

Article

Barriers and Recommendations to Innovative Ownership Models for Wind Power

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Abstract: Local ownership models have proven to be an important way to avoid local resistance to onshore wind turbines. As wind power expands into onshore and nearshore wind farms, such ownership models become of increasing importance, while also undergoing further development. This paper uses the Choice Awareness theory to examine some of the barriers connected to the implementation of these new ownership models and presents recommendations to overcome such barriers. Choice Awareness addresses societal aspects (discourse, socioeconomics, and public regulation) mainly related to implementing alternatives to existing technologies. For the theory to be able to embrace the complexity of the transition of the energy system more holistically, we explore and specify the organizational dimension of choice-eliminating mechanisms. Based on the case of an NGO's attempt to bid for a tender for nearshore wind turbines, it is shown how the central administration prevents new innovative ownership models from entering the tender. A strong path dependency has led to a conscious or unconscious elimination of projects based on organizational structures that do not fit the definition of large energy companies. As a result of this, the paper makes three recommendations for policy changes with the aim to secure equal possibilities for actors involved in nearshore wind power tenders.

Keywords: energy policy; local ownership; choice awareness; nearshore wind

1. Introduction

The development of plans and strategies for reaching 100% renewable energy systems is gaining momentum in many countries, regions, municipalities and communities [1–5]. In Denmark, the government has set a national goal of 100% renewable energy in 2050 [6,7]. It has been suggested that achieving these goals requires a new understanding of the energy system as a smart energy system that integrates and balances all energy sectors to obtain the most feasible solutions [8]. Where the former system was based on fossil fuels utilized in centralized production units, an energy system based on renewable energy necessitates a real-time utilization of the energy source on its location (e.g., solar, hydro and wind) [9,10]. This also means that the energy production is moved closer to the consumers due to the distribution of the renewable energy resources, which may lead to resistance in the local communities if the planning is not done right [11,12].

Denmark is often highlighted as a frontrunner in public participation in energy planning and development [13–17] and, up until 2002, the implementation of onshore wind turbines in Denmark was carried out rather successfully. This was especially due to a wide popular support and local ownership [15,18]. Examples can be found of onshore wind projects based on ownership models with a mix of local ownership and trust ownership, where parts of the turnover are used to benefit the local society (e.g., for new sports facilities). Examples of such projects are wind turbines on the island of Ærø and in Hvide Sande. In these projects, local citizens are members of the co-operative together with

local foundations. The local foundations make sure that a part of the turnover from the wind turbines is re-invested in local development projects for the wider benefit of the local communities [19,20]. Examples of local ownership can also be found for nearshore wind turbines, even though the offshore market is primarily dominated by large energy companies. Examples of nearshore turbines can be found outside the island of Samsø and at Middelgrunden in Copenhagen, where half of the 20 turbines are owned by the Middelgrunden wind turbine co-operative and the other half by DONG Energy (Since 2 October 2017 known as Ørsted) [21].

However, the onshore wind turbine development is starting to experience local resistance [22,23], due to challenges in finding good and cheap locations for the turbines. During the last 15–17 years, a decrease in the local ownership of wind turbines has become a reality and the tendency is moving towards large-scale industry (Own data based on figures from the Danish Energy Agency and The Danish Energy Regulatory Authority). This leads to minimal competition, which is seen in relation to offshore wind turbine farms, where only a few companies, DONG Energy and Vattenfall, own all the large offshore wind turbine farms in Denmark [24].

Increased focus is placed on nearshore wind turbines in the Danish wind power development, and recent tender material for nearshore wind turbines bears witness of a tendency to perceive nearshore wind turbines as a large-scale industry with large energy companies as the main investors [25]. In the last tender for 350 MW Danish nearshore wind turbines, no projects based on local ownership were included in the bidding process. This is despite the fact that two projects (Wind & Welfare and Lemvig Municipality) made a strong effort to participate in the process.

1.1. Research Scope—The Wind & Welfare Project

In the period of 2013–2015, the Danish Energy Agency, on behalf of the Danish government, organized a tender for up to 350 MW nearshore wind power distributed over six locations along the Danish coast. The tender was won by the Swedish, state-owned energy company Vattenfall in competition with three other bids [26].

The case studied in this paper is the Danish grassroots organization Wind People's attempt to participate in the national tender for 350 MW nearshore wind turbines with a project "Wind & Welfare" based on local ownership. Local ownership was to a limited extent included as a possibility in the tender through the "20% rule", which initially was introduced in 2008 for onshore wind turbines. The rule requires that wind power project developers offer 20% of the project shares to local citizens. The ambition of Wind People was more far-reaching: the goal of the "Wind & Welfare" project was to sell as many shares as possible to local citizens and community organizations—100%, if possible. However, the "Wind & Welfare" project could not live up to all pre-qualification criteria for the tender, and was thus excluded from the final bidding round alongside a municipality-organized bid. The pre-qualification criteria that the potential bidders should fulfill were [25]:

- The applicant must present an average turnover of 4 billion DKK (~537 million €) over the past three years.
- The applicant must have an equity ratio of 20% or more. For financial institutions, however, the credit rating must be BBB- or more (Standard & Poors and Fitch) and/or Baa3 or more (Moody's) or an equivalent rating from another recognized credit rating agency.
- The applicant must have at least one reference to an offshore project with an installed capacity of minimum 30 MW within the last five years.

