Towards a Process-Support Tool for Dutch Wind-on-Land Decision-Making Processes

The design of a Support Tool for the Decision-Making Processes of the Development of Wind-on-Land Projects in the Netherlands

MSc Thesis Kees van Santen

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Preface

After seven months of researching this report is the end product for my Master Thesis Project for the Master program Systems Engineering, Policy Analysis and Management of the Delft University of Technology in collaboration with the engineering company Royal HaskoningDHV. The research resulted in a process-support tool for the process manager of decision-making processes of wind-on-land projects and a user guide to help the process manager use the tool.

How to read this Report

In this report we start with discussing wind-on-land processes and the problems during these processes. After that we describe the products of decision-making, which provide links and variables used for the development of the tool. Using the input of the analysis we develop the WINST (Wind in Nederland Support Tool) and evaluate this with the help of interviews with all actors involved in wind park Deil. At last we discuss the relevance of the project, make recommendations for future research, present the main conclusions and reflect on the thesis research.

Attached to this report are the following documents;

- User Guide: “Wind In Nederland Support Tool: A User Guide for the Process Manager”
- Scientific Article: “Towards a Process-Support Tool for Dutch Wind-on-Land Decision-Making Processes”

Acknowledgements

In the past seven months of analyzing the decision-making processes of wind-on-land projects the complexity of the task for a process manager became very clear. At the same time designing a process-support tool and writing a report was like managing a complex process myself. The crucial difference was that I had actors in my network that were supportive and to whom I could turn for good advice or a helping hand. Therefore I want to thank Tineke Ruijgh, as my first supervisor, for always being available to give feedback on my work and discuss future steps. Our differences in working styles must have worried her in the beginning, but she succeeded in letting me focus on developing a balanced report, instead of putting all my effort in making the WINST perfect. I am grateful for the supervision of Job van den Berg and Hans-Peter Oskam, who gave me the chance to be a part of a real wind-on-land decision-making process. This enriched my research and personal development in many ways. For me this was the first time I worked on the same project for such a long time, worked in a professional engineering company and witnessed real negotiations. Furthermore, I want to thank Wil Thissen and Bauke Steenhuisen for being a part of my graduation committee and supporting my research by giving feedback.

Kees van Santen

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Summary

In the Netherlands the goal of the government is to increase the amount of electricity produced from wind turbines on land to 6000 MW by 2020. This ambitious goal asks for a different approach for these projects, because with the classic approach the development is too slow and invokes too much resistance in the local community. The largest delays during the development of wind parks are caused by problems during the decision-making process.

To increase the speed and keep all involved actors on board the decision-making process can be managed by a process manager. Because this is a very complex task, the process manager might need support during the process. Although different models are made that calculate the business case of a wind park, there is no tool available that sees a wind park project as a process in which all important actors are included. Existing models look at a wind park from the eye of the project developer, such as the business case model of Agentschap NL (Veghel, 2013). In this research we will not be looking at one actor, but we will take a multi-actor approach. Only financial aspects are included in the existing models, while the processes are including much more than only financial aspects. In these decision-making projects the influence of the park on the surroundings, the risk of participation options, and the development of the region are only a few of the issues present. Therefore in addition to the multi-actor character of the tool we will include more aspects to the tool than just the financial aspect.

The absence of literature describing the causes of the slow progress in decision-making processes of wind-on-land projects in the Netherlands led to the following research question; *How can the problematic aspects during the decision-making process of wind-on-land projects be managed?* To answer this question we have to identify the problematic aspects, the requirements of good process management and the products of decision-making. After that we can look to the tool and therefore the following design question was developed; *How can a process-support tool help the decision-making process of wind-on-land processes?*

To answer the research question we reviewed literature, conducted expert interviews and analyzed the cases of Deil, Houten, Dronten en Nijmegen. The Deil case has been extensively analyzed, because we participated in the process of decision-making in multiple rounds. To review the prototype of the tool we interviewed the actors involved in wind park Deil, including the two process managers. This gave us the input for revising and adding aspects of the tool.

The Decision-Making Processes

The slow progress of this decision-making process is caused by the lack of trust among the actors, the lack of available information of the actors and the different languages the actors speak. The negotiation rounds during this process are taking a lot of time, because, due to the problems mentioned, actors are not able to decide on the complex aspects of the three products of decision-making, namely; the municipal spatial plan, the business cases and the participation plan for civilians. These three products are linked in multiple ways, although these links are not known by all actors. Choices for one product affect the other products and in that way change the project. The tool shows what the effects of these choices on the project are, so the actors can see what their proposals do for the project.

The WINST

The designing phase of the thesis led to the WINST (Wind In Nederland Support Tool) in Excel based on the Agentschap NL model of (Veghel, 2013). Two additions were done to this model. First, all important actors were included; the project developer, the municipality, the province and the

civilians. The existing model calculated the business case for the project developer and partly for the municipality, but neglected the civilians and the province involved. Moreover, the other goals except for the business case were added to the tool. A positive business case is just one of the goals of an actor and, as we wanted to include more than just financial aspects, we included the other goals per actor.

This led to additional sheets to the existing model with a multi-criteria table for each actor is shown in which the criteria are the goals of the actor. The weights and scores in this multi-criteria table have to be given by the actors using the input provided partly by the existing model and partly by new input sheets, covering the spatial plan and the participation plan. In the tool the effects of different proposed options are clearly listed per goal, so the actor can assess the option based on the key variables. For the process manager an overview sheet was added, so the tool can easily be presented during the negotiation rounds.

Usability of the WINST

To test the preliminary assumption that the WINST could help during the decision-making process all actors involved in wind park Deil were interviewed, including the two process managers. These interviewees all stated that the WINST could help in the process by informing the inexperienced actors and checking proposals on their feasibility. The actors all saw the WINST being used at the earliest stages of the process, so the inexperienced actors could really participate in the discussion from the start. This helps to distribute the information among the actors. It can also increase the trust as the discussion about the goals of the different actors can create more clarity about the motives of the actors and in that way bring actors closer. At last the tool can help the actors to ask the right questions during the negotiation rounds and form a jargon with the tool as the basis for all actors. This can decrease the differences in languages among the actors.

The WINST has become a large Excel file, which is not easily used by a process manager without a lot of knowledge about wind parks, as was remarked by the process managers during the interviews. Therefore we added a user guide to this thesis, in which the process manager will be led through the tool in several steps. The process manager will have to sit down with each actor separately to explain the tool and collect the weights and scores to reduce the chance on strategic behavior.

Future works

Before the tool is used in a real process, one improvement has to be made. A thorough verification and validation of the tool has to be conducted. Now we only roughly analyzed the outcomes of the tool by entering the default settings of the Agentschap NL model. In that way we could estimate during the development of the tool in an iterative process if the tool was producing values that were reasonable. Before the tool is used all factors and links have to be checked for accuracy and the tool as a whole should be checked for producing values and scores that are reasonable. In this check also a sensitivity analysis should be conducted to see if the tool is very sensitive for the input of certain variables.

With the improvement mentioned above the tool could be used by a process manager, but further improvements can improve the usefulness of the tool even more. First, the tool can be expanded by adding more variables and links to make the tool more complete. In section 4.5 linked variables that were too complex were left out of the tool, but a separate study can try to incorporate these links. Second, a thorough guideline for the tool can be written. Although a user guide is comes with the report, a more thorough guideline can help clarifying the following points; when to use the tool and when not to use the tool, what can be negative effects of the tool, how can these negative effects be overcome, what can be strategic behavior and how can this be decreased? Third, a process (with

place for the tool) can be designed. A process design from start to finish of the process can help as guidance for the process manager.

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Glossary

B&W	Mayor and Municipal Executive
Bouwleges	*Bouwleges* are calculated as a percentage of the costs of the build of a project and have paid to the municipality.
Gebiedsgebonden bijdrage	A financial contribution to the region that is a percentage of the profits of a wind park.
Gebiedsvisie	A *Gebiedsvisie* is an exploration of the spatial possibilities of an area.
Gemeenteraad	Municipal Council
Inpassingsplan	A development plan of a province or the central government in which the zoning of a certain area is legally bounded.
Leges	The development of a wind park brings along investments in the municipality and work for the municipality officials. This work has to be paid by the project developer in the form of *leges.*
MER	Environmental effects report
Omgevingsplan	Is a broader plan for a municipality than a Municipal Development Plan, including also arrangements on nature, environment and heritage.
OZB	Property tax
Planschade	Compensation for house value depreciation caused by for instance the construction of a wind park.
Ruimtelijke visie	Vision for spatial development of an area.
SER-Energieakkoord	Agreement between over forty different organizations and provides arrangements for a long-term vision on energy in the Netherlands.
SDE+	Subsidy for sustainable energy
Structuurvisie	In this document the vison on spatial policy for the whole municipality, province or other administrative area is described. It describes the dependency between multiple Municipal Development Plans.
Vollastuur	Full load hour
Windvisie	Document in which a province assigns potential wind energy areas. A Windvisie can also be a municipal document in which the vision for wind energy in the municipality is explained.
WOZ-waarde	Value of immovable property

1. Introduction

The Dutch central government is focusing on renewable energy sources to respond to issues raised in the Kyoto protocol. The decreasing supply of fossil fuels and the increasing CO2 emissions are the biggest problems. Replacing fossil fuel consuming electricity plants for plants that use renewable energy sources can help to solve both. Wind energy is an important renewable energy source for the Netherlands.

In the Netherlands there have been successful wind-on-land projects for the past 25 years. There are approximately 2000 wind turbines on land, which together provide the Netherlands with a small 4% of the total electricity need or 2000 MW, but in neighboring countries like Germany (Breukers & Wolsink, 2007) and Denmark (Kamp, 2010) the development of wind turbines on land has been faster than in the Netherlands. The Dutch government has set its goal to increase the amount of electricity produced from wind turbines to 6000 MW by 2020. The policies and regulations "Wind op Land", the SER-Energieakkoord and the subsidies in the SDE+ will have to enable this increase (Min. van I&M, Min. van EZ, 2013)(SER, 2013).

To reach this ambitious goal new wind-on-land projects have to be developed rapidly, but the past two decades the development of wind parks has been a rather lengthy process (van Lierop, 2014). The wind parks in Houten and at Deil are examples of this, as the Houten project took 15 years before actual construction started (Houten, 2014) and the first initiatives for the wind park at Deil started over 10 years ago, while no final arrangements are made till today (Santen, 2014). The largest delays during the development of wind parks are caused by problems during the decision-making process.

1.1.1 Existing Process-Support Tools

The process of decision-making can be lengthy and can slow the whole wind park project down. This decision-making process, in which the most important actors take place, can be managed by a process manager. To manage the process a process manager will need knowledge about both wind parks and about process management. A process manager can be supported in different ways, for instance by a wind park expert, a process design or a calculation model.

In the field of environmental issues, such as land and water resource management, there is a move from pure analysis of effects to application in decision-making or policy context (Matthies, Giupponi, & Ostendorf, 2007) . This means that also economical and socio-technical issues are included in the tools or context of the tools. Since the 1970's these decision-support tools have been a popular way of approaching environmental issues (Matthies, Giupponi, & Ostendorf, 2007). A well-known example of such a tool is the *Blokkendoos Ruimte voor de Rivier* described in Box 1.1.

Box 1.1 Tool Example - Blokkendoos

The *Blokkendoos Ruimte voor de Rivier* tool is an expert tool that calculates the effects of different measures on large rivers in the Netherlands. The tool is used to come to an optimal set of measures with all stakeholders. The *Blokkendoos* has been very useful during the decision-making process, because all stakeholders were actively playing with the tool and because the stakeholders believed in the outcomes of the tool (Zhou & Mayer, 2010).

With the tool in Box 1.1 remarkable results are made in a multi-actor context, but in the field of wind park development such tools are not yet present. A comparison between these environmental issues and wind power projects can be made, because both have effects on multiple actors, local spatial quality and the local environment. Both involve different layers of government and are costly projects. This is an indication that a tool for the support of a wind park decision-making process can have similar effects as these popular environmental decision support systems. Zhou & Mayer (2010) identified the 'room to play' in the tool was one of the most important factors contributing to the success of the tool.

Although different models are made that calculate the business case of a wind park, there is no tool available that includes all important actors of the process. Existing models look at a wind park from the eye of the project developer, such as the business case model of (Veghel, 2013). Only financial (Veghel, 2013) or environmental (Dominguez, Navarro, Marti, & Garcia, 2001) aspects are included in the existing models, while the processes are including much more than only these aspects. In wind-on-land projects the influence of the park on the surroundings, the risk of participation options, and the development of the region are only a few of the issues present.

1.1.2 Problems in Wind-on-Land Decision-Making Processes

During the wind-on-land decision-making processes the following problems are occurring: a lack of trust, lack of information, different languages (section 2.5). These problems are causing delays and a frustrated process of wind park development.

By adding information to the decision-making processes, we will aim at directly reducing the lack of information for different actors. At the same time the tool can help to create a more uniform language, as the tool will give guidance during the process. By creating more openness about information of the wind park and about the goals of the other actors we aim to increase the level of trust via that way. At last the tool can help the actors to ask the right questions during the negotiation rounds and form a jargon with the tool as the basis for all actors. This can decrease the differences in languages among the actors.

1.1.3 An Integrative Multi-Actor Process-Support Tool

To reduce the problems mentioned in section 1.1.2 we will design an integrative multi-actor process-support tool. With integrative we mean that the tool should cover the most important aspects of wind park projects and multi-actor means that the most important actors are included in the tool. This differs from the existing tools that we have seen in section 1.1.1.

The tool can help to contribute to the objectives, shown in Table 1 (Bots, van Bueren, ten Heuvelhof, & Mayer, 2005). These interfaces can be improved by the tool and are applicable to the process of decision-making in wind park projects. Improving these interfaces will help to decrease the problems mentioned in section 1.1.2.

The expert-policy interface can be improved, because municipalities need to make decisions about the wind park without having all the knowledge. The tool will have to provide the necessary information for the municipalities and the provinces. The tool will also be used to improve the expert-public interface, as the citizens will take part in the process and the tool will have to be helpful to bridge the gap of knowledge between citizens and for instance project developers. The tool will also have to help to legitimize political decision-making, when the tool will provide enough room for the preferences of citizens. This can help to improve the public-policy interface, which has been problematic in multiple cases, such as in the Houten wind park (Gedeputeerden windpark Houten, 2013). The disciplinary interfaces are important to improve as they can help to improve the problem of the different languages and lack of knowledge, further explained in section 2.5.

Table 1 Objectives for a Tool (Bots, van Bueren, ten Heuvelhof, & Mayer, 2005)

Improving the	*Explanation*
Expert-policy interface	How to make scientific and technological knowledge more useful for (political) decision-making?
Expert-public interface	How to bridge the gap between experts and public and incorporate 'experiential knowledge' into the design and planning process?
Public-policy interface	How to improve the quality and legitimacy of political decision-making through effective participation of citizens and other stakeholders.
Disciplinary interfaces	How to arrange more effective communication and co-operation between professionals from different disciplinary backgrounds and with different forms of expertise.

1.2 Research Questions and Deliverables

For process managers it is hard to keep the speed in the process as well as keeping all actors informed and engaged. The research question therefore is:

How can the problematic aspects during the decision-making process of wind-on-land projects be managed?

To give an answer to this question the following sub-questions were developed:

- What are the main aspects that slow wind-on-land decision-making processes down?
- What are the functions of a process manager of decision-making processes?

When these aspects are identified after research, we want to make these aspects less problematic. Therefore the design question of this research will be:

How can a process-support tool help the decision-making process of wind-on-land development processes?

The challenge will be to design a tool that improves the sharing of knowledge, sharing of language and building of trust. We will make a tool that aims at speeding up the process, while taking every actor's goals into account. The tool will be designed for the process manager and will be used in the discussion and negotiation between the different actors.
The following research questions will be used to come to the development of the tool:

- What are the products of a wind-on-land process and how do they interact with each other?
- What does a tool look like that supports the wind-on-land development process?
- How can we improve the prototype to be useful for the process manager?

This research has multiple deliverables that will be presented at the end of this report. The first deliverable is the identification of the problems during the decision-making process of wind parks. Second is the tool that will support the decision-making process to decrease the problems. This tool will quantify effects of decisions in the business case, participation model and spatial plan and will be

a tool in the negotiations to clarify standpoints of actors. To present a useful tool we also need a user guide that helps the process manager to use the tool in a process. The last deliverable is the feedback of actors that have evaluated the tool. This can be useful to identify extensions and improvements of the tool that will be the basis for new research.

1.3 Approach Report

To develop the tool the design method of Nigel Cross (Cross, 2000) is used, which identifies four stages of developing a tool, namely; exploration, generation, evaluation and communication (Figure 1). Not many design methods use the concept of communication at the end, but that is exactly why this method is chosen. Because it is crucial for the tool that people can use it and want to use it, communication is the key to success. Therefore we reflect on the value of the tool in the communication stage of the research, while we conclude on the main findings of the research. Attached to this report a separate user guide is provided to help the process manager using the tool. This user guide can be seen as a part of the communication stage of this research.

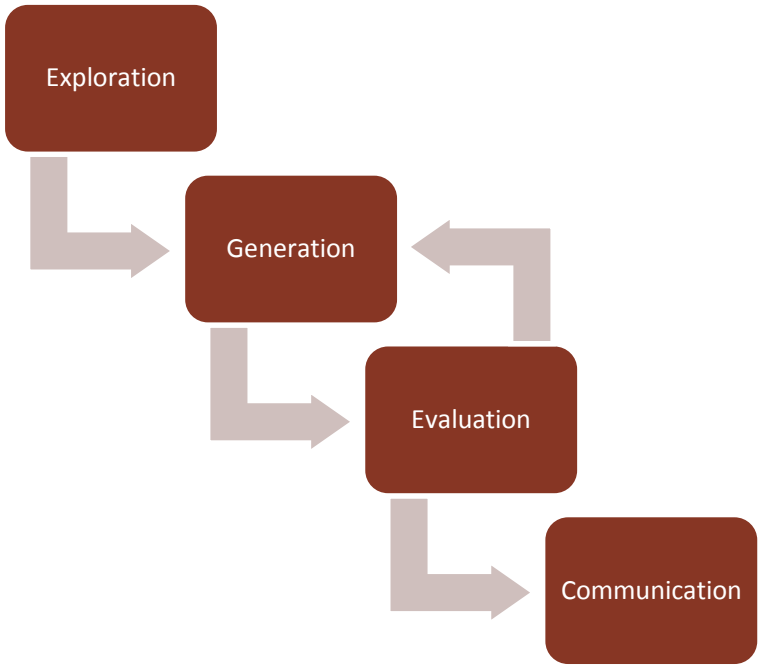


Figure 1 Four Stages of Design (Cross, 2000)

In Figure 2 the approach for this report is shown. In the exploration stage we will take a look at wind-on-land processes to get an answer on the first research question; what are the main aspects that slow the development of wind-on-land projects down? We will analyze the characteristics of wind-on-land projects and identify the barriers for development. Than we identify the products of a typical wind park process and the functions of a process manager. In chapter 3 we will analyze these products in more detail. The business case, the participation plan and the spatial plan will be described and research into their dependencies will be conducted. Together with the main characteristics and barriers this will provide the input for the tool as is shown in Figure 2.

After the input for the tool is described, we will focus on the design of the tool in the generation stage. First we take a look at models or tools we can use and then we define the goals and requirements of the tool in chapter 4. When the requirements for the tool are clear and other input of models is described we describe the actual design of the tool in chapter 5.

When the prototype of the tool is developed, it will be reviewed by actors involved in wind park Deil during interviews in chapter 6. In this evaluation stage also improvements of the prototype and the context of the tool are made.
The communication stage, as was mentioned before, consists of the discussion and recommendations, the conclusions and the reflection on the research, as well as a user guide to help the process manager during the preparations for a wind-on-land decision-making process.

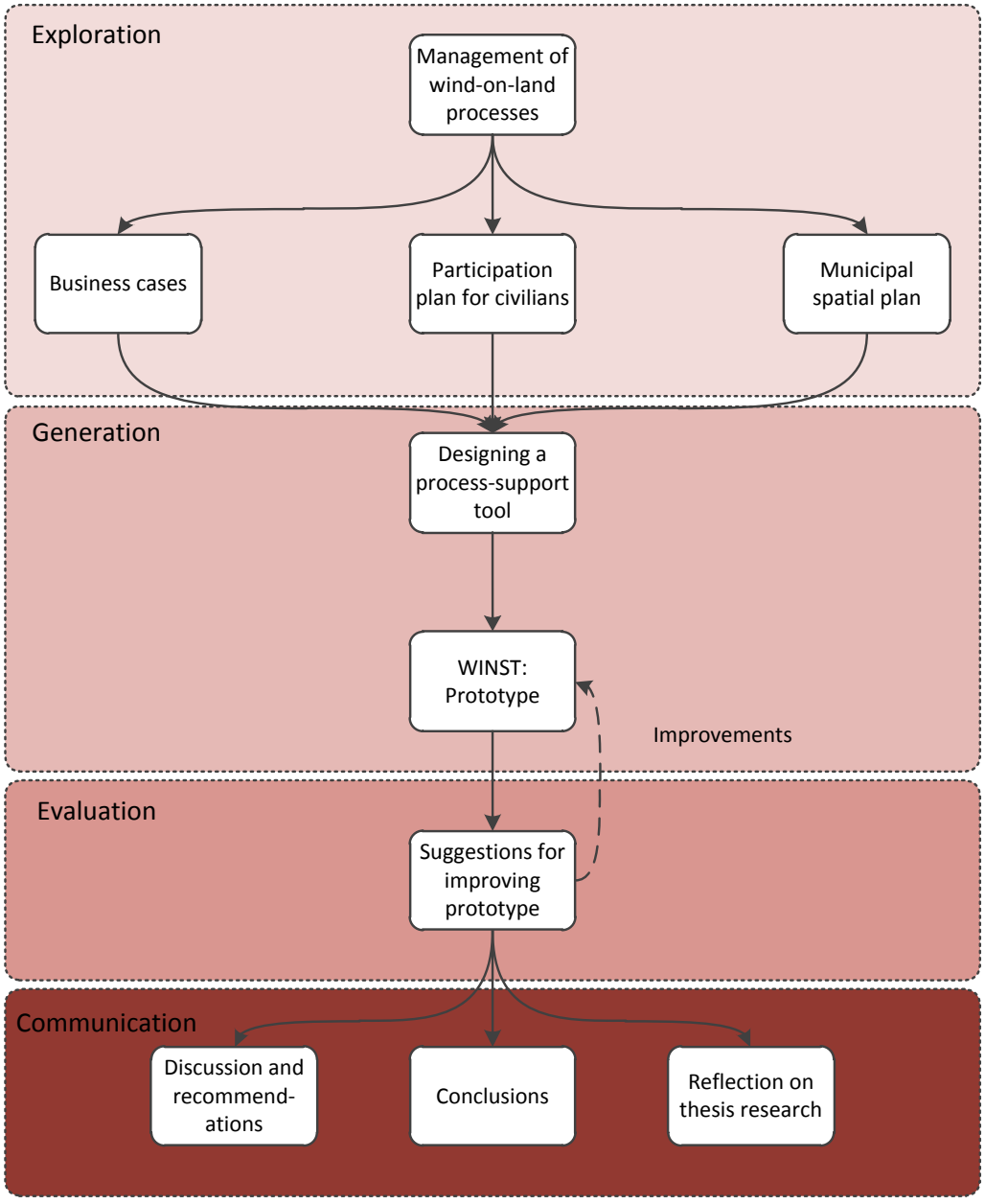


Figure 2 Approach Master Thesis

1.3.1 Research Methods

The development of the tool is based on a theoretical framework developed in chapters 2 and 3. In chapter 4 all input of the first chapters is summarized and preparations are made for the design of the tool. Below the most important research methods used to write these chapters are explained.

