed. Critically, paddy, a water guzzling crop, saw increase in sown area from 12 lakh hectares (2020-21) to 16.44 lakh hectares (2024), driven by assured market prices and constant electricity subsidies which have been kept at ₹0.10 per unit (0.11 pence per kWh) since a decade. The provincial government's agricultural electricity subsidy constitutes 89% of

total electricity subsidies and creates permanent economic incentives for deepening tubewells. This paper reframes Haryana's water crisis as essentially an energy infrastructure problem, and presents an argument that degrowth offers the necessary framework for reimagining irrigation systems toward sufficiency rather than maximization.

Nearly 70% of the groundwater extracted is used in agriculture and such extraction is facilitated by energy subsidies as canal water distribution remains inadequate, forcing over-reliance on groundwater. Agricultural electricity subsidies create irreversible technological and social lock-in due to political concerns. Therefore, irrigation policy cannot be decoupled from energy systems.

The paper grounds degrowth theory in Haryana's institutional landscape. *My Water, My Heritage* scheme attempting paddy reduction targets fails because it addresses symptoms, not causes. Rather than focusing on efficiency through precision and drip irrigation or solar pumps, degrowth agriculture challenges the growth assumptions embedding Haryana's crisis: *Why expand inefficient subsidies when hydrological limits demand contraction?* The paper found that despite adoption of drip irrigation, energy subsidies are increasing and water levels are going down. The paper argues that Haryana's transition requires agriculture's reorientation towards degrowth: shift from tubewell-dependent irrigation to surface-water and rainwater-harvesting systems. The paper suggests that reorientation toward sufficiency of groundwater recharge rates is a must.

Keywords: Degrowth Agriculture, Water-Energy Nexus, Irrigation Sufficiency.

Ava Rawson: Post-Oil Futures and the Ruins of a Carbon Modernity

With complexities manifested through laborious processes of economization, the reduction and serial alienation of liability from operators, and a race to the bottom for the cost of removal and 'recycling', the decommissioning of offshore oil and gas infrastructure within the North Sea is anything but straightforward. This research is primarily concerned with how the material legacies of the oil and gas industry can be reconciled within the creation of post-oil futures. Highlighted through two disparate temporal crises—the present 'suspension', or bureaucratic stalwart, within the completion of decommissioning activities, and the future degradation of all sites which have been successfully plugged—this research forefronts the labour necessary in attending to the post-life of derelict oil and gas infrastructure.

This will be done through a study of licensing regimes, alongside an excavation of what future this infrastructure was made for, and how this affects its (de)construction. The waste generated from the devolution of post-productive platforms, the potential harms of unplugged or improperly plugged wells on surrounding marine ecosystems, the increased CO₂ and methane emissions resulting from such sites, coupled with the nascence of the decommissioning industry itself, all have the potential to threaten long-term decommissioning plans within the region. Industry injunctions, and the social constitution, of 'inevitable', and dichotic constructions of risk alongside these harsh material realities are integral to understanding the efficacy of our post-oil futures.

Keywords: Post-Oil, Future-Making, Decommissioning

Current UK legislation, including the Environment Act (1995), requires that mines be restored after extractive operations end, with the goal of returning them to a usable state. Typical reclamation projects focus on physical and chemical stabilisation, recreating natural features to prevent erosion, and re-establishing self-sustaining ecosystems with biodiversity. While unconventional, there is also a longstanding practice of utilising Land artworks to transform degraded sites, with a view to not only meeting environmental standards but also generating social and cultural value.

Originating in the United States in the late 1960s, proponents of the Land Art movement created sculptural interventions, often on a monumental scale, which employed the landscape itself as a medium. Key examples of artwork created to facilitate the restoration of exploited mines include Robert Morris's *Johnson Pit #30* (1979), Agnes Denes's *Tree Mountain* (1996–ongoing), and Charles Jencks's *Fife Earth Project* (2009–13). Offering the first dedicated art-historical study of this phenomenon, I argue that while such initiatives appeared to represent sustainable ideals, in reality they functioned as a sophisticated form of corporate and/or state greenwashing which was concealed under the refined guise of high art.

Although the employment of artists by mining companies has fallen out of fashion in recent years, a growing number of designers and engineers are developing new approaches to mine reclamation. For example, the harnessing of abandoned mines as latent sources of geothermal energy is being led by the UK Mining Remediation Authority (MRA), with major operations already functioning in Gateshead and Ammanford. Meanwhile, the startup company Gravitricity is pioneering the utilisation of disused mine shafts as large capacity gravity batteries. As a precursor to them, I aim for my critical analysis of Land Art's employment as a reclamation strategy to support the development of such innovations along more ethical and historically informed lines.

Keywords: Mine reclamation, Land Art, greenwashing

Infrastructure 2

Bennett Collins: River Restoration as Decolonial Transition: Critically Examining Politics of Local Opposition to Dam Removal in Central Maine

This project looks into whether there are settler colonial logics behind dam removal opposition in the US when Indigenous peoples are involved. For the Penobscot Nation, whose traditional lands incorporate much of central and southern Maine, the damming of the Penobscot River and its tributaries has had long-term consequences for a 'proud riverine people' whose 'epistemology, culture, and society are rooted in their intimate relationship to the River' (Wabanaki Alliance 2025). It is for this reason that the Penobscot Nation has taken a lead position in the past two decades in seeking legal stewardship over the river and the removal of dams on the Penobscot River and its tributaries. As case studies, this British Academy/Leverhulme-funded project looks at three towns in Central Maine that used direct ballots on dam removal in 2025 and where Wabanaki peoples are supporting removal. At its core, the project proposes that the process of dam removal is much more than a matter of ecological well-being and financial costs for both sides of the argument. Interpretations of dams matter depending on subjective relation to place; they can be either materialised

epistemological violence against Indigenous peoples (Bacon 2019; Bang et al 2014; Wabanaki Alliance 2025) or geographic symbols of settler ingenuity and desires to be native-to-place (Reibold 2022). Through this framing, dam removal becomes a process of material and cultural decolonisation and ecological transformation in a way that helps advance the well-being of Indigenous Wabanaki lifeways, while possibly simultaneously taking away historical geographies from contingents of non-Indigenous, majority white European settler communities.

Keywords: Dams; Settler Ethnogeographies; Decolonial Just Transition

Fiona Polack: Speculative infrastructures and post-fossil fuel marine futures

Architects and other designers have imagined a plethora of ways in which to repurpose decommissioned oil platforms. They have also been inspired by existing rig technologies more broadly in their plans for new marine structures. Some of their blueprints have come to actual fruition: The 2022 West-super-mare *See Monster* art installation, for instance, adapted a former North Sea drilling rig into a work designed to prompt questions about sustainability and environmental futures, and Saudi Arabia is currently developing an offshore adventure tourism project deploying decommissioned infrastructure. Many more plans for repurposing oil rigs and platforms have, however, remained undeveloped. Indeed, in this paper I focus primarily on speculative projects not necessarily ever intended for actual implementation and thus uninhibited by physical or fiscal practical constraints. Moving beyond Philip Larkin's (2013) definition of infrastructures as "built networks that facilitate the flow of goods, people, or ideas and allow for their exchange over space" to encompass unbuilt projects, too, I explore what we might learn from purely speculative post-fossil fuel adaptive infrastructure. Designs ranging from XTU Architects "Rigs Cities," to Zachary Coughlan's plan for redeploying obsolete rigs as "material scrapyards" for a Viking heritage site, ask us to move beyond our current understandings of the possible, in order to imagine new kinds of just and environmentally benign futures. Such projects also prompt questions about how we might characterize and define relationships between actual and imagined infrastructures in conceptual terms, too.

Keywords: oceans; fossil fuel infrastructure; speculative environmental futures

Jessie Martin: Resilience and Reproduction: The Transalpine Pipeline as a Locally Situated, Global Tool of Power

The term 'resilience' is often used by energy companies to describe their ability to recover from crises. Social contract resolutions formulate webs of life as productive resources, containers of individuated inputs destined for elevation beyond themselves; as the pre-condition of ethical agency, such resolutions create an inherent impossibility for emancipation. Economies grow through nature, and the perpetual striving for growth absorbed into hegemonic politics puts planetary recovery at odds with this. The Transalpine Pipeline has carried oil between Trieste and Ingolstadt since 1967. Its construction was led by ENI and the project was one of the largest private investment projects of the period. The pipeline supplies 100% of Southern Germany's crude oil, 90% of Austria's, and 50% of the Czech Republic's. This paper examines the material history and present of the pipeline through its interconnections, the policies that govern its operations, its (in)visibility and imaginaries.

The narrative of the pipeline portrayed by its triad of operating companies, is one of invisibility. The seamlessness by which the pipeline blends into the landscape, becoming almost part of nature, is emphasised; the pipeline is visualised as enabling life above ground by not disrupting it, and above-ground activities are conceptualised as energised through oil as a hidden, life-giving force. My research tells the hidden stories of the pipeline: how it was created to challenge the Anglo-American oil monopoly; how it enabled refinery land by the Danube in Ingolstadt to become toxified, in a move only halted because it ceased to be valuable; protests against its expansion and use of EU recovery funds; proven shipments of oil by shadow fleets into Trieste. The paper explains how the local pipeline operates as a global tool of power, detailing why current environmental regulations are therefore insufficient to prevent its damages.

Keywords: Pipeline, Oil, Power

Infrastructures of Heat: Anthropology, Method, Theory and the Thermal

Convenors: Elaine Forde, Simone Abram

Panel Abstract

What is heat and how do we study it? Heat is illusive. Heat is present or absent. Heat is intimately bound to the human body. Heat is oppressive. It sustains life, and heat kills. The affective experience of heat is relational between and even within bodies. Shifting meanings of heat and representations of it reveal political and economic power. Extractivist logics and legacies of colonialism contribute to the creation and shaping of infrastructures of heat as diverse as domestic heat networks, industrial cooling systems and climate-controlled spaces.

This panel invites paper proposals that apply anthropological methods and theory to situating the affective experience and material properties of heat—through the entire thermal range—alongside socio-culturally constructed ideas about politics, power, equity, rights, economy and perhaps most crucially—the role of human societies in managing and even minimising the impacts of heat on non-human worlds.

Since Mauss, anthropological engagements with heat have reflected dominant theoretical discourses, yet heat itself has rarely appeared, or been theorised directly. Rather, heat is framed via other phenomena, and as a vector for other values. Reinforcing the notion that heat is a relational category, heat appears in field diaries as anthropologists recorded their subjective affective experience of heat as somehow separate to the lived realities they were studying (Venkat, 2020). How, therefore, does heat enter anthropological knowledge? A focus on infrastructures of heat, we suggest, helps to frame heat more clearly as an ethnographic object, rendered thus through different and sometimes competing processes of making.

Anthropological research and writing with heat considers interrelations between bodies, places and politics that other framings do not allow for. The affective and undeniably "felt" experience of heat has led to framings of embodiment, affect and phenomenological accounts, which situate heat as a material reality that can be discovered and experienced. Heat, equally, acts as agent via the devastating impacts of its extremes. This affective reality of heat, while differentiated and oftentimes unequally felt, suggests it is a material-discursive category, able to mobilise thought and action across different conceptual regimes. Heat, though, is also

political as architectural theorists and urban studies scholars have shown impactfully (Chang 2024). Heat becomes a political object when a rights-based framework is applied to understand the intersecting inequalities that deliver too much—or too little—heat, as well as the impact that extreme heat has on other infrastructures, material or conceptual.

This panel seeks papers that highlight the value of a human centred, anthropological approach and which reveal how heat manifests itself in peoples' daily lives; as affective, embodied, relational and political. This invites critical attention to how heat becomes an object of ethnographic enquiry, and critical attention to how heat flows and is distributed: by whom, to whom and how? Seeking methodological innovations in the study of heat, as well as ethnographic accounts of heat, this panel highlights heat as a valuable focus for anthropological enquiry while offering interdisciplinary critical heat studies valuable anthropological perspectives.

Island Energy vs Energy Islands

Convenors: Cornelia Helmcke, Christian Calvillo Muñoz,

Panel Abstract

Peripheral yet pivotal, islands and other energy grid-remote regions are increasingly turning into hotspots for renewable energy investments. Behind this development promise lies an often-complex reality where innovation collides with infrastructure constraints, environmental trade-offs, and the unintended consequences of decarbonisation. Exploring these challenges offers a window into the broader risks and opportunities of the global energy transition.

This panel session will focus on the dual and co-existent phenomena of 'energy islands' and 'island energy'. We understand energy islands as infrastructurally marginalised places that lack sufficient connectivity, accessibility and investments in infrastructure, energy and fuel provision and therefore struggle with fuel and transport poverty, energy insecurity and/or decarbonisation. In contrast, we understand island energy as the new frontiers of energy generation – regions far from traditional 'power' centres that are now in the spotlight of renewable energy investments, innovation and infrastructural developments, such as related to offshore wind. While the second phenomenon might suggest solving the first phenomenon when happening in the same place, this panel critically explores cases where both processes seem to flourish in conjunction; in other words, where island energy further marginalises communities in place. Consequently, we discuss the importance of alternative perceptions to island energy characterised, for instance, by smaller-scale and self-determined energy pathways directly targeted at overcoming energy islands. Topics to be addressed range from place identification and transition resistance to local energy entrepreneurship, from energy injustices to community benefits and energy democracy, from deprived isolated townships to empowered and sustainable communities, from aging insufficient infrastructure to innovative microgrids and peer-to-peer networks.

Encouraging interdisciplinary and cross-sectoral engagement, this panel advances critical debates within energy geographies, rural development, and just transition politics by conceptualising the simultaneous and often contradictory dynamics of infrastructural marginalisation and energy transition investment. Through the dual lens of 'energy islands' and 'island energy', the session interrogates how processes of decarbonisation and infrastructural

expansion intersect with, and at times exacerbate, existing spatial, environmental and socio-economic inequities. By foregrounding empirical cases where renewable energy development coexists with or even reinforces energy insecurity, the panel contributes to nuanced understandings of the uneven geographies of energy transitions. Furthermore, by engaging with concepts such as energy justice, energy democracy, and community-led innovation, the session proposes alternative frameworks for examining and addressing peripheral energy futures, offering insights into how place-based, participatory approaches might resist or enable energy transitions.

This panel will speak to the broader conference themes of justice, fuel poverty and structural inequalities, crisis, hope and despair, commons and collectives, co-benefits and biodiversity, environmental, social and governance, and growth and degrowth. We are planning six shorter paper presentations which we will divide into two consecutive panel sessions. Each session will include a panel discussion which will tie together common themes and answer questions from the audience, and which will trigger critical reflections and insights for (re-)imagining just energy futures in and beyond island geographies.

Carmen Séra-Penker, Rosa Lehmann, Kristina Hinds: Thinking with, from and across the island energy transition in Barbados

Paper abstract: Small island spatiality affects the range of possibilities for decarbonising the energy system. In the Caribbean region, many island states experience a high dependency on fossil fuel imports, to power their electricity system and as fuel source. Barbados is one such island. Aiming to transition to 100% renewable energy by 2030, Barbados has set the energy transition process in motion. However, spatial characteristics and contextual factors of the past, present and future influence its trajectory. As an energy grid-remote region, there are no subsea power cables to neighbouring islands, infrastructure constraints for innovation complicate the transport of large windmill components because of narrow and windy roads, and among the unintended consequences of decarbonisation features the broad promotion of EVs which however for a while still will have to be powered by electricity generated from fossil energy sources. Renewable energy investment includes the development of a hydrogen facility on the island as island energy, whereas local energy entrepreneurship is meant to contribute to energy democracy. Asking how place-based conditions of islands shape regional energy transitions, this study analyses the ongoing energy transition process in Barbados by applying the concept of regional foundations for energy transitions in, of, and by the region viewed through the analytical lens of the island as a political interstice along the continuum of separation and connection. The study employs qualitative interviews and policy analysis to show that the energy provisioning system of the region works through separation, whereas the resource endowment in the region is an example for connection aspects, as is the agency of island states. The paper contributes to highlighting the characteristics of an island energy transition by focussing on place-based factors that shape barriers and opportunities for decarbonisation.

Keywords: energy transition, island spatiality, Caribbean region

Umberto Cao: Island energy citizenships and contested transitions. The case of Sardinia

Paper abstract: The island of Sardinia has a long history of colonisation with several rulers succeeding one another over the centuries. Once the original territorial nucleus of what would become the current Italian Republic, the island is today affected by the structural and age-old socio-economic problems that characterise all the southern regions of the country. Added to these, however, are the specific conditions of insularity. From an energy perspective, Sardinia is a shining example of an “energy island”. 75% of its electricity comes from fossil fuels, specifically from two old coal-fired power plants. The island hosts the largest refinery in the

Mediterranean, with a capacity of 300,000 barrels per day, which has also raised considerable environmental and public health concerns since its installation in 1966. Nevertheless, the prices of oil fuels on the island are higher than on the continent, and methane is still unavailable. As for mobility and transport, its railways have one of the lowest densities per square kilometre in Italy, aren't electrified (the locomotives run on diesel) and are almost all single track. The road network is in poor condition, resulting in the island having the highest road mortality rate in Italy. Territorial continuity with the continent is a problem that has remained unresolved for decades.

At the same time, Sardinia has also become a remarkable case of “island energy”. In one year since the spring of 2023, about 800 requests for authorisation of wind and solar energy parks, on-shore and off-shore, have been submitted in the island, without any process of information, discussion or consultation with the communities or local authorities concerned, nor impact assessment (Lupo and Fadda 2024). The final installed capacity pursued by these projects would be about 10 times higher than the quota allocated to the island by the national energy plan, and the infrastructure for the possible export of surplus energy to the mainland is missing (idem). This situation is the result of a combination of the large amount of public funding available from the European Union's decarbonisation programmes and an inadequate Italian regulatory framework: financial speculation through RE projects has therefore proliferated, mainly in Sardinia, but also in other historically marginalised areas of southern Italy.

