

Report 2021

Task 28

Photo: Nicholas Doherty/Unsplash

Social Science of Wind Energy Acceptance (SoSWEA)

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As wind energy deployment continues to grow globally, in both established and emerging markets, where the availability of renewable energy has become increasingly important, if not critical, Task 28 continues to add value to addressing societal impacts and dynamic challenges.

Social and community acceptance continues to be a key constraint for the development of wind energy projects. Local and regional protests of wind projects can halt permitting and construction, regardless of a country's climate goals. Task 28 participants and its network of international researchers are defining challenges and applying solutions at local, regional, and country-wide levels. Social scientists and others participating in this Task conduct research and share findings to increase the knowledge base among Task 28 members, industry, and governments. Task members collaborate with partner Organisations and disseminate high quality data and analyses for decision-makers, researchers, planners of energy projects, and others.

Table 1. Countries Participating in Task 28

	COUNTRY	INSTITUTION
1	**Ireland**	Sustainable Energy Authority of Ireland
2	**United States**	Colorado State University National Renewable Energy Laboratory
3	**Germany**	Federal Ministry for Economic Affairs and Energy
4	**Switzerland**	Swiss Federal Office of Energy
5	**Japan**	National Institute of Advanced Industrial Science and Technology
6	**Denmark**	DTU Wind Energy Department of Wind Energy
7	**Canada**	Western University, Canada
8	**Sweden**	Swedish Energy Agency

Introduction

Offshore wind is set for robust growth globally, with the current policies of many governments in the EU, the Americas, and Asia aiming to multiply offshore wind capacity over the next decade. Bolstered by policy targets and falling technology costs, global offshore wind capacity is projected to increase dramatically. The level of planned investment means that offshore wind will account for 10% of investment in renewables-based power plants globally. Task 28 recognises the social science challenges in meeting such growth targets, and its research will enable appropriate and responsible deployment through increased R&D collaboration. In doing so, Task 28 will reach out to emerging markets.

There is an opportunity to influence policies in countries new to on- and offshore wind energy and to provide examples of best practices to influence the evolution of equitable arrangements in countries with existing deployment.

Task 28 has been highly productive and successful to date, but significant work remains. The value of international collaboration only increases as wind deployment advances around the globe. We have learned that wind energy developments and social science intersect in many different areas (local town boards and municipalities, utility providers, energy planners, state regulators, etc.); for example, research has highlighted the differences in stakeholders between on and offshore wind projects, and between different international jurisdictions and cultures (what works in the EU and North American may not in Asia or Africa).

For Phase IV (May 2020 – April 2024), Task 28 has taken a more holistic systems view of the social science of wind energy acceptance so that information can be useful to a wider audience. As the global energy supply transitions to lower carbon energy sources, such as solar and wind, Task 28 research can be useful for any community experiencing an energy transition, whether that be the closing of a coal power plant or the opening of a wind farm. Local practitioners can learn from parallels in perceived procedural fairness, for example.

Task 28 has become and will continue to be a globally recognised source of social science expertise for wind energy. This expertise can and will be made available to other IEA renewable energy programs such as solar and hydropower.

Progress and Achievements

Task 28 successfully completed Phase III in 2020 and commenced Phase IV after its proposed work program May 2021 – April 2024 was approved by IEA Wind TCP Executive Committee. Phase IV has now been successfully underway since May 2020 and is on the programme in terms of planned deliverables and activities.

During Task 28 Phase IV, Year 2 (May '21-April '22), as planned, several meetings and collaborations have taken place, with many publications, presentations and dissemination delivered.

Highlight 1: Task 28 member Joe Rand and advisor Ben Hoen co-authored a journal article with Ryan Haac, Ryan Darlow, and Ben Kaliski for **Energy Research and Social Science** *In the shadow of wind energy:*