Interviews

During the first stages of the research interviews were conducted with several employees of Royal HaskoningDHV. All of these interviewees are involved directly or indirectly with wind parks in the Netherlands and are used as references. In the table below an overview of the interviewees is presented.

Table 2 Interviewees of Royal HaskoningDHV

Interviewee	*Relation to wind parks*
Wim van Lierop	Expert on MER reports (including wind park projects)
Joris Truijens	Structural engineer for wind parks
Mark Groen	Author of the *Windvisie Gelderland,* expert on (plan)MER wind parks
Marco Karremans	Expert on financial issues and financial participation wind parks

Reporting on meetings

My internship at Royal HaskoningDHV gave me the chance to attend multiple negotiation rounds in the decision-making process of the development of wind park Deil and other wind park related meetings. During these meetings I was using participant observation as the method to make a thorough analysis of what happened during the decision-making processes. Becker & Geer (1957) explained this method as follows: "*By participant observation we mean that method in which the observer participates in the daily life of the people under study, either openly in the role of researcher or covertly in some disguised role, observing things that happen, listening to what is said, and questioning people, over some length of time."* In the report the meetings are used as the input for the text boxes with case examples. In the table below the meetings I attended are displayed.

Table 3 Meetings during Internship

Date	*Type of meeting*
11-02	Internal meeting wind-on-land RHDHV
10-03	NWEA (Dutch wind energy association) day on participation methods
12-03	Negotiation round wind park Deil
09-04	Negotiation round wind park Deil
24-04	Civil meeting (ambtelijke bijeenkomst) on wind park Deil
28-05	Communication work group wind park Deil
17-06	Communication work group wind park Deil
03-07	Negotiation round wind park Deil

1.3.2 Method for Reviewing: Interviews

After the prototype is made in chapter 5, we review the prototype, as described in Appendix 9 and 10. All actors currently involved in wind park Deil will review the prototype, so it can be improved. Also the two process managers of Royal HaskoningDHV process managing wind park Deil are interviewed. We will use the interview to see if the tool is useful in the process, what additions could be, if it fulfills the requirements, when it should be used and what possible strategic behavior the tool can invoke. After the interviews are analyzed (section 6.1), we will improve the prototype in section 6.2, so we can present the final tool.

1.4 Readers Guide

The thesis starts with an introduction of the problems occurring during wind park processes and how these problems can be managed in theory in chapter 2. In chapter 3 we analyze the three different products that have to come out of the decision-making process. The choices for the values of variables of these products are the most important choices to be made in the tool by the process manager. The problems and how they can be managed together with the analysis of the products will form the input for the designing of the tool in chapter 4. After that the tool is presented in chapter 5. To review the tool different actors and process managers are interviewed and their suggestions are integrated in the tool in chapter 6. Chapter 7 presents a discussion of the research and recommendations for future research, while chapter 8 presents the conclusions. I chapter 9 a reflection on the research and writing a Master Thesis is presented.

2. Decision-Making in Wind-on-Land Projects

Due to the different land owners, municipalities, project developers and citizens all having their own goals and power, there is not one actor that can develop a wind-on-land project using a top-down approach. In several wind park projects, such as Deil and Dronten, a process approach of developing a wind park and making decisions is used. Process management is the opposite of project management and is used in networks instead of hierarchical systems. The difference between a hierarchy and a network is presented in Table 4.

Table 4 Hierarchy versus network (ten Heuvelhoff, de Bruijn, & in 't Veld, 2010)

Hierarchy	*Network*
Dependence on superior	Interdependency
Uniformity	Pluriformity
Openness	Closeness
Stability, Predictability	Dynamic, Unpredictability

In a hierarchy a project approach is applicable as the system is controllable and all the aspects of a project are well-known. A superior can instruct his employees or other organizations and can manage the project in a top-down manner. In a network a process approach is more useful, because it embraces the complexity of the system. It focuses on the process of decision-making, because a clear-cut solution to the problem is not available, which is explained in more detail in Appendix 2. Therefore the process management approach focuses on interaction between the different actors to come to a good foundation for a solution.

The relationship between a province and a municipality can be seen as a hierarchy, but the municipalities themselves clearly are acting in a network. Therefore in several recent projects a process approach is used, such as in the Deil case. In the Deil project no real progress was made for 10 years, as the project developers used a classic project approach, but including the most important actors in a process is leading to more agreement between the actors and most likely a final agreement in the foreseeable future. In this research the process approach during the decision-making process will be analyzed.

2.2 Wind-on-Land Processes in the Netherlands

We can identify different phases in the wind-on-land development process that go from the pre-feasibility phase to the operational phase as is shown in Figure 3. We describe what the different phases include.

Figure 3 Phases of Wind-on-Land Development Processes (Karremans, 2013)

Pre-feasibility phase - In the pre-feasibility phase the *gebiedsvisie* and the *ruimtelijke visie* are made. This means that in this phase wind energy is introduced to the municipalities, the identification of possible locations is made, a concept business case is made and the role of the municipalities is analyzed. At the end of this phase *B&W* is approving the plans, followed by the *Gemeenteraad* with their vision on wind energy. At this point the municipality can state that they want to get a wind park, but only if citizens and local companies can participate (Karremans, 2013).

Feasibility phase - In this phase it is important to analyze the feasibility of the projects on the location, the financial situation, possibilities for participation and the role of the municipality. This is primarily done by the project developers, who try to make a business case for the specific location. At the end of this phase the approach for the project is presented. This approach includes all facets of the project and is therefore the guideline for the rest of the project.

Scoping phase - In the scoping phase all the tasks are identified that have to be carried out during the process. Also the information needed for all these steps is gathered. The scoping phase involves identifying stakeholders, doing environmental research and set up environmental review standards, doing a risk analysis and investigating participation strategies.

Definition phase - In the definition phase all the contracts are signed, so all the tasks are specified. All the actors know after this phase what their part of the project is. Arrangements are made about the financing methods, the technical characteristics of the project and the way to get the permits needed for construction. In this phase the most important and fundamental decisions are made for the wind park.

Realization phase - In the realization phase the actual wind park is constructed. But before that the permitting process is finished in the same phase. This means that all the arrangements between the actors that are made in the previous phase, are executed in this phase.

Operational phase- The operational phase is about running the wind park. For instance the selling of electricity and the maintenance of the wind turbines are part of this. Clear arrangements have to be made in the definition phase to be sure that no problems arise during the operational phase of the wind park.

2.3 Focus of the Research

To develop a wind park in an efficient way, so keeping the speed and all actors on board, a process manager has to deal with the complexity of a wind park project. First it is important to look at the process we are describing in more detail in Figure 3. In this figure the different steps of the process of realizing a wind park are shown in the different blocks. The scope will consist of the feasibility, scoping and definition phase. In the pre-feasibility the allocation plans of the provinces and the national government are made and this is left out of the scope. The realization phase and the operational phase are left out of the scope, because the decisions about these phases are already made in the feasibility, scoping and definition phases, which will be the subject of this report.

At the end of these three phases the three products, shown in Figure 4, will be defined to get to the municipalities for permitting. The municipality will value the quality of the three products to make sure if it fits their goals and regulations. After the permitting is done and there are no objections left that block the permitting, the project developer can go through to the realization phase.

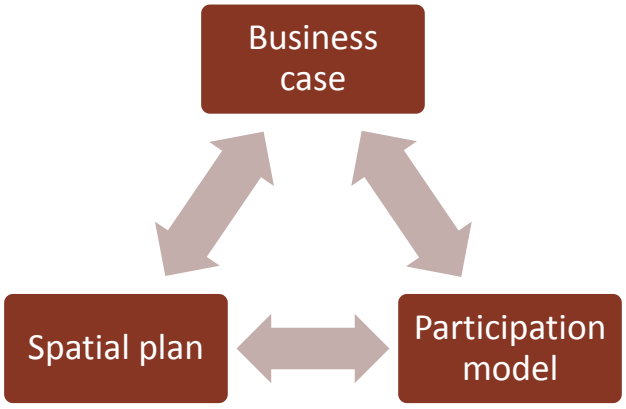


Figure 4 Products of Decision-Making Process for Wind Parks

The business case product does not only include the business case of the project developer, but also the potential business cases of the land owners, the citizens, local companies and the municipalities. This is closely related to the participation model in which the options for local actors to participate in the project are designed. The spatial quality of the wind park is strongly influenced by the locations and the technical characteristics of the wind turbines and these aspects have also a strong influence on the business case. The three products are analyzed in detail in chapter 3.

In recent projects, such as Deil and Nijmegen, actors tried to integrate the process of decision-making for these three products to come to a faster and more supported outcome for the process. When integrating these three processes the negotiation table also becomes larger, because now provinces, municipalities, citizens and land owners all have stakes in the process. By combining these processes and actors the goal is to reduce opposition by incorporating potential opposition in the process and in that way reduce the time to develop a wind park.

Wind parks differ not only from one singular wind turbine to hundreds of wind turbines, the processes of development differ as well. In the table below we see the characteristics of the wind parks we will be looking into in this research.

Table 5 Type of Wind Parks

Factor	*Focus*	*Explanation*
Size	5-100 MW	Below 5 MW a wind park is most likely one or two wind turbines, which makes the project less complicated. Above 100 MW the central government will decide with an *Inpassingsplan* and in that case the whole process changes.
Phase	Process has to be started already	The project doesn't have to be finished to be interesting to research. The process has to be started, because otherwise it is only a plan and there's nothing to research.
Participation	Participation has to be an option	In some projects participation is not an issue, because for instance the land is owned by one project developer and not a lot of citizens are close to the wind park.

The three factors mentioned in the table above define the scope used to look at projects that might be researched. Before we can look at the problems of wind-on-land processes we have to identify which projects we are looking at. We looked at different well-known wind parks in the Netherlands and set up a list with their characteristics (Appendix 1).

Table 6 Wind Park Comparison

Wind park	*Capacity (MW)*	*Phase*	*Participation*	*Useful?*
Deil	37,5	Decision-making	Yes	Yes
De Drentse Monden-Oostermoer	175,5	Preparing	Yes	No
West Brabant A16	200	Preparing	Yes	No
Houten	6	Finished	Yes	Yes
Dedemsvaart-Zuid/Ommen-Noord	30	Preparing	Yes	No
Dronten	13,8	Decision-making	Yes	Yes
Goerree-Overflakkee	200 (uitbreiding)	Decision-making	Yes	No
Zuidlob	121,3	Finished	Yes	No
Barendrecht	30	Preparing	Unknown	No
Nijmegen	15	Decision-making	Yes	Yes

As we look at the table above, we see that four wind parks are within the scope of this research. The others are excluded because several provinces plan to build large wind parks or the parks are too early in the process to be considered. The four wind parks that will be used as case examples in this research are: Deil, Houten, Dronten and Nijmegen.

2.4 Complexities of Wind Park Projects

Most previous projects went through the different phases (Figure 3) using a project approach (Oskam, 2014). This led to much resistance of local actors, because they were not included in the process and the project had negative effects on their living situation. In these phases a process could be designed by a process manager to align the positions of the different stakeholders and to come up with solutions to the complex technological, social and institutional issues. The development of a wind-on-land project is complex in multiple ways:

Technical Complexity

Wind turbines are a proven technology, but the choice between different types of wind turbines has a great influence on the local acceptance of the wind park. The local acceptance is depending on the characteristics of the wind turbine, such as the noise, the height, the shape and the cast shadow (Wolsink, 2000). The choice for size and power of a wind turbine is also important for the business case of a wind park. The potential of wind energy and thus the profitability is depending on the location of the wind park.

The technical design is depending on the institutional space laid down in regulations by the government about for instance the distance to houses and nature reservation areas. The potential wind park is also constrained by the dense population and infrastructure in the Netherlands. The constraints come from regulations for safety about the distance between houses and infrastructure to a wind park and from the complaints of local inhabitants that can cause financial claims. This can in turn make the business case less profitable. Therefore the technical design, although wind turbines are a proven technology, is still a complex part of the project.

As described by (Wolsink, 2000) the impact of a wind park on the region and the inhabitants is a serious problem. Many initiatives are delayed by citizens using their blocking power, because they anticipate that wind parks will affect them negatively. Civilians have blocking power, because of the changes that have to be made in the allocation plan of a municipality to make room for a wind park. Spatial issues are important, because of the Netherlands being densely populated. Even when a possible location is found within the network of cities, highways and nature, there are still people living close to or on the potential location. Local acceptance appears to be the key to reach the 2020 objective (Krens, 2011).

Box 2.1 Case example - Deil

The location of the potential wind park at Deil is bounded. A crossing of two highways, a train track, gas pipes, farm land and houses are located. This restricts the height, the number of wind turbines, and thus the potential electricity produced. Also the technical design has to deal with potential environmental impacts on a nearby protected nature and housing areas. The design must prevent that several radar signals may be disrupted by the wind park. On top of that landscaping of the wind park has to match with the surroundings. (RHDHV, 2014)

The different land positions of the project developers are indicated with the colored areas. The different restrictions from for instance gas pipes and roads are indicated by the areas with lines and bullets. The red dots with the brighter areas indicate the houses and their area surrounding it. When the wind turbines are within this area the households will faces issues like cast shadow and noise. This illustrates the complexness of the technical issues surrounding the construction of a wind park.

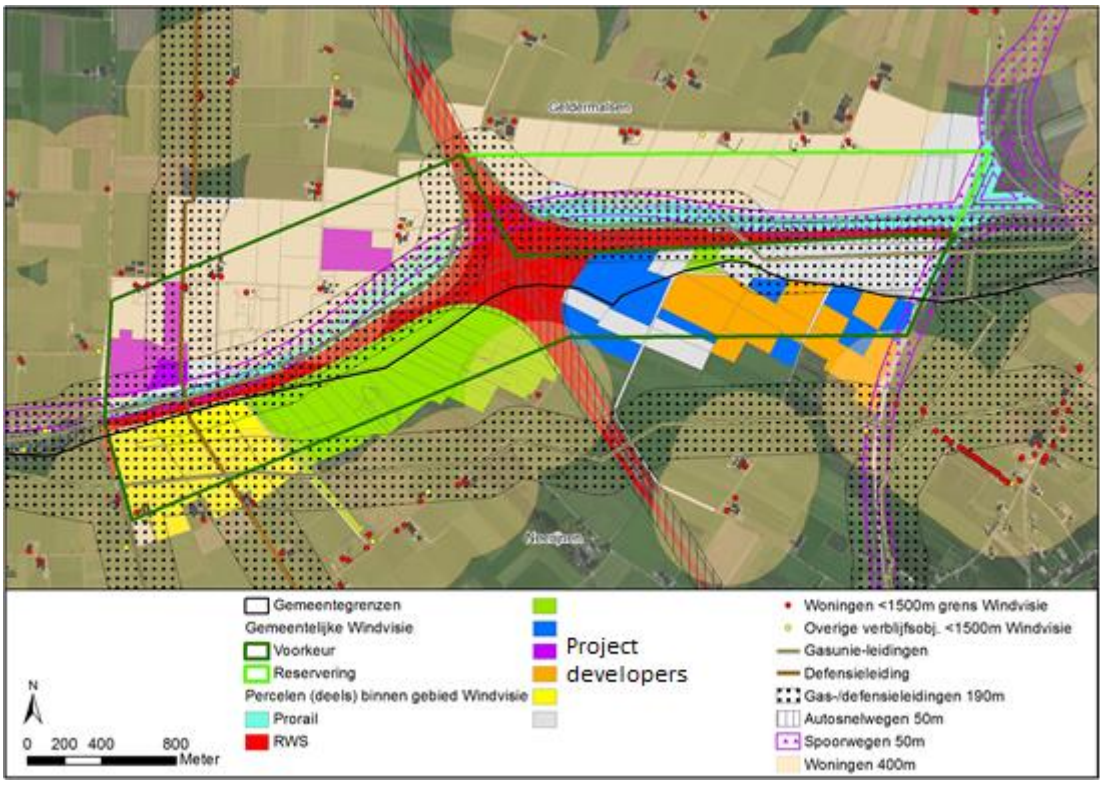


Figure 5 Map of wind park Deil (HaskoningDHV, 2014)

The example in Box 2.1 illustrates the technical complexity perfectly. Although the locations are designated by the provinces as potential locations, still numerous issues arise when building a wind park at such a location. This is due to the dense population and infrastructure of the Netherlands.

Institutional Complexity

First of all the existing institutional design is complex. For instance the *Structuurvisies* of the provinces point to locations suitable for wind energy, while this is not always communicated beforehand with the municipalities. This can create friction between project developers and municipalities and between municipalities and provinces. Another example is the complex regulation about compensation for citizens in close range of wind turbines (*Planschade* regulation). This regulation creates uncertainty for the project developers; what will this compensation cost and how much people have the right on this compensation? Also the citizens are faced with uncertainty; how to get compensated and how much will cover the loss in value of my house (van Lierop, 2014)?

Project developers often want to compete for a location as a consequence of the lack of available sites, as is shown in Figure 5. The project developers need a permit for the development of a wind park and in most cases the Municipal Development Plan (MDP) has to be changed by the municipality. The permit has to be granted to the project developers by the municipality, so the municipality has to make a choice between the plans the different project developers hand in. This creates a problem for the municipalities as they might not have the knowledge to determine which plan of which project developer is optimal for the location. This problem is exacerbated by the fact that potential locations for wind parks are often on the borders of municipalities as these are open spaces or rural areas (Oskam, 2014). The neighboring municipalities might have other goals or levels of experience, which makes this another difficulty for the development of a wind park.

An extra problem here is that the different project developers all start with securing their land positions by offering contracts to the land owners (van Santen, 2014). This fixes the positions of the project developers even before they can communicate with the other actors. A consequence can be that project developers buy land so close next to each other that there is no physical way that they can both develop a wind turbine (Figure 5). Also the power and interests of the actor changes radically when he is the owner of land. Not only because he has a lot of possibilities to build a wind park, but also because he made a considerable investment.

On the other hand for every wind-on-land project, new institutions have to be constructed. Contracts can be made between project developers or a company can be a way for project developers to work together (section 3.3.5). Compensation can be given to citizens, but also financial participation of citizens and businesses in the area can be a good way improving the local acceptance. Agreements between project developers and municipalities might be created to ensure that part of the money earned by wind turbines flows back in the community. The development of these new institutions between all kinds of different actors is adding much complexity to the development of a wind park.

To finance a wind-on-land project a lot of different financial arrangements are needed. Land owners have to be paid, the municipalities have to be paid for the permitting, and citizens surrounding the wind park can be compensated. Also the cooperation between project developers is an important financial arrangement that has to be designed.

The more innovative part of the financial arrangements is the financial participation of citizens in the wind park project. This participation can take multiple forms, like obligations, shares, setting up an own initiative that participates, etc., as is analyzed in section 3.3.4. Also compensation for the community such as lower electricity prices and a fund that engages in local projects are options to increase the local acceptance of a wind park. All these financial arrangements have to be considered in the process from initiation to permitting of a wind park. Multiple authors state that financial participation of local actors positively influences the local acceptance, such as in (Breukers & Wolsink, 2007), (Jobert, Laborgne, & Mimler, 2007) and (Krens, 2011). Financial participation can lead to participation in the process of decision-making which can create uncertainty among project developers about the influence of the other actors in the project.

The social complexity comes mainly from the interaction between the project developers and the local actors. This is a delicate relationship and is hard to influence positively. Some local actors act with a strong NIMBY-character (section 3.3.1) and a first step to decrease this behavior is to have

clear communication (Appendix 5). Participation might lead to social problems between the participating citizens and the non-participating citizens and eventually lead to problems for the whole project, which happened at the wind park in Houten (Houten, 2014).

Box 2.2 Case example – Houten

In this case three wind turbines were constructed in the municipality of Houten. After construction multiple problems arose. 800 citizens surrounding the wind park claimed compensation for the lower value of their houses (RTV Utrecht, 2013). Other citizens claimed that the noise of the wind turbines so much that they demanded the project developer to shut the turbines down at night (Gedeputeerden windpark Houten, 2013)

Social or actor complexity is also very much an issue in the relationships inside and between the other actor groups. For instance the project developer or project developer group consists of very different actors, such as large private companies, one-man-companies, civilian initiatives and public organizations.

2.5 Problems in the Decision-Making Processes

In wind park projects in the Netherlands we see the following problems: a lot of projects are never finished and the ones that are finished take a long time. This is mainly caused by the decision-making processes and not by for instance the construction time of the turbines, which can be clearly seen in the Deil case (van Santen, 2014) and the Houten case (Eneco, 2014). We will discuss the most important causes of this problem in this section. We will use case studies to illustrate why these factors cause the problems mentioned.

Lack of Trust

Koppenjan and Klein (2004) state that trust between the different actors is the most important factor influencing the outcome of a process. In different cases, such as Houten (Box 2.4) and Deil (van Santen, 2014) we see that the actors have a strong feel of distrust against each other. This distrust is caused by different aspects, such as the absence of clarity about goals of actors and the lack of communication between actors. These two aspects cause for instance citizens to feel distrust against project developers, as they will earn money while the citizens are facing the downsides of the wind park. Project developers on their side tend to feel that the citizens are blocking wind parks because of feelings of frustration or NIMBY-behavior. It is important to note that the absence of clarity about goals of actors is not necessarily caused by the unwillingness of actors to be clear about their goals, but it can also be caused by the lack of clear, well defined goals. Especially inexperienced actors might not have their goals clear for themselves at the beginning of the process.

The length of the process only makes the lack of trust grow further as actors get frustrated by the behavior of other actors. Therefore it is harder to process manage a process that already has a long history. The lack of trust between actors might frustrate the negotiation process in such a way that little or no progress is made. If issues of trust are not solved during the development of a project, this can lead to problems after completion of the project, as is illustrated in Box 2.4.

Box 2.3 Case example – Houten

After the project was developed, the distrust between citizens on the one hand and project developer and the municipality on the other hand got even larger. Opposition was caused by the influence of the wind park on the house prices and the noise of the turbines. The level of noise was experienced higher by the citizens than research predicted. Citizens expect their house prices to drop, because of the noise by the turbines and the spoiled view. Because the citizens believe that the municipality and the project developers act together they do not trust the "independent" research into the effects of the wind park (Gedeputeerden windpark Houten, 2013).

