



This project has received funding from the European Union's Horizon 2020 research and innovation programme under the Marie Skłodowska-Curie actions grant agreement MISTRAL No 813837

# Online Symposium: Social acceptance and the energy transition

13<sup>th</sup> and 14<sup>th</sup> May 2020

## Authors, Titles, and Abstracts

### Session 1: Community Perspectives (1)

*Place Meaning and Consistency with Offshore Wind: An Island and Coastal Tale*

**Aaron Russell**

University of Delaware

This work contributes a unique perspective to a growing body of literature on local communities' responses to the Block Island Offshore Wind Project, the first of its kind in the United States. Specifically, this research asks if the consistency of place meanings with perceptions of the wind project contribute to public acceptance. Data collection included a multi-wave survey focused on island (5 km distance) and coastal resident (at least 26 km distance) attitudes toward the project and cognitions of the coastal setting. We report results from the final survey. Multivariate statistical analysis using ordinary least squares and logistic regression was used to evaluate what variables drive place consistency as well as the relationship between place consistency and project support.

Results indicate that attitudes about the project have solidified as more people have seen it. A majority support the project, and a small percent consider the project inconsistent with specific meanings associated with the ocean environment. These meanings stand out amongst other place constructs. Furthermore, the relationship among turbine descriptions and place meanings and their consistency with the project as a use of the ocean, along with general support for the project is explored. Notable differences include a larger effect for turbine descriptions on the coast and differing conceptualizations of place meaning such as pristineness and recreation. The results validate a place-based understanding of the responses to changing energy systems that must incorporate landscape effects as well as the symbolic natures of the technology and location. The findings agree with a literature outlining a connection between lower support for renewable energy infrastructures and feelings that the ocean is pristine or wild; however, this correlation should not be taken as the rule and depends on factors unique to each community.

*Winds of Change: Examining Longitudinal Attitude Changes Regarding an Offshore Wind Project*

**Samantha Bingaman**

University of Delaware

The amelioration of climate change impacts depends on swift and effective utilization of greenhouse gas mitigation strategies today. The deployment of offshore wind power serves as one of these promising strategies. As the industry burgeons with 22GW installed in Europe (coupled with ambitious climate goals) and 25 GW of planned in the US in the coming decade, it is imperative to understand the factors that influence public acceptance of offshore wind projects over time to harmonize the energy transition.



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Accordingly, this study's purpose is to augment the paucity of longitudinal research on public acceptance of offshore wind power.

Taking a mixed methods approach, this study seeks to understand how acceptance of the Block Island Offshore Wind Project – the first in the US– changed over a three-year period, roughly aligning with the construction, operation, and post-operation phases of the project. The presentation will include analysis of panel data (2016, 2017, 2018) from a survey of Block Island and coastal Rhode Island residents, including how acceptance levels and opinions about turbine visibility, fit, and general effects changed over time. A random effects probit regression model is employed to observe how these acceptance levels were influenced by internal factors (e.g., attributes of participants' attitudes such as confidence in opinion and knowledge about the project) and external factors (e.g., turbine visibility, look, and fit with the landscape). Semi- structured interviews with select participants are currently in progress to complement the quantitative findings.

By telling a multi-layered story describing public acceptance patterns regarding an offshore wind project over time, this study can prepare the industry to anticipate concerns of local residents, better engage communities, and adhere to a theme of social responsibility paramount to the green energy transition.

*Investigating public acceptance of wind energy: evidence from cross-country surveys*

**Anna Ebers Broughel**

Tetra Tech

Despite being one of the most cost-effective sources of renewable electricity, wind parks face intense local opposition, especially near residential areas. This presentation summarizes insights from four countries that answer the questions of what are the most acceptable features of wind energy projects and what are the best ways to present energy projects to the public.

The first study focuses on Switzerland, Estonia, and Ukraine, which were identified as regions with high potential for wind power development. We conducted a choice experiment, jointly testing the influence of procedural and distributional justice on social acceptance, in combination with other factors, such as a wind project's environmental impacts, location, and ownership. The survey demonstrates high social acceptance of wind energy in Switzerland, Estonia, and Ukraine. It was shown that minimizing ecological impacts of wind projects could significantly increase social acceptance. This finding underlines the importance of environmental impacts analyses, which can be seen as an instrument to secure social acceptance. Keeping wind power projects local and nature-friendly are the two most important attributes influencing social acceptance among residents in all 3 countries surveyed.

