The Technical University of Denmark

Response Strategy to different issues regarding Local Acceptance in Wind Power Development

Master Thesis for the degree of Engineering Management

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Abstract

In the promotion of renewable energy, wind power is identified as a key factor to achieve ambitious goals regarding reduction of green house gas emissions for a more sustainable future. Through the years wind power has had high level of social acceptance and until recently, lack of local acceptance wasn't considered as a serious problem that needed special attention. Active communication strategy was considered as a key factor to get local acceptance. The actors in the industry have now recognised the problem, and agree on the importance of expanding the knowledge about what shapes local acceptance.

The primary objective of this thesis is to develop and introduce a new method to address the problem by combining different theoretical perspectives, Technological Innovation System (TIS), Innovation Design and Conflict Theory. By building on these theories, wind power development and the controversial issues that arise during project development regarding local acceptance have been described with socio-technical characteristics. The main focus in the analysis has been to create a process of sense-making to be able to group issues based on uncertainty and ambiguity to determine a strategic approach to deal with those issues. This contributes to stakeholder management.

In order to test the method it was applied on two cases, Hagesholm and Ågård Gods wind farms, both in the north of Sjælland. The result showed that the process of sense-making with a collaborative approach of different theories and methods, gave results in each step which made it easier to move forward in the process. Two strategies were identified, one strategy to deal with uncertainty, proactive strategy, and on other to deal with ambiguity, reactive strategy. Both strategies are considered to increase the level of procedural justice, distributional justice and trust amongst the different actors and stakeholders, which are the key elements of local acceptance.

Furthermore the method that has been designed in this thesis is considered appropriate to use in other large infrastructure projects that have socio-technical characteristics.

Preface

The present master thesis, *Response strategy to different issues regarding local acceptance in wind power development*, has been conducted by Tinna Björk Sigmundsdóttir and is submitted to Management Engineering at Technical University of Denmark. The thesis fulfils the requirement of the M.Sc degree in Engineering Management and represents 30 ECTS points. The thesis was written during a five months period, during summer and fall semesters 2014 under the supervision of Kristian Borch and co supervision of Christian Langhoff Thuesen both the from Department of Management Engineering at DTU.

The main topic of this thesis is local acceptance in wind power development and delivers a method for project managers on how to manage uncertainty and ambiguity in complex projects.

Acknowledgements

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Above all, I would like to thank my family, specially my three sons, Haukur, Einar and Jakob for their support throughout the entire process and understanding my absence during the work of this thesis. A very special thanks to my best friend, Dagur Gretarsson, for unconditional support, help and understanding.

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Copenhagen, Denmark, October 17, 2014
Tinna Björk Sigmundsdóttir

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EIA - Environmental Impact Assessment.

NIMBY - "Not In My Back Yard" describes the phenomenon of people who are in favour of wind power but are opposed to wind turbines in their own area (Wolsink, 2000).

Issues - Controversial concerns that local stakeholders have regarding wind power project in the local community.

Local acceptance - Acceptance of siting decision and renewable energy projects by local stakeholders, particularly residents and local authorities (Wustenhagen et al., 2007).

Uncertainty - Absence of information required for the decision that needs to be taken at a point in time (lack of information)(Winch, 2010).

Ambiguity - The existence of two or more interpretations of the same cue (lack of clarity/understanding) (Brun and Saetre, 2009, p. 34).

Framing - It is when all the different actors establish a common world which allows them to achieve a collective scenario of desired outcome (Jolivet and Heiskanen, 2010).

Overflowing - Overflowing represents the instability and uncertainty of projects when actors do not agree on the desired outcome or do not conform what was expected of them and they start to carry out their own desired scenario (Jolivet and Heiskanen, 2010).

Controversies - Controversies are situations where actors disagree (or better, agree on their disagreement) (Venturini, 2010, p. 261-262).

Stakeholders - Stakeholders are persons or organizations, who are actively involved in the project or whose interests may be positively or negatively affected by the performance or completion of the project (PMBOOK, 2008, p. 24).

Actors - Actors are someone or something which make a difference and have importance for a process (Latour, 2005).

Chapter 1

Introduction

There is a certain mega-trend going on globally regarding energy production, the focus is on renewable energy and to reduce the greenhouse gases (CO2). The amount of investors for clean energy is growing and the key driver for innovation is sustainability and sustainable development. Governments all over the world are aiming for high goals regarding reducing the CO2 emissions and increasing the renewable energy production. The Danish government is no exception and has ambitious goals, aiming for a fossil free energy production in Denmark in the year of 2050 where wind power systems are expected to contribute significantly (Klima, 2013).

The Danish government has a clear value proposition when it comes to wind power systems and has made an agreement with The Municipalities National Association (Kommunens Landsforening) which states that municipalities account and plan for wind power systems in their local environmental planning (Komunens Landsforening, 2010). One could assume that a strong value proposition of the Danish government would reflect the beliefs and opinions of the whole community, but how is it in the local communities, what shapes local acceptance when it comes to big infrastructure projects? Local acceptance is an important but uncertain element in meeting this ambitious target. The uncertainty, risk, and complexity that arise during the project development because of issues regarding local acceptance, create and build up ambiguity. There is a lack of in-depth knowledge about the subject and these issues need to be addressed carefully and with respect to the stakeholders involved.

In this thesis the aim is to develop a method to be able to create strategy to deal with the different issues that arise in wind power development, contributing to stakeholder management. A case study is conducted to identify issues regarding local acceptance.

This thesis is contributing to three different elements:

- Firstly the economic, environmental and social sustainability by showing

how wind power development is adding value to the society by generating wealth, reducing threats to the environment and making the energy system more robust and less depended on fossil fuels.

- Secondly to different literatures about wind power development as a socio-technical innovation system, to Innovation Design and to local acceptance of renewable energy systems.

- Lastly it contributes with a method that fostered the development of two types of strategies on how to deal with the different issues in wind power development.

1.1 Background - Wind 2050 Multidisciplinary study on local acceptance and development of wind

"The overall objective of this project (Wind 2050) is to identify and analyse 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 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" (Borch, 2013).

This thesis is contributing to work package 3 (WP3), local acceptance and private project development practices. Also the two cases presented in this thesis were a contribution to the Mapping wind energy controversies online, in work package 1 (WP1) of the wind 2050 project.

"As part the Wind2050 project funded by the Danish Council for Strategic Research we have mapped controversies on wind energy as they unfold online. Specifically we have collected two purpose built datasets, a web corpus containing information from 758 wind energy websites in 6 different countries, and a smaller social media corpus containing information from 14 Danish wind energy pages on Facebook. These datasets have been analyzed to answer questions like" (Munk, 2014):

- How do wind proponents and opponents organize online?

- Who are the central actors?

- And what are their matters of concern?

1.2 Learning Objectives

The learning objectives for this thesis are designed to fulfil the Bloom's taxonomy. At the Technical University of Denmark, it has been decided to use a modified version of Bloom's taxonomy (Rasmussen et al., 2010). Figure 1.1 shows Bloom's hierarchy for learning concepts with, on one side, progression of learning and, on the other side, the corresponding complexity of the learning objective.

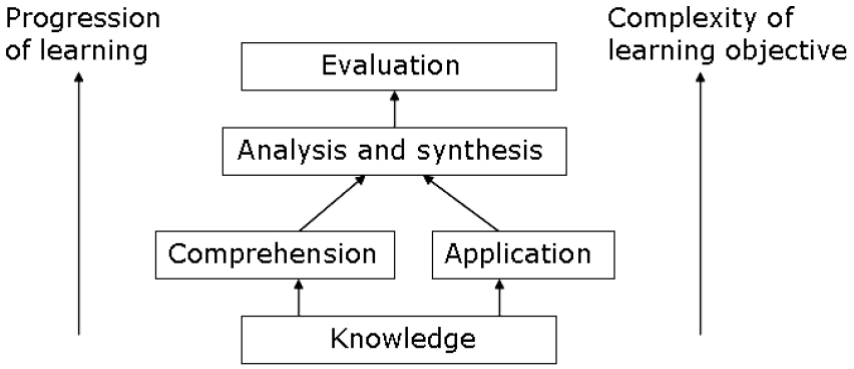

Figure 1.1: Bloom's hierachy for learning concepts.
(Rasmussen et al., 2010)

The research design that is presented in section 4.2, is build to reflect and to be coherent to the learning objects of this thesis. The learning objectives are:

1. Gain knowledge about local acceptance of wind power development, with a literature review, interviews and discussions to describe the current situation in the wind power industry.
2. Use the knowledge that has been gained and apply TIS and Value Framework for the process of sense-making and understanding wind power development as an innovative solution with the goal to create value for the society and to understand the dynamics of the industry.
3. Use the knowledge that has been gained and a case study approach to identify and understand issues that arise in the project development of wind power projects, from the project developer's point of view. To accomplish this, it is necessary to define and describe the following concepts: framing and overflowing, uncertainty and ambiguity, controversies, local acceptance and social acceptance.
4. With the support of the case study, theories and literature to analyse and position/place the issues and challenges identified where they belong in the value framework. To accomplish this, it is necessary to define and

describe stakeholders in wind power projects and the success factors that shape local acceptance.

5. Identify what type of conflict each issue creates and determine which strategy to apply based on type.
6. Illustrate the main findings and design a response strategy to the different issues that have been found through the analysis.
7. Evaluate the main findings and discuss limitations and possibilities of applying it to other kind of projects.

This thesis is structured as follows, in chapter 2 the research question will be presented. In chapter 3 the theoretical perspectives "state of the art" will be presented. In chapter 4 the case study method, data collection, research design and analytical framework will be presented. In chapter 5 the Danish energy market with the main focus on renewable energy and wind power will be presented. In chapter 6 the case study of this thesis is covered by introducing the context and background of both cases along with case description. In chapter 7 the analysis of wind power development as a socio-technical innovation system are conducted along with the empirical findings from the case study. In chapter 8 the main findings are discussed, the limitations of the study and how the method could be applied to other similar infrastructure projects. Chapter 9 is the last chapter and holds the conclusion of this thesis.

Chapter 2

Research Question

This master thesis deals with the subject of local acceptance in wind power development from the project manager perspective. The U-shaped development of local acceptance presented in figure 2.1 illustrates how the level of acceptance evolves during project development as Wolsink has described (Wolsink, 2007).

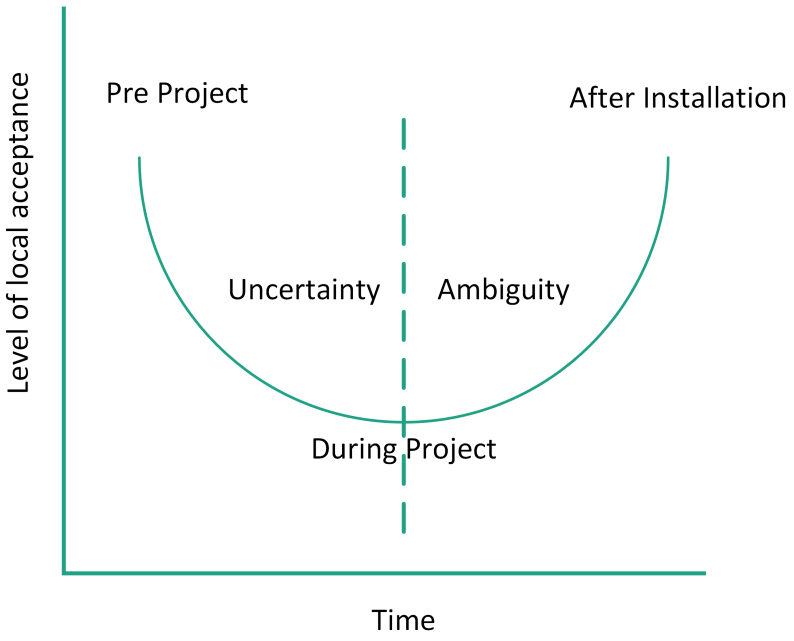

Figure 2.1: Level of local acceptance during project development.

The characteristics of wind power projects are high levels of uncertainty and ambiguity, and it is assumed that the current functional pattern to deal with uncertainty and ambiguity is not good enough. Note that even though this is

how the local acceptance is considered to evolve during project development, there are projects that receive constant complaints after installation. For instance the Hagesholm wind farm case presented in this thesis, 3 years after installation is still receiving complaints.

The goal of the master thesis is to create a method that will take into account how to deal with uncertainty and ambiguity in wind power projects. This is done with the process of sense-making, where wind power development is considered as an innovative solution developed to create value for society. With the help of a case study analysis, issues that arise in wind power projects will be identified and categorised based on uncertainty and ambiguity, and a strategic approach to deal with each category will be formed.

Based on a case study of the project developer's point of view, of wind power development in Denmark, the following research question forms the basis of this thesis.

How can Project Managers with the process of sense-making form a strategy to deal with the issues, related to local acceptance, that arise in the innovation systems of wind power?

In order to structure the basis of this thesis the research question is supported by the following sub-questions that build up the ground for, which answers this paper will return:

How can TIS analysis and controversy mapping, support sense-making on issues of controversy in wind power projects?

How can issues of controversy be valued using theory of Innovation Design - the Value Framework?

What kind of strategy can be applied based on the type of value it is affecting and the type of conflict it arises from?

Chapter 3

Theoretical Perspective - "State of The Art"

This chapter will provide fundamental understanding of the theories, methods and concepts applied in this thesis.

3.1 Technological Innovation System

Technological Innovation System (TIS) *Geels (2004), Bergek et al., (2008), Carlsson (2002), Hekkert (2007)*

Contribution: Approach to study socio-technical system, involves TIS analysis and contributes to the sense-making process. **Characteristics:** Helps understanding the process regarding innovation and knowledge creation in science and technology. Framework that accounts for system performance as well as the factors influencing the performance.

"Innovation systems can be defined in a variety of ways, they can be national, regional, sectoral, or technological. They all involve the creation, diffusion and use of knowledge" (Carlsson et al., 2002).

TIS analysis is a practical and useful framework for the process of sense-making as it accounts for system performance as well as the factors influencing the performance and is considered as an useful and robust tool for policy makers (Bergek et al., 2008). A system can be defined as the set of actors and rules that influence the speed and direction of technological change in a specific technological area (Hekkert et al., 2007) (Bergek et al., 2008) or as Carlsson defines it, "Systems engineers define a system as a set of interrelated

components working toward a common objective. Systems are made up of components, relationships and attributes" (Carlsson et al., 2002).

The TIS analysis is performed by following the six steps that Bergek recommends, as figure 3.1 illustrates.

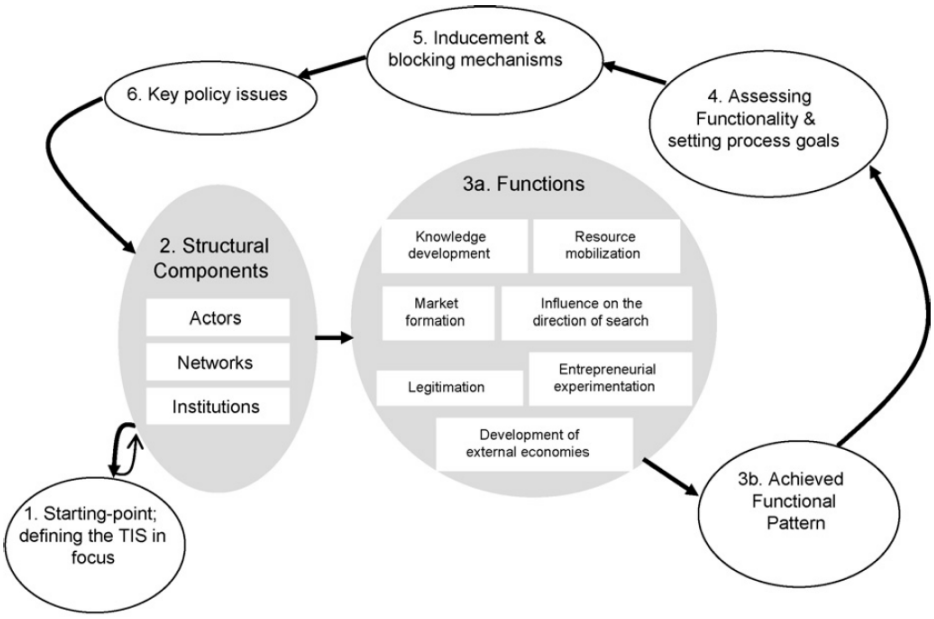

Figure 3.1: The Scheme of analysis.
(Bergek et al., 2008)

Other scientist (Jolivet and Heiskanen, 2010) and (Callon et al., 2009) have used Actor Network Theory (ANT) to the question of participation process and methods, where Jolivet states that a wind farm project development is a hybrid engineering problem, where the global and local, the human and the technical, interact constantly (Jolivet and Heiskanen, 2010). The ANT is not sufficient for the sense-making process, as the subject of this thesis is the lack of local acceptance, which have the tendency to be based on lack of legitimacy. Thus there is an urgent need to look deeper and use a framework that addresses the socio-technical system in focus. "TIS's do not only contain components exclusively dedicated to the technology in focus, but all components that influence the innovation process for that technology. A TIS may be a sub-system of a sectoral system (when the focus is one of the sector's products or a knowledge field that is exclusive to the sector) or may cut across several sectors" (Bergek et al., 2008, p. 409).

3.1.1 Controversies in Wind Power Development

Controversies *Venturini (2010), Munk (2014)*

Contribution:
Determines the definition of the concept and provides an issue dictionary and overview over global and local innovation systems.
Characteristics:
Understanding when science and technology become controversial.

In order to understand what controversy is and when science and technology become perceived as controversial it is important to come with a definition, according to Venturini, "controversies are situations where actors disagree (or better, agree on their disagreement)" (Venturini, 2010, p. 261-262). Venturini also states that following features are common to all controversies:

- Controversies involve all kind of actors both human and non human.
- Controversies display the social in its most dynamic form.
- Controversies are reduction-resistant.
- Controversies are debated.
- Controversies are conflicts.

Venturini refers to MACOSPOL'S (Mapping Controversies on Science for Politics) documentation for a definition of the word controversy, "The word controversy refers to every bit of science and technology which is not yet stabilized, closed, or "black boxed"... we use it as a general term to describe shared uncertainty" (Macospol, 2007, p. 6). There are similarities between controversies and ANT, according to ANT the society is not constructed through human meaning and action alone. According to ANT the society is built up around technical and non-technical elements with all of their factors, that are all treated equally. The ANT is a good way of interpreting relationships in networks between things and concepts (Latour, 1991a), (Latour, 1991b) (Callon, 1986) and (Law, 1992).

Jolivet and Heiskanen (2010) use ANT to analyse controversies in wind power development, "ANT thus provides a socio-technical approach to analyse controversies and concepts that helps to track the chain of micro-decision and power relationships through which actors gradually agree up on, going from mere idea to its realization. To do so, project planners need to adapt and interpret generic tools and materials and combine them so as to make them fit local specificities. They do so through a process of constant negotiation, compromises, arguments and conflicts during the implementation of their plan" (Jolivet and Heiskanen, 2010, p. 6748).

One subject of the Wind 2050 project, work package 1 (WP1), is to produce a digital controversy map, based on an issue dictionary. Mapping controversies

is based on ANT.

"When working with controversy mapping its important for us to get as much information as possible in order to have a broad picture on the controversy. Callon, who was working in MACOSPOL, is one of the first authors who has described the methodology of controversy mapping. According to Callon et al. (2009:28) different concealed events become revealed through the controversies by bringing forward different groups involved in them. Therefore it was important for us to include the public in our project. It was essential that the public would have the opportunity to express their views on matters of their concern because they cannot be sure that the politicians and scientists will get it right (Irwin, 2006:300)" (Jorgensen et al., 2014).

The controversy map and the issue dictionary created in WP1 are both used as data in this thesis. It provides a basic understanding of the controversial debates regarding wind power.

"It is generally recognized that discussions on wind energy take place in a highly networked space that transcends national borders and offers various channels for information exchange. This is true for both proponents and opponents of wind power. It is also true that much of this networking activity takes place on the open Web. There are websites and social media pages dedicated to various kinds of public wind advocacy work as well as various kinds of public wind protest. These networked online issue spaces make a difference to the controversy on wind energy, they are part of its anatomy, and it has therefore been a key objective to map them" (Munk, 2014)

The contribution from WP1 is considered to fit in the theoretical frames of this thesis as it provides the first steps of the sense-making process. The TIS analysis is then a "layer" put on top of the basic understanding for the purpose of in-depth knowledge and even deeper sense-making process.

3.2 Innovation Design - Value Framework

Innovation Design - Value Framework *den Ouden (2012)*

Contribution:
For the purpose of understanding value and different perspectives of value.
Characteristics:
To determine the value creation on four different levels in wind power development.

den Ouden considers that there is a "need for transformational innovations to provide solutions to the challenges facing our society. Awareness is growing that these societal and environmental challenges need a collaborative effort by large corporations, innovative entrepreneurs, non-profit organizations, governments and citizens. If they are well designed, transformational and innovative solutions create value for their users and for the organizations involved in developing and delivering them, and as a result they generate sustainable value for society at large" (den Ouden, 2012, p. 13).

For the purpose of understanding value, Ouden chooses to distinguish value in four levels: value for user, value for organisation, value for ecosystem and value for society. Wind power projects can create different values depending on which level the focus is on. The value framework is an useful tool to understand the different expectations, interest and values, of each level when the purpose is to create value through a wind power project. Figure 3.2 illustrates the four different levels of value which overlap each other, thus the value of the user needs to be included in the value of the organisations, those of the organisation need to be included into the values of the ecosystem and so on (den Ouden, 2012).

To understand better what value really means for different people it is necessary to put it into better perspective. In an economic understanding value can be understood as a worth of something, for instance money, while in other perspectives value is considered as something is held to deserve, worth or usefulness of something. The value can also be something personal or cultural. Ouden's figure 3.2 shows an integrated view on value from social science and illustrates the different perspectives that need to be considered when defining value in the different levels.