On the island, this phenomenon burst onto the public arena under the label of ‘green invasion’ (Cao and Tuscano, forthcoming) and sparked large-scale social mobilisations (the largest in decades), leading to numerous civil resistance initiatives, a citizens' initiative bill and the promotion of a popular referendum (Cossu 2024). At present, the situation is at a standstill due to emergency measures brought by the regional government. Yet, several large-scale RE projects have been completed. Based on an ethnographic study ongoing since 2024, this paper aims to reflect on three levels:

The first addresses the types of environmental, social, economic and heritage impacts perceived by local communities as a result of top-down imposition of decarbonised energy production initiatives on their territories. This, taking into account that definitions such as “decarbonisation through dispossession” (Andreucci and et al. 2023), “green extractivism” (Bruna 2022) and green sacrifice zones (Zografos and Robbins 2020) have been employed to describe similar circumstances elsewhere. The second explores the opportunities and challenges of grassroots energy democratisation, with the emergence on the island of the first energy communities (Callaghan and Williams 2014; Hanke, Guyet, and Feenstra 2021). The third reflects on the possibilities for local energy citizenships (Silvast and Valkenburg 2023) to influence energy policies and strategies, in an insular context subordinate to a central state. In fact, we will pay particular attention to how the “green invasion” underway in Sardinia relates to previous patterns of colonisation and marginalisation (Siamanta and Dunlap 2019) and have reactivated a never entirely dormant desire for independence from Italy (Morgan 2023).

Laura Tolnov Clausen, David Rudolph: Two tales of an interconnector: infrastructural imaginaries of green energy transition

Paper abstract: The interest in infrastructures supporting the green transition has gained increased political and academic attention within the last decade. The material and political lives of infrastructure often contain narratives of technological progress, energy security, globalization and green growth development. However, such narratives frequently undermine fragile and unequal relations between geographies, economies and the institutions that govern or provide them, making infrastructure a productive object to examine the reproduction of spatial, political and economic power including different notions of energy futures.

This paper aims to bring together the concepts of socio-technical imaginaries (Jasanoff & Kim, 2009) and endogenous and exogeneous development (Van der Ploeg & Long 1994) considering various place-based, political and economic imaginaries of the importance of energy infrastructures for gridremote regions. By exploring the yearslong political process towards the establishment of a new submarine interconnector between the Isle of Lewis and the mainland of Scotland, it addresses the question of how the installation of infrastructure supporting the renewable energy transition can be the solution to uneven geographical development and how different notions of infrastructure are connected to different notions of energy futures. The paper identifies two rival narratives that make sense of the link between energy infrastructure and regional development: One narrative represents the idea of 'island energy' placing emphasis on exogenous green growth parameters such as external financial investments in large renewable energy infrastructures that take precedence over any other form of renewable energy development (e.g. energy communities). Another narrative sees smaller renewable infrastructure as an endogenous catalyst for 'energy island' empowerment, place-based independence and resistance to green capitalism.

The paper concludes that a less recognized element in political and economic appreciation of technical infrastructures underpinning the renewable energy transition is their ability to consolidate political power and create new forms of marginalization and dependency, but also their ability to open for new and emancipatory pathways of regional development.

Lara M. Santos Ayllón: The Orkney (Energy) Islands: Informing energy transition pathways through place-based visions of (un)just energy futures

Paper abstract: The Orkney Islands make up an archipelago of 22,000 people off the north coast of Scotland, where energy innovation and production have historically taken place. Activities range from testing wind, tidal and wave turbines, community owned energy, green hydrogen production or hosting oil terminals. Indeed, with the highest levels of fuel poverty in the UK and a vast renewable energy generation potential, the future of Orkney is intimately tied to ongoing decarbonisation plans. Against this backdrop, this presentation delves into the anticipated energy justice risks and opportunities for the Orkney Islands as conveyed through visions of just and unjust energy futures in the archipelago. These were developed throughout my PhD research project which aimed to anticipate energy justice risks and opportunities of emerging energy innovations and place-based transitions in Orkney. Data was primarily generated through 39 interviews and 4 place-based workshops in different islands across Orkney. In the

latter, participants engaged collaboratively in extensive anticipatory and reflexive thinking on Orkney's energy futures.

Energy-and-justice scholarships, amongst many others, have readily highlighted both the risks and opportunities of status quo approaches to the energy transition. Thus, there is a growing imperative to plan for the mitigation of injustice – and to proactively design justice into future worlds – as we undertake the energy transition. In the context of “energy islands” with island energy, the contrast between what is, and what could be, is perhaps starker than elsewhere. Drawing on place-based visions of just and unjust energy futures in Orkney, this presentation will delve into findings relating to the (a) diverse expectations and relationships to energy, species and place (b) multi-scalar power dynamics and tensions pertaining to energy transitions and (c) the dynamic interplay of justice dimensions underpinning these. Taken together, these findings offer opportunities to inform energy transition pathways, while inviting reflection on the methods, voices and interactions by which these are currently underway.

Katharina Oemmelen: The Cost of Silence: A case study of community engagement gaps in Madagascar's Mini-Grid Sector

Paper abstract: Mini grids are widely recognised as a key pathway to provide millions of households in sub-Saharan Africa with clean, affordable, and reliable energy. Yet the longer-term viability of this ‘island energy’ technology remains constrained by financial, regulatory, and social challenges. Based on six months of qualitative fieldwork (February–July 2024) in rural Madagascar, this paper explores the consequences of a prolonged delay in a private-sector mini grid project triggered by sudden regulatory change. Drawing on community-level interviews and observations, the research shows how the implementation delay intersected with local dynamics to shape household perceptions of the project and of electricity access more broadly. These social impacts are considered alongside the financial implications of the delay for the mini grid company. The case study highlights how the absence of communication between community members and the service provider during the project's stagnation amplified its negative effects. To address this gap, and thus contribute to making mini grid projects more sustainable, the paper proposes strategies to foster more effective dialogue between ‘island energy’ users and providers.

Emil Nissen, Julia Kirch Kirkegaard: Is there space for ‘ordinary energy’? An ethnographic inquiry into the local citizen energy community Bornholms Havvind amidst (inter)national plans for the Danish giga-scale project Bornholm Energy Island

Paper abstract: The empirical setting of this paper is the Danish island of Bornholm in the Baltic Sea. Although it's roughly 40.000 inhabitants may not constitute a closed island grid in the original sense of the term, the islanders nevertheless experience lower reliability of electricity supply than the rest of Denmark. In contrast to this circumstance, Bornholm has recently been designated as Denmark's (and the EU's) flagship site for hosting the gigawatt-scale ‘Bornholm Energy Island’ (BEI) project envisioned as part of a future meshed High-Voltage Direct Current grid. The overarching vision is that a growing number of such islands promises should accelerate green energy transition, enhance energy security and resilience by transporting vast amounts of renewable power from multiple offshore wind farms to several countries over unprecedented distances. Based on ethnographic fieldwork and document analysis, we dive

into how and whether there is space, amidst the (inter)national plans for the BEI, for ‘ordinary energy for ordinary people’. We follow the emic notion of ‘ordinary energy’ as envisioned by a group of locals who aim to establish a citizen energy community - “Bornholms Havvind” – operating a nearshore 100 MW wind farm project. Their project seeks to alleviate many of the “grid-remote” ailments of Bornholm’s island electricity system but has so far only received formal rejections to move ahead. Grounded in an STS informed Valuation Studies perspective, we ethnographically trace the valuation and power struggles between the colliding forms of emergent ‘island energy’ and new forms of ‘energy islands’. In doing so, we demonstrate how exclusion is both enacted from the Danish State and from Bornholms Havvind, using different mechanisms and producing different socio-material effects. We conclude with contributions to notions of energy democracy by discussing implications for citizen-driven energy communities and the potential agency of peripheral energy futures to gain momentum.

Roxane Permar: Landscape in Pain

Paper abstract: The project Landscape in Pain is a multi-layered visual and social response to the construction of the industrial scale Viking Energy Wind Farm in Shetland which commenced in 2020 after many years of public debate and local dissent. The project strives to make visible extractivist practices as industrialisation threatens to destabilise Shetland. It is part of on-going public dialogue which questions the value of industrial scale mining of our natural resources and raises concerns about our health, land and sea. It asks how we can achieve sustainability in island communities, and leverage renewable resources without causing harm, risk of depopulation and irreparable damage to our environmental and social ecosystems.

There is a resurgence of concern among Shetlanders that new developments, e.g., wind farms, substations, pylons, a battery park, ammonia plant and hydrogen factory are leading to disproportionate industrialisation. While Shetlanders are well aware of the need to address climate change, many are deeply concerned about environmental damage and human impact, which raises questions around long term sustainability. Fears of depopulation and destabilisation of community values, culture and heritage have arisen in the face of proposals for future developments that are intended to turn Shetland into a ‘green energy island’. The project, Landscape in Pain, asks how we can address the complexity of issues linked to climate change while achieving a balance between sustainable development and care for the communities who are rich in resources such as wind power yet are being exploited by multi-national corporations to construct renewable energy developments.

Just Storage? Batteries and the Challenge of Energy Justice

Convenors: Malcolm Sanger, Laurianne Debanné, Janine Richter

Panel Abstract

It is widely accepted that a rapid and extensive transition away from energy systems based on fossil fuel combustion is necessary to mitigate the effects of global heating caused by CO₂ and other greenhouse gas emissions. This transition relies on the development of energy storage technologies capable of storing energy derived from renewable, intermittent sources reliably, efficiently, and sustainably. At the same time, it is also understood that energy systems are

implicated in questions of environmental justice and injustice, including the uneven distribution of social and economic opportunity and security, individual and community health and well-being, and political power.

This panel will present the work of the Just Storage project of the McGill Centre for Innovation in Storage and Conversion of Energy. The project convened research teams across three disciplines – the McCalla Lab (Chemistry), the Grierson Research Group (Media Studies), and the Canada Research Chair in Housing, Community, and Health (Geography) – to develop an interdisciplinary framework for treating energy storage as a matter of environmental justice, and environmental justice as a matter of energy storage. This framework aims to support approaching technical design, viability and implementation as integrated with, not isolated from, questions of social, economic and political equality and to provide a basis for approaching environmental justice as informed by the technical configuration, potential and limitations of existing and emerging energy storage technologies.

The panel will be comprised of three papers, one by each of the disciplinary teams involved in the project, focused on the test case of sodium-ion batteries. The panel will culminate in the presentation of a proposed framework for orienting interdisciplinary research in relation to emerging energy storage technologies, so that it might take both technical and energy justice considerations into account and thereby support more just outcomes in the design and implementation of these technologies.

Eric McCalla, Janine Richter: What New Opportunities do Sodium-ion Batteries Offer?

Mylene Riva, Laurianne Debanné: Energy Storage oriented towards Energy Justice

Darin Barney, Malcolm Sanger: Energy Storage and/as Infrastructural Mediation

Eric McCalla, Janine Richter, Mylene Riva, Laurianne Debanné, Darin Barney, Malcolm Sanger: The Just Storage Framework

Justice and Energy Transition 1

Daniela Alvarez Gallo: Can a spatial microsimulation of energy consumption inform regional pricing? Scotland case study

Energy prices have become a central concern for European households, significantly impacting living costs and public welfare. In Scotland, fuel poverty has risen dramatically since 2017, with approximately 34% of the population living in poverty or extreme fuel poverty.

Qualitative research has introduced the “double energy vulnerability” concept to describe the difficult and often enduring trade-offs many households face, such as choosing between heating their homes, preparing hot meals, or affording transportation. Simultaneously, UK’s NetZero Agenda, a national strategy aiming to reduce greenhouse gas emissions to net zero by 2050, is placing a growing pressure on the domestic sector to retrofit homes and improve energy efficiency. However, this policy push paradoxically burdens families already struggling to afford energy.

Scotland faces a further paradox: abundant wind energy generation leads to grid overload, requiring the government to pay wind farms to shut down. Simultaneously, households self-ration energy consumption due to high prices. A regional pricing scheme would allow poorly insulated homes to access more affordable energy, thereby increasing demand and reducing the government's curtailment payments. However, there is a lack of information on demand, building stock and socioeconomic circumstances at the local level that will enable local councils to offer relevant programs for different types of households according to their context.

A refined representation of how energy use is spatially distributed in Scotland and its relationship with socioeconomic characteristics at the household level is needed to approach these upcoming challenges. Yet the granularity required for such analysis is typically unavailable due to privacy restrictions and the absence of open data.

This study aims to develop a spatial microsimulation model of Scotland's energy consumption patterns by combining the National Energy Efficiency Data Framework, the 2022 Census, and Energy Performance Certificates, we overcome privacy restrictions and address the scarcity of detailed building-level data producing synthetic population and household data. The model enables exploratory policy simulations to assess impacts on local policy frameworks and provides a tool to identify and mitigate energy injustices. In this session we will showcase the synthetic dataset designed for energy studies and present preliminary findings on spatial disparities in household energy consumption across Scotland.

Keywords: Energy consumption, spatial microsimulation, energy inequality

Jonathan Lindsay: Configuring (in)justice: Market formation and Energy Justice in Scotland's Dounreay Programme

Energy transitions are not merely technological or economic shifts. They are processes of infrastructure building, institutional alignment, and moral choice. Decisions made early in the formation of energy markets shape innovation pathways, determine who bears the risks, assign decision-making power, and define benefits across space and time. While energy justice is influential in evaluating energy systems, its relevance to the formative stages of market creation remains underexplored.

This paper brings energy justice into dialogue with scholarship on market formation within Technological Innovation Systems, examining how markets are actively constructed through coordination, legitimation, and expectation building. Drawing on Boon et al.'s Market formation framework, it analyses how distributive, procedural, and recognition justice are configured through infrastructure investment, governance arrangements, and institutional decision making not as downstream outcomes, but as constitutive elements of market formation itself.

The analysis draws on a qualitative historical study of the Dounreay fast breeder reactor programme in Scotland, using parliamentary debates, government correspondence, and institutional archives from initial planning through decommissioning. The case reveals how early market formation enabled rapid infrastructural development and national technological ambition while simultaneously foreclosing local participation, marginalising community concerns, and deferring responsibility for long-term socio-economic and environmental consequences. Justice tensions intensified during market destabilisation and

decommissioning, exposing how early institutional and infrastructural commitments structured later vulnerabilities and constrained alternative pathways.

The paper argues that justice cannot be treated as an evaluative lens applied retrospectively to build infrastructures. Rather, justice is embedded in market formation processes themselves in coordination mechanisms that determine whose knowledge counts, legitimisation strategies that marginalise dissent, and expectation building that defers accountability. This has critical implications for contemporary low-carbon transitions: understanding how justice is configured during formative stages can inform more democratic, accountable approaches to the design and governance of emerging energy systems.

Keywords: Energy justice; Energy innovation; Market formation

Paolo Cherubini, Clair Cooper: Making “Enough” Actionable: Translating Essential Energy Needs into Electricity Provision

“Essential energy needs” appears across fuel poverty advocacy and sufficiency debates as an intuitively compelling baseline for justice: people should be able to access “enough” energy to live well. Yet electricity infrastructures and the market/regulatory arrangements built around them generally provision a uniform commodity, offering limited practical means to specify and secure “enoughness” without simultaneously opening contentious questions about authority, responsibility, and the boundaries of legitimate demand. Starting from the observation—developed in prior exploratory work—that current provision does not distinguish between minimum sufficient provision and unconstrained demand, this paper develops a conceptual framework to connect the ethical idea of “essential energy services” with the frictions that arise in attempts to implement it in practice.

The paper maps four implementation challenges within a defined scope (electricity as an energy vector; residential settings): (1) heterogeneity of household needs and contested categories of essentiality (e.g., care, medical dependence, or other non-universal needs); (2) housing condition and appliance stock as determinants of the energy required to realise the same basic services; (3) the role and limits of existing consumer safeguarding mechanisms; and (4) policy proposals that explicitly seek to protect “essential” usage through tariff design, including rising block approaches that place a lower-cost band under minimum needs while applying higher prices to higher consumption.

Rather than offering a single definition of “essential”, the framework surfaces key ethical and infrastructural questions—who decides, what is measured (kWh vs services), and how lower-bound protections interact with upper-bound concerns—aiming to support productive exchange between engineering approaches to Net Zero transition and energy-ethics scholarship on infrastructures, justice, and governance.

Keywords: fuel poverty, sufficiency, energy justice

Justice and Energy Transition 2

Androniki Papathanasi, Daniel Friedrich: Who is left cold in a marketised island energy system? An exploratory spatial analysis of housing efficiency, affordability exposure, and accountability in Orkney, Scotland

Remote and island regions are frequently portrayed as exemplars of the renewable energy transition, yet households can continue to experience cold, damp, hard-to-heat homes alongside high and volatile heating costs. This paper presents an exploratory case analysis of Orkney, Scotland, examining how housing energy performance and socio-economic conditions co-locate spatially, and what these patterns imply for accountability in marketised energy systems in the context of heating decarbonisation.

The empirical component links domestic Energy Performance Certificates (EPCs) for Orkney with small-area socio-economic indicators, using the Scottish Index of Multiple Deprivation (SIMD) and income proxy indicators, to produce descriptive maps and summary statistics. Housing efficiency is operationalised using standard EPC measures (e.g., band/rating thresholds), and the analysis maps where lower thermal performance and socio-economic disadvantage coincide, identifying areas of compounded exposure relevant to heating affordability pressures and adequate indoor warmth in a rural/island context. Using available EPC attributes, overlap areas are characterised by dwelling archetypes and heating attributes, and contextualised using area-level tenure composition to clarify the housing conditions represented within these concentrations.

The interpretive component situates these findings within debates on infrastructures, markets, and energy justice. Drawing on documented features of electricity market design and retail pricing—including wholesale price pass-through and the role of balancing and network-related costs—the paper outlines pathways through which cost volatility can be differentially experienced where building fabric is inefficient and retrofit options are constrained. The paper also considers how prevailing metrics and targeting rules can under-recognise combined housing-and-income vulnerability, with implications for the distribution of responsibility between households, regulators, and service providers.