The biggest hurdle for the "Wind & Welfare" project was the 4 billion DKK turnover requirement. As a project facilitated by a grassroots organization and based on local ownership, which was specifically organized with the purpose of bidding on the tender, Wind People did neither have the size nor could they find an adequate partner who could meet the turnover requirement. The technical requirement of prior experience with offshore wind was easier for Wind & Welfare to fulfill, for instance, by hiring experienced consultancy companies [27].

Local ownership is not a new area in the Danish energy system and planning. However, local ownership of large energy projects such as offshore and nearshore wind farms have not yet been seen in the Danish context. The Wind & Welfare project was therefore seen as an innovation in offshore energy, since the project intended to activate new actors in the market. Wind People has experience with community-owned onshore wind turbine projects and has developed a local ownership model, where local citizens can own wind turbine shares individually or in a cooperative together with a local trust (in Danish “fond”). The trust ensures that parts of the profit from the turbines are spent on activities beneficial to the local community. This shared ownership model therefore represents a “social” update of traditional Danish local ownership, as wind turbine profits are not only distributed to individuals, but also contribute to the local common good. Similar ownership models have been developed in Scotland (e.g., [28]). Moreover, in terms of its scale, the Wind & Welfare project represented a first attempt to further develop the Danish local ownership model to be compatible with the increasing wind turbine and wind farm sizes [29–32]. At the time of the tender, the Wind & Welfare project was somewhat ahead of the Danish legislation, which had not made specific provisions for community ownership in renewable energy. This is contrary to the latest proposal at the EU level, which specifically mentions energy communities [33].

As a critical and interesting aspect of the Wind & Welfare case, Wind People has tried to develop a project based on the above concept of shared local ownership to bid for the 350 MW nearshore wind turbines, which was the first attempt to do so in Denmark for a centralized tender. The attempt from Wind People and their ownership model are described in detail in Jensen and Sperling [27]. The role and ambition of Wind People in the Wind & Welfare project were to organize and facilitate a broad local ownership amongst specific local actors in the communities close to the nearshore wind power locations, as well as amongst as many Danish electricity consumers as possible. Wind People managed to develop a strong ownership model and they would not bid for the tender without having raised the money for the project, in the form of both a bank loan and advanced commitments from potential shareholders. The ownership model was structured as a limited partnership where 30% of the financing would have been sold as shares to limited partners such as private consumers across Denmark, Danish municipalities and companies. The remaining 70% would have been financed through a bank loan with Wind People as the responsible loan taker. In practice, this would have meant that the shares in the Wind & Welfare project would have had a value of 5000 DKK (~670 €), but with the bank loan they could have been offered at 1500 DKK (~200 €) per share. The limited partners would have been allowed to buy shares equal to their electricity consumption. The limited partnership was chosen as the ownership model because private consumers are only liable for their own capital investment in the partnership [34]. (In the Wind & Welfare project, this would have been 30% of the share value, i.e., 1500 DKK per share. A common organisational model for Danish wind power cooperatives with many local shareholders has usually been a “partnership” (I/S in Danish). In this model, joint and several liability applies to the shareholders, meaning that all shareholders are jointly liable for all assets in the partnership.) The ownership model and the relationship between different actors are further described in [27]. Regardless of this financial set-up, ultimately, Wind & Welfare could not fulfill the 4 billion DKK turnover criterion set by the Danish Energy Agency and could therefore not submit a final bid. As a result of the tender process, it thus seems very unlikely—if not impossible—that the 350 MW nearshore wind power could be organized and established by a grassroots organization, as an alternative to the ownership models behind the three bidders eligible to submit a final bid. This is also indicated in the other locally anchored and municipality-organized project (Lemvig Municipality) which was also excluded from the bidding process on the grounds that it was unable to meet the qualification criteria.

1.2. Structure

In Section 1.3, the research problem is presented together with a delimitation of the focus in the paper. In Section 2, the theoretical frame is outlined. The methodology is described in Section 3.

In Section 4, the analysis is presented and, in Section 5, the results are discussed. Finally, Section 6 answers the research problem and concludes the paper. An overview of the research process is presented in Figure 1.

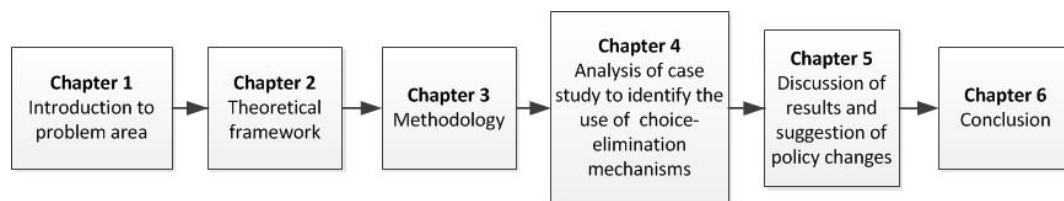


Figure 1. Overview of the research process.

1.3. Aim of the Paper

The aim of this paper is twofold. First, the aim is to develop a theoretical framework for analyzing the use of choice-eliminating mechanisms for new innovative ownership models within the renewable energy sector. Second, the aim is to apply this framework to a concrete case to analyze choice-eliminating mechanisms in practice.