Lack of Information

Klaassen (1995), ten Heuvelhoff, de Bruijn & in 't Veld (2010) and Koppenjan & Klein (2004) indicate that adding information to the network is a key function the process manager has to fulfill. The actors involved in a wind park all have different backgrounds and professions. Therefore the level of knowledge and information is not evenly spread among these actors. This creates friction during the negotiation process when actors cannot participate in the discussion or ask questions that are obvious for other actors (van Santen, 2014).

Although this is a problem, an even bigger problematic aspect of these processes is the fact that the interaction between the different actors is lacking. Each actor has specific information about an aspect of the wind park development process, but, because of the distrust mentioned earlier, it seems to be complicated to share this information. Therefore the interaction between different decisions is hard to grasp. What does a choice for a higher wind turbine mean for the landscaping of the wind park in its surroundings or the number of affected households? This kind of questions can be answered in a better way when the information that is available is shared between actors.

The lack of information is also present in the governmental policies on wind park development. If policies are clear and stable this can be a solid base for making a business case. Also the information provided by municipalities on spatial quality is lacking substance in many cases. This causes extra uncertainty and distrust between mainly the project developers and the municipalities.

Different Language

The actors have different backgrounds as was mentioned before and this causes another problem for the process. We use the term different language to indicate different jargons of the actors, but also the topics they focus on during negotiations. Ten Heuvelhoff, de Bruijn and in 't Veld (2010) mention enriching problem definitions and solutions as an important task for a process manager. The language the actors speak is different, because they see the wind park project from another perspective. The project developer sees a business case, the municipality sees spatial plans and local support and the civilian sees local environment and participation. Therefore communication is focused on their own goals and means, which makes the negotiation like a meeting about various different projects. To come to a solution an interaction has to be found between the different aspects to see where a good solution can be found.

Box 2.4 Case example – Deil

At the start of a negotiation round three actors were asked to present their vision on the most important issues that had to be solved in this wind park process. The project developers presented their business case and showed what the available variables were. The municipalities showed what the spatial plans had to be adjusted and what ways there are to do it. The civilian initiatives showed what kind of regional plans could benefit of the wind park and what participation options were available. (van Santen, 2014)

This example illustrates that the perception of the problem can be very different among actors involved in the same project. The problem of the difference in language can be decreased by making the goals more explicit and by providing information so the knowledge levels of the actors are closer on multiple topics.

2.6 The Complex Task of the Process Manager

To reduce the problems of section 2.5 the approach of the process manager can differ in projects, but several authors listed the generic tasks of the process manager. We start by analyzing these different views and then we will discuss their overlap and what this means for wind power projects. In this section we will discuss the views of Klaassen (1995), ten Heuvelhoff, de Bruijn & in 't Veld (2010) and Koppenjan & Klein (2004). We combine the views of the different authors to get a complete view of the functions of a process manager. This will be used in section 6.4, in which preliminary assumptions for the tool are made, and in section 6.5, which describes the program of requirements of the tool.

In the following chapters of this research we will use the term process manager for the process manager and the process architect as being the same. The process architect designs the process and the process manager executes that process design and steers when it's necessary. We see this as the same task as the process design can be adapted constantly during a process, so we will use the term process manager from now on.

The authors use different concepts to describe the work of a process manager; Klaassen uses functions, ten Heuvelhoff et al. use arguments for the introduction of a process manager in a process and Koppenjan & Klein use strategies of a process manager (Appendix 3). Although these concepts are quite different, we could see an overlap between many aspects mentioned, as is shown in Table 7. The combination of the views of the three authors is developed in the form of functions, as this can be used as input for section 6.5.

Table 7 Combination of the views of (Klaassen, 1995), (ten Heuvelhoff, de Bruijn, & in 't Veld, 2010) and (Koppenjan & Klein, 2004)

Nr.	*(Klaassen, 1995)*	*(ten Heuvelhoff, de Bruijn, & in 't Veld, 2010)*	*(Koppenjan & Klein, 2004)*	*Combination of views*
1	Bring balance in the arena	De-politicizing decision making	Fix actor positions	Bringing balance in the arena
2	To act as a countervailing power	Enriching problem definitions and solutions	Influence network information	Influencing information about effects of solutions
3	Make sure that there	Support	Change actor	Influence actors

	is support		positions	to gain support
4	Keep the information open for all the actors	Transparency in decision making	Change access rules for games	Openness of information in rules
5	Make the financial room to maneuver explicit	Reducing substantive uncertainty		Reducing the uncertainty by adding information
6	Make sure actors get compensated		Add actors	Add the actors with little influence, but who experience downsides
7	Look and propose solutions for nature that can get affected			Look and propose solutions for nature that will get affected
8		Incorporating dynamics	System changes	Incorporating the dynamics to coop with system changes
9			Enhance self-regulation	Enhance self-regulation

As is shown in the figure above there are nine unique functions a process manager has to fulfill to come to a good process. These functions will be used to develop requirements for the tool in section 4.2.

2.7 Conclusions

The focus of the research described in section 2.3 means that we can research the different products of decision-making, as we know that we will be looking at the municipal spatial plan instead of the provincial spatial plans, at multiple business cases of the most important actors instead of one business case and at the participation plan for civilians. This will provide structure to the complexity of a wind park development project and can provide structure in the tool. By using the three products the results of the tool will be easily can be easily linked to the products that have to be delivered to the municipality.

The problems during the wind-on-land decision-making processes are the lack of trust, the lack of information and the different languages. A process manager has the task to reduce these problems to speed-up the process, while keeping the involved actors on board. This task is complicated not only because of the problems themselves, but also because of the complex issues that have to be solved during the process. A tool should help to give insight in the complexity and help to mitigate the problems during the decision-making processes.

After identifying the nine functions for the process manager we can conclude that process management is complex and a tool will most likely not help to fulfill all of the functions of the process manager. We will have to make a selection in the functions, so the functions can help to develop the program of requirements. The development of requirements for the tool will be done in section 4.2, using the functions of 2.6 as input.

3. Three Products of Decision-Making

At the end of the decision-making process three products have developed; the spatial plan, the business case and the participation plan. We describe the most important aspects of these products and conclude with the links between the different products.

3.1 Municipal Spatial Plan

The development of a wind park has a significant impact on its surroundings and therefore the project developers have to develop a spatial plan that has to fit in the plans of the municipality for the area. In most cases the municipality has to change their Municipal Development Plan (MDP), because most municipalities have no land designated to wind parks. Therefore the project developers have to develop a plan that shows what the effects of the wind park on its surroundings are. In many cases also the province has a plan for the region, so the spatial plan of the project developers has to fit in that plan too. Without the approval of the municipality with the spatial plan, no change will be made in the MDP and no wind park project can be started.

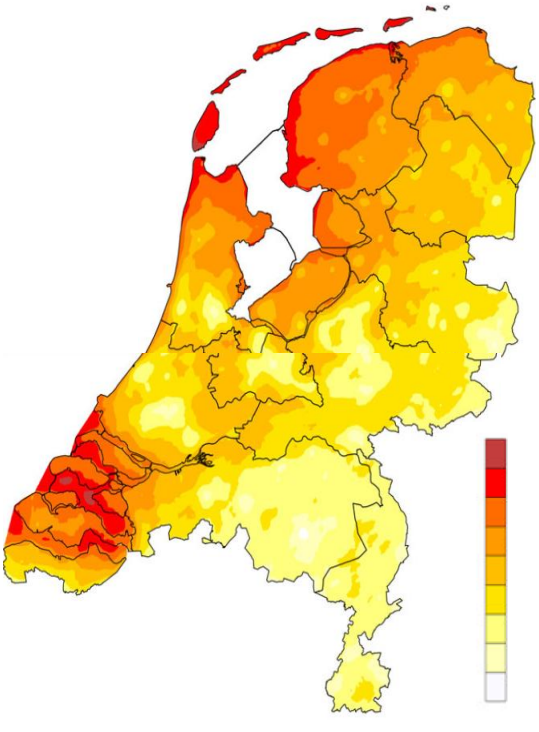
Box 3.1 Case example – Deil

In the Deil case two different spatial plans are important for the project developer (van Santen, 2014). First his spatial plan has to be aligned with the plans of the province and then the local MDP has to be changed. Both should be done by "fitting" the wind park in the surroundings. This description is quite broad and therefore along with other negotiations on the wind park, different actors try to force the municipalities and the province to make their requirements more explicit.

As is illustrated by the case example the requirements for a spatial plan are not very clear. It is important to note that the requirements can differ between municipalities and that is why we describe the technical characteristics of wind parks and the regulations that are in place for all cases.

3.1.1 Technical Characteristics of Wind Parks

To decide what kind of wind turbine is ideal for a location, it is important to look at the potential of wind energy on that location. The amount of *vollasturen* has a huge influence on the outcomes of the business case (Veghel, 2013). A *vollastuur* or a full load hour is an hour in which the wind turbine produces at full power. In Figure 6 indications for the amount of *vollasturen* are shown, which can be used to estimate the amount of electricity provided by a wind turbine on a certain location.



Wind speed	Vollasturen
< 7 m/s	2.200
7-7,5 m/s	2.400
7,5-8 m/s	2.600
8-8,5 m/s	2.800
> 8,5 m/s	3.000

Figure 6 Wind speed map (AgentschapNL, 2014)

From this figure we can conclude that in coastal areas the wind speed is the highest and in the rest of the country the differences can be quite dramatic. In this figure the wind speed is measured for a wind turbine with a height of 100 meter. This has a huge impact on the business case of a potential wind park (AgentschapNL, 2014). As the wind speed rises in most cases when you reach a higher altitude, the wind speed is very much defining the type of wind turbine.

Type of wind turbine

The type of wind turbine is strongly determining the amount of hinder that citizens will face after the wind park is developed. The small wind turbines in the earlier years of wind turbine development didn't face much opposition, but the wind turbines with a height of 100 meters or more can have a significant effect on its surroundings.

As the wind speed rises when you reach a higher altitude, the wind speed is very much defining the type of wind turbine. When the wind speed is lower, the wind turbine has to be higher to get a viable business case. Looking at Figure 6 we can conclude that the wind speed in the coastal areas is much higher than in the other areas. This makes the coastal areas good locations for wind parks, as can be seen by the wind parks of the Noordoostpolder, Flevoland and the plans for large wind parks in Friesland. The height of wind turbines can get up to 180 meters, but a normal height for the Netherlands is between 80 and 130 meters. When a wind turbine gets higher it will cost more to build it, so if a wind park can be positioned in a high wind speed area this will make the business case for the project developer much more attractive. A larger rotor diameter also raises the amount of electricity that can be produced by a wind turbine. Normally a higher wind turbine has a larger rotor diameter, simply because there is more space for the rotor. The combination of a higher wind turbine and a larger rotor diameter can exacerbate the problems for the citizens in the municipality. The problems are listed in the figure below.

Table 8 Problems caused by wind turbines

Problems	*Actors involved*	*Caused by*	*Increased by*
Noise	Local residents	Air moving around the rotor blades	Difference in wind speeds, higher turbines and larger rotor blades
Cast shadow	Local residents	Sun casting a moving shadow on the surrounding area	Higher turbines and larger rotor blades
Horizon pollution	Citizens	Turbines interfering with the view of citizens on the surroundings	Higher wind turbines, no line set-up, no three rotor blades, unequal turbines
Reduced recreational value	Citizens	The three problems mentioned above only now lowering the value of a recreational area.	Locations of wind turbines, height and size rotor blades

The noise of a wind park is subject to rules of the government, mentioned in the adjustment of the environmental rules on wind turbines (Huizinga-Heringa, 2010). A wind turbine cannot make more than 47 dB per year, measured on the outer walls of a house. At night this cannot be more than 41 dB. On a façade with windows cast shadow cannot be received for more than 17 days a year for at least 20 minutes (Rijksoverheid, 2014).
On top of the problems mentioned above it is important to look into the local barriers for the wind park. These local barriers are different for each wind park, but can range from railroads to radar signals. These barriers have to be researched thoroughly to come to the available plot for the wind turbines within the available land. In this research we will leave this aspect of the spatial plan out, because this forms the starting point for the technical research and is therefore more a boundary that is hard to change. There are always options to for instance change gas pipelines to make room for the foundation of a wind park (van Lierop, 2014), but that will not be in the scope of this research. Apart from the type of wind turbines the set-up of the wind park is also very important for the spatial plan. For the positioning of wind turbines there is guideline available of the province of Flevoland in which currently the most wind turbines are installed (Grutters, Vreugdenhil, van Huissteden, & Menting, 2011) . The following design principles were developed:

- Wind turbines have to be constructed in a line.
- Singular wind turbines should not be constructed.
- Ample distance between two lines.
- A line has to consist of the same type of wind turbines.

Constructing the wind turbines in a line will give a calm spatial integration. The line can be used to mark a change in scenery, such as the distinction between sea and land. Singular wind turbines should not be constructed, because they disrupt the view. In Flevoland for instance it is common to have a minimum of 7 wind turbines in a line (Grutters, Vreugdenhil, van Huissteden, & Menting, 2011). If there is not enough distance between two lines, the view gets disrupted, because the two lines seem to interfere with each other on the horizon. The set-up of the park has to consist of the same type of wind turbines, so the same height, rotor diameter, direction of rotation and number of rotors.
Following these principles and taking the problems mentioned in Table 8 into account a spatial plan has to be developed for the wind park. This spatial plan will be influenced by different regulations, discussed in the next section.

3.1.2 Spatial Planning Regulation

The most important regulations for the spatial planning of a wind park are; the provincial spatial planning, the MDP and the *Planschade* regulation.

Provincial spatial planning

The province sets up a *Structuurvisie* as a guideline to connect national, provincial and local policies. Among else it is used as a way of checking a new or changed MDP. A couple of provinces changed this *Structuurvisie* into a *Omgevingsplan* in which the policies for the environment and spatial planning are described more in-depth. A *Structuurvisie* as well as a *Omgevingsplan* is not judicially binding. It is possible for project developers to let the province change its plans as is illustrated by the example below.

Box 3.2 Case example – Dronten

The location for the wind park in Dronten was not available for a line of wind turbines as the province thought the area needed to stay open. After a lobby of the project developers at both province and municipality level the attitude changed and the wind park was seen as a pilot project and was incorporated in the *Omgevingsplan* of the Flevoland province (Kubbeweg, 2014).

MDP

When the project developer delivers a plan to the municipality, the municipality can decide to change the function of the specific location by making a change to the MDP or local zoning plan. Such a change may be from 'agricultural use' or 'grassland' to 'wind mill park' or 'industrial zone'. In a MDP all the land within a municipality gets a land-use function, but in most cases a municipality didn't anticipate for a wind park in their MDP. To be approved a plan has to include a spatial plan, a business case and a participation plan in many cases and in any case a MER-report. On basis of the MER-report and the other pieces the municipality will make its choice to grant the building and the environmental permit (Kubbeberg, 2014). The process of changing a MDP in theory takes multiple months, but in reality can take many years, as is illustrated in Box 3.3.

Box 3.3 Case example – Dronten

In Dronten the municipality developed a vision for wind energy to be able to construct more lines of wind turbines instead of singular turbines (Kubbeberg, 2014) . This was to improve the view on the wind turbines as is described in the previous section. After that the changes to the MDP took over ten years, because the local opposition kept on objecting to the changes.

In the case example above it is clear that although the municipality can be behind the project, local opposition can easily frustrate the project. The process approach described in this report has the goal to lower this opposition.

Planschade

The *Planschade* regulation for compensation of the devaluation of houses is already explained in section 2.3. What is important to add in this section is that the technical characteristics highly determine the amount that might have to be paid to the directly local residents. When the wind turbines are not aligned, higher or closer to houses this can increase the height of the compensation. Therefore it is important to estimate the amount that can possibly be paid and how this changes between different plans.

3.2 Business Cases

When the pre-feasibility phase is finished and the locations for possible wind parks are identified, the project developers start to secure their land positions. With that they start making their business cases. Traditionally the only business case that is developed in great detail is the business case of the project developer. If the decision-making for the wind park is done with a process management view the business case of other actors are important as well.

3.2.1 Multiple Business Cases

In the tool we will include the business cases of the most important actors. The table in Appendix 4 lists all actors and provides information about their interests. To analyze for which actors a business case will be developed in the model Table 9 is developed. This table is developed from the eye of the process manager, who has the task of bringing the actors together to develop a wind park. Therefore there is a difference between the actors that share the viewpoint of the process manager more or less and the actors that have a different viewpoint. The actors that possess resources that are essential for the problem are indicated as critical in the table (Lei, Enserink, Thissen, & Bekebrede, 2010). The other actors will be indicated as non-critical actors. The determination of the actor to use its resources will determine whether this actor is dedicated or non-dedicated.

Civilian initiatives can represent the citizens in the negotiation process, but it is important to note that this can be problematic, as the initiative cannot represent all opinions in the community. Because not all citizens can be present during negotiations, from now on we assume that the civilian initiatives represent the goals of the citizens.

Table 9 Critical actor analysis (Lei, Enserink, Thissen, & Bekebrede, 2010)

	Dedicated actors		**Non-dedicated actors**	
	Critical actors	*Non-critical actors*	*Critical actors*	*Non-critical actors*
Similar perceptions, interest, and objectives	Project developers, provinces, civilian initiatives, land owners		District/ transmission system operators	KNMI, Army
Different perceptions, interests, and objectives	Municipalities, civilian initiatives, local residents	Local environmental organizations	National environmental organizations	Construction companies, turbine suppliers

The business cases of the critical actors in Table 9 will have to be investigated in this research, although some business cases are far more complex than others. The tool will have to incorporate the business cases of these actors to be useful in the process of decision-making, as these actors will be part of the process.

3.2.2 The Variables of the Business Cases

The variables of the business cases of the critical actors form an important input for the tool, as these variables indicate the viability of the business cases. For some actors the business case is more elaborate than for others, who have a very straightforward business case with only a few variables.

Project developers

The business case for the project developers is well defined in the model of Agentschap NL (Veghel, 2013). The main variables that have to be found to assess the profitability of the wind park for the project developers are presented in the table below.

Table 10 Variables business case project developer

Variable	*Explanation*	*Unit*
NPV	The Net Present Value is the present value of all income minus the present value of all costs.	Euro
IRR Project developer	The Internal Rate of Return is the net rate of return on the investments in the project.	%
Min. DSCR main loan	The Debt Service Coverage Ratio indicates if there are enough operating cash flows for interest and pay off. This is the ratio for the loan of banks/ project developers.	Ratio
Min. DSCR civilian loan	The Debt Service Coverage Ratio indicates if there are enough operating cash flows for interest and pay off. This is the ratio for the loan of citizens.	Ratio

These four variables are most important in giving a quick scan on the business case of a wind park project. The calculation of these values will be left out of this research, as it is already modelled and defined in the Agentschap NL model (Veghel, 2013).

Municipalities

The development of a wind park brings along investments in the municipality and work for the municipality officials. This work has to be paid by the project developer in the form of *leges.* For a small municipality these *leges* can be a welcome addition to the municipal budget. The variables of the business case are already included in the Agentschap NL model (Veghel, 2013).

Table 11 Variables business case municipalities

Variable	*Explanation*	*Unit*
Income of land sold	Land owned by municipality that is sold	Euro
Income of land rent	Land owned by municipality that is rented	Euro
Income of *OZB* (property tax)	A Dutch tax on owners and users of real estate	Euro
Income of *leges*	Costs for extra work for municipality *and bouwleges* on total costs wind turbines	Euro
Income of *Gebiedsgebonden bijdrage*	Project developers can set up a *Gebiedsgebonden bijdrage* that brings a part of the profit back into the municipality	Euro

The income of the municipalities is very case specific and can thus vary significantly. The income of land sold and rent is of course only available when the municipality owns land on the area of the new wind park. When this is not the case, these two forms of income are not available. The income of *OZB* is calculated as a percentage of the Value of Immovable Property (WOZ-waarde). This percentage is developed each year by the municipality council. The Value of Immovable Property is determined by the municipality using a computer model or appraisal (Rijksoverheid, 2014).

The *leges* are less transparent as most of the times municipalities don't have multiple wind parks in their municipality, so these *leges* are determined for the first time. Multiple cases can be found in which project developers question the height of the *leges* (Arnhem, 2012) or additional legislation is needed (Raad, 2014) . In most cases this is about the *bouwleges*, so about the percentage and about

what is included in the costs. *Bouwleges* are calculated as a percentage of the costs of the build of a project.
A *Gebiedsgebonden bijdrage* is an amount of money that the project developer pays to the region, so the region can benefit of the wind park as well. This can go to other sustainable projects, but also to youth, spatial quality or other aspects of which the whole region can benefit.

Provinces
The provinces don't have a business case, unless the municipalities do not grant the necessary permits to the project developer and the project developer takes their permit request to the province. The province can decide to make an *Inpassingsplan* and in that case the province will be paid by the project developers in the form of *leges*, similar to the *leges* for the municipality (van Santen, 2014).

Citizens
Two groups of citizens can be identified around wind parks: the local residents and the rest of the citizens of the region. The local residents may be able to claim a compensation for the lower value of their house following the *Planschade* regulation (section 3.1.2). The compensation of the *Planschade* regulation is determined per individual household (van Lierop, 2014). This compensation is not included in the tool, because of the individual determination of the compensation. Also we couldn't add the compensation easily to the other income, because we would have to take the depreciation of the house also into account. If the *Planschade* regulation would work perfectly the compensation minus the depreciation of the house would mean an income equal to zero. The financial ways of direct participation, such as obligations and shares, will have as performance indicator the IRR. The different forms of financial participation will be explained in the section 3.3.4.

Civilian initiatives
The civilian initiatives don't have a real business case as long as they are not participating financially in the wind park project. They take the role of bringing the citizens together and being the voice of the citizens. So although the civilian initiatives are a critical actor, a civilian initiative business case will not be developed. The option of a civilian initiative developing its own wind turbines will be analyzed in the section 3.3.5.

Land owners
Currently the business case of the land owners is rather simple; the project developer makes a land contract, the land owner signs and when the wind turbine is built the land owner gets an annual amount of money. This can be very profitable for the land owner, as this annual amount can go up to 50.000 Euro's a year, while the land owner can still use the land surrounding the wind turbine (van Lierop, 2014). The land contracts can differ in form from project developer to project developer (van Santen, 2014). Project developers are not open about the form of their contracts.

3.3 Participation Plan for Citizens
To get a permit from the municipalities usually a participation plan has to be handed in together with the business case and the spatial plan, whereas originally these two were enough to get a permit.
Therefore this chapter will explain the characteristics of and the options in a participation plan.

3.3.1 Why Participation?
In recent wind park projects in the Netherlands participation is a key concept, but why is participation necessary for the development of a wind park? First we take a look at other types of

projects with the same forms of opposition caused by NIMBY behavior and then other reasons for participation will be discussed.

