



User-Centred Energy Systems

D2 Drivers and barriers of public engagement in energy infrastructure



UsersTCP

Public Engagement
for Energy
Infrastructure

Institute for European Energy and Climate Policy (IEECP)
and Renewables Grid Initiative (RGI)

November 2023



Relevance of the work



A deep and rapid transformation of our energy systems is required to meet international energy and climate goals



While the public is in favor of the energy transition, concrete energy infrastructure developments are often met with **public opposition in practice.**



Research found that **public participation can influence the acceptance** of energy infrastructure projects positively



Yet, there's a need to explore **different forms** and **drivers and barriers for public engagement** within the development of energy infrastructure



The research objectives

1

What are the socio-psychological, socio-technical, and institutional **drivers and barriers to acceptance and participation** within the context of energy infrastructure projects?

2

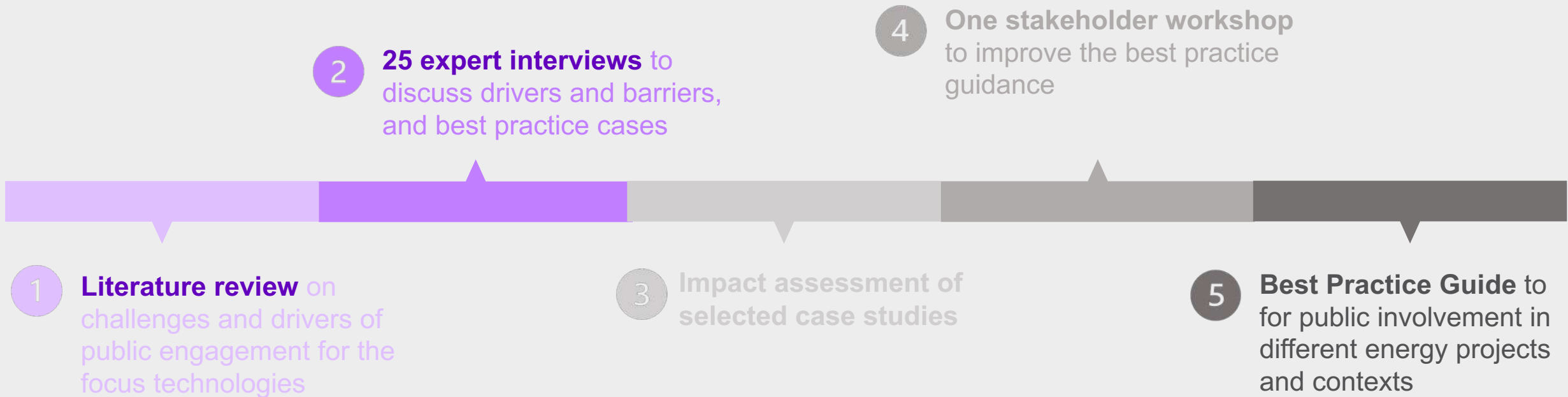
When and why have infrastructure projects failed due to a lack of good public engagement?

3

Which **forms of public engagement** are suitable for increasing acceptance and achieving a fair and inclusive decision-making within energy infrastructure projects?



The results are based on two methods | next steps

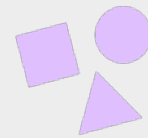




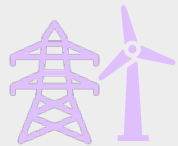
Literature review



72 articles, reports
and books reviewed



Review papers and single
case studies



Most literature on wind energy
and grid infrastructure



Most case studies from Europe
and North America

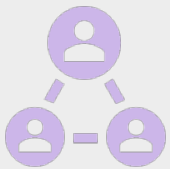


Expert interviews

- 25 interviews with 26 experts between June and October 2023 conducted
- Experts at European-level, and 7 national European countries
- Four different stakeholder groups
- Gender representation was balanced across interviewees

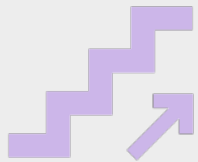
Stakeholder groups:	Polycymaking	Energy industry	Non-governmental organization	Research and consulting	Total per country
Countries:					
European Union	1	1			2
Denmark		2			2
Netherlands	1	3			4
Ireland	2	3*	1	2	8
Sweden		2		1	3
Switzerland		1	1		2
Romania		1			1
United Kingdom	2	1		1	4
Total per stakeholder group	6	13	2	4	26

Results – Levels and purpose of public engagement



Public engagement can **take different forms or levels**, depending on individual understandings, the country or political systems

Different understanding of the concept between interviewees: While for some, it means to listen and inform (Interviewee 4), for others it means to “have a say”, or “have a share” (Interviewee 6), or actively “shaping the (energy) system together” (Interviewee 22).