In this thesis the value framework will function as a supporting tool to the TIS analysis presented in chapter 3.1. The motivation with applying this method to an innovative solution like wind power project, is to provide insight to each level of the innovation "project process", to identify expectation of every stakeholder including actors, networks and institutions and to the issues that arise during project development. Ouden states, "It came clear at an early stage that creating meaningful innovations with value for organization, user and society at large most often requires collaboration between different

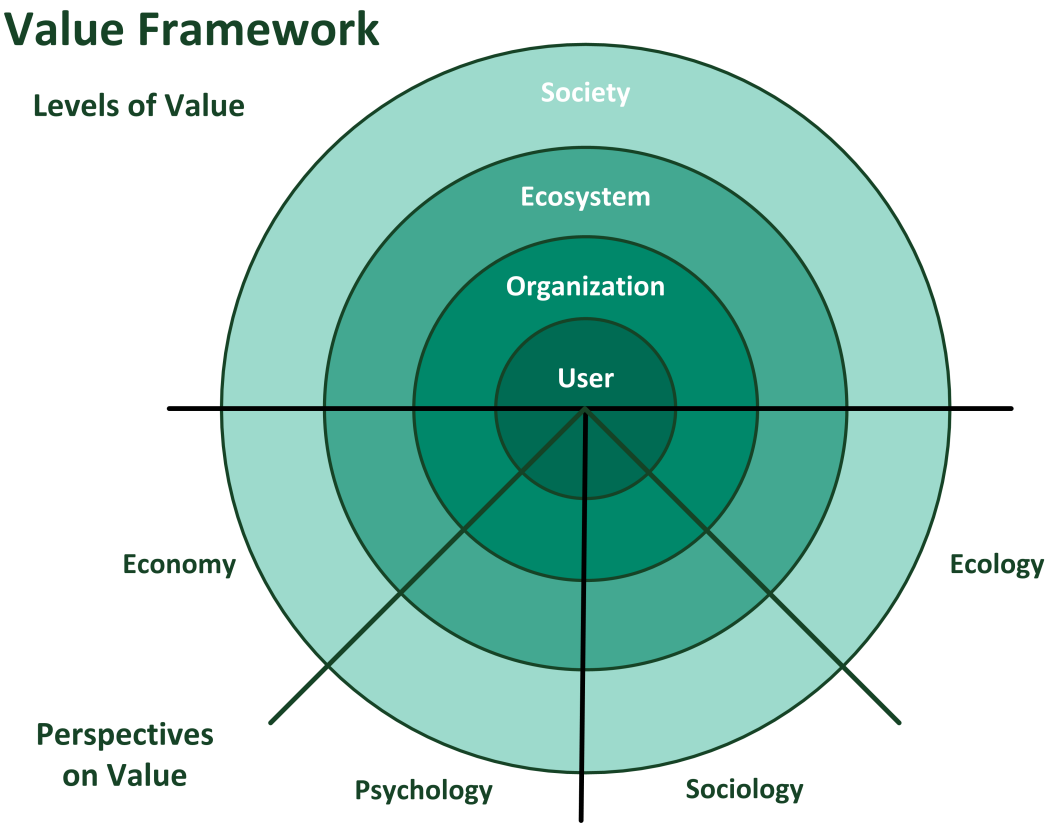

Figure 3.2: The Value Framework: An integrated view on value from social sciences.

players. In fact it is not just the innovation itself that needs to be designed, but also the ecosystem to support it. These multiple players are needed to jointly contribute knowledge, experience and resources; to deeply understand the societal issue being addressed; and to generate ideas that really solve that issue in a way that brings value to all the stakeholders" (den Ouden, 2012, p. 6).

It can be assumed that Ouden only considers an innovation meaningful if it fits into every layer of the value framework. When looking at socio-technical systems like a wind power development, it is very important to account for everything in the system. Dr. Maarteen Wolsink states that a social acceptance of wind power is a complexed issue. "A socio-technical system that includes wind power may induce different reactions from an actor, and there are many different types of actors who are involved at various scale levels, all with their own institutional embedded behavioural patterns. This complexity provides for many opportunities for misunderstandings" (Wolsink, 2013, p. 4).

In this statement the complexity of a socio-technical system is taken even further, the amount of stakeholders, the different interests and the meaning of

value in each stakeholder group. That is why the value framework along with the TIS is considered as an excellent choice in the process of sense-making in wind power development. The value framework is actually providing us a way to open up for the sense-making from user to society.

3.3 Social Acceptance - Moving from Global to Local

Social Acceptance *Wolsnik (2013), Wustenhagen et al., (2007), Jobert et al., (2007) IEA Wind, (2010), Jolivet et al., (2009)*

Contribution: Helps with the understanding of social acceptance and local acceptance in wind power development and provides the success factors of local acceptance. **Characteristics:** Description of how social acceptance can be a powerful factor. Understanding the three dimensions of social acceptance and narrows down to the understanding of local acceptance/community acceptance.

IEA Wind definition of social acceptance is, "as a societal consensus on the planning, construction, and operation of wind power projects - therefore has the potential to become a powerful facilitator of wind development" (Huber and Horbaty, 2010, p. 5). This is very coherent with Dr. Maarten Wolsink that states that, "a successful implementation of a new technology requires social acceptance" (Wolsink, 2013, p. 1). Thus social acceptance has the potential to become a powerful factor when it comes to wind power development. Over the years the concept of social acceptance has been brought to the light, after having been considered as a rather simple problem that could be solved with an effective communication strategy. Moreover it was not considered as an isolated problem of its own, it was just assumed that a social acceptance was coherent to public acceptance (Wolsink, 2013).

To conceptualise social acceptance and clarify the understanding, Rolf Wustenhagen et al. (2007) distinguishes social acceptance in renewable energy innovation into three dimensions, those dimensions are illustrated in figure 3.3.

Figure 3.3: The triangle of social acceptance in renewable energy innovation. (Wustenhagen et al., 2007, p. 2684)

Socio-political acceptance: This is the social acceptance in the broadest sense and includes both policies and technologies from different actors. Thus that socio-political acceptance is related to the support or resistance toward policies that effectively promote the implementation of wind power. The support and/or resistance can come from different directions and from different actors. These actors institutionalise the policies and set the framework that effectively foster and enhance the other two dimensions, market and community acceptance.

Community acceptance: Refers to the specific acceptance of the local stakeholders. This is the level that is considered as a blocking mechanism of wind power development. At this level a certain "gap" between high level of social acceptance and lack of community acceptance can be identified. Public opinion polls can show that there is a support for a project but on the local community level the NIMBY effect is often felt strongly. The important factors to look at in this dimension are:

- Distributional justice - How are costs and benefits shared?
- Procedural justice - Are all relevant stakeholders given an opportunity to participate in the decision making process?
- Trust - Community relationship with actors from outside the community.

Market acceptance: It is a part of the social acceptance and the process of the market adoption of an innovation through a communication process between the adopters and the environment. In this dimension there is a link with socio-political acceptance, because some of the stakeholders are influential in the development of energy policies and can use their influence in crucial decisions.

Before going any further it is necessary to state that in this thesis the concepts of "community acceptance" and "local acceptance" refer to the same definition. That is the neighbours to the expected wind power project, the local area and the local authorities

3.3.1 Factors of Local Acceptance

Jobert et al. made a multiple case study of five different cases to identify and analyse success factors that shape local acceptance (Jobert et al., 2007). Based on previous work and interviews on the subject "local acceptance" the factors are divided in two dimensions, one related to site-specific conditions and one related to institutional conditions, in other words geographical factors and project management factors. Those factors are presented in table 3.1 and in table 3.2.

Geography and visual impact:
How does the wind park fit into the landscape? How visible is it to the local inhabitants? Does this aspect come up in the local discussion process, and if so, how?
Former use and perception of the territory:
Was the site used by the local population? For which activities? What impact will the wind park have on those activities?
Ownership of the territory:
Communal or private.
Local economy:
Role of tourism, economic situation, possible or presumed impacts.

Table 3.1: Factors that determine geographical dimension.
(Jobert et al., 2007)

Local integration of the developers:
Are there developers from outside or inside the region? Are they familiar with the area? Do they have contracts there? What type of developers are they?
Information and participation:
When and how are the public informed of and integrated into the planning?
Creation of network of support around the project:
Can the developers create a network of local actors in support of the project, and if so how?
Ownership of the park and financial participation:
Is financial participation offered to the local population? Does the commune own the park or a part of it?

Table 3.2: Factors that determine project management dimension. (Jobert et al., 2007)

Having identified the local acceptance as a blocking mechanism of a wind power development it can be assumed that a project success for the project developer is based on the local acceptance. Thus the goal of the project developer will always have to be, to get the local acceptance. The goal with applying this approach, using these two dimensions and the four factors in each dimension, is to gain in-depth knowledge and contribute to the sense-making process about what shapes local acceptance. And to identify where in the project process the different challenges and issues arise.

3.4 Conflicts in Projects

Conflicts in Projects *Hahn (2008), Vindeløv (2012)*

Contribution:
Determines the four dimensions of conflicts in projects.
Characteristics:
Description on how project managers can be suited to deal with conflicts before, during and after they have occurred.

One of Venturinis' definition of controversies is that they are conflicts (Venturini, 2010). Conflict theory has been used to explain wide range of social phenomena like gender and race discrimination. The conflict theory used in this thesis is conflict resolution which is conceptualised as the methods and processes that is used to come to peaceful ending of a conflict. Furthermore the focus is on two dimensions of resolution, the first is related to problem solving and settlement, with the aim to come to a solution or an agreement. This dimension is characterised by conflicts of interest, "Conflicts of interest do not necessary imply that the parties differ in their values, indeed, the opposite is more likely to be the case. It is precisely because the parties share the same view of the worth of the subject of the dispute that there is the basis for the conflict" (Vindelov, 2012, p. 42). And the second dimension is the cognitive model related to values, with the aim to come to a mutual understanding. "A conflict of values concerns one's own identity and will typically be values for which one is prepared to fight. This category includes conflicts of a more personal nature, concerning person's image of them selves, the need for recognition and acknowledgement, the desire not to be excluded" (Vindelov, 2012, p. 42). The only way to come to a mutual understanding is for all parties to acknowledge the vale based aspects of the conflict and try to understand it, for instance with a dialogue.

As mentioned earlier there are multiple stakeholders in wind power development that often have different expectations, needs, interests and values, those things needs to be brought up and discussed to make a common understanding about the situation among the stakeholders. Rikke Rye Hahn states that, "personality, basic beliefs and values on the individual and organizational level play an essential role in leading differences, misunderstandings - and finally: conflicts" (Hahn, 2008). Table 3.3 provides an overview over four different dimensions of conflicts and the main characteristics in each dimension. The first two dimensions, instrumental and interest relate to uncertainty and the other two dimensions, value and personal relate to ambiguity.

Instrumental Dimension:
Disagreement on what to do and how to do it.
About: Tangible issues like methods, procedures and structures.
Approach: Problem solving
Desired aim: Solution
Interest Dimension:
Fight of power territory and interest.
About: Allocation of resources like time, money, labour and space
Approach: Negotiation
Desired aim: Agreement
Value Dimension:
What we consider value, what is right and wrong.
About: Political, religious, moral values
Approach: Dialogue
Desired aim: Mutual understanding
Personal Dimension:
Infects our personal existence and every day life, creates vast suffering and confusion.
About: Identity, self esteem, loyalty, rejection etc.
Approach: Dialogue
Desired aim: Mutual understanding

Table 3.3: The four dimensions of conflicts - overview.
(Hahn, 2008, p. 48)

The conflict theory is used as a model to group issues after the type of conflict it creates, the result is used as a guidance on how to handle the issues when creating strategies.

3.5 Stakeholder Management

Stakeholder Management - Uncertainties and Ambiguity *Winch (2002), Thyri02 (2002),PMBOOK (2008), Loring (2006)*

Contribution: Determines the importance of sense-making in the process of reducing/preventing uncertainty and ambiguity and determines the definition of these two concepts along with framing and overflowing. **Characteristics:** Identification of stakeholders in wind power development. Description on how ambiguity builds up during a project and affects local acceptance and the project success.

As mentioned earlier, the local acceptance is often called the blocking mechanism of wind power development and refers to the primary research question of this thesis. In the following section the main stakeholders in wind power development will be presented.

The IEA Wind has developed a stakeholder framework based on the three dimensional criteria for social acceptance by Wustenhagen et al. This framework provides a list of stakeholders in "normal" wind power projects. It is not possible to provide a list of all stakeholders in every project as it may vary between projects, countries and other factors (Huber and Horbaty, 2010, p. 27).

A stakeholder analysis based on the identified stakeholders has been performed in power/interest matrix to gain overview over stakeholders and the power and interest each stakeholder has, this is illustrated in figure 3.4, the power interest matrix is according to the PMBOOK (PMBOOK, 2008, p. 249). This analysis is helpful in the process of prioritisation where to start when it comes to strategy planning.

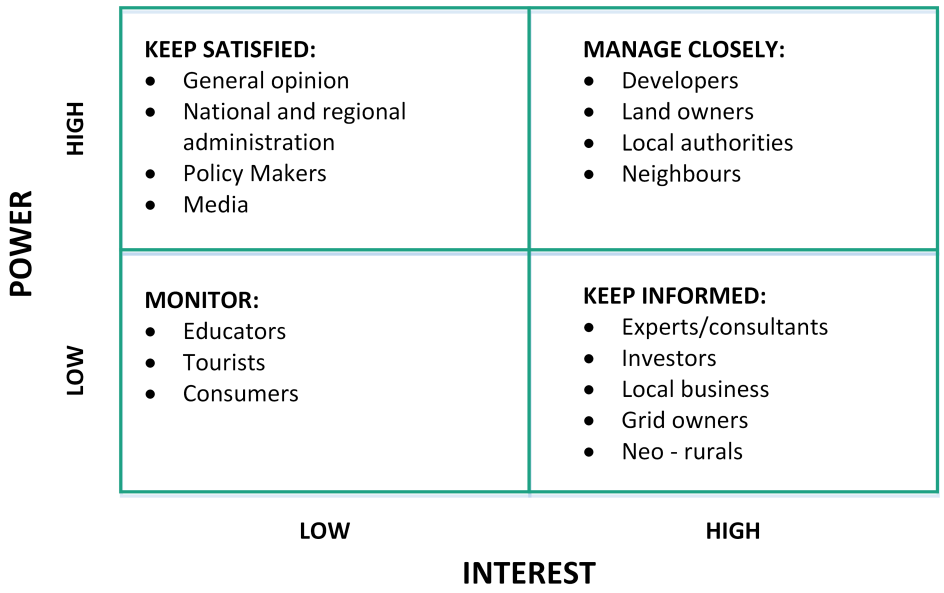

Figure 3.4: Stakeholders in wind power projects - power interest matrix.

3.5.1 Uncertainty and Ambiguity

In the Oxford dictionary uncertainty is defined as, "something that is uncertain or that causes one to feel uncertain" (Oxford Dictionary, 2014b) . When it comes to construction project management, uncertainty is defined as, absence of information required for the decision that needs to be taken at a point in time (Winch, 2010). Figure 3.5 illustrates the project process as a dynamic reduction of uncertainty through time. As the figure shows, uncertainty can be reduced by gaining more information through time.

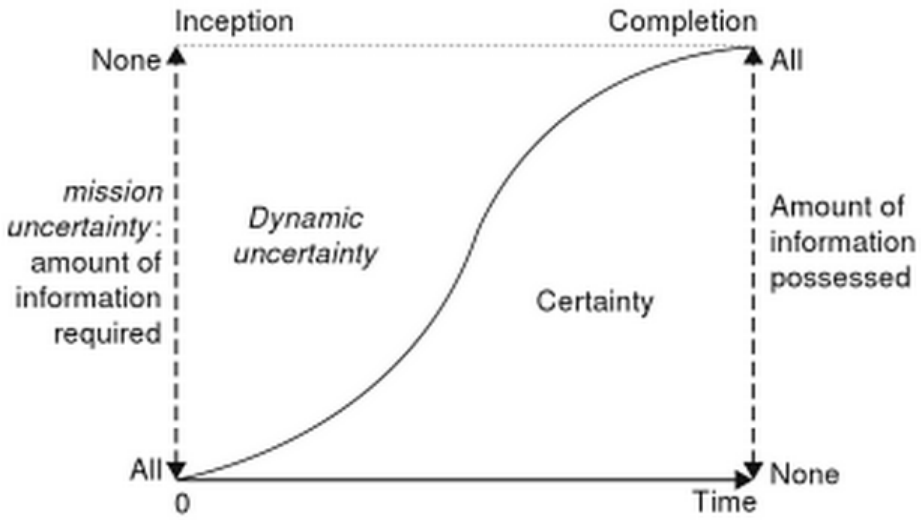

Figure 3.5: The project process as a dynamic reduction of uncertainty through time.

(Winch, 2010, p. 7)

The word ambiguity in the same dictionary is defined as, "the quality of being open to more than one interpretation; inexactness" (Oxford Dictionary, 2014a). Eric Brun and Alf Steinar Sætre define ambiguity, "as the existence of two or more interpretations of the same cue" (Brun and Saetre, 2009, p. 34). In this thesis the word ambiguity is defined as, when different people interpret issues in a different way based on the same facts.

Different from uncertainty, ambiguity can not be reduced by giving more information and cannot be predicted. Ambiguity is something that builds up during project development and can lead to an unexpected situations, often with a negative outcome and is based on the understanding and/or interpretation of each person.

M. Thyri puts uncertainty and ambiguity into matrix illustrated in figure 3.6 and states that before an attempt to any reduction of uncertainty, a process of

ambiguity reduction is necessary. In the case of wind power projects there are multiple stakeholders that often have different expectations, needs and values that need to be brought up and discussed to make a common understanding about the situation among the stakeholders. "It is a context where the aim is to identify and understand needs and expectations and reduce ambiguity through negotiation before attempting to use any kind of uncertainty-reduction process" (Thyri, 2002, p. 223).

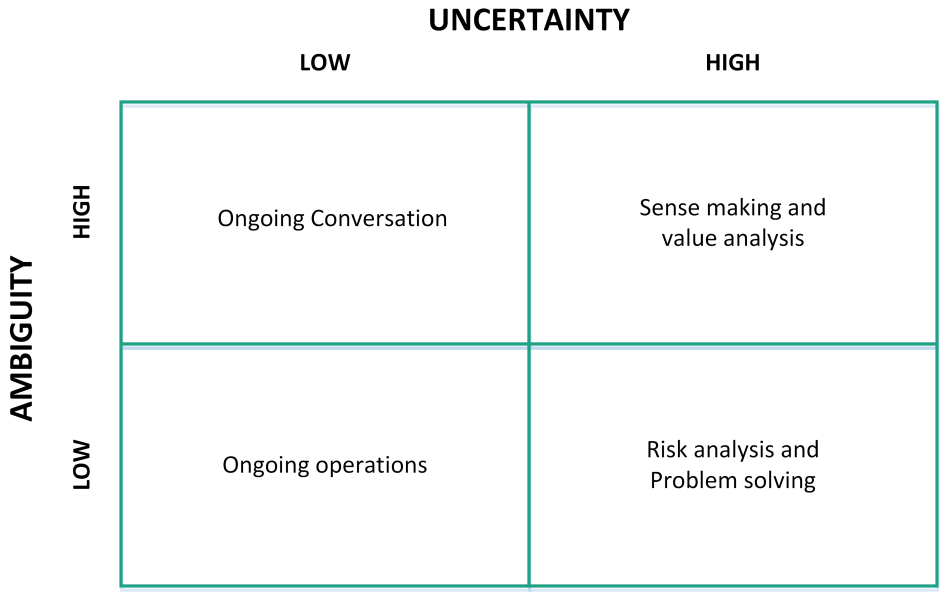

Figure 3.6: The uncertainty-ambiguity relationship in change situation.

Furthermore Thyri proposes a strategic model that is developed towards performance and learning strategy of projects, called The integrated programme management cycle model, illustrated in figure 3.7. The matrix is a supporting tool of choosing which strategy to apply depending on the uncertainty and ambiguity in the project.

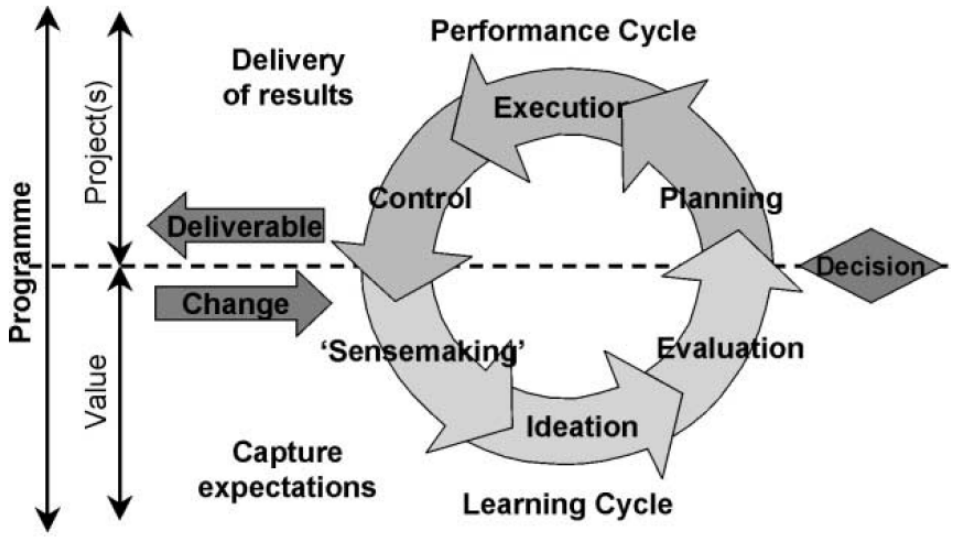

Figure 3.7: The integrated programme management cycle model.
(Thyri, 2002, p. 223)

3.5.2 Framing and Overflowing

The concepts of framing and overflowing are a good way of understanding a bit deeper the concepts of ambiguity and uncertainty in projects in relation to time. Framing and overflowing can be seen as a participation process based on analysing power relation and controversies (Jolivet and Heiskanen, 2010).

The process that is initiated before a project starts is called framing, it is when all the different actors establish a common world which allows them to achieve a collective scenario of desired outcome. Framing sheds light on the ways in which such a scenario is gradually transformed into reality (Jolivet and Heiskanen, 2010).

The framing process takes place before any appearance of ambiguities around the project builds up. If the framing process is done properly, with all the different actors involved, a low level of ambiguity is expected.

Overflowing represents the instability and uncertainty of projects when actors do not agree on the desired outcome or do not conform what was expected of them and they start to carry out their own desired scenario (Jolivet and Heiskanen, 2010).

Overflows during project development may lead to a high level of uncertainty, ambiguity and even to conflicts. As it was in the cases of Albi and Cap Eole (Jolivet and Heiskanen, 2010), in the case of Kalvebod syd (Sotto, 2014) and

in the case of a number of wind farms in Spain (Saralegui, 2014).

Having done the literature review it is assumed that in order to gain the in-depth knowledge about what shapes local acceptance, it is necessary to have an even deeper understanding of what really takes place in the project development. Combining the theories, methods and concepts mentioned in this section is considered as a robust and good way of doing so.

Chapter 4

Method

In this chapter the research method that has been applied for this master thesis is presented along with how the research was designed and the analytical framework. The approach that has been chosen is the case study research, first a general introduction to the case study research approach is given. Subsequently the 4 phases of research design will be described followed with a description of the data collection. In the last part of the chapter the 6 phases of analytical framework will be presented.

4.1 Research Approach

This case study is based on a qualitative research approach based on an open and explanatory collection of data. "The analyst's aim in an explanatory case study should be to pose competing explanations for the same set of events and to indicate how such explanations may apply to other situations" (Yin, 1984, p. 5). Based on this data collection an abductive research methodology is followed in order to (1) understand how wind power projects are developed (deductive), (2) understand how those projects are being executed (deductive) and (3) find out where in the project development there may be a room for improvements (inductive). The case study approach is chosen for the purpose of empirical research that will lead to analytical results. Case study is a research strategy which focuses on understanding the dynamics present within single settings (Eisenhardt, 1989, p. 534). Yin stresses that a case study can either involve single or multiple cases and can employ an embedded design, that is, multiple levels of analysis within a single study (Yin, 1984).

The research design for the case study is discussed in the following section.

4.2 Research Design

The research framework that has been developed for this case study is divided into four different phases as illustrated in figure 4.1. The first phase is twofold, firstly it was necessary to gain knowledge about the research subject and secondly in the sense-making of the dynamics within the industry in wind power development. To support the process of sense-making, the TIS analysis is performed (Bergek et al., 2008).

The second phase was developed for in-depth knowledge, understanding and identifying the issues and challenges wind power projects face. This is done by interviews and surveys which are then the base for the case description. Moreover the results from the mapping controversies (Munk, 2014), is used as a reference to those issues identified through the interviews and surveys.

The third phase represents the search for the correct methods and theories to apply to the case study according to the goals of the research question. Several theories where identified at this stage and pros and cons of each of them were evaluated. For example if it was appropriate to perform a whole value chain analysis in the sense-making process to identify and understand, firstly the networks and dynamics in the industry, and secondly to identify the challenges. The research question in this thesis is isolated, relates to local acceptance and is owned by the project manager. Therefore it was not necessary to perform and use the value chain analysis.