NIMBY Behavior

The development of wind-on-land projects in the Netherlands can be seen as a typical NIMBY problem. First we will explain what NIMBY behavior is by using another NIMBY-problem as an example. Then we analyze the NIMBY character of the development of wind-on-land projects.

Box 3.3 Case example – Barendrecht

CCS Barendrecht

In 2007 the first plans were developed to construct a carbon capture and storage pilot project in Barendrecht. This technology would be used to store CO2 from the nearby oil refinery in Pernis in two depleted gas fields under the city of Barendrecht (Feenstra, Mikunda, & Brunsting, 2010).

As is described by (Feenstra, Mikunda, & Brunsting, 2010) the development of CCS in Barendrecht was influenced by a lot of NIMBY behavior. From the point of the presentation of the plans in 2008 the municipalities and the citizens opposed to the plan. Although Shell, as the developer, and the government tried to change the mindset of the people by organizing different information events, but it was already too late. Local politicians already expressed their worries especially the safety of the project and *de Volkskrant* published an article, which expressed the opinions of citizens with quotes as “so many young families live there” and “because people make mistakes” (Feenstra, Mikunda, & Brunsting, 2010). This immediately framed the project in being harmful and dangerous and the long response time of Shell only increased this feeling.

The problem with the CCS Barendrecht was not only that the communication with the municipalities was set up too late, but also that there was not really a lot to offer. So on the process side there was no involvement of the local actors and only some information was given in a later stage. And on the participation side nothing was offered to the local actors to compensate for the risks of the CCS technology near to municipalities (Feenstra, Mikunda, & Brunsting, 2010).

Eventually the CCS project was never constructed, because of the lack of support of the local actors and the enormous attention of the media on the downsides of CCS. Therefore two lessons learned can be drawn from this project looking at wind park projects:

- Wind energy has an important advantage as opposed to CCS, because the financial benefits of wind energy are easier to quantify and thus to distribute among the local actors. This creates a lot more opportunities for the participation of actors and with that more support in the region.
- When starting a project with a strong NIMBY character like a CCS or wind park project it is helpful to start with informing the local actors in an early stage. Than the project developer takes the first step in framing the project and the media or municipalities will have to react on that instead of framing the project as being harmful for the citizens.

In a comparison between five CCS projects in different countries including the Barendrecht project made by the ECN it becomes clear that involving local actors in an early stage by informing them and letting them participate in the decision-making process influences the outcome of a project positively (Ashworth, Bradbury, Feenstra, Greenberg, Hund, & Mikunda, 2010). The three projects that have been executed successfully had a high rate of integration of citizens in the projects, while the two other projects, including Barendrecht, didn’t involve the local actors and were unsuccessful (Ashworth, Bradbury, Feenstra, Greenberg, Hund, & Mikunda, 2010).

The example in Box 3.3 is an indication that for wind power, because it also has a strong NIMBY character, early participation of the local actors in the decision-making process can add to the probability of success of the project.

The NIMBY-character of wind park development

To get to a sustainable electricity supply in the Netherlands wind-on-land projects are needed. Wind turbines on land are the most cost-effective way of producing electricity. The Dutch inhabitants are positive about wind energy in the Netherlands, but this attitude changes, when a wind park is planned in their municipality or region (van Lierop, 2014). The attitude changes, because of the negative effects of wind parks on its surroundings (Wolsink, 2000). Therefore wind parks face typical NIMBY-character of local actors.

The potential negative effects of a wind park make citizens anxious about wind parks. Therefore groups of actors tend to stop the development of wind parks from an early stage, comparable to the case example of Barendrecht in Box 3.3. The lessons learned of projects such as the CCS, summed up in Box 3.1, have to be taken into account when designing a process to come to the development of a wind park. Other wind parks were developed but faced problems afterwards with local opposition, as presented in section 4.1.2. Only NIMBY behavior might not explain the trend of participation, so in the next section we will look at different reasons for participation.

More Reasons for Participation

Because of the increased complexity of many public-private projects, process management is more and more applied. This approach involves the participation of local actors in the project in such a way that their goals will not be harmed or that harm will be minimized. Different authors have acknowledged the need for participation of local actors and the use of bottom-up learning methods.
The Nobel price winner Ostrom (1990) states that the local situation should be the starting point of any project. In the project the wishes, ideas and capacities of the local community have to be incorporated. The strategy is to give as much room as possible for local wishes and needs. This can be more effective than the usual project approaches, because the potential of the community is used in a positive way. This view is closely related to the *De energieke samenleving* of Maarten Hajer (Hajer, 2011). Hajer also shows the importance of using the local potential and couples this to the development of a more sustainable society. With participation in wind-on-land projects it can be possible to use the potential of the local community. The influence the local community can have depends on the participation options that are chosen, which will be further explained in section 3.3.4. The municipalities force the project developers to hand in a plan for participation of citizens (Groen, 2014). Therefore project developers have to think about participation, but at the same time this can give them a lot of benefits, such as the support of local actors and the speeding up of the process.

There are multiple examples of the outcome of a process approach were local actors, like the municipalities and citizens, participated successfully:

- In Denmark lots of wind turbines are owned by the citizens, who also are subject to the negative sides of wind turbines. Also in the Netherlands several wind turbines are owned by citizens and is known that the downsides are not as annoying, when the turbines are owned by themselves (Bröer, 2006).
- In Flevoland multiple good examples exist where civilian initiatives (partly) finance wind turbines and the farmers there don't see the wind turbines as annoying, because it is a source of income (van Lierop, 2014).

Also different examples can be found where projects where executed and afterwards the opposition was so strong that the project ended up with a lot of difficult issues. If the local actors had the possibility to participate early in the process, these problems might not have occured.

- In Belgium a wind park had to shut down their wind turbines at sunny days, because it turned out that the local residents had a lot of complains about the noise and the cast shadow of the turbines. This of course reduced the profitability of the wind park (Bröer, 2006).
- The Netherlands also has several examples, such as the wind park in Houten. Although it is already build, still a lot of problems are present around this wind park. Citizens want the wind park to close and similar to the Belgian case the wind park in Houten has restrictions at what time it can operate (Gedeputeerden windpark Houten, 2013).

3.3.2 Affected Actors by Participation

Participation in a wind park project influences also other aspects than only the business cases. Thus, choosing between different participation methods is only possible if the goals of the different actors are clear.

Scope of a Wind Park Project

Before we look at the goals of the actors we have to address the scope of the actors of a wind park project. The scope of the project differs per actor and to address this in the process can clarify a lot of the underlying assumptions (van den Berg, 2014). A wind park can be seen with different scopes as is shown in Figure 7.

Project developers like to see the wind park at the project scale, which means that the project includes the wind turbines, the directly surrounding area and its inhabitants (van den Berg, 2014). Project developers tend to think that inhabitants of the region should not have to be included in the process. This would only increase the complexity of the decision-making process, while these actors are not influenced by the wind park in the opinion of the project developer.

Municipalities tend to see a wind park as a burden for their municipality, so they want to get compensated for that (van den Berg, 2014). Except for the *leges* that cover the costs of work for the municipality, the municipalities want the wind park to add to the development of the municipality. Civilian initiatives often cover more than one municipality and represent a region (van den Berg, 2014). The profits of the wind park will have to add to the development of the region. This can be done in the form of for instance help for sustainable initiatives, youth development or public space projects.

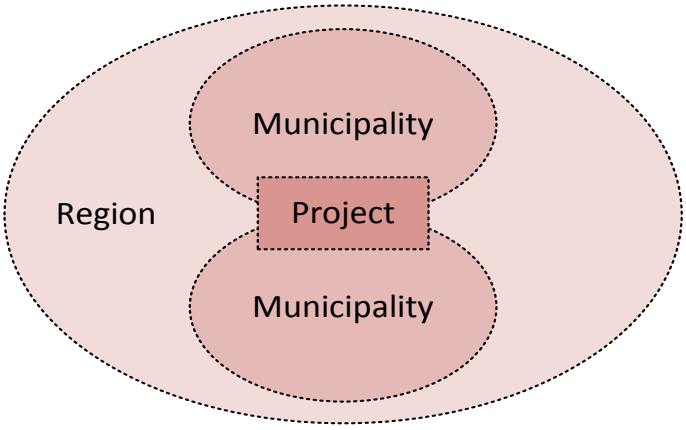


Figure 7 Scope of the project (van den Berg, 2014)

The difference in scope can lead to a lot of friction between the actors. The scope is also closely related to the goals of the different actors. By specifying these goals early in the process and talking about the scope of the project, the actors can understand each other's motives better. That can help solve the distrust between the actors and therefore lead to a smoother process (van den Berg, 2014).
As the municipality has to grant a building permit, the wind park is not only related to the project site. The requirements of the municipality for the grant of a permit, as further explained in section 3.3.3, will give the project a municipality or even a regional scope. Together with the provincial plans on spatial quality, described in section 3.1.2, and the provincial goals for wind energy, a wind park cannot be seen simply seen with a project scope. In the tool that will be developed we will look at the system with a regional scope, so also paying attention to the goals of the inhabitants of the region and the goals of municipalities and provinces.

Goals of the Actors

We take a look at the same actors that turned out to be dedicated in section 3.2.1, only now we include the difference in scope of the project. In the table below we present the different actors that can possibly participate in the different phases of the process by financial participation, financial compensation, local instruments or just taking place in the negotiation process. In this table we see which actors can participate plus in which stage they are explicitly needed in the process.

Table 12 Actors and the phases they are needed in viewed from a classical project approach.

Actor	*Actor's participation is needed in*
Municipality	Pre-feasibility phase, realization phase
Province	Pre-feasibility phase, realization phase
Citizens	Realization phase

We see clearly that the different actors are not necessarily needed in the phases this report focusses on. But that is how the classic project approach would look at these kinds of projects. By incorporating the actors in the decision-making process, the amount of trouble in the realization phase can be reduced. By incorporating the actors in the decision-making process it is necessary to incorporate the goals of the actors in the process. If the actors don't see their goals reflected in the process, they might not want to join the process. Therefore we identified the goals of the different actors using goal trees in Appendix 6. In the table below the goals of the different actors are summarized.

Table 13 Goals of Actors

Actor	
Citizens	High profits of investments civilians
	Low risk for investments civilians
	High amount of influence in the process
	Low direct nuisance wind park
	Well-developed region
Municipalities	Well-developed region
	High income
	High acceptance of wind park
Provinces	Reaching government targets on wind energy
	Well-developed region
	High income
Project developers	Profits

3.3.3 Requirements for a Participation Plan

For many locations the municipalities require a participation plan to come with the business case and the spatial plan, but for project developers there are a lot of participation methods to choose from. Many municipalities are not very specific in their requirements for the participation plan. The participation plan is quite a political aspect of the development of a wind park, because it can create support among the citizens. For the municipality the participation plan is important as the support of their citizens for the project can be translated in the support for the municipality council.

Case example – Deil

In the Deil case the municipalities made a *Windvisie* in which the participation plan is described (Geldermalsen, 2013). This participation plan has to consist of two aspects: civilian participation and a sustainability fund. The form of civilian participation has to be negotiated with the project developer. The fund is filled with money by the project developer and managed by the municipalities. The money of the fund is managed by a group in which the citizens, local businesses, project developers and municipalities are participating. Criteria will have to be constructed for the division of the money of the fund.

The Deil case illustrates that the municipalities are not perfectly clear about the requirements for the participation plan. The explanation for this might be that the municipalities want to see what the citizens ask for before they are making requirements for the project developers. Otherwise the municipality councils might risk votes in the next election. The lack of clarity about the requirements for a participation plan means that we will analyze a broad range of possible participation methods in the next section.

3.3.4 Financial Participation and Compensation

The financial participation and compensation for the actors can be divided in financial means with control, financial means with limited or without control and local instruments. The most important instruments are described in Appendix 7 and 8.

In the figures below we see a summary of the most important characteristics of the different instruments for financial participation. The financial participation options are characterized based on three aspects: the risk of the investment for the civilian, the prospectus of the return on the investment and the influence of a civilian in the project via the participation method. For a wind park project it is important to look for a portfolio of options that is specifically designed for the region. This can increase the amount of people that will start using the opportunities for participation.

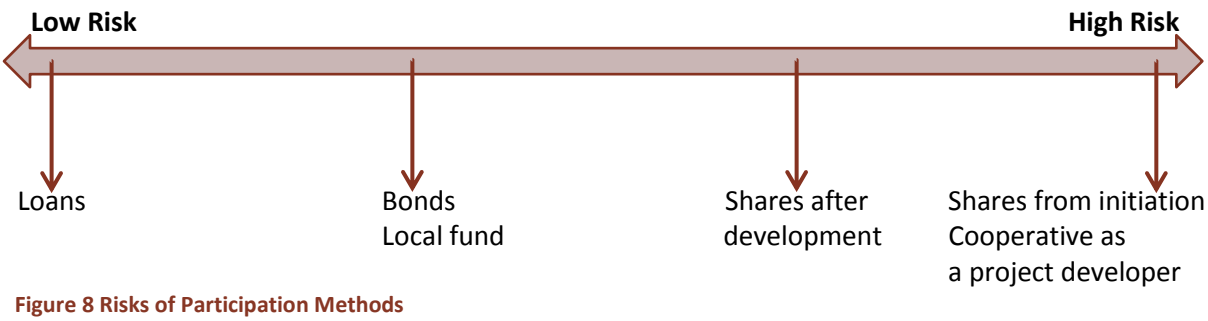


Figure 8 Risks of Participation Methods

The risk of a participation option is important as citizens might have different risks they want to take on an investment. Therefore a good analysis of the target group of citizens is needed, so the participation options are aligned with the local community. We see that shares from initiation have the highest risk profile together with the situation in which the citizens take the role of project developer. Loans have the lowest risk for the civilian and are thus safest for an investment.

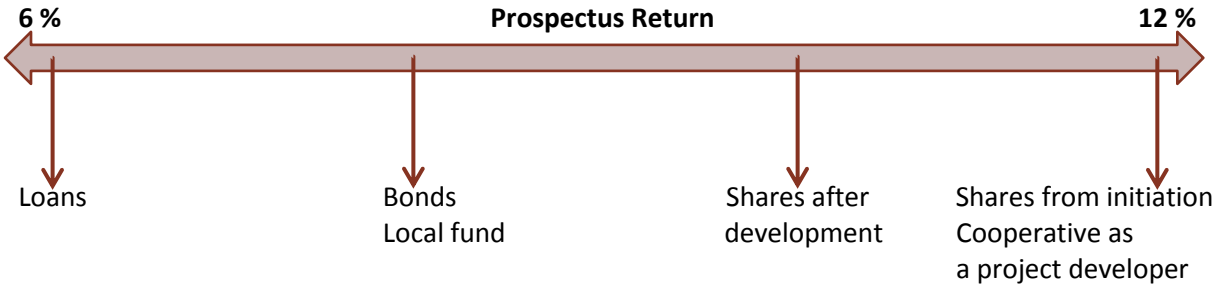


Figure 9 Prospectus Return of Participation Methods

The prospectus of the return for a participation option is related to the risk. If the risk is higher a civilian would like the prospectus of return to be higher to compensate for the high risk. That is why in this slider the different options are distributed in the same way as in the risk figure. It is important to note that with some participation options the return is fixed (for instance bonds) and with other options the return can be highly flexible (for instance shares).

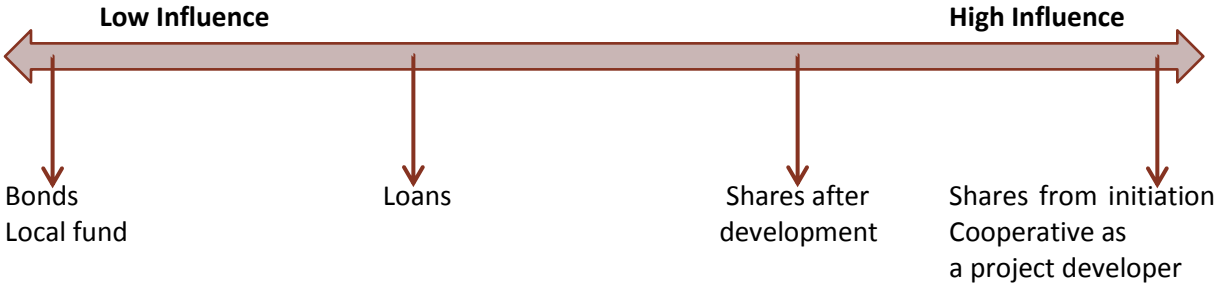


Figure 10 Influence due to Participation Methods

The participation options are distributed on the slider on their moment of influence and their amount of influence. This is explained in Table 33 in Appendix 7. We see that the shares from initiation and the cooperative make the highest influence possible, because with these options the citizens are influencing the project in the earliest stages. The bonds and the local fund have the lowest influence in the decision-making process.

Comparing these figures the following conclusions can be drawn from the different types of financial instruments for participation.

- Shares from initiation and the cooperative as a project developer are the methods with the highest expected return and influence, but also the highest risk.
- Shares after development give a lower risk profile than shares from initiation, but also a lower expected return and no influence in the part of the process where the most important decisions are taken.
- Loans get a relatively low expected return at low risk, but with loans there are possibilities to have influence in the decision-making process of the project.
- Bonds and local funds are comparable. There is no possibility to influence the decision-making process, but there is a decent return that is fixed with relatively low risk.

Local instruments

Except for active participation of citizens in a wind park, the project developer can also use other instruments to create ties with the local community. Each type is assessed on an indication of the costs of the instrument (see Table 14). A further description of the instruments and their possible effects on the ties with the region can be found in Appendix 7.

Table 14 Costs of local instruments; 1= (Kort & Louter, 2011), 2= (Windpark Goyerbrug, 2014), 3= (Veghel, 2013)

Local instruments	*Costs*
Local support fund	% of profits or income (for instance between 10% and 30% of exploitation at wind park Noordoostpolder)[1]
Support local sustainable projects	% of profits or income[1]
Sell electricity to region	Has to be assessed per case. Depends on potential in region, transmission network capacity, potential discount.
Discount on electricity for local residents	% of electricity price[2] or deposit for electricity[3] for a wider range of citizens.

These local instruments can be combined with financial participation methods to develop a portfolio for a wind park project. Although the local instruments can create ties with the local community, these instruments are not facilitating participation in either the decision-making process or the project itself.

3.3.5 Judicial Arrangements

Except for financial participation and compensation (initiated by the project developers), the citizens can participate more individually in wind park projects. Citizens and local enterprises can join a cooperative to invest in wind energy as is described in the previous section. There are multiple choices for the cooperative on how to invest in wind parks listed by the (Agentschap NL, 2011):

- Develop and exploit wind turbines itself.
- The local initiative brings its activities under the flag of a new project group.
- The local initiative brings its activities under the flag of an existing project developer.
- The cooperative buys certificates in an existing project.

For the citizens, before they are participating in any way, a strategy is to come together and become a stronger actor in the field. One option in this respect is the earlier mentioned cooperative. The choices for a local group of citizens that want to start or participate in a wind park and be a united actor are shown in the table below (Agentschap NL, 2011).

Table 15 Options for uniting citizens scored by (Agentschap NL, 2011)

Criteria	*Cooperative*	*Bv/nv*	*Association*	*Foundation*
Common investment feeling	++	+/-	++	-
Influence of participants on activities	++	+	++	-
Possibility for different participation forms	++	+	++	-
Possibility adjustment of participation form	++	-	++	Not applicable
Flexibility in structure	++	+	-	-
Possibility to make different	++	-	-	-

growing phases				
Flexibility in possibilities structure	++	+	-	+
Possibility to work together	++	++	+	-
Costs	+	-	++	++

In this figure a ++ is given on a criterion if this very much reflects the judicial form and a + if this +reflects the judicial form much. A +/- is given when the judicial form scores average on this criterion. A – is given when the judicial form doesn't score high on this criterion and with a -- the judicial form scores low on this criterion. Not applicable means that there is no option in the judicial form to fulfill the criterion.

The judicial forms have their own characteristics as is already shown in Table 15, but we will explain the functioning of these forms below. The most important aspects of these judicial forms of civilian participation are:

1. Cooperative: The cooperative is owned by the members, who form a union with a say for the members. A cooperative can pay out profits.
2. *BV/NV*: There is no union element within the *BV* or *NV*. The participation element is purely formed by the share proportion. Therefore the *BV* or *NV* misses the collective appearance.
3. *Vereniging*: There are no profit-making activities. A *vereniging* has members with group spirit and can steer a *BV/NV*. Geen winstgevende activiteiten, wel leden, wel groepsgevoel, kan wel *BV/NV* aansturen.
4. *Stichting*: A *stichting* has no members and cannot organize profit-making activities. It can steer profit-making activities and is leaded itself by a board.

From Table 15 we can derive that the cooperative is the most applicable form of uniting citizens that want to develop (a part of) a wind park themselves. There might however be a case where costs are most important and in that case the association would be a good choice. In the rest of this research we choose the cooperative as being the best option for people to unite, because it scores only ++ except for the costs, on which it still scores a +.

When the civilian group decides not to develop the project itself, but to be a part of a project from a project developer, the group will most likely not take the form of one of the juridical forms mentioned before. Instead they can buy in on a project using one of financial forms of participation mentioned in the section before.

When citizens want to unite themselves with the goal of developing (a part of) a wind park the cooperative seems to be the best choice. In the rest of this research we therefore use the term cooperative, when we talk about a group of legally united citizens that want to develop a wind park. However, in some real cases another judicial form might be chosen, because of the case-specific characteristics of that project. An example of such a case is given in Box 3.4.

Box 3.4 Case example – Nijmegen

In wind park Nijmegen the citizens are aiming to completely own the wind park and therefore the following construction is made (Windpowernijmegen, 2012):

- The citizens participate in a cooperation (Windpowernijmegen), that also includes the supervisory board and the management.
- This cooperation is the owner of the wind park and its management gets the task to steer the so called project-BV.
- The project-BV is dealing with the day-to-day management of the wind park in order to keep the participation and a functional management at the same time.

3.4 Linked Variables between the Different Products

Between the three products many variables are linked, either directly or indirectly. In the figure below we see the three products in the rectangles and the linked variables in the ovals with the most important links between them. We will describe these links, as they are the input for the tool. Incorporating these links will help to show in what way changes in one product affect the variables in the other product.