Keywords: energy justice, fuel poverty, energy regulation

Chinedu Candidus Nsude: Power, Place and Justice: Reimagining Large-Scale Renewable Energy Infrastructure Planning through Social Ethics.

The global transition to renewable energy technologies (RETs) presents unprecedented opportunities to address climate change and energy access challenges. Yet, the rapid expansion of large-scale energy infrastructure often overlooks critical social dimensions, particularly energy and environmental justice (EEJ). This paper investigates the integration of social science, specifically energy ethics and justice into the technical and spatial frameworks that guide renewable energy siting and development. Drawing on a novel GIS-based multi-criteria decision analysis (MCDA) that integrates distributive, procedural, recognition, and restorative justice indicators, this study reveals how justice considerations can be systematically embedded within hybrid solar-wind power system site suitability assessments in Nigeria. The study findings expose stark regional disparities, where infrastructural conflicts, community willingness to transition, and electricity access converge shape ethical feasibility

alongside technical viability. By highlighting the persistent marginalization of vulnerable populations and the socio-political complexities underlying “just transitions,” this research challenges prevailing techno-centric models and advocates for participatory, equity-centered decision-making processes. This integrative approach not only enhances the legitimacy and sustainability of energy infrastructure but also redefines success metrics beyond energy output to include social empowerment and conflict mitigation. The paper concludes by outlining policy pathways and methodological innovations necessary to mainstream energy ethics in infrastructure planning, urging scholars and practitioners to embrace interdisciplinary frameworks that reconcile technical rigor with justice imperatives. This work contributes a transformative lens for energy transitions, emphasizing that equitable energy futures require the deliberate integration of social sciences to navigate the intertwined technical, environmental, and ethical landscapes of renewable energy development.

Keywords: Social ethics, Renewable Energy Planning, Energy and Environmental Justice

Justice and Energy Transition 3

Jan M. Jasinski: Wishful policy and its consequences: An ex-post analysis of the distributional effects of Domestic Smart Energy Solutions in Scotland

The net zero strategy of many Western countries, including Britain, relies on the deployment of innovative domestic low-carbon technologies in the home, including heat pumps, PV panels, batteries, and smart meters; a major example of technological solutionism. In Britain, the deployment of these innovative technologies, and their associated benefits, has been primarily left to the market, despite common awareness of the many injustices residing within the nation’s existing energy system, and its approach to innovation policy in particular.

Therefore, to better understand how the market distributed these innovative technologies so far, and how this distribution could be improved, a clear picture of the existing deployment of these technologies is necessary.

To do so, this paper combines two novel, highly geographically granular, nationwide datasets involving the time-bound diffusion of various Domestic Smart Energy Solutions (DSES), with a variety of demographic indicators, to conduct an ex-post analysis of the diffusion of these technologies, embracing an energy justice perspective. Thanks to the high granularity of this data, smart meter installations can be directly correlated with the deployment of DSES on a nationwide scale, to understand the connections between smart metering, low-carbon technology, and socio-technical relationships, and identify the pockets of society which are most likely to miss out on the market’s distributional forces.

Using concepts from novel energy justice perspectives, this research advances the methodological approach to large-scale energy innovation diffusion work, while further developing what just diffusion of innovation can look like. In empirical terms, it identifies specific areas in which energy innovation has diffused against expectations, which will be considered in later work.

Keywords: Energy justice, diffusion of innovation, policy

Nayani Ghoshal: Decisions from the grounds - Insights into small-scale renewable energy implementation and the role of local governance

Renewable energy technologies, particularly off-grid solar energy technologies (such as roof-top solar photovoltaic systems and solar cookers) are critical to transform rural energy systems, especially where access to the electricity grid is technologically and economically limiting. The dominant discourse on current policies of governance in enabling this rural energy transition, particularly in the Global South, tends to focus on meeting the national-level targets. However, limited attention is given to the interplay of regional and local governance. In this regard, this paper explores the local governance dynamics of decision-making for implementing small-scale renewable energy technologies in rural West Bengal, a state in Eastern India. It attempts to investigate how these technologies are implemented and the socio-material factors (referring to the intertwined nature of social and physical spaces and how local stakeholders, including government bodies, organisations, and local people, play a role in energy transition decisions (Gailing and Röhring, 2016)) that influence decision-making at local levels. To achieve this, this paper draws on qualitative case studies and elite interviews in the rural regions of the Purulia District of West Bengal. Analysis shows that the local stakeholders involved in the implementation of small-scale off-grid solar energy technologies are influenced by their own social hierarchical positions and social groups, affecting their decision-making and influencing procedural and recognition justice in the outcomes of renewable projects. In effect, therefore, this paper argues how local and regional level governance negotiates decision-making and navigates social hierarchies and procedural justice, affecting both the recognition of the voices of the beneficiaries and the outcomes of the renewable energy projects.

Keywords: Small-scale renewables, Local governance, procedural justice, recognition justice, rural energy transition

JusticeFirst! Energy transitions and energy justices in marginalized communities

Marcello Graziano: From Green Discontent to unjust staticity: evidences from Justice40 Communities in the USA post-IRA.

Panel Abstract

Over the past decade, the USA has undergone a series of energy transitions that have changed and are deeply changing the country's energy profile, and questioning its approach to planning for and governing of energy processes. From a fossil fuel powerhouse until 2020, to a global leader in renewable energy technology thanks to several legislative initiatives, and especially the Inflation Reduction Act of 2020 (IRA), as of 2025 the USA has entered a phase of uncertainty, marked by a dynamic energy landscape and a roadblocking federal government. Building upon the research of Gallagher et al (2023), Hoicka et al. (2025), and the work conducted in collaboration with ISO New England, this work presents the lessons learned from the last lustrum of U.S. energy policy. The evidences emerging point at severe issues in the energy planning system as a whole, with bottom-up and localist frameworks used to slow down or even block transformative changes. The recent successes of these blockades are particularly evident in the transmission and offshore wind energy sectors. The slow down of transition processes, coupled with engrained regional socioecological and socioeconomic inequalities, risk to

generate an unjust staticity, where the status quo is maintained, and the cost of inaction are bore by the same groups and communities. In this work we argue that this staticity is operationalized and fueled by the 'habit' of these groups and communities to become bearers of liabilities. The work further proposes an agenda for overcoming the bottom-up/top-down dichotomy, without the risks of the an 'Abundance discourse', but, rather, built around existing democratic and engagement processes.

Keywords: IRA; Transitions; justice.

Gwendolyn Blue, Harsh Jatkar: Energy justice: Why provenance of conceptual frameworks matter

Energy justice is gaining increasing attention - nationally and globally - as a key dimension of energy futures. Early formulations of energy justice emerged in the context of sustainable development and focused on distributional processes. More elaborate frameworks soon followed, highlighting other dimensions such as representation, recognition, fairness, equality, and intergenerational dynamics. Building on efforts to expand the conceptual horizons of energy justice, this presentation calls for deeper recognition of the contexts of energy justice concepts. Efforts to establish common theoretical roots and foundations for energy justice run the risk of discounting regional, cultural, and political variability. In short, justice is not an apolitical nor context-independent term, particularly when viewed with histories of colonization in mind. To illustrate, we draw on arguments raised by Indigenous scholars in the settler colonial state of Canada about the limitations of Euro-western framings of environmental justice, and examine shifting configurations of energy justice in the context of post-colonial India. Overall, we call for more attention, not only to how justice is framed, but by whom, for what purposes, and in what contexts.

keywords: energy justice, post-colonial, decolonial

Henrike Rau: Energy cultures in transition: Lessons learnt from community energy projects

This paper fuses conceptual considerations with empirical case study material from Ireland and Germany to explore cultural differences in how energy is viewed and used. Building on a growing body of international literature on energy cultures, it challenges established approaches to energy transition that focus exclusively on individual-level behavior change and technological solutions. In this context, the concept of energy cultures offers a credible alternative that treats energy use as the result of culturally rooted everyday practices, including their socially negotiated meanings and their materialities. These, in turn, are embedded in local conditions that reflect past and present energy systems, practices and social relations. It is argued that treating energy use as cause and consequence of place-specific cultural practices opens new avenues for social scientific energy research that looks beyond socio-technical systems. At the same time, a focus on energy cultures draws attention to local power relations and issues of (in)justice that would otherwise remain invisible.

The empirical part of the paper utilises qualitative and quantitative data from sustainable energy initiatives in Ireland and Germany to highlight the benefits of culturally sensitive energy policy and practice. Drawing on interview and survey data, ethnographic fieldnotes and observations, the paper reveals the effectiveness of local approaches to energy transition that

take seriously the concerns of citizens and communities while also capturing potential pitfalls and limitations. In particular, the paper provides evidence of the power of deliberate disruptions to established energy-intensive practices through change initiatives that involve different types of households and that facilitate collective action at the local level. The paper concludes with some recommendations for the design and implementation of local energy transition plans in other cultural contexts.

Keywords: energy cultures, everyday practices, energy justice

Emanuela Ferrari, Jennie C. Stephens: The Dangers of Performative Public Participation: The Potential and Pitfalls of Co-creation

Public participation is widely recognised as a crucial part of good governance and policymaking, especially in the context of ‘a just transition’ and ‘just sustainability’. Since Arnstein’s articulation of the ladder of participation in 1969 to the more recent popularity for co-creation, participatory mechanisms have been enthusiastically supported and applied in many contexts.

Co-creation holds huge potential to generate relevant, appropriate and actionable knowledge, to increase a sense of ownership among constituents, to expand legitimacy in decision-making, and to promote democratic accountability. Each of these potential benefits link to efforts to reduce and reverse social polarization, which is a growing feature of current politics in many places around the world. However citizen participation is not exempt from questions and critiques.

This paper expands, updates and builds on critiques to participation by arguing that the practice of co-creation in many environmental governance processes runs the risk of being superficial and tokenistic. Drawing from critical participation scholarship, the concept of performative participation is developed to refer to a dangerous type of co-creation. Also, the risks associated with the rise in co-creation with industry actors rather than communities and publicly serving organisations are highlighted. Several characteristics of performative participation, including disregard of power dynamics, emphasis on procedural and managerial mechanisms, lack of implementation, and a focus on financial mechanisms are proposed.

Empirical examples from Ireland, a country that has invested heavily in participatory processes and co-creation mechanisms, are provided to demonstrate key points. Reflections on how performative participation reinforces a neoliberal governance framework, where the pretence of political action conceals issues of climate obstructionism and market power are discussed. Ultimately performative participation both prevents much needed civil society oversight and critique over current political dynamics and hijacks the possibility of a socially just and sustainable future.

Keywords: public participation, co-creation, sustainability transition

Debra J. Davidson: Justice and energy transition: synergies and tensions

Abstract: As evidence of the severity of implications of global warming escalates, so too do observations of injustice in the distribution of those impacts, and accountability for them. Efforts to address the climate emergency in the form of mitigation and adaptation strategies also entail justice implications, which tend to get far less research attention. Calls for rapid

renewable energy transition and its associated technologies are a case in point. There is no question that eliminating the greenhouse gases associated with fossil fuel production and consumption will benefit everyone across the globe by slowing global warming, particularly those most vulnerable to its effects. Renewable energy technologies also hold promise in the areas of job and business creation, and electrification in remote regions, among other benefits. However, urgency often runs the risk of sidelining considerations for equity and justice. The local socio-ecological implications of rapid expansion in the exploitation of critical minerals have already received attention, with some observers referring to such exploitation in the name of climate mitigation as ‘green colonialism.’ There are several other dimensions of energy transition with justice implications, including the prohibitive costs of many renewable energy technologies, unintended effects on local cultural and livelihood practices, and decision-making procedures in which Indigenous rights-holders and affected communities are excluded. Underlying these processes is a privileging of new projects and practices that are prescribed by western knowledge and worldviews. These synergies and tensions between climate response strategies and justice will be discussed in this presentation, with reference to several illustrative examples drawn from case study research being conducted as part of the international Justice First! project, funded by the New Frontiers in Research Fund.

Keywords: Justice; Energy Transition; Communities

Gregory Pierce: Lessons Learned from Los Angeles’ Just Energy Transition Initiative” as part of already-accepted panel “JusticeFirst! Energy transitions and energy justices in marginalized communities

This study is based on already-accepted papers in Nature Energy and Energy Research Social Science. Decarbonization of our energy systems is key to alleviating environmental injustices and enabling a more sustainable, livable planet for all. Yet, without careful planning, the costs of this transition are likely to fall most heavily on those least equipped to bear them. To address this challenge, research in the growing field of energy justice has advanced guiding theoretical frameworks and principles. While these frameworks have been widely analyzed and applied to small-scale sustainability projects, far fewer efforts have applied an energy justice framework at scale or in direct collaboration with energy providers. This article examines one such prominent case: Los Angeles’s LA100 Equity Strategies (LA100 ES) effort. Over two years, the city of Los Angeles convened its local electrical utility, the Los Angeles Department of Water and Power (LADWP); national and local researchers; and local community-based organizations to develop strategies for achieving a 100 % renewable, equitable electricity grid by 2035. Drawing on participant observation and document analysis, this case study highlights both the promise and the limitations of applied energy justice in the context of large-scale grid decarbonization. While demonstrating the feasibility of community-engaged planning at scale, the effort also highlights the challenges of turning research into action – as the bulk of identified strategies have not yet been implemented. Ultimately, the case emphasizes that broad frameworks may be insufficiently subtle to address entrenched barriers to energy justice, and should be complemented by place-based strategies that acknowledge the structural and moral components of the modern energy system.

keywords Equity, local policy, energy transition

Katrina Rønningen & Sunniva Solnør: Energy transition, land losses and burdens in Sápmi. Divergences in governance structures, participatory mechanisms and justice claims

The operationalization of low carbon energy transition remains problematic, often inequitable. This is especially the case for Indigenous Sámi reindeer husbandry, facing the “double burden of climate change”; 1) impacts of climate change, and 2) climate mitigation; policies and strategies for the low carbon energy transition, constraining reindeer herding through land fragmentation and land losses.

Our study is part of the international JusticeFirst! project, based upon collaboration and co-creation of knowledge with local communities and indigenous groups related to energy transition, climate and justice issues. Drawing on insights from two focus group discussions held in 2024 and 2025 with 8-10 members of the Norwegian Reindeer Herder's Association and local units (sijte) in Mid-Norway, including a qualitative research and policy review, our aim is to contribute to better and more just plans and processes, and land use planning.

Sámi reindeer herding practices with seasonal movements, based upon land use rights, national legislation and international conventions, clashes with energy investments and associated infrastructure developments. (Cfr the Fosen case and the Supreme court decision of 2021.) This interacts with and adds to already strong cumulative effects of previous and other ongoing developments, including hydropower, cabin construction, mining, roads etc.

The extensive governance systems, including consultation regulations and EIAs, are supposed to ensure meaningful participation, however forces Sámi communities and reindeer herders into time-consuming and resource-intensive battles, at the cost of time spent on their livelihoods and the very culture they seek to protect.

We claim a third burden, implying added labour – both practically and emotionally. Devolution of power, without devolution of resources and expansion of institutional capital, risk reducing participatory decision-making to rather a symbolic exercise, not producing justice.

Key words: planning processes, justice, indigenous land use rights

Patricia Romero-Lankao: How do City Officials Target Equity in Urban Planning? Insights from Mexico City and Los Angeles

Changing the trajectory of global climate change will require transitioning away from fossil fuels as a critical component of climate action. Yet decisions around what energy actions to embrace, who will make those decisions and who will benefit are fraught with contention. Scholars and practitioners are, therefore, calling for a nuanced understanding of how principles of justice are operationalized in urban energy transition planning.

We compare how equity principles are operationalized in planning in Los Angeles USA and Mexico City. These cities share some features, such as challenges in accessing affordable energy and housing, adequate transportation services, and barriers to navigating climate and socioeconomic stressors in equitable and sustainable ways. At the same time, each city varies in ways that bring depth to our comparison and contribute to the panel, “Justice First! Energy transitions and energy justices in marginalized communities.” For instance, Los Angeles plans a net-zero grid by 2035 and net-zero transportation, buildings, waste, and wasted water by 2050.

While Mexico City lacks net-zero targets, it has a long tradition of localizing climate action, most recently as part of its solar, mobility and disaster risk programs.

We critically engage with ecological modernization and sustainability transitions literature to examine whether, despite their differing socioeconomic, and political dynamics, the cities share foundational narratives and sociopolitical regimes influencing how equity is operationalized in energy transition planning. We draw on an analysis of policy documents covering 2000-2025 and semi-structured interviews to urban governmental and non-governmental actors, conducted during September 2025 and March 2026. The semi-structured interviews explore the core analytical dimensions of equity in climate action. These dimensions are designed to capture both discursive (narratives, visions, paradigms) and structural (policies, institutions, power) elements that influence how climate action promotes equitable and just sustainability transitions.

Equity and justice, city planning, climate action

Lines, Loops & Tentacles: Poetic Tools for the Polycrisis

Presentation & poetry reading with Q&A; Rebecca Sharp.

Poet and interdisciplinary artist Rebecca Sharp was the inaugural Artist in Residence with the CEE in 2022-2024, during which time she researched and wrote the poetry collection *Long Field Loop* (Tapsalteerie 2024), longlisted for Scottish Poetry Book of Year. Rebecca will talk about the creative process behind and between this and two other works, which together complete a trilogy. Exploring the poetics of oil and the imagination, *Rough Currency* (Tapsalteerie 2021) excavates our personal, political, mythological and geological entanglements with fossil fuels and the oil economy; receiving a Royal Society of Literature Award and an Art of Energy Award with the CEE. When so much of moving forward includes looking back, the poems in *Long Field Loop* (2024) make space for making amends – where land, humans and more-than-humans explore patterns of experience in times of reckoning. Completing the set is the forthcoming collection *Squid Complex: a commonplace of complicated loss* (Tapsalteerie 2027). Following the verticality of *Rough Currency* (oil, economics, extraction) and the cyclical motifs of *Long Field Loop*, *Squid Complex* presents a hydropoetic horizontal and rhizomatic expansion. The title coins a term for being, having or adopting a ‘squid complex’: tentacular expressions of interconnectivity, reciprocity and mutuality; exploring complex attachments; finding or inventing new expressions of repair, reconciliation and change.