The second paper focuses on a coastal setting in Massachusetts, USA. The research investigated how public attitudes towards wind energy projects shift in response to



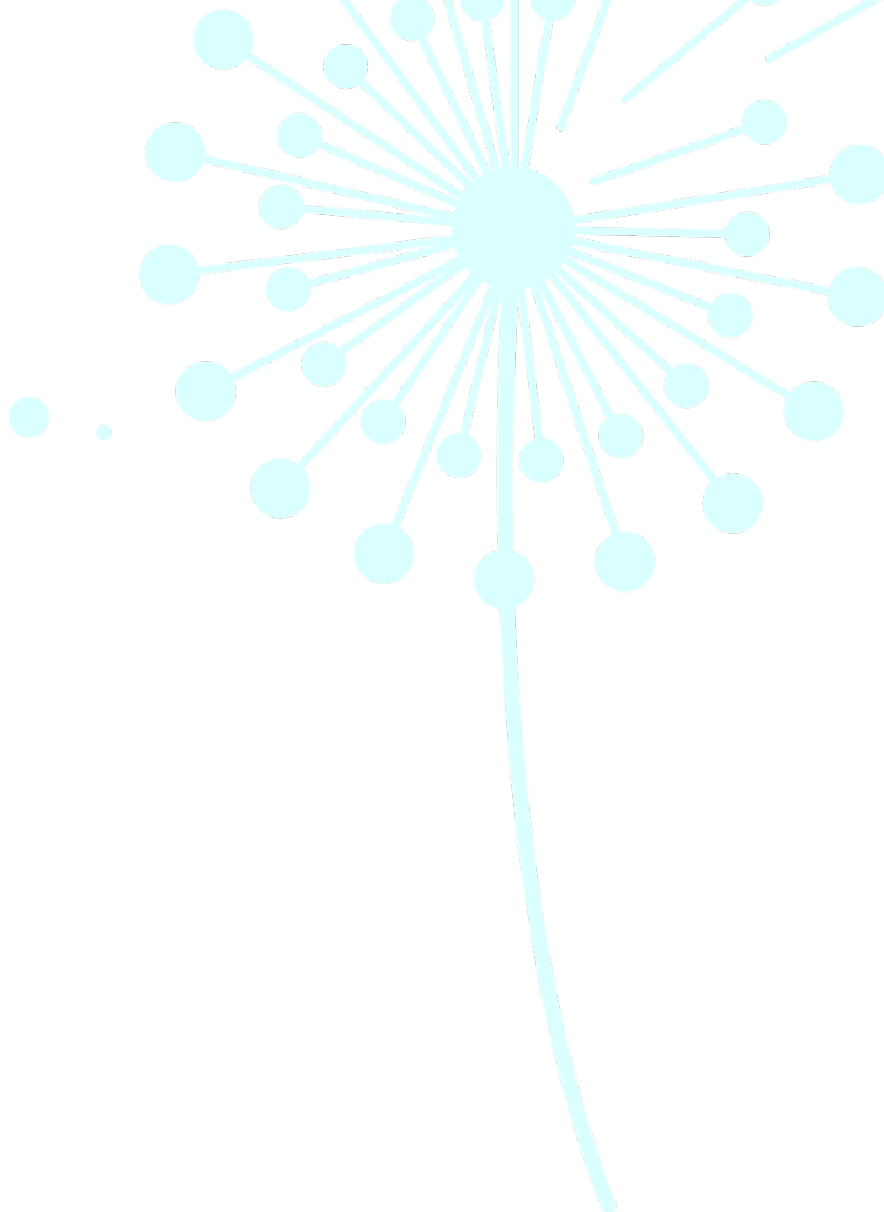
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exposure to immersive media. The researchers investigated the impact of a 360-degree video of a wind project delivered using VR on attitudes toward renewable and non-renewable energy. The study results show that more immersive, multimodal media such as VR are able to provide a more accurate understanding of a proposed wind project, potentially allaying concerns during the siting and permitting process, or enabling better communication between stakeholders, developers and regulatory agencies.