Different levels of public participation

- From **information** (one-way interaction) to **consultation** and **empowerment** (two-way interaction).
- Each level can be valid, as publics may have different preferences for their participation.



Results – Levels of public engagement



Most of the public prefers **high level of consultation, or active participation**, where they have the possibility to influence the decision-making during planning and approval.



BUT: most of the projects reviewed in the literature remained at the level of informing or consulting rather than empowering the public.



Non-participation can be also a sign of resistance to predefined participation roles.



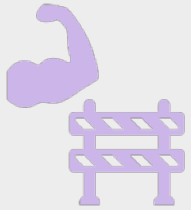
“[...] the point is that the infrastructure is really very crucial for our society on all kinds of elements and that's why I think that the people should be involved [...]”. (Interviewee 22)

Results – Purpose of public engagement

Literature review and expert interviews revealed **different reasons why the public should be engaged** in certain infrastructure developments

- To give the public a voice in decision that affect them, such as infrastructures which are changing their landscapes and neighborhoods;
- To allow project promoters to listen to the public's opinions, needs and ideas to address concerns and encounter possible conflicts;
- To legitimize the decision-making processes carried out by the project promoters;
- To inform the public about planned projects;
- To raise awareness among the public about the infrastructure needed to progress with the energy transition, participation opportunities, among others, and receive interest;
- To increase understanding why certain projects in certain localities are needed;
- To build relationships and create trust amongst the public in businesses and local governments;
- To increase the likelihood of effective project siting;
- To decrease opposition towards and increase acceptance for infrastructure projects;
- To make decisions on practical local knowledge about the local pre-conditions;
- To collect feedback and understand public preferences;
- To collaborate and jointly promote projects;
- To discuss planning, siting and ownership of infrastructure;
- To discuss potential community benefits.

Results – Drivers and barriers



There are several factors that can encourage and discourage public involvement in energy infrastructure projects.

Two dimensions were considered:

- the motivations and barriers for public to engage with energy infrastructure
- the drivers and barriers of project institutions/developers are facing when engaging (with) the public.



Many identified drivers and barriers of public engagement overlap between findings from the literature review and the interviews.





“What participation we should be doing is to enable energy infrastructures that are responsive to public concerns and values” (Interviewee 1).

Results - Drivers of public engagement (1/2)

Driver category	Type of driver	Concerned actors	Found in what country context	Found for what technology	Literature references	Expert reference (interview number)
People are affected and concerned	Socio-psychological	Public	Denmark, Germany, Netherlands, United Kingdom (UK)	Wind energy, grid development	[58], [59]	1, 3, 5, 7, 19, 20, 25
Wider environmental concerns and sustainability motivation to support	Socio-psychological	Public	Denmark, Germany, Netherlands; Review of 15 case studies	Renewable energy, storage	[64], [65]	2, 6, 9, 11, 16, 19, 22
Feeling of agency and mandate to influence decisions	Socio-psychological	Public	Canada, Germany, Scotland, Uganda, Zambia	Wind energy, renewable energy	[31], [39], [67]	3, 5, 8, 10, 12
Fair perceived process	Socio-psychological	Public	Germany, Norway, United Kingdom, Sweden; global (literature review)	Transmission grids, renewable energy transition, onshore wind energy	[31], [67], [70]-[72]	8, 19
Solution fits to wider sustainable local development	Socio-psychological	Public	Netherlands, Ireland, Switzerland	Wind energy	[54]	2, 3, 4, 6, 7
Financial incentives and community benefits	Socio-economic	Public	Canada, Denmark, Germany, Scotland, Sweden, global (literature review)	Wind energy, wind energy combined with hydrogen	[77], [78]	2, 4, 6, 7, 11, 18, 19, 22, 24, 25
Local (co-)ownership	Socio-economic	Public	Review of 15 case studies, global (literature review); Denmark	Storage (mainly in combination with solar photovoltaic), onshore wind	[54], [65], [72]	2, 4, 7, 13, 23
Sense of community	Socio-psychological	Public	Review of 15 case studies,	Storage (mainly in combination with solar photovoltaic)	[65]	24

“[Company] has used public participation networks, which are linked to municipalities and counties, and one of the main areas of discussion has been around where there’s funding, grants available to go for these groups to divide the expending. When the money is on the table, people get very interested” (Interviewee 11).