The fourth phase represents the analysis of the data collected through the research work and the development and design of the method, along with general reflections on the research work.

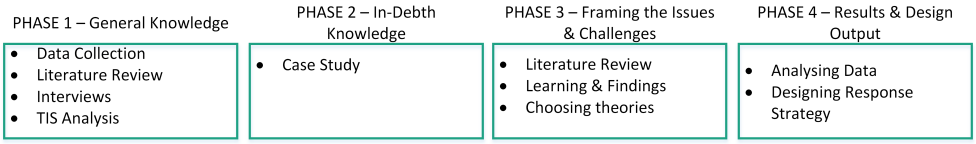

Figure 4.1: The four phases of the research design.

In the following section data collection will be presented.

4.3 Data Collection

The main collection of data will be based on two wind power projects in Denmark, Hagesholm wind farm and Ågård Gods. The selection of the two cases has followed criteria from Anders Kristian Munk, as the two cases were a contribution to the Mapping wind energy controversies online, in work package 1 (WP1) of the wind 2050 project. The search was aimed at cases that had

many controversial issues, that had been debated online, that had various level of community participation and various level of success regarding the issues that arose during project development. Furthermore it had to be feasible to collect data on the cases.

The purpose with the two cases is to gain a deep understanding about how wind power projects are managed and executed and try to point out possible improvements that will increase local acceptance and decrease uncertainty and ambiguity of those projects. To gain deep understanding on the subject, an open and explanatory collection of data is needed. In order to do so the data will be collected from previous literature, from WP1 the mapping controversies, discussions and semi structured open interviews with different actors in the industry. This is consistent with Kvale that stresses that the very virtue of qualitative interviews is their openness (Kvale, 2007).

The main data collection and the case description of the two cases represented in this thesis are based on interviews and discussion with:

- Arne Rahbek (AR) who is head of communication at Vattenfall. Arne has 20 years of experience in the energy communication sector, including 7 years at Vattenfall where the main focus and responsibility of his work is on wind power, communication, regulatory affairs and stakeholder management. Moreover he is a member of different international and Danish organisations that involve wind energy.
- Dennis Ravn (DR) who has been employed at Kalundborg municipality for five and a half years with different responsibilities within the technical sector. For the last two years he has held the main responsibility of the wind turbine planning and executing the existing wind energy plan. Dennis has been involved in projects and organisations both on national and municipality levels that involve wind power.

Qualitative interviews, number of discussions, emails and phone-calls to different actors and specialists from different sectors of the industry were conducted, list can be found in appendix 10.1. The interview and the interview guide were designed to identify networks, institutions (also community) and stakeholders, and built up as a semi-structured open interview. The first question is a general question whose focus is to understand the interviewee's opinion about community acceptance based on knowledge and experience. The other questions are divided into four categories: Network, Community Acceptance, Community Participation and Project Success. Those four categories were chosen in coherence with Loring's factors of project success (Loring, 2007).

The same interview guide was used for the two cases represented in this thesis, before the interview, a short presentation of the research was held for the sake of clarifying the motivation of the researcher and the goal of the research. The interview guide can be found in appendix 10.2.

A survey was developed to identify some project characteristics regarding local

community participation as well as some of the socio-technical characteristics of the cases studied (Loring, 2007). In the survey the possibility to identify project characteristics regarding hard projects and soft projects was also accounted for (Crawford and Pollack, 2004). The last part of the survey was to identify the coherency in the interviews, the survey can be found in appendix 10.3.

Einenhart states that, "Case studies typically combine data collection methods such as archives, interviews, questionnaires, and observations" (Eisenhardt, 1989, p. 534). The approach by conducting interviews and surveys that has been applied is coherent to the case study research strategy.

To understand and characterise wind power project development, collected data are analysed and put into theories based on the state of the art description in chapter 3 and the interview guide in appendix 10.2. Handling the working questions like this is meant to open up for further discussions about wind power development and possible improvements on project management practises to increase local acceptance.

4.4 Analytical Framework

The analytical framework reflects which approach is applied in order to answer each working question presented in chapter 2. The main goal with this master thesis is to create a method that will take into account, how to deal with uncertainty and ambiguity in wind power projects. In order to be able to develop such a method, data need to be handled in the correct order within the theoretical frames provided in chapter 3. Figure 4.2 illustrates the phases of the analytical process.

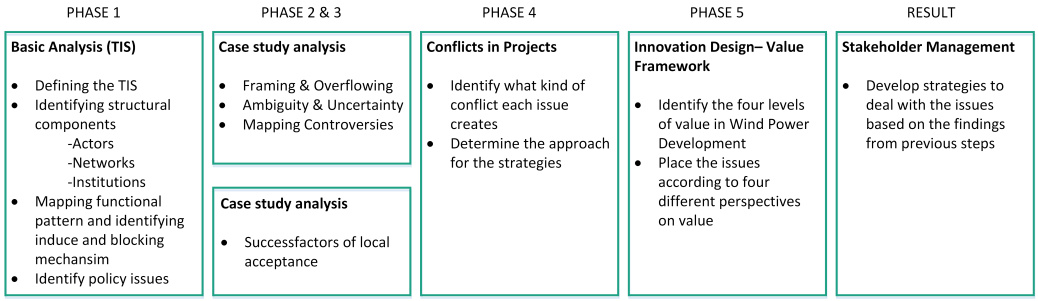

Figure 4.2: Analytical framework.

4.5 Method Criticism - Limitations

Although case study is a distinctive form of empirical inquiry, many research investigators nevertheless show disdain for the strategy (Yin, 1984). When using a case study approach in research it can be questioned how the approach can be put in context with the whole market. Based on the data collection in this thesis on two Danish wind power cases, it wouldn't be right to make the assumption that: This is how every wind power project in the Danish marked is performed. The case study is based on two Danish cases and to gain more understanding it would be appropriate to involve more cases or use another research approach. The result from the mapping process and the issue dictionary clearly shows that there are more issues "out there" than are to be found in two cases. In appendix 10.4 a full issue list from the issue dictionary is provided, where the issues identified in the mapping process are identified in relation to cases.

Chapter 5

The Danish Energy Industry

According to the Danish Energy Agency the yearly energy production in 2012 was 801 [PJ] where renewable energy had a portion of 138 [PJ] and thereof the wind production produced 38 [PJ]. Figure 5.1 illustrates how each type of renewable energy production has developed over the years.

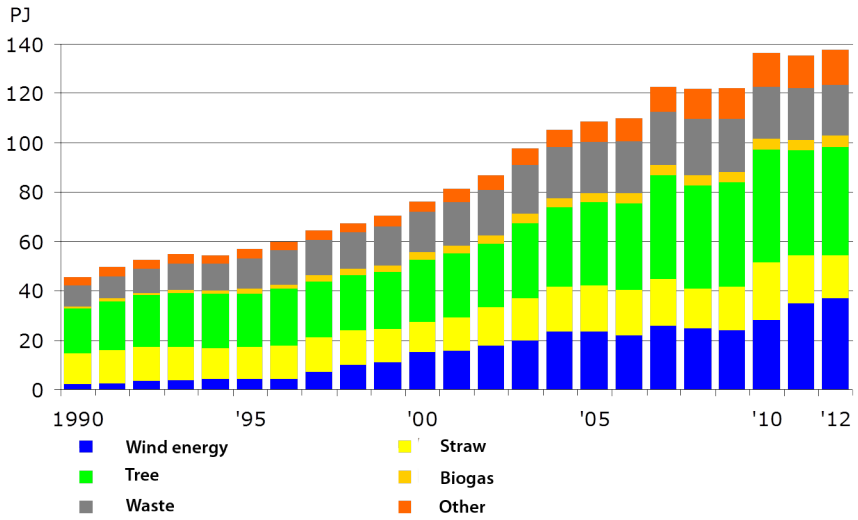

Figure 5.1: Production of renewable energy by energy product. (Klima, Energy- og Bygningsministriet, 2013b)

The development of wind energy in the Danish energy industry seems to follow the global trend in that sector. There is an increase in energy efficiency, the proportion of renewable energy sources are increasing (Klima, Energy- og Bygningsministriet, 2013b) and the CO2 emissions are decreasing (Klima,

2013).

Denmark is a true leader and has a clear value proposition when it comes to fighting the climate change, thus the government is aiming for higher goals than are presented in the European Renewable Energy Directive (2009/28/EC) (European Parlament. Directives, 2009). In 2020 the country is aiming at producing 70 % of its energy from renewable energy sources. This is the first step because the country is aiming for 100 % in 2050. Today Denmark claim to produce 43 % of its own energy with renewable energy sources (Klima, Energy- og Bygningsministriet, 2013b).

In march 2012 a new Energy Agreement that contains a very ambitious goals for the upcoming year was put into force, bringing Denmark a step closer to the 100 % target regarding renewable energy. The main goals until 2020 according to Energy Efficiency Policies and Measures in Denmark 2012 are (Klima, Energy- og Bygningsministriet, 2013b):

- More than 35 % renewable in final energy consumption.
- Approximately 50 % of electricity consumption to be supplied with wind power.
- 7,6 % reduction in gross energy consumption in relation to 2020.
- 34 % reduction in green house gas emissions in relation to 1990.

Generally power generation from wind power is supported, both by the general public and all major political parties.

5.1 The Danish Wind Industry - Yes to Wind and Sun

The Danish wind industry has a strong tradition and one could assume that it has had a certain first-mover benefits over the years. In its early years the industry was driven by the oil crisis in the 1970s, when the Danes got the opportunity to say "NO" to the use of nuclear and said "YES" to wind and sun, wind power and solar cells.

Figure 5.2, illustrates how both the market and different technical factors have evolved over the years. In the early years until 1995 the wind turbines were approximately 55 kW to 300 kW, up to 60 m heigh and owned by cooperatives. From 1995 the turbines became 500 kW-1MW and were owned by local farmers rather than cooperatives. Today's wind turbines are 2,3 MW, up to 150 m high and are owned by local farmers and developers.

A critical factor in the early years of wind power development was, amongst others, that the government funded up to 30 % of all new wind turbines in the years from 1980 to 1990. Also the local and collective ownership of the

wind turbines was encouraged and supported through series of laws known as Resident Criteria and Distance Regulation Laws. This factor, the participation of the community through the ownership in the wind power development, has been critical for the growth of the renewable energy capacity. In 2000 new legislations were put in force, that, amongst other factors, the local ownership element was removed which resulted in less benefits for the local community and less local taxation. One could assume that this leads to the fact that the local community are less in favour of installation of new wind power projects in the near area. In 2009 The Promotion of Renewable Energy Act was put in force and changed several factors in the industry. This subject will be covered in its own section, section 5.2

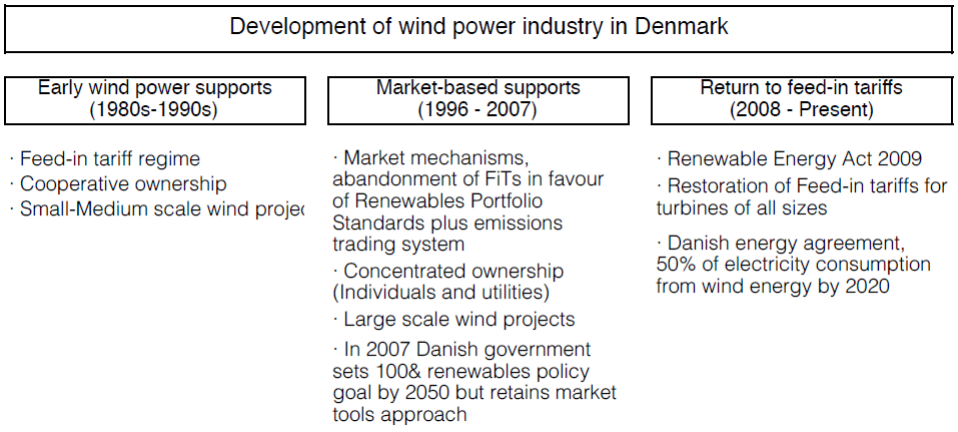

Figure 5.2: Development of wind power industry in Denmark. (Sotto, 2014)

The wind industry has over the years generated a lot of knowledge, has had a steady growth and has employed many citizens. For example in the years of 1997 to 2007 the average growth in the Danish industry was 22,4 % per year. Since the financial crisis the development had been negative but there are certain figures that have a positive development, such as export. The amount of employment in the industry is about to be on the same level as it was before the crisis and in 2013, 27.480 people were employed in the industry. Today according to the industry statistics the Danish industry holds a quarter of the global turnover DKK 80,4 million DKK (DAMVAD, 2014). Figure 5.3 illustrates the share of wind power generation of the total energy generation and reflects the growth in the industry over the years.

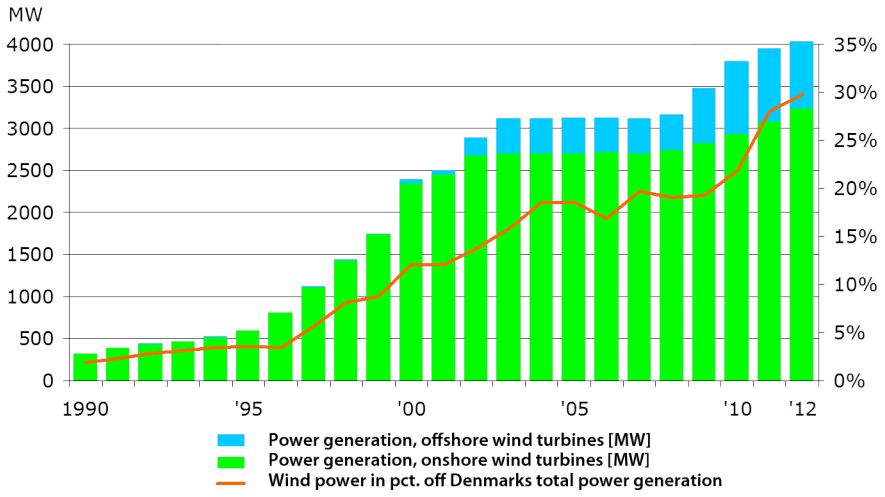

Figure 5.3: Share of wind power generatioon of the total energy generation. (Klima, Energy- og Bygningsministriet, 2013b)

5.2 The Renewable Energy Act 2009

In January 2009 the Promotion of Renewable Energy Act was put in force. The act contains four schemes to encourage the local population's acceptance in the development of wind turbines on land (Danish Parliament, 2008).

- Loss of value to real property due to the erection of wind turbines.
  The project developer of a wind turbine has a duty to pay compensation for loss of value of real property following the installation of the wind turbine. The size of the loss of value is determined by an appraisal authority. The claim from the owner of a property affected must be notified before the wind turbine has been erected. The erector of the wind turbine is therefore obligated to visualise the project and prepare other material as well as provide information to the citizens affected at a public meeting no later than four weeks before the municipal planning process ends. Any claims raised at a later stage will only be assessed as an exception to the rule.

- Local Citizens option to purchase wind turbines shares.
  The project developer of a wind turbine has a duty to offer at least 20% of the shares in the wind turbine to those with an option to purchase. The erector of the turbines must as a minimum announce the project in the local papers and the shares on offer must correspond to at least 20% of the value (cost) of the turbines. A share corresponds to the price of 1,000 kWh, which is currently around DKK 3,000-4,000. Shareholders share the costs, revenues, risk and influence on equal terms with the erector of

the turbine.

- A green scheme to enhance local scenic.
  The Ministry of Climate and Energy has a green scheme which can provide subsidies for initiatives launched to promote local acceptance of new wind turbines on land. Danish municipalities can submit an application for subsidies under the green scheme to Energinet.dk. The subsidies are granted to projects which strengthen the landscape and recreational opportunities in the municipality, and they are granted to cultural and information activities. Examples include subsidies for establishing a nature path and for preparing teaching material about the climate and energy.

- Recreational values and guarantee fund to support financing of preliminary investigations etc., by local wind turbine owners association. These provisions generally apply to onshore turbines over 25 m high, and offshore turbines that are installed following a tender process.
  The guarantee is to act as a security for groups of citizens, wind turbine associations and others who require a better basis for decision making before deciding whether to erect a turbine, e.g. preliminary investigations of the area, nuisance for neighbours, financial aspects etc. A guarantee is granted for a maximum of DKK 500,000 per project. The guarantee will be paid if the project is not implemented and the loan cannot be repaid.

Chapter 6

Case Study

For the bases of this thesis, two case studies were conducted, one in cooperation with Vattenfall who is the owner of Hagesholm wind farm project in Holbæk, and one in cooperation with Kalundborg, which is a municipality that has installed some of the biggest wind turbines in Denmark, the case studied is Ågård Gods. The two cases will be described with the help of the framing and overflowing concepts, considering success factors of local acceptance. The municipalities meaning about wind energy will also be presented.

6.1 Hagesholm Wind Farm

Hagesholm wind farm was commissioned in 2011 and is located in Lammefjorden south west of Holbæk, Sjælland. The wind farm is fully functional and contributes with a yearly production of 48 GWh. There are 10 large scale Siemens turbines installed in two groups, each with a capacity of 2,3 MW. All permissions were obtained and every criteria regarding noise, shadow flicker, distance and so on have been met. The wind farm is one of Sjælland biggest, with turbines of 126,5 m total height that supplies 12.000 households for electricity. The project developer, Vattenfall, stresses that they try to obtain a good relationship with their neighbours. In addition to the 10 wind turbines that is owned by Vattenfall, there are 6 other wind turbines owned by others, so in total the wind farm contains 16 wind turbines. In 2007 when the project was initiated the new Renewable Energy Act was not institutionalised. Figure 6.1 is from Hagesholm wind farm.

Figure 6.1: Hagesholm Wind Farm.
(Sjællands Nyheder, 2013)

Holbæk is a municipality in the Sjælland region with around 70.000 people. The municipality is known for a beautiful, varied landscape and a large forest area. The coast area is quite big where a part of the coast is in the Lammefjorden. According to the newest municipality plan (2013-2025) the focus is on further development towards a more sustainable municipality alongside growth and welfare. In the plan new strategic areas for renewable energy sources have been selected. Figure 6.2 illustrates the location of Holbæk municipality, the white area represents where Hagesholm wind farm is positioned and the red circles represents existing wind farms, the figure is adapted from the environmental plan of Holbæk municipality Holbæk Planafdeling (2013).

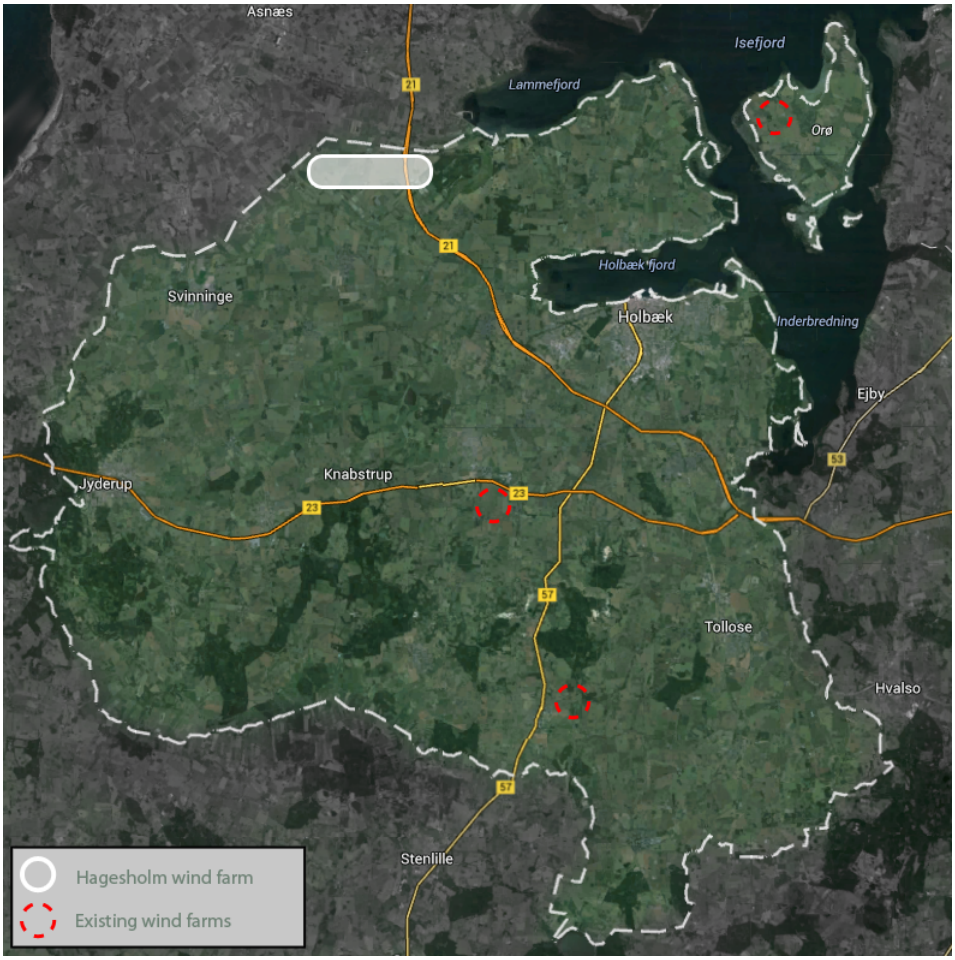

Figure 6.2: Location of Holbæk with Hagesholm and other existing wind farms identified.

The municipality holds a clear value proposition for more sustainable energy plan and the assessment/assumption that a big wind farm can have a positive effect on the landscape.

6.2 Case Description - Hagesholm Wind Farm

The motivation for erecting this wind farm is considered twofold. Firstly, the municipality had pointed out possible areas for big wind turbines in the municipality's environmental planning and secondly, Vattenfall owned some wind turbines at their storage area that they wanted up and running.

The wind farm was considered to fit perfectly in the landscape as the project location already had 6 wind turbines installed and the municipality planned and accounted for further wind power development in this area. The local

residents of the area were thereby used to the view, to the effect and to how the land was used. The local residents are mainly summerhouses owners and farmers and the land was owned by a local farmer. Figure 6.3 provides an overview over the nearest neighbours to the wind farm.

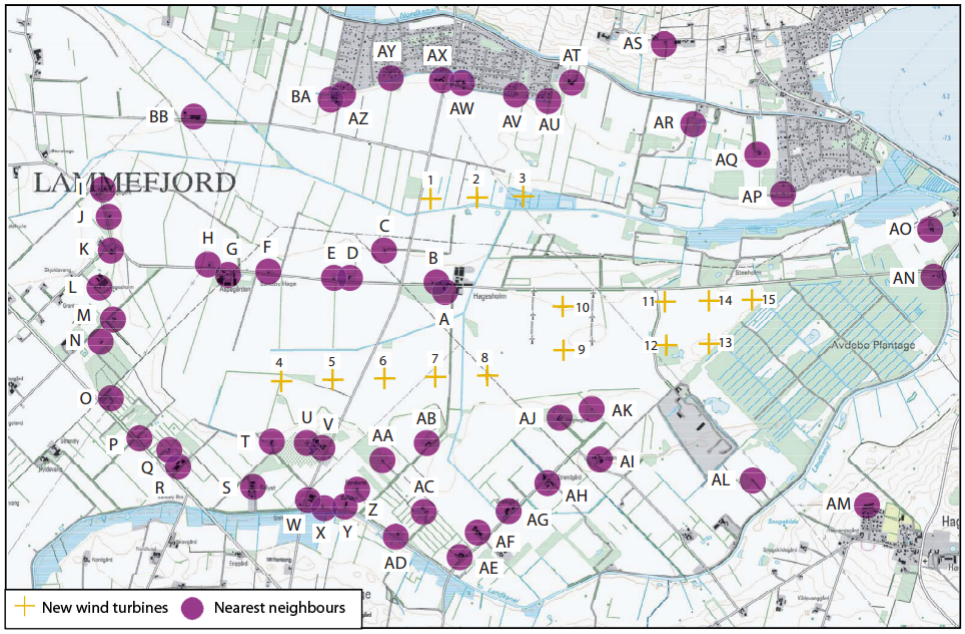

Figure 6.3: Hagesholm wind farm, nearest neighbours (Holbæk Planafdeling, 2009)

Right from the beginning there had been strong signs of local resistance, the strongest resistance coming from 8-9 nearest neighbours to the project. Those neighbours had the impression that they were excluded from the decision making process, that they were not informed properly and claimed that some information were being kept from them, such as noise measurements.