Finally, both studies investigated perceptions with respect to wind energy projects' impacts on energy independence, added value to the local economy, as well as potential negative impacts on health, ecology, tourism and real estate prices.





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## Session 2: Community Perspectives (2)

*What's love got to do with it? Understanding Cognitive and Affective Responses to Wind Turbines to Advance Policy and Communication*

**Jeremy Firestone**

University of Delaware

Negative perceptions of renewable energy projects or development processes often lead to protest, resulting in delay or failure. Alternatively, methods for promoting good communication and understanding among developers, governments, and communities are pathways to success. While literature referencing the social aspects of renewable energy siting have become widespread, analyses of the individualized psychological aspects of perception and judgement are rarer. Behavior and judgment can be perceived in at least two distinct ways: 'affective' and 'cognitive'. Understanding emotional as well as cognitive perceptions is crucial for adequate understanding of not just consumptive or productive aspects of energy, but entire systems. Such insight can help to point to possible challenges in communication or policy measures.

We use a US national cross-sectional data set of 1705 individuals who live within 8km of a wind turbine. This data was collected in a research project led by Lawrence Berkeley National Lab in a random probability based phone, mail and online survey in 2016, <https://emp.lbl.gov/projects/wind-neighbor-survey>. We hypothesize that individuals who moved-in prior to construction commencement will process their local wind projects differently than those who moved in subsequently. Variables include emotions such as pride, anger, and annoyance, perceptions of fit with the landscape, descriptions of the turbines as industrial and whether they added to or detracted from the community. For those who moved into their homes prior to commencement of project construction, the affective variables pride, sound annoyance and anger are significant and the largest effect sizes, while for those who moved-in subsequent to construction, the cognitive variables, perception that wind turbines are symbolic of clean energy progress and that wind power is an effective means to mitigate climate change are the most important. The emphasis on anger and pride amongst the former suggests a greater role for community participation in project siting and ownership.

*Keep it Local and Low-Key: Social acceptance of alpine solar power projects*

**Pascal Vuichard**

University of St. Gallen

Locating utility-scale PV projects in alpine regions with high solar irradiation could help to meet demand during the winter season. However, similar to wind farms, large solar projects change the landscape and may therefore face social acceptance issues. In contrast to the rich literature on wind energy, social acceptance of solar power has received less attention. This paper helps close the gap with the help of a large-scale survey (N=1036) in Switzerland. We opted for a choice-based conjoint experiment to



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identify the relative importance of different attributes that define the social acceptance of such projects. Within a choice experiment, each choice task elicits the respondent's willingness to accept trade-offs among more or less desired project attributes, the levels of which vary randomly. The project attributes included procedural and distributional justice, as well as local ownership, and also more novel attributes such as the influence of innovative design elements on social acceptance.

We find a high level of overall acceptance (64% would agree or fully agree) suggesting that alpine solar power generation looks like a potentially promising candidate from a social acceptance point of view. We also find a PIMBY effect: residents of alpine regions show a significantly higher acceptance level than "lowlanders". The results of the choice experiment confirm findings suggesting that procedural and distributional justice correspond to higher levels of social acceptance. We also find that low environmental impact, as well as local ownership, are positively related to acceptance. Importantly, we demonstrate that design can play a key role: Respondents clearly preferred a design which minimizes the visual impact by adjusting the color of the panels to the natural surroundings. To successfully implement solar PV projects in alpine regions, it appears to be crucial to keep them local and low-key, in the sense of minimizing the perceived landscape change.

### *Offshore Wind and Community Benefits in Kitty Hawk, NC*

#### **Grant Tyler**

University of Rhode Island

As offshore wind energy development gains a foothold in the United States, the possibility of conflict between local communities and developers may become increasingly common. Coastal communities within the viewshed or hosting transmission cables may fear several impacts but few benefits. This lack of benefits can influence the level of support in the community for a project and eventually lead toward opposition. Community benefits, provided through the wind farm developer, may help garner local support in communities in close proximity to a wind farm project. In the U.S. offshore wind industry, community benefits are not obligatory but are sometimes offered voluntarily by the developer. This research focused on the federal Kitty Hawk Wind Lease off the Outer Banks of North Carolina, which was awarded to a private energy company in 2017. Remote communities, like the Outer Banks of North Carolina, may see little investment or job opportunities from an offshore wind farm while still experiencing effects from its proximity.