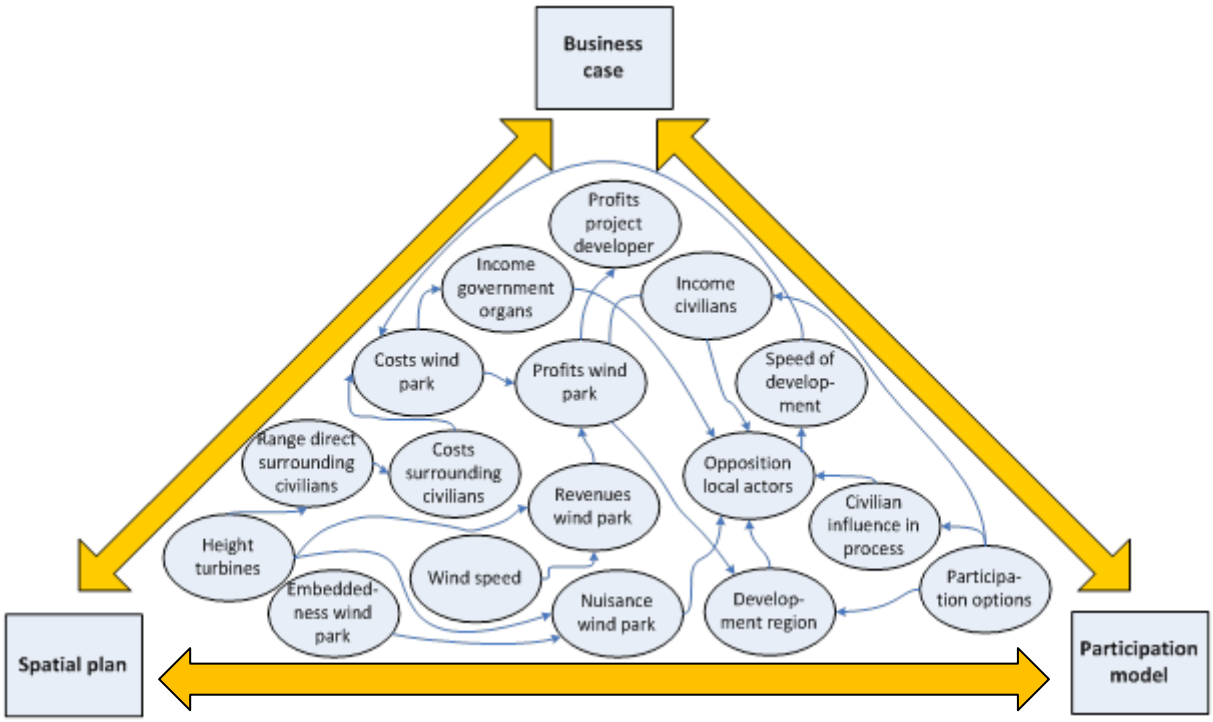


Figure 11 Linked Variables between Three Products of Decision-Making

Business case

The three key factors for the different business cases are the income for the project developer, the citizens and the governmental organs. This income is composed mainly of the profits of the wind park itself; as the profits increase, the income for the different actors will increase as well. This of course depends on the participation options for the citizens and the income options for the different forms of government.

In Figure 11 you can see that the profits and incomes are clearly related to the physical attributes of the wind park, such as the height and the local embedding of the wind park in its surroundings. These determine the costs and revenues on the one hand and the opposition of local actors on the other hand. The participation options determine the income for citizens and the opposition of local actors. This all leads to the profits of the wind park and its distribution among the actors.

Participation plan

We see that the participation options directly influence the income of the citizens, the influence of the citizens and the development of the region, which all have been discussed in section 3.3.4. Remarkable is that citizen's influence in the process is linked with nuisance of the wind park and with opposition of local actors, while nuisance wind park is already linked with opposition of local actors. This is done to indicate the fact that if people are participating they might change the level of nuisance by for instance changing the landscaping of the wind park, but they also can become less opposing by the fact that they can influence other parts of the process. The income of the citizens is directly linked with the participation options, but the profits of the project developer are also linked only indirect.

It is clear that the participation model is linked with the business case as the business cases can change significantly with the varying options. Also the spatial plan is influenced by the participation model, as with more participation a whole other wind park can be designed than in the case where the project developer is the only decision-maker.

Spatial plan

We see that the two main factors of the spatial plan are the technical characteristics of the wind park (summarized in height turbines) and the embedding of the wind park in its surroundings. We see that the height of the turbines influences the range of direct local residents who fall under the *Planschade* regulation or get compensated directly. These costs influence the profitability of the wind park and thus the business case. It is also important to note that the average wind speed and the height of the turbines influence the revenues of the wind park.

The height of the wind turbines and the embedding of the wind park add to the amount of nuisance that the wind park provides. The nuisance of the wind park influences the opposition of local actors and thus influences the speed of development. In other words, if the technical characteristics and the local embedding are chosen in good way the opposition will be lower and the development process of the process will be smoother and faster.

4. Designing the Process-Support Tool

In the previous chapters we analyzed wind parks in the Netherlands and described problems during the decision-making process. To help solve these problems we will design a process-support tool in this chapter. We show what decisions are made in the design process and how this influences the tool. At the end of this chapter we will have analyzed what the tool will look like and what it has to do.

4.1 Preliminary Assumptions

Before the tool is designed it is important to describe the preliminary assumptions for the design and the use of the tool. This will help to give guidance in the design process. We will assess the tools assumptions by asking questions about the use of the tool. The preliminary assumptions will be tested in chapter 6 by interviewing different actors involved in the Deil case.

What?

The first and most important assumption, made in section 1.1.3, is that a tool will help the process of decision-making in a wind park. A tool that could make the financial room explicit, show the goals of the actors and show the links between the important factors, looked very helpful to the process. This could help to decrease the problems of *the lack of information* and *the difference in languages* (section 2.5) by adding information in a structured way and decrease *the lack of trust* by giving insight in the goals of actors.

Who?

The tool will be used by all the actors in the negotiation process and all actors will have the possibility to take the tool home to look into it. In that way every actor can become familiar with the model and think about their goals. Zhou & Mayer (2010) identified the 'room to play' in the *Blokkendoos Ruimte voor de Rivier* tool was one of the most important factors contributing to the success of the tool. The process manager can look into the tool before the other actors do and already fill in the non-negotiable input variables. This will clarify what the actual room to maneuver is. In the process the tool will be filled in by the process manager asking the input of all actors in a negotiation session. Then the outcomes will be analyzed by all. The chosen option means that all actors will have to be able to use the tool, as is indicated in the program of requirements in Table 18.

Another option would be to only give the model to the process manager, who can show what happens when certain solution would be implemented. We will not use this option, because the lack of information (described in section 2.5) can be decreased more when actors have the actual tool.

The tool can also be supplied to everybody interested on the Internet. This is an option, but this might invoke a discussion about substance right from the start, whereas a process manager could have reasons to let that discussion be transferred to a later stage in the process. For instance the actors might take a defensive standpoint about certain participation methods after analyzing the tool before they enter the process, but a process manager might see the first stage as a trust-building stage in which limited substance is discussed.

When?

The tool will be used after the intention agreement is signed by all actors. Before this agreement the focus of the process manager will be mainly on getting the needed trust and after the signing of this

agreement the focus will shift to more substance based negotiations. This is when the tool can fulfill its main functions and add to the process. This timing corresponds to the end of the scoping phase of the project, described in section 2.2, as in that phase all stakeholders are identified and connected. In the definition phase already final contracts are discussed and at that moment the tool should already be introduced. Otherwise it will only be a calculation tool and not a tool that helps giving insight in complexities and goals. The timing of the tool will be analyzed further in sections 6.1 and 6.2.

Reflection on preliminary assumptions

We assume that a tool will be helpful in the process of decision-making in a wind park process. This assumption will be tested during the interviews with the actors in section 6, as it can be that a tool will not help the process, but only derail it further. Then it could be much more effective for instance to design a process or show judicial changes that have to be made by the government to speed up the process.

It is important to pay special attention to potential strategic behavior of actors using the tool. The chosen option might be naïve, because the discussion in the group with all the actors filling in their own tool can make the process rather chaotic. If the tool is used in this way everybody might have made conclusions at home based on this tool and will try to express this in the process. The discussion might shift away from the sharing knowledge and building trust to defending your own outcomes.

The tool is introduced after the intention agreement, but it might be possible that the knowledge sharing is already done for a large part at that point. Therefore the tool might be more useful in the earlier stages of the process in which actors don't have a lot of knowledge about developing a wind park. But to distribute the tool among all actors a certain level of trust has to be present and with the signing of an intention agreement a certain level of trust has to be present.

4.2 Requirements for the Tool

In Table 16 the requirements for the tool from the previous chapters are presented. Three requirements are developed in Appendix 3 using the functions of the process manager in section 2.6. The other requirements have to be included in the tool to incorporate the section in the 'from section' column, which is needed to give a good overview of the wind park and the effects of different solutions.

Table 16 Requirements from previous chapters

Requirement	*Explanation*	*From section*
Provides an overview of the financial room to maneuver	Show the key performance indicators for each business case and show when business cases get unprofitable.	2.6, 3.2
Provides insight in the goals of actors	Show the goals of actors and how the goals get influenced by different variables.	2.6, 3.2.1, 3.3.2
Provides insight in linked variables between the different products	Show if and how changes in one product influence the two products, so actors can see what adjustments in variables do for other products.	3.4

Provides insight in differences between participation methods	Show what the main characteristics of participation methods are and make it possible to incorporate them in the different business cases.	3.3.4, 3.3.5
Provides insight in the effects of wind parks on surroundings	Show how the wind park influences its surroundings in terms of noise, cast shadow and spatial quality. Show what compensations can be for actors.	2.6, 3.1.1

For the tool we will design, we identified five requirements: Provides an overview of the financial room to maneuver, Provides insight in goals of actors, Provides insight in dependency between different products, Provides insight in differences between participation methods and Provides insight in the effects of wind parks on surroundings. Defining the financial room, giving insight in the dependencies, in the differences between participation methods and in the effects of wind parks will help to reduce the lack of information. All actors will get the same information via the same tool, so this will help to create a uniform language. Actors will have discussions based on this tool, so that will help to understand each other and give structure to the process. Giving insights in the goals of actors can help to create trust among the actors, as this will invoke the discussion about the goals and targets of the actors. This discussion can lead to a clearer view and can reduce the fear for hidden agendas. This can then create more trust in the other actors.

In the book *Communicative tools in sustainable urban planning and building* of (Bots, van Bueren, ten Heuvelhof, & Mayer, 2005) different views on developing supporting tools for negotiations are presented. In this book the requirements of supportive methods for multi-actor decision-making of (Geurts & Joldersma, 2001) are described. Although this work focusses on sustainable urban planning and building, these requirements for the support tool are similar to the ones coming out of the previous chapters. With they in the table below decision support tools are meant.

Table 17 Requirements of a decision support tool according to (Geurts & Joldersma, 2001)

Requirement	*Explanation*
Integrative	They should consider different aspects and levels of design and decision-making in a holistic interdisciplinary and systemic way.
Dynamic	They should be able to show the 'performance' of various alternatives in relation to the preferences and the 'behavior' of stakeholders.
Interactive	They should be able to support the negotiation process between stakeholders.
Transparent	They should produce results that are clear and understandable to all stakeholders, i.e. no 'black box'.
Flexible and re-usable	They should be usable for, or adaptable to, a range of (similar) situations.
Fast and easy to use	The required time to apply them should be relatively short and non-experts, e.g. residents, politicians, should be able to use them.
Communicative and educational	They should be able to convey meaning and insight to stakeholders about problem structure, alternatives and different perspectives.

The first two requirements in the table above are covered with the requirements in Table 16. This is about the content of the tool. The "interactive" and the "communicative and educational" requirement are in this case similar. We try to support the negotiation process by conveying meaning and insight to stakeholders about problem structure, alternatives and different perspectives. Therefore we combine the two into one requirement that will be called "interactive" from now on. The other three requirements (transparent, flexible and re-usable and fast and easy to use) are all important for the tool for the wind park negotiation process, so they will be in the final program of requirements.

Table 18 Program of requirements

Requirement
Provides an overview of the financial room to maneuver
Provides insight in the goals of actors
Provides insight in linked variables between the different products
Provides insight in differences between participation methods
Provides insight in the effects of wind parks on surroundings
Fast and easy-to-use
Flexible and re-usable
Transparent
Interactive

When the tool is finished we will let the actors evaluate the tool on the different requirements to see how well the tool fulfills the program of requirements. At least one person of each actor group will be asked to evaluate the program of requirements, which will be described in chapter 6.

4.3 Agentschap NL Model as the Basis

In an arena in which trust is such an important issue, as we identified in section 2.5, trust in the tool is crucial. Because of the importance of language (section 6.1) we looked for a Dutch model from a well-known and respected actor. The Excel model of Agentschap NL will be used as a basis for the tool (Veghel, 2013). This model is developed by Rebel for Agentschap NL and both are well-known actors in their field. This basis can improve the trust in the tool. Also many data and calculations can be used that would otherwise take a lot of effort to gather and develop.

After assessing three decision-support tools Karstens & Willems concluded that a decision-support tool should be build based on the existing components to speed up the development of the tool (Karstens & Willems, 2010). This is needed, because the policies tend to change a lot and a tool is mostly focused on the current policy of the government. An adaptive tool is recommended by Karstens & Willems to ensure that the tool can be used for different goals and policies (Karstens & Willems, 2010). Basing the tool on an existing Excel model helps to make it adaptive, as Excel allows changes to be made in all variables and formulas.

In this model the business case for the project developer is analyzed into great detail, but the other actors are not thoroughly analyzed. In the program of requirements below we listed in what way the Agentschap NL model already fills in the requirements set for the tool.

Table 19 Program of requirements filled in for the Agentschap NL model

Requirement	*Evaluation*
Provides an overview of the financial room to maneuver	Financial room for the project developer is well defined, as well as for the municipalities. The financial situation for the citizens and the provinces is ill-defined. Therefore the financial room for the total project is not completely clear.
Provides insight in the goals of actors	This is not included in the model.
Provides insight in linked variables between the different products	This is made explicit in the model, but definitely linked variables are included. This will be further explained in section 7.2.
Provides insight in differences between participation methods	Only the financial differences are displayed. Differences in influence in the process and risk for the participator are not included.
Provides insight in the effects of wind parks on surroundings	This is not included in the model.
Fast and easy-to-use	The model is fast, but not very easy-to-use as many calculations and variables need explanations for non-experts.
Flexible and re-usable	The model is definitely re-usable, as changes In values of variables can be made for different cases. It is not very flexible as new ideas about for instance participation cannot be added easily.
Transparent	The model is transparent, as all variables are quantifiable and well-known in the economic world.
Interactive	The model is supporting the negotiation process in the way that it is adding information to it. It is not a very interactive tool, because it can just be filled in by one expert.

As is shown in Table 19 the model focusses on the financial aspects of a wind park. This model therefore will provide a solid basis for the financial part of a wind-on-land project. We will add the important links between the variables of the products in section 4.5. These links are already identified in section 3.4. The additions that have to be done are mainly: incorporating all the actors and their goals, give insight in all important characteristics of participation options, give insight in the effects on the surroundings of the wind park and making the three products more explicit. The model can also be improved by making it more easy-to-use, flexible and interactive. These additions will be done in chapter 5 to come to a tool that fulfills the requirements.

4.4 Choices in Design

This section will describe the choices in the design that will be used in the next section to construct the tool. The following paragraphs will each define a choice in design and explain why this option is chosen.

The tool has to make goals and their ranking explicit using a multi-criteria table

To give insight in the goals of the actors, which is a requirement presented in Table 18, we will use a multi-criteria table. In this table the goals of the actor will be presented and with the input of the rest

of the model scores will be made for the goals. The goals will get a weight attached to it, which the actors will define. The benefit of this approach is that it will help to get insight in the goals of the actors and will add to the discussion about these goals. It also gives insight in the differences options make in the goals of actors and how the effects changes when the preferences for the goals shift.

The tool has to provide the key performance indicators for the business case per actor

Each actor has a certain business case and it is important to show what the key performance indicators of these business cases are, as this helps to define the financial room to maneuver (Table 18). Except for the fact that it will be used in the goals mentioned above, the tool can also be used to give an overview purely of the business cases in this way. As a basis the model of Agentschap NL will be used for the business case of the project developer and the other business cases will be derived from this. The key performance indicators are presented in section 3.2.2.

The tool has to calculate how different participation options affect the goals of the actors

Participation options will have effects on the goals of the actors as they can influence for instance the profits and regional development. This has to be included in the model. Some of these effects will not be quantifiable, so in that case a qualitative alternative will be the input for the multi-criteria table. The characteristics of participation options were described in section 3.3.4.

The tool has to provide an overview of the specifications of the participation options

For the calculation of the effects of participation options the specifications of the options have to be in the model. This can also be used to present the options without a valuation, but just to explain what the differences are. The characteristics of participation options will be used from section 3.3.4.

The tool has to calculate what the coverage for a participation option has to be

To see if a certain participation option, such as shares, is applicable for the specific region, it is important to calculate what the degree of coverage for the area has to be. With coverage the percentage of people that have participated from the total amount of residents is meant. This will have to be calculated and can be used to rate to what extend a participation option will have to be deployed for a municipality or a whole region. This is important as it indicates the scope of the project, as discussed in section 3.3.2.

The tool has to address the characteristics of a spatial plan

It is hard to calculate the effects of spatial plan, so the most important choices will be displayed in the tool. With this the actors can fill in what their choices will be and discuss what this means for instance for the nuisance for the citizens. In section 3.1.1 the important characteristics are described and these will be coupled to the other two products in the tool.

The tool has to be easily adaptable to different cases

Because different cases will be unique it is important that the tool can be changed easily. Of course an important part of the adaptability is in the weights and the scores of the goals that can be changed manually. Also a wide range of participation options will be included that can be adapted easily. It has to be clear which cells in the Excel has to be filled in and thus are case specific and which are calculating cells.

4.5 Modelling the Linked Variables

The linked variables that are useful to add are described in the previous section and this section is about making these variables linked to each other in the Excel model. Links that are too complex will get left out of the model in this phase. This is the first step of making the prototype. We take a look at the linked variables for the business case first in the table below.

Table 20 How are the Business Case Linked Variables Modelled?

Linked variables	*Modelled as*
Opposition local actors → speed of development → costs wind park	Too complex to include
Nuisance wind park → opposition local actors	Score filled in by the citizens on basis of nuisance parameters
Height turbines → range direct local residents → costs local residents	Height turbines → Height turbines * factor range = range → amount of people in range * costs per person = costs local residents
Participation options + profits wind park → income citizens	Participation options explained on sheet *Participatie* + profits wind park → IRR and income citizens
Height + wind speed → revenues wind park	*Vollasturen* → Revenues wind park (already modelled by AgentschapNL) Wind speed is higher at greater height, so if area doesn't have a high wind speed, wind turbine gets higher. (Fill-in with information in Excel)

In Table 20 we see how the linked variables of the business cases are translated into an Excel model. The first link is left out of the model, because estimations about the level of opposition, the speed of development and the influence on the costs of a wind park are very difficult to make general. We see that the development of wind parks with a lot of opposition can stop for some time and start again. Because of the many possible variations in timelines for the development it is very hard to create a general quantitative connection.

Table 21 How are the Participation Plan Linked Variables Modelled?

Linked variables	*Modelled as*
Participation options → development region + civilian influence in process + income citizens	- Local instruments add to *Ontwikkeling gebied* - Participation with influence adds to *Veel zeggenschap* - IRR adds to *Winst*
Civilian influence in process + development region → Opposition local actors	Too complex to include
Opposition local actors → speed of development	Too complex to include
Speed of development → costs of wind park	Too complex to include

The linked variables of the opposition of local actors and the speed of development are hard to quantify, because they are composed of a complex set of variables, which can hardly be made

general. It is important to note that the outcome of the sheet *Burgers* is the extent to which the goals of the citizens are met. If the goals are not met at all the citizens would be more likely become the opposition of the project and frustrate the speed of development.

Table 22 How are the Spatial Plan Dependent Variables Modelled?

Linked variables	*Modelled as*
Height wind turbines → range direct local residents → costs local residents	Already mentioned in Table 14
Height wind turbines + wind speed → revenues wind park	Already mentioned in Table 14
Height wind turbines + embedding wind park → nuisance wind park → opposition local actors	Too complex to include

The first two linked variables are already covered in the business case linked variables, because these are the spatial plan-business case linked variables. The last interface is too complex to quantify, because the embedding of the wind park is hard to translate into a value for nuisance. The embedding is also very case specific and that is why it is not modelled in the tool.

5 WINST: Prototype

In this chapter we will present the prototype of the tool using visualization of the spreadsheets in Excel. The name of the tool will be WINST, which stands for Wind In Nederland Support Tool. First a short version of the user guide will be presented, so we can go through the tool according to the steps described in this user guide. The full-size user guide comes with the report separately.

5.1 Expanding the Model

In step two of making the tool we make changes to the model to make it into a useful tool. In the Excel model we describe the three products discussed before. The business case is already thoroughly analyzed in the Agentschap NL model, so we only add the spatial plan and the participation plan. Both products get an own Excel sheet in the tool, as is shown in Figure 12. The sheets *Invulformulier* and Cockpit are developed by Agentschap NL and will be explained in section 5.3. In this figure also the main aspects on these slides are presented. The last sheets present an overview of the important variables, a visualization sheet and an optimization sheet, which will be all discussed in more detail in section 5.3.

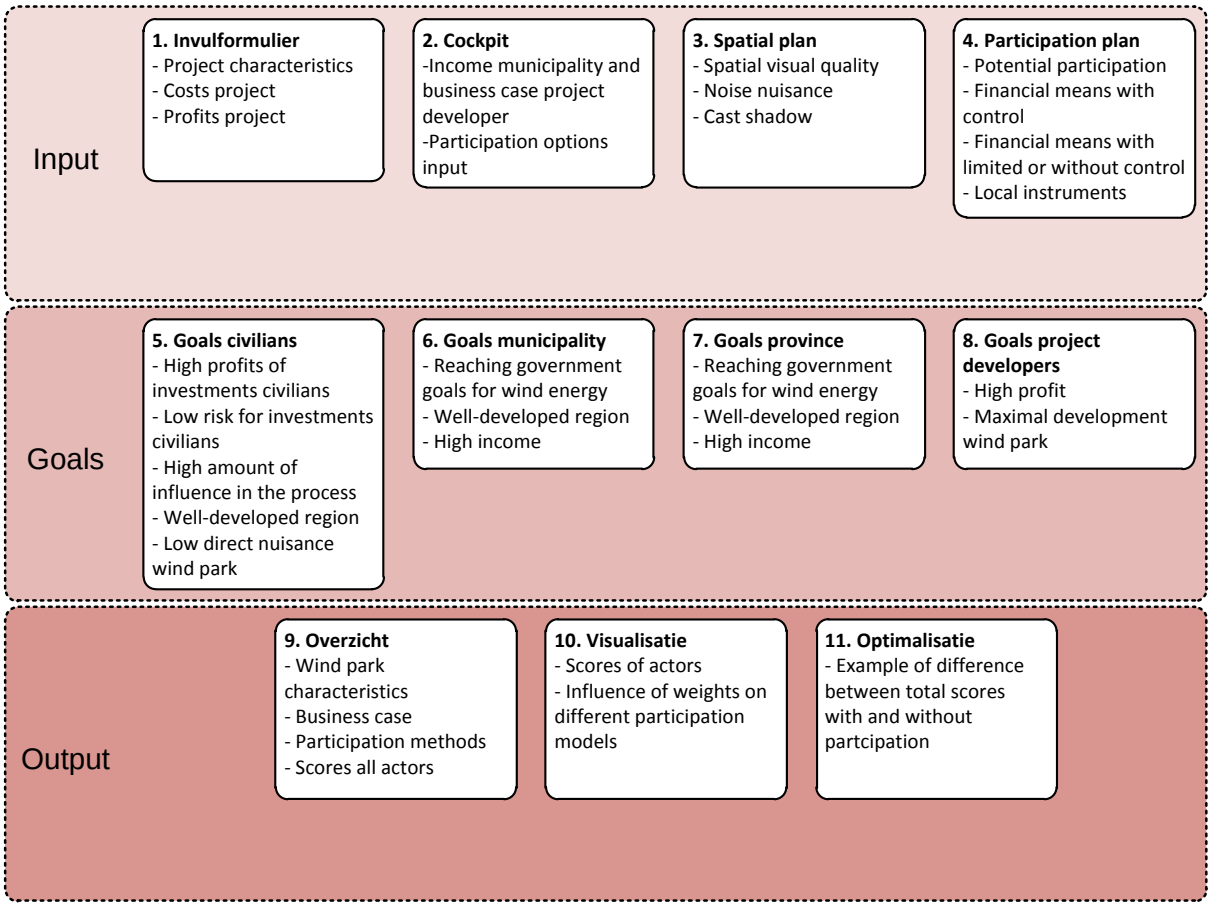


Figure 12 The Eleven Sheets of the WINST

It would be logical to make one Excel sheet for the business case, the participation plan and the spatial plan, as these are the three products described in chapter 3. The business cases of all actors would have to be given to make a tool useful for everybody in the negotiation process. As we analyzed in section 3.3.2, there are more goals for the other actors than just making profits.