We focus on the mechanisms used by the central administration (mainly represented by the Danish Energy Agency, and to some extent also The Danish Ministry of Energy, Utilities and Climate, and the Government) to exclude small locally anchored projects, exemplified by the Wind & Welfare case. The central administration might not have a direct interest in excluding certain actors; however, as indicated in [27], the central administration is influenced by interests from incumbent energy companies. In this paper, we delimit ourselves from a more detailed analysis of lobby activities' role in shaping regulatory approaches within the central administration. However, in future research, it is important to investigate this issue further, if projects involving innovative ownership models should succeed. New actors such as Wind People need to gain a better understanding of the institutional context that they face, and the central administration needs to understand the real possibilities and limitations of its legislation.

As we explain in the theory, chapter 2, the exclusion of certain technological choices, actors, interests, etc., can happen intendedly or unintendedly and at various levels and stages of a planning process.

The Choice Awareness theory is used to identify different eliminating mechanisms that have an impact on, in this case, new actors attempting to make a radical technological change in the energy market by introducing local ownership models to large centralized energy production tenders.

The Wind & Welfare case itself has been described and analyzed in detail in another report [27]. In the present study, the same case serves a different purpose, namely, to specifically identify the kind of eliminating mechanisms that a central administration can employ in this type of tender process. Therefore, the identified eliminating mechanisms are seen through the concrete experience of Wind & Welfare, which makes it possible to identify unintended eliminating mechanisms. We do acknowledge that we delimit ourselves from an analysis of the central administration's perspective on the same mechanisms.

Furthermore, we limit ourselves to only considering the eliminating mechanisms used within the central administration. We do not include the actions taken by the competing actors, even though we are aware that these also have a role in the process by, for instance, entering pre-agreements with manufacturers and consultants that limit the potential network of Wind & Welfare. Further details regarding the different actors' actions can be found in [27].

2. Theoretical Frame

2.1. Choice Awareness

The Choice Awareness theory is used to analyze how the central administration in Denmark creates and governs conditions and processes that either promote or limit a broad public participation and ownership of nearshore wind turbines.

Choice Awareness postulates that (technological) choices always exist, even though it might not seem so or is portrayed otherwise by certain actors. Rooted in Lund's concrete experience with analyzing energy alternatives, Choice Awareness presents a number of (analytical) steps to be taken to raise the awareness of (technological) choices. Furthermore, an important part of the Choice Awareness theory is to understand that organizations often seek to eliminate certain choices from political decision-making processes due to their perceptions, interests and path dependencies [8]. A central aspect of the Choice Awareness theory is to support the implementation of Radical Technology Change and to identify where and how such a change is hindered. The theory of Radical Technological Change implies that technology consists of the five elements of knowledge, organization, technique, product and profit. A radical technological change occurs when more than one of the five elements are altered [8,35].

Choice-Eliminating Mechanisms

Choice Awareness theory has two main theses:

- *"When society defines and seeks to implement objectives implying radical technological change, the influence and discourse of existing institutions will affect the implementation."* ([8], p. 30)
- *"Society will benefit from focusing on Choice Awareness, that is, raising the awareness that alternatives do exist and that it is possible to make a choice."* ([8], p. 34)

When the need or the possibility for radical technological change arises, incumbent organizations are likely to ignore it, or to make incremental changes to their existing technologies to meet societal or political pressure. At the same time, incumbent actors are likely to make use of choice-eliminating mechanisms to eliminate technological alternatives outside their own perception. Existing organizations that depend on a technology will act to eliminate other choices in the public debate and the common perception. They will execute power at different levels to eliminate choices outside their perception [8]. Lund [8] highlighted three different eliminating strategies in the choice awareness theory:

1. *"The exclusion of technical alternatives from the debate and the decision-making arenas."* ([8], p. 30)
2. *"The technical evaluation of alternatives on the basis of methodologies that assess the radical new technology in question as not being relevant to or not complying with the requirements"* ([8], p. 30), and
3. *"The design of feasibility studies in such a way that radical new technologies are assessed as not being economically feasible to society"* ([8], p. 30)

Choice Awareness focuses on perceiving and analyzing technical alternatives for energy planning, as the first step in the transition of the energy system. This includes the analytical, political, organizational, and economic processes that lead to the choice of certain technical alternatives and the elimination of others. Subsequently, with the increasing penetration of renewable energy technologies, organizational, ownership and financing factors become increasingly critical in the energy planning process. From a planning theory point of view, not only technical alternatives, but also actors, actions, interests and outcomes can be subject to choice awareness and choice elimination (Connelly and Richardson [36]). Since all decisions involve choices that exclude actors, actions, interests and outcomes from planning processes, either consciously or unconsciously, it is important that key decisions are made transparently. This is especially important due to the fact that different exclusion decisions will result in different consensus and consequences for society [36].

In this paper, Choice-Eliminating Strategies are used as inspiration to frame an analysis of the organizational dimension of choice-eliminating mechanisms found in the Wind & Welfare case. Our main assumption is that the Choice Awareness theory is applicable at a societal and organizational level, despite the technical focus in the theory. To what extent this is the case based on this study is described and discussed in the results and discussion sections.

Overall, Choice Awareness has proven to be an adequate tool for identifying elimination mechanisms in the green transition. Other approaches, such as, for instance, Carbon Lock-In, could also have been applied to the analysis of the Wind & Welfare case, albeit at a more general level. Carbon Lock-In is very much focused on path dependency and how institutional, technological and behavioral systems are locked-in on carbon-intensive technological paths [37]. In our view, both approaches complement each other well, with the institutional and behavioral types of carbon lock-in being reflected in the organizational dimension of Choice Awareness, which is the specific focus in this paper. Similar to Choice Awareness, carbon lock-in is concerned with explaining and overcoming barriers to radical technological change in view of climate change. We believe that the carbon lock-in approach offers a suitable macro perspective, whereas Choice Awareness is better applicable to case studies, such as the one in this paper. This is because Choice Awareness presents a more detailed framework for analyzing the specific mechanisms that either constrain or enable technological choices in certain organizations. This is exactly our interest in the Wind & Welfare case, and therefore Choice Awareness is used as the main theoretical and analytical approach in this paper.