According to Arne Rahbek (AR) "How things were done in this case is not how things are done today". Hagesholm was one of the first projects that he was a part of at Vattenfall, his entry point to the project was to participate in a public community meeting where the EIA report was presented. The municipality chose to use their own employee to make the presentation and answer the questions. The employee was qualified but only to some extent, and was not prepared for 150 people asking critical questions. The lack of knowledge, not being able to answer the sensitive questions, the confusing reality resulting from the fact of two sets of politicians, started the overflowing effect and the local community started to show some resistance to the expected project.

A lot of questions came up at the meeting. In the following period they

were analysed in details. The project phase was really long and heavy. It was a really large project but since some obstacles had come up, the project was reduced from the original plan that included 14 wind turbines installed in Holbæk and 7 in Odsherre municipality. The existence of two sets of politicians from the two municipalities made things confusing. At some point in the project phase Odsherre municipality convinced Holbæk municipality to delay the project and look at the possibility of locating the wind farm in relation to a new highway that was planned. Vattenfall agreed on looking into this possibility but knew that within the laws and regulations around those kind of constructions it would not be a feasible solution, which was the result of the research work. The analysis process of the complaints resulted in, that there could only be one wind turbine located in Odsherre municipality. The result had a strong negative effect on the whole project, because it would be really time demanding and expensive to go through the whole democratic process for installation of one wind turbine. Thus it was not in the project owners interest, or in the municipality's interest, to get one wind turbine installed. Odsherre municipality and Vattenfall ended their cooperation. Only Holbæk municipality was left as an option.

The protest regarding the wind farm and the overflowing started when the community meeting was held. The protest and complaints were mainly about noise, wildlife, water and the view. When all the complaints and cases had gone through the democratic process, Vattenfall got the building permission and installed the wind turbines.

There are still complaints that have not gone through the system. The initial EIA report was done for 1,8 MW wind turbines, but they were upgraded to 2,3 MW without doing a new EIA report and there have been complaints about that. Vattenfall's opinion on these complaints is that it is not the power generation that should be looked at, but the height of the wind turbines and the turbine radius. Because, according to them, it does not matter if its a 1,8 MW or 2,3 MW turbine that is installed, the turbines always has to obey to the rules and regulations for noise and shadow affect. The reason for installing a 2,3 MW instead of a 1,8 MW is that Vattenfall had the wind turbines in their storage place and needed/wanted to use them. From the complaints there was a trial in the district jury where the EIA report was discussed. The result from the trial was that Holbæk municipality had to look at the complaints and find out if there was a need for another EIA report. The result was that the municipality was not obligated to make a new EIA report, the one that was done in the beginning was good enough. This case/complaint isn't completed yet but it is the municipalities responsibility, not the project developers'.

In this case there is overflowing when it comes to the loss of value evaluation that was performed. Some of the property owners would not accept the results from the evaluation and it ended up in a trial. The main result in the value loss evaluation was that there was not so much value loss in that area, mainly because of the number of summerhouses. Vattenfall won the trial in the district

court, all the stakeholders involved appealed the results and there will be a new trial in December 2014 in the high court.

An attempt to involve the nearest neighbours came, maybe too late, when Vattenfall tried to approach them to increase the level of procedural trust. At this point it was not obligated to offer visualisation of the planned wind turbines to the neighbours, but Vattenfall choose to do so. A letter was sent to all the neighbours that had wished to have the value loss evaluation performed. The neighbours had the opportunity to chose a viewpoint on the property/land where the picture would be taken from so it would help the taxation committee to make their case before the wind turbines would be installed. None of the people who later ended up with a value loss case in trial had said yes to the visualisation offer. Today this is a part of the regulations around installation of a wind turbine, but at this point it wasn't, so in Vattenfall's opinion they tried to do more than they were obligated to do.

Vattenfall also tried to increase the level of distributional trust and offered the stakeholders some shares in a project. They invited them to a meeting alongside their lawyers, to address the question; *"Are there some alternatives to what we have offered you, what can we do better?* There wasn't much interest in general for shares in the Hagesholm project so Vattenfall decided that it would be really expensive to make a new cooperative around that project. The stakeholders got the offer to be a part of, according to Vattenfall, a better project, Nørrekær Enge wind farm where they would get the opportunity to buy shares at half of the price that Hagesholm shares would have cost. So the approach was in a way, "you can be a part of a much better wind farm project for half the price". Then they left the room for 30 minutes, leaving the stakeholders to make the decision, the offer was only valid if everybody could agree. There were 8 people/stakeholders invited to that meeting, 7 of them said yes to the offer but only one of them said no. And therefore it resulted that the ownership of Hagesholm wind farm is owned 99 percent of Vattenfall and the rest is owned by this 8-9 individuals.

When the wind farm was commissioned Vattenfall installed informative signs about wind turbines. They contained some general knowledge about wind energy, how many wind turbines were in this particular wind farm and how many houses it would contribute electricity to and so on, no advertisements were printed on those signs. A downside on this knowledge contribution was that at the same time, some of the stakeholders installed their own signs that were pointed against Vattenfall as a company. The municipality received several complaints from the stakeholders about the information signs which had to be taken down. Vattenfall then made the same complaints about the other signs, which also had to be taken down.

6.3 Ågård Gods

On the 19th of October 2011 project developer Just Wind applied for permission to install two wind turbines at Ågård Gods. The application was coherent to the municipality plan 2009-2021 for Kalundborg municipality, in which Ågård Gods had been pointed out as a wind turbine area. Ågård Gods is a 446 hektar manor that was founded in 1660, located in Gørlev, Kalundborg municipality in the west of Sjælland.

The Ågård Gods project consists of 2 Vestas V112 turbines with a total height of 140 m and a capacity of 3,0 MW. The wind turbines are expected to contribute with a yearly production of 19,000 MWH. Figure 6.4 shows how the two wind turbines are going to look like (Kalundborg Kommune, 2013).

Figure 6.4: Ågård Gods wind turbines
(Kalundborg Kommune, 2013)

The status of the project is that all permissions are approved and all complaints covered. The installation process started in the summer 2014. The project developer of this project is Just Wind. Just Wind was established in 2009, the founder of the company at that point owned 7 wind turbines and decided to start his own consultant company with special focus on wind power.

Kalundborg is a municipality in the Sjælland region with around 49.000 people. The municipality is known for its beautiful landscape and big industrial harbour. The coastline is 160 km long. According to the newest municipality plan (2011-2021) the focus is on further development towards sustainability. The new municipality plan points out areas for wind energy options. Figure 6.5 illustrates the location of Kalundborg municipality, the white area represents where Ågård Gods is positioned and the red circles represents existing wind farms, the figure is adapted from the environmental impact assessment of the project (Kalundborg Kommune, 2013).

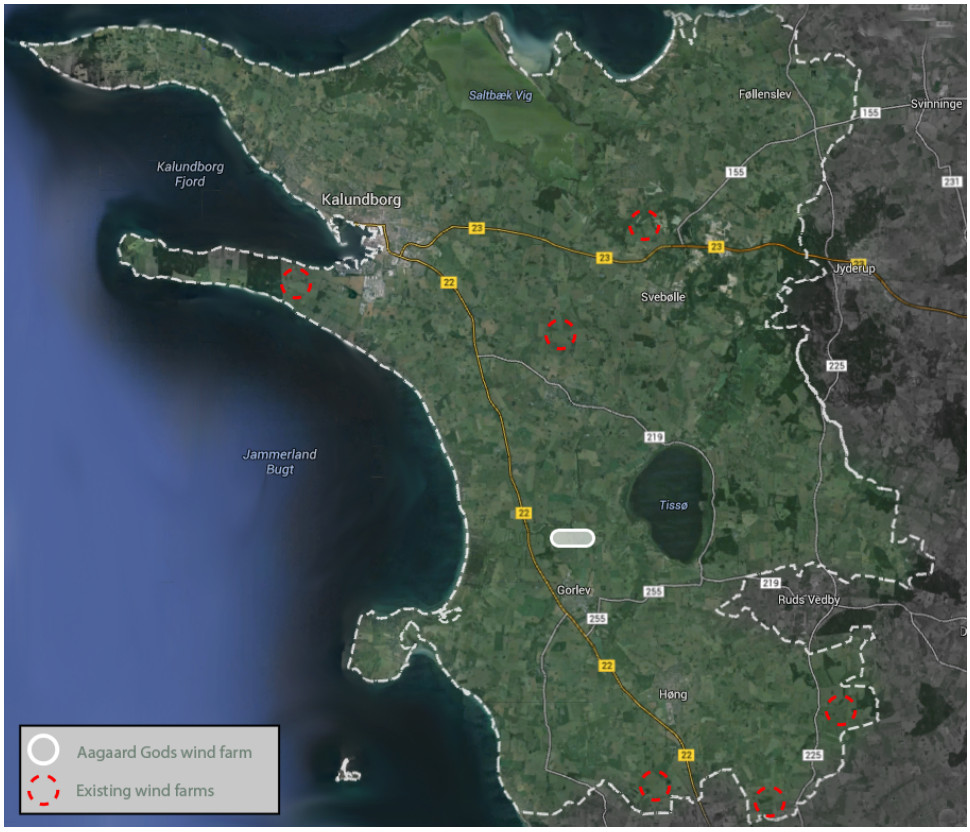

Figure 6.5: Location of Kalundborg with Ågård Gods and other existing wind farms identified.

The municipality holds a clear value proposition for more sustainable energy sources. It has very positive position regarding wind energy as an option, given that the installation of the wind turbine is done in a proper way with regards to the neighbours, nature, landscape, cultural heritage values and the agricultural interests.

6.4 Case Description - Ågård Gods

The motivation for erecting this wind farm came from the farmer that owned the land that had been chosen as a possible area for big wind turbines in the municipalities environmental planning. Ågård Gods was in the second part of the municipalities wind energy plan. Figure 6.6 provides an overview over the nearest neighbours to the wind farm.

Figure 6.6: Ågård Gods wind turbines, nearest neighbours (Kalundborg Kommune, 2013)

The project started in 2011 when the municipality started the process of doing the EIA report, and called out for any concerns from the local community regarding the project. A folder was sent out to the nearest 100 neighbours of the project, approximately living in the radius of 4 times the wind turbine height. To be absolutely sure, a folder was also sent out to the ones on the "edge" as well. The goal was to know the concerns that the neighbours had so they could be taken into consideration in the EIA report. This process, sending out the folder, gave one concern and the municipality felt that they had a project that could easily be executed.

The land owner wasn't eager to start, as he became really worried about his role as a wind turbine owner towards his neighbours and their good relationships. A process of negotiation and dialogue took place and the solution was that the neighbours, around 12 of them, got the ownership of one wind turbine, creating some kind of cooperative, and the land owner owns the other one. By the end of 2011 the land owner and his neighbours had found out how everything could work for them regarding the expected project. At this point the municipality was really positive that this could easily be executed. Specially now that more local people owned a part of the project.

Next step was to make the EIA report public and send it out in the community to get feedback and know which measures had to be taken in order to be able to execute the project. This is when the actual overflow started and the local community showed some concerns about this project.

The people living in the north part of Gørlev had big resistance and were very loud about it, 350 people signed a complaint about this project and handed it to the local politicians. They claimed that their property value would decrease significantly and got supported by a local realtor. Those people had concerns about their view but in reality could not be affected by noise or shadow effect for instance.

The apparent lack of knowledge in the local area in the making of EIA report lead to several complaints. Some "inside tips" would and could have avoided misunderstandings and difficult situations with local people who cared about the area. In the EIA report it was claimed that the project would not have any environmental effects. It would have been relevant to enquire about the behaviour of the geese in the area instead of claiming that there were no geese at all. They could have asked into the use of the lands and official walking and biking trails, for instance in the part where "Jernbanesti mod øst" is covered, a river is called for a small water stream, which insulted the locals. One of the official walking paths north from the project was too close to the expected project. In the municipalities' plan it is stated that a project like this can not be within a certain radius or be to close too official areas, but this path was within this radius and was not mentioned in the EIA report in relation to any special considerations. The lack of inside knowledge of the area lead to several complaints and resistance within the local community, which felt that they had been left out in the decision making process and that they had not been informed properly. At this point the municipality realised that there had been a need for an earlier community meeting where all of those concerns could have been heard and registered and taken into consideration in the EIA report.

The EIA report contained extra visualisation because the municipality really wanted to ensure that they had covered the area and could show how it would affect the different views and properties. The local community felt and claimed that the pictures where manipulated, the positioning was wrong and that they were missing a lot of viewpoints. The main concerns in the local community regarding this was that, if the EIA report didn't include all the viewpoints, the taxation comity could not see how the project would really affect the given property.

Dennis Ravn (DR) claims that there is a certain gap in this process. The municipality is responsible for the EIA report and it has to contain and cover certain elements based on laws and regulations. One of these elements is the visualisation part. The visualisation is then used by Energinet in the taxation process. This creates all kinds of concerns such as, *how will they know how the project affects my property if they don't have any visualisation of how it affects me?*

The wind turbines are high or 140 m. The general opinion is that a wind turbine of such height should be positioned at sea and there were several com-

plaints about how high they were. However the municipality plan accounted for wind turbines up to 150 m high, so this was technically not an issue.

Ågård Gods is close to a water called Tissø and there were several concerns about the birds in the area and how the project would affect them. Moreover Tissø is a Local Agenda 21 area so the local community were concerned about the area as a whole. As a consequence Ågård Gods has limitations on what can be grown on its land. Those limitations are based on the birds at Tissø, for instance they cant grow sugar because then the gees would rather stop at Ågård Gods in stead of Tissø.

One issue that became quite important was the bats and this is mainly because the EIA report was done before new requirements regarding how to handle bats in the EIA report were decided. Therefore in the middle of the process, new requirements/law were put in force and the consultant did the mistake of not including concerns regarding the bats in the area in the EIA report. The field work had been done but just not included in the report that was handed out. This resulted in the community having big concerns about the bats in the area and it became a major focus point. This required a lot of resources and time to show and tell how the municipality had accounted for the bats in the project planning.

Experience from other earlier projects made the municipality have a focus on the visualisation from the churches in the area. An extra visualisation was done from Bakkendrup church, this came up as one of the concerns but didn't become a big focus point in the resistance side.

The noise effect from the wind turbines became an issue, visualisation of high voltage lines in the area, landscape effect and health issues in general.

In the middle of the planning process it was decided to carry out a research on cancer in relation to wind turbines, and this research ended up as an issue that the opponents used. There were several concerns, especially when other neighbour municipalities decided to delay all of their wind energy planning and wait for the results from the cancer research, which is expected in 2015. In the case of Kalundborg this was the last part of the existing wind power plan so there was a political will to finish this project.

Many of the complaints were general, and based on how they were formulated, one could assume that they had some link with other wind energy projects complaints. Meaning that some more global mobilisation had been in forced.

At this point the municipality had so many complaints and concerns from the local community that DR was concerned that this project would not get accepted and approved at the next municipality meeting. While all this was going on, DR was participating in a project with the Environmental Ministry, a work shop where the main goal was to learn how the ministry could get the community to be more involved in the local planning in general. He got placed

at the same table as the opponents at this work shop, listening to what kind of concerns the opponents had, he came to the conclusion that he had to invite them to one last community meeting. The deadline for complaints had already passed so he just wanted to explain in a proper way those misunderstandings that were based on the lack of knowledge about the local area and maybe because they had used the wrong words and thus insulted some locals.

There were approximately 30-40 opponents in total that were invited to this meeting and 15-20 of them showed up. In the beginning of the meeting the atmosphere was pretty aggressive but it ended up being a really good meeting, where the municipality managed to explain some of the concerns in a clear and educational manner and ended up with more acceptance than they had before. At the next municipality meeting the project was accepted.

The municipality decided in June 2012 that the green fond received from this wind power project and three other projects would be used to build 3 football fields (kunstofbaner), one in Kalundborg, one in Svebølle and one in the south, either Gørlev or Høng. The position of the fields are coherent to where the wind power projects are positioned and therefore a distributional justice to some extensions fulfilled.

Chapter 7

Analysis and Results

Both cases presented in chapter 6, show how critical local acceptance can be in the development of wind power projects and state the importance of having the right "tools" to deal with the issues that arise during project development. In this chapter the results from the analysis that have been performed by following the analytical framework presented in figure 7.1 will be presented.

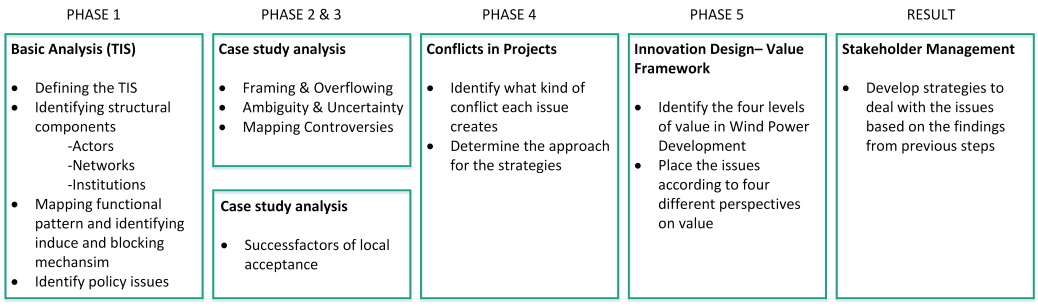

Figure 7.1: Analytical Framework.

7.1 Phase 1 - Technological Innovation System (TIS)

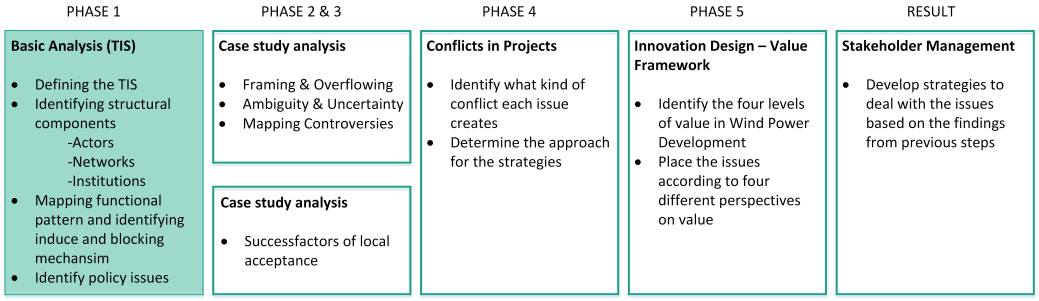

Figure 7.2: Analytical Framework - phase 1.

First phase of the analysis is the sense-making, to understand the dynamics of the industry and to identify actors, networks and institutions. A Technological Innovation System, scheme of analysis is used as a framework to make a TIS analysis with wind power and the subject of local acceptance in focus.

7.1.1 Step 1 - Defining the TIS in focus

The first step of the analysis is to define the TIS in focus, this will set a starting point for the analysis. Bergek states that the analyst faces several choices when picking a precise unit of analysis (focus of the study), the outcome of these choices determine the choice of the TIS which is captured (Bergek et al., 2008). The importance of making the "right" choice is stated even further by Carlsson "the system boundaries, the actors involved, the networks and institutions may vary depending on how we choose the level of analysis" (Carlsson et al., 2002).

The three types of choices that Bergek describes are, the choice between knowledge field or product as a focusing device, the choice between breadth and depth and the choice of spatial domain. The choices that define the TIS in focus in this thesis are described as follows:

- **The choice between knowledge field or product as a focusing device:** One could assume that the obvious choice in this thesis would be wind turbine. Bergek states that this choice is a common and straight forward starting point for the analyst in terms of product or product group. But the nature of this study is based on the lack of in depth knowledge on what shapes local acceptance. And therefore it is appropriate to choose the focus on the knowledge field of local acceptance, the process of getting the wind turbines erected, the local community that has something to say about it and the institutions in the sector that act in favour or against the installation both local and in a broader sense.

- **The choice between breadth and depth:** The study will focus on on-shore wind power projects in Denmark, addressing the controversial issues of local acceptance.
- **The choice of spatial domain:** Due to time limitation these two cases are only included. The scope of the study is limited to two cases in Denmark, even though TIS are characterised as global.

Bergek states that there is not one correct choice. "The starting point depends on the aims of the study and the interest of the involved stakeholders" (Bergek et al., 2008).

Finding the appropriate focus is not always straight forward. Bergek states that for an analyst that is new to a case it might be necessary to have a broad starting point and as the understanding of the TIS increases the focus can be narrowed down (Bergek et al., 2008). Carlsson is coherent to Bergek and states, "by focusing on technology in the sense of a specific knowledge field, we clearly cut a different "slice of the cake" then if the (multi-technological) product had been chosen as the level of analysis" (Carlsson et al., 2002).

7.1.2 Step 2 - The structural components of the TIS

Next step of the TIS analysis is to identify and analyse the structural components of the system. In Bergek's approach three structural components are defined, Actors, Networks and Institutions (Bergek et al., 2008).

Actors The first step is to identify the actors within the TIS that form the basis of the analysis of the functional dynamics of the innovation system. This is often based on a value chain analysis, as stated in section 4.2, "The research question in this thesis is isolated, relates to local acceptance and is owned by the project manager. Therefore it was not necessary to perform and use the value chain analysis." Bergek introduces four different methods to identify actors:

- Industry associations.
- A patent analysis.
- Bibliometric analysis.
- Interviews and discussions with technology or industry experts.

The method to identify actors in this thesis is the interview method often called "snowballing" method. Following the actor-groups and the actors identified will be presented, then there will be a description on their characteristics, roles and activities they have within the TIS.

Research and development within the industry is on the hands of *Universities and Research Institutions*. There is often very close cooperation between those

actors. Actors in this group are for instance *Technical University of Denmark (DTU)* and *Roskilde University (RU)*.

Legislation in the industry comes from *Danish Ministry of Climate, Energy and Building*, *The Danish Ministry of Environment* and from *The Environmental Protection Agency* (EPA). The legislation provide the requirements for distance and noise limits, environmental legislations amongst other regulations and guidelines that those projects have to follow. All wind turbines in Denmark must be authorised under *The Danish Energy Agency* technical certification scheme. The agency is responsible for the entire chain of tasks linked to energy production and supply, transportation and consumption, including energy efficiency and savings, as well as the Danish national CO2 targets and initiatives to limit emissions of greenhouse gasses. *The Municipalities National Association* set the requirement that every municipality have to account and plan for wind power.

Every *Municipality*, accounts and plans for wind power in their environmental planning. They also hold the responsibility of informing the citizens and getting the project approved.

The Specialist/Consulting Engineers, are an influential group of actors as they have a very broad role when it comes to wind power projects. This group of actors advises both private and public customers. Before a project is initiated, they can be involved in research and studies such as the environmental impact assessment, making the tenders, functioning as project managers during the project period, documenting the project and reporting to the authorities.