Therefore a tool that supports the process can add more to the process if also the other goals are described in the model. That is why the business cases are not presented on a separate sheet, but as one of the goals of the actors.

The four blocks 5-8 in Figure 12 illustrate these four sheets including the goals per actor. On these sheets a multi criteria table is presented in which goals can be scored and weighted by the actor using the input provided by the tool. As an example the goals of citizens and the variables on which the scores will be based are presented in the table below. In the table we can also see which scores will be following automatically from the tool and which scores will have to be graded manually on basis of the variables calculated.

Table 23 Goals and Scores Citizens

Goal	*Score based on*	*Score calculated by the tool?*
High profits of investments	IRR Participation options	No
Low risk for investments	Risk participation options	Yes
High amount of influence in process	Control due to participation options	No
Well-developed region	Local fund Support sustainable initiatives Sell electricity to region Discount on electricity	No
Low direct nuisance wind park	Visual plan Noise Cast shadow	No

We see that the scores on the different goals are based on the variables in the middle column. In one case this can be translated in a score directly by the tool, in other cases it depends on the valuation of the actors how high the score will be. The score that is directly calculated is indicated in the Excel file by green, otherwise by orange. This is done throughout the Excel file, so for inexperienced users it is clear which variables they have to fill in and which will be calculated by the model. This will clearly indicate on what aspects choices have to be made.

The calculation of the variables is done based on an overview of the different participation options and an overview of the choices for the spatial plan, which are both described as design principles. Also the key performance indicators of the original Agentschap NL model are displayed.

On the participation sheet of the model calculations will also be made about the needed coverage of the participation options. This will give the actors insight in which scope (described in section 3.3.2) has to be used to get enough available funds among the citizens for the participation option.

When the scores are given, an important step has to be taken; the valuation of the weights. The weights are given to the different goals to rate how important an actor finds these goals comparing the goal to the other goals. Eventually scores on the goals with the weights will lead to an average score for the actor. This score indicates to what extend the goals of the actor are reached, including the preferences for goals of the actor.

5.2 User Guide

For the tool to be useful in the process a user guide is needed. We will present a short user guide that consists of six steps to be executed by the user (Figure 13). These steps all correspond to one or more sheets in the tool, as is indicated in the arrows. On the right the steps that have to be executed sheet are presented.

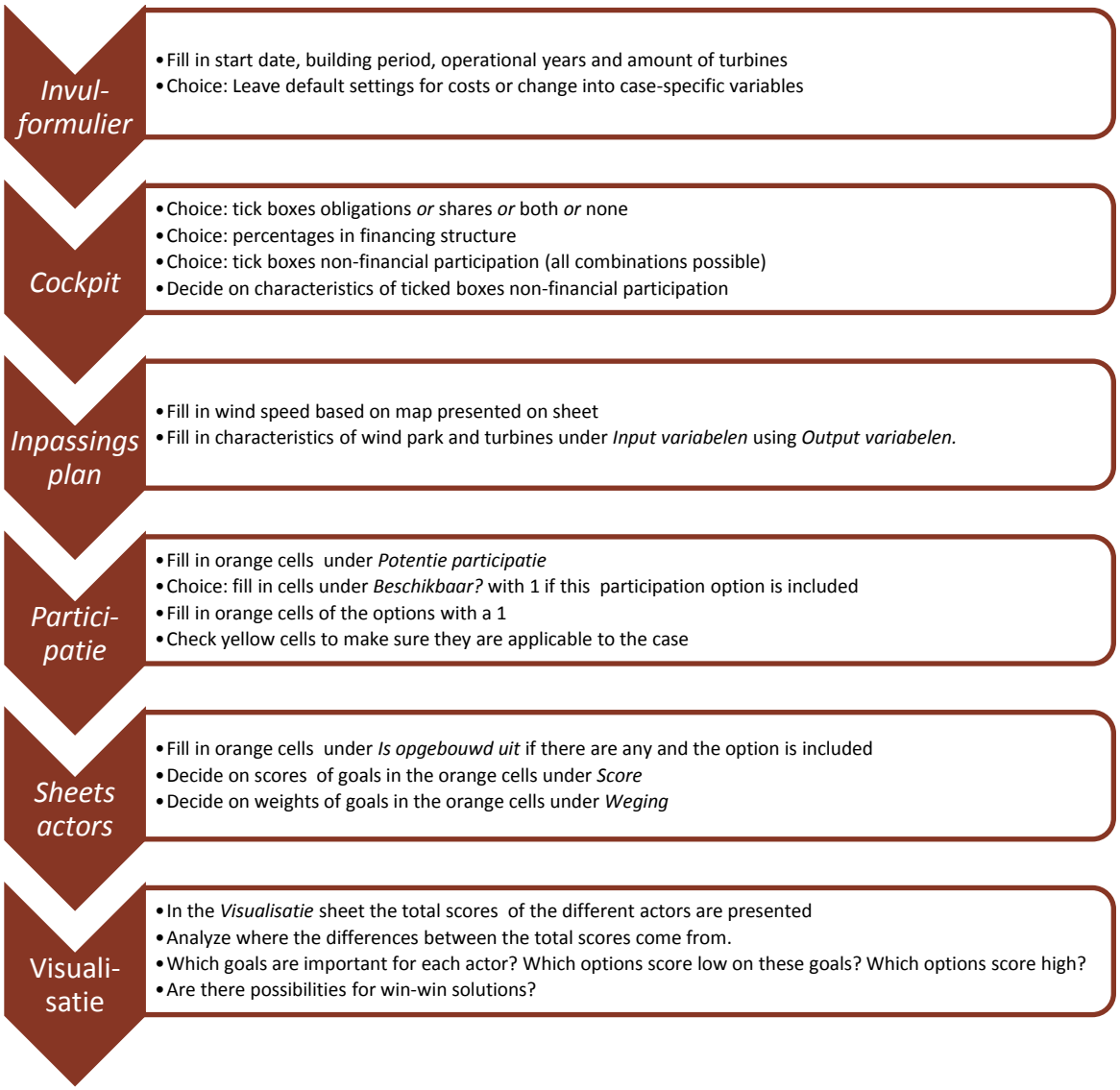


Figure 13 The six steps of using the tool

At the *Invulformulier* sheet the most important inputs are the start date of the build, the building period, the number of operational years and the amount of turbines. The other variables can be changed if it is necessary to fully calculate the effects, but, when the tool is used to give a more general explanation of wind parks to inexperienced actors, the settings can be held at default. For filling in this sheet with case-specific information already quite a lot of research has to be done.

In the *Cockpit* sheet a few choices are really important for the outcomes of the tool. First of all the participation methods have to be ticked on or off. Then the chosen participation methods have to be filled in. Also the financial structure has to be defined, strongly influenced by the financial ways of participation that are chosen.

The *Inpassingsplan* sheet is used as input for the rest of the model. With help of the wind map the wind speed can be calculated, which in turn leads to the amount of *vollasturen*. This is used as input for the *Invulformulier* sheet. The rest of the characteristics of the wind park can be filled in by doing a little research in the area. A clear overview has to be made of the local residents, where the wind turbines are placed and what the characteristics of the wind turbines are.

In the *Participatie* sheet first the orange cells of the *Potentie participatie* have to be filled in to get an idea of the potential of the region as it comes to financial participation. Then the orange cells under *Beschikbaar?* have to be filled in with a 1 if this option is included in the project. The orange cells of these included options have to be filled in as well. At last the assumptions in the yellow cells have to be checked, because these can be case-specific.

The actor sheets are where most of the input of the actors comes in. After filling in the few orange cells under *Is opgebouwd uit* for the options that are included, the scores to the goals can be given as well as the weights to the goals. The scores are given on a scale from 1 to 5 in which 1 means 'the goal is not reached at all' and 5 'the goal is maximally reached'. The scale of the weights differs per actor, but the same is that each weight can only be given to one goal. Both scales are explained in the notes in the Excel file.

The last step of analyzing and interpreting the outcomes is the most important step of using the tool. On the *Visualisatie* sheet the total scores for the different actors are presented. This is not meant as a final score that decides who wins or loses, but as an indication of to what extend goals are reached. This is the starting point of a discussion. Why does this actor score low on its goals? Which changes in for instance participation options can change this? What is the influence of this change on the goals of other actors?

It will be the task of the process manager to prepare some graphs that show what different options do for the scores on goals of actors. By making these insights explicit the actors know what their plans do and hopefully see where they can meet other actors in the middle to have a good result for both. This 'good result' is not the same as making the scores of the actors equal, so therefore the tool is a starting point for a more open and well-informed discussion.

5.3 The Design of the Tool

In this section the design of WINST is described. We look more in-depth to the different sheets to explain how it is build up and how it works. We use the steps indicated in the user guide in the previous section. The first two sheets, the *Invulformulier* or start sheet and the *Cockpit,* are developed by Agentschap NL, but form the basis for the sheets developed in this research. The other six sheets are developed in this research. The last sheet *Visualisatie* will be discussed in the next section. The tool consists of many more sheets, but these are just supporting the other sheets and are there to calculate different variables. For the use of the tool this is not directly important and therefore we are not discussing these slides in the report.

In all sheets the same colors are used to indicate the different variable cells. The green cells indicate cells that are calculated by the tool or are filled on another sheet. The orange cells mark variables that have to be filled in by the actors using the tool and are thus case specific. We also see the boxes with *Nieuw* in it that indicate the possibility for new options. If the boxes are filled in the values are automatically incorporated in the model just as the similar variables in that column are done. The orange callouts in the coming figures additional information is given to explain the tool, but in the actual tool these callouts are not present.

Invul-formulier

- Fill in start date, building period, operational years and amount of turbines
- Choice: Leave default settings for costs or change into case-specific variables

The sheet *Invulformulier* is the start of the tool. In this sheet (developed by Agentschap NL) the basic choices are filled in by the actor or process manager. This acts as the input for the calculation model of Agentschap NL and for the tool developed in this research. In Figure 14 we see the sheet with its default settings. The sheet focusses on the main characteristics of the park and the costs associated with that.

Project	**Altijd zelf invullen**			
Timing:				
Startdatum Bouw	01 jan 15		datum	
Bouwperiode	12		maanden	
Aantal operationele jaren	20		jaren	
Omvang project:				
Aantal Turbines	10		Turbines	
Indexatie				
Prijspeil Kosten	2.013	2013	jaar	
Indexatie Capex	2,00%	2%	%	
Indexatie Opex	2,00%	2%	%	
Prijspeil Opbrengsten	2.013	2013	jaar	
Indexatie Energieprijs	-	0%	%	
Opbrengsten				
Vollasturen				
Vollasturen per jaar P50	2.400	2.400	vollasturen	
Vollasturen per jaar P90			vollasturen	
Indien slechts 1 van beide bekend is, is dat voldoende. Echter om in de cockpit gebruik te kunnen maken van het P90 scenario moet hier wel een waarde worden ingevuld.				
Grijze Strooom				
Grijze stroomprijs	48	48,09	Eur/ MWh	
Kosten voor onbalans + profiel	8,50%	8,50%	%	
Grijze stroomprijs - windenergie	44,0	44,0	Eur / MWh	
SDE - Kies fase (voor vollasturen en Eur /MWh zelfde fase)				
Vollasturen Fase 3: 1920				
Eur / MWh Fase 3: 112,5	*Zelf invullen:*	*Volgt uit keuze links:*		
Maximum aantal Vollasturen SDE	1920	1920	vollasturen	
Maximum jaren SDE	15	15	jaren	
Basisprijs SDE (vast voor 15 years)	112,5	112,5	Eur / MWh	
Investering				
Turbine Capaciteit	3	**3**	**MW**	
Totaal Investeringskosten per turbine:	4.050	**4.050**		
Totaal Investeringskosten (conform ECN)	4.050	4.050	EURk/ turbine	
Turbines & Fundering			EURk/ turbine	
Ontsluiting park			EURk/ turbine	
Investering Netaansluiting & electr. Infra			EURk/ turbine	
Overige kosten tijdens bouwfase			EURk/ turbine	

Transactiekosten voor start bouw			EURk/ turbine
Project Management			EURk/ turbine
Leges			EURk/ turbine
Ontwikkelkosten			EURk/ turbine
Afschrijftermijn	15	15	Jaar
Sloopkosten einde project			EURk/ turbine
Grond			
Grond aankopen van derden?	-	-	1=ja, 0=nee
Grond aankopen van gemeente?	-	-	1=ja, 0=nee
Aankoopkosten grond?	100	100	EURk
Operationele Kosten			
Variabele kosten			
Variabele Onderhoudskosten	0,011	0,011	EURk/ MW h
Vaste kosten			
Vaste Onderhoudskosten	14	13,8	EURk/ MW
Totaal onderhoudskosten vast (ECN excl OZB)	13,8	13,8	EURk/ MW
Operationeel Management			EURk/ MW
Verzekering			EURk/ MW
Jaarlijkse kosten netaansluiting			EURk/ MW
Eigen energie consumptie			EURk/ MW
Onvoorzien & OZB			
Onvoorziene kosten	0,0%	0,0%	%
OZB	0,216%	0,216%	%
Grond			
Grondpacht aan derden?	-	-	ja=1, nee=0
Grondpacht aan gemeente?	1	1	ja=1, nee=0
Grondpacht/huur per MW	0,0053	0,0053	EURk/ MWh
check grondkosten maar 1 keer ingevuld?	-	-	ja=0, nee=1

Figure 14 Sheet *invulformulier*

Cockpit

- Choice: tick boxes obligations *or* shares *or* both *or* none
- Choice: percentages in financing structure
- Choice: tick boxes non-financial participation (all combinations possible)
- Decide on characteristics of ticked boxes non-financial participation

After the *Invulformulier* sheet we find the *Cockpit* sheet that was also in the original model of Agentschap NL. On this sheet the key performance indicators of the business cases for the project developer and the municipalities (Figure 15) are presented, which will be used later in their sheets. Also the financing structure and the operating cash flows are visualized on this sheet.

Financieel Haalbaar?		
	P50	
Op basis van Vollasturen P50 of P90?		
NCW (wacc 6,3%)	957	NCW EURk
IRR Ontwikkelaar	6,53%	%
IRR Burgeraandelen	n.v.t.	%
Min. DSCR hoofdlening (geeist: 1,25)	1,36	ratio
Min. DSCR burgerlening (geeist: 1,1)	2,02	ratio
Elk jaar burgerlening volgens schema afgelost?	-	0=ja, 1=nee
Inkomsten Gemeente - nominale totalen tijdens exploitatie		
Inkomsten uit Grondverkoop	-	*EURk*
Inkomsten uit Grondpacht	*9.839*	*EURk*
Inkomsten uit OZB	*849*	*EURk*
Inkomsten uit Leges (indien ingevuld)	-	*EURK*
Inkomsten uit Gebiedsgebonden Bijdrage	-	*EURk*

Figure 15 Key performance indicators on sheet *Cockpit* (default settings)

Important for the working of the tool is the part in which you can tick the participation options for a wind park. These ticks are influencing the financials of the wind park, but new in the tool is that it also influences the goal sheets of the different actors. Ticking a participation option in the *Cockpit* means that the business case, the influence in the project and the risk for the citizens change. In the figure below we see the ticking boxes and the financing structure. The financing structure is presented, because this changes when financial participation of citizens is included in the park.

Financiering & Financiele Burgerparticipatie			
Financiele Burgerparticipatie:			
Obligaties beschikbaar voor burgers:	☑		
Aandelen beschikbaar voor burgers:	☑		
Financieringsstructuur:			
% Hoofdlening van totaal vermogen	70%	70%	%
% Burgerobligatie lening van tot. verm.	10%	10%	%
% E.V. Ontwikkelaar van totaal vermogen	10%	10%	%
% E.V. Burgers van totaal vermogen	10%	10%	%
	100%	100%	
Hoofdlening	-	***29.568***	***EURk***
Rente (bancaire) hoofdlening	5,0%	5,0%	%
Looptijd Hoofdlening	15	15	jaar
Geeiste DSCR	1,25	1,25	ratio
Obligatielening burgers:	-	***4.224***	***EURk***
Nominale Waarde Obligatie		250	Eur
Aantal Obligaties	-	*16.896*	*Aantal*

Rente burgerobligaties		8,00%	%
Looptijd Obligatielening		15	jaren
Geeiste DSCR		1,1	ratio
Extra transactiekosten		50,0	EURk
Eigen vermogen ontwikkelaar	-	***4.224***	***EURk***
Gewenst Rendement Ontwikkelaar	10,0%	10,00%	%
Eigen vermogen burgers:	-	***4.224***	***EURk***
Nominale Waarde Aandeel		250	Eur
Aantal Aandelen:	-	*16.896*	*Aantal*
Gewenst Rendement Burgers		10,00%	%
Extra transactiekosten		50	EURk

Niet Financiele Burgerparticipatie

Korting op de energierekening:	☑	
Percentage Korting? (tijdens hele periode)	0,00%	%
Aantal Huishoudens?	-	#
Gemiddeld Energieverbruik?	3,48	MWh / jr
Inleg vermogen voor energie	☑	
Inleg per huishouden?	-	EUR
Aantal Huishoudens?	-	#
Energielevering voor inleg?	-	MWh / jr
Duur van energielevering?	-	jaar
	☑	
Gebiedsgebonden bijdrage:		
Percentage van winst?	10%	%
Percentage van investering?	-	%
	☑	
Energiebesparingspakket:		
Pakket ter waarde van: (bij start project)	-	Eur
Aantal Huishoudens	-	Inwoners

Figure 16 Participation options and financing structure on sheet *Cockpit* (all boxes ticked to show all variables)

The non-financial participation options will influence other goals of the actors than the financial options. The non-financial options can influence the development of the region and the business case and don't involve risk. The regional fund can be managed by the citizens, as discussed in section 3.3.4, but this will not give them influence in the wind park development project. Therefore with non-financial options the citizens will not be able to influence the project development or decision-making.

Inpassings plan

- Fill in wind speed based on map presented on sheet
- Fill in characteristics of wind park and turbines under *Input variabelen* using *Output variabelen.*

The sheet of the *Inpassingsplan* lists the most important spatial characteristics and choices that have to be made for each wind park. The spatial plan is used as important input for the business case of the wind park and the different goals of the actors. It can also be used to show inexperienced actors what the characteristics of a wind park are and how they influence the business case and goals.

Inpassingsplan

Input variabelen			
Windsnelheid op locatie		8,0	
Omwonenden	Afstand minder dan 500m		Dit is de input voor de participatieoptie waar korting op de elektriciteitsrekening wordt gegeven. Deze korting wordt groter naarmate men dichterbij de turbines woont. Er kan ook worden gekozen voor een vaste korting onafhankelijk van de afstand tot het windpark.
	Afstand tussen 500m en 750m		
	Afstand tussen 750m en 1 km		
	Afstand tussen 1km en 1.5km		
Direct omwonenden (binnen 1200 meter)		80	Local residents are not defined the same in every project. The range of 1200 meter is from the wind park in Wieringermeer. (Wieringermeer, 2014)
MW per windmolen		3	From sheet *Invulformulier*
Aantal windmolens		10	
Aantal huizen binnen grenswaarde (slagschaduw)		100	Eis aan slagschaduw: stil zetten pas als meer dan 17 dagen per jaar gedurende 20 minuten per dag slagschaduw kan optreden.
Lijnopstelling		Ja	
Zelfde type molens		Ja	Fill in on basis of range calculated below.
Aantal rotorbladen		3	
Rotordiameter		120	
Ashoogte turbine		120	
Geluidsoverlast		10	Aantal huizen waar hoger dan 47 decibel tegen muur van huis overdag wordt gemeten, 41 decibel 's nachts.

Output variabelen		
Vollasturen	2800	
MW project	30	
Grenswaarde afstand huis tot windmolen (slagschaduw)	1.440	12*rotordiameter = grenswaarde

Figure 17 Sheet spatial plan

Partici-patie

- Fill in orange cells under *Potentie participatie*
- Choice: fill in cells under *Beschikbaar?* with 1 if this participation option is included
- Fill in orange cells of the options with a 1
- Check yellow cells to make sure they are applicable to the case

In the sheet *Participatie* the input is given for the calculations for the goals of the different actors. The characteristics that are identified in section 3.3.4 are displayed in tables, shown in a copy of the sheet below. We see that except for the green and orange variables also yellow variables are shown. These variables are assumptions and are thus to be checked by the process manager before using the tool in the process. For different wind parks a different prospectus on the expected return can be given, because of the difference in financing structure, profitability of the wind park itself, etc.

Participatie

Financiële middelen met zeggenschap					
			Beschikbaar?		
1.	Aandelen	Vanaf initiatie		Prospectus rendement	12%
				Risico	5
				Zeggenschap	4
		Vanaf oplevering		Prospectus rendement	10%
				Risico	4
				Zeggenschap	3
2.	Cooperatie als eigenaar		-	Prospectus rendement	
				Risico	5
				Zeggenschap	4
Nieuw				Prospectus rendement	
				Risico	
				Zeggenschap	

Financiële middelen met beperkt of geen zeggenschap					
			Beschikbaar?		
3.	Lokaal beleggingsfonds		-	Prospectus rendement	8%
				Risico	3
				Zeggenschap	0
4.	Leningen		-	Prospectus rendement	6%
				Risico	2
				Zeggenschap	2
5.	Obligaties		-	Prospectus rendement	8%
				Risico	3
				Zeggenschap	0

Gebiedsinstrumenten					
			Beschikbaar?		