2.2. Temporary Spaces as an Arena for Eliminating Strategies

Innovation literature speaks about temporary spaces in relation to participatory innovation [38]. In these temporary spaces, innovation processes can undergo a development through a meeting with different actors. Innovation involves movement through several temporary spaces that include different actors related to the innovation/technology [38]. Clausen and Gunn also outlined how political discourses and practices can have an influence on the inclusion and exclusion of actors in these temporary spaces. Boundaries have to be made in the process, but it is difficult to ensure that the boundaries do not exclude actors that are important for the innovation processes. The temporary spaces theory helps to identify where in the tender process different actors would be able to influence the tender process, but also highlights the “scenes” where the choice-eliminating mechanisms become apparent.

3. Methodology

The analysis in this paper is based on a case study of the process around a grassroots organization’s attempt to bid for a tender for nearshore wind turbines in Denmark.

3.1. Critical Case Study

Based on Flyvbjerg’s [39] definition of critical case studies, this case is seen as a critical case study. The Wind & Welfare project has a strategic importance in terms of assessing the actual possibilities for projects based predominantly on community and shared ownership to participate in large energy tenders in Denmark. The Wind & Welfare case is an example of how the central administration responds to new actors and bottom-up projects in a market that is increasingly dominated by large energy companies. As an underlying criterion for the critical case study, the central administration’s reaction towards Wind People and the Wind & Welfare project could have been similar for similar new projects and actors attempting to enter the existing tender system. The Wind & Welfare case is thus critical to the assessment of the degree of choice awareness inside the Danish central administration in terms of how the nearshore wind power sector can and should be developed.

Specifically, as stated in the research problem, the goal of the case study was to explore in which parts of the tender process and through which kind of strategies—direct, indirect, conscious or unconscious—Wind People was excluded from the nearshore wind tender. Therefore, the case study

focused on Wind People's actions in and related to the tender process, and, accordingly, most of the empirical data were collected through Wind People. This means that we primarily built the perception of the tender process from the perspective of Wind People. However, the authors did have access to some email correspondence between Wind People and the Danish Energy Agency, and internal emails from the Danish Energy Agency, which gave us information about the perception at the central level.

3.2. Data Collection

The dataset used in this study is the same as used in [27]. It was, however, analyzed in a new context applying temporary spaces and the choice awareness theory. The dataset is built upon a qualitative research approach using document analysis, narrative interviews and informants' sound recordings. For the interviews and sound recordings, written transcripts were compiled.

A document analysis of the tender material was conducted to understand the terms that potential bidders should be aware of in the design of the projects. General material from the national level has been used during this study. Finally, documents that show the correspondence between Wind People and the Danish Energy Agency or parties representing the government or the Danish Energy Agency, were analyzed to identify the eliminating mechanisms used, but also to identify the different actors' perceptions of the tender process and rules.

Furthermore, narrative interviews and sound recordings, in the form of verbal diaries, were used to obtain knowledge about the tender, from the perspective of Wind People. The narrative interview is one of the main data collection methods in this study. When a narrative interview form is used, the respondent has the chance to tell his/her story within an overall theme, but without the interviewee cross-checking a strict guideline. Furthermore, this approach gives the interviewee the chance to listen carefully to the story and ask follow-up questions when needed [40,41]. Four narrative interviews with two representatives from Wind People were conducted (three face to face meetings and one phone conversation). These were supplemented with access to a diary, which one of the representatives from Wind People recorded through the process, documenting the process that Wind People was going through, together with the employee's reflections related to the different situations (in total 13 days of spoken diary recordings).

The combination of these three data generation methods forms the basis of the analyzed material in this study. The analysis was made from the perspective of the NGO, which was also represented in the narrative interviews and the sound recordings. This paper differs from the previously mentioned report "Who should own the nearshore wind turbines?" in which we discussed and analyzed Wind People's strategies in relation to setting up a bid for the Wind & Welfare project. Our focus in this paper is on the use of eliminating strategies in the central administration, which come to the surface through the Wind & Welfare case. Being a critical case, the Wind & Welfare project therefore can be seen as the "mechanism" that opens up the "black box" of eliminating mechanisms for nearshore wind power used in the central administration.

4. Results: Organizational Dimensions of Choice-Eliminating Mechanisms Appearing in the Wind & Welfare Case

Different actors were involved in the tender, which is illustrated in Figure 2. Actors are mapped not only to get an overview of involved actors, but also to get a picture of the perception within the Danish Energy Agency.

In Figure 2, the actors are mapped in terms of how close they are placed to decision making in the tender process.

In the blue inner circle, the tender for the nearshore wind turbines is placed along with the Danish Energy Agreement of 2012 and legislative frameworks.

In the dark grey circle, the existing network around nearshore wind power can be seen. This is based on the identified perception within the Danish Energy Agency, who views the tender as "big business" and therefore only considers a limited number of potential bidders. The Danish Energy

Agency and the Danish Government seem to be path dependent towards offshore wind as an activity for large energy companies and they also seem to place nearshore wind power within this path.