The research goal of this study was to understand how key informants think of a proposed offshore wind farm in the context of community benefits. In Summer 2019, we conducted extensive semi-structured interviews with 11 key informants in the area. Using thematic analysis, we developed overarching themes in the data. Our data shows that key informants are skeptical of direct benefits like local employment from the





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project while showing optimism for indirect, regional benefits. Concerns over impacts center on the landing of a transmission cable and possible effects on the commercial fishing industry. Regarding community benefits, the majority of key informants were interested in a community fund that would be administered by the local government or a trusted local organization. This study emphasizes the need for more research on community benefits from offshore wind in the United States and makes recommendations on how to incorporate community benefits into the U.S. federal leasing process.





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## **Session 3: Roundtable discussion - International experiences**

*Intersection participation policy and practices in wind energy in six European countries*

**Kristian Borch**

Aalborg University

**Zoe Chateau**

**Patrick Devine**

**Jean-Pierre Roux**

University of Exeter

**Jan Hildebrand**

Institute for Future Energy and Material Flow Systems (IZES gGmbH)

**Martijn ten Klooster**

**Mariëlle de Sain**

Pondera Consultants





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## Session 4: Innovations in policy, technology, and governance of renewable energy

*Understanding variable deployment of offshore wind power in Europe: How does policy innovation occur?*

**Jean-Pierre Roux**

University of Exeter

This presentation summarises provisional findings from an on-going critical literature review of policy innovation in and between European states (or lack thereof) in support of offshore wind power expansion. Policies related to R&D are not considered, rather, it focuses on four policy mechanisms:

- Seabed leasing (including marine spatial planning)
- Financial settlement (e.g. structuring of subsidies through REFITs or auctions)
- Development rights (i.e. planning approval processes)
- Grid connection policies

Current gaps in the literature suggest that a fruitful way to understand variable political responses to offshore wind is to study the processes of national policy innovation aimed at adopting and implementing a mix of policy mechanisms supportive of offshore wind power expansion. A comparative study between national leaders and laggards in the deployment of offshore wind power may increase understanding of the factors that aid or hinder the opening of windows for policy innovation.

*Size Matters: The Cultural Political Economy of Research and Innovation of Wind Energy*

**Robert Wade**

**Alex Miller**

Queen's University Belfast

**Tom Cronin**

**Julia Kirch Kirkegaard**

**Cristian Pons-seres de Brauwer**

Technical University of Denmark

Technology is widely acknowledged to play a key role in addressing the multiple social and ecological crises of our time. Wind energy technology is expected to be crucial in the transition to low-carbon energy systems and climate change mitigation efforts. Innovation has emerged as a key concept in relation to the evolution of wind energy technology in energy systems. A dominant discourse around wind energy has framed the technology as intrinsically value free, with value judgements only entering the conversation regarding the process of deployment. However, critical approaches to technology demonstrate the inherently political and value-laden nature of scientific and technological development, which technological objects come to embody. Analysing the





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ideas that underpin technologies can expose overlooked power structures and dynamics which influence decision-making processes. This research examines the case of wind energy technology development in Denmark and investigates the embeddedness of ideas related to technological innovation.

It is argued that the logic of the 'neoliberal marketplace for ideas', based on the structural imperative for market-competitiveness, innovation, and growth, has driven the size and cost of turbine technology upwards, thus excluding communities from participating in the energy transition. We investigate the de-politicisation of technology and its relationship to the concepts of social acceptance, trust, and participation. We posit that the focus on innovation has served to disaffect local communities and reduce trust, thus contributing to widespread opposition seen in numerous countries. Finally, we examine alternatives including the co-production of science and the application to locally appropriate energy technologies.

*Scale, history and justice in community wind energy: An empirical review*

**Jamie Baxter**

University of Western Ontario

**Chad Walker**

University of Exeter

**Geraint Ellis**

Queen's University Belfast

**Patrick Devine-Wright**

University of Exeter

**Michelle Adams**

Dalhousie University

**Romayne Smith Fullerton**

University of Western Ontario

Although there is a clear positive link between community wind energy (CWE) projects and social acceptance, there is still empirical and conceptual ambiguity concerning the details of why. To fill this gap, we revisit foundational papers in this field and then, focusing on empirical case studies between 2010 and 2018 (n=15), trace how recent research has engaged with existing conceptual frameworks. Most empirical researchers verify the importance of the two key dimensions defined by Walker & Devine-Wright (2008): process and outcome, and then relate this to procedural justice and distributive justice.