6.	Gebiedsfonds		Indicatie kosten	% * winst
7.	Steun duurzaamheidsinitiatieven in de regio		Indicatie kosten	-
8.	Elektriciteit verkopen aan de regio		Indicatie kosten	-
9.	Korting op elektriciteit voor omwonenden		Indicatie kosten	-
10.	Nieuwe banen in regio		Indicatie kosten	€ / jaar

Figure 18 Sheet participation overview

We see the *Nieuw* area in which new ways of participation can be inserted. The new participation method is in that way directly linked to the goals of the actors, so no complicated links have to be made by the user. This overview can also be used to summarize the characteristics of different participation methods for inexperienced actors in the beginning of the process.

Participation potential

On the *Participatie* sheet is except for an overview of methods also the participation potential table presented (Figure 19). In this table indicators for the potential in a region are given. By filling in the orange variables we can see what the percentage of participants has to be to in either the municipality or the region. These percentages give the possibility to quickly scan the opportunities in a municipality or region.

Potentie participatie	
Aantal direct omwonenden	
Aantal omwonenden	
Aantal inwoners aangrenzende gemeenten	
Aantal inwoners regio	
Gemiddeld spaargeld Nederland (2011)	
% beschikbaar voor investeren	
% van inwoners die investeren	
Gemiddeld geld voor investeren	€ 0
Potentieel investeringskapitaal gemeenten	€ 0
Potentieel investeringskapitaal regio	€ 0
Potentieel dekkingsgraad gemeenten	-
Potentieel dekkingsgraad regio	-
Dekkingsgraad nodig binnen gemeenten	#DIV/0!
Dekkingsgraad nodig binnen regio	#DIV/0!
Verschil in procentpunten gemeenten	#DIV/0!
Verschil in procentpunten regio	#DIV/0!

Perhaps the municipality can give more accurate figures on this. Otherwise sources like (Geld.nl, 2014) can give an indication.

The percentage of the savings available for investments. If you want the full potential, fill in 100%. Most likely this percentage will be lower, as people will not invest all their savings in wind parks.

The full equations used to calculate these values can be found on the sheet *Participatie* next to this table.

Figure 19 Participation potential

If an actor proposes for instance to use shares as the participation method that are limited to the own municipality and have to bring in a certain percentage of the total investments in the project, it can be checked if this option is realistic. When this option looks not realistic for the municipality it can be checked whether the option is realistic for multiple municipalities or a region.

Sheets actors

- Fill in orange cells under *Is opgebouwd uit* if there are any and the option is included
- Decide on scores of goals in the orange cells under *Score*
- Decide on weights of goals in the orange cells under *Weging*

In the figure below the sheet is presented in which the goals of the citizens are analyzed. We see the five goals of the citizens (Table 13); profit, low risk, high influence in the process, development region and minimal nuisance. On the right side we see which variables influence the goals. The profit is based on the business case in the Agentschap NL model in combination with the participation methods described in the sheet *Participatie* that will be described later. The influence in the process and the risk are both based on the characteristics of participation options in the sheet *Participatie*. The development of the region is based on the region instruments also described in the *Participatie* sheet. The fifth goal of minimal nuisance gives indicators for the nuisance of a wind park. On this basis the actor can decide how to score the nuisance based on these indicators that are described in sheet *Inpassingsplan.*

Doelen burgers

Doelen burgers

	Weging	*Score*	*Weging X Score*	*Is opgebouwd uit*	
1. Winst	4	5	20	Inleg obligaties of beleggingsfonds	€ -
				IRR	-
				Inleg aandelen	€ -
				IRR	- %
				Korting op elektriciteit omwonenden per jaar	€ -
				Korting op elektriciteit omwonenden over operationele jaren	€ -
				Cooperatie als eigenaar: rendement	-
				Leningen (in plaats van bank): rendement	-
				Nieuw	
2. Laag risico	2	1	2	Risico	Hoog risico
3. Veel zeggenschap	3	5	15	Zeggenschap	Zeggenschap vanaf initiatie
4. Ontwikkeling gebied	1	1	1	Gebiedsfonds	€ 212.201,90
				Steun duurzaamheidsinitiatieven in de regio	€ -
				Elektriciteit verkopen aan de regio	€ -
				Toegevoegde waarde aan regio door nieuwe banen	€ -
				Nieuw	€ -
					€ -
				Totaal	€ 212.201,90

Score on risk (Appendices 5 + 6)

Influence in process (Appendix 5)

5. Minimale overlast	5	2	10	Visuele inpassing	Lijnopstelling?	Ja
					Zelfde molens?	Ja
					Aantal rotorbladen	3
				Geluid hinderlijk voor		10
				Slagschaduw hinderlijk voor		100
Gewogen totaal score			2,55			

Figure 20 Sheet goals citizens

We also see that the support to local sustainable initiatives will have to be filled in by the actor. This is because for the model of Agentschap NL there is no difference between this option and the regional fund, therefore if you want to increase the support to local initiatives you can increase the local fund in the *Cockpit.* We name the support to local initiatives separately because it has another impact on the region. The orange cell of the variable is not included in the total amount, because it is already included in the regional fund. In that way we can leave the Agentschap NL model untouched and still functioning in the same way.

The goals of the municipality

The sheet with the goals of the municipality is build up in the same way as the *Goals of citizens* sheet. The profits come out of the *Cockpit* sheet of the Agentschap NL model. The development of the region is the same as in the *Goals of citizens* sheet, but of course the score and the weight can differ as the municipality fills this in itself. The broad acceptance of the wind park is measured using the influence of the citizens in process, so this is also linked to the *Participatie* sheet.

Doelen gemeenten

Doelen gemeenten

	Weging	***Score***	***Weging X Score***	***Is opgebouwd uit***		
1. Inkomsten	1	5	5	Inkomsten uit leges	€	-
				Totaal uit leges, grondverkoop, grondpacht, OZB en gebiedsgebonden bijdrage	€	-
				Totale inkomsten gemeente (of gemeenten)		
				Totale inkomsten gemeente (of gemeenten) over operationele jaren	€	-
				Deel inkomsten windpark uit totale inkomsten over operationele jaren		
				Nieuw		
2. Ontwikkeling gebied	3	1	3		Euro per jaar	
				Gebiedsfonds	€	-
				Steun duurzaamheidsgebieden in de regio	€	-
				Elektriciteit verkopen aan de regio	€	-
				Toegevoegde waarde aan regio door nieuwe banen	€	-
				Nieuw	€	-
					€	-

Incomes are calculated over the number of operational years (*Invulformulier)*. Leges are paid only once.

For instance participating financially in a wind park

				Totaal	€ -
3. Breed gedragen project	5	5	25		Zeggenschap
				Participatie burgers	Zeggenschap vanaf initiatie
Gewogen totaal score			3,67		

Figure 21 Sheet goals municipality

In the variables contributing to the first goal we see that the income of the municipality in total (so without the wind park) has to be filled in by the municipality itself. In that way they can put the income of the wind park in perspective, so they can give an appropriate score on this goal.

The goals of the province

The goals for the province are similar to the goals of the municipality, but the most important difference is that the province has to meet the sustainability goal of the central government, whereas the municipality wants the citizens to accept or even support the development of a wind park.

Doelen provincie

Doelen provincie

Score based on percentage of potential; 0-20% = 1, 20-40% =2, etc.

	Weging	*Score*	*Weging X Score*	*Is opgebouwd uit*		
1. Halen duurzaamheids-doelstelling	5	4	20	Aantal MW project		
				Aantal MW in doelstelling		
				% toevoeging aan behalen doelstelling		
				Potentie gebied volgens visie in MW		
				% MW gehaald uit potentie		**Indicatie hoogte**
2. Ontwikkeling regio	3	2	6	Gebiedsfonds	€ -	
				Steun duurzaamheidsgebieden in de regio	€ -	
				Toegevoegde waarde aan regio door nieuwe banen	€ -	
				Nieuw	€ -	
					€ -	
				Totaal	€ -	
3. Winst	1	1	1	Leges for "inpassingsplan"	€ -	
				Nieuw	€ -	
					€ -	
				Totaal	€ -	
Gewogen total score			3,00			

Selling electricity is left out, because it is a local instrument. Scope is too small for province.

Figure 22 Sheet goals province

The reaching of the targets of the central government is measured using the percentage of MW that is constructed of the total potential for that area, as indicated in the plans of the province. If this percentage is low, this means that only a small percentage of the potential is fulfilled in that area. This makes the targets of the central harder to reach for the province.

The goals of development of the region and profits are similar to the goals of the municipality. The profits for the province are limited in comparison to the municipality, as the province can only collect *leges*, when the municipality is not changing the *MDP.* In that case the province has to change the *inpassingsplan* for which it can collect *leges* (section 3.2.2). This is the only business case for the province, but room is kept for the unique situation in which the province for instance is the owner of land on the potential wind park site.

The goals of the project developers

The main goal of a project developer is to make profits of wind parks. Therefore the most important variables (section 3.2.2) that indicate a viable business case are indicated in this sheet. These are already indicated in the *Cockpit* sheet of Agentschap NL, but to complete the overview copied here. Except for the fact that there have to be profits for the project developers, some project developers might have a more philanthropic goal of developing as much wind power as possible. In that case the profitability can be scored lower than in the case of a purely business minded project developer.

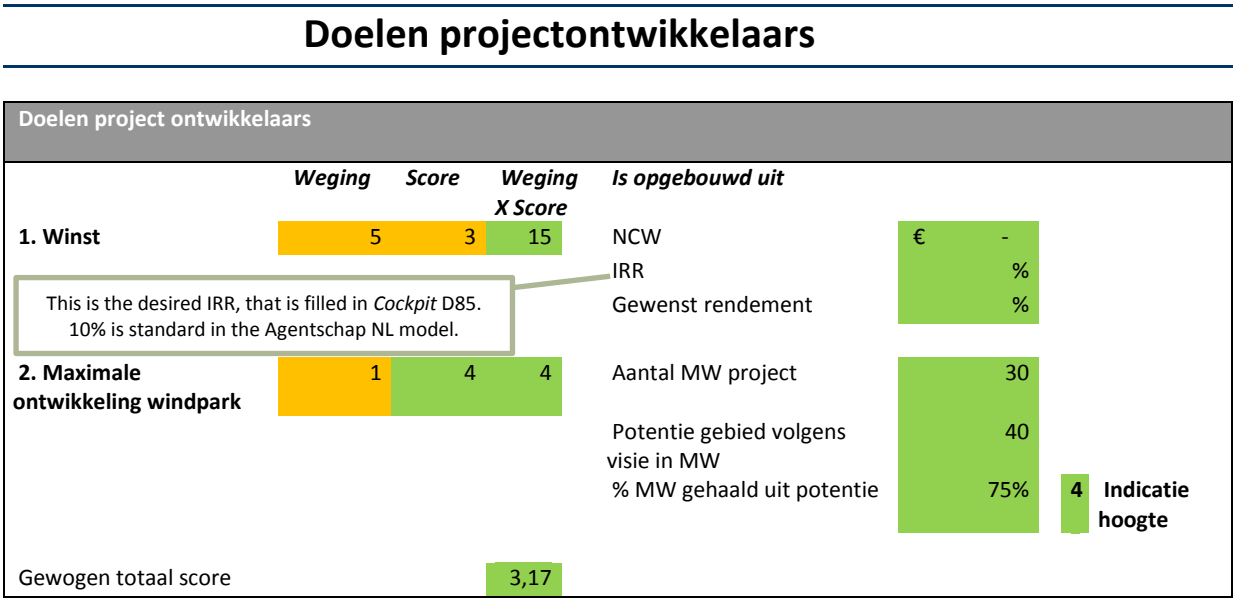


Figure 23 Sheet goals project developers

Visualisatie

- In the *Visualisatie* sheet the total scores of the different actors are presented
- Analyze where the differences between the total scores come from.
- Which goals are important for each actor? Which options score low on these goals? Which options score high?
- Are there possibilities for win-win solutions?

In the *Visualisatie* sheet the total scores of the actors are presented and the importance of the weights is illustrated. This is purely an example of the influence of weights on the scores and will not have to be filled in by the actors.

The weights are influencing the eventual score for the actors highly, so it is important to be aware of this, when negotiating within the actor group and with the other actors. The weights can differ highly across different regions, municipalities and within municipalities. Openly thinking and discussing the goals can contribute to understanding the problems and other actors. In the figure below a representation is shown of how different weights change the scores on different participation options for the same actor (in this example: citizens). The weights are chosen to show the possible differences for the ideal package, so these are not real-life values.

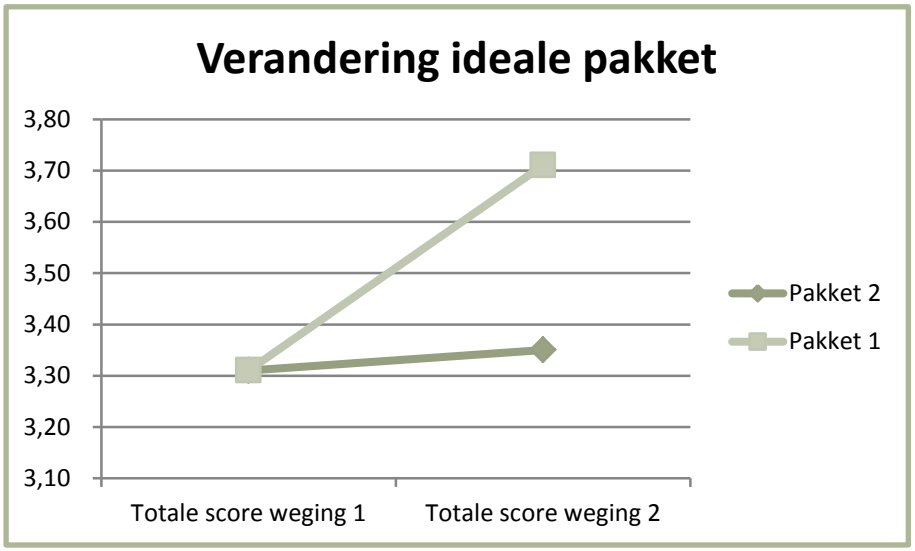


Figure 24 Change ideal package of participation options (actor: citizens)

In Figure 24 we see that with the first set of weights the two different packages of participation options score more or less the same. In that case it would be hard to make a choice between the two packages based on the tool. With different weights package 1 becomes much more attractive for the citizens.

These kinds of figures can also be developed for different changes in variables, such as a different wind speed, that influences the profitability of the wind park, or the spatial plan, that influences the nuisance of the wind park. During negotiations the different actors can change different variables in the model and discuss the influence on the different goals with each other. In this way the tool can both add to the understanding of the system and of the other actors.

The scores on the goals

The tool will thus go further than analyzing the dependent variables described in the previous section and calculating different variables. The scores of the different actors will be presented together with the explanation of the Figure 24 on the last slide of the model, called *Visualisatie.* In the figure below we see an example of the scores of the different actors included in the tool.

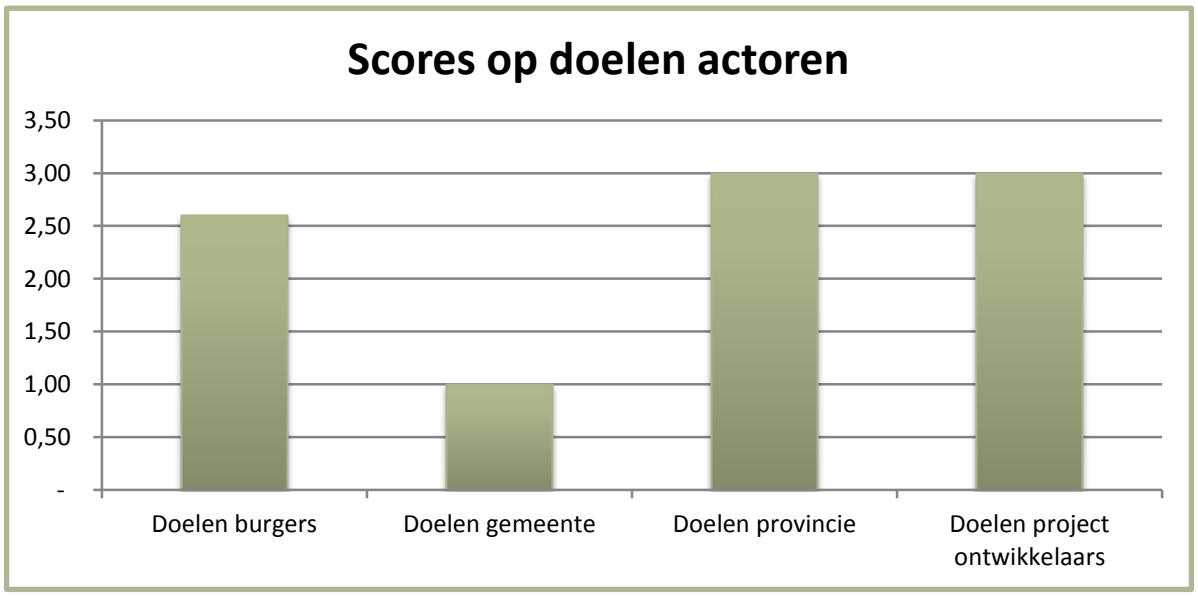


Figure 25 Scores on goals actors

In Figure 25 we see from left to right the goals of the citizens, municipality, province and the project developers. In this case we see that the project developers and the provinces have the highest scores, followed by the citizens. The municipalities have the lowest score. When such an option is presented it will be hard for the municipality to accept this and they might show strategic behavior to change the outcome of the process. Therefore it is important to note that the tool must be used with caution when calculating and presenting the total scores, as it might invoke strategic behavior. In chapter 6 the interviewees will elaborate on the chances of strategic behavior.

6 Suggestions for Improving the Prototype

In the previous chapter we described the prototype and what insights the tool can add to the wind park development process. This chapter will provide expert opinions on the prototype and the improvements that have to be made based on these expert opinions.

6.1 Expert Opinions on Prototype

First we will briefly introduce the interviewees of each actor group (Table 24) to get an idea of their backgrounds before analyzing their answers. The full interviews can be found in Appendix 9 and the all evaluations of the program of requirements in Appendix 10. All actors are actively involved in the negotiation process about the wind park at Deil.

Table 24 Interviewee overview

Interviewee	*Actor*	*Description*
Arjen Gerritsen	Citizens	Actively involved in civilian initiatives 11Duurzaam and Dirk III. Working as a facility interim/implementation manager.
Jeroen Gelinck	Province	Program leader Energy transition of the Province of Gelderland. Worked in different governmental agencies primarily on spatial development.
Rolf van Os	Municipality	Author of the "Windvisie" of the municipality of Geldermalsen. Working at the municipality on environmental issues.
Jan Hiemstra	Project developer	Development director at YARD ENERGY, director at Wind & Co and lawyer partner at EBH Elshof Advocaten.
Job van den Berg	Process manager	Senior consultant at Royal HaskoningDHV, process manager of the Deil case, expert on process management.
Hans-Peter Oskam	Process manager	Junior consultant at Royal HaskoningDHV, process manager of the Deil case, expert on wind parks.

Question 1 - How do you score the different requirements? Why do you give the different scores to the requirements?

The requirement 'provide insight in the goals of actors' is rated as not important for the municipality as they know their own goals, but the goals of other actors are seen as important to get insight in. This will mean that their own goals will be quickly rated on weights and that the goals of other actors are still interesting, therefore we didn't change anything to the tool on basis of this requirement.

The tool has to be improved to fulfil the requirement 'provide insight in dependency different products' better, because both the province and the project developer see things to improve. Both have their own point of view on how this should be done. The province wants to see the dependency clearer, so inexperienced actors can see how for instance the spatial plan influences the business case. The project developer notes that there is no legal basis for the participation plan and therefore

it should not be seen as equal to the business case. The spatial plan and for instance the MER-research attached to it are for a project developer not leading. The business case is leading and the effects of spatial planning are not leading for the project developer. This insight of Jan Hiemstra comes clearly from his expertise as a lawyer. Hans-Peter Oskam points out that not all dependencies are included, so we are actually cherry-picking quantifiable dependencies.

The 'Easy-to-use' requirement showed clearly that the actors thought the tool should be used by the process manager. Because the process manager should have knowledge about the tool and developing wind parks, this requirement only counts for the process manager. Job van den Berg states that he needs an expert on wind parks to use the tool or a really clear guideline. Hans-Peter (an expert on wind parks) would only need a guideline to use the tool.

The ´Interactive' requirement can be better reflected in the tool by presenting the total scores for a package of options, so the mutual gains can be investigated. This remark is made by Hans-Peter Oskam.

Question 2 - In which phase of the process do you see that this tool is used?

All actors see the best use of the tool in earliest stages of the process. Then the inexperienced actors can get insights on the complexities and dependencies in wind park development. For the project developers this is not as important as for the other actors, because they have already a lot of experience in wind parks.

Except for the project developer, every actor sees a role for the tool in the later stages of the process to keep track of the progress that is made and to give an indication of effects of certain options. For the province and the citizens this will be used to support the decision-making process directly, but for the municipality officials it will be used to inform the *Raad* of the municipality about the progress of the project. The project developer only sees a role for the tool at the earlier stages for inexperienced actors to get their goals sharp and their knowledge at the right level. An explanation for this can be that by using the tool in the negotiation the focus will be on getting all the scores at the same level, while the project developers have invested a lot of time and money in the project and other actors didn't in their opinion.

Question 3 - What are additions or changes you would like to see in the prototype?

The additions or changes are different for each actor as they mainly focused on their sheets in the model or their expert background. Table 25 summarizes the additions proposed by the different actors.

Table 25 Additions by interviewed actors

Actor	*Additions for tool*	*Additions for context of tool*
Citizens	Work availability should be added to the development of the region.	What is the difference between control/influence in the project and ownership for citizens? Is process participation analyzed instead of only participation in the project?
Province	Profits are not a goal for the province. Amount of jobs created should be added.	
Municipality		Municipality is involved in process, but not negotiating.
Project developer		Show the legal context of the project before using the tool.
Process manager	Overview dashboard to show most important choices made and effects on goals.	
Process manager	The total scores can be presented, so you can see how different scenarios influence the total score. This can be linked to the mutual gains theory.	

Two sorts of additions are identified; additions directly for the tool and additions for the context of the tool. Additions for the context can be included in the introduction of the tool to make clear what the context is that influences the use of the tool. For instance the legal context of the project can be decisive in the focus of the process on one of the three products. As the participation plan doesn't have legal status for instance, the project developers might want to see something in return for their effort of letting citizens participate (Hiemstra, 2014).

It is clear that the work availability should be added to the tool, as both the citizens and the province state this is of great value for the development of the region. Both actors would like that the wind park project leads to more jobs in the area. In the rest of the research this is called work availability. The province also claims that the profits are not a goal for the province, as the province only focusses on goals for development of the province. We choose leave this goal in the tool as it was for two reasons; the *leges* have to be paid to someone, so otherwise this money should go out of the tool, and it is logical that the program leader of energy transition doesn't see the profits as a goal, but maybe another province official might find this very important. If a province in a case really thinks the profits are not a goal, two things can be done; the weight of the goal gets a score of one or the goal is completely deleted out of the Excel file.