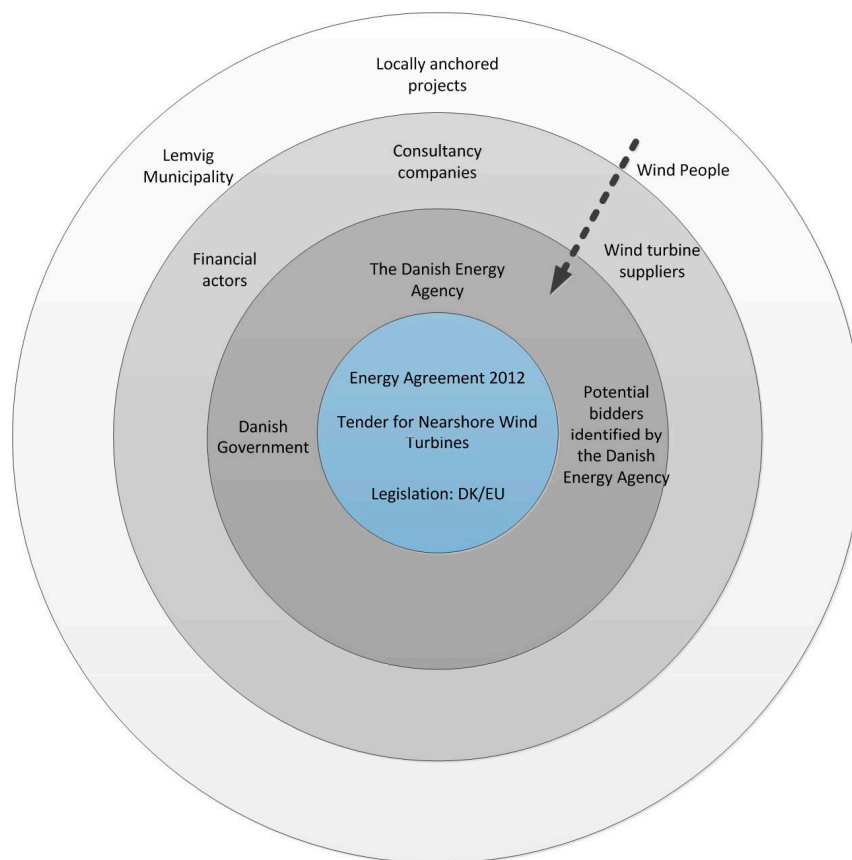


Figure 2. Actors in the tender for 350 MW nearshore wind turbines in Denmark, mapped in relation to how closely they are connected to the Danish Energy Agency and thereby the decision making in the tender process. The closer the actors are placed to the blue inner circle, the more likely they are to be included in the tender process.

In the light grey circle, we place those actor groups which potential bidders depend upon in their development of the projects. These actors are, e.g., financial actors, consultancy companies and wind turbine suppliers. The blue and grey circles illustrate the perception found within the Danish Energy Agency today, and the actors within these circles can therefore also reflect who the Danish Energy Agency have included directly or indirectly within the temporary spaces for the tender.

Furthest out in Figure 2, a white circle is added to illustrate new actors, as Wind People and Lemvig Municipality, positioned according to the current perception in the Danish Energy Agency. The dotted arrow going from the white circle to the dark grey circle illustrates the new actors' attempt to enter the market for nearshore wind turbines. Wind People has great difficulty in entering the "grey circles" and in getting access to the Danish Energy Agency and the nearshore wind tender, but also in establishing a relation with some actors in the "light grey circle". Different perceptions can be found among the actors in the circle. Some of the actors supported the innovative project that Wind People was trying to organize, but, at the same time, they were not willing to commit to the project, due to the path dependency in the market and in the Danish Energy Agency. Other actors were already committed to actors within the competing network and could therefore not represent the new coming actors on the market (Wind People). A further investigation of this is not in focus in this study; however, it is elaborated on in [27].

During the tender process, which is illustrated based on the key activities of the Danish Energy Agency, Wind & Welfare's chances of success were limited through the use of elimination mechanisms

in several actions. These are illustrated in Figure 3. By analyzing how these actions have influenced Wind People's opportunities to enter into the bidding round for the tender, we can assess to which degree smaller, not-for-profit project developers were given the opportunity to realistically participate in the tender. By applying Lund's Choice Awareness theory on Choice-Eliminating Mechanisms, "The exclusion of technical alternatives from the debate and the decision-making arenas" ([8], p. 30) can be identified as the particular mechanism that has led to the Danish goal to install more nearshore wind turbines. The Energy Agreement from 2012 states that a fixed amount of nearshore wind turbines should be installed, and other technical alternatives are thereby eliminated from the debate at the time when the tender is developed. However, this eliminating process should be acknowledged as a relatively transparent and common phenomenon, since it took place in a parliamentary process at the governmental level. The electricity capacity could also have been fulfilled by other renewable technologies; however, this discussion is not within the scope of this paper.