Funding Organisations, is a group of actors that is firstly funding research and development and secondly funding project development. One control factor when it comes to funding research and development is the direction of the research. European funding programs often require that the research benefits more than one country. When it comes to funding wind power projects it is mainly the power producers that are the main investors among other players in the value chain such as manufacturers, installation companies and corporate investors.

Land Owners, are both private and public, private would be individuals and public the municipalities. Private land owners often "end up" by chance owning a land that has been pointed out as a possible area for wind power project in the municipality's environmental planning. The land owner can also initiate a project by contacting a project developer or the other way around. Private land owners often have worries about their role as a wind turbine owner in relation to their neighbours.

Local Citizens, are the people that live in the municipality both close to the project or in some distance. These individuals regularly feel like they have been left out of the decision making process. Which makes them feel powerless, that

their interests are not taken under consideration and that they are not being heard. This often leads to resistance to the installation of a wind farm project in their neighbourhood.

Interest Organisations, manage and protect the interest of the different actors and stakeholders. These organisations are both the ones that promote wind power development and the ones that are against it.

Grid Owners, in Denmark the overall energy infrastructure is owned by Energinet As. which is responsible for the electricity and natural gas systems. They ensure reliable energy supply and create the framework for well-functioning energy markets and effective integration of renewable energy. Energinet is also responsible for the loss of value scheme.

Users, in Denmark the energy users can choose which form of energy they prefer to buy. The user have the power to choose wind power as an energy source, the energy companies then ensures that a proper amount of wind power is distributed.

Project Developers, are companies within the energy sector with a special focus on renewable energy. The main motivation is to make a sustainable business value, both regarding profit and competitiveness, while providing value for its customers.

Wind Turbines, as an actor can "say" many things, based for example on hight and the noise they create.

Networks The idea of a TIS is that actors function in networks, informal as well as formal. Bergek points out that for the analyst, it is often easier to recognise the formal networks than the informal, as the informal require more in-depth knowledge of the industry. Bergek also points out that analysts have to be aware and look for signs pointing to the existence or non-existence of networks (Bergek et al., 2008).

Knowledge network, is one form of formal networks. These networks exist between different actors within the system, for instance knowledge exchange between researchers and industry, between users and industry and across geographical borders.

Research network, amongst the different actors, including universities, research institutes and consulting engineering to name some.

Institutions - Rules A good example to explain institution would be supportive legislations and technology standards. Geels provides us with analytical grouping of different kind of rules. It is possible to distinguish between formal and informal institutions, thus the formal are the rules that are codified and the informal are more tacit and organically shaped by the different actors within the system. The informal ones are more difficult to map systematically so the focus will be on the formal institutions, the ones with the formal policies of the industry (Geels, 2004, p. 904).

- Regulative Rules - "refers to explicit, formal rules, which constrain behaviour and regulate interactions, e.g. government regulations which structure the economic process".
- Cognitive Rules - "Constitute the nature of reality and the frames through which meaning or sense is made".
- Normative Rules - "confer values, norms, role expectations, duties, rights, responsibilities".

The wind power industry is constrained by many legislations adopted by The European Union and by Danish authorities that regulate the industry.

Environmental Impact Assessment - EIA Directive 2014/52/EU has been in force since 1985 and assures that a procedure is followed that accounts for environmental implications before the decisions are made. The EIA directive in one of the main legal instruments for protecting nature and environment. The directive has been amended in 1997, 2003, 2009, 2011 and 2014 (European Parliament, Council of the European Union, 2014).

Access to environmental information - Directive 2003/4/EC gives the citizens the right to be involved in the decision making process when it comes to environmental planning issues. This directive sets limitation to public authorities, mainly because of the formal process of involvement (European Parliament, Directives, 2003).

The Birds and Habitats Council Directive 92/43/EEC provides a legal framework for the EU countries to protect species and conserve the core areas. For instance through the Local Agenda 21 program. The main aim of the Habit directive is to protect biodiversity in Europe (European Parliament Council Directives, 1992).

Promotion of the use of energy from renewable energy sources - Directive 2009/28/EC which resulted in that Danish authorities entered into force The Renewable Energy Act in January 2009. The act contains four schemes to promote the local population's acceptance in the development of wind turbines on land (European Parlament. Directives, 2009).

The cognitive rules constitute the nature of reality, how we sense things and how we learn through experience. Like symbolic meanings of wind power and ideas about impacts.

The normative rules are the kind of rules that constrain and make the engineers, researchers and developers work in a certain way. The Danish Energy Agency holds the responsibility of the technical certification scheme for design, manufacture, installation, maintenance and service of wind turbines that all wind turbines in Denmark must fulfil (Klima, Energy- og Bygningsministriet, 2013a).

Figure 7.3 provides a framework with an overview of the different rules. Note

that different actors (social groups) share different sets of rules, so moving from one actor group to another could mean different results or sets of rules.

	Regulative	Normative	Cognitive
Examples	Formal rules, laws, sanctions, incentive structures, reward and cost structures, governance systems, power systems, protocols, standards, procedures	Values, norms, role expectations, authority systems, duty, codes of conduct	Priorities, problem agendas, beliefs, bodies of knowledge (paradigms), models of reality, categories, classifications, jargon/language, search heuristics
Basis of compliance	Expedience	Social obligation	Taken for granted
Mechanisms	Coercive (force, punishments)	Normative pressure (social sanctions such as 'shaming')	Mimetic, learning, imitation
Logic	Instrumentality (creating stability, 'rules of the game')	Appropriateness, becoming part of the group ('how we do things')	Orthodoxy (shared ideas, concepts)
Basis of legitimacy	Legally sanctioned	Morally governed	Culturally supported, conceptually correct

Figure 7.3: Varying emphasis, three kind of rules/institutions.
(Geels, 2004, p. 905)

7.1.3 Step 3 - Mapping the functional pattern of the TIS

The aim with this part of the TIS scheme is to analyse how the TIS is behaving in terms of a set of key processes. Bergek has defined seven key functions that all have identified key indicators that may reflect to what extend the function is fulfilled (Bergek et al., 2008).

Knowledge development and diffusion: This is the function that is normally placed at the heart of a TIS and represents the knowledge base and the evolution of the TIS. It is possible to distinguish between different types of knowledge and different knowledge development (Bergek et al., 2008).

The subject of this thesis is the lack of in-depth knowledge on what shapes local acceptance, thus this function is a central function in this thesis. The type of knowledge we are dealing with is scientific and the research subject is known globally in big infrastructure projects. There are numbers of publications regarding local acceptance, which is a good indicator. This function has strong relation to the next function that is influence on direction of search. The essence in this function is the knowledge that the system is missing in order to make the system more efficient.

Influence on the direction of search: Bergek states that if a TIS is to develop, a whole range of firms and other organisations have to enter it. Direction of search in this case is driven by combined strength of:

- Changes in the "landscape": "Climate change, for instance, is currently putting pressure on energy and transport sectors, triggering changes in technical search heuristics and public policies" (Geels, 2004, p. 914).

- Regulation and policies: Authorities are regulating the industry according to the ambitious goals regarding fighting the climate change and aiming for more sustainable energy production.
- Technical bottleneck: Local acceptance is identified as a blocking mechanism of wind power development in chapter 3.3. The different stakeholders in the industry have recognised the problem which is clearly reflected in the participation level of WIND 2050 research.

Bergek suggests that there are four factors that can measure this function or at least be indicated by qualitative factors such as:

- Beliefs in growth potential.
- Incentives from factor/product prices, e.g. taxes and prices in the energy sector.
- The extent of regulatory pressures, e.g. regulations on minimum level of adoption ("green" electricity certifies, etc.) and tax regime.
- The articulation of interest by leading customers.

The direction of search is driven by the authorities and the industry that have identified shared values through the goals regarding decreasing CO2 emissions, the demand for more sustainable energy production and the identified gap in social acceptance and local acceptance.

Entrepreneurial experimentation: "A TIS evolves under considerable uncertainty of technologies, applications and markets" (Bergek et al., 2008, p. 415). This uncertainty is not only related to the early stages of the TIS, it evolves with time and the uncertainty is characteristic at later stages of the TIS as well. Entrepreneurial experimentation is the main source of uncertainty reduction as it unfolds a social learning process. Without experimentation the TIS will stagnate. The indicators Bergek recommends are for the analyst to map the number and variety of experiments taking place in terms of, for example:

- Number of new entrants, including diverged and diversifying established firms.
- Number of different types of applications.
- The breadth of technologies used and the character of the complementary technologies employed.

There is a bit challenging to use those indicators, for the main reason that the TIS identified is subjected to the knowledge field on what shapes local acceptance in wind power development. There are many actors, institutions and stakeholders that are experimenting in one way or another. For example with different technologies to invite citizens to community meetings, how to perform the visualisation and how the process of the EIA is conducted. All

this is done to contribute to the knowledge field. A proper way to identify the factor of entrepreneurial experimentation is to introduce two big projects contributing to the knowledge field:

The Danish Ministry of Environment launched a project called "åbenhed, dialogue og inddragelse" where the main goal is (MiljøMinistriret - Apropos, 2014):

- To create interest, understanding and dialogue amongst the local stakeholders in the wind industry.
- To develop good ideas through cooperation on how to create bigger involvement in wind power planning.
- To communicate ideas and experience, to make them useful to others.

Wind 2050 is a multidisciplinary study on local acceptance and development of wind. The scope of the study is broad but key factors that are contributing to this knowledge field and experimenting are (Borch, 2013):

- To identify and analyse the key factors that drive the local acceptance of wind power.
- 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.
- To address local acceptance from 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).

Market formation: In emerging TIS, at a certain point, market may not exist or be greatly underdeveloped. Marketplaces may not exist, potential customers may not have articulated their demand for the new technology and it could also be that the price and/or the performance may be poor. For market to evolve an institutional change is often needed (Bergek et al., 2008).

Bergek recommends indicators based on qualitative and quantitative data and states that the analyst needs to assess what phase the market is in. Is the market matured? Who are the users? How do they purchase the product? Is there an established demand profile?

The market for wind turbines is described as follows: "in terms of the number of wind turbines and/or wind power capacity installed in a particular year and in terms of the distribution between different customer groups (e.g. farmers and energy companies)" (Bergek et al., 2008, p. 416).

In chapter 5 the Danish energy market is described and stated that renewable energy has the portion of 138 [PJ] and of which wind power 38[PJ] in 2012

and holds quarter of the global turnover, 80,4 million DKK. The market for sustainable energy is growing and that is mainly due to the demand from authorities, globally and on national level of decreasing CO2 emissions and aim for more sustainable energy production to be able to fulfil their goals.

The main challenge of the market, which exists, is growing and has national support (social acceptance), are the different actors, like the local community and interest organisations that are not capturing the value of the wind power. These actors show resistance and the lack of local acceptance becomes an factor. This often leads to the fact that wind power projects are cancelled or face huge delays, which requires a lot of resources both in time, people and money and in the cases where the projects get cancelled the project developer is not able to produce or sell its product, wind power.

The essence in the market is the high level of ambiguity that is reflected in how different actors capture value.

Legitimation: "Legitimacy is a matter of social acceptance and compliance with relevant institution: the new technology and its proponents need to be considered appropriate and desirable by relevant actors in order for resources to be mobilised, for demand to form and for actors in the new TIS to acquire political strength" (Bergek et al., 2008, p. 416-417).

In wind power development there is a high level of social acceptance and the TIS is aligned with the value base in industry but there is a lack of alignment when it comes to society, which can be traced to the lack of local acceptance. The industry is legislated to promote sustainable energy production, to give the citizens right to be involved in the decision making process and to protect the environment and biodiversity. Even though the industry is legislated as described, it seems that it is failing to reach to the citizens and get local acceptance. Legitimacy may be increased with more documentation on the issues that arise in the industry, with education of those documented issues and with promotion of the values the industry is creating for the society at large.

Resource mobilisation: Wind power development has the capability to mobilise. As explained in chapter 5, in 2013 the Danish industry employed 27.480 people and thus it is assumed that availability of human competences in terms of educated people is high. In 2012 the Danish industry held a quarter of the global turnover, 80,4 million DKK and thus it is assumed that the capability for funding of research, such as on what shapes local acceptance, is sufficient and necessary for the industry.

Development of positive externalities: This function is not seen as independent, as it may happen that new entrance contribute to other functions and strengthen them, so it benefits others in the system. Therefore this function is highly dependant on the other six functions of the TIS and can be seen as an indicator of the overall dynamics of the TIS (Bergek et al., 2008).

The TIS identified is the knowledge field on what shapes local acceptance, which is a known problem, not only in wind power development but in big infrastructure projects in general. So any research or new findings in that knowledge field is considered to strengthen the TIS identified. The developed method in this thesis and the response strategy created is a good example of positive externalities.

Summary

- *Knowledge field and diffusion:* The subject of this thesis is the lack of in-depth knowledge on what shapes local acceptance. The essence in this function is the knowledge that the system is missing in order to make the system more efficient.
- *Influence on direction of search:* Direction of search is driven by the authorities and the industry, which have identified shared values through the goals regarding CO2 emissions, demand for more sustainable energy production and the identified gap in social acceptance and local acceptance.
- *Entrepreneurial experimentation:* There are many actors, institutions and stakeholders that are experimenting in one way or another to contribute to this knowledge field. A proper way to identify the factor of entrepreneurial experimentation is to introduce two large projects contributing to the knowledge field; "åbenhed, dialogue og inddragelse" and "WIND 2050".
- *Market formation:* The market exists, is growing and has national support (social acceptance). The main challenge is the different actors, such as the local community and interest organisations that are not capturing the value of the wind power, these actors show resistance and the lack of local acceptance becomes a factor. The essence in the market is the high level of ambiguity that is reflected in how different actors capture value.
- *Legitimation:* The industry is legislated to promote sustainable energy production, to give citizens the right to be involved in decision making process and to protect the environment and biodiversity. Even though the industry is legislated as described it seems that it is failing to get to the citizens and get the local acceptance.
- *Resource mobilisation:* Wind power development has the capability to mobilise, in 2013 the Danish industry employed 27.480 people, therefore it is assumed that availability of human competences in terms of educated people is high.
- *The development of positive externalities:* The TIS identified is the knowledge field on what shapes local acceptance which is a known problem, not only in wind power development but in big infrastructure

projects in general. Therefore any research or new findings in that knowledge field is considered to strengthen the TIS identified.

7.1.4 Step 4 - Assessing the functionality of the TIS and setting process goals

Bergek recommends the use of two bases for the assessment of the functionality of the TIS. Firstly the phase of development of the TIS and secondly system comparisons to distinguish between the phases the TIS is in, either a formative phase or a growth phase (Bergek et al., 2008).

The TIS identified is in the formative phase. As pointed out when the TIS was identified, a certain "slice of the cake" has been cut out when a knowledge field was choosen as a TIS. In that sense the TIS identified is positioned in a formative phase (wind power/local acceptance) that is part of a much bigger TIS which is in the growth phase (sustainable energy/wind power).

The indicators that can be used to identify the phases are:

- The *time dimension*, over the years local acceptance has been brought into the light, from having been considered as a rather simple problem that could be resolved with an effective communication strategy to a powerful factor of big infrastructure projects.
- The *uncertainty* factor, local acceptance or lack of local acceptance creates uncertainty regarding these projects.
- The *lack of legitimacy* amongst some organisation that are mobilised against wind power development, regarding some of the issues that arise in wind power development.

The TIS is known across borders and when it comes to research, regulations and knowledge sharing it appears that the level of *direction of search*, *entrepreneurial experimentation* and *resource mobilisation* is high. Different wind power development cases are even compared across boarders in order to identify success factors when it comes to local acceptance, such as (Loring, 2007) and (Jobert et al., 2007) did.

The process goal of the TIS is to broaden the knowledge base of what shapes local acceptance and widen range of experiments.

7.1.5 Step 5 - Identify inducement and blocking mechanism

TIS is dynamic and it is important to understand the blocking mechanisms that shape the dynamic within the system. The dynamics lies in all the functions identified and the importance of each function being served to some

degree, but it depends on the inducement and blocking mechanism (Bergek et al., 2008).

The identified inducement mechanisms is the demand of reducing threats to the environment and making the energy system more robust and less dependant on fossil fuel. On a global scale Denmark is considered as a pioneer when it comes to wind power development, which definitely has a positive effect on the *knowledge development*, *entrepreneurial experimentation* and *legitimacy* of the importance of local acceptance. Here it is important to emphasise on the existence of global innovation system and the local innovation system. Strong global innovation system is considered as an inducement mechanism. Anders Kristian Munk has in his process of mapping controversies presented that when the full web corpus is used, the interaction between different actors and networks are across boarders. On the other hand if one specific project is specified, a completely different result is obtained, that shows that in local projects, actors do not interact so much across boarders. Figure 7.4 and 7.5 represents the global and local innovation systems (Munk, 2014).

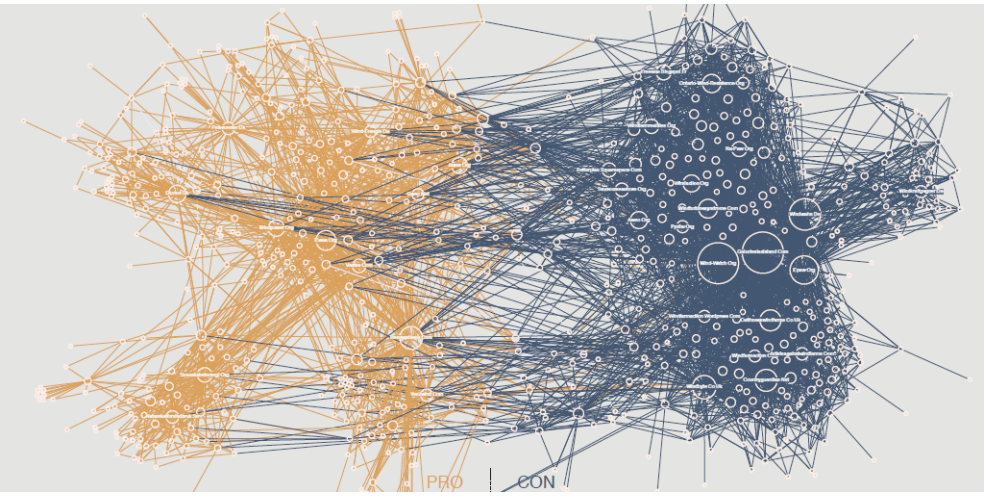

Figure 7.4: Global innovation system - full web corpus.
(Munk, 2014)

Blocking mechanism of local acceptance can be identified with the help of previous literature on the subject, Wustenhagen identifies three factors that determine local acceptance: procedural justice, distributional justice and trust (Wustenhagen et al., 2007). The lack of local acceptance is one of the main reason why different issues arise during wind power development. The blocking mechanism of local acceptance is identified as the lack of those three factors. The cases studied show that local citizens often feel like they have been left out in the decision making process, that their interests were not taken under consideration and they where not heard in the process. The issues that arise during project development can vary from one project to another and have

been identified in different studies both in Denmark and other countries (Jolivet and Heiskanen, 2010), (Sotto, 2014) and (Saralegui, 2014). Those cases include for instance, noise, loss of property value, view and worries for the environment/biodiversity. Other blocking mechanisms identified are the "gap" in the process of EIA and the loss of value scheme, where different actors hold the responsibility of documenting, the visualisation and others to estimate the loss of value. Both of these mechanisms effect the *legitimacy* in a negative way and create uncertainty.

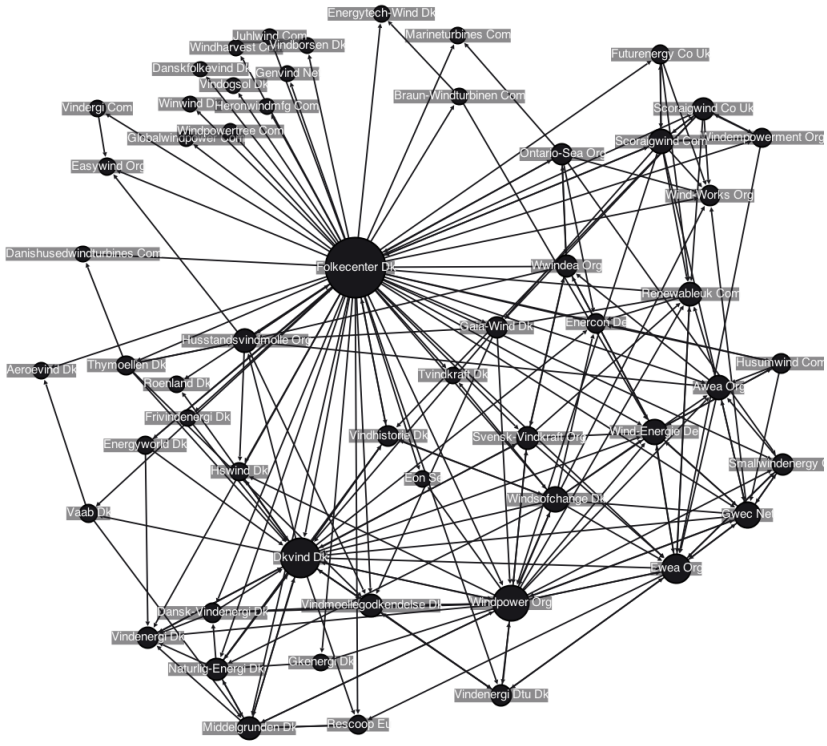

Figure 7.5: Local Innovation sytem - Folkecenter for sustainable energy in Denmark.

(Munk, 2014)

7.1.6 Step 6 - Specify key policy issues

Bergek argues that policy should aim at remedying poor functionality in relevant TISs by strengthening/adding inducement mechanisms and weakening/removing blocking mechanisms (Bergek et al., 2008).

To deal with these policy issues there is an urgent need to:

1. Gain in-depth knowledge about what shapes local acceptance.

2. Decide on how to involve and support citizens in the democratic process.
3. Diffuse documented knowledge to increase legitimacy and decrease uncertainty.
4. Improve the process of EIA and Value loss scheme to increase legitimacy and decrease uncertainty.
5. Develop a strategy to increase the probability of local acceptance.

The scheme of analysis has contributed in the sense-making process and put focus on what is actually going on in the TIS identified. Thus what is achieved in the system and to identify the weaknesses of the system expressed in the seven functions. In the following chapter the issues that arise during wind power development will be identified based on the information from the two cases, with the goal of develop a strategy to increase the probability of local acceptance.

7.2 Phase 2 - "What is the Issue?"

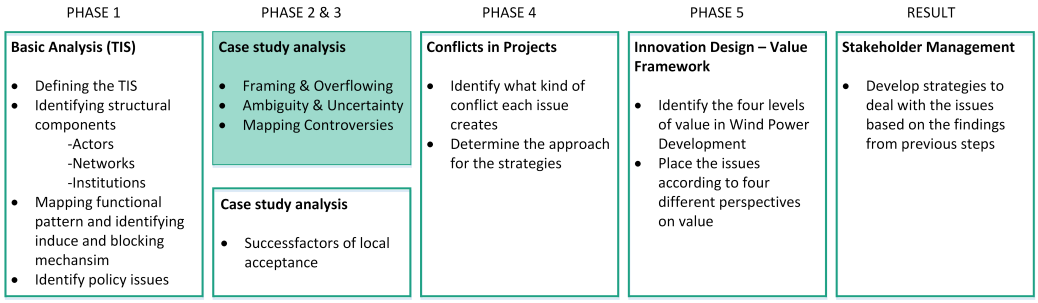

Figure 7.6: Analytical Framework - phase 2.