Literary Approaches to Petro Knowledge

Harry Pitt Scott: The Promise of Electrification: Silicon Valley's Science Fictions

‘Electrify everything’ is the new guiding mantra for the transition away from fossil fuels, shaping corporate strategy, climate policy, and financial investment, and rapidly cohering into a new, hegemonic common sense. Who lays claim to this hopeful future? This paper proposes to analyse how the narrative of electrifying everything is used in Silicon Valley (a shorthand for the class of tech entrepreneurs). The ‘promise of infrastructure’ made by Elon Musk, Bill Gates, Saul Griffith, Marc Andreessen, and others, is that electrification will increase efficiency, enable technological innovation, drive growth, and solve climate disaster. As this series of promises

implies, electrification means more than the replacement of carbon-emitting technologies with electric-power equivalents. I intend to analyse the promise of electrification as an expression of the technological and political outlook of an oligarchic class, for whom it offers the possibility of consolidating power through infrastructure and the ethical legitimization of that power.

To understand and critique this new ethos, I focus on electrification in Silicon Valley as a form of speculative worldmaking. Tesla's Cybertruck and Diner; OpenAI's expectation of the technological singularity; Andreessen's techno-optimism: Silicon Valley is steeped in images, concepts, and ideas taken from science fiction. These electrocapitalists read sf as ethical imaginary for a techno-optimistic, libertarian, pro-market form of life, where mind and the body have been remade through information technology, artificial intelligence, genetic engineering, and medical bodily modification. They see the future of humanity in the stars, driven by exponential growth in energy and artificial intelligence into a multiplanetary capitalist utopia. Thinking through narratives of a hopeful future enabled by electricity infrastructures will let us see how energy

Keywords: Electrification; Silicon Valley; Science Fiction

Inna Häkkinen: Chornobyl 2086: Re-launched Nuclear Infrastructure as a Hyperreal Cityscape in Tetiana Tikhovska's 'Anthill'

Fictionalizing Chornobyl in speculative narratives tends to conceptualize the nuclear site as a mythopoeic landscape, producing new cultural narratives and exploring nuclear as a generative myth by extending Barthes's myth theory (1957) into the realm of technological myth-making, which positions energy infrastructure as a modern mythic space, that embodies hope, hubris, and apocalypse simultaneously.

The presentation aims to outline the literary dimensions of a '*hyperreal cityscape*' as a manifestation of Chornobyl post-nuclear hyperreality, where fantasy, memory, and technological narratives collide. Regarding the future Chornobyl as a simulacrum of the pre- and post-disaster speculative worlds, blending reality with manufactured ecological and technological imaginaries (Orvell 2023), resonates with Baudrillard's concept of hyperreality – '*reality itself is produced as a network of models, from which the real has been evacuated and replaced by a hyperreal space of operational signs*' (Baudrillard 1994) – but contributes to positioning nuclear infrastructure itself as a simulacrum, blurring distinctions between real and hyperreal ecological threat, complicating environmental storytelling and memory politics in nuclear landscapes.

The presentation introduces Tetiana Tikhovska's *Anthill* (in Ukrainian origin: Тетяна Тіховська, *Антхил*, 2019), speculative 'chimeric' fiction, depicting a re-launch of the Chornobyl nuclear power plant in 2086 and the creation of a futuristic city nearby, named Anthill after the enormous anthills, observed in the radiation de-contaminated area, and the ambitious attempt to rehabilitate the exclusion zone through advanced technological interventions.

Manifesting a layered narrative depiction of re-launched Chornobyl energy infrastructure (at socio-technical, ecological, ethical-political, and memorial levels), which interacts dynamically to create a complex narrative – '*a 'polysemic' space, inviting multiple interpretations*' (Fedoniuk 2024) – that reflects a vision of technological progress as both a solution to past catastrophes

and a source of new vulnerabilities, as well as critically interrogates humanity's relationship with nuclear technologies.

Via appealing to *radiogenic resilience* (Andrade 2022; Kumar 2023) and *nuclear ethnoscape* (Appadurai 1991; Chun 2012) the presentation facilitates the discussion on a re-born nuclear infrastructure in speculative narratives as a battleground for memories (official, traumatic, and mythic), as a space of reconfiguring local and global ecological identities, and as a substrate for new energy narratives, where engineering feats intersect with social anxieties, environmental risks, and the specter of future scenarios.

Keyword: hyperreal cityscape, speculative narrative, Chornobyl 2086

Matthew Pangborn: Energy's "Unthinkability": Horror in American Science-Fiction Film of the 1970s

For centuries, our understanding of energy has taken form in stories. But our most powerful story has been presented as a non-story: energy is like any other commodity, its significance captured by quantification, "production" rising to a peak. That peak, in turn, reflects how the fossil-fuel age has been commonly understood as a techno-utopian progress to a rational and moral "high ground." Yet, as Rüdiger Graf points out about the 1970s' oil shocks, our "petro-knowledge," dependent on forecasts of complex systems, is more a matter of "managing ignorance," even navigating a "sea of irrationality." This observation is not meant to lay blame, or even to find fault, but to recover the complexity of the subject, the way that energy is "lived" rather than known. Indeed, it is quite possible that narrative is one of humanity's earliest and most valuable energy levers, attempting as it does through figure, compression, and self-reflexivity to account for a complexity of experience inaccessible to distanced observation. The danger in our "energy telling," then, is not the story, per se, but rather the oversimplification inherent in what David Nye describes as a typology of "explicit narratives," including the tropes of "natural abundance" and "human ingenuity" in the progress myth. This paper adapts what Eugene Thacker calls the "horror of philosophy" to urge us instead to think through our fossil-fuel encounter as the confrontation of a kind of "unthinkable," which arises again and again in what Nye calls "implicit" narratives, such as the American sci-fi horror of the 1970s, which explored the crises of the decade, crises that persist today. Is it possible that by confronting a similar "horror of energy" in such narratives that we might find a path beyond the "stuckness" that Mark Simpson and Imre Szeman call the "defining condition of our time"?

Keywords: narrative, petro-knowledge, horror

Mapping the Corridor of Impact: Affects and Pathways of Energy Transportation Infrastructure

Convenors: Caura Wood, Arthur Mason

Panel Abstract

In what way does the concept of "corridor" reconfigure landscapes and livelihoods as host to energy infrastructure? Taking inspiration from Andrew Barry's (2013) insight that "mapping the corridor of impact" provides solutions to biopolitical questions of which communities count as

affected, this panel invites papers to address the abstractions and materialities of corridors where energy makes or is expected to make an impact. Energy corridors take various forms including but not limited to trunk pipelines, transmission lines, shipping lanes, and sea infrastructure. They index pathways that open possibility for traversing the gaps between the “here and there,” the production hinterland and consuming metropolis, thus creating conditions of spatial compression. They call attention to environmental flow and its governance through digital means (drones, remote sensing) and other configurations that conjoin assemblies of material entities with competent agents engaged in valuation practice. By uniting separated landscapes, the corridor transforms the old dichotomy of nature-culture by organizing the world and its resources through projected symmetries thereby working to erase the inevitable frictions encountered in making things flow. This panel asks, what requirements enable the corridor as conditions of impact? How is the energy corridor arranged intellectually, imagined pragmatically, and implemented authoritatively? This panel welcomes papers that ethnographically engage with the corridor concept with respect to energy infrastructures, ethics, and transition.

Moral Economies of Net Zero Infrastructure

Convenors: Hannah Knox, Itay Noy,

Panel Abstract

In this panel, we invite papers that explore the planning, development, implementation, and dismantling of infrastructures related to wider projects of decarbonisation, often framed under the banner of ‘net zero’. Many countries and cities around the world have made ambitious commitments towards decarbonisation with net-zero targets inscribed in laws, strategies, and policies (with some aiming for as soon as 2030). While some governments, local authorities, and organisations celebrate decarbonisation as the basis for local and national economic renewal, others worry about the costs that decarbonisation projects will entail. Many are working to find novel financing models for net zero infrastructure projects by developing new avenues of capital investment, alternative conceptualisations of social value, or a reconsideration of existing energy policies that maintain the status-quo. These approaches make claims not only about carbon emissions reductions but also about issues such as local community needs, ownership and control, distributions of resources and benefits, and forms of decision-making. Meanwhile, backlash against net zero projects also frequently hinges on moral economic questions about who becomes asked to bear what costs, and with what implications. In this panel, we will explore net zero infrastructure projects as sites of deliberation about moral economies, opening up questions about the economic arrangements that decarbonisation projects demand, and the values, ethics, and questions of fairness that they entail. In paying attention to moral economies of decarbonisation, our panel will contribute to broader debates on infrastructures of energy by tracing how materially grounded economic imaginaries animate and constrain infrastructures and their promises. We are happy to receive papers that discuss decarbonisation projects in any part of the world, but are particularly keen to hear from those working ethnographically or institutionally outside the Global North.

Olga Bostan: The Impasse of Decarbonisation: Moral Economies of Heat in Bucharest

his paper examines Bucharest's district heating (DH) system as a site where competing moral economies of decarbonisation are negotiated and contested. As the largest centralized heating network in the European Union (EU), the system sits uneasily within Romania's commitments to EU climate policy frameworks. Built under socialism to provide universal, affordable heat, the network today operates in a state of infrastructural decay, chronic underinvestment, and fragmented governance. These conditions materialise into residents' lives as prolonged interruptions to hot water and heating, while simultaneously complicating efforts to align Romania's energy system with net-zero ambitions.

Drawing on ethnographic research with municipal and state actors, energy policy experts, pipe repair workers and residents, the paper traces how decarbonisation is articulated as both a technical and moral project. At the policy level, EU decarbonisation targets promise modernization, efficiency, and environmental responsibility, yet their implementation hinges on financing mechanisms, co-funding requirements, and administrative capacities that local authorities often lack. Subsidies designed to maintain affordable heating and hot water are simultaneously framed as social protections and as obstacles to modernization, producing tensions between welfare obligations and market-oriented reform.

I argue that Bucharest's DH system reveals an impasse characteristic of post-socialist energy infrastructures: an infrastructure too large to abandon, too old to modernise, too essential to neglect. Proposed futures such as partial privatization, decentralization, or individualized heating, carry uneven social and environmental consequences, risking increased emissions and deepened inequality. In this context, net zero functions less as a clear pathway and more as a moral horizon that redistributes responsibility, risk, and blame across municipalities, states, and supranational institutions. This paper shows how infrastructures become arenas where questions of fairness and responsibility are worked out in practice and highlights how historically grounded welfare expectations and material constraints shape the limits and possibilities of energy transition in Eastern Europe.

Clinton Westman: Weird Decarbonization Infrastructure in Canada's Oil Sands

In recent decades, owing to the growth of oil sands extraction in northern Alberta, Canada has moved to near the front of the pack as an oil-exporting nation. Canada's extraction and processing of oil sands is its most significant source of greenhouse gas emissions (even without considering the end uses of the fuels) and the sector's emissions are growing. New megaprojects are being proposed to move the refining and extraction processes towards net zero while continuing to produce increasing amounts of oil. In addition to nuclear reactors to power oil sands extraction and refining, such proposals include large-scale carbon sequestration projects, which will involve piping carbon dioxide emissions to central locations and injecting them into geological formations. Indeed, carbon sequestration has become the industry's preferred climate change mitigation strategy. One such project would pipe emissions 400 km and bury them, in hopes of reducing sectoral emissions by 22 megatonnes per year. Yet such proposals remain speculative, experimental at scale, and incredibly expensive. The federal government is considering providing funds for this \$16.5 billion project, which dwarfs anything yet attempted, inevitably engendering its own ecological and social impacts. Not incidentally, carbon sequestration is also forecast to enable more efficient extraction of oil, by repressurizing

existing deposits that had already been tapped. I have suggested that such proposals are hubristic and defy both Indigenous ontological and treaty relationships, thereby bringing new forms of risk. I want to continue to develop this idea of hubristic, even weird infrastructure, by examining the moral economies of such megaprojects, which use net zero rhetoric as a form of greenwashing to attract public investments to continue the extraction of fossil fuels.

Diogo Sobral: Covas do Barroso: Moral economies of the energy transition and the NIMBY argument

This paper examines resistance to the proposed Barroso lithium mine in northern Portugal as a site where the moral economies of decarbonisation are actively contested and reconfigured. While European and national authorities frame lithium extraction as a technical necessity for the green transition and the achievement of net-zero targets, local opposition reveals how decarbonisation infrastructures are embedded in competing understandings of the common good, sacrifice, and responsibility.

Drawing on collaborative ethnographic work in Covas do Barroso, the paper argues that the conflict is often mischaracterised through the depoliticising label of NIMBYism, which assumes a rigid division between private interests and public necessity. Such framing reduces local resistance to the defense of household or village interests against broader societal needs. Instead, I propose analysing the struggle through the tension and mutual constitution between *oikos* (the sphere of everyday life, subsistence, and care) and *polis* (the sphere of public deliberation and collective decision-making).

Initial opposition often emerges from disruptions within domestic and livelihood spaces damaged beehives, threats to water, land, and quiet living. Yet these experiences quickly become politicised, linking personal harm to broader questions about energy policy, territorial sacrifice, and the distribution of transition costs. Local actors, corporations, state agencies, and activists all mobilise competing notions of the “common,” producing overlapping scales of belonging—from family and village to nation and planet. Resistance thus does not merely refuse infrastructure but articulates alternative moral ecologies in which territory, continuity, and intergenerational responsibility are not considered expendable.

By foregrounding how private life becomes a site of political articulation, the paper challenges the assumption that opposition to net-zero infrastructures is anti-transition. Instead, the Barroso struggle reveals how communities contest the moral and economic arrangements underpinning decarbonisation projects and demand transitions that do not reproduce sacrifice zones. In doing so, the paper contributes to debates on energy infrastructures by showing how moral economies shape both resistance to and possibilities for more just pathways toward decarbonisation

Emiliano Castillo Jara: Competing storylines in Canada's net-zero discourse: Contestation over CCS infrastructure projects

This paper addresses the inequalities in the planning and development of net-zero infrastructures, specifically Carbon Capture, Utilization, and Storage (CCS) projects, in the Canadian oil sector. Framing net-zero as a driver of sustainable and inclusive economic development, the federal government has promoted the goal of net-zero emissions by 2050

through legislation and policies. This discourse, however, is inconsistent with Canada's growing greenhouse gas emissions from heavy crude oil extraction and the contestation dynamics surrounding net-zero projects. Environmental organizations, some First Nations and Indigenous groups, and researchers oppose government and corporate-led CCS projects, arguing they perpetuate fossil fuel expansion, land dispossession and greenwashing practices. By contrast, other First Nations see the ownership of such infrastructure projects as an opportunity to gain influence over land-use decision-making and ensure a more equitable distribution of economic benefits. Within the Canadian government, disagreements persist between fossil fuel-dependent province of Alberta and the federal administration regarding the pace of emissions reduction in the oil sector and its potential impacts on the regional economy. A focus on the Canadian case is relevant because it exposes the contradictions of the net-zero policy in its attempts to decarbonize the oil industry while ensuring a just energy transition. Employing Hajer's argumentative discourse analysis, this paper examines competing storylines through which Canada's net-zero discourse is constructed, governed and contested across multiple scales and policy arenas. In doing so, this paper contributes to scholarly discussions about what kind of energy futures are being articulated, by whom, and with what socio-economic and environmental implications.

Marcel Llaveró-Pasquina: Fossil fuel companies, environmental conflicts, energy transition

In response to mounting political and social pressure to transform their business models, the fossil fuel industry is attempting to portray itself as "part of the solution" to the climate crisis by emphasising its investments into renewable energy, biofuels, green hydrogen, carbon capture and storage, and carbon offsets. However, environmental justice organisations have labelled these technologies as "false solutions" that do not address the root causes of the climate crisis and entrench environmental injustice and fossil fuel companies' power. In this paper, we formalise and operationalise a definition of false solutions by engaging with Gramsci's conception of hegemony and incumbent strategies, in particular the concept of *trasformismo*. We extend neogramscian theory by proposing a model of reproduction and reinforcement of power within and between three power domains: ideas, infrastructure, and institutions. Empirically, we explore the environmental conflicts that arise around the deployment of false solutions through a global analysis of 48 case studies in the EJAtlas and a coding methodology that identifies processes of power reproduction and reinforcement. We show that false solutions comprise an array of technologies that prolong fossil fuel hegemony and neutralise socio-political pressures for systemic transformation, thereby sustaining current extractive economic models that reproduce environmental conflicts and injustices.

Sebastian Koa: Panic at the 'Fish Disco': The Political Ecologies and Moral Economies of Nuclear Saltmarshes along the River Severn

Who bears the burdens of Net Zero infrastructures in the UK, and what forms do contestation take when communities reject these projects? Using a case study of the UK's Hinkley Point C nuclear power plant, this paper argues for studying contemporary energy transitions through the dual lens of political ecology and moral economy. Specifically, the paper contributes to a growing literature interested in reviving early disciplinary preoccupations with the moral economies of rural societies (e.g. Watts, 1983) and taking them in new directions. Empirically,

this paper traces the controversy that arose out of the ill-fated attempts by the energy company Électricité de France to nullify legal requirements to install acoustic fish deterrents for the power plant. It charts the company's efforts from 2020-2025 to substitute the deterrents with an alternative (notably, cheaper) measure for biodiversity mitigation: the creation of saltmarsh habitats by converting agricultural land along the River Severn. This was to be enabled through legislative powers granted to the project for compulsory acquisition of land necessary to complete it. Unsurprisingly, this resulted in a wave of panic and moral outrage that ripped through affected communities threatened with dispossession, and a rapid repurposing of local collectives – originally created to contest solar/wind infrastructure development – to resist this latest encroachment. Through this, the paper demonstrates that classic political ecological questions of the commodification and instrumentalization of nature – here, underpinning the larger driving interest of capital – can be productively analysed alongside questions of the competing moral economies of rural livelihoods and decarbonisation projects. Along the Severn, such controversies turn on mutually imbricating issues of competing moral identities, contested environmental knowledges, ignored histories and claims to inheritance, and customary relations of attachment to land.