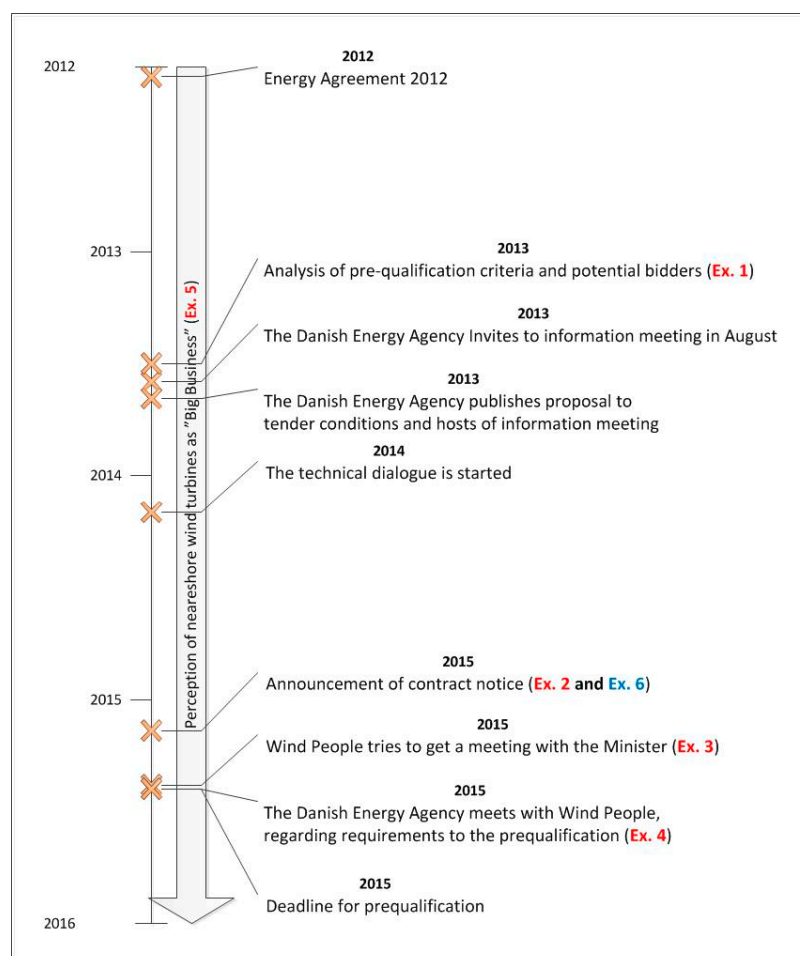


Figure 3. The tender process for the 350 MW nearshore wind turbines in Denmark taking its point of departure in key activities of the Danish Energy Agency. The timeline for the tender process is divided into several actions which have been important to the pre-selection of the bidders. It should not be seen as a complete timeline for the tender process, since, e.g., the interaction with different actors (others than Wind People) has not been identified. Some actions are marked with an example number and a color, which refer to examples of societal choice eliminating mechanisms as hindrances to the Wind & Welfare project. The red color refers to societal eliminating mechanism A and the blue color to societal eliminating mechanism B. Both the societal eliminating mechanisms and the examples are described in Table 1.

This paper is concerned with the processes after a technical solution has been found—namely nearshore wind power—where we suggest that there is a need for raising awareness of the choices within the organizational set-up around the technical alternative. We found that it was necessary to investigate how alternative organizational ownership and financing models are eliminated in the Danish tender process by exploring and clarifying the theory of choice-eliminating mechanisms to include an organizational dimension. The reason is that the organizational choice-eliminating mechanisms are not necessarily as transparent and democratic as the abovementioned parliamentary process around the Energy Agreement, containing the nearshore wind power expansion goal.

Based on Lund’s technical eliminating mechanisms and the Danish Energy Agency’s interaction with Wind People, we clarified the organizational dimension of Choice Awareness eliminating mechanisms in Table 1. An important term for both the technical as well as the organizational dimension of the eliminating mechanisms is the awareness that all decisions involve choices that are either made consciously or unconsciously. When entering the organizational dimension, conscious choices can, for instance, be ignoring or refusing inputs or interests from certain actors. An example of an unconscious choice could be not to invite potential new actors or organizations in the technical dialogue for the tender process. This could be explained by the Danish Energy Agency’s practices developed over time in the offshore wind power sector, with a focus on involving mainly large energy actors.

Table 1. Lund’s original Choice-Eliminating Mechanisms are presented, together with the identified organizational choice-eliminating mechanisms. The third column lists examples of these eliminating mechanisms identified in relation to the Wind & Welfare case. Each of the examples is explained further below.

Choice-Eliminating Mechanisms from the First Choice Awareness Thesis	Organizational Dimension of Choice-Eliminating Mechanisms in Choice Awareness Theory Identified in the Case Study	Examples
(1) “The exclusion of technical alternatives from the debate and the decision-making arenas” ([8], p. 30)	(a) Exclusion of actors from the debate and decision-making arenas	<p>Ex.1: Analysis of potential bidders, only five actor groups are investigated.</p> <p>Ex.2: The Danish Energy Agency ignores potential bidders’ input during the technical dialogue.</p> <p>Ex.3: Wind People’s failed attempt to get into a dialogue with the minister.</p> <p>Ex.4: Meeting between the Danish Energy Agency and Wind People where Wind People’s suggestion regarding requirements to the prequalification is excluded with reference to the late timing.</p> <p>Ex.5: Perception that nearshore wind turbines are “Big Business”.</p>
(2) “The technical evaluation of alternatives on the basis of methodologies that assess the radical new technology in question as not being relevant to or not complying with the requirements” ([8], p. 30)	(b) Design of framework conditions that only make it feasible to some actors to participate	<p>Ex.6: Pre-qualification criteria.</p> <p>Ex.6: Short timeframe from publication of final tender material to deadline for pre-qualification application.</p>
(3) “The design of feasibility studies in such a way that radical new technologies are assessed as not being economically feasible to society” ([8], p. 30)	(c) Design of feasibility studies in such a way that radically new organizational, financing and ownership models are assessed as not being economically feasible to society	Occur through a lack of such a feasibility study prior to the tender.