A dictionary of issues was created in the project "Mapping Controversies" which is a part of work package 1 (WP1) in the Wind 2050 research. All the issues have either been identified through the two cases or are common controversial issues found in the mapping process or based on previous studies and literature. The issue dictionary contains 46 words that mostly all relate to the controversial issues in wind power development, some of them are very related to each other so they are grouped together while some of them were left out as they were not considered relevant to the analysis. Full list can be found in appendix 10.5. The 11 issues that were identified in the two cases are represented in table 7.1 and have been rated with positive agent (+) if the issue is identified in one of the cases and negative agent (-) if the issue is not identified in one of the cases.

	Issues	Hagesholm	Ågård Gods
1	Animal welfare/protection	(+)	(+)
2	Birds	(+)	(+)
3	Bats	(-)	(+)
4	Cultural heritage	(-)	(+)
5	Nature Conservation	(+)	(+)
6	House prices	(+)	(+)
7	Setback Distance	(+)	(+)
8	Noise	(+)	(+)
9	Health	(+)	(+)
10	Local ownership	(+)	(+)
11	High voltage lines	(-)	(+)

Table 7.1: Issues identified through case studies.

This approach gives an overview over issues that can arise from overflows, and are the basis for the "what is the issue". The 11 issues that have been identified through this approach are the ones that further work is built upon towards developing the strategy.

7.3 Phase 3 - "Why it is an issue!"

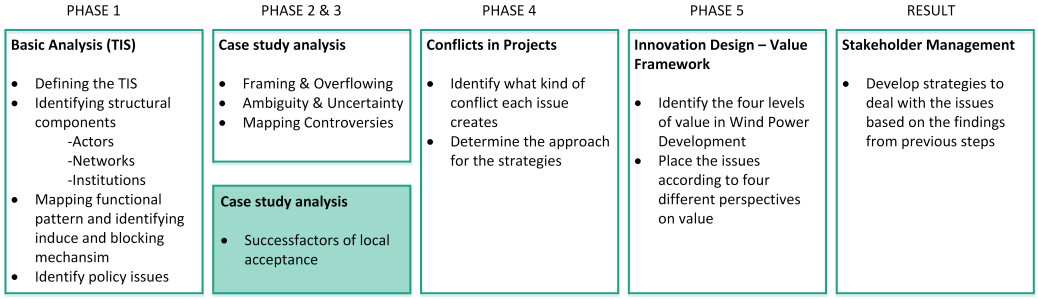

Figure 7.7: Analytical Framework - phase 3.

In this section the success factors of local acceptance from the two cases studied in this thesis will be identified. The concept of framing and overflowing will be used as a supportive "tool" for the analysis. The goal is to identify or at least give an idea on where in the project process there was an overflow and thus create some base for further analysis.

In chapter 3.5 the concept of framing was described. In a sense when it comes to wind power projects there are a "few sets of framing" that each and everyone affect each other, seen as a continuous process that ends up with the framing

of a certain project. "Framing is the process through which a common world is established between different actors that allows them to achieve a collective scenario of a desired outcome" (Jolivet and Heiskanen, 2010).

The first set of framing would be the regulations and the desired outcome set by EU. The second set of framing would be similar to the first one but on a national plan, Denmark. The third one is the municipalities environmental planning process. The last part of the framing is the actual initiation of a certain project within the municipalities environmental plan.

In the two cases studied, Hagesholm Wind farm and Ågård Gods, it is important to point out the strong value proposition of the two municipalities when it comes to sustainable energy, specially wind power. Both municipalities have very positive intentions about wind power as an option, given that the installation is done in a proper way regarding the neighbours, nature, landscape, cultural heritage and the agricultural interests. It is considered interesting to discover that the initiated projects, Hagesholm and Ågård Gods had been in the municipalities environmental planning for several years without any serious complaints or opposition, thus the first step in the process of framing the initiated projects took place years before the projects were assigned to project developer, different actors got their responsibilities and the actual project phase started.

Both projects were designed and planned to meet the existing regulations at the given time. Designed to fit into the landscape, previous use of the land was considered, the project execution was in the hands of experienced project developers that came from outside the municipality. The land was owned by local farmer that worked in close cooperation with local authorities, which fulfilled their duties in communicating about the expected project to the citizens.

Table 7.2 has been formulated based on the success factors of local acceptance presented in chapter 3.3.1. These factors have been rated with the positive agent (+), if the factor was a success in the project, or rated with a negative agent (-), if the factor functioned as a blocking mechanism for the success of the project. The factors that have neither positive or negative agent are not rated as the information is missing. In the analytical process of the two cases, two factors are identified as missing and will be added to the success factors of local acceptance. Those factors are the factor of **Ecosystem/Wildlife** and the factor of **Well being** which will be position in a new dimension that is called **Value Dimension**.

	Hagesholm	Ågård Gods
Geographical Dimension:		
Geography and visual impact	(+)	
Former use and perception of the territory	(+)	
Ownership of the territory	(-)	(-)
Local economy		(+)
Project Management Dimension:		
Local integration of the developer	(-)	(-)
Information and participation	(-)	(-)
Creation of network of support around the project	(-)	(-)
Ownership of the park and financial participation	(-)	(+)
Value Dimension:		
Wild life ecosystem	(-)	(-)
Well being	(-)	(-)

Table 7.2: Successfactors of local acceptance results from case studies.

Those 10 factors and the three dimensions are a good way of identifying where in the project development the sources for the overflow are situated, and are the basis for the "why there is an overflow".

7.4 Phase 4 - "What type of Conflict?" - Approach to Deal with the Issues

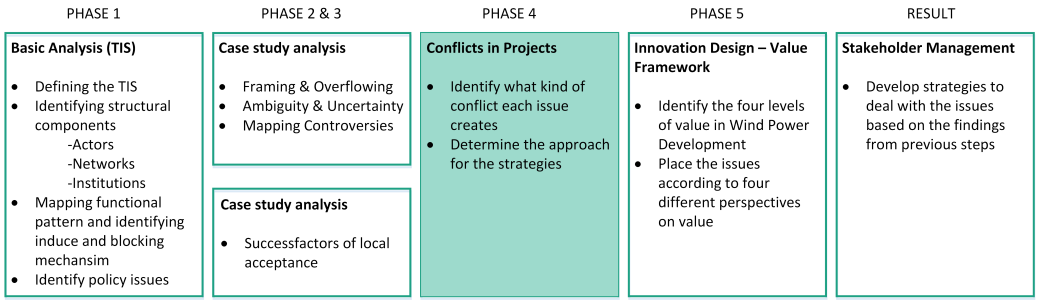

Figure 7.8: Analytical Framework - phase 4.

Based on the case studies and according to table 3.3, the four dimensions of conflicts in section 3.4, the following table has been made. Table 7.3 illustrates the findings on what type of conflict each issue creates.

	Issues	Instrumental	Interest	Value	Personal
1	Animal welfare/protection	X		(X)	
2	Birds	X		(X)	
3	Bats	X		(X)	
4	Cultural heritage			X	
5	Nature conservation			X	
6	House prices		X		
7	Setback distance				X
8	Noise				X
9	Health				X
10	Local ownership		X		
11	High voltage lines				X

Table 7.3: Issues based on type of conflict it creates.

The first three issues are positioned in the instrumental dimension according to how they occur in the cases. But there has also been considered the possibility that those three issues could be positioned in the value dimension as there are some individuals that have strong concerns and values regarding those issues, therefore there is an ex (X) in brackets in the value dimension.

This approach helps us to identify if the issue relates to uncertainty or ambiguity and thereby distinguish between approaches to deal with the issues. Table 7.4 provides an overview over issues in relation to ambiguity and uncertainty.

	Issues	Ambiguity	Uncertainty
1	Animal welfare/protection		X
2	Birds		X
3	Bats		X
4	Cultural heritage	X	
5	Nature conservation	X	
6	House prices		X
7	Setback distance	X	
8	Noise	X	
9	Health	X	
10	Local ownership		X
11	High voltage lines	X	

Table 7.4: Issues based on uncertainty and ambiguity.

This analysis is essential in the process towards a response strategy as each category is treated differently. In the case of uncertainty the approach is

proactive strategy, thus uncertainty can be reduced through more information and knowledge, and contributes to the sense-making in projects. While ambiguity requires another approach where dialogue is essential to come to a mutual understanding and capture the different values, therefore in the case of ambiguity the approach is reactive strategy. This is coherent to what M. Thyri presents in his uncertainty and ambiguity matrix illustrated in figure 7.9 (Thyri, 2002).

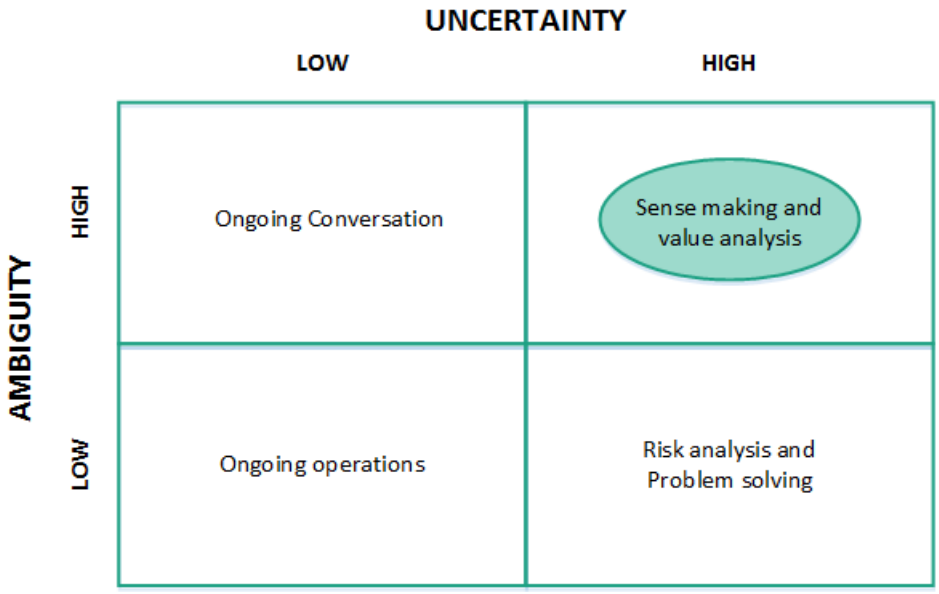

Figure 7.9: High level of uncertainty and ambigutiy.

Both cases presented show high levels of uncertainty and ambiguity, Hagesholm with eight issues identified, and Ågård Gods with eleven issues identified. The overview gained in this section provides a good ground to work further towards the response strategy, in the next phase it is determined what type of value each issue relates to, based on the findings from the case studies and type of conflicts.

7.5 Phase 5 - Value Framework

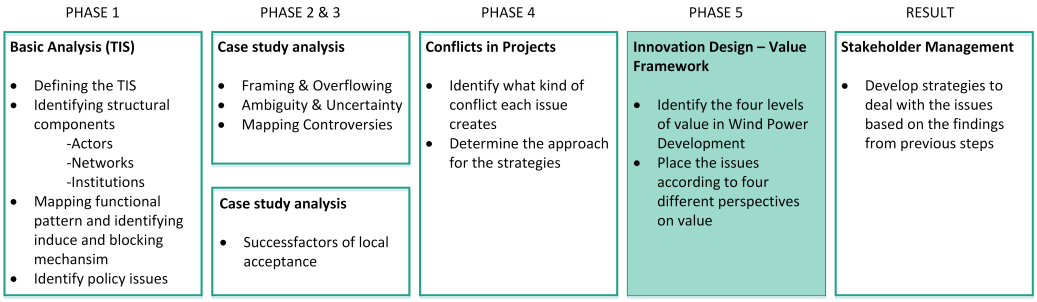

Figure 7.10: Analytical Framework - phase 5.

den Oden doesn't consider that innovation is meaningful unless it fits into every layer of the value framework (den Ouden, 2012). In this section the four levels of value in wind power development will be described: user level, organization level, ecosystem level and society level, and an overview on the four different perspectives on value within the value framework identified will be provided: economy, psychology, sociology and ecology.

In the last part of this section the identified issues will be placed within those levels and within the different perspectives identified in the Value Framework.

7.5.1 Level of Values in Wind Power Development

User level: Is defined as the wind farm owner, the person, municipality or company that owns the project and initiates it. The main motivation is to make a profit, the profit in this sense can either be money or eco-footprint and to do so the installation of the wind farm is a necessary step and is often done in cooperation with a project developer.

Organisation level: This is the project developer, usually a company within the energy sector with a special focus on renewable energy. The main motivation is to make a sustainable business value for it self both regarding profit and competitiveness, while providing value for its customers. At the same time the organisation is creating value in larger extend, for their employees and the labour market in general by creating and providing jobs.

Ecosystem level: Ecosystem includes all stakeholders that have a direct or indirect role in the various phases of the innovation: the definition, creation, realisation and extension (den Ouden, 2012, p. 17). This includes the ones that are against wind power, the ones that are promoting them, manufacturer and government agencies. The best approach would be to look at the whole value chain of wind power projects. There are many different opinions of wind

energy and governmental agencies and municipalities often have a different value proposition when it comes to promoting wind energy. It is therefore assumed that the ecosystem can face different complications by their users and organisations. One of the main characteristics of the ecosystem is how the members of the ecosystem have to depend on each other for their own effectiveness and survival. The main goal of the ecosystem will always be to have a satisfied society that will support the ecosystem to survive in the future, making it able to extend the market and contribute to sustainable development of the wind power industry.

Society level: Society is the highest level of value in the model, including all of the other levels. This level includes the local authorities, land owners and neighbours. In many cases the impact on the society is underestimated and it is a common opinion of the society that they feel like they have been left out in the decision making process. This makes them feel powerless, that their interest are not taken into consideration and they are not being heard. This often leads to resistance towards the installation of a wind power project in their neighbourhood. This affects the project developer directly, as process of resistance is very time demanding, takes a lot of resources and can cost a lot of money.

7.5.2 Different Perspectives on Value

In the value framework den Ouden has identified four different perspectives on value, within each perspective he has identified different value definition and different value concepts that fit into different levels of the value framework (den Ouden, 2012). The goal in this section is to to provide an overview of the characteristics of each perspective. Table for each perspective with value definitions and concepts can be found in appendix 10.6.

Economy: The unity of analysis distinguish in micro- and macroeconomics, in microeconomics the unit is individual such as household or company. It is assumed that individuals have a clear idea of what they want to get out of life and they try to get as much as possible for the least effort and sacrifice, while the macroeconomic definition fit with society as a whole (den Ouden, 2012).

Psychology: Value in the perspective of psychology is a desirable trans-situational goal, serving as a guiding principle in people's life (den Ouden, 2012, p. 30). Values in the psychological perspectives define what people strive for, the human values, as well as how these influence their behaviour.

Sociology: In a social context, the roles of individuals are important. We are what we are perceived to be by others, but they might only see us in a certain role. In general people tend to see only a partial perspective, there appears to be a human limit to understand that one's own perspective is only a part

of a much larger totality. The perception of what each person values may be different in the different roles.

Ecology: Considers the earth as a whole, with the man just being a part of a larger ecosystem which creates a holistic view of values.

7.5.3 Analyse where in the Value Framework identified issues belong

Ouden doesn't consider that innovation is meaningful unless it fits into every layer of the value framework (den Ouden, 2012). Looking at wind power development with the blocking mechanism of local acceptance, it is noticeable that the innovation is not fitting into every layer in the framework or creating value on the society level. The issues will be positioned in the society level of the value framework. Table 7.5 provides an overview of where the issues have been positioned in the different perspectives on value, based on the findings from the cases.

	Issues	Economy	Psychology	Sociology	Ecology
1	Animal welfare/protection				X
2	Birds				X
3	Bats				X
4	Cultural heritage			X	
5	Nature conservation				X
6	House prices	X			
7	Setback distance		X		
8	Noise		X		
9	Health		X		
10	Local ownership	X			
11	High voltage lines		X		

Table 7.5: Issues based on perspectives on value.

This overview provides a fundamental understanding of value and provides a ground to work further towards the response strategy.

7.6 Phase 6 - Strategies

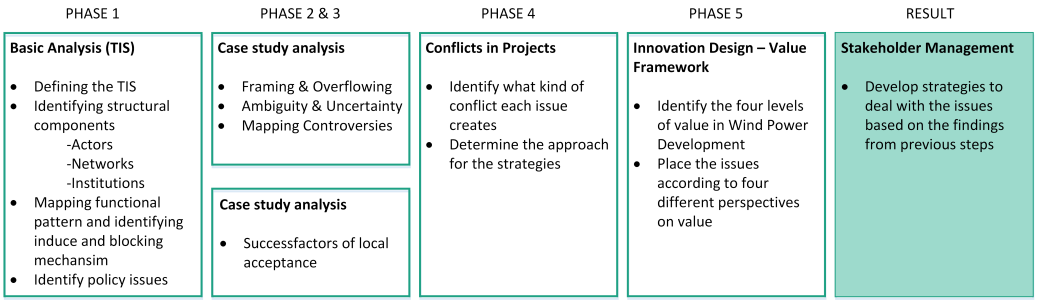

Figure 7.11: Analytical Framework - phase 6.

In this section two types of strategies for the different issues identified through the case studies will be developed with the help of different theories and concepts. An overview of each issue will be provided, starting with a presentation on the issue, followed by an explanation of why it is considered an issue. Finally it will also be elaborated on the value and type of conflict associated with each issue. The approach to the development of the strategies is a collaborative approach of three theories: Technological Innovation System, Innovation and Design and Conflict Theory. The result is considered to contribute to the subject of stakeholder management with two different approaches: proactive strategy and reactive strategy.

Issues - Controversial concerns that local stakeholders have regarding wind power project in the local community.

Two different approaches will be suggested to deal with the issues, which are accordingly to the approach presented in this thesis, grouped based on uncertainty or ambiguity. The evolution of a project is usually characterised by high level of uncertainty at the beginning, which tends to decrease as more information is shared. This uncertainty can then develop and become ambiguity, which is harder to deal with.

In the following section two issues will be covered. One relates to uncertainty for which the approach is proactive strategy, and one relates to ambiguity, for which the approach is reactive strategy. The two issues that are covered are related to the conclusions from the article: *Health impact of wind farms*, where over 20 scientific articles related to the subject are reviewed. "Fears of wind turbine projects among the population are usually associated with the potential impact of such investments on their property, and above all their health" (Kurpas et al., 2013, p. 603). The issues that will be covered are **house prices** and *noise*.

7.6.1 Proactive Strategy

Proactive strategy is designed to be applied in the framing process of a project, with a focus on the information flow/knowledge sharing to the different stakeholders. This knowledge sharing should be planned with the desired aim to cover the information/knowledge regarding success factors of local acceptance. There are though limitations on how much knowledge can be shared, thus people can not be fed with endless amount of information, and for that reason the learning process has to be contained to some extent.

Explanation of house prices: House prices is considered as an issue in wind power development because some properties lose value following the erection of a wind turbine. This issue is recognised by institutions in Denmark and the Loss of Value Scheme is the part of the promotion of the renewable energy act (European Parlament. Directives, 2009).

Why it is an issue? This issue is related to the success factor of ownership of the park and financial participation. When the citisens are afraid of the unknown, they are uncertain about how the wind power project is going to affect their property value and they don't trust the process.

Value perspective: House prices are positioned in the value perspective of economy, as illustrated in table 7.5 in section 7.5.3, and is considered to belong to the wealth and prosperity.

What type of conflict: House prices is considered to be positioned in the interest dimension of a conflict type, as illustrated in table 7.3 in section 7.4, where the main characteristic of the conflicts are fight of power, territories and economy. In this type of conflict the approach to solve them is negotiation with the aim to come to a solution.

In both of the cases presented, house prices (loss of value) became an issue. In the Ågård Gods case it became an issue when the residents of Gørlev mobilised against the project and claimed that the erection of the wind turbines would affect their property value. In the Hagesholm case the 9 nearest neighbours were not satisfied with the results regarding the estimated loss of property value. The amount is calculated through the loss of value scheme performed by Energinet, and the process is thus institutionalised.

Even though the process is well documented and performed by authorities, citizens seem to lack trust in the process. Especially the visualisation part, despite the fact that the data used for the estimation of visual effect is from the EIA report, which is done by specialists/consultants. Lack of trust also comes from the fact that different actors are responsible for different parts of the process, as noted in the following text from the Danish Energy Agency. "The claim from the owner of a property affected must be notified before the wind turbine has been erected. The erector of the wind turbine is therefore obligated to visualise the project and prepare other material as well as to

provide information to the citizens affected at a public meeting no later than four weeks before the municipal planning process ends. Any claims raised at a later stage will only be assessed as an exception to the rule" (Energistyrelsen, 2014).

Proactive strategy is aimed at the local stakeholders involved in this particular issue. The stakeholders are identified through the power interest matrix illustrated in figure 7.12.

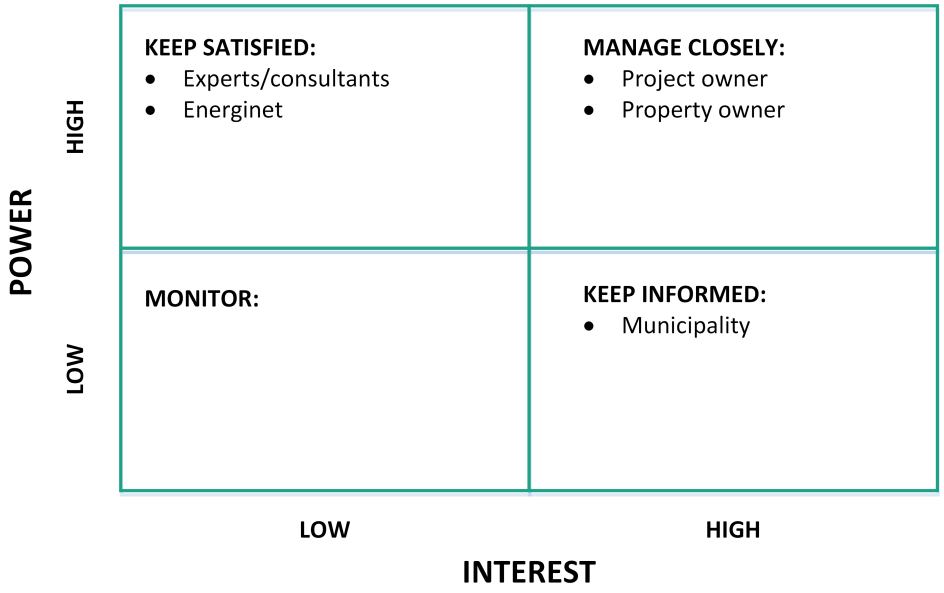

Figure 7.12: Stakeholders regarding the issue, house prices - power interest matrix.

There are two types of stakeholders that have been identified with high power and high interest and two with high power and low interest. The process regarding loss of property value involves high involvement of the identified stakeholders. It is useful to position them in the level they belong to in the value framework and to identify the different interest and values each stakeholder has. Figure 7.13 illustrates the position of these stakeholders.

- The project owner is positioned in the user level of the value framework. His main interest in erecting the wind farm is to make a profit. This positions the project owner in the dimension of economy in the value framework with the value definition of use value and exchange value with the goal to provide value for money.
- The property owner is positioned in the society level of the value framework. His main interest is own prosperity. This positions the property owner in the dimension of economy in the value framework with the value definition of wealth.