John Szabo: Valuing Europe's Gas Infrastructure Futures, Limitations, and Morals

Valuing Europe's gas network has posed an immense conundrum, as it swung from a crucial component of the energy transition to being labelled a stranded asset to an essential tool dampening the adverse impacts of the recent energy crisis. This paper discusses the shifting futures linked to Europe's gas infrastructure to explore the political economy shaping relevant energy futures and the imprint this had on current policy. As the energy transition was poised to accelerate following the Paris Agreement, transmission system operators were vocal in supporting a hydrogen economy to sustain their relevance in Europe's energy infrastructure system. Initial policy indicated that their assets would be of value and they could extend the lifetime of the grid and reap profits accordingly. Technological and economic limitations as well as contradictions within fossil capital led policy-makers to reevaluate this trajectory, pivoting onto a path that would strand these assets. The energy crisis brought a turn, yet again, as most European states doubled down on their fossil gas reliance and expanded infrastructure, frequently supported by EU and national funds. Fossil gas' energy future remains bleak but it continues to play a strong role in the EU's energy mix and politicians have been less enthusiastic over its phase out than a few years, given the supply security risks and political blowback associated with the presumed costs of change. The 'value' of the gas infrastructure has thus drastically shifted as the EU's political agenda changes and the contours of alternative energy futures are constructed. This paper explores these dynamics by deploying a socio-technical imaginaries framework, which it expands with moral considerations as the political economy of the construction of social imaginaries have been deeply exclusionary while entailing a high cost to the broader populace.

Politics of Risk in Contested Energy Futures

Convenors: Emilka Skrzypek, Nick Bainton

Panel Abstract

As global energy systems face mounting pressures – from climate change to geopolitical conflict and financial volatility – the concept of risk is taking on new urgency and complexity. On the one hand, we are seeing how extractive and infrastructure projects previously considered too risky to develop are having their viability reassessed, and how geopolitical instability combined with the climate crisis reshape the notion of energy security. We observe how experimental technologies are advancing with less regulatory friction and weaker evidentiary thresholds than previously accepted, justified by the scale of the climate crisis. The risk of inaction pitched against risks associated with specific interventions. On the other hand, risk is no longer merely something to be avoided or mitigated; it is being actively recast as a form of innovation, leadership, and moral imperative. From venture capital funding unproven energy startups to governments subsidizing uncertain infrastructure and extractive bets, new narratives are emerging around what counts as acceptable—or even visionary—risk.

Risk, in this context, is not just something to avoid or manage. It is also being used to justify action: by governments backing strategic industries, by investors funding unproven solutions, and by institutions reframing uncertainty as opportunity. Yet this raises important questions: Who defines what counts as an acceptable risk? Whose interests are protected, and whose are exposed? How do financial markets and public policy adapt to this shifting risk landscape? And how do narratives of risk shape our energy presents, and futures?

Ming-Jen Wu: Negotiating Risk and Benefit: The Local Politics of Geothermal Extraction in Taiwan

This paper explores the competing notions of risks that have become a central feature of geothermal extraction projects on indigenous territories along the Jinlun River in Taiwan. Among significant challenges marked by operational uncertainties and communication gaps among the government, corporations, and local communities, there is friction among indigenous stakeholders regarding distribution of risks and benefits. Upstream residents claim legitimacy through proximity, while downstream groups emphasize hydrological interconnectedness that extends the impacts, and benefit claims, all along the river. In those contexts, risk functions as a sociopolitical arena where social solidarities are actively contested and redefined during energy transitions.

Karina Standal, Tom Erik Julsrud: Imagined and constructed? Exploring how risk is framed and understood in the low-carbon energy transition in Svalbard

Svalbard and the main town Longyearbyen are facing simultaneous dramatic climate change and undergoing a low-carbon energy transition. There, the energy transition has been politically and socially contentious, as well as practically challenging. This article explores how the energy transition is being narrated locally in terms of different framings and understandings of risk. These divergent understandings reflect different institutions, actors and regulatory regimes, but also different value prioritisations and timescales. In this paper, we identify the dominant risk narratives and use them to analyse how they impact potential outcomes for the low-carbon energy transition.

Desen Özkan, Megan Egler: Moments of Risk Translation in New York's Offshore Wind Ecosystem

In 2011, three of New York's largest electric utilities requested an offshore lease from the U.S. Bureau of Ocean Energy Management (BOEM) for \$20,371. Six years later, the same lease sold to Equinor for \$42.5 million. Drawing on Actor–Network Theory, this paper examines four moments of translation—problematization, interessement, enrollment, and mobilization—to trace shifting configurations of risk and public value in New York's offshore wind ecosystem (2011–2025). Through documentary analysis and expert interviews, we show how political interventions, volatile markets, and emerging technological demands reshape risk narratives, while public actors underwrite transitions yet remain structurally constrained in shaping their outcomes.

Diana Ayeh: Critical Mineral Supply and the Geopolitization of Risk

This paper examines how a recent wave of geopolitization has reshaped the global landscape of mineral investment and policy. Drawing on long-term ethnographic research on gold investments in West Africa (since 2016) and lithium investments in Western Europe (since 2020), it explores how narratives of geopolitical risk drive political action and sustain the global economy of extraction. The analysis focuses on gold's socio-material construction as a safe haven in times of geopolitical instability, and on lithium's framing as a material solution to the climate crisis within global investment and policy arenas.

Faranak Hardcastle, Rini Astuti, Nick Bainton: Compound Risk and Ethical Preparedness in the Energy Transition

The rapid expansion of critical mineral extraction for the energy transition raises complex ethical challenges for communities, workers, and governments. Existing risk frameworks are poorly equipped to capture the interacting pressures shaping emerging mining frontiers, particularly where climate change and extractive development intersect. Drawing on the concept of double exposure, this paper reviews empirical research on climate change and critical mineral extraction and identifies a significant evidentiary gap: most studies analyse these pressures separately. We argue that addressing compound climate-extraction risks is essential for ethically informed and locally responsive governance of the energy transition.

Audrey Sérandour, David Schröter: Materialising green energy futures through financial flows: how risk is defined, mobilised and mitigated in critical raw material supply chains

In this paper we analyse the role risk plays in critical raw materials sourcing for the EU by looking at financial flows. We look at how actors arbitrate between different types of financial flows, mobilising risk to rally support for projects construed as strategic – combining profitability and geopolitical interests. Looking at financial flows as tools that materialise political decisions, connect diverse sets of actors across scales, and as productive of discourses and promises, we argue that they provide a privileged lens to understanding the role risk plays in securing critical raw materials for the EU.

Sean Field: The Technoeconomics of Climate Risk

Across industries and governments, risk is something that is calculable using technoeconomics, and should be managed. Within this context, climate change presents a range of risks across timescales, that threaten people's lives and livelihoods, as well as create opportunities for profiteering. This conference paper argues that 'climate risks' have failed to cause a fundamental shift in contemporary financial capitalist practices because the expected impacts of these risks are set beyond the timescales of contemporary technoeconomic calculations. Immediate-term climate change fuelled extreme weather is changing this, but has not caused a fundamental shift in how risks are calculated or addressed.

Alicia Phillips: Insuring climate change loss and damage: Future proofing future generations

Climate change heightens global risks and vulnerabilities, prompting countries to implement adaptation, mitigation and resilience strategies. Insurance is a key tool for managing climate related losses by supporting recovery, investment in resilience and innovative mechanisms like climate risk pools, green bonds and parametric coverage. These approaches provide financial protection and promote proactive risk management. As climate risks become more complex, insurance remains essential for sustainable development and community protection. This research utilizes case studies from Bordeaux, Venice, Barbados, and Antigua & Barbuda to explore how insurance influences climate policy, risk management, and equity for the benefit of future generations.

Realizing Environmental Justice in Ocean Energy: What will it take?

Panel convenors: Ichsan Rahmanto, Jeanne Féaux de la Croix

Panel Abstract

New energy infrastructures are part of increasingly busy, multi-purpose oceanic spaces. Many analysts see both great environmental justice risks in the rush to conquer 'blue frontiers', as well as opportunities for a 'new blue deal'. The uneven field of ocean energy expansion includes industries such as tidal and thermal energy extraction, deep sea mining of critical minerals for renewable energy production, hydrogen transport and offshore wind farms. The ocean energy field also includes community ambitions such as net zero island living, and alleviating energy poverty in Asia and the Caribbean through marine renewables. All of these projects intersect with established ocean roles in fishing, tourism, major transport routes - and as a habitat in its own right.

Building on the 'oceanic turn' in the humanities, as well as critical perspectives on emerging blue economies, this panel asks how ocean spaces are being reshaped by new energy infrastructures - and how scholarship might actively contribute to wise and careful handling of ocean energy. The panel builds on a differentiated notion of environmental justice that includes e.g. representational, procedural and distributionary as well as restitutive and transgenerational aspects, and does not shy away from critiques of the 'justice' framework itself. We ask:

- How do ocean energy projects invoke a wide variety of affective projections, from major investments, to outspoken resistance to faith in solving the climate and environmental justice issues?

- What is specific about the issues of trust and mistrust, hope and despair, in relation to ocean-based energy infrastructures?
- How do the specificities of ocean-based energy production, circulation and consumption impact established ,terrestrial‘ energy industries?
- What ocean epistemologies other than the ,blue economy/frontier‘ are suited to building ,right relations‘ around energy?
- What opportunities can we grasp to put scholarly analyses and networks in the service of blue energy justice?

Research at the Margins of Justice: the Ethical Dilemmas of Conducting Critical Research on Climate and International Development

Convenors: Natalie Boyd-Williams, Tash Perros, Jennifer Cronin

Panel Abstract

Carbon offsetting has become one of the few mechanisms through which climate finance reaches communities in the Global South. This flow of funding is sustained by positive narratives: claims of emissions avoided, environmental co-benefits delivered and lives improved. In this politically charged space, critical research becomes both necessary and dangerous. When findings expose failures, exaggerated impacts, or disempowered participation, they may lead to project cancellations, threatening the limited finance reaching marginalized communities.

This panel will examine the ethical, political and strategic tensions facing researchers working on carbon markets, climate finance and just transitions. Importantly, we confront the broader political context: in an era of rising backlash against climate action in some countries, critical research can be twisted to justify dismantling funding altogether, rather than reforming and redirecting it toward more effective, just, and locally accountable policies. Can critical research unintentionally do more harm than good? What does it take to carve out a space for research that is both honest and constructive, and is critical without being fatal to the very idea of climate solidarity?

Natalie Boyd Williams

Natalie’s research examined the efficacy, justice, and fairness of carbon offsetting through a biogas project in Malawi, where Switzerland intends to support the installation of 10,000 digesters under its Article 6.2 bilateral agreement. Natalie set out to assess whether the project was meeting its stated aims and benefiting the farmers it was designed to support. Instead, she encountered a difficult research process marked by limited access, ethical constraints, and pushback from project developers and local partners concerned that negative findings could harm the project, reduce funding for local communities, or be used by critics of carbon offsetting.

As a result, Natalie had to change her approach and could not collect the data she had originally planned. Her presentation offers an honest account of this process, including the compromises and uncertainties that shaped her fellowship research. It reflects on the ethical dilemmas of conducting critical research in a politically sensitive setting: how can research remain independent and constructive without causing harm to the people and institutions it studies, and without undermining the possibility of climate solidarity?

Hillary Chanda

This paper examines the ethical tensions surrounding climate finance and rural renewable energy transitions in sub Saharan Africa through the concept of the charcoal solar paradox, which was developed in Dr Chanda's doctoral research. Drawing on empirical evidence from rural communities, the study demonstrates how households frequently finance solar photovoltaic systems through charcoal production and other environmentally unsustainable livelihood practices. While climate finance and decentralised solar programmes are promoted as pathways towards sustainable development and energy justice, their implementation often remains entangled with poverty, environmental degradation, and unequal socio economic conditions. The paper reflects on the dilemmas faced by critical researchers whose findings may challenge dominant narratives surrounding clean energy transitions and climate solidarity. The study questions the ethical integrity of transition models that inadvertently entrench structural injustices. It argues for a constructive and justice oriented approach to energy research that foregrounds lived realities, participatory engagement, and the structural constraints shaping renewable energy adoption in marginalised rural communities.

Anna Seeger

Anna presents her research on "Elite-Energy Environments: Field experiences of Ethical Dilemmas and Power Dynamics in Studying Energy Leaders." This paper is based on ethnographic research experiences in studying strategically situated energy professionals – managers, executives, and investors in the hydrocarbon and renewable energy industry. It discusses inter-personal and ethical dilemmas that arise when working alongside 'powerful energy actors' with a specific focus on the positionalities of female researchers and the precarities (and opportunities) they may face. In recent decades, scholars have successfully pointed out the importance of 'studying up' (Nader 1982). Studies of energy leaders have demonstrated that essential insights towards energy futures and energy transitions can be gained from examining energy leadership (High 2022; Field 2025). However, there is a visible lack of scholarly examinations that explore the precarities researchers themselves may face when conducting in-person fieldwork in 'elite energy environments'. This paper asks: how may (female) researchers successfully and safely navigate ethically and personally challenging energy fieldwork environments? The aim is to start a conversation, and find (new) methodological strategies that may turn precarities into opportunities for safe and fruitful scholarly work.

Tash Perros

Carbon finance has become an increasingly important source of funding for clean cooking and biogas projects. At the same time, recent controversies surrounding overcrediting, methodological weaknesses, and inequitable benefit distribution have intensified scrutiny of carbon markets. This research uses semi-structured interviews with project developers, investors, intermediaries, nonprofits, and market experts to explore how recent developments in voluntary and compliance carbon markets are reshaping the distribution of costs, risks, and benefits within carbon-financed clean cooking and biogas interventions.

The findings reveal a sector in transition. Carbon revenues are increasingly central to the commercial viability of higher-tier cooking technologies, yet this dependence exposes companies to policy uncertainty, methodological changes, and volatile carbon prices. New technologies and research aimed at improving integrity, including digital monitoring systems and updated fraction of non-renewable biomass values, are rebuilding buyer confidence. However, they favour larger, better-capitalised firms and technologies that are easier to meter. Smaller local actors remain structurally excluded from carbon markets, while households often receive limited influence over project design and benefit allocation. Although there is growing momentum behind fairer benefit sharing and higher-quality credits, entrenched incentives continue to reward scale, opacity, and overcrediting. The research concludes by identifying governance and market reforms needed to improve transparency, accountability, and distributive justice in carbon-financed clean cooking transitions.

Samir Bahadur Thapa

Recent empirical studies and growing public scrutiny have intensified debate over the integrity of carbon markets, particularly clean cooking methodologies that credit emissions reductions from avoided biomass use. This presentation synthesises emerging research on over-crediting and its implications for trust, equity, and governance in carbon finance. Drawing on my professional experience in carbon methodology design and ongoing work on digital MRV and equitable allocation frameworks, I argue that integrity must extend beyond accurate carbon accounting alone. High-integrity systems depend on incentives that are aligned across the value chain and supported by transparent data architectures, fair revenue-sharing mechanisms, and inclusive governance. By situating technical accounting challenges within wider questions of justice and energy transitions, the presentation proposes a broader framework for carbon finance systems that are both environmentally credible and socially equitable.

Research design and codes of practice for maximizing the impact of energy and climate social science

Workshop

Abstract: Researchers today need to secure funding, collaborate, share data, publish results, commercialize research, and demonstrate impact. Early career researchers in particular are faced with multiple pressures around these challenges. This presentation will help scholars, especially early career researchers, gain an understanding of how to design their research more effectively, and how to improve their chances to get your work published. Using examples from the energy and climate social sciences field, it will bring attention to the importance of clearly

articulating research questions, objectives, and designs. It will provide a framework for conceptualizing novelty. It will suggest codes of practice to improve the quality and rigor of research. It will provide guidelines for improving the style and communication of results. It will lastly discuss what academic (and non-academic) impact are and propose ways to enhance it. In doing so, the presentation gives first-hand insights into successful research methodologies, what journal editors (and reviewers) look for, as well as advice on how to successfully promote your work.

Sustaining the Small: Maintenance, Rights, and Responsibilities in Small-Scale Hydropower

Panel Convenors: Agnieszka Joniak Lüthi, Hannah Plüss, Elisabeth Schubiger,

This panel draws attention to a largely overlooked dimension of the renewable energy landscape: small-scale hydropower and the people who build, maintain, and depend on it. Often portrayed as locally embedded and environmentally benign, these decentralized systems appear to offer an ethical alternative to large-scale, resource-intensive infrastructures. Yet their long-term viability rests on fragile social, political, and legal arrangements—and the often invisible labour of maintenance.

From land and water rights to licensing, liability, and repair, small hydropower systems are shaped by ongoing negotiations among communities, governments, and private developers. This panel explores how rights are claimed and responsibilities distributed across time, and how legitimacy is maintained in the face of shifting policies, institutional fragmentation, and material decay.

While the energy ethics literature increasingly critiques the global entanglements of large-scale renewables—including their ties to extractivism, capital flows, and geopolitical conflict—this panel shifts focus to the quieter, slower dynamics of small-scale systems. What happens when infrastructures are sustained not by investment cycles but by local commitment, legal perseverance, and moral imagination? What ethical questions arise when anthropologists engage with not the mega-project, but the micro-infrastructure?

By foregrounding maintenance, this panel offers a new vantage point for understanding energy infrastructures as relational, enduring, and precarious. We invite ethnographically grounded contributions that examine how small-scale hydropower is kept alive, by whom, and at what cost.

Hannah Plüss: Small projects, big players: How much power is needed to maintain a micro hydropower plant?

Small scale community energy projects have the image of being good due to their closeness to local needs and circumstances and their tendency to rely upon more democratic decision-making processes in comparison to big scale projects built and managed by actors far away

from the surrounding communities. Nevertheless, such community infrastructures are not easy to maintain, even less so in remote areas with little presence of the state.