4.1. Exclusion of Actors from the Debate and Decision-Making Arenas

The first choice-eliminating mechanism for the organizational dimension that we formulate is the exclusion of some actors from the debate and decision-making arenas. This eliminating mechanism is very much linked to the first eliminating strategy in the choice awareness theory; i.e., “The exclusion of technical alternatives from the debate and the decision-making arenas” ([8], p. 30) (see Table 1). The difference is that it is not technical alternatives that are eliminated in this case, but social groups, specific actors

and interests that are linked to and seek to promote radically new organizational, financing and ownership models.

Ex.1: An example of the use of the organizational choice-eliminating mechanism (a) is an analysis made by the consultancy company Deloitte on behalf of the Danish Energy Agency [42]. The aim of the analysis was to analyze which consequences different technical criteria would have on different stakeholders' possibilities to participate in the tender. The Danish Energy Agency decided which actor groups should be included in the analysis, and in that way also consciously or unconsciously decided who should be excluded from the analysis and thereby the debate around the tender. Five actor groups were included in the analysis: international energy companies, international projects developers, regional energy companies, "open door" applicants and pension funds/capital funds. The analysis indicates that especially the design of financial criteria could have a great influence on who can fulfill this criterion, since actors structure their financial balances differently. Furthermore, it is stressed that a requirement of joint and several liability would limit financial actors' willingness to participate in project consortiums due to the financial risk [42].

Ex.2: An example of a conscious use of the eliminating mechanism (a) is that the Danish Energy Agency as a part of the tender process set up a technical dialogue, where potential bidders could give input to the tender material before it was published. Several potential bidders mentioned in the technical dialogue that they found the economic criteria of a turnover of 4 billion DKK too high and that the Danish Energy Agency instead should be focusing on solvency and company rating as criteria for the tender. The Danish Energy Agency assured that it would find an appropriate level in the final tender material, but kept the high turnover as a criterion and thereby ignored the inputs from several actors.

Ex.3: Another conscious use of eliminating mechanism (a) appeared when Wind People attempted to enter into a dialogue with the Minister of Climate and Energy. Wind People contacted the Head of Office in the Ministry and was promised that the problem of limited access for local projects, such as Wind & Welfare, to the tender for nearshore wind turbines would be presented to the Minister. The Ministry would then get back to Wind People with a reaction to their expressed problem. Neither the Minister nor other representatives from the Ministry did get back to Wind People. Wind People was later met with a dismissive attitude when they called the Ministry to follow up on their request.

Ex.4: The last example of conscious use of eliminating mechanism (a) is the Danish Energy Agency's reaction at their meeting with Wind People on 26 May 2015; the day of the deadline for applications for the pre-qualification. At this meeting, Wind People presented two alternative suggestions to the pre-qualification criteria, which would allow popular projects to bid in the tender process. The reaction from the Danish Energy Agency to the suggestions was that these could be interesting to look into in relation to future tender processes, since it would be too late to make changes in the current process. The Danish Energy Agency used this argument even though Wind People argued that they had pointed out several times in the tender process that local projects were not able to fulfill the pre-qualification criteria.

Ex.5: A presumably unconscious use of the organizational choice-eliminating mechanism (a) is a strong path dependency within the Danish Energy Agency keeping it locked within the perception that nearshore wind power is "Big Business". This perception might stem from the DEA's experiences from the offshore wind power sector, which is dominated by large private companies. This may also help explain the other examples related to eliminating mechanism (a). The consequence is that, already from the outset, NGOs and local projects never appeared as potential bidders in the actual tender material or in any other material or process related to it.

4.2. Design of Framework Conditions That Make It Feasible for Only Some Actors to Participate

The second choice-eliminating mechanism defined under the organizational dimension is termed Design of framework conditions that make it feasible for only some actors to participate.

This eliminating mechanism excludes certain actors and organizations from the formal tender process. It is mainly evident in the tender material, which sets the boundaries for who and what can be included in the formal process around the actual tender including pre-qualification and actual submission of bids. As such, it can be seen as a consequence of choice-eliminating mechanism (a), which is concerned with the processes leading to the design of the formal rules of the tender.

Ex.6: When defining the pre-qualification criteria, the Danish Energy Agency used the second organizational choice-eliminating mechanism. The pre-qualification criteria—mainly the 4 billion DKK turnover criterion—are set at a level that makes it difficult for some actors to meet the requirements. One can argue that it is not completely unrealistic for all actors to fulfill the requirements. For grassroots organizations, such as Wind People, it will take longer time to develop a project, due to the fact that these organizations to some extent depend on voluntary work and therefore do not have the same resources as private bidders [43]. For instance, it took Wind People a considerable amount of effort and time to negotiate with organizations that could be willing to provide the 4 billion DKK security [27]. Large established energy companies have better preconditions for developing a project than, e.g., grassroots organizations. In this way, this eliminating mechanism limits the competition on the energy market.