- Experts/consultants are positioned in the organisation level of the value framework. Their main interest is to make a sustainable business value and stay competitive. This positions them in the dimension of economy in the value framework with the value definition of exchange value and labour value with the goal to make profit.
- Energinet is positioned in the ecosystem level of the value framework. Its main interest is to fulfil its institutionalised duties regarding the process of loss of property value. This positions Energinet in the dimension of ecology in the value framework with the value definition of exchange value and surplus value with the goal to provide stability.

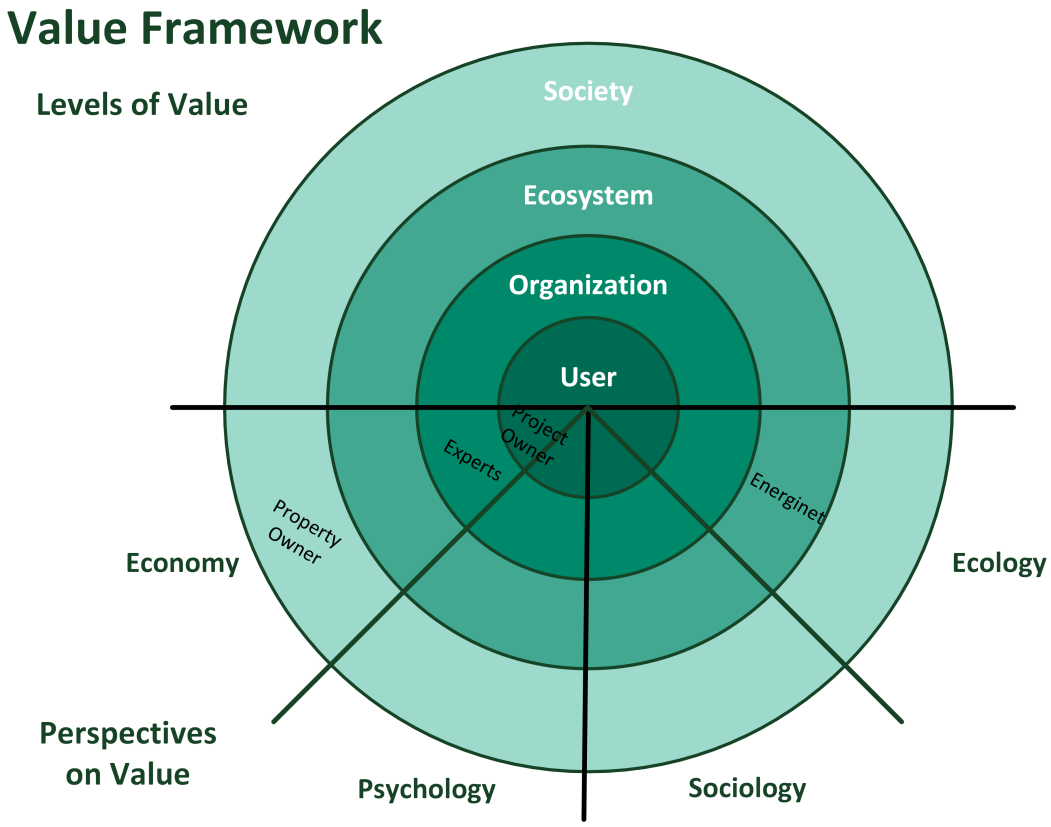

Figure 7.13: Stakeholders positioned in the different perspectives on value.

To be able to deal with a conflict it is important to understand its dynamics. In the case of the house prices four stakeholders that have high power have been identified and two of them also have high interest. While two of the stakeholders, project owner and experts/consultants, are aiming for profit, the property owner is caring for his own prosperity and Energinet is trying to provide stability and sustainable value delivery for all stakeholders. It is assumed that all stakeholders identified consider this issue positioned in the interest

dimension of a conflict type. It is not possible to identify in the Hagesholm case if the attempt to offer the neighbours shares in a wind farm project was aimed directly at solving the issue of house prices. In the Hagesholm case the total loss of value was evaluated to 2.220.000 DKK for 11 properties, 4 properties did not receive compensation (Taxation Myndighederne, 2011). It is assumed that offering shares is the approach that Vattenfall used to solve the issue. The loss of value evaluation in the Ågård Gods case was just finalised in September this year, there is no information about how satisfied the nearest neighbours are with the evaluation. In the Ågård Gods case the total loss of value was evaluated to 445.000 DKK for 8 properties, 3 properties did not receive compensation (Taxation Myndighederne, 2014).

The approach to solve a problem in the conflicts of interest dimension is negotiation with the desired aim to come to an agreement, which should be possible as we have something solid between the parties involved. To be able to come to an agreement the first step is to recognise the problem. The process from recognition to agreement is illustrated in figure 7.14. Regarding the issue of house prices stakeholders have been generalised and identified in power interest matrix, this is step 2. Different interests and values have been identified with the value framework, providing understanding about the dynamics, and constitutes step 3.

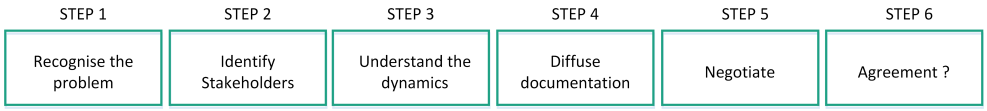

Figure 7.14: 6 steps of proactive strategy.

Diffuse documentation is the next step, step 4, where the approach should be to share information about the process of loss of property value. It is important to keep in mind:

- Which knowledge/information to share?
- How to share it - which channels to use?
- Who is going to receive the information?

This step is crucial in the proactive strategy where the aim is to decrease uncertainty. If this is done properly the stakeholders involved know what they need to do in the process and when to do it. By involving the citizens early in the planning process and applying the value framework to identify the different interests and values each stakeholder has, the probability of knowing what to negotiate about, in step 5, and come to an agreement, in step 6, will increase. This will also increase the legitimacy in the process, decrease the uncertainty and thus increase the level of acceptance.

7.6.2 Reactive Strategy

Reactive strategy is designed to deal with ambiguity that builds up during project development.

Explanation of Noise: Noise is caused from turbulent air flow over and around an object, in this case the wind turbine. Noise is considered to decrease the quality of sleep, causes stress, anxiety, depression and other health related problems (Kurpas et al., 2013). Noise can be measured but it has to be taken into account, because of the wide variation in the levels of individual tolerance to noise, that it is not possible to measure exactly how a particular noise will be heard or perceived by a person (Rogers et al., 2006).

Why it is an issue? It relates to the success factor of well-being. When citizens become afraid of the unknown, they are uncertain about how the noise from the wind turbines is going to affect their lives, it increases ambiguity amongst them.

Value perspective: Noise is positioned in the value perspective of psychology, as illustrated in table 7.5 in section 7.5.3. It is considered to belong to well-being and contentment, thus the result of the comparison on how life is versus how life should be (with the noise and without the noise).

What type of conflict: Noise is considered to be positioned in the personal dimension of conflict types, as illustrated in table 7.3 in section 7.4. In this dimension the main characteristics of the conflicts are issues that infects our personal existence and every day life, create vast suffering and confusion. The approach to solve this type of conflict is dialogue with the aim to come to a mutual understanding.

In the case of Hagesholm wind farm, noise became an issue. It became an issue when Vattenfall decided not to hand in proper noise measurement after installation, which has to be done within two months after installation time. Holbæk municipality forced Vattenfall to shut the wind turbines down while a proper noise measurement was performed. The noise measurement, performed by authorised company, DELTA, showed that the wind turbines were operating within the noise limitation. The DELTA test-report was available on the internet (Delta Testrapport, 2012) and a press release regarding the subject was sent out (Vattenfall, 2012). After this, the closest neighbour to the wind farm claimed that he, his wife and his 14 employees had health problems in relation to the low frequent noise from the turbines. Even though the process of noise measurement had been performed, the noise from the wind turbines still seem to be above the tolerance of the nearest neighbours. This person also claims, according to email sent on his behalf, that "he can't get his hands on the official noise measures that were performed", the email can be found in appendix 10.7.

Even though Vattenfall has created public documentations on the fact that the

wind farm is operating within the noise limits given by institutions, this issue is still considered unsolved and has a high level of ambiguity, three years after installation. The desired aim and appropriate actions should be to reduce the level of uncertainty and ambiguity and have ongoing operations as illustrated in figure 7.15.

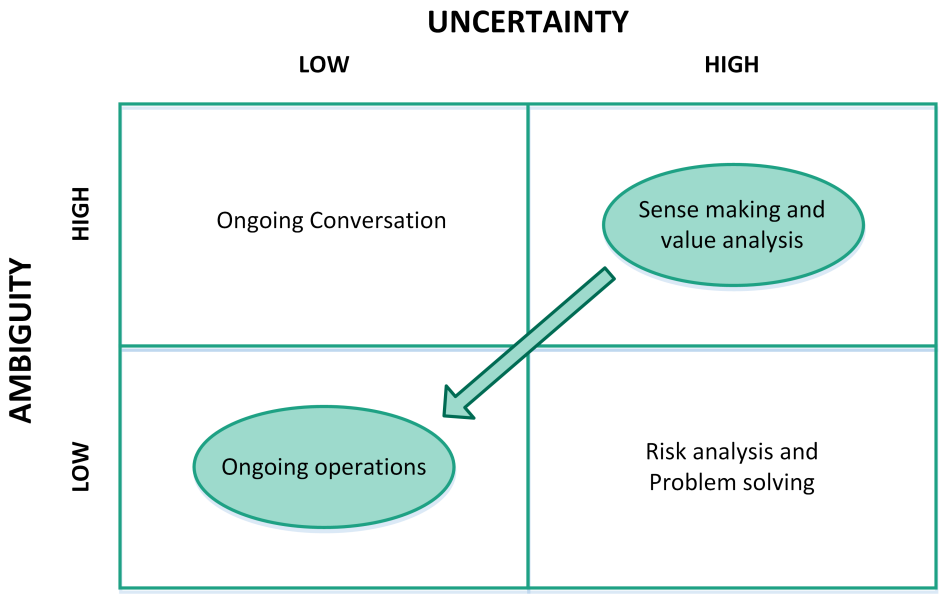

Figure 7.15: Level of uncertainty and ambiguity - desired aim with appropriate actions.

Response strategy aims at the local stakeholders that have been identified through the power interest matrix illustrated in figure 7.16 and are involved in this particular issue.

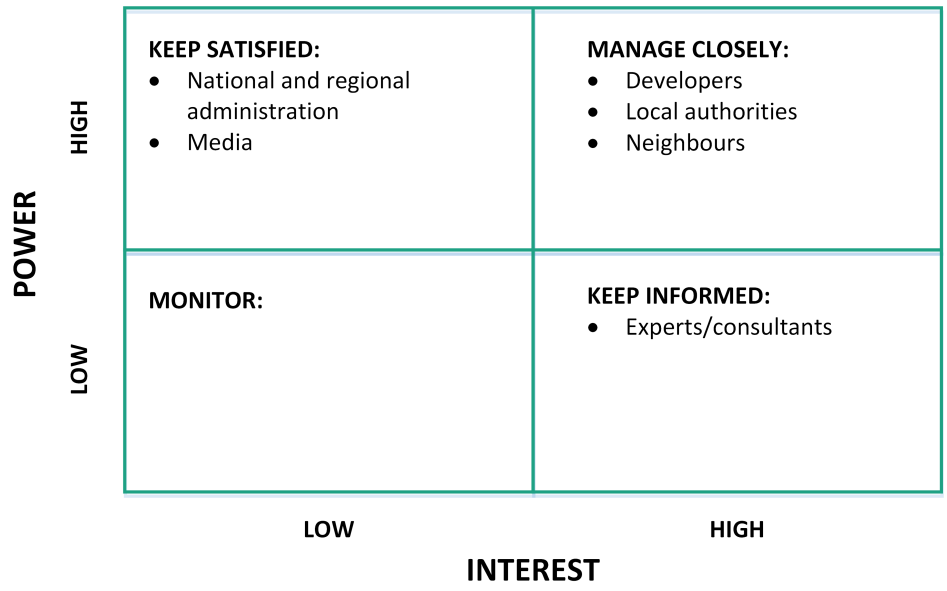

Figure 7.16: Stakeholders concerned by the noise issue - power interest matrix.

What is interesting in this matrix, is that the three stakeholders that have been identified with high power and high interest are all from different levels in the value framework. Therefore it is appropriate to identify the different interests and values each of them has. Figure 7.17 illustrates the position of these stakeholders.

- The project developer, in this case Vattenfall, is positioned in the organisation level of the value framework. Its main interest is erecting the wind farm to maintain its sustainable business value. This positions Vattenfall in the dimension of economy in the value framework with the value definitions of exchange value and labour value with the goal to make profit.

- The local authorities, in this case Holbæk municipality, is positioned in the user level of the value framework. Its main interest is fulfilling its goal regarding sustainable energy production and contributing to the CO2 reduction plan, eco-footprint, while it also has to control some of the institutional requirements. This positions Holbæk municipality in the dimension of ecology in the value framework with the value definition of human development, creativity and spirituality.

- The neighbours, in this case the closest neighbour, is positioned in the society level of the value framework. His main interest is his own health and own well-being. This positions the neighbour in the dimension of psychology in the value framework with the value definitions of happiness, contentment and subjective well-being.

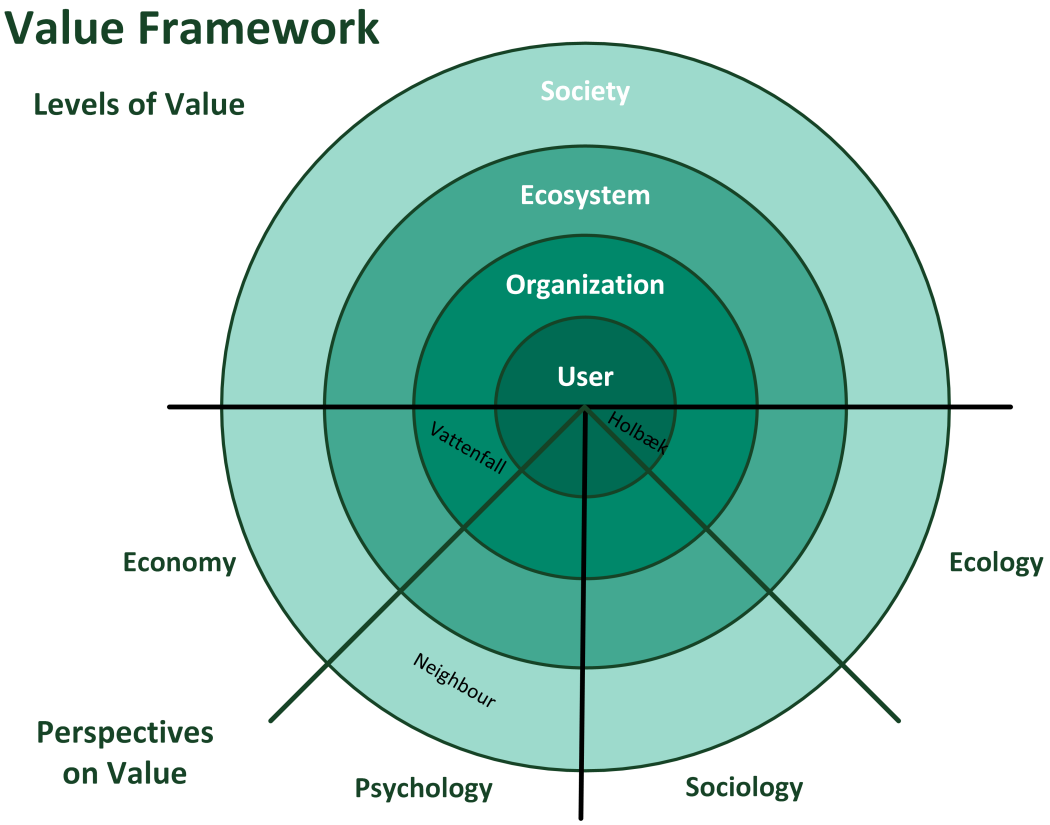

Figure 7.17: Stakeholders positioned in the different perspectives on value.

To be able to deal with a conflict it is important to understand its dynamics. In the Hagesholm case we have identified three stakeholders that have high levels of power and interest. By using the value framework to understand their dynamics (interest and values), it has been noticed that two of the stakeholders, Vattenfall and Holbæk municipality has value and interest that can be identified as positive ones while the neighbour have value and interest that can be identified as negative. It should also be noted in this case, that even though noise is considered as an issue that is positioned in the personal dimension of a conflict type. The project developer or the municipality may consider it as a conflict of interest or instrumental one, at least the approach that was used to solve the issues, negotiating and offering something, are more related to a solution type that would fit in those dimensions. Even though it is not possible to identify in the Hagesholm case if the attempt to offer the neighbours shares in a wind farm project was aimed directly to the issue of noise, it is assumed that the official documentation of noise measurement and the offered shares are the approach that Vattenfall used to solve the issue.

With reactive strategy the approach to solve a problem in the personal dimension is dialogue, with the desired aim to come to a mutual understanding.

The process from recognition to possible mutual understanding is illustrated in 6 steps in figure 7.18. To be able to come to a mutual understanding the first step is to recognise the problem. In the Hagesholm case, regarding the issue of noise, stakeholders involved have been identified with the power interest matrix, this is step 2. With the value framework the different interests and values each stakeholder has have been identified and therefore the understanding about the dynamics gained, this constitutes step 3. It has also been identified that the approach that was used in the Hagesholm case wasn't a successful one, resulting in high level of ambiguity three years after installation. In the following steps another approach than was used in the Hagesholm case will be suggested.

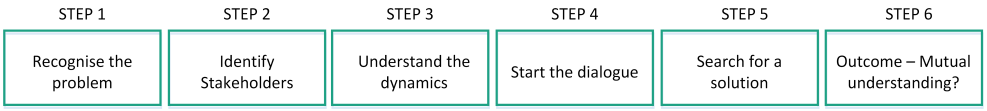

Figure 7.18: 6 steps of reactive strategy.

Starting the dialogue is the next step, step 4, where the approach should be a constructive conflict communication that should create a dialogue and foster acceptance and respect. The following questions should be kept in mind (Hahn, 2008):

- **Winning at all cost or seeking an acceptable compromise?**
  When the other party recognises that you are not fighting to win, that you are not trying to eliminate him/her, but that you are trying to work out a plan that can satisfy both his and your own interests, he/she would usually ease up, let go off the defences, and help seeking an acceptable compromise.
- **Interrupting or listening?**
  The conflict escalates when we treat the other person without respect. It is good for everybody to be treated with respect and interest. Not just by the spoken language, but by the attitude, body language, and eye contact.
- **Rhetorical or open questions?**
  The open questions are inquiring - we already know the answer to the guiding ones.
- **Blaming or expressing one's wish?**
  It is often more useful to openly and politely express what you wish or need, than to blame someone for not giving it to you later on.
- **Generalising or being specific?**
  Generalisation tends to give statements an air of supremacy, which can provoke the other person opposition. It is more appropriate to stick to

the actual case.

- **Past or present?**
  Talking about possible steps to take in the future is more fruitful and less controversial.

Step five is the search for a solution. It is a search with trial and errors where it may be necessary to come back to step 4 and step 5 a few times to come to a mutual understanding. Based on the dialogue and the different interests and values of the stakeholders it should be possible to act in a way towards mutual understanding, thus towards acceptance. In the Hagesholm case the search for a solution was the official documentation on noise measurements and to offer the neighbours a share in a wind farm project. These approaches are valid ones and could lead to success, but in the Hagesholm case it came a bit late in the process and the neighbour had formed a strong opposition against the project.

When the fifth step is initiated it should be kept in mind that all actions have a cost, and it is not possible or sustainable to offer whatever seems fitted to achieve the goal. Like the possibility to make the wind turbines higher to decrease the noise perceived, but of course it has other related effects as illustrated in the case of Albi. "Changing the height of the turbines from 80 to 100 m changes the noise heard in the homes at 400m (by est. 1 dB), the distance at which the turbine is visible during the day and during the night, the impact on bird and bat flight, the wind speed (increased by 1 m/s), the weight of the turbine (by 40%), the foundations necessary to hold them (by est. 30%), the constraints exerted on the pole, and the overall economics of the farm (by 7%) (Jolivet and Heiskanen, 2010, p. 6751).

It also should be kept in mind that amongst the stakeholders, are some with a strong NIMBY opinion, and they will always be against the project, no matter what they are offered or how the approach towards them is done.

The focus in the search for a solution should be to turn the identified interests and values into positive ones and/or to "move" the issue to another value perspective. One step in the approach is to show the neighbour that all possibilities regarding noise reduction have been looked at and actions planned in the most feasible ones. Another step is to offer the neighbour some kind of compensation either in form of shares in the project, money or other. Offering shares or money could turn the interest from psychological dimension with interest in their health and well-being into the economic dimension with interest in prosperity.

There is not one right answer in this process as wind power projects vary greatly from one project to another, but by applying the right strategy and use the right tools to support the process, the probability of acceptance will certainly increase.

Chapter 8

Discussions

In this thesis a conceptual approach of mainly three theories has been applied to identify possible strategies to deal with uncertainty and ambiguity, and contributing to stakeholder management in wind power projects. In this section the strengths and weaknesses of the method created will be discussed, alongside with the concepts used in the analysis.

8.1 Basic Analysis - Answer to the first sub question

How can TIS analysis and controversy mapping, support sense-making on issues of controversy in wind power projects?

The basic analysis can be seen as the researchers' process of sense-making to be able to gain in-depth knowledge about the dynamics within the industry and the research subject. The basic analysis enabled the identification of actors, networks and institutions. Furthermore it supported a process where every function of the system had to be taken into consideration, identifying what is useful in the system and what is lacking. That resulted in the identification of the induce and blocking mechanisms of the system. What's interesting in this analysis is that the local innovation system is a part of a much bigger TIS system that is mature and has "lived" a good a life over the years, a national innovation system where the opponents until now have not function as blocking mechanism. It is really not a question whether or not wind power is the option when it comes to reducing the green house gases, but a question on where to position the wind turbines. This really puts an emphasis on the importance of having the right tools and methods to work with in the planning phase of a project as well as when the project is initiated.

The result from this process was the identification of 5 policy issues that all aim at remedying poor functionality in the system. However applying TIS analysis on a "system within a system" was at some point a bit confusing. This process was therefore very challenging in regards to staying within the specifics and not becoming to general or broad in the analysis.

8.2 Case Study Analysis - Answers to the second and third sub-questions

How can issues of controversy be valued using theory of Innovation Design - the Value Framework?

What kind of strategy can be applied based on the type of value it is affecting and the type of conflict it arises from?

The case study analysis has been a necessary step to gain knowledge about specific projects and identify which controversial issues regarding local acceptance can be identified. To be able to perform the case study analysis it was necessary to "build" some frames on how to analyse and where to look. The starting point was to identify the issues with the help of the framing and overflowing concepts and with the use of success factors of local acceptance to get an idea of where in the project process the overflow occurs. The next step was to identify which type of conflict each issue creates, whether the issue relates to uncertainty or ambiguity, and thereby distinguish between approaches to deal with the issues. The last part of the case study analysis was to position the issues in the value framework, both in levels of value and in different perspectives on value.

This way of handling the case study analysis gave result in each step and built up confidence for further work towards answering the main research question. Thus the analytical method has some strong points but, some shortcomings can also be identified. The method was effective for the purpose of identifying controversial issues from the cases, but it would have been necessary to ask more further questions in the interviews to be able to identify why and where in the process certain issues appeared.

8.3 Stakeholder Management - Answer to the main research question

How can Project Managers with the process of sense-making form a strategy to deal with the issues, related to local acceptance, that arise in the innovation systems of wind power?