“There are long procedures for each project, so it’s important to have engagement not only after the project start, but also before to inform them why it is important and why the project is being done.” (Interviewee 12)

Results - Drivers of public engagement (2/2)

Driver category	Type of driver	Concerned actors	Found in what country context	Found for what technology	Literature references	Expert reference (interview number)
Make participation easy	Institutional	Developers, governments	UK, Netherlands, Ireland	Renewable energy, wind energy, grids		1, 2, 4, 5
Early and ongoing participation invitation	Institutional	Public, developers, governments	Germany, Netherland, Norway, UK / Scotland, Sweden, Switzerland	Transmission grids, wind energy	[5], [39], [70], [80]	2, 6, 7, 8, 10, 12, 18, 19, 20, 23, 25
Clear communication, and timely, transparent, and reliable provision of information	Institutional	Developers, policymakers	Denmark, Germany, Ireland, Netherlands, Scotland, Switzerland	Transmission grid, wind energy, energy strategy	[39], [81]-[83]	1, 2, 5, 7, 12, 15, 18, 19, 20, 25
Raising awareness and capacities building	Institutional	Developers, policymakers	Germany, Netherlands, Scotland	Wind power, transmission grids	[19], [39], [58]	
Harnessing local knowledge	Institutional	Developers	Czech Republic, Denmark, Netherlands, South Africa, UK / England,	Wind energy, solar energy	[57], [62], [77], [78]	1
Local traditional or opinion leaders, or “visions”	Institutional	Public	Denmark, Romania, Uganda, Zambia	Renewable energy, wind energy	[53], [54]	1, 2, 15
Local people or authorities lead engagement processes	Socio-technical, institutional	Public	Ireland, Netherlands, UK,	Renewable energy, solar energy, grids	[54]	1, 2, 7
Economic interests by the private sector	Socio-economic, institutional	Developers, governments	Ireland	Grid, wind energy		3, 11, 22, 24
Legal requirement of public engagement	Legal	Developers, policymakers	Canada; Germany; Netherlands; Chile, Costa Rica, Colombia, and Mexico; global (literature review)	Renewable energy, wind energy, geothermal energy	[72], [73], [75], [82], [87]	8, 22, 23, 24



“To create trust, you have to be transparent, open-minded, have to go on site, talk to the local communities, engage with different perspectives.”
(Interviewee 12)

Results - Barriers of public engagement (1/2)

Barrier	Type of barrier	Concerned actors	Found in what country context	Found for what technology	Literature references	Expert reference (interview number)
Unawareness of participation opportunities and purposes	Social-technical	Public	Netherlands, UK	Energy and transport infrastructure, geothermal energy	[59], [69], [90]	2, 6, 8
Lack of interest, lack of incentives	Socio-psychological, socio-economic	Public	Ireland, Switzerland, UK	Energy transition		3, 5, 25
Time and resource intensity of processes	Socio-psychological, institutional	Public	Denmark, Germany, UK, USA	Wind energy, transmission grids, energy transition	[58], [74], [91]	6
Limited awareness and knowledge about energy infrastructure and its development	Social-technical	Public	Global reviews, EU, Germany, India, Netherlands, Romania	Green hydrogen, onshore wind, Transmission grids, biogas, solar micro-grid	[5], [55], [66]	4, 7, 9, 11, 15, 16, 22, 24, 25
Mobilization by anti-renewables movements	Socio-psychological	Public				6, 18, 24, 25
No decision-making power and autonomy	Social-psychological	Public	Canada, Denmark, England, global literature review	Wind energy	[72], [87], [91], [95]	
Lack of trust in developers and local governments	Social-psychological	Public, developers	Denmark, UK / England, Germany, Netherlands Norway, USA, global literature review	Wind energy, electricity grids, energy transition	[20], [58], [64], [72], [94], [95], [97]-[99]	4, 12, 15, 25



“[...] projects have been delayed for many, many years [...]. So, when we investigated the reason behind all of this, it became very apparent that it was through a lack of public engagement and a lack of consultation or meaningful participation from citizens in the process”. (Interviewee 7)

Results - Barriers of public engagement (2/2)