This contribution focuses on the maintenance of two small scale hydropower plants in two different departments of rural Peru. It shows how they were maintained and even expanded during their decade-lasting existence by Christian institutions that assumed the role of a coordinated, top-down actor, similarly to a state entity. But what does their role mean for these infrastructures and the communities that surround them? Do these projects still fulfil the hopes and ideas the pertinent literature places in community energy projects? Or do these actors replicate colonial patterns of domination and power in the region? My analysis brings to light how maintenance of infrastructure often depends on an actor that has the power to unify, systemize, or eventually even replace the community effort, changing, like this, the character of a community project.

Quirin Rieder: Making 'Community' in Community Infrastructure: On Self-Organising Water and Energy in Aliabad, Northern Pakistan

This paper looks at the political relations and moral discourses in managing, maintaining and envisioning self-organised infrastructure. It explores the local and global allure of small-scale hydropower as socially and environmentally just solution through the context of energy poverty in Northern Pakistan. By situating self-organised hydropower projects within the region's history of community-run irrigation and sanitation infrastructures, I discuss the 'community-making' role of (energy) infrastructure through a historical and ethnographic perspective.

The paper is based on nine months of ethnographic fieldwork between 2022-23 in Aliabad, Hunza Valley, Northern Pakistan. The region is unconnected to the national grid and has a chronic shortage of electricity generation, resulting in 20h of rotating daily blackouts (load-shedding). Next to a few state owned and village-cooperative owned hydropower plants, also other ways of maintaining electricity have emerged. In many villages in Hunza, it was until recently an established practice to patrol neighbourhoods during peak-demand hours to ensure that no household uses more watt/h of electricity than designated, in order to maintain everyone's grid service. Many of my interlocutors regarded this bottom-up initiative of 'electricity guards' as successful practice of communal care despite its controlling function and occasional tensions. By comparing these initiatives with plans for cooperatively run hydropower plants and ongoing disputes over locally organised water infrastructures, this chapter investigates self-organising electricity as a contested form of community-making. Community-making, I argue, takes place through socio-material and moral practices producing belonging and deservingness, infused by a global discourse of community-centred development, and structured by local as well as international inequalities. This can contribute to an understanding of why and how small-scale hydropower plants emerge, function, or fail.

Letizia Bindi: Electric Heritage around Hydroelectric Infrastructure.

Reflecting on water in contemporary Molise provides a critical lens through which to explore processes of landscape valorization, patrimonialization, and conflict in peripheral territories.

This presentation examines how water operates simultaneously as resource, heritage, and political agent, focusing on the controversy surrounding the proposed hydroelectric project Pizzone II in the Volturno Valley, an area shaped by artificial lakes, protected environments, and long-standing practices of ecological inhabitation.

Currently under evaluation by Italy's Ministry of Environment and Energy Security, the project has activated an intense arena of public participation and resistance. This mobilization reveals not a simple opposition between development and conservation, but a deeper friction between competing regimes of value. On the one hand, water is framed institutionally as a technical asset within national energy transition policies, valued for its capacity to store and stabilize renewable energy. On the other, local actors mobilize water as a biocultural heritage and as the foundation of a lived landscape, supporting eco-tourism, small-scale economies, and affective relations to place.

Based on ethnographic fieldwork, document analysis, and a landscape-based approach, the presentation conceptualizes the Volturno valley as a site of active and contested patrimonialization. Here, lakes, infrastructures, springs, and minor hydraulic artifacts function as heritage devices through which legitimacy, citizenship, and future imaginaries are negotiated. Patrimonialization emerges as a frictional process, shaped by governance asymmetries, procedural constraints, and unequal access to technical expertise and decision-making arenas.

By tracing how the Pizzone II project has already reshaped social relations, suspended local initiatives, and reconfigured landscape imaginaries - regardless of its eventual realization - the paper argues that water acts as a catalyst of territorial transformation. The Volturno valley case shows how contemporary landscape valorization is inseparable from conflict, and how heritage-making around water becomes a political practice through which alternative visions of sustainability, development, and belonging are articulated.

Milan Brouhns: Off-grid / Main-grid : methodological reflection on the phenomenologies and scales of moral economies

This paper will seek to offer theoretical reflections on the methodological challenges investigating the moral economies of small-scale energy production may pose, and this with specific regard to the intermingled issues of scalability and phenomenology.

Indeed, if investigating “small”, self-reliant, localised energy grids in contrast with their national or global counterparts offers promising analytical tropes for the disciplines (with power dynamics between global and local phenomenon to explore), recent turns in Anthropology posit potential methodological warning to heed prior engaging with such tropes.

More precisely, from Latour's ANT, to Viveiros de Castro's perspectivism, and generally the Ontological Turn, recent expansion of what socio-cultural system may be (with for example the inclusion of the non-exhaustive category of “non-humans” within said systems) pose the question of whether studying the moral economies of SHP as “off-grid” infrastructures (that is, energy production systems defined by their distinctiveness from “main-grid” infrastructures) remains relevant at all. Are SHP actors' moral economies truly to be understood relatively to

Main Grid actors? What about the humans and “non-humans” actors that exist within their immediate socio-cultural systems but that might not be integrated within any form of energy production? Do they also perceive moral duties and dues toward and from such actors?

The many faces of the post-extractivist landscapes of Scotland

Speakers: Maria Karssenberg, Finlay Bain Kerr, Mike Browne, Richard Hardy, Frank McElhinney

Panel abstract

In the Scottish Central Belt coal was the main source of energy production for centuries, and hence a strong driver of employment, a shaping factor of communities, of industrial development and infrastructure, and of national identity. Coal has for long shaped and reshaped both the social and the physical landscape. In this panel we aim to bring together a variation of perspectives on the multifaceted transformation away from coal.

The panel brings together researchers and practitioners, people who study the transformations but also those seeing the transformations up close, of their environment, of their communities, and of their jobs. In this way the panel is part of a transdisciplinary methodology as also a critical conversation reflecting the tensions between the different actors shaping the developments.

This conversation will offer the perspectives from the social and political theory side of things, from the environmental science and history side, from the mining restoration engineering side, from the social and geological heritage side, from the local community side and from the just transition campaigner perspective.

All these will bring forward an interrelated, overarching story of an area in transition to post-extractivism, shaping new means of energy production and its infrastructures, and new relationships to the landscape and its resources. Through discussion we hope to bridge the physical and environmental aspects of this transition with the social, political and ethical aspects, as also to bridge between research and practice. By doing so we aim to bring the discussion in the field of critical energy studies further by offering a truly transdisciplinary approach.

The Role of Philosophy and Ethics within Energy Transition Discourses

Convenors: Giovanni Frigo, Nynke Van Uffelen, Nathan Wood, Behnam Taebi

Panel Abstract

What is the role of philosophy – or that of philosophers and particularly ethicists – in the debates about energy transitions? Energy transitions’ debates and discourses often contain reference to *philosophical* concepts, notions, or at least jargon. However, to date most philosophically oriented contributions have not come from “professional” philosophers and ethicists but rather from scholars from neighbouring disciplines (Galvin, 2019; Jones et al., 2015; Pellegrini-Masini, Corvino, et al., 2020; Pellegrini-Masini, Pirni, et al., 2020; Sovacool, 2013). Of course, the discipline of philosophy does not have any monopoly over the use of terminology such as “value”, “justice”, or “responsibility”. Yet, there seems to be a lack of philosophical engagement of philosophers and ethicists in the energy transition discourses. Moreover,

in recent years there has been a lot of work around the notion of “justice”. Indeed, the rapid uptake and dissemination of energy justice frameworks (Baasch, 2023; Jenkins et al., 2016; Van Uffelen, 2024) has brought this question into focus. While these frameworks often make liberal use of philosophical terminology, there is growing concern over their lack of engagement with the philosophical reasoning and methods that give such terms depth, nuance, and critical utility (Bombaerts et al., 2023; Laes et al., 2023; Lee & Byrne, 2019; Van Uffelen et al., 2024; Wood et al., 2024). This and similar tensions raise further questions: Does the spread of ready-made justice frameworks risk marginalising the potential contributions of philosophers to interdisciplinary debates about energy and ethics? Does it reduce the philosopher’s role to that of fine-tuning or “making the frameworks work”? Such a view risks narrowing philosophy’s potential – to critique, conceptualise, reframe, or even challenge the foundational assumptions of energy justice. Assuming Energy Ethics as a broader area of intellectual engagement made of both descriptive and normative approaches (Frigo & Hillerbrand, 2022), we would like to explore how philosophical investigations could further benefit energy transition debates. The hope is to identify and suggest novel avenues for future interdisciplinary engagements between philosophers and scholars from other disciplines (e.g., SSH and STEM), as well as transdisciplinary collaborations between the former and other stakeholders. More specifically, this panel seeks to explore the range of contributions that moral and political philosophers can make to energy sciences and transitions. More broadly, we consider whether understanding energy justice as part of a larger field of energy ethics might open new spaces for dialogue, critique, and conceptual innovation. We ask how philosophers might participate more meaningfully in discussions of energy ethics, and what barriers or practices within the field may currently limit this engagement. We aim to explore questions such as:

- How are environmental/energy/climate kinds of ethics and justice scholarship related?
- Why did discussions about the moral dimensions of the energy transitions not occur in moral philosophy and ethics earlier?
- Is the philosopher’s role limited to conceptually refining existing justice frameworks, or is there scope for more expansive contributions?
- At what point in the research or policy cycle should philosophers interrogate underlying normative assumptions?
- How can we cultivate greater reflexivity, creativity and originality in a field often shaped by repeated applications of (largely) static frameworks?
- Can energy justice frameworks themselves take on the critical or reflective functions typically associated with philosophy?
- Do these frameworks unintentionally crowd out the philosophical voice, and if so, how might that be addressed?
- Should the language of “energy justice” be expanded – or perhaps replaced – by a broader and more flexible discourse of “energy ethics”?
- What are key/needed (potential) contributions that philosophers and ethicists can make to energy transition debates?
- What is the role of philosophers in interdisciplinary collaborations? Is there anything that the philosopher needs to do differently?

Through these and similar questions, we aim to reimagine the role of philosophy in energy debates – not as ancillary, but as integral to navigating the ethical complexity of global energy transitions.

Erik Laes and Gunter Bombaerts: Enhancing critical or reflective functions of energy justice frameworks and energy ethics with system thinking.

The three-tenet framework has the leading framework for discussing the justice dimensions of energy transitions, but it is not always clear how it can guide concrete action. This paper proposes a practical way of linking energy justice with systems thinking. It starts from a simple matrix in which different energy services (e.g., heating, cooling, mobility, cooking, lighting, and digital access) are placed alongside the three tenets of energy justice: distributive, procedural, and recognition justice. The purpose of the matrix is not to produce a complete assessment, but to help stakeholders locate where they see the most urgent problems and to make explicit which kinds of justice claims are involved.

The selected issue is then examined through value network mapping. This step traces the actors, relationships, dependencies, resources, incentives, and forms of value that shape the relevant energy service. By doing so, the analysis shifts attention from a single injustice or vulnerable group to the wider network that makes the problem persistent. It can reveal, for example, where responsibilities are unclear, where certain actors have little influence, where costs and benefits are unevenly distributed, or where existing arrangements prevent alternative solutions from emerging.

The paper argues that this combination offers a useful bridge between the normative vocabulary of energy justice and the practical orientation of systems intervention. The matrix supports a structured but participatory diagnosis of justice concerns, while value network mapping helps identify possible leverage or intervention points. Together, they provide a way to discuss energy justice not only as a matter of fair outcomes, but also as a question of relations, capacities, institutional arrangements, and opportunities for change.

Giovanni Frigo: What's Special about Philosophy in Energy Studies?

Energy studies has emerged as a profoundly interdisciplinary field shaped primarily by engineering, economics, policy analysis, and the social sciences. Within this landscape, philosophy is often assigned relatively narrow roles. For example, philosophy is expected to provide normative guidance concerning sustainability, justice, or technological risk. This paper argues that philosophy may contribute something more fundamental, yet theoretical, to energy studies. Its distinctive value may lie not merely in evaluating energy systems ethically, but in interrogating the conceptual, ontological, and temporal assumptions through which energy becomes intelligible as a social and political object in the first place.

Modern industrial societies tend to treat energy as a neutral, quantifiable resource available for extraction, optimization, and consumption. Yet this understanding is neither self-evident nor politically innocent. Drawing on philosophy of technology, energy humanities, and environmental and political philosophy, this paper argues that contemporary energy systems are embedded within deeper metaphysical commitments concerning growth, efficiency, abundance, and human mastery over nature. This assessment is not completely new as other authors have already developed work in similar directions. Yet, genuinely philosophical contributions in energy studies are quite rare and do not seem to be particularly visible. Philosophy, then, can help explore some of the key assumptions that shape not only infrastructures and policies, but also social imaginaries, expectations of mobility and convenience. Moreover, philosophy can help anyone develop a personal, existential reflection about what constitutes a “good life” in relation to energy access, distribution, use, and waste.

The paper develops this argument in three steps. First, it examines how dominant energy discourse reduces transition to technological substitution while leaving intact the underlying logic of extractivism and endless expansion. Second, it explores how fossil-fuel modernity has produced particular temporal structures characterized by acceleration, immediacy, and permanent growth expectations. Third, it argues that philosophy uniquely enables critical reflection on these hidden frameworks by clarifying concepts such as justice, need, sufficiency, progress, sovereignty, or responsibility. Here, philosophy is understood as part of the humanities and as a discipline that needs to be also informed by empirical evidence obtained by natural and social sciences.

The paper concludes by suggesting that philosophy is perhaps “special” in energy studies because it does not simply ask whether particular energy choices are just or efficient, but whether the forms of life and conceptions of humanity and politics presupposed by contemporary energy regimes are themselves ethically and politically defensible. Without such philosophical reflection, “energy transition” risks becoming a merely sociotechnical reformulation of the very paradigms that generated the current ecological crises as well as stereotypical visions of “what energy is for”.

Ray Galvin: Can we make energy justice claims more credible and effective?

The popular “triumvirate” energy justice framework comprising “distributional”, “recognition” and “participation” justice, along with its extensions “restorative” and “cosmopolitan” justice, has become a quasi-Kuhnian paradigm through which other approaches are frequently judged. However, it suffers serious weaknesses of inner consistency, an abstract rather than concrete approach to defining injustices, consequent difficulties in implementation, and an uncertain meta-ethical foundation that is often uncritically assumed to be sound. I argue for an alternative approach that pays close attention to four themes: the rights and responsibilities of *individual human beings*; the interplay between *society and the individual*; the *practical implementation* of energy justice in policy and action; and the problem of *meta-ethics*. For the first I contrast the abstractness of the triumvirate view with the concreteness of the Capabilities approach of Martha Nussbaum, which focuses persistently on empirically verifiable instances of the flourishing and deprivations of individuals. As a convenient example for the second I set the societal aspects of the Catholic Doctrine of the Common Good alongside Nussbaum’s list of 10 “Capabilities”, suggesting an 11th “Capability”: the human need to enhance the wellbeing of others. Third, I set these in the context of the Sustainable Development Goals, as an example of how society can implement social justice, albeit with inherent limitations. Finally, I comment on the limitations of these and other energy justice approaches, from a position of skepticism as to the meta-ethical foundations of moral claims. I argue that the view of human rights and societal responsibilities that is embedded in an energy justice approach is ultimately a matter of choice.

Giuseppe Pellegrini-Masini: Energy Equality in Practice: A Critical Re-orientation of Energy Justice Debates

A vast literature now frames the ethics of energy transitions in terms of “energy justice,” usually organised around distributive, procedural, and recognition-based concerns, and more recently extended to restorative and cosmopolitan dimensions. While this vocabulary has generated important insights, it remains grounded in heterogeneous normative traditions, including

Rawlsian fairness, the capability approach, recognition theory, and ecocentric ethics, that offer no common metric for resolving conflict among competing claims. As a result, energy-justice debates often remain plural but indeterminate, leaving policy choices to discretionary political balancing. This paper argues that the field should be re-oriented around a clearer and more auditable principle: equality.

Energy equality is defined here as an equal entitlement to the benefits of energy services and an equal share in the responsibility for the environmental burdens generated across their life cycle. Rather than treating equality as one value among others, the paper proposes it as the primary normative benchmark for governing energy transitions under ecological constraints.

This ethical reorientation is translated into a three-level quota architecture. At the individual level, all citizens within a country receive equal personal carbon-emission quotas, which are non-tradable in order to prevent wealth-based accumulation of ecological privilege. At the corporate level, firms receive equal quotas within the same economic sector, with tradability allowed only within those sectoral boundaries so as to preserve incentives for efficiency and innovation without undermining comparability. At the international level, countries are assigned collective emissions quotas on a population basis, but differentiated according to levels of development, so that egalitarian climate governance does not entrench existing global inequalities or prevent poorer countries from pursuing industrialisation and material improvement.

Within this framework, hydrogen is not treated as inherently just or unjust, but as an example of why multi-scalar equality is needed. Without such governance, hydrogen value chains may allow wealthier countries to decarbonise while displacing resource use, environmental burdens, and production-related externalities onto poorer producer countries. A quota-based egalitarian approach would instead subject such technological pathways to constraints designed to prevent the externalisation of ecological costs across class, sectoral, and geopolitical lines.

The paper therefore proposes energy equality as a more coherent normative compass than the current plurality of energy-justice frameworks. By linking individual restraint, sectoral regulation, and differentiated international responsibility within a single egalitarian logic, it offers a clearer basis for assessing energy systems and emerging technologies in a world of tightening carbon limits and uneven development.