The conceptual approach of the three theories, Technological Innovation System, Conflict Theory and Innovation and Design has contributed to the process of sense-making in order to be able to form a strategy to deal with issues that arise in wind power development.

The analytical process leads us to group issues based on two types, issues based on uncertainty and issues based on ambiguity. This resulted in two types of strategies: The proactive strategy to deal with the issues of uncertainty and the reactive strategy to deal with the issues of ambiguity. This answers the main research question.

The essence in the response strategy is to identify the different interests and values each stakeholder has, both the negative and positive ones in order to be able to act in a direction that can increase the level of local acceptance in the community. Howeverr there will always be some stakeholders that hold the strong NIMBY opinion or are against the project, project managers have to admit and accept that opinion.

It would have been good to have time to analyse which information and which knowledge should be distributed in the proactive strategy coherent to the success factors of local acceptance. It would certainly give the designed method more value.

8.4 Recommendations and Further Research

The essence in the response strategy and the first recommendation is to project managers to follow the developed method to identify the different interests and values each stakeholder has.

Other recommendations are based on the five policy issues identified in the TIS analysis in section 7.1.6:

- Project managers have to recognise the controversial issues and accept that they are based on uncertainty and ambiguity which have to be dealt with in a different way.
- Project managers start to look at each project as one of a kind, with new stakeholders and actors involved each time. Sense-making has to be a part of each project to be able to gain in-depth knowledge about what shapes local acceptance in the given project.
- Project managers have to decide on information to distribute according to the success factors of local acceptance, and decide on channels to use, to support the citizens in the democratic process.
- Improve the process of EIA and value loss scheme.

All of those recommendations are considered to increase the level of procedural justice, distributional justice and trust amongst the different actors and stakeholders, which are the key elements of local acceptance.

Other studies, (Sotto, 2014) and (Saralegui, 2014) focus more on the planning phase of wind power development with the aim to decrease the level of uncertainty and ambiguity. The main results presented in both cases, are that the municipalities are responsible of not framing the projects well enough, which creates issues. This is important in order to recognise the causes of some of the controversial issues that arise during project development and end up being the project managers responsibility. Thus it is important to know the cause, but also to have tools like the proactive and reactive strategy to deal with the uncertainty and ambiguity. It is recommended that Interest organisations perform TIS analysis on the whole renewable energy sector, in order to really recognise what is going on in the sector and determine which actors hold responsibility in the different institutions identified.

8.5 Possibility to Apply the method to other large Infrastructure Projects

The method has been empirically illustrated "state of the art" with a good description of the processes involved. The method is considered appropriate to use in other large infrastructure projects that have socio-technical characteristics. Further recommendation would be to test this method on other projects of that kind.

Chapter 9

Conclusion

Controversial issues in wind power development arise from uncertainty and disagreements of the different actors involved. This is when the strategical approach of stakeholder management should contribute constructively to the project success. By creating a method that distinguishes between uncertainty and ambiguity and how to deal with them, the process will be perceived as more trustful and democratic, and the probability of local acceptance will increase. However the process of wind power development is complexed and modifications are often done in the project period, and the project changes. Early involvement increases distributional and procedural trust, for instance shared noise measurements and/or calculations in the beginning that may change during the project development. This is when project management becomes more challenging and decisions have to be made on how to handle the changes. Project managers have to be aware of not losing the trust that was created in the beginning with early involvement.

The Danish government aims for a fossil free energy production by the year of 2050 and wind power systems are expected to play a leading role towards that direction. As presented earlier in this thesis, one of the blocking mechanisms in wind power projects is local acceptance. If the Danish government is to achieve this ambitious goal, there is a need of support from the local communities, therefore the issue of local acceptance is so important. It is in this context that the developed method in this thesis provides a successful, sense-making tool dealing with the controversial issues of uncertainty and ambiguity in wind power projects.

One of my challenges was to interview and involve the opponents of wind power. That was mainly because of their scepticism towards the wind 2050 project, which they perceive as one sided with a political aim. I really want to stress the importance of their involvement in the development of the method, especially when identifying interests and values. The lack of their involvement is considered to weaken the results. When I look back at the process I also

consider that interviewing the identified stakeholders, or a representative from each stakeholder group would have strengthened the results. Due to rather limited amount of time it was not possible.

The method developed in this thesis can be used in other large infrastructure projects that have socio-technical characteristics, to solve other controversial issues. But to strengthen the process a key lesson learned in my research should be considered, that is to involve and get an input from all stakeholders identified in order to gain hands-on knowledge about the different interests and values each of them has, which is the most essential part of my method.

On the learning objectives my conclusions are, that in the beginning of the project I felt that I maybe had too ambitious goals regarding the identified learning objectives, and was worrying about the fact that I was using too many theories, methods and concepts to build my research on. But as the research developed I really felt confident with what I was using and feel that I have fulfilled what I was aiming for in regards to the learning objectives.

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Chapter 10

Appendix

10.1 Data Collection - Interviews and Project Groups

Name	Organisation	Description	Date
Project Group	Wind 2050	Meeting with the actors in Wind2050	24.03.2014
Arne Rahbek	Vattenfall	Semi structured open interview	04.04.2014
Dennis Ravn	Kalundborg Kommune	Semi structured open interview	21.05.2014
Kristen Verit	Naturstyrelsen	Semi structured open interview	28.04.2014
Wind Work shop	Wind 2050 Issue dictionary	Participation in a work shop with different actors in the wind industry	23.04.2014
Project Group	Wind 2050	Meeting with the actors in Wind2050	22.08.2014
Niels Kjølstad Poulsen	DTU	Email	26.08.2014
Email fra A	Stillhed EU	Email to issue dictionary group	02.02.2014
Henrik Kamp Justesen	De fire Vindmølleordninger	Email regarding loss of value evaluation	09.10.2014

Table 10.1: Overview over data collection - interviews and other forms of data collection.

10.2 Interview Guide

General:

Working Question:
What do you understand by local community in relation to wind power projects? Who does it belongs to?
Goal of the Question:
To understand the interviewee's opinion about community acceptance based on their knowledge and experience.

Networks:

Working Question:
Who were the main stakeholders in this project? Was there any previously established network among them?
Goal of the Question:
To identify the main stakeholders in the project development. Who are the main actors? Do they exchange information and how do they do it?

Community Acceptance:

Working Question:
How was the attitude of the local community towards the project? How did it evolve during the process?
Goal of the Question:
To get to know how the local community reacted throughout the project development, to identify any special actions that "made" the community to be more for the project or against it: Like, for instance local community meetings or some other actions.

Community Participation:

Working Question:
When and how was the local community informed about the project? What were the arrangements to the project made with them?
Goal of the Question:
To identify how the local community is informed about the project development, which channels were used, how the information flow was regarding cost and benefits of the project, and how the cost and benefit distribution are in the project. Where there any special actions taken to get people "on board" and how did it go?

Project Success:

Working Question:
Opportunities of modifying wind power development in general according to the experience from this project?
Goal of the Question:
To identify project management procedures, like planning, monitoring, controlling and executing with the aim to see if there is any room for improvements. Lesson learned!

10.3 Survey

Project:

Project Developer/Organization:

1. ***Rate the level of the next statements in relation to the project (High-Medium-Low)***

1.1 *Network stability*

1.2.1 **Strong relationships* among actors within the network**

High ☐	**Medium** ☐	**Low** ☐
Network is well developed, as indicated by many relationships between actors.	Network is present , as indicated by some relationships between actors.	Network is very limited, as indicated by few relationships between actors.

*Strong relationships are evident when actors agree on their roles and goals and when they actively participate and interact with others in the network. Strong relationships are also indicated when actors have known each other a long time, worked together before or were good friends prior to their involvement in the project.

1.1.2 **Significant texts or documents**

High ☐	**Medium** ☐	**Low** ☐
There is a substantial number of letters, documents, flyers, brochures and posters, produced and distributed among the stakeholders	There are some letters, documents, flyers, brochures and posters, produced and distributed among the stakeholders	There is a low number of letters, documents, flyers, brochures and posters, produced and distributed among the stakeholders

1.1.3 **Multiplicity**

High ☐	**Medium** ☐	**Low** ☐
Actors are able to draw upon the resources from one network to help their efforts in another.	Actors may be able to draw upon the resources from one network to help their efforts in another.	Actors are not able to draw upon the resources from one network to help their efforts in another.

1.2 *Community acceptance*

1.2.1 **Positive results in public opinion surveys about the project during the planning phase**

High ☐	**Medium** ☐	**Low** ☐
Mainly positive results in public opinion surveys	Both positiveand negative results in public opinion surveys	Mainly negative results in public opinion surveys

1.2.2 **Significant interest groups* generally in favour (or not opposed) to the project**

High ☐	**Medium** ☐	**Low** ☐
Many significant interest groups	Few significant interest groups	No significant interest groups

*Interest groups, such as parish councils, local sporting clubs, environmental organizations, groups of local businesses

1.2.3 **Attendees to public meetings generally in favour (or not opposed) to the project**

High ☐	**Medium** ☐	**Low** ☐
High number of attendees in favour	Some attendees in favour	Few number of attendees in favour

1.2.4 **Letters of objection sent to planning authorities and newspapers**

High ☐	**Medium** ☐	**Low** ☐
Strong feelings against the development project, with a lot of letters of objection to planning authorities and newspapers.	Some letters of objection to planning authorities and newspapers.	No presence of letters of objection to planning authorities and newspapers.

1.2.5 **Letters of support sent to planning authorities and newspapers:**

High ☐	**Medium** ☐	**Low** ☐
Some letters stating clear support for the project	Few letters stating clear support for the project	No presence of letters stating clear support for the project

1.2.6 **Positive media coverage**

High ☐	**Medium** ☐	**Low** ☐
Strong positive news and articles in favour the development project from the media	No presence of news or articles in favour the development project from the media	News and articles from the media opposing the project

1.3 *Community particpation*

1.3.1 **The participants are representative of the views of the full range of potentially affected people**

High ☐	Medium ☐	Low ☐
Extensive measures were taken to include all the view points in the decision-making process	Reasonable measures were taken to include all possible view points, including some beyond those legally requiered by the planning process	Minimal measures were taken to include all possible view points

1.3.2 **Barriers* to participation were minimized**

High ☐	Medium ☐	Low ☐
Extensive measures were taken to reduce barriers to participation	Reasonable measures were taken to reduce barriers, including some beyond those legally required by the planning process	No special measures were taken to reduce barriers other than those legally required by the planning process

*Examples of barriers to participation are if public meetings are: not widely advertised; inconveniently located; held in locations that are intimidating for some individuals; or scheduled at times when some interested individuals cannot attend

1.3.3 **Community members impact decisions about the project**

High ☐	Medium ☐	Low ☐
Decision regarding the project made by a large group of local community members in collaboration with planners and, if relevant the developer	Decision regarding the project made between the planners, the developer (or landowner), and a small group of interested local individuals	Decision regarding the project made largely by developer and the planners. Local comments such as those made in letters or during 'open days' were considered

1.3.4 **Community members have financial ownership in te project**

High ☐	Medium ☐	Low ☐
Individuals other than the landowner receive all revenue or all revenue goes to a community fund	Landowners receive revenue from turbines	No community financial ownership in community other than land rental and small community funds

1.3.5 **Local initiation of the project**

High ☐	Medium ☐	Low ☐
Community group initiated and submitted application	Landowner(s) initiated and submitted application alone or had a significant role in the application submitted by the developer	Landowner and developer initiated and submitted application together, or the landowner asked developer to consider that site

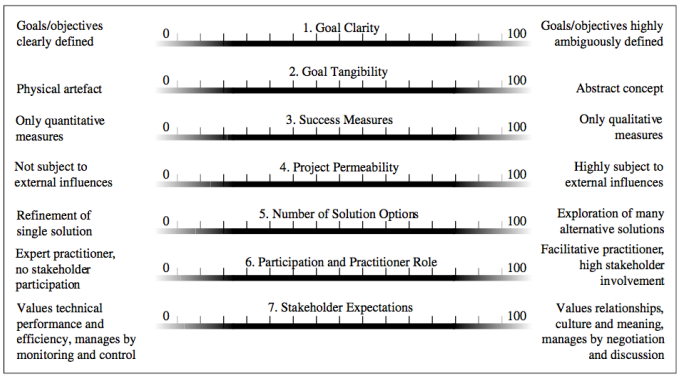
1.3.6 **Community will have continued involvement in the project**

High ☐	Medium ☐	Low ☐
Community group will continue to be involved within the project through receipt of revenues (or decision-making responsibility regarding the use of revenues) and decision-making responsibilities regarding the management of the project	Community group will continue to be involved within the project through significant or high- profile local activities that are directly connected to the project, such as a visitor centre	Minimal continued community involvement through low-profile activities related to the project, such as funding of computers for local schools

1.4 *Planning success*

High ☐	Medium ☐	Low ☐
Project obtained planning permission	Project obtained planning permission, but only after appeal or lengthy delays or expensive requests for additional information	Project did not receive planning permission

2. ***Rate the level of the next issues in relation to the project (High-Medium-Low) (Low** means agreed with the description on the **left,** while **High** means agreed with the one on the **right)***

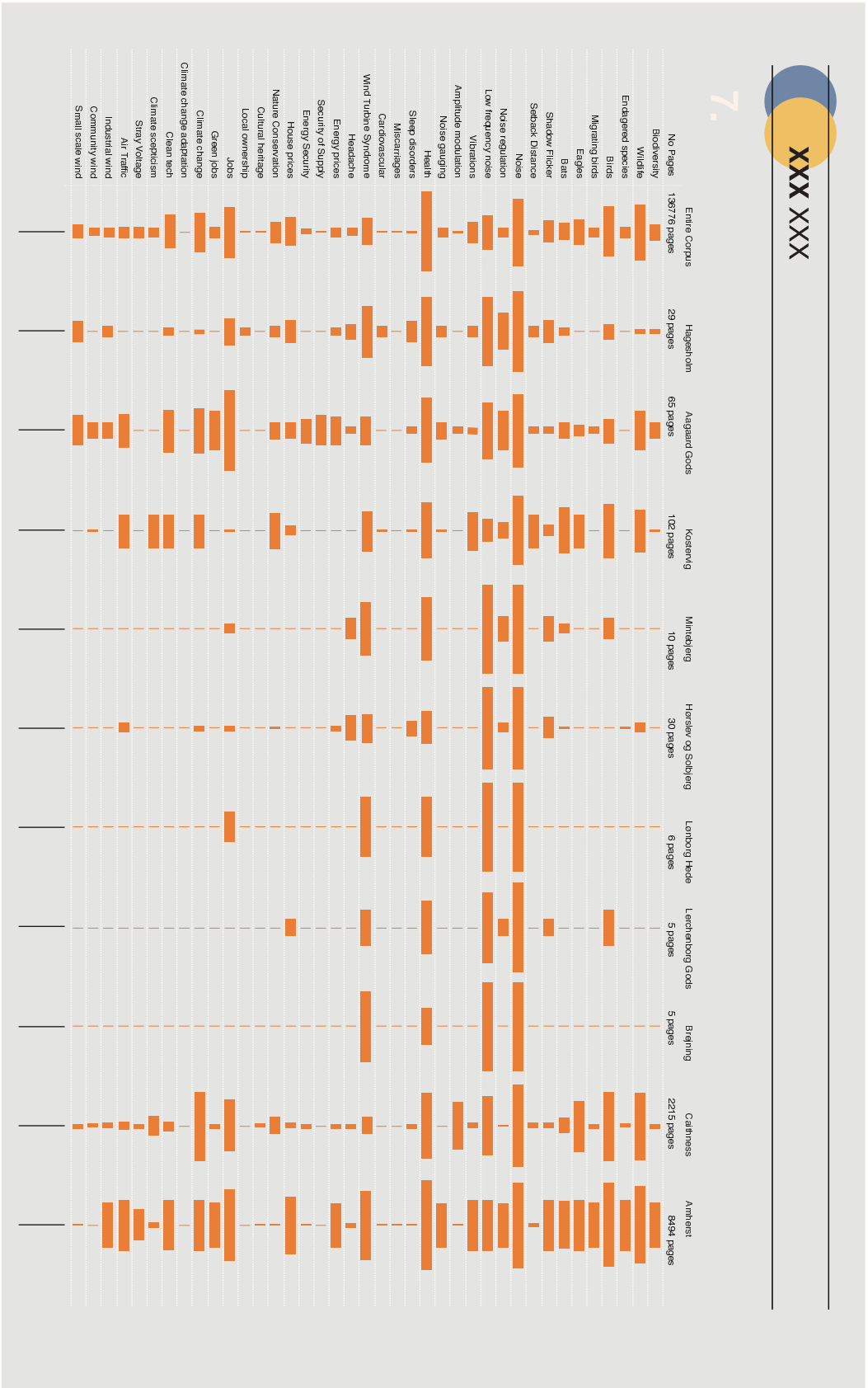


1. *Clarity*	
2. *Tangibility*	
3. *Permeability*	
4. *No. Solutions*	
5. *Participation*	
6. *Measures*	
7. *Expectations*	

3. ***Rate the level of importance of the next issues in relation to the project (High Medium Low)***

1. Local ownership/Shares-investment opportunities	
2. Local economy/Local costs and benefits and their equitable distribution	
3. Wildlife/Ecosystem	
4. Trust/ Relationships between local community, local authorities and developers	
5. Well-being/Aesthetic appreciation (Landscape and noise)	
6. Compensation for loss of property values/Home price depreciation	
7. Involvement and consultation of the local community in the decision-making process	
8. Emotional attachement to the place	

10.4 DNA - Cross-count of issues in Cases



10.5 Issues


Name
Group
Final Result
Biodiversity
Wildlife
Endagered species
Animal welfare and protection
Animal welfare and protection
Birds
Migrating birds
Eagles
Sea Eagle
Birds
Bats
Bats
Shadow Flicker
Shadow Flicker
Cultural heritage
Cultural heritage
Nature Conservation
Nature Conservation
House prices
House prices
Setback Distance
Setback Distance
Noise
Noise regulation
Low frequency noise
Vibrations
Amplitude modulation
Noise gauging
Noise
Health
Sleep disorders
Miscarriages
Cardiovascular
Wind Turbine Syndrome
Headache
Health
Energy prices
Energy crisis
Security of Supply
Energy Security
Energy prices
Energy crisis
Security of Supply
Local ownership
Jobs
Local ownership
Jobs
Green jobs
Climate change
Climate change adaptation
Clean tech
Climate scepticism
Green jobs
Climate change
Stray Voltage
Air Traffic
Stray Voltage
Air Traffic
Industrial wind
Big wind
Community wind
Small scale wind
Offshore
Onshore
Near shore
1 Animal welfare and protection
2 Birds
3 Bats
4 Cultural heritage
5 Nature conservation
6 House prices
7 Setback distance
8 Noise
9 Health
10 Local ownership
11 Stray voltage

10.6 Different Perspectives on Value

Value definitions and concepts from an economic perspective (den Ouden, 2012, p. 29)

	User	**Organization**	**Ecosystem**	**Society**
Value definitions	Use-value Exchange value	Exchange value Labour value Surplus value	Exchange value Surplus value	Wealth GDP
Value concept	Value for money	Profit	Stability	Prosperty

Table 10.2: Value definitions and concepts from an economic perspective.

Value definitions and concepts from a psychological perspective (den Ouden, 2012, p. 35)

	User	**Organization**	**Ecosystem**	**Society**
Value definitions	Human values Motivational values Happiness Contentment	Organizational values	Organizational values	Subjective well-being Happiness
Value concept	Happiness	Core values	Shared drivers	Well-being

Table 10.3: Value definitions and concepts from a psychological perspective.

Value definitions and concepts from a sociological perspective (den Ouden, 2012, p. 43)

	User	Organization	Ecosystem	Society
Value definitions	Value as a meaning Signification Symbolic value Sentimental value	Social significance Image value	Network value Affiliation Social significance	Cultural value Historical value
Value concept	Belonging	Social responsibility	Reciprocity	Meaningful life

Table 10.4: Value definitions and concepts from a sociological perspective.

Value definitions and concepts from an ecological perspective (den Ouden, 2012, p. 45)

	User	Organization	Ecosystem	Society
Value definitions	Human development Creativity Spirituality	Business Spirituality Creativity	Earth centered values	Biodiversity Gross national happiness
Value concept	Eco-footprint	Eco-effectiveness	Sustainability	Livability of the environment

Table 10.5: Value definitions and concepts from an ecological perspective.

10.7 Email From A

Sent 02.05.2014

jeg har lige talt med X og vi blev enige om, at vi vil aflyse mødet. X stånder uhørt pres, ene mand mod et uhyrligt indspist system. Han har flere retssager kørende, han har ikke fået resultater af de officielle støjmålinger, som kommunen har foranlediget og hans 14 medarbejdere og han selv med konen er ved at blive nedbrudt over deres situation. Som arbejdsgiver har han ansvaret for sine medarbejderes sundhed, der er blevet stærkt påvirket af den konstante lavfrekvente støj p deres arbejdsplads. At de unge kvinder har fået hormonforstyrrelser, har jeg fortalt jer. Deres menstruationer er altid forstyrret, når de arbejder pågartneriet og kommer pånormalt niveau, nde er hjemme igen.

Hvad skal han gøre? Lukke sin virksomhed, fordi der skal køre kæmpe vindmøllers larm over hans grund? Ingen vil hjælpe ham med at fåslukket for møllerne, ingen vil give ham den dokumentation, hvor mange decibel støjen kører på. Kommunen holder informationerne lukket, myndighederne og ministerier siger, at alt er i orden. Sådan har det gået i flere år nu.

Det er meget svært i sådan en situation, at være behælpelig med nogle studieopgaver, der jo ikke har til formål at gåtil offentligheden og fortælle, hvad der foregår i dagens Danmark. Husk nu, hvad jeres projekts præmisse er: Naboer skal lære at acceptere vindmøller påland! Det er en vindindustri lobbyopgave. Betalt af det offentlige, der er bidt af ideen om vindenergi som hovedenergikilde i året 2050.

Jeg selv har haft den oplevelse at være p Christiansborg og være gæst ved samrådet om vindmøller. Jeg meget vred over den totale ignorance, som politikerne og myndighederne udviser overfor deres egne landsmnd. Det er ikke til at bære, at uskyldige familier bliver ramt af en lovgivning, der har bidt sig fast i at udbygge denne form for industri i landskabet, i nærheden af beboelse. At de mennesker bliver hånet med følgende ord: "Der foreligger ikke videnskabelige beviser for, at mennesker bliver syge af vindmøllestøj." Denne sidste stning fik jeg smidt i hovedet af vindindustriens repræsentant Y , som sad sammen med mig p en bænk og ventede p at blive lukket ind til samrådet. Jeg svarede hende, at det var ren "NEWSPEAK", ren DDR. "Vil I have lig p bordet?" Det ville hun nu ikke, sagde hun. Men mit svar var: "Det får du, hvis det ikke er mennesker, såer det dyr." Husk mine ord! De har en stor betydning,

Y sad i øvrigt lige direkte bag Z og er meget påvirket af vores åbne skanderi. Vi gav hinanden hånden til sidst, men uden at sige et ord.

I måhave en god studietid fremover og jeg håber på, at hele debatten har givet jer et indtryk af en anderledes virkelighed end i havde troet var muligt i et officielt demokratisk samfund. Jeg regner med at I sender mit brev videre til C og D og vil ved denne lejlighed bede om at blive slettet fra kontaktlisten.

Jeg ønsker ikke at blive involveret i dette projekt længere.

Med venlige hilsner

A