Barrier	Type of barrier	Concerned actors	Found in what country context	Found for what technology	Literature references	Expert reference (interview number)
Limited early and continued invitation to participate	Institutional	Developers	Chile, Costa Rica, Colombia, and Mexico; South Africa; 13 country review	Geothermal energy, hydro energy, wind energy	[18], [89], [100]	
Insufficient knowledge and consideration of citizens values, identified, preferences	Socio-technical, institutional	Developers, governments	Denmark, Netherlands, India, Uganda and Zambia, Malawi and South Africa	Wind energy, geothermal energy, rural electrification, bioethanol / biogas	[55], [71], [92], [102]	1, 3, 7, 8, 11
Limited value and resources placed on engagement	Socio-psychological, institutional	Developers	Belgium, Denmark, Ireland, Netherlands, Uganda and Zambia,	Transmission grids, rural electrification, district heating	[19], [53], [105]	11, 18, 19
Lack of internal capacity	Institutional	Developers	Ireland, UK	Grids	[94]	11, 18
Existing power relations	Institutional	Public, developers, governments	Review of 93 articles	Renewable energy	[32]	
Lack of practice and instrumentalization	Socio-psychological, institutional	Developers	15 case studies review; Chile, Costa Rica, Colombia, and Mexico; UK, Ireland	Renewable energy, storage mainly related to solar; geothermal energy	[105]	1, 11
Lack of understanding about engagement preferences	Socio-psychological, institutional	Public, developers, governments	Uganda and Zambia; review of 13 countries	Rural electrification, wind farms	[53]	
Lack of understanding about the importance of the social dimension of energy infrastructure	Socio-technical, Institutional	Developers, governments	Germany, India	Onshore wind, biogas, solar micro-grid	[55], [107]	3, 11, 13, 15, 21, 23
Missing or complex legal frameworks	Legal	Governments, developers	Denmark, Netherlands; UK; Uganda and Zambia; Chile, Costa Rica, Colombia, and Mexico	Energy and transport infrastructure, rural electrification, geothermal energy, regional energy strategy	[53], [59], [89], [108]	5, 7, 8, 19
Legal and financial constraints	Institutional	Developers, public	Denmark, Netherland, Ireland	Wind energy, grids	[91]	2, 7, 22
No institutionalization of participation	Institutional	Developers governments	Germany, Ireland, Uganda and Zambia	Energy transition, wind energy, rural electrification	[71]	7

Legal requirements for public engagement



We found both **mandatory** requirements and **voluntary** guidance for public engagement in energy infrastructure

Depending on country/region and energy infrastructure → most requirements for wind energy and grids.



At the European level, **Directive 2011/92/EU** is a legal framework that deals with the assessment of the environmental impacts of certain public and private projects.

Highlights the importance of effective public participation in the decision-making process for such projects.

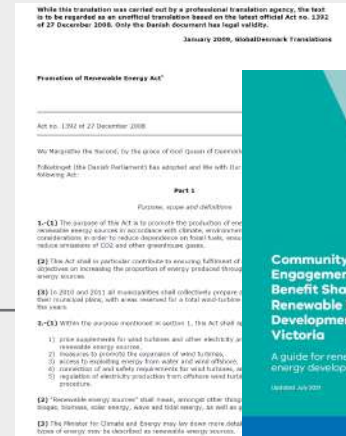
"Effective public participation in the taking of decisions enables the public to express, and the decision-maker to take account of, opinions and concerns which may be relevant to those decisions, thereby increasing the accountability and transparency of the decision-making process and contributing to public awareness of environmental issues and support for the decisions taken."



“The challenge of principles is that they are easy fluffy words to publish, but then you need buy-in to enforce them.”

Legal requirements for public engagement

- Some countries focus on involvement throughout the *process*, others concentrate on the project *outcomes*, but all share a common goal of engaging citizens to create a positive impact on both the environment and the communities involved
- Some examples:
 - UK, **principles on engaging the public on onshore wind** (guidance document)
 - Germany: "Citizen and Community Participation Act": **Obligation to involve local residents and communities** close to the site
 - Ireland, **community benefit fund** in "Terms and Conditions for the First Offshore Wind RESS Competition ORESS 1“ (“Community aspects”)
 - Danish Renewable Energy Act: **compensation for the loss** of value of their property
- Diverse approaches demonstrate how different countries prioritize and incorporate citizen participation to create more sustainable and community-centric projects in the realm of renewable energy development.





Formats and methods

All forms of participation are all inclusionary and exclusionary in certain ways, you will also exclude certain public, certain framing, certain views.”
(Interviewee 1)



- Different formats and methods can facilitate public participation processes
- Actors involved in the public engagement vary according to the phase of the project and depend on methods applied.
- Inclusiveness implies an open invitation of participants, the accessibility of the place and the diversity of communication formats, considering different types of disabilities.
- A mix of different methods and formats is necessary for a fair and meaningful engagement.