Behnam Taebi and Nynke van Uffelen: Energy Ethics 2.0: A reflection on Europe's Futures of Nuclear Energy

A key goal in combating climate change is to move away from fossil fuel technologies as quickly as possible. The pace of this heavily relies on technologies, energy policies, and how we design our technologies and institutions, all of which give rise to intricate normative uncertainties. These questions pertain, among other things, to the risks that different options pose to present and future generations, and to how we address these risks. In this talk, we present a new approach to energy ethics that accounts for technological innovations and policy-making. This could help us to better appreciate the often-hidden normative uncertainties of energy transitions. We will illustrate this by reflecting on the future of nuclear energy in Europe. Nuclear energy is receiving renewed attention in Europe (Addo et al. 2023). What contributed to its popularity was the gas crisis following the Russian invasion of Ukraine, which painfully laid bare

Europe's dependence on gas from Russia. The following political sentiment centered on energy security/independence, with nuclear energy seen as a solution for steady electricity production. Particularly, the so-called Small Modular Reactors (SMRs) are receiving increasing attention these days.

What is overlooked is that there are still crucial choices to be made with different risks involved and with varying ethical implications about nuclear reactor technologies, fuel cycles, and waste management (Taebi and Kadak 2010). What are the implications of a rapid and large-scale shift to nuclear energy for safety, sustainability, and the economic viability of various energy options in Europe? We will specifically focus on one important development. The new approach to energy ethics needs to be technologically informed, account for policy, and help us navigate normative uncertainties.

Carlos Tornel: Energy, Equity, and the War on Subsistence: Revisiting Illich for an Ethics Beyond Energy Justice

This chapter contributes to the Energy Ethics agenda by revisiting Ivan Illich as a foundational (and still underused) theorist of energy, equity, and the ethical limits of high-energy modernity. Against approaches that treat energy as a neutral “resource” to be expanded and then fairly distributed, Illich helps show how “energy” becomes a modern social principle: it defines needs, reorganizes everyday life through infrastructures, and normalizes dependence on expert/bureaucratic systems. Building on Illich's core claim that rising mechanical energy and social equity move in opposite directions, the chapter develops an ethics of thresholds and counterproductivity: beyond certain scales, systems meant to enable mobility, welfare, or inclusion begin to disable vernacular autonomy and produce “modernized” dependency on services, professionals, and bureaucratic management. This perspective resonates with the volume's call to go beyond energy justice by interrogating the normative assumptions behind “access,” “needs,” and “desired futures,” without reducing ethics to policy toolkits. The chapter closes by extending Illich's “age of systems” diagnosis to contemporary AI, asking what de-modernizing energy could mean for conviviality, autonomy, and total liberation today.

Nynke Van Uffelen: Energy models and energy justice: Beyond the distributive paradigm

Energy systems enable almost all daily activities, and its breakdown, even for a few seconds in case of electricity infrastructure, can have disastrous consequences. This, in combination with climate change, makes the transition towards a renewable energy system a high-stake wicked problem. As energy transitions pose an immensely complex technical and economic challenge, computational models are heavily used in energy transition decision-making. However, energy transitions also have social and ethical components, which are often shrouded by the dominance of the techno-economic gaze afforded by energy models. Although an increasing number of publications focus on integrating justice concerns in modelling or the modelling process, we argue that the dominant energy models still reproduce a specific and limited outlook on justice, namely the distributive paradigm, as proposed by Iris Marion Young. This paradigm reduces justice to matters of distributive and procedural justice, as in, how to (decide how to) distribute goods, services, burdens and benefits. We argue that computational energy models used for energy transition decision-making reproduce this paradigm, as their design makes them most suited to explore issues of distributive justice. Consequently, certain

injustices and issues are foregrounded, while others remain marginalized and hidden from the public debate. We propose an increased awareness of the limited gaze that such models bring to social issues, such as energy transitions. Moreover, we explore to what extent it is possible for energy models to go beyond the distributive paradigm and propose an alternative way of viewing energy models and their position in decision-making, namely as relationally constructed artefacts.

Nathan Wood: Is a “Just Transition” actually a useful goal?

Discussions surrounding energy and justice are frequently mischaracterised. Phrases such as “a just transition for all” and “a truly just transition must...” – while powerful for activist movements – often substitute for conceptual analysis and obscure the structural and relational nature of injustice. The field of energy justice frequently problematise energy transitions by pointing to multifaceted issues that emerge from intersecting systems, yet often reverts to locating work as contributing to the achievement of a siloed ‘just transition’. This is not what we are in the business of doing: the transformation of energy systems can only go so far in ameliorating injustices that are mediated by wider social conditions. The rapid uptake of energy justice frameworks has compounded this problem. I propose a different take on the field: a broad space in which to explore the ways energy transitions intersect with wider systems of deprivation and to deliberate how we might transform these systems to make the world *more* just. Drawing on Amartya Sen’s work on justice this article makes three claims to encourage debate surrounding the work we seek to undertake as a field:

1. A just transition is not the goal.
2. “Energy injustice” is a useful boundary but not a useful analytic.
3. Discrete energy justice frameworks have significant limitations.

Theorising Industrial Decarbonisation: Ethics, Entanglements, and Emerging Futures

Convenors: Kari Dahlgren, Timothy Neale

Panel Abstract

Industrial decarbonisation and its energy base represent a critical, yet under-theorised, dimension of the global response to climate change. As heavy industries like cement, steel, fertilisers, fossil fuels, and others, are reimagined as sites of low-carbon innovation, new ethical and political questions arise through the convergence of diverse domains, such as energy systems, labour relations, financial and policy instruments, supply chains and much more. While the imperative to decarbonise such industries is strong, most projects being pursued rely on technocratic, developmentalist, and capital-intensive logics that reproduce existing inequalities, social and environmental harms. This raises critical questions about what kinds of futures are being imagined into being, for whom, and at what cost.

This panel asks how social scientists can meaningfully engage with the ethical and political stakes of industrial decarbonisation. To do so, we must understand this transformation not as a single, socio-technical challenge, but as a convergence of multiple domains including energy, extraction, infrastructure, labour, finance, carbon governance, environmental policy, and

Indigenous struggle, each with its own knowledge systems, histories, and power dynamics. These domains are increasingly drawn together under the umbrella of industrial decarbonisation, creating new assemblages often yet to be named or studied. Critically engaging with these convergences requires dialogue across disciplines and traditional areas of sub-disciplinary expertise. This panel asks how social scientists can meaningfully engage with the ethical stakes of industrial decarbonisation by bringing together scholars and scholarship to theorise the complex convergence of these shifting domains.

Together, we hope to explore questions such as:

How do the ethical imperatives of decarbonisation take shape within industrial contexts shaped by long histories of extraction, labour and Indigenous struggle, and environmental harm?

In what ways are new coalitions of expertise shaping the moral and political contours of industrial decarbonisation?

How are certain industrial futures made desirable or apparently inevitable, and what ethical assumptions underpin these visions of low-carbon industrial development?

Whose knowledge systems and ethical frameworks are centred or excluded in the governance of industrial transitions?

By drawing on and expanding the framework offered by energy ethics, this panel aims to build a dedicated subfield of the social science of industrial decarbonisation, which centres the ethical entanglements in the reconfiguring of industrial life in the climate crisis. Therefore, we seek papers which are grounded, situated and reflexive accounts of how ethical imperatives are mobilised, negotiated and contested in the name of industrial decarbonisation. This panel will also serve as a foundation for future collaborations, including a co-authored publication, in order to develop new conceptual and empirical insights into this multifaceted transition.

Adrian Deoancă, Velislava Petrova: From Waste to Worth: Industrial Decarbonisation at the EU's Periphery

The European Union recognises cement as both essential to the bloc's economic infrastructure and a disproportionate source of greenhouse gas emissions. In response, policies for industrial decarbonisation increasingly promote waste as an alternative fuel, positioning its burning as a gesture of climate responsibility that addresses both emissions and the growing urban waste crisis. This paper examines how the revaluation of waste as fuel informs the politics of decarbonisation at the Eastern periphery of the European carbon economy.

Drawing on research in Bulgaria and Romania, we analyse how waste-fueled decarbonisation rests on four interlinked logics: substitution (waste replacing fossil fuels), exemption (biogenic carbon treated as neutral), avoidance (emissions diverted from landfill), and displacement (externalisation to peripheral communities). In Romania, these calculative frameworks allow waste-burning to appear as carbon reduction while concealing continuities with earlier extractive and polluting practices. Cement companies frame waste-burning through narratives of European alignment and climate responsibility, claiming it cuts emissions while simultaneously providing a better solution to waste than landfilling, even as residents in cement towns express unease about hidden pollution, and suspect that the waste being burned is sourced through dubious channels. Such practices illustrate a form of marginal

decarbonisation, where modest carbon savings are achieved through waste-to-fuel substitution, often sustained by imported waste considered higher quality than domestic refuse.

In Bulgaria, the case of the capital's RDF plant reveals the economic, moral, and political contradictions of waste-fuelled decarbonisation. Marketed as a circular solution, RDF has become a profitable commodity: cement plants are paid to destroy it, it is transported at public expense to cement kilns near the Black Sea at the industrial town of Devnya, and the process allows companies to report lower emissions. Yet waste policy in Bulgaria operates in diverging registers: publicly, the municipality presents RDF transfer as a pragmatic solution to the city's waste crisis, while cement companies frame it more quietly as part of the green transition. The transfer of RDF is thus not framed as climate action but as a practical effort to restore order and curb the "waste mafia." In this way, the city's cleanliness is achieved through displacement: pollution, moral responsibility, and even the carbon footprint of long-distance transport are externalised to peripheral communities such as Devnya, a town marked by memories of past chemical disasters. Waste thus becomes both energy and a sign of civic virtue, transforming moral and spatial hierarchies under the guise of cleanliness rather than ecology.

By juxtaposing these cases, we approach industrial decarbonisation as a socio-technical and political process. We show how regulatory instruments, infrastructures, and low-carbon practices converge to make waste newly valuable (materially, as energy, and symbolically, as evidence of cleanliness and participation in Europe's ecological modernisation). These transformations depend on transnational regimes of expertise and carbon governance, the consequences of which are negotiated within specific urban and industrial landscapes. By tracing how waste-fuelled decarbonisation is imagined, justified, and contested, we contribute to an anthropology of industrial decarbonisation attentive to the ethical and political entanglements through which low-carbon futures are enacted.

Steffen Dalsgaard: Technological Decoupling and Decarbonisation: Performativity or Fantasy?

Decarbonisation and other attempts at decoupling growth from climate impact have increasingly become industries in and of themselves, yet they haven't appeared out of nowhere. In Northern Europe especially, the state and the EU have been active players in what has been called 'state entrepreneurialism', where funding for 'innovation' is given to construct new energy products, new energy infrastructures and even subsidise relevant sectors to create the necessary markets, all at once. The problem is not only that this process of multiple subsidies appears inefficient, or that industrial innovation as a response to climate change can be problematic in its own right, but that many of these 'green' technologies themselves face significant challenges related to their efficiency. For example green hydrogen or 'power-to-x' result in conversion losses of energy at up to 84%. Providing a social scientific perspective on this apparent paradox, this paper is torn between trying to take the desires to pursue decoupling and decarbonisation seriously as indications of a genuine wish among involved actors to create a better world, while also trying to understand how this can be pursued by such actors, who are well informed about the drawbacks, but still believe in the appeal and optimising potential of technologies despite evidence that these promissory or 'emergent' technologies are continually presented as inefficient. The paper will weigh this in relation to two different theoretical perspectives – on the one hand as attempts to create relations that are performative (a

theoretical trend recently popular in STS with the work of Callon, Mackenzie and others), and on the other hand as processes driven by a 'fantasy' (in Žižek's sense of a critique of ideology)

Jonas Köppel: Mineral Supply Chains and the "How" of Global Connection

In this paper I explore the panel's main question through my long-term ethnographic research on lithium, a mineral required for batteries. How can we meaningfully engage with 'industrial decarbonisation' in social science by understanding it as a 'convergence of multiple domains'? My premise is that answering this question requires attending to how others turn this convergence into a 'single, socio-technical challenge,' or the other way round; and I will show how the figure of the supply chain is a principal means for them to do so. For example, it allows companies and governments to claim lithium extraction as a critical contribution to solving a global challenge, while also enabling communities and activists to situate local mining conflicts into broader conversations about that challenge. The problem with supply chains, I will argue, is not so much their linearity - as is well acknowledged - but that they connect people and places in a particular direction. To stay with the example, lithium almost entirely derives its significance from the increasing demand (projections) provoked by battery production, whether it is for the risks it poses to national supply security or to local communities and ecosystems. Thereby it forecloses crucial questions: How much lithium is actually required? Where does it come from, and go to? Who gets to decide these questions? To meaningfully engage with industrial decarbonization, we need to find other ways of connecting multiple domains, some of which I will explore in this paper.

Katie Ulrich: Biomanufacturing New Futures: The Nonlinear Scaling of Biotech and Critique

Industrial biotechnology, also called biomanufacturing, describes the application of living organisms, cells, or their derivatives within industrial and manufacturing settings. It aims to reduce reliance on fossil fuels and petrochemicals, instead using bio-based raw materials and biotech in the production of plastics, fuels, specialty chemicals, food and personal care ingredients, and more. Thus often framed as a more sustainable alternative to conventional emissions-heavy and polluting processes, industrial biotech and biomanufacturing have received increasing attention and funding in the US from the government, venture capitalists, and existing incumbents in the manufacturing space. This paper draws on ethnographic fieldwork carried out among biotechnologists and industry actors in two key regions of concentrated biomanufacturing efforts in the US: the San Francisco Bay Area and the Midwest corn belt. It examines how industrial biotech and biomanufacturing are giving novel shape to the relations between agriculture (which often supplies the bio-based raw materials), tech, and domestic manufacturing. Namely, it traces biomanufacturing as an emerging domain where 1) industrial agriculture arrangements in the Midwest and Central Valley of California, 2) salvational notions of technology, especially coming out of Silicon Valley, and 3) post-Fordist neoliberal labor and manufacturing patterns are coming together and transforming each other in the process. Such transformations and their ethical considerations are explicitly problematized by actors as they reckon with changing conceptions of energy, food, and labor.

The paper zooms in on one element of biomanufacturing/industrial biotech efforts: the process of scaling up biotechnologies from the laboratory scale (a liter of broth growing the microbes/cells) to pilot and demo scales (vats of 10 to 1,000 liters) to finally commercial scales (10,000 liters and beyond). As biotech actors quickly encounter, scale-up is not a simple, linear

process of adding more broth and microbes. Unlike purely (petro)chemical systems, the biological functioning of these biotech systems changes at different scales. For example, as volumes of broth increase, the underwater pressure on microbes near the bottom of the vat increases and can compromise their metabolism. Larger vats also need to have special systems for agitating the broth in order to distribute dissolved oxygen evenly. Beyond the technical challenges exist logistical and social considerations. Whereas at the laboratory scale the raw materials (e.g. sugar to feed the microbes) are usually ordered in bottles from a typical lab reagent catalog, at larger scales biotechnologists need to shift to pallets and establish new partnerships with industrial supply chains. They also need to produce a new workforce of technicians and/or retool the skills of existing manufacturing laborers. The paper ultimately theorizes the nonlinearity of scale-up processes in relation to the nonlinearity of ethical considerations when it comes to industrial biotech and other decarbonization efforts more generally. Biomanufacturing far from represents a straightforward boon for sustainability. But it also exceeds a tidy critique that Big Tech synergizes with Big Agriculture and Big Oil as technologies framed as revolutionary nonetheless reinforce existing structures of oppression. Bioprocesses rarely behave as expected, and from deep in the frothy, aromatic vats of industrial biotech this paper suggests new openings for understanding decarbonized futures.

Nicolas Perticari Pesci, Jessica Smith: The Ethical Entanglements of Industrial Decarbonization Research and Development

Abstract: Industrial decarbonization has become an intense site of both moral and financial investment in future-building. As a lively and increasingly urgent field of practice, industrial decarbonization is comprised of heterogeneous suites of technologies that act across multiple domains of social life and inflect multiple historical trajectories. Yet the researchers and professionals who create foundational knowledge and deploy it in industrial projects consider the inherent societal and ethical dimensions of their work with limited intentionality, structure, experience, or institutional support. This paper explores how engineers and applied scientists integrate (or fail to integrate) societal considerations and social science experts into early-stage research related to industrial decarbonization. We draw from team-based participant-observation and interviews in two technology-driven research centers, one dedicated to carbon capture, utilization, and storage and one focused on materials for renewable energy conversion and storage. We first share the methodological framework we developed to analyze the different forms of sociotechnical integration as they relate to distinct stages of the research process, from problem definition to dissemination. We then share our findings in a series of ethnographic portraits that illustrate the range of approaches to sociotechnical integration we observed among STEM-trained researchers. These portraits show how agency, structure, and meaning matter for how researchers consider – or fail to consider, or are discouraged from acting upon – the ethical implications of their work. We conclude by reflecting upon the significance of our findings for social science research. Embedded research with engineers and scientists opens up new collaborations and opportunities to shape industrial decarbonization, knowledge creation, and project development – especially by encouraging more explicit reflection on the ethical stakes of these activities – but it also carries its own burdens and risks.

Ziya Kaya: Carbon Multiplicities: Historical and Ethical Questions in the Digitalization of Decarbonization through Regenerative Agriculture

Abstract: This paper examines a digital farming technology company in Turkey and its efforts to generate tradable carbon quotas that could provide farmers with additional income within the anticipated European Union soil carbon market. More specifically, the company promotes regenerative farming practices—such as no-tillage, crop rotation, and reduced chemical use—with the use of digital farming technologies including smartphone applications and AI-driven spraying programs in order to reduce carbon emissions and increase soil carbon storage as organic matter. Farmers would be able to sell their digitally verified negative carbon footprints as carbon quotas (or commodities) to high-emitting industries, such as cement plants, natural gas-powered energy facilities, iron and steel factories, and airlines, which seek to offset their emissions and projected to be required to pay for their carbon-emitted products traded into the European Union by 2030. This demonstrates the company's efforts not only to promote agricultural decarbonization but also to place the burden of industrial decarbonization on agriculture—particularly on farmers—thereby creating an agriculture–industry decarbonization nexus or “connections” (Whittington 2020), while allowing carbon-intensive industries to continue emitting. In this paper, I examine the emerging contested ethical imperatives that frame agriculture as responsible for bearing this burden.