Meanwhile, the core concept of "community" has been deployed, in both practice and research, in so many different and sometimes ambiguous ways that it remains difficult to assert if, and how, community-based renewable energy policy and siting practice produces high levels of local community acceptance. We suggest that parsing out the scale of investment in wind energy projects and the local historical context of energy

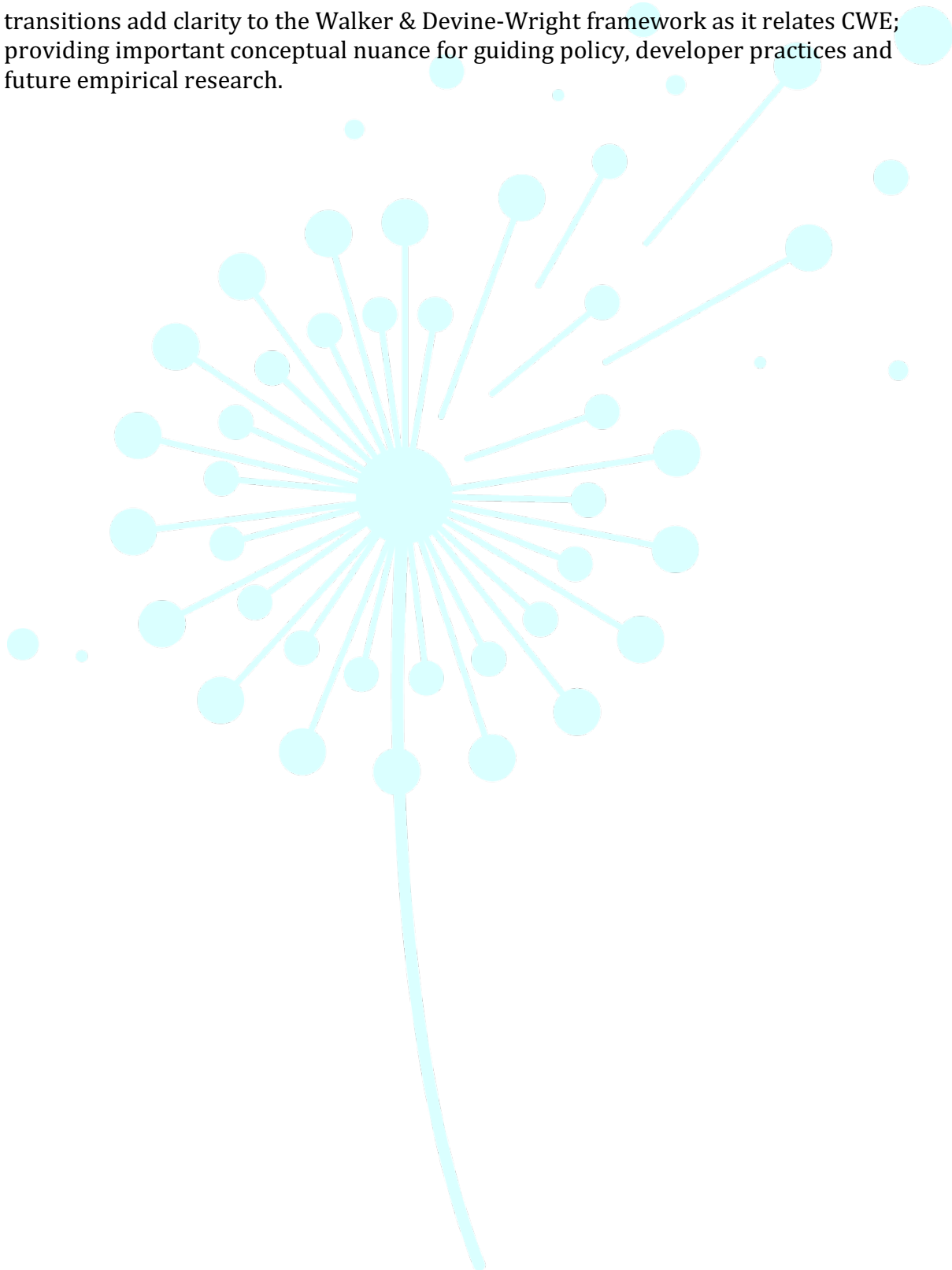


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transitions add clarity to the Walker & Devine-Wright framework as it relates CWE; providing important conceptual nuance for guiding policy, developer practices and future empirical research.