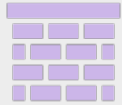


Common formats and methods

Level of participation	Method/ Format	Purpose	Country context	Technology	Examples from the literature
Information	Written information provision	Public can share their knowledge	Denmark, Germany, Ireland, Netherlands, Scotland, UK	Grids, wind energy	Leaflets, flyers, brochures, webpage, mailings, posters
Information	In-person events	Share information, answer questions	Denmark, Ireland, Netherlands, Sweden	Grids	Informational sessions, workshops
Information	Educational & cultural activities	Gain trust, create awareness	Netherlands, Switzerland, Ireland, UK	Wind energy, solar energy & heat	School trips to renewable energy facilities, learning activities, stand in local fairs and events
Information	City networks	Not specified	Sweden	Heating & wastewater	EU Green capitals network
Consultation	Open public consultation in written formats	Gather feedback of oppositions to the project	Denmark, Netherlands, Sweden, UK	Grids, wind energy	Proforma letters, letters sent to governmental authorities
Consultation	Written consultations	Opinion about technologies, or specific options for a project	China, UK, Wales and Scotland	Solar energy, wind energy, cross-tech	Household surveys
Consultation	In-person events	Share information, gather feedback, create trust	Denmark, Germany, Netherlands, Ireland, Switzerland, Sweden, UK, Jordan, Malawi, South Africa, Ireland	Wind energy, grids, biogas	Public exhibitions, public hearings, workshops, roundtables, info markets, site visits
Consultation	Presenting a visualization/ simulation of the project	Share information and gather feedback	Germany, UK, USA	Wind energy, solar energy	Dedicates websites, online tools, photo manipulation, interactive web mapping, 3D models
Consultation	Meeting points	Share information, gather feedback, exchange of knowledge	Netherlands, UK	Wind energy, solar energy	Dedicated call centers, energy service point
Empowerment	Local communities' forums/ committees	Co-design / co-ownership / co-production	Belgium, Denmark, Germany, Ireland, South Africa, UK, USA	Grids, wind energy, hydrogen, solar energy, heat	One "umbrella" of several different initiative to engage the public in representative governance groups that will co-design of the project
Empowerment	Financial compensation mechanisms	To create positive impacts, involving citizens into the creation of community funds	Ireland, USA	Grids	Community funds, which are defined by local stakeholders, and fund local businesses with social projects
Empowerment	Community representation	Engage the public through elections, through local (neighborhood) level	Sweden, UK	Grids, heating network, heat energy from biomass	Public officials are indirectly elected to manage municipal renewable energy sources; the UK's 2011 Localism Act
Empowerment	Initiatives coming from residents	Protest, express discontent	Sweden, UK	Wind energy	Protest groups; letters sent by residents to governmental authorities, leaflets handed to other residents to inform about the protests and its motives; protest social media groups



Conclusions



Public engagement with energy infrastructure can be **driven or hindered by different factors** stemming from the people, project developers and policymaking.



Poorly designed participation processes can lead to anger and mistrust, which can be even an obstacle to acceptance, or lead to project failure. Thus, **more democratic ways** of working between policy makers, the private sector and local communities is required.



There are **different forms of public engagement with energy infrastructure**, from information to consultation and empowerment, which are valid and can contribute to a higher acceptance of energy infrastructure projects



Importance of the local context in which a specific energy project is to be implemented, and the **need to understand local conditions and public needs**.



Policy recommendations

- 1 Policy makers need to communicate better and raise more awareness** about the opportunities for public engagement with energy infrastructure projects. This engagement should highlight that infrastructure projects are key to enabling the energy transition, and can bring benefits to the public. Any engagement strategy should also aim to integrate national climate and energy action plans into the local context of citizens.
- 2 Greater awareness-raising and capacity-building is needed among businesses,** including planners and developers, on the importance of public engagement for a rapid and just energy transition, including best practices for public engagement.
- 3 Need for closer cooperation between different actors** to enable knowledge sharing and collaboration on public engagement with energy infrastructure projects. Policy makers should initiate a "community of practice" to enable different actors to share experiences and initiate mutual learning within and across energy technologies, and to ensure that participation and engagement processes on the ground are inclusive.



Public Engagement
for Energy
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Renewables
Grid Initiative 

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Literature review and expert interviews

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Technology Collaboration Programme
by IAEA