In line with anthropological work on carbon and carbon markets (Dalsgaard, 2013; Günel, 2016; Neale, 2022), I observe that the digital farming technology company is not merely imposing a predesigned decarbonization project on farmers, reducing soil carbon to a single commensurable value while disregarding farmers' lived realities and exercising dominance over them (cf. Lansing 2010; MacKenzie 2009). Instead, the company is attempting to develop a project that addresses farmers' multiple socioeconomic conditions as well as soil's multiple ontologies as a living being. I claim that this represents how agricultural-industrial decarbonization is promoted through a “post-pastoral” ethics (Paxson 2013; Lorimer 2020). More specifically, they envision a future that returns to pre-Green Revolution times, in which farmers are not dependent on synthetic chemicals, heavy machinery (e.g., ploughs and tractors), or monocropping through regenerative farming, while promoting the use of “advanced” digital technologies. For this purpose, they provide digital technologies free of charge to farmers who otherwise cannot afford them, enabling regenerative agriculture that stores carbon and reduces emissions for both soil health and carbon trading. In doing so, they treat soil carbon not merely as a tradable commodity to be extracted, but as organic matter that sustains “living soil.” Although the company expects farmers to adopt this post-pastoral ethical imperatives of agriculture–industry decarbonization, I show how farmers create their own, informed by kinship and memories of the Green Revolution, often in tension with the company's approach.

Transition and Ecologies

Anna Bettini: Contested Solar Futures: Agrivoltaics and the Politics of Rural Energy Transitions in Italy and Canada

Rural regions are unique sites where social and economic sustainability tightly intertwine with the shaping of relationships with the natural environment and landscape (Woods 2015). Renewable energy projects often located in rural areas have led to heightened reactions, opposition, and barriers, creating what scholars have defined as sacrifice zones of energy transition (Brock, Sovacool, and Hook 2021). In areas of intensive agricultural production and strong rural heritage, large solar farms have been seen as both a symbol of promise to move

forward a net-zero economy, but also as symbols of disruption to local livelihoods, land use, and the rhythms of rural life (Bettini 2025; Nicholls 2020; O'Sullivan, Golubshikov and Mehmood 2020). A solution to these problems in many regions has been the introduction of agrivoltaics, a system that combines solar power generation with agricultural activities and production; yet questions persist about how land is valued and imagined (Jamil and Pearce 2023; Torma and Aschemann Witzel 2023). Drawing on ethnographic research in Tuscany, Italy, and Alberta, Canada, this paper explores how rural communities have faced these tensions and their perspectives toward the introduction of renewable energy projects and agrivoltaics on their land. In Tuscany, Italy, the surge in renewable energy projects over the last 10 years has raised concerns among local farming communities, tourism organizations, and conservation organizations about their management of territories, and has sparked significant apprehensions about the potential of agrivoltaics for traditional farming methods. Similarly, in Alberta, renewable energy projects have faced political and policy restrictions due to concerns from farmers and landowners. By examining these dynamics, this study aims to understand how the energy transition is reshaping socio-ecological relationships and to discuss patterns of inequality, ethical dilemmas, and the complex affective and political dimensions of renewable energy development.

Keywords: Agrivoltaics; rural landscapes; energy transition

Dana McLachlin: Ambivalent Transitions: Electrification and Environmental Change in Southwestern Bangladesh

International development agencies and global media portray southwestern, coastal Bangladesh as uniquely susceptible to climate change, due to its low-lying sea level and vulnerability to extreme weather events. These representations of climate victimhood clash with the state's increasing investment in the area as a potential hub for energy infrastructure. Mongla, on the border of the Sundarbans, is now home to multiple natural gas storage centers, a coal power plant, an expanded port, and a solar energy plant; these investments were central to the now-deposed Awami League government's goal of 100% electrification. My paper draws on 18 months of multi-sited ethnographic fieldwork in and around Mongla with neighboring residents, plant workers, and state electricity technicians. I examine how national electrification projects mediate moral complaints over degrading environmental conditions and forms of environmental loss. Even as Mongla residents desired better electric infrastructure, they blamed electricity for various forms of decline and narrated the growth of electrical availability alongside the degradation of the land, the saltier air, and transformations of the verdant green landscape into what residents increasingly called a "desert." As a material infrastructure that literally wires citizens together, electrical inclusion carries anxiety about national and capitalist integration and accompanying cultural and environmental changes. Although often attributed to an apoliticized climate change, these changes are directly related to a political economy of commercial shrimp farming in the area and river dredging by commercial and state interests for the Mongla port (Dewan 2021, Paprocki 2021). I trace how residents' critiques of environmental change and ambivalent electrical desires reflect contradictions between government-imposed ideals of Sonar Bangla (Golden Bengal) futures based on industrial development and infrastructural growth (Cons 2025) and alternative ideals of wealth and progress rooted in food, land, and biological diversity.

Keywords: electrification; moral epistemology and climate change; industrial futures

Douglas Robb: Land of the Living Skies: Carbon Ontologies, Design Pedagogy, and the Ethics of Carbon Dioxide Removal

Drawing on recent pedagogical experiments in Canada's "Land of the Living Skies," this paper examines how emerging carbon dioxide removal (CDR) technoscience frames carbon and reorganizes landscapes, and how landscape design might trouble these framings. In Alberta's prairie grasslands, fossil fuel extraction, agro-industrial monocultures, and large-scale CDR projects are converging on a region promoted as both hydrocarbon frontier and an epicentre of negative-emissions research and development. In this context, CDR policy and engineering literatures tend to produce carbon as an abstract, dangerous substance to be quantified, captured, and stored, rendering complex socio-ecological relations governable. Building on work in political ecology, science and technology studies, and Indigenous scholarship, I trace experiments in architecture and landscape architecture pedagogy that reframe carbon as relational "kin" rather than an enemy, and to re-imagine CDR infrastructures accordingly. Through close reading of technical CDR documents and speculative design projects, I show how designers might grapple with the ethical and political stakes of technoscientific "nature-based" solutions that conscript plant and soil labour while deepening settler-colonial control over land. The paper argues that spatial design can be a crucial site for cultivating "carbon literacy" that resists both reductionist and systemist imaginaries, attending instead to the messy, place-based negotiations through which carbon is made knowable, governable, and contestable.

Keywords carbon dioxide removal; technoscience; carbon ontologies; design pedagogy; settler colonialism

Uncommoning the Commons: Contesting the Property Related Status of Energy Resources

Panel Convenors: Maria Pfeiffer, Marco Sonnberger

Panel Abstract

Natural resources like water, geothermal energy, and solar power are increasingly central to debates around energy production and environmental governance. However, these resources' status as commons (or as private or state property) is often the subject of societal conflicts and struggles. This session explores how scientific theories, technological advancements, and social practices shape the definitions, properties, and management of commons-based resources, particularly those used for energy production. We examine how energy resources traditionally considered commons, such as water and wind, are redefined, propertized and commodified in the context of renewable energy transitions.

The session invites participants to critically examine questions such as: Under what conditions do commons-based resources, such as water, geothermal, or solar energy, become subject to excludable (private) property regimes? How do competing discourses and practices shape the property related legitimacy of these resources in energy production, and how do power dynamics influence these shifts? How are energy commons turned into state or private property

and vice versa? Which theories are able to capture and explain the uncommoning of energy commons? What are the negative (or positive) effects of uncommoning energy commons?

By focusing on a range of energy resources, we aim to broaden the conversation around "uncommoning"—the process through which commons are redefined and restructured in response to contemporary environmental challenges, including the drive for renewable energy. Through these discussions, we will consider how social sciences can contribute to rethinking the governance of commons.

Robert Wade: Renewable energy resource rights from a materialist perspective

Dan van der Horst: Making Electrons Green (Again?); the materialities of 'how' and the uncommons of 'where'

Katja Müller: And how is it all connected? Ownership, control and governance of the electricity grind in times of increased renewable energy production

Lourdes Alonso Serna: Uncommoning the Wind: Land Tenure and the Enclosure of Energy Flows in Southern Mexico

When Grids Fail: The Ambiguous Role of Diesel Generators in Our Fractured Energy Landscapes

Convenors: Camillo Stubenberg and Charlie Lawrie

Panel Abstract

Diesel generators are often seen as outdated, inefficient technologies. Yet amid intensifying climate disruption, conflict, and infrastructural fragility, they remain indispensable across global energy systems. They continue to underpin both daily life and emergency response, serving as primary power sources in areas with weak or nonexistent grids and as backup in critical facilities like hospitals and airports. Furthermore, diesel generators play a key role in the expansion of decentralized solar microgrids, where they compensate for the intermittency of renewable sources and the high cost of battery storage.

This panel will examine the diesel generator's evolving role in the past, present, and future of energy provision. We seek contributions that explore how diesel generators are governed, resisted, and integrated worldwide, shedding light on issues of energy access, poverty, policy, and transitions. We particularly encourage interdisciplinary perspectives—historical, comparative, ethnographic, economic, and technical—from a range of international and infrastructural contexts.

Camillo Stubenberg and Charlie Lawrie: Dismantling the Machine: Theoretical Perspectives on the Diesel Generator

This paper develops a conceptual framework for understanding the role of diesel generators in contemporary, increasingly fragmented energy landscapes. Rather than treating generators as

residual or outdated technologies, we frame them as analytically productive sites through which to view broader transformations in energy systems.

Drawing on insights from the international political economy of energy, political ecology, science and technology studies (STS), the anthropology of energy, and humanitarian and security studies, the paper maps a set of distinct yet overlapping analytical lenses. Read through each of these perspectives, the diesel generator becomes legible in different ways: as a device for achieving decentralisation, a vehicle for rent extraction, a form of improvised infrastructure, a tool of crisis response, or a site of environmental and social contestation.

We argue that diesel generators are fundamentally ambiguous technologies. They emerge as responses to infrastructural breakdown, conflict, and climate stress, yet simultaneously reproduce and stabilise the very political and economic conditions that give rise to such crises. In certain contexts, they acquire socio-technical momentum, entrenching fragmented and unequal energy regimes; in others, they operate as flexible and adaptive infrastructures that enable energy access and security in situations of acute uncertainty.

By assembling these perspectives, the paper offers a conceptual toolbox for analysing diesel generators across diverse empirical settings. In doing so, it provides a common theoretical baseline for the panel and contributes to a broader rethinking of how supposedly unfashionable fossil fuel technologies continue to underpin and shape contemporary energy transitions.

Daniel Jordan Smith: 'Standby' Generators: Improvised Electricity and Society in Nigeria's Petroleum-Dependent Political Economy

In Nigeria, the most popular response of citizen-consumers to the failure of their government and the national electric power company to provide anything resembling a regular supply of electricity is the purchase and use of small Chinese-made, gasoline-fueled generators marketed under the brand name Tiger. They make up most of the estimated 60 million generators owned by Nigerians for their small businesses, their homes, or both. This paper situates these small generators in a larger context of improvised infrastructure in Nigeria, where people rely heavily on entrepreneurial, informal economic enterprises to survive and to thrive. In addition to being a seemingly ubiquitous “everyman” solution to shortages of electricity, these small generators offer a window onto state-society relations, political culture, and the dynamics of inequality in Africa’s most populous country.

The paper presents ethnographic examples in which generators feature in popular humor, animate widely circulating conspiracy theories, and give rise to frequently repeated discourses of complaint. I argue that the political and symbolic power of these little machines crystallizes key features of Nigerian cultural, social, political, and economic life. Their social power is far greater than their small size might lead one to imagine. Whether it is their familiar nickname—“I pass my neighbor” (Nigerian Pidgin English for “I’m better than my neighbor”)—or widely circulating conspiracy theories about “generator mafias” that deliberately keep the national power grid from functioning well so that they can sell more generators, these cheap, portable machines sit at the heart of Nigeria’s petroleum-dependent political economy, encapsulating people’s hopes for the future but constantly reminding them of their disappointments.

Joanne Nucho: From Lebanon to California: The Role of Diesel Generators in Fragmented Energy Decentralization

Individualized off-grid solar residential systems—solar panels paired with batteries—are now deployed in contexts as varied as post-grid Lebanon, where electricity from the national public grid has become almost non-existent, to middle-class homes in California. In California, residential solar and storage off-grid systems are rendered as the horizon of a new, decentralized future “free” from the grid, even as they introduce new intermediary actors and forms of debt into a reworked energy governance landscape. In this essay, I draw from fieldwork in California’s Mendocino and Humboldt Counties, where intentional experiments with off-grid living since the 1970s formed an important backdrop to the developing solar industry in California, an industry now connected genealogically and institutionally to a growing global small solar industry. Despite the images of a clean, seamless solar-powered disconnection from a carbon-powered grid, when small solar and storage systems are deployed in places where grid power is truly unreliable or unavailable, not only Lebanon but also the rural, sparsely populated and heavily forested Mendocino and Humboldt Counties, the use of diesel generators remains a nearly ubiquitous backup across the usual developmentalist divides of global north and south. In this essay, I describe how a fragmented approach to energy decentralization, where everyone must plan and finance their own energy system, makes ongoing diesel generator dependence, and its many ambiguities, far more likely.

Abeer Al-Eryani: The Structure of Rent in Decentralised Fossil-Fuel Electricity Generation: Path-Dependent Configurations Between Infrastructure and Rent-Extraction Practices

Following the collapse of Yemen’s national grid in 2015, small-scale diesel generators, fuelled by imported petroleum products, became a principal source of electricity. Despite prolonged fuel embargoes, the breakdown of domestic oil production, and the loss of refinery capacity, commercial diesel-based generation emerged for the first time at scale and continues to expand, particularly in areas outside government control.

While unmet demand helps explain the spread of diesel generation, the persistence of embargoes and the high end-user cost of fuel and electricity tariffs render a purely market-based explanation inadequate. Rather than treating these systems as ad hoc responses to supply gaps, this paper conceptualises diesel infrastructures as structured sites of rent extraction embedded within Yemen’s wartime political economy.

Drawing on original fieldwork, the paper compares rent structures in government-controlled centralised provision and in non-government-controlled decentralised systems. It identifies three interlinked rent channels shaping diesel-based electricity across both configurations. First, control over fuel importation and distribution generates scarcity and regulatory rents, particularly where access to ports, customs points, and transport corridors is politically mediated. Second, neighbourhood-level generator operators exercise spatial monopolies over captive consumers, producing monopoly rents through price setting and service control. Third, de facto authorities extract revenue through licensing, taxation, and selective enforcement, embedding diesel provision within broader systems of fragmented governance.

The paper argues that these practices are path-dependent. Pre-war subsidy regimes and patronage networks conditioned the initial turn to decentralised diesel, while wartime embargoes and institutional fragmentation reinforced and expanded extractive arrangements

across the conflict divide. Decentralised diesel has thus evolved into a parallel electricity sector that sustains daily life while reproducing economic distortions and fragmented authority. Understanding diesel infrastructure as a rent-generating system is critical to explaining the resilience of fossil-fuel dependence and the political constraints shaping renewable energy expansion in Yemen.

Ali Al-Wakeel: Neighbourhood Diesel Generators in Iraq – Reality and Applicability of Alternatives

Over the past three decades, chronic electricity shortages, grid instability, and rising demand have reshaped Iraq's power sector, leading to the widespread emergence of neighbourhood diesel generators as a key source of electricity provision. Initially introduced in the late 1990s and early 2000s as a stopgap solution, these locally assembled systems—often built from repurposed truck engines—have evolved into a central component of everyday energy infrastructure, supplying millions of households and small businesses.

At the same time, both the federal government of Iraq and the Kurdistan Regional Government have begun promoting renewable energy, particularly solar photovoltaics, through large-scale projects and financial incentives for residential and commercial installations.

This paper examines the relationship between these two systems, asking under what conditions solar energy might replace, transform, or coexist with neighbourhood diesel generation. It explores the technical, economic, and policy factors shaping this transition, including the absence of regulatory mechanisms such as net metering and feed-in tariffs.

Rather than assuming a linear shift toward renewables, the paper argues that diesel generators are likely to remain embedded within emerging hybrid energy systems. Understanding their continued role is essential for designing cost-effective and reliable pathways toward more sustainable and resilient electricity provision in Iraq.

Alonso Alegre-Bravo: The Role of Diesel Generators in Off-Grid Systems in Rural Central America

Central America is rich in renewable energy resources, particularly hydropower. In many off-grid rural areas, small-scale hydro systems have enabled communities and farmers to achieve a degree of energy sovereignty, reduce costs, and protect surrounding ecosystems.

However, over the past decade, these systems have come under increasing pressure. Intensifying climate change effects, especially prolonged droughts, combined with financial constraints for maintenance and growing demand, have undermined the reliability of small-hydro infrastructure. In this context, diesel generators have re-emerged as a rapid and flexible solution, particularly for users who depend on consistent electricity for productive activities.

This paper examines the shifting role of diesel generators within rural off-grid energy systems in Central America. While generators can stabilize supply and improve electricity quality, their adoption raises important trade-offs. Increased reliance on diesel may erode local energy sovereignty and introduce new social and environmental burdens, including noise and air pollution.

By situating diesel generation alongside small-hydro systems, the paper highlights how climate stress and infrastructural limitations reshape the balance between sustainability, reliability, and autonomy in rural energy provision.

Theresa Sabonis-Helf: Generators as a National Reserve: The Present and Future of Diesel Generators in Ukraine

After several years of targeted attacks on its electricity grid, Ukraine's reliance on diesel generators is unusual among developed countries.

The government has come to rely heavily on generators for a wide range of services and has incorporated this dependence into its future planning. The government of Ukraine's 2026 plan to procure a "national reserve of generators," including 100 new industrial diesel units of varying capacities, highlights the extent to which generators are integrated into both current survival strategies and future infrastructure planning.

Generators have played a key role on both the battlefield and the homefront. This paper examines how they rose to prominence during the war—from securing electricity supply for small businesses, to powering front-line operations, to maintaining the stability of nuclear power plants when surrounding grids fail due to attack.

The paper also considers how Ukraine, outside investors, and relief organizations envision the future role of generators as the country moves toward a more resilient and distributed electricity system.