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## **Session 5: Theoretical Perspectives**

*Planning and the management of social acceptance of wind energy; Using a governmentality approach to compare Ireland and Denmark*

**Senni Määttä**

**Geraint Ellis**

Queen's University Belfast

**David Rudolph**

Danish Technical University

Community opposition has been recognized as a major constraint for wind energy deployment in most European countries, and there is a wealth of research that has explored the factors that condition local responses to such projects. While there are studies that evaluate how regulatory measures such as consenting regimes participation and 'planning gain' such as community benefit packages and ownership, there are very few studies on how the complex relationships between host communities and infrastructure development are managed by wider governance regimes.

In this paper we use concept of governmentality to explore how the social acceptance of wind energy has been managed as a form of 'conduct of conduct' in two wind rich European countries: Denmark and the Republic of Ireland. We use the Foucauldian concepts of problematizations, rationalities and technologies to analyse the evolving legislation, polices and regulatory instruments in two wind-rich European countries, Denmark and Ireland. In each country we sketch out the historical evolution of wind energy and track emerging social acceptance issues. We conclude with some general reflections on the usefulness of a governmentality framework in energy transition research, suggesting that 'acceptance' is as much an issue of power as it of community-technology interactions, which have very different wind energy pathways and trajectories, but which have ultimately adopted similar strategies to deal with community acceptance concerns. which will have implications for the broader energy transition.

*Green growth or energy descent? Assessing collaborative approaches to urban energy transitions*

**Silver Sillak**

Danish Technical University

Cities all over the world are increasingly setting ambitious targets of becoming zero carbon and 100% renewable based in the near future. However, transitions towards new energy systems in cities are being stalled by increasing public resistance. Research has shown that this is often due to dominant technocratic planning practices that tend to exclude participation and downplay local concerns. Although there is evidence that these problems can be alleviated by more extensive collaboration, existing theories have yet to provide answers on what kind of collaboration might be appropriate in a given context.



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This paper aims to critically review the wide variety of collaborative approaches available in the fields of urban planning, public administration and energy transitions. On the basis of this review, it proposes a flexible framework that can help assess the appropriateness of collaborative models that are used in practice. The usefulness of this framework is illustrated with examples of urban energy transitions in Sønderborg (Denmark), run by a public-private partnership, and Totnes (UK), led by a community-based charity. The results highlight a number of differences between the seemingly similar collaborative approaches in expectation alignment, resource acquisition, social learning as well as monitoring and evaluation. Most notably, differences in inclusion in the initiation phase led to diverging visions, with Sønderborg advancing green growth and Totnes promoting planned energy descent. While both provide appropriate solutions to local concerns, their implications differ in the context of the global climate and ecological emergency.

*Unpacking the visual-spatial impacts of energy infrastructures: A critical outlook at its dimensions and associated socio-psychological processes*

**Susana Batel**

University Institute of Lisbon, Portugal

**Patrick Devine-Wright**

University of Exeter

This paper proposes that it might be relevant to problematise the visual impact of large-scale renewable energy and associated infrastructures (RET) as a factor associated with people's responses to these infrastructures, by disentangling its three interrelated dimensions: individual, community/local, and socio-cultural/institutional. We first critically review social acceptance literature on the visual impacts of RET for highlighting the relevance of considering those three dimensions. We then suggest that some analytical tools from the Theory of Social Representations might be useful for empirically grasping how those three dimensions shape people's responses to RET. To illustrate this proposal, we examine data collected from UK newspapers from 2008-2014 on wind energy and rely on examples from some of our previous research. We finish by discussing how the visual-spatial impacts of RET reflect and shape the commodification of RET as part of the larger socio-economic and political system that they are materialising.