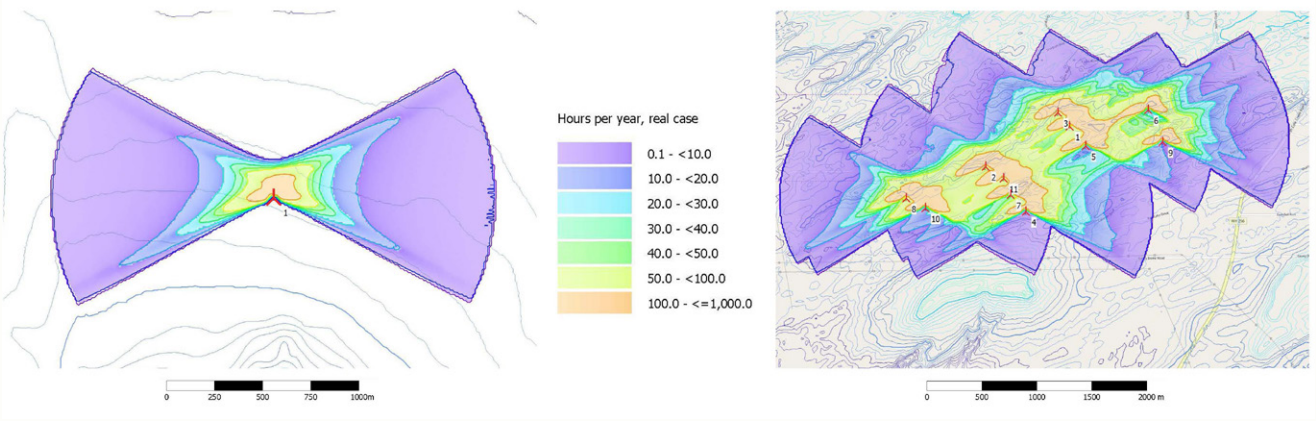

Figure 1. Example of annual shadow flicker hours around (A) a single wind turbine and (B) a string of wind turbines. (Haac et al, 2022) https://emp.lbl.gov/publications/shadow-wind-energy-predicting



Fisherman with offshore wind turbines in background

Photo: Dreamstime

Predicting community exposure and annoyance to wind turbine shadow flicker in the United States. [1]

For this article,

- Shadow flicker (SF) was modelled at ~35,000 residences surrounding US wind turbines, including 747 survey respondent homes.
- Modelled SF exposure strongly predicted whether in fact a respondent perceived and reported SF in their home.
- Higher modelled SF exposure levels did not mean higher levels of self-reported annoyance to SF.
- Instead, self-reported SF annoyance was correlated with subjective factors, e.g., project appearance and general annoyance.

Highlight 2: Photo from the Publication of best practice guidelines on Offshore Wind Farm Projects: Stakeholder Engagement and Community Benefits, A Practical Guide, from participating member countries. The lead authors were Garry Keegan and Ann Torres, of Ireland. This guide was disseminated widely by ENTSO (E) and EU Commission and Parliament. [2]

Task 28 Deliverables 2021 (available at https://iea-wind.org/task28/)

- Work Package 2 Deliverable: Cost of Opposition to Wind Energy Development Briefing Document "understanding costs associated with wind energy opposition and stakeholder engagement", by Elizabeth Gill and Joseph Rand, US Task 28 participants. [3]
- Maruyama, Yasushi. 2021. *The Governance of Renewable Energy Projects and Expanded Distributive Justice,* in Miyauch and Fukunaga eds., Adaptive Participatory Environmental Governance in Japan: Local Experiences, Global Lessons, Springer (book in print).
- OPIN (Ocean Power Innovation Network) November 2021: Task 28 Presentation.
- *Offshore Wind Farm Projects: Stakeholder Engagement and Community Benefits, A Practical Guide,* from participating member countries. Lead authors: Garry Keegan and Ann Torres, Ireland.
- *In the shadow of wind energy: Predicting community exposure and annoyance to wind turbine shadow flicker in the United States, by Task 28 members Joe Rand and Ben Hoen (USA) among others.*

The industry is involved in Task 28 in every member country.

- Denmark representatives have collaborated with developers (including on conference presentations) to advance the WIND2050 Project. "Wind Farm Developers: a typology of acceptability" at the International Sustainability Transitions Conference, August 2020.
- Jamie Baxter (Task 28's Canadian member) presented "Social Science of Wind Energy Acceptance" to the Canadian Wind Energy Research Network. (2021).
- Task 28 representative in Japan serves on Wind Energy Zoning Council in Akita.
- Members serve on the Irish Government Advisory Group for community aspects of offshore wind.
- Irish representatives of Task 28 conducted a knowledge exchange survey about offshore wind social acceptance.
- In the UK, Task 28 participants with MISTRAL hosted an online symposium on social acceptance and the energy transition with 93 attendees.
- Patrick Devine-Wright (Task 28, UK) consulted with IPCC on social acceptance of climate mitigation technologies including wind.
- The U.S. Department of Energy convened developers and academics (including Tegen and Rand) to develop their wind energy stakeholder engagement strategy in 2021.

Task objectives:

- Ensuring diverse participation from a larger number of countries and a variety of researchers and social scientists;
- Adopting new methods of knowledge sharing based on more proactive involvement of Task participants and new online webinar and meeting tools;
- Greater emphasis on maximising the value of the Task outputs through the engagement of end users and broad systems thinking;
- Exploration of increasing the Task's reach to emerging economies;
- Increasing the profile and awareness of Task 28 by proactive outreach and on-line dissemination to and through wind and other renewable energy stakeholders globally.

Priority Topics for Task 28 Phase IV (May 2020 - April 2024)

Task 28's focus is on social science acceptance but is closely linked with environmental and economic impacts as well as communication, education, and stakeholder engagement, so it can help inform IEA members and audiences on these topics.

The two tracks for Task 28 research and dissemination are *Research Synthesis and Gap Analysis and Research Dissemination, Facilitation and Knowledge Exchange.* The tracks align with the division of past Task 28 efforts and participant country priorities for the Task. They are broken down as follows (Track (T) and Work Packages (WP):

Track 1: Research Synthesis and Gap Analysis

1. Innovations in value additions and benefit schemes from wind projects – what have we learned from Phases 1-3, and where are current gaps in research?
2. Understanding costs associated with community engagement and opposition.
3. New and emerging issues in wind energy acceptance (e.g., supersized turbines, airborne wind, floating offshore wind).