The additions for the context of the tool are very different, so they will be described separate briefly. In the tool there is no difference between control and influence in the project and ownership by citizens; if the citizens own a part of the wind park, this means that they have full influence or control in the process. The second issue of the citizens was the process participation versus the project participation. Because the tool is introduced in a stage in which all actors are already included in the process, we can already say they participate in the process. Therefore we are only addressing project participation in the tool.

The municipality is not negotiating in the process, but says it is involved, so therefore the process manager has to ask for this explicitly in a new case. If the municipality states that they don't want to negotiate this can be important context information to give in the earlier stages of the process to the other actors.

The legal context of the tool can be important as this defines the boundaries for the use of the tool. In section 3.3.5 we discussed several judicial arrangements influencing the wind park development process, so it might be good to highlight these arrangements in the introduction to the tool. Important note is that the *Windvisie* of the municipality doesn't have any legal ground and so does the participation plan described in it (Gemeente Geldermalsen, Neerijnen en Tiel, 2013).

Question 4 - How useful do you think this tool will be, including the before mentioned changes?

All actors see the tool as really helpful in the process especially in the beginning. It can be helpful in giving inexperienced actors insights in the complexities and dependencies between different factors. Only the project developer didn't bring up use in the later stages of the process, whereas all other actors thought the tool would be very useful in these stages as well. The use in later stages is about keeping track of the progress and seeing the effects of certain options. This can create clarity in the process and can speed up decision-making. Also it can be used to communicate with other actors or people within the actor group, such as the *Raad* of the municipality. The process manager stated that the tool can be very helpful in giving guidance in the discussion between the actors about goals and interests of the different actors, as well as getting them to know how wind park cases work. In earlier phases of the Deil project the process manager saw that discussing a calculation model similar to the Agentschap Nl model already helped to grow trust between the actors and share knowledge. This tool can help in the same way; only adding even more knowledge and trust.

Question 5 - Do you see opportunities for actors to behave strategically? What are these opportunities?

The civilian initiatives, the municipality and the project developer think there is an important role for the process manager. The process manager needs to use the tool himself and just ask and discuss the input with the actors. In that way he can collect the scores and weights of the goals. Arjen Gerritsen of the civilian initiatives states that the process manager should have the knowledge to identify the moments when actors behave strategically (Gerritsen, 2014). Rolf van Os of the municipality is not very experienced in games like these, so for him it is very important to not negotiate on basis of the tool with all actors at the table, because than the project developers will be too influential (van Os, 2014). Jan Hiemstra as a project developer states that presentations of the process manager about outcomes of the tools will help to give the process guidance, but strategic behavior is always present and part of the game. The process manager will have to translate preferences in a meeting into the tool, so strategic behavior is limited. The process manager

Jeroen Gelinck of the province sees a smaller role for the process manager, because after an introduction per actor group of the tool, all actors will have to study the tool at home (Gelinck, 2014). By splitting the actors they can think about their weights and goals in a non-competitive environment. This reduces the chances for strategic behavior.

6.2 Conclusions for the Tool

We will summarize what the answers given by the interviewees mean for the tool. First we look to the additions to the actual tool and then we will look to the context and the use of the tool.

6.2.1 Additions to the Tool

The additions to the tool proposed by the interviewees are; the number of created jobs, an overview of the important variables to present the tool and an example of mutual gains illustrated by scores of the tool.

Number of Created Jobs

The addition to the tool from question 3 of the previous section is the number of jobs that adds to the goal of development of the region. In the figure below the addition to the goal development region on the sheets of the citizens, municipality and province is shown. This means that the number of new jobs has to be chosen by the actors with the corresponding salary. This sum of money is added to the total money spent on regional development. This will be the input for the scores given by the actors.

Table 26 Addition to sheets of citizens, municipality and province

Toegevoegde waarde aan regio door nieuwe banen	€ -	*Aantal nieuwe banen * salaris*

This addition is also influencing the business case of the wind park. Therefore we first made changes to the *Participatie* sheet in which we added the new jobs as a regional instrument. The costs of the new jobs are the amount of jobs times the possible extra salary, because the cheapest option is not found, but the local option is used. This extra cost is multiplied by the operational years defined in the *Invulformulier* sheet. Then these costs are divided by the amount of turbines (in sheet *Invulformulier*). This is done to let the extra cost be added to the total investment costs on the *Invulformulier* sheet, because these are calculated over all operational years per turbine. Via that way the business case is adjusted if this option is chosen and extra costs are involved.

Most likely the effects of this option are not drastically reducing the viability of the business case, as it is not likely that the extra salary costs are very high. The number of jobs is again a matter of scope; do you want to create jobs that are directly involved with the wind park or do you want to create jobs for the whole area using the profits of the wind park. This is a question that should be asked early in the process to add clarity to the standpoints of the actors.

Table 27 Addition to participation sheet

10.	Nieuwe banen in regio		Indicatie kosten	€ / jaar	*banen*extra salaris*
			Kosten banen operationele jaren	-	
			Kosten banen per turbine	-	

Overview Important Variables

In Figure 26 the overview sheet with the important variables is presented. This can serve as a sheet that is used in presentations during negotiation rounds to quickly scan new propositions for feasibility. Therefore we displayed the main characteristics of the wind park and its business case. The participation options that are chosen will get a ticked box. At last the weighted scores of the

different goals are presented. In this way the results for a proposed set of options can be reviewed on this sheet. When an aspect of the wind park or a goal of an actor is problematic the process manager can switch to the specific sheet to elaborate on the causes.

Overzicht Belangrijke Variabelen

Windpark		Business case	
Startdatum Bouw	-	NCW (wacc 6%)	€ -
Bouwperiode	-	IRR Ontwikkelaar	- %
Aantal operationele jaren	-	IRR Burgeraandelen	- %
		Min. DSCR hoofdlening (geëist: 1,25)	-
Aantal Turbines	-	Min. DSCR burgerlening (geëist: 0)	-
MW project	-	Elk jaar burgerlening volgens schema afgelost?	-

Participatie methodes			
Aandelen vanaf initiatie	-	Gebiedsfonds	-
Aandelen vanaf oplevering	-	Steun duurzaamheidsinitiatieven in de regio	-
Coöperatie als eigenaar	-	Elektriciteit verkopen aan de regio	-
Lokaal beleggingsfonds	-	Korting op elektriciteit voor omwonenden	-
Leningen	-	Nieuwe banen in regio	-
Obligaties	-		

Burgers		Gemeenten	
Doelen	**Gewogen score**	**Doelen**	**Gewogen score**
1. Winst	-	1. Inkomsten	-
2. Laag risico	-	2. Ontwikkeling gebied	-
3. Veel zeggenschap	-	3. Breed gedragen project	-
4. Ontwikkeling gebied	-		
5. Minimale overlast	-		
Totale score	**-**	**Totale score**	**-**

Provincie		Projectontwikkelaars	
Doelen	**Gewogen score**	**Doelen**	**Gewogen score**
1. Halen duurzaamheidsdoelstelling	-	1.Winst	-
2. Ontwikkeling regio	-	2. Maximale ontwikkeling wind park	-
3. Winst	-		
Totale score	**-**	**Totale score**	**-**

Figure 26 Overview Important Variables

Mutual Gains by Participation

Hans-Peter Oskam recommended showing what the total scores of different participation packages are in a sheet. This will help to indicate what the mutual gains can be with different participation options. We choose to show this by comparing the situation when no participation was available for citizens and a situation in which three participation options are used. In Figure 27 the sheet is presented. The weights and scores are fictive, but are just to indicate how the tool works.

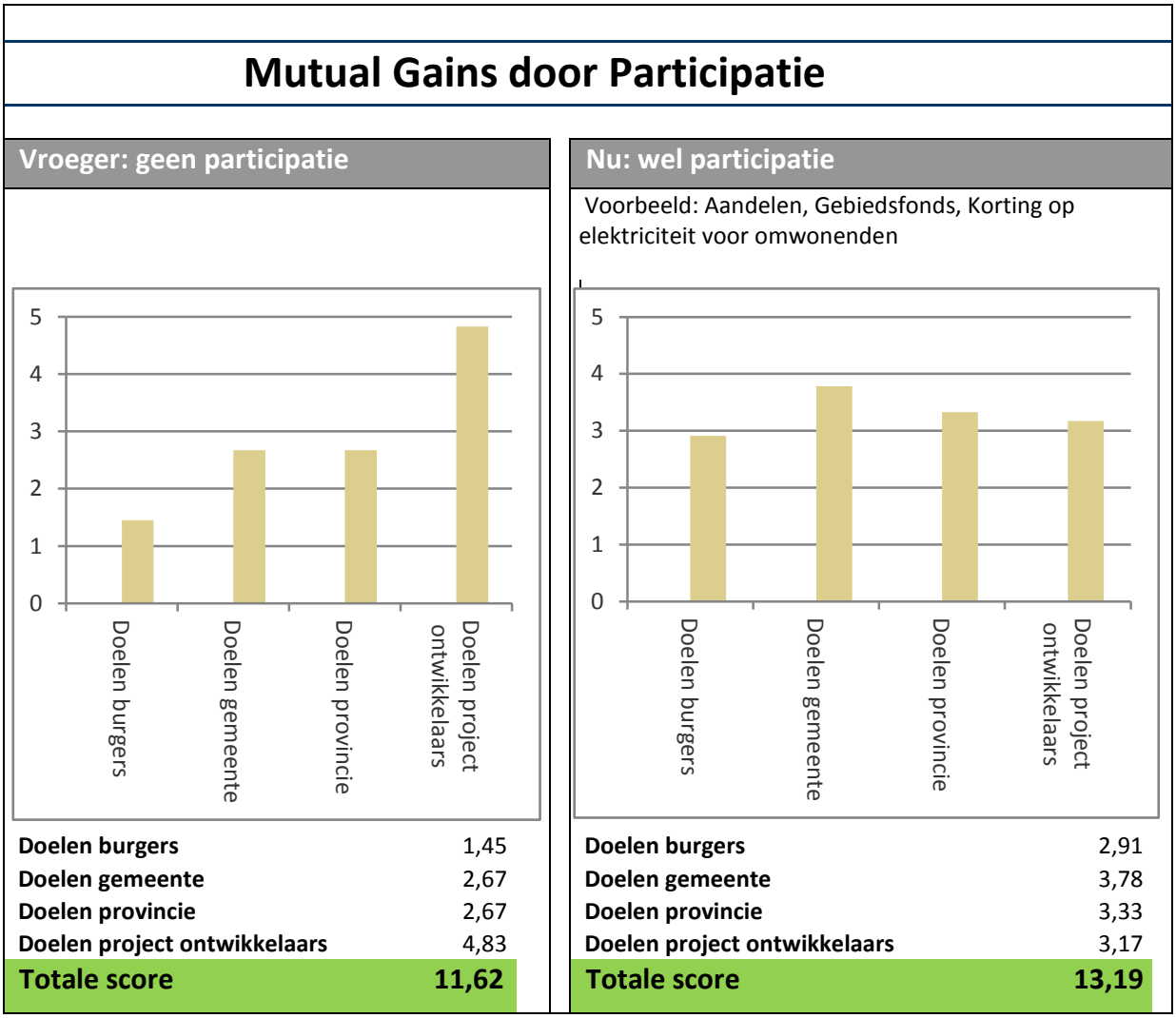


Figure 27 Mutual Gains Sheet

By introducing three participation options (shares, a local fund and a discount on electricity for surrounding citizens) we see that the total score increased from 11,62 to 13,19. This means that the total score of the goals of all actors increased and in that way the mutual gains increase by adding this set of participation options. However, it should be noted that the score of the project developer has decreased and this can lead to friction during negotiations. It should also be noted that these scores are all rather subjective, so these total scores can give an indication, but should not be used to make a final decision.

6.2.2 Additions to the Context of the Tool

The requirements that were not reflected enough in the tool were the 'easy-to-use' requirement and the 'give insight in dependency different products' requirement. The tool becomes easier to use, when a user guide is handed over to the process manager, as it is clear from the interviews the process manager should use the tool. With this user guide and the existing knowledge on processes the process manager should be able to use the tool. Therefore the easy-to-use requirement is dropped for the other (inexperienced) actors, as the only direct user is the process manager.

Giving insight in the dependency between the different products is harder to incorporate in the tool, so therefore we choose to explain the dependency in the introduction to the tool. This can be combined with the legal context, mentioned by Jan Hiemstra, which is also used to define what the

link between the different products is (Hiemstra, 2014). In the text box below a set-up is made for an introduction of the tool to help the process manager prepare an introduction for each actor group.

Box 6.1 – Set-up introduction tool

Case-specific introduction

- Highlight the milestones in history of the wind park (start date first initiative, important governmental decisions, land positions of actors, already made arrangements between actors)
- Highlight current situation (actors involved in process, planning for process, milestones to reach)
- Show deliverables for the end of the process; business case, participation plan and spatial plan. Make clear what legal context is (which product has to be delivered on legal basis, which product on 'voluntary' basis, who is responsible for which product)

Tool introduction

- Present goals of the tool; show complexities and dependencies, give insight in the goals of actors and how these are influenced by different options.
- Show different products; business case on sheet *Cockpit*, participation plan on sheet *Participatie*, list of important choices for spatial plan on sheet *Inpassingsplan*. Highlight a few dependencies between products.
- Start setting up a discussion to come to answers needed for filling in the tool. Use steps of the user guide.

'

The set-up for the introduction of the tool consists of two parts; the case-specific introduction and the introduction of the tool. The case-specific introduction is used to show the context of the wind park to make sure all actors know where the project comes from and where we want it to go. Also the deliverables or products are identified and their dependency in the legal way is shown. This also gives a division of roles between the actors, so they know where to focus on. After the use of the tool they should have more insight in how their decisions in their role influence the other actors.

The tool introduction is first used to show what the goals of the tool are. They are slightly different than solving the problems mentioned in section 2.5. Increasing the trust between actors is not mentioned as a goal of the tool, because this might have adverse effects on the process. Actors might act different if too much emphasis is placed on building trust. Also the problem of different languages of the actors is not made explicit, because this difference in languages will be reduced by using the language and not by emphasizing this is a goal.

Showing the different products doesn't mean that all the sheets should be explained, but it's done to show that the tool includes all the products and to highlight a few dependencies. This information is given to the actors to show that the tool is useful and will give new insights. After this the process manager can start the discussion using the user guide attached to this report.

7 Discussion and Recommendations

This research including the development of the WINST will be discussed on its scientific and social relevance. To improve the usability and with that the scientific and social relevance recommendations for future research are presented.

7.1 Scientific Relevance

We analyzed the problems during the decision-making process of wind park development and have coupled this to the available literature on how a process manager can influence the process. For wind park development process management is presented as a good way to reach the goals of government for 2020. However, how to process manage wind park projects is not analyzed thoroughly.

Research on participation methods (Kort & Louter, 2011), business cases (Veghel, 2013) and spatial planning (Bröer, 2006) are available, but how to integrate these perspectives to manage the complex process is not mentioned. Although tools that integrate multiple aspects and actors are developed in other fields of study (Zhou & Mayer, 2010), for wind park processes such tools are not available. In this research we identified the links between the products of the decision-making process and took the next step by developing a tool to support the process. This tool combines the three products of decision-making and incorporates the goals of the crucial actors. Tools and models were all about one of the products and mostly took the perspective of the project developer. The integrality of the tool developed in this research is new and can be a start for future research.

We made the preliminary assumption that the tool should be used by all actors, so they had significant 'room to play', as was indicated as an important success factor of the *Blokkendoos Ruimte voor de Rivier* tool (Zhou & Mayer, 2010). After interviewing the different actors involved in wind park Deil, we can conclude that the success factors of support tools for environmental decision-making cannot be translated easily to the decision-making of wind-on-land projects. According to the interviewees the chance of strategic behavior is so high that there should be only 'room to play' for the process manager.

In this research the model of Agentschap NL is combined with an in-depth research into the different participation methods. Although research on participation methods exists, for instance the research of Kort & Louter (2011), this is not linked directly to the other goals of the actors except for the business case. This research makes the links between the participation methods and the different goals explicit.

7.2 Social Relevance

Royal HaskoningDHV process manages the wind park development in Deil and they saw that there was a lack of research into these specific wind-on-land projects. This research identifies the problems during the processes and explains what can help to solve them, but also comes with a tool that can be used during the processes.

The tool can help to give structure to the process and new insights to the actors involved. When the tool is further developed, which will be described in section 7.3, the tool can be used in different processes in the Netherland. Therefore we can say that apart from the research, which already contains insights for the actors, the tool can help the process manager to manage these processes. Also the actors involved will benefit if a wind-on-land process can be smoother and faster.

7.3 Recommendations for Future Work

In this section we will discuss what improvements have to be made and can be made in future work. First we analyze the work that has to be done before the tool can be used and then we will look at possible extensions of the tool or of the context of the tool.

Needed Improvement

Before the tool is used in a real process, first a thorough verification and validation of the tool has to be conducted. Now we only roughly analyzed the outcomes of the tool by entering the default settings of the Agentschap NL model. In that way we could estimate during the development of the tool in an iterative process if the tool was producing values that were reasonable. Before the tool is used all factors and links have to be checked for accuracy and the tool as a whole should be checked for producing values and scores that are reasonable.

In this check also a sensitivity analysis should be conducted to see if the tool is very sensitive for the input of certain variables. In the Agentschap NL model is noted that the model is very sensitive for the amount of *vollasturen* of the turbines after they had analyzed the sensitivity. In the tool the sensitivity for the amount of *vollasturen* will be present, but we have to check if the outcomes of the tool are very sensitive for newly introduced variables.

Possible Improvements

With the improvement mentioned above the tool could be used by a process manager, but further improvements can improve the usefulness of the tool even more. We list a few of the possible improvements:

1. *The tool can be expanded by adding more variables and links.*

   Although most important links and variables are included in the tool, more can be added to the tool to complete it even more. In section 6.10 we identified linked variables that were too complex to include given the timeframe of this research. In future works these more qualitative links can be analyzed and added to the tool. We could also for instance include a model that calculates the values of the wind park on its surroundings in this tool to give the spatial plan more body. We can conclude to say that in future works there are many aspects that can be specified more or added to the tool.

2. *A thorough guideline for the tool can be written*

   Although a short user guide is included in the report, a more thorough guideline can help clarifying the following points; when to use the tool and when not to use the tool, what can be negative effects of the tool, how can these negative effects be overcome, what can be strategic behavior and how can this be decreased? This and more can be added to help the process manager, when he is going to use the tool.

3. *A process (with place for the tool) can be designed*.

   A process design from start to finish of the process can help as guidance for the process manager. A thorough process design can be designed using the information in section 2.2. In this process design the tool can be embedded, which makes it easier for the process manager to implement the tool. Otherwise the process manager might have a process design he wants to use and has to embed the tool in that existing design, which can be hard to accomplish.

8 Conclusions

In this research the WINST is developed for the support of wind-on-land decision-making processes. After discussing the research and making recommendations for further research we can discuss the answers on the research and design questions developed in section 1.5. First we discuss the research question and then we discuss the design question, both including their sub-questions.

8.1 Research Question

To reach the goal of the central government of having a capacity of 6000 MW of wind energy installed in 2020 a lot of wind parks have to be developed in the Netherlands. Although the central government set goals per province and the provinces allocated possible areas for wind park development, the actual development of wind parks is still going slowly. In neighboring countries like Germany and Denmark wind parks are developed faster, while these countries are comparable to the Netherlands if we look at the availability of wind.

Therefore we presented the research question for this research in section 1.2:

How can the problematic aspects during the decision-making process of wind-on-land projects be managed?

To answer these questions different sub-questions were developed, for which we will present the answers after each question. The first two research questions present the answer on the research question.

1. *What are the main aspects that slow wind-on-land decision-making processes down?*

The main aspects that slow wind-on-land decision-making processes down are identified in section 2.5, namely; a lack of trust, a lack of information and different languages between the most crucial stakeholders (project developers, local governments and local inhabitants). The decision-making processes are very lengthy and rough, because of these problems and the uniqueness of each wind park. When these problems should be decreased the processes should be smoother, get more local support and therefore lead to a faster development of a new wind park.

2. What are the functions of a process manager of decision-making processes?

After identifying the problems during wind-on-land decision-making processes we compared literature in section 2.6 to see how these problems could be decreased by the process manager. First we described that process management is more applicable to wind park development than project management, as wind park development takes places in a network rather than a hierarchical system. After that we analyzed the functions of a good process manager, as defined by Koppenjan & Klein (2004), Klaassen (1995) and ten Heuvelhoff, de Bruijn, & in ‘t Veld (2010). We combined the views of those authors in one list of functions of a process manager, visualized in Table 7. We can conclude that the task of a process manager is very complex and with the tool we will help to fulfill the functions, as is described in Appendix 3.

Conclusions for research question

The main aspects of wind park development that can be improved are; the lack of trust, the lack of information and the different languages between the most crucial stakeholders. These aspects can be improved using good process management instead of project management. A tool that could help

the process manager in the process has to help fulfill the functions described in Table 7. The process manager faces a complex task and a tool that can support the decision-making process can help the process manager to fulfill the functions of a good process manager.

8.2 Design Question

After the aspects that can be improved are identified, a solution has to be found to reduce the problems. This led to the design question:

How can a process-support tool help the decision-making process of wind-on-land development processes?

To answer the design question three sub-questions were developed, which will be discussed separately. After that the conclusions for the design question will be presented.

1. *What are the products of a wind-on-land process and how do they interact with each other?*

The products of wind-on-land processes are described in chapter 3 and are; the business case, the participation plan and the spatial plan. These three products will be developed at the end of the process and handed over to the municipality. The municipality will then decide if it changes the *MDP* for that area, so a wind park can be developed.

To describe the interaction between these products, we looked at the dependent variables that link these products. In section 3.4 we saw that changes in one product could mean that the variables of the other product changed. These links were described in section 3.4 and made explicit for the tool in Excel in section 4.5. We saw that the participation plan influences the business cases heavily, because participation options tend to reallocate the profits of a wind park among the actors. The spatial plan influences the business case, because the choice for location and turbine is determining the profitability of the wind park. When the citizens participate in the wind park and get influence in the project, they can change the choices in the spatial plan.

2. *What does a tool look like that supports the wind-on-land development process?*

We analyzed the functions of a good process manager, as defined by Koppenjan & Klein (2004), Klaassen (1995) and ten Heuvelhoff, de Bruijn, & in ‘t Veld (2010), which helped us to come to five requirements for the tool; Provides an overview of the financial room to maneuver, Provides insight in goals of actors, Provides insight in the linked variables between different products, Provides insight in the differences between participation methods and Provides insight in the effects of wind parks on the surroundings.

After identifying the problems in the process and describing the products with their dependencies, we developed a process-support tool, which is presented in section 5.3. We chose for a tool in Excel based on the model of Agentschap NL, which calculates the business case for the project developer. Two sheets contain the important variables of the participation plan