4.3. Design of Feasibility Studies in Such a Way that Radically New Organizational, Financing and Ownership Models Are Assessed as Not Being Economically Feasible to Society

The third choice-eliminating mechanism that we formulate in the organizational dimension is the Design of feasibility studies in such a way that radically new organizational, financing and ownership models are assessed as not being economically feasible to society. The eliminating mechanism appears indirectly through the absence of such feasibility studies at a governmental and societal level. To our knowledge, the central administration has not analyzed the potential societal benefits of different organizational, financing and ownership models in this case.

5. Discussion

The transition of the energy system is a complex process with different aspects and interests. Lund's Choice Awareness theory emphasizes how the perceptions of established actors in the energy scene can lead to the elimination of technical alternatives in energy planning. At the same time, Connelly and Richardson [36] state that most decisions involve choices that exclude actors, actions, interests and outcomes from planning processes. These are aspects that are not only connected to the technical choices in the energy system, but also to the more societal and organizational aspects concerning, for instance, who should be involved in the transition of the energy system. We argue that the choice awareness theory could therefore be specified to better embrace both technical and organizational dimensions of energy planning.

In this paper, we add to the existing choice awareness theory by defining three organizational choice-eliminating mechanisms concerning the elimination of certain actors and organizational structures in the energy system. These new choice-eliminating mechanisms are closely related to the original mechanisms and do add a new dimension to the theory. An expansion of the choice awareness theory to also include organizational eliminating mechanisms strengthens the theory to better embrace the complexity of both technical and organizational challenges in the energy system.

The choice awareness theory builds on another thesis, besides choice-eliminating mechanisms, which is important to the overall use of the theory. The second thesis argues that society can benefit from knowing which choices exist. Lund [8] highlighted three ways to promote this awareness:

- *“Promoting the description of concrete technological alternatives in various debates and decisions on new plans and projects at all levels*
- *Promoting feasibility study methodologies that include relevant political objectives in the analyses*
- *Promoting the concrete description of public regulation measures to advance new technologies” ([8], p. 34)*

Following the second thesis of the choice awareness theory, we propose the following policy changes:

- The involvement of actors, including locally anchored actors, should be broadened in the development of future tenders for nearshore wind power in Denmark. This implies that a broad variety of actors are invited to join the process at an early stage. This could, e.g., be done by inviting relevant NGOs to join the decision-making processes in relation to the specific tender rules.
- Tender rules should be defined in a way that does not exclude locally anchored projects. It is important that the different qualification criteria do not exclude certain actors just based on their organizational set-up. This means that economic requirements should be defined in a way that makes sure that potential bidders have the needed financial stability to realize the project, but without excluding certain ownership models. Furthermore, it is important that the timeframe leaves enough room for new actors to organize their projects.
- A support scheme and secretariat should support actors in preliminary analyses, feasibility studies, etc. New actors would not have the same professional network as already established actors on the market. For new actors to be able to develop realistic projects, a central support scheme that supplies funding to gain the needed knowledge could bridge this gap. Such a support scheme could specifically target non-profit actors or organizational set-ups with a high share of local ownership and could entail a central secretariat providing advice to these projects.

As the implementation of smart energy systems has as one consequence that energy production is being moved closer to local communities and citizens [8,44,45], a radical change in the organization of ownership of the energy system is needed to secure wide support for this local expansion of production units. The suggested policy changes would help to gain more transparency in the tender process and ensure that all actors have equal opportunities to make a deliberate decision to enter a tender.

We have proposed three organizational choice-eliminating mechanisms based on a critical case study, arguing that the eliminating mechanisms can be applied to similar cases. However, since this study to a large extent relies on information gathered through Wind People, it is also contingent on the correctness of this information, for instance, regarding Wind People's perception and experience of particular choice-eliminating mechanisms. Furthermore, it is possible that the identified elimination mechanisms would have been different if Wind People had acted differently in the process. This concern, we believe, is somewhat offset by the fact that the phenomenon of local ownership of off-shore and nearshore wind turbines at such a large scale is extremely limited at the grassroots organization level and in the Danish Energy Agency. This means that Wind People took on the "pioneer" role on behalf of other NGOs and grassroots organizations, leaving a good chance that many of the same elimination mechanisms would probably have been identified, had another grassroots organization attempted the same as Wind People. Due to Wind People's intense attempt to enter the tender, their close interaction with the Danish Energy Agency, as well as their willingness to share important information, we were able to identify the elimination mechanism used in the process. As a grassroots organization, Wind People does not represent any particular business interest and comes close to acting "on behalf of society", which in our view increases the reliability of their data. However, to further validate the eliminating mechanisms we could have collected and used data from other actors involved in the same tender process to see if they have had similar experiences throughout the process. This could have been, e.g., Lemvig municipality, who also tried to organize a locally based project, and/or Vattenfall, who won the tender. Investigating both the "winner" and the "losers" would provide information that could show whether all actors are treated identically.

6. Conclusions

This paper investigates the mechanisms used by the central administration to exclude certain actors and organizational structures from participation in renewable energy projects. Choice Awareness theory is used to develop a theoretical framework for analyzing new actors' attempt to make radical

changes in the market for renewable energy. We argue that the Choice Awareness theory benefits from a specification of the organizational dimensions of the theory. By doing so, the theory is more likely to embrace all challenges in the transition to the smart energy systems.

The analysis of the case study reveals that several organizational choice-eliminating mechanisms were used by the central administration to exclude the Wind & Welfare project from entering the market for nearshore wind power. We argue that this is not desirable if the green transition of the energy system should succeed with support from citizens and the local communities hosting the energy production units. Therefore, we suggest a number of changes to future policy frameworks for tenders for nearshore wind power.

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