Track 2: Research Dissemination, Facilitation, and Knowledge Exchange (ensuring research is shared globally)

4. Increased global engagement and knowledge exchange of wind energy acceptance and social science
5. Offshore Wind Working Group on Social Science and Wind Energy Acceptance Issues: expert convening exchange and information dissemination

Outcomes and Significance

Debates surrounding wind energy projects in the field show that social acceptance is a topic that needs to be better understood if various policy tar-

gets for renewable energy production are to be accomplished. Individual projects require public approval, and to be realised, proponents and opponents need to work together to improve projects. Industry, government, and research institutions appear to be increasingly interested in these topics.

Achieving long-term acceptance of wind power will require efforts such as the interdisciplinary and international Task 28 approach.

Task 28 activities and outcomes since the commencement of Phase IV in May 2020 are listed above.

Next Steps

Task 28 has committed to a plan of deliverables (DV) over the course of Phase IV. The following table lists all deliverables, showing status and completion if applicable. Future milestones are identified in blue font.

Deliverable (DV) No.	Deliverable	Contributors	Quarter Due	
T1 WP1 DV1	Report & Online Briefing	JOA, and Denmark, Germany, Japan, US, Canada, Ireland.	Q4, 2021	Complete
T1 WP2 DV1	Literature Review	JOA and US, Japan, Ireland, Sweden, Switzerland, Finland	Q3, 202	Complete
T1 WP2 DV2	Online Briefing Document	JOA and US, Japan, Ireland, Sweden, Switzerland, Finland	Q1, 2022	Complete
T1 WP2 DV3	Report and Presentation for Conference or Webinar	JOA and US, Japan, Ireland, Sweden, Switzerland, Finland	Q1, 2024	
T1 WP3 DV1	Report and Briefing Document	JOA and US, Japan, Ireland, Germany	Q4, 2022	
T1 WP3 DV2	International Web-based convening (collaborating with industry)	JOA and US, Japan, Ireland, Germany	Q3, 2023	
T2 WP4 DV1-3	Webinars and In-Person Meetings	JOA and all participants	Q2, 2021, '22 & '23	33%
T2 WP4 DV4	Conference Social Science Track or Session	JOA and all participants	Q3, 2021	Complete
T2 WP4 DV5	Multiple Tracks / Sessions at Engineering and technology Conferences	JOA and all participants	Q4, 2022	50%
T2 WP4 DV6	Joint Meetings with IEA Solar & other Renewables	JOA and all participants	Q4, 2022	25%
T2 WP4 DV7	Fact-sheet and/or Joint Webinar	JOA and all participants	Q4, 2023	
T2 WP4 DV8	Peer Reviewed Social Science	JOA and all participants of Wind Energy Acceptance Database (Excel-based)	Q4, all years	50%
T2 WP5 DV1	Best Practice Publication on offshore wind	JOA and Ireland, US, Canada, Japan, UK, Denmark, Norway, Netherlands, Germany.	Q1, 2021	Complete
T2 WP5 DV2-8	Present at International Workshops, Seminars, Conferences. Awareness Building via Industry Publications Netherlands, Germany.	JOA and Ireland, US, Canada, Japan, UK, Denmark, Norway, 'Q2, '24	Q2 Q4,'21; Q1, 2 , 4, 22 & '23;	partial
T2 WP5 DV9-14	Fact-sheets	JOA and Ireland, US, Canada, Japan, UK, Denmark, Norway, Netherlands, Germany.	Q4, 2021; Q2 & 4, '22, '23; Q2, '24	33%

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In addition, members of Task 28 have been discussing the importance of adding participants to the IEA Wind TCP from emerging economies in places like Africa, Asia, and South America. If global climate goals are to be met and energy demand is increasing dramatically in these parts of the world, they have the opportunity to leapfrog to modern technology, moving to clean rather than fossil fuel for. This will work most efficiently if participants from emerging economies can learn from mistakes and successes that other countries have already had.

References

[1] Ryan Haac, Ryan Darlow, Ken Kaliski, Joseph Rand, and Ben Hoen (2022). *In the shadow of wind energy: Predicting community exposure and annoyance to wind turbine shadow flicker in the United States.* Energy Research and Social Science Volume 8; Number 102471. https://emp.lbl.gov/publications/shadow-wind-energy-predicting

[2] Garry Keegan and Ann Torres (2021). *Offshore Wind Farm Projects: Stakeholder Engagement and Community Benefits, A Practical Guide.* http://ipc10.com/wp-content/uploads/2022/01/Final-Offshore-Guide.pdf

[3] Gill, Liz and Joe Rand (2022). *Understanding Costs Associated with Wind Energy Opposition and Stakeholder Engagement.*

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