Wind2050 - Multidisciplinary study on local acceptance and development of wind power projects

Project financed by Danish Strategic Research Council, 2014-2017

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Project web site: www.wind2050.dk

1. Summary

Wind power systems are expected to contribute significantly to Danish fossil free energy production by 2050. Despite initiatives aimed at increasing public participation and local acceptance, both public and private bodies continue to experience an increasing lack of local acceptance of wind power projects. This has been a common issue across Europe, with the factors driving and influencing acceptance appearing to differ depending on economic, political and cultural context. The Wind2050 project is unique in that it will draw on international experience to understand the dynamics of local acceptance of both off-shore and land based wind energy projects in DK and compare these with projects in Ireland and United Kingdom focusing on the institutional and regulatory context *as well as* technical and social aspects in project development. The project seeks to examine both the factors that influence local acceptance *and* the influence of governance, project development and deployment of wind power. The project applies an interactive, research framework involving researchers from legal, social, economic and technical sciences who continuous exchange knowledge with end-users (authorities, industry, interest organizations, citizens and other local actors). The overall analytical perspective considers wind power facilities as socio-technical systems, which allows the work packages to use different scientific perspectives and methods in order to understand why and how different institutions, regulations, actors and perceptions induce or block deployment of wind power. The analyses are finally integrated in strategic scenarios, which provide recommendations and decision support for future deployment of wind power and other renewable energy sources.

2. Objective of the project

Wind power systems are expected to contribute significantly to Danish fossil free energy production by 2050 and local acceptance is an important but uncertain element in meeting this ambitious targets. However, while Denmark has strong competences within wind energy technology and economy there is a lack of in-depth knowledge on what shapes local acceptance and how project planning as well as public decision-making and policy measures may reduce conflicts.

Therefore the overall objective of this project is to identify and analyze the key factors that drive the local acceptance of wind power (and similar renewable energy technologies) in a Danish context and to develop or adjust policy measures as well as project design and planning that are necessary to meet Danish renewable energy targets drawing on existing international research and practice. Moreover, it is the objective to address local acceptance from a multidisciplinary perspective in order to gain new scientific insights in sustainable development of socio-technical systems under strong influence of uncertainty factors such as acceptance.

3. The main results of the project

- Understand the co-shaping of local wind power projects and local acceptance including how controversies shape the public debate in order to guide policy measures (WP1);

- Analysis of how public decision-making, including planning legislation and processes, and specific policy measures affect local acceptance of wind energy projects using international and Danish case studies, (WP2);
- Identification and description of the project development practices and their influence on local acceptance in collaboration with a range of private sector actors (WP3);
- Analysis of preference for local acceptance, estimation of the associated acceptance costs and application of the acceptance cost in cost-efficiency analysis of wind deployment path for Denmark (WP4);
- Develop strategic scenarios for 2050 based on the analysis in the project and end-user workshops considering a range of technical, economic and social uncertainties (WP5);
- Disseminate the findings using academic, practice-based and social media in close collaboration with a wide range of actors throughout the course of the project (WP6).

4. Background and hypothesis/research questions of the project

Wind power systems are expected to contribute significantly to Danish fossil free energy production by 2050 and local acceptance is an important element for meeting this ambitious target. However, In Denmark and many other countries the public good nature of wind power has been taken for granted. The problem is that national public interest for wind power does not necessarily translate into a local public interest (Bergek, 2010). In lack of better explanations proponents of wind farms has often labeled local resistance as NIMBY (Not in my back yard) referring to selfish, irrational behavior by local people unconcerned for the greater good. Protest certainly does exist, but hardly on the basis on NIMBY alone and a wealth of empirical evidence has convincingly argued that referring to protests as NIMBY'ism is opaque, inappropriate, and unhelpful (e.g. Devine-Wright, 2009; 2011; Van der Horst, 2007; Wolsink, 2007). Moreover, there seems to be a consensus among most policy makers, decision takers, and developers that off-shore wind parks are less problematic alternatives to on-shore wind farms. However, wind farms off the coast of in the UK England have not proceeded without opposition or conflicts (e.g. Brack and Haggett, in press; Devine-Wright and Howes, 2010; Ellis et al., 2007). This has in most cases led to long delays, public inquiries, and ongoing disputes. Also studies of wind farms outside Massachusetts and Delaware, US show that the majority of the public expects negative impacts from the project (Firestone and Kempton, 2007; Firestone et al., 2010). Exceptions from the UK and US experiences may be Danish off-shore projects such as Middelgrunden (Sørensen et al., 2002) and Anholt (Danish Wind Industry Association, personal communication); however, this has not been documented in a scientific study before. A recent review of the contemporary literature summarized in six themes of controversy that are important for local acceptance of wind power projects (Borch, 2013):

1. The aesthetic appreciation of the particular landscape
2. The emotional attachment that people have to the place
3. Fears of impacts on the local environment and economy
4. The ownership of a development, and locals relationships with developers
5. The decision making processes, trust in decision-makers, and opportunities for the locals
6. Sustainability (wind power is dependent on subsidies)
7. How actors construct narratives for or against specific wind power projects through mass media or the internet based on one or several of the themes above, and how the competition between these stories in the public debate influence the acceptance.

While research to a large extent can describe general causes behind lack of local acceptance in socio-technical systems such as wind power, science still cannot explain differences from case to case due to contextual and cultural variations. Thus we lack knowledge on how to manage conflicts of interest without jeopardizing citizen rights on one hand and policy targets of a fossil independent energy system on the other. In order to approach these knowledge gaps this project asks the overall research question:

How can key actors (policy makers, authorities, industry, developers, consultants and civil society organizations) manage conflicts on implementation of wind power in order to increase local acceptance of wind power and other renewable technologies?

The overall analytical perspective considers wind power facilities as socio-technical systems and is theoretically based on actor network theory (e.g. Latour, 1992) and neo-institutional theory (e.g. Geels, 2004). Actor-network theory understands the shaping of socio-technical systems through the shaping of network relations among human actors, technology, geographical conditions etc. New-institutional theory combines regulative, normative and cognitive aspects of the processes by which institutional structures influence social behavior.
When drawing on the actor network theory the development of each wind power project is considered a genuine process of (re)creation of a technological artifact (Jolivet and Heiskanen, 2010) The project development process involves re-using existing methods, skills and equipment that have been shaped elsewhere. An important aspect is whether and how projects planners adapt and interpret generic tools and materials for wind power facility planning and combine them so as to make them fit local specificities. Are there processes of negotiation, compromises, arguments and conflicts during project planning in order to stabilize the relationships surrounding the project, and to what extent are these processes important to success or failure of the planning of the wind power facility? Similarly, it is important to gain knowledge about how public authorities and regulation can reduce conflicts through decision-making processes, planning practices as well as other policy measures.
The comprehensive recommendations from the project will synthesize the results from the scientific WP's by focusing on similarities and differences between assumed practice, enforced practice and actual practice. This way it is possible to identify needs and space for local adaptation of rules, tools, methods, etc. and develop future recommendations for different professional practices as well as public policy and decision-making.
These overall analytical perspectives allow on the one hand the WP's to analyze cases from different scientific and methodological perspectives, and on the other hand it ensures integration among the analyses from different perspectives.

5. Innovative value, impact and relevance of the project

This project will make a strong contribution to international research adding new insights into how local acceptance can be mitigated by policy-makers, public authorities and private wind power developers. The scientific findings of the project will form the basis for recommendations to both improve and guide public regulation and decision-making processes and to ensure private project developers mitigate the risk of an unsatisfactory implementation of wind power projects (Strazzera et al. 2012). These are actions that are vital in order to achieve its target of a fossil independent energy system by 2050.
Government and ministries: The government wants to stimulate performance of the wind power system, but does not know exactly the costs of acceptance and which regulations and instruments are feasible when planning for the different types of wind power facilities. The project analyzes and develops policy responses which can help reaching the goals for a fossil independent energy system by 2050.
Businesses: Businesses need to develop technologies and services, including design methodologies in accordance with societal values and public concerns. Future scenarios of wind power can support development of business models and innovations that obey future expectations of wind power technology and services. Thus the project results are important inputs to strategy and CSR policy of the industry.
Municipalities and local communities: The project can support the capacity of municipalities in public decision-making processes for new wind power systems and empower local citizens, businesses, and knowledge institutions etc.
Non-governmental organizations (NGOs): The project can support the capacity of NGOs to participate and deliver important knowledge in the planning of wind power projects.

Research institutions: Advanced and in-depth understanding of public and private decision-making processes and the effectiveness of specific policy instruments aimed at increasing public acceptance of wind power and renewable energy technologies

6. Project's methodology and results

The project involves a multi-disciplinary team, drawing on social sciences (including economics and law), technical sciences and specific professional perspectives, such as spatial planning. It will also draw on a wide range of stakeholder knowledge, including public authorities, industry, interest organizations, citizens and other local and national actors.

The focus of the analysis will be on local acceptance of individual wind power projects and on how the perceptions and actions of different stakeholders, including project developers as well as public decision-making, planning processes and policy measures may facilitate or block the deployment of wind energy projects. Empirically the Wind2050 project is based on analyses of previous wind turbine projects as well as on-going and future wind turbine projects in Denmark, Ireland and the UK.

WP1: Mapping and analyzing co-shaping of wind power facilities (DTU, AAU, QUB)

Objectives:

1. To explore, and systematically describe socio-technical characteristics and local controversies of off-shore, near-shore and on-shore cases of wind power projects in Denmark (month 1-30)
2. To organise dialogue research with three on-going Danish wind power projects (month 6-36)
3. To analyse the co-shaping and local acceptance of the wind power projects in Denmark (month 30-42)

WP1 applies Actor Network Theory (ANT) to explore and describe local controversies in previous and on-going Danish wind power projects (e.g. Rygg, 2012; Jolivet & Heiskanen, 2010). Dialogue research based on interviews, observations and document review is organised with three on-going Danish wind power projects during their planning and implementation as longitudinal case studies in order to contribute to reflections in these wind turbine projects about the co-shaping of the projects and the local conditions (Aitken, 2010), applying narrative theory (Barry, 1997). Comparative analyses are made with international experiences, especially British and Irish experiences.

Methods:

The cases are systematically described with respect to socio-technical characteristics, (Dryzek et al, 2003), and controversies in wind power projects. Web based controversy mapping tools (Venturini 2010) are used for the initial identification and mapping of controversies in previous wind power projects followed by discourse analysis in order to characterize the controversies. Interviews, participant observation, stakeholder meetings and workshops, and document review are used for the dialogue research in the longitudinal case studies of on-going wind power projects. WP1 is drawing on findings from the DSF funded projects EIS (Energy Innovation Systems) and SusTrans (Enabling and governing transitions to a low-carbon society) projects. The WP will coordinate a screening of case studies serving as a database for joint and specific analysis in subsequent WPs.

WP2: Local acceptance and public regulation (UCPH, UCL, QUB)

Objectives:

1. To analyse relevant public decision-making processes and policy measures, and their role in increasing local acceptance, building trust and reducing conflicts (month 1-36)
2. To explore factors shaping the relationship between the individual citizen and public decision-making and regulation, including public participation (month 1-36)
3. To identify new or adjusted policy measures aiming at increasing local acceptance and reducing conflicts (month 24-42)

The WP will focus on the design and dynamics of policy and decision-making processes related to wind power projects with a particular focus on participation (Renn, 2006, Healey, 1996) as well as the use and relevance of specific policy measures (Cass, et.al., 2010; Anker et.al, 2009, Olsen, 2010). WP2 analyses how spatial planning legislation and processes, including judicial review, public participation, EIA and landscape analyses, affect the relationship between the individual and the society. Furthermore, WP2analyses specific policy measures aimed at promoting local acceptance, including compensation schemes and community benefit or ownership schemes, and how such measures influence local acceptance.
WP2 also includes comparative analyses of the legal and regulatory framework for wind power projects in the UK with a particular focus on spatial planning, EIA, public participation and specific measures aimed at local acceptance. The UK regulatory tradition within planning, public participation and safeguarding of landscape values has in recent years been challenged and modified in view of renewable energy policies and wind energy development (Lee et.al, 2012).

Methods:

Based on legal science, social science and professional planning practices WP2 includes: 1) legal analyses of the regulatory framework and public policy measures regarding wind power projects, 2) Qualitative case study interviews generating in-depth knowledge on the relationship between public decision-making, policy measures and local acceptance, 3) Explorative case studies of e.g. landscape analyses and other adjusted policy measures focusing on options for increasing local acceptance. WP2 will seek a strong involvement of public decision-makers and other relevant actors. WP2 is drawing upon experience from research projects such as CIDEA (Citizen Driven Environmental Action Program) and DIAPLAN (Dialogue based landscape planning). WP2 generates knowledge on the role of the legal and regulatory framework, the role of authorities and public decision-making processes and is closely linked to WP3 focusing on a project developer perspective and WP4 analysing preferences and acceptance drivers.

WP3: Local acceptance and private project development practices (DTU, KORA, RPS, DWIA)

Objectives

1 To identify and analyze wind farm project development practices and their influence on local acceptance (month 1-24)

2. To compare with good practice for development of large infrastructure projects including offshore wind farms (month 12-30)

3. Analysis of risk management practices of project developers with regards to environmental risks and community involvement (month 12-30)

4. To identify new or adjusted project development practices with the aim of reducing conflicts and increasing local acceptance (month 30-42)

Methods

The work includes analysis of selected projects in Denmark, UK and Ireland with regards to a number of project and process characteristics and their impact on local acceptance. Each project will be described by selected socio-technical characteristics (Loring 2007) including wind resource, selected technology, layout, landscape features, visual impact, noise, land value etc. Special attention will be given to the identification and handling of stakeholders including the development of their perception of the project during the implementation of wind farms locally (Hagget 2012). The projects will be studied through interviews with developers and owners in the project development and operation phase. Findings from the selected projects will be compared to identify sources of uncertainty in connection to project complexity and ambiguity (Pich, et al. 2002). Furthermore, the findings will be juxtaposed with experiences and findings from other large infrastructure projects. A workshop discussing preliminary findings with developers and main stakeholders is foreseen in collaboration with WP6. WP3 receives input from WP1 and WP2 and is especially closely coordinated with WP2 with regards to the links between the spatial planning process, the legal framework and the project development process. The results from WP3 is utilised in WP4 and WP5.

WP4: Acceptance preferences and their consequences for cost-efficient wind deployment (KORA & DTU)

Objectives:

1. Analyse novel preference acceptance data for onshore and offshore wind power development and estimate acceptance costs (month 1-12)
2. Carry out a new preference acceptances study focusing on the most relevant drivers of attitude found in WP1-WP3 and estimate the new relevant acceptance costs (month 12-30)
3. Develop a cost-efficient wind deployment path for Denmark, considering the estimated acceptance costs in addition to technical wind power costs (month 1-39)

WP4 makes a new contribution by combining acceptance costs and cost-of-energy and learning curve approaches. Costs of acceptance are estimated using a non-utilised dataset focusing on the spatial acceptance preferences for wind turbine attributes and new preferences data for the acceptance drivers identified in WP1-3 in relevant onshore, near-shore and offshore wind cases (Devine-Wright, 2011; Ladenburg et al., 2013). Wind power cost curves (Lindman and Söderholm, 2012) are extended by these acceptance costs for the different technology and size alternatives (WP1 scenarios). A cost-efficient country-wide development path including the acceptance externality can hence be derived (input to WP5). Moreover, the revenue of wind farms on power markets is assessed to judge their financial feasibility as a possible obstacle.

Method

State-of-the-art preference methods (Ladenburg and Lutzeyer, 2012) are used to estimate acceptance preferences/costs for wind power (cases coordinated with WP1-3). Acceptance cost will be aggregated with technical wind integration cost in the cost efficiency analysis. Interplay with other technologies and resulting price effects (coordinated with WP3) are analysed with energy systems/market models. The cost-efficient deployment paths serve as input to WP5.

WP5: Comprehensive recommendations and scenario analysis of a fossil independent energy system by 2050 with wind power as a key driver (DTU, QUB)

Objective

1. To synthesize recommendations from previous WPs as comprehensive recommendations on how to manage controversies of wind power projects
2. Scenario analysis of wind power development in a fossil free energy system by 2050 considering local acceptance and other key uncertainties

Scenarios and the compilation of recommendations will take into account the identified drivers of local acceptance as well as options for adjusting measures and practices from a regulatory as well as a project developer point of view take future uncertainties of acceptance and technology development/availability into consideration and identify policy responses which, directly or indirectly, can support a development towards a desired direction in order to achieve a sustainable transition in accordance with the targets set for 2020 and 2050 (Wangel, 2011). The scenario analysis integrate the various WP findings into converging conclusions that consider key uncertainties in long term wind power development towards 2050. Scenarios are known to inspire innovation (De Smedt et al. 2012) where the objective is to understand wind power in a larger context where different future developments of local acceptance, renewable technology and other key uncertainties will influence innovation and determine how a fossil independent energy system can be realized with wind power as the initial technology driver.

Method

Compiled recommendations and guidelines will be formulated in a common framework involving all partners. The scenario analysis will be developed in two steps: 1) Future images describe different future situations, depending on the character of uncertainties 2) Backcasting and action planning determining the actors and change dimensions that must be included and integrated during the time scale between the present situation and the future images as well as the pace at which this development process must be put into effect.

The WP will be based on inputs from WPs and on participatory end-user workshops arranged as part ofWP6 (Rasmussen, 2011).

WP6: Knowledge sharing and dissemination of results to end users (CONCITO)

Objectives

1. Sharing of knowledge between partners and end-users (month 6- 36)
2. Dissemination of results to relevant policy- and decision-makers and other wind energy stakeholders (month 6-36)
3. Dissemination of conclusions and recommendations to the wider public including politicians (month 36-42)

Based on the actor network analysis in WP1 this WP will handle popular communication of results, conclusions and recommendations to specific target groups. Knowledge sharing between partners and end users will be secured by arranging biannual workshops, followed up by a short newsletter to relevant actors. Popular communication will be handled by communicating the scenarios developed in WP5 as a significant part of the popular dissemination of all the research results. The popular communication will be handled as press releases to newspapers and magazines in order to create more focus on the challenges faced by local actors, when implementing the policy targets of wind power. Finally WP6 will make an updated and scientific robust version of the CONCITO report "Long term wind power planning in municipalities (Concito, 2011).

Method

Knowledge sharing workshops for partners and end-users, newsletters, press release and popular reports.

7. Project plan

Themes

Private Development

Public Regulation

Regulation

Project Planning

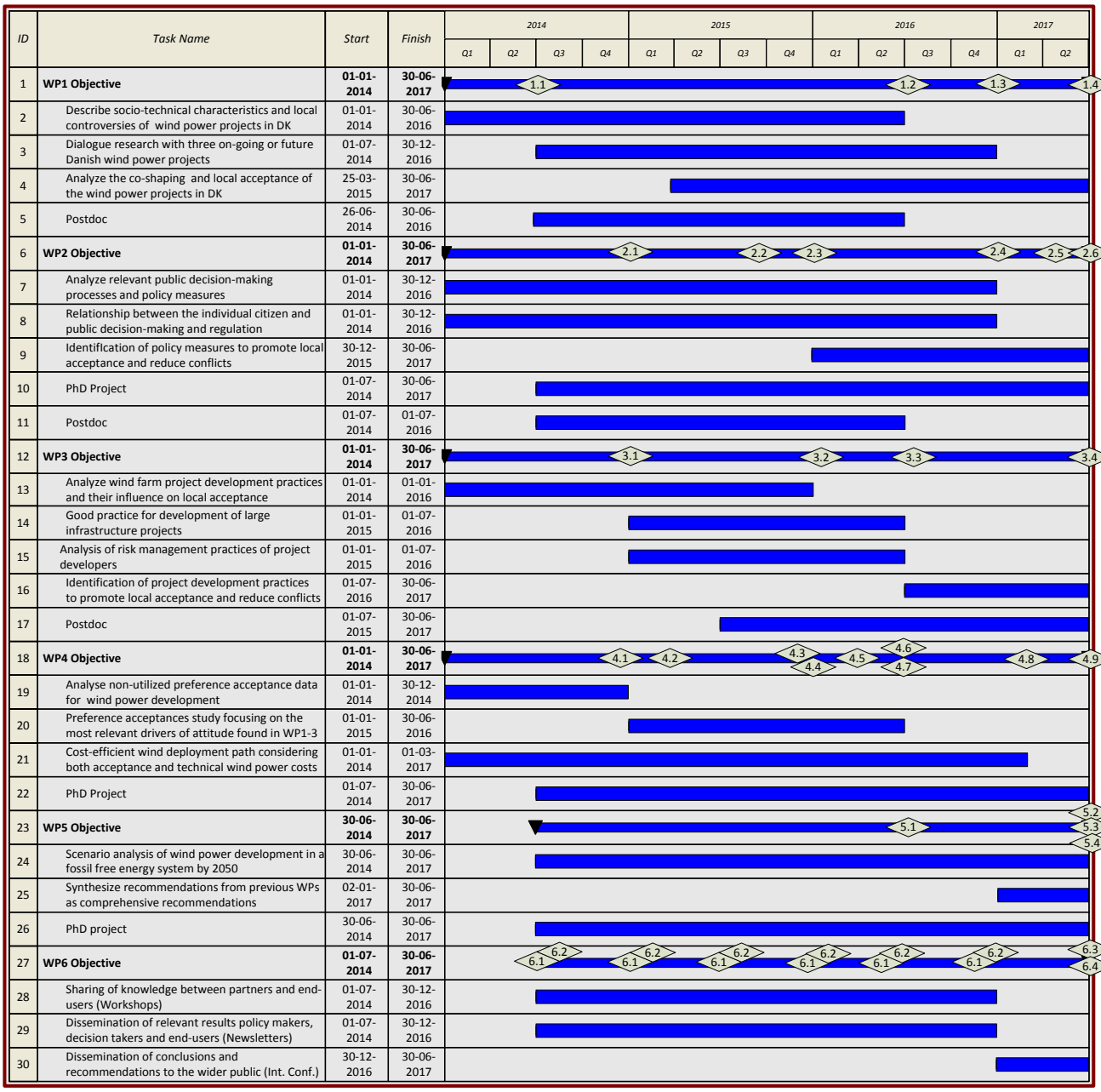
Economy

Policy

Communication

The project uses milestone planning to coordinate process and interdependencies. Each milestone is evaluated based on SMART criteria: **S**pecific, **M**easurable, **A**chievable, **R**ealistic, and **T**ime-bound. Moreover stakeholder analysis is performed for each WP in order to secure the assistance of powerful actors and build a critical mass of support for the WP. Uncertainty elements are handled in predetermined decision gates up to each milestone where the advisory panel is consulted on how to proceed with preceding phases.

Milestones		Dissemination	
IR: Internal Report, PP: Popular Paper, SP: Scientific Paper, PR: Progress/Project Report			
1.1	Core group of case studies identified and described	6	IR
1.2	Controversy mapping and discourse analysis finalized	30	PP, SP
1.3	Longitudinal case studies	36	PP,SP
1.4	PhD study finalized	42	SP
2.1	Mapping of the legal and regulatory framework delivered	12	IR, SP
2.2	Relationship between spatial planning and local acceptance analyzed	20	PR, SP
2.3	Public policy measures and local acceptance delivered	24	SP
2.4	Comparative analyses finalized	36	SP
2.5	Recommendations regarding new or adjusted public policy measures delivered	40	PR, SP
2.6	PhD study finalized	42	SP
3.1	State-of-the-art of wind farm project development in DK, UK and IRE finalized	12	SP
3.2	Core interviews with selected strategic developers performed (DK, IRE & UK)	24	IR
3.3	International best practice for onshore projects benchmarked (EDF EN)	30	SP
3.4	Recommendations to project developers	40	SP, PP
4.1	Analysis of acceptance preferences for onshore and offshore wind power development completed	12	SP
4.2	Learning curves for different classes of wind turbines constructed	15	PP
4.3	Cases described with respect to their role and possible upscaling	23	PP
4.4	New preferences acceptance survey carried out	24	IR
4.5	Wind deployment cost in Denmark for acceptance externalities accounted for	27	SP
4.6	Wind deployment cost in Denmark for acceptance externalities accounted for	27	SP
4.7	Analysis of acceptance preferences for new acceptance data completed	30	SP
4.8	Power market price effects described	40	SP
4.9	PhD study finalized	42	SP
5.1	Future images developed	36	IR
5.2	Comprehensive recommendations for wind power projects produced	42	PP, SP
5.3	Policy measures assessed regarding uncertainties	42	PP
5.4	PhD study finalized	42	SP
6.1	Biannual workshops organized	6, …, 36	PP
6.2	Newsletter distributed together with short press release	7, …, 37	PP
6.3	Final conference	42	PP
6.4	Popular report on comprehensive recommendations and scenarios	42	PP



ID	Task Name	Start	Finish
1	**WP1 Objective**	**01-01-2014**	**30-06-2017**
2	Describe socio-technical characteristics and local controversies of wind power projects in DK	01-01-2014	30-06-2016
3	Dialogue research with three on-going or future Danish wind power projects	01-07-2014	30-12-2016
4	Analyze the co-shaping and local acceptance of the wind power projects in DK	25-03-2015	30-06-2017
5	Postdoc	26-06-2014	30-06-2016
6	**WP2 Objective**	**01-01-2014**	**30-06-2017**
7	Analyze relevant public decision-making processes and policy measures	01-01-2014	30-12-2016
8	Relationship between the individual citizen and public decision-making and regulation	01-01-2014	30-12-2016
9	Identiflcation of policy measures to promote local acceptance and reduce conflicts	30-12-2015	30-06-2017
10	PhD Project	01-07-2014	30-06-2017
11	Postdoc	01-07-2014	01-07-2016
12	**WP3 Objective**	**01-01-2014**	**30-06-2017**
13	Analyze wind farm project development practices and their influence on local acceptance	01-01-2014	01-01-2016
14	Good practice for development of large infrastructure projects	01-01-2015	01-07-2016
15	Analysis of risk management practices of project developers	01-01-2015	01-07-2016
16	Identification of project development practices to promote local acceptance and reduce conflicts	01-07-2016	30-06-2017
17	Postdoc	01-07-2015	30-06-2017
18	**WP4 Objective**	**01-01-2014**	**30-06-2017**
19	Analyse non-utilized preference acceptance data for wind power development	01-01-2014	30-12-2014
20	Preference acceptances study focusing on the most relevant drivers of attitude found in WP1-3	01-01-2015	30-06-2016
21	Cost-efficient wind deployment path considering both acceptance and technical wind power costs	01-01-2014	01-03-2017
22	PhD Project	01-07-2014	30-06-2017
23	**WP5 Objective**	**30-06-2014**	**30-06-2017**
24	Scenario analysis of wind power development in a fossil free energy system by 2050	30-06-2014	30-06-2017
25	Synthesize recommendations from previous WPs as comprehensive recommendations	02-01-2017	30-06-2017
26	PhD project	30-06-2014	30-06-2017
27	**WP6 Objective**	**01-07-2014**	**30-06-2017**
28	Sharing of knowledge between partners and end-users (Workshops)	01-07-2014	30-12-2016
29	Dissemination of relevant results policy makers, decision takers and end-users (Newsletters)	01-07-2014	30-12-2016
30	Dissemination of conclusions and recommendations to the wider public (Int. Conf.)	30-12-2016	30-06-2017

8. Project's international dimension

In aspiring to the best standards of research, the research framework is international and multi-disciplinary involving researchers from two universities in the UK and one private organization in Ireland. The reason for choosing UK and Ireland is that both countries have experienced strong local resistance against implementation of wind power, while at the same time having strong traditions for public participation at local level.

QUB: Prof. Geraint Ellis is a scholar of social acceptance of international implementation of wind power, and has contributed significantly to the literature. Geraint will support the project both with important knowledge inside social acceptance that we do not possess in DK, and with methodological expertise supporting WP1 and WP5.

UCL: The Institute of Sustainable Resources (ISR), University College London will contribute to the comparative study of the role of the legal and regulatory framework, incl. planning, law and specific policy measures through legal analyses and case studies on the functioning of planning procedures and specific policy measures such as community benefit schemes in

relation to local acceptance. The Institute of Sustainable Resources which is headed by Prof. Paul Ekins carries out research in the sustainable use of natural resources, including renewable energy, in a cross-disciplinary context. Furthermore, the ISR has established expertise regarding strategic policy scenarios aimed to promote the globally sustainable use of natural resources and energy systems. The ISR will also offer research training and collaboration on energy-environment issues with a particular emphasis on social sciences, economics and law.

RPS Group Ireland (incentive effects): RPS is a leading planning, design, engineering, environmental and communication consultancy and deliver least two crucial competences:

1. RPS Group has competences on effective communication on major infrastructural projects and PR consultancy services to public and private sector clients. This is a competence that both Danish public energy planers as well as private developers have called for.
2. RPS Groups unique integrated approach of bringing Planning, Environmental, Engineering and Communications skills to a project marks them out from other consultancies nationally and internationally. The managed delivery of a project including the safety, technical quality, cost, time, stakeholder interfaces and sustainability objectives are important knowledge that will be transferred and further developed in the Wind2050 project.

EDF-EN is a large international wind farm developer and will serve as benchmark with regard to good practice for project development. EDF-EN is affiliated partners.

9. Legal and ethical aspects, etc.

The survey analyses will observe the legislation for data collection and data keeping: the Act on Processing of Personal Data (Act No. 429 of 31 May 2000, amended most recently in 2009), which implements EU Directive 95/46/EC on protection of individuals with regard to processing and movement of personal data. It is not expected that a formal application to the Danish Data Protection Agency is necessary. The research is not directly aimed at developing commercial products. Hence the legal rights to results of the research are not considered commercial property by the parties of the alliance. The project will observe legal procedures for copyright etc. in negotiations with publishers.

10. Publication and promotional strategy and exploitation of results

Each WP is responsible for scientific publications (see milestone plan), while WP6 has been given the responsibility for broader dissemination of the project results in the form of seminars, workshops, and targeted newsletters to actor groups (see task description of WP6). WP6 will also be in charge of arranging international conference in collaboration with IEA Task 28, which will be followed up by both popular and scientific proceedings.
The planed end-user workshops will work as direct channels for continuously implementing of project results. Specifically three on-going wind power projects will be selected as longitudinal case studies in dialogue with the local actors (see WP1).

11. The participating parties, project management

Core academic partners:	Core non-academic partners:
Technical University of Denmark (DTU-MAN)	CONCITO
Technical University of Denmark (DTU-WIND)	Danish Wind Industry Association (DWIA)
Copenhagen University (KU-Science)	
Aalborg University (AAU)	
Danish Institute of Governmental Research KORA (former AKF)	
University College London See section 8	
Queens University Belfast See section 8	

WP work teams

The work is organized in WP teams staffed with professionals across institutional affiliations who together can accomplish the WP objectives. Several individuals are represented in more than one WP securing coherence and synergy between the WP's.

WP1

Michael Søgaard Jørgensen, Associate professor (AAU) in sustainable innovation and sustainable transition is leader of WP1: Michael is responsible for the analyses of controversies in Danish wind power projects and the dialogue research with on-going projects. Furthermore he contributes to scenario development activities and Ph.D. supervision in WP5.

Kristian Borch, Senior scientist (DTU): Kristian is experienced scholar of socio-technology systems will perform system and discourse analysis.

Mads Borup, senior scientist (DTU) and representing the EIS project supporting the system analysis.

Anders Kristian Munch, Associate professor (AAU): Anders will develop and supervise the web based controversy mapping.

Geraint Ellis, professor (QUB) is a scholar of social acceptance of wind power and will support the discourse analysis applying Q-methodology.

WP2

Helle Tegner Anker, Prof. of law (KU) is leader of WP2: Helle will provide analyses of the legal and regulatory framework for wind energy projects drawing on her expertise in planning law and environmental law.

Tove Enggrob Boon, Associate professor in environmental governance (KU): Tove will explore factors shaping the relationship between the individual citizen and public decision-making, with a focus on the role of public participation

Jens Emborg, Associate professor (KU): Jens will provide qualitative case study interviews to explore the relationship between public decision-making, policy measures and local acceptance drawing on his expertise in environmental conflict management, public involvement and trust.

Vibeke Wainø Nelleman¸ Senior adviser in spatial planning and landscape management (KU): Vibeke will contribute to case studies with landscape analysis methods and EIAs with local involvement, drawing on her expertise in landscape analysis and dialogue based spatial planning.

Chiara Armeni, Research associate (UCL): Chiara will provide analyses of the UK legal and regulatory framework for wind energy projects with a particular focus on planning law, EIA and specific policy measures aimed at increasing local acceptance drawing on extensive research experience in climate change technologies regulation.

Julia Tomei, Research associate (UCL): Julia will carry out case studies in the UK.

Paul Ekins, Professor of Energy and Environmental Policy (UCL): Paul will support the project by supervision and review.

WP3

Niels-Erik Clausen, Senior advisor (DTU) is leader of WP3: Presently project coordinator of the Nordic TFI project Icewind and work package leader of EU South Baltic Offshore project. Niels-Erik will be responsible for the analysis of the project development steps and in general contribute with technical wind technology know how.

Tom Cronin, Senior advisor (DTU) will contribute with his experience as the banks technical advisor to the comparative analysis of international practices for project development.

Christian L. Thuesen, Associated professor (DTU) in project management**.** Christian will together with Sten contribute to the comparison with large infrastructure projects and risk management practices.

Sten Bonke Associate professor in construction project management (DTU). Sten will particularly address aspects of stakeholder management and forms of collaboration in project development and implementation processes.

Melanie Kreye visiting scholar from, University of Bath, UK (DTU) will supplement the work by Sten and Christian focusing on project uncertainty and complexity.

Graham Winch, Prof. of construction project management at Manchester Business School, and presently affiliated with Centre for Infrastructure Development at Chalmers, will contribute to the expert knowledge base on the escalation of major projects and the policies for managing such challenges.

Sune Strøm, chief economist (WP3), responsible for economic regulation of wind power, grid and electricity market issues in DWIA. Together with Karina Lindvig Sune will perform market analysis and secure contact to the industry.

Karina Lindvig, advisor (WP3), 3½ years of experience in the wind industry.

Jim Gannon (RPS) is an expert in Wind Energy Project Development and Risk and is working on a range of energy and infrastructure projects from policy development through to project delivery. Jim will Support identification of existing methodologies and development practices within industry including evaluation of the effectiveness of the development practices, comparison to other civil engineering projects. Moreover Jim will support identification of spatial planning/regulation/legislative frameworks for decision-making and stakeholder engagement, and the influence of these frameworks on project development practices and local acceptance.

WP4

Jacob Ladenburg, Senior Scientist (KORA) and Leader of WP4: Jacob has headed several national projects. Latest the FSE 275-06-066. Jacob is an international expert in social acceptance and preferences for wind power development. He will be responsible for the preference acceptance analyses and for carrying out the new preferences acceptance study.

Henrik Klinge Jacobsen, Senior scientist (WP4): Henrik is an energy economist and will contribute with his knowledge of support schemes and power sector regulation development.

Sascha Thorsten Schöder, Scientist (DTU): Sascha is an energy engineer and economist and has several years of wind power regulation and power markets, esp. offshore. He will co-supervise the PhD student and contribute to wind cost and power market benefit analyses.

WP5

Kristian Borch, Senior Scientist (DTU) and leader of WP5: Kristian has headed several national and EU multidisciplinary projects. Latest the FP6 project AG2020. Kristian has a solid experience in scenario and foresight analysis. Kristian is a guarantor for a participatory process and inclusion of knowledge from all WPs as well as end-user perspectives in the scenario analysis.

Lauge B. Rasmussen, Associate professor (DTU): Lauge has solid experience as facilitator and expert in interactive methods and will facilitate the scenario analysis.

Geraint Ellis, Prof. (QUB) Geraint will provide the Q-model and compare Danish results with his own research in the UK. Geraint will also co-supervise a PhD student who will be part-based in his institution at Queen's University, Belfast.

WP6

Michael Minter (CONCITO) leader of WP6. Michael Minter is head of secretariat at CONCITO and co-author of the CONCITO-report on "Long-term land wind turbine planning in the municipalities" from 2011. Previously he has worked as an EU Policy Officer for the Danish Society for Nature Conservation (DN), boardmember for the European Environment Bureau,

communication advisor for Operate A/S and as an independent consultant for ECOPA Sustainability Consulting.

Kristian Borch, Senior scientist (DTU) has documented experience in popular dissemination (e.g. Helsted & Borch, 2011) and will prepare the scenario analysis for popular dissemination.

Affiliated Partners

GK Energi ApS, Eurowind Energy A/S, Kommunernes Landsforening KL, Naturstyrelsen - Vindmøllesekretariatet, Energistyrelsen, Siemens Wind Power, Energinet.dk, Ringkøbing-Skjern Kommune, Sønderborg Kommune, Århus Kommune, Svendborg Kommune, Guldborgsund Kommune, Kalundborg Kommune, HoFor (Københavns Kommune), ProjectZero, Danmarks Windmølleforening og EDF-EN Portugal, Vestas Wind Systems A/S, Vattenfall A/S

Other Partners

Danmarks Naturfredningsforening DN, Vindmøller med Omtanke VMMO, Hvidovre Kommune, Lejre Kommune.

Project management

A steering committee will represent each partner headed by the project manager. The steering committee will decide on administrative and budgetary matters. The steering committee will meet at least every 6 months to coordinate and ensure progress in each work package. The meetings are open to all project participants allowing young researchers to participate in the management of the project. In addition online meetings (web-conferences) are arranged when needed. Disputes in the project group will handled through to n “ADR-Clause”; (Alternative Dispute Resolution-Clause) that covers all the alternatives for solving a conflict through the intervention of one or more outside persons.

Project Management is handled by DTU with Kristian Borch (KB) as project manager. Besides his background in natural science KB hold a GD in Business Administration (HD), and a master in conflict management. KB has a history as head of section and is an experienced manager of international multi disciplinary research projects and will ensure that the project is consistent with overall objectives and that the research activities are genuinely collaborative in nature. KB will be responsible for the contact and collaboration with the affiliated and other partners of the project. Major changes and deviations shall be approved by the project manager (and for the PhD and postdoc projects, also by the Board of Research Education and the responsible University). Besides the overall management of the project, KB will coordinate administrative and financial relations between the partners and the host: DTU Management Engineering. Jette Gents has been appointed as Administrative Aid to support the project management.

The Research Education Program is coordinated by Tove Enggrob Boon who has extensive experience in management of interdisciplinary research and teaching teams (1997-), and as PhD supervisor, mentor and research coordinator. Tove is a member of the University Study board (2008-). Besides Quality assessment of the PhD and post doctorial projects the program includes a course on an interdisciplinary PhD course focusing on conflict management drawing on the expertise and experience within project.

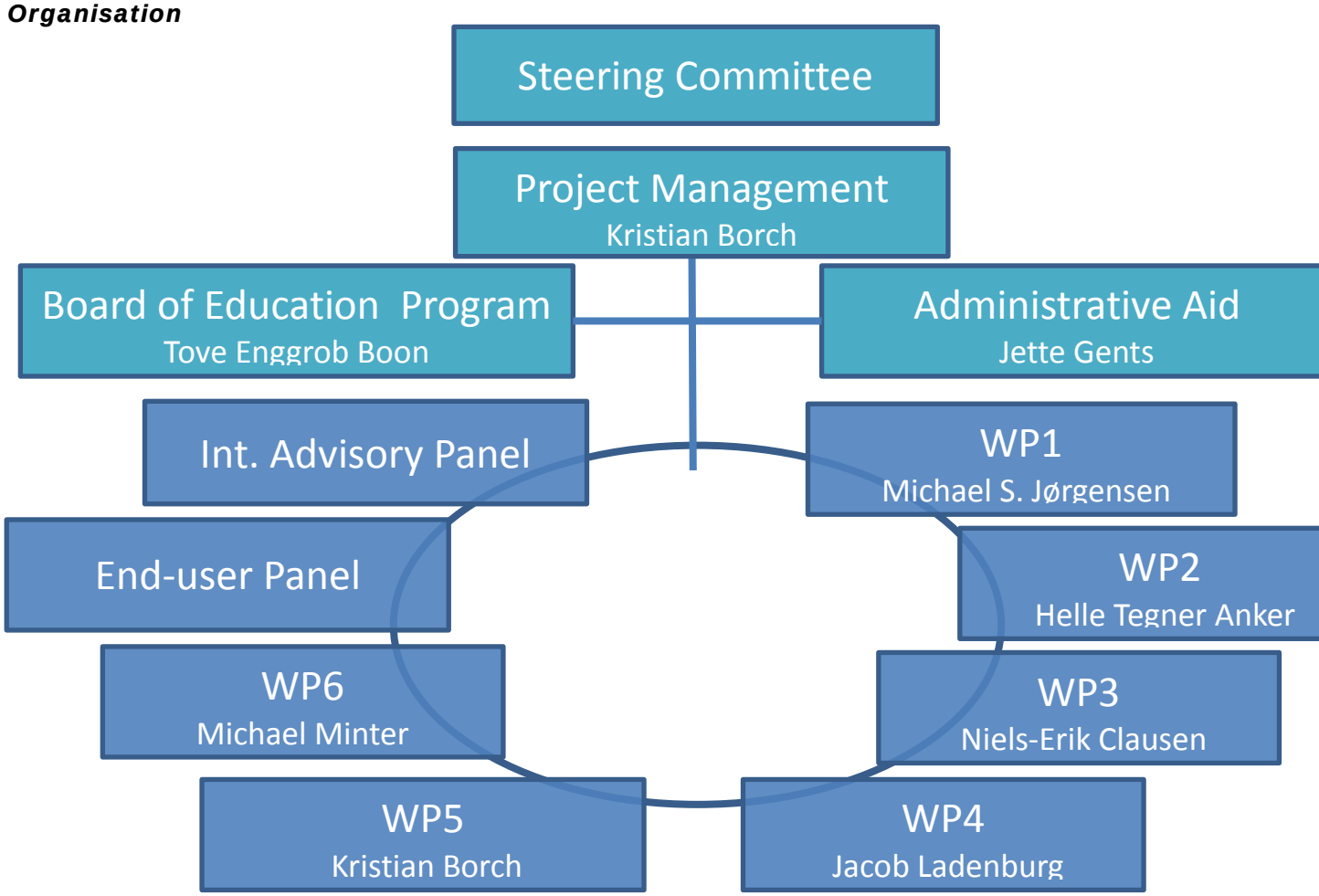
The Scientific Advisory Panel will be established where highly recognized international scholars of acceptance will be represented. The advisory panel will meet three times throughout the project period in affiliation with the planned end-user workshops. The advisory panel’s role is to peer review the scientific progress of the project and contribute with international perspectives on the project. Through the advisory panel different international research networks which the Wind2050 researchers participate in, can be involved, including the Sustainable Transitions Research Network (STRN), and IEA Task 28.

The Work Package leaders are all experienced project leaders whose task it is to ensure the highest quality of analysis, fulfillment of milestones and timely deliverables of the WP’s.

Inclusion of end-users of the research result will be prioritized and several end-users have already been committed as affiliated partners or other partners. It is expected that more end-users will be identified and involved in connection with the mapping performed in WP1, the screening performed by KL, and the fact that KL, CONCITO and DWIA represents all key actors in Denmark. Furthermore, workshops will be arranged serving as knowledge exchange and direct dissemination to a wider audience of end-users.

International network relations are maintained primarily through in International Energy Agency (IEA) Task 28, Social Acceptance of Wind Energy Projects.

Organisation



Contribution to research education

WP1 includes a 2 year postdoc project will develop the web based controversy mapping of wind power projects supporting the discourse analysis. This will be an important element in understanding the co-shaping of wind power projects and local acceptance.

WP2 includes a PhD project with the objective to analyse the specific Danish policy measures aimed at promoting local acceptance, in particular the compensation scheme, community benefit scheme and ownership scheme and how these measures influence local acceptance in practice. WP2 also includes a post doc that will analyse how spatial planning legislation and public decision-making processes affect the relationship between the individual citizen and the society. Both projects will be based on social science research methods, including case study interviews, and they will compare Danish experiences with UK experiences in collaboration with the international partners.

WP3 includes a post doc that will focus on analysis of the technical steps in the development of wind farms and their impact on local acceptance.

WP4 encompasses a PhD project that will address the cost developments of different types of wind generation and compare them to expectable benefits from market price signals. As a main externality, local acceptance costs will for the first time be integrated in this analysis. The PhD student will be based at DTU-Man and co-supervised by KORA.

WP5 includes a PhD project with the objective to study the uncertainty of acceptance and how it influences the development and implementation of wind power and other renewable technologies. The PhD study will be supervised by QUB and DTU-Man, thus the PhD-student will be part-based at Queen's University.

12. Key references (maks. 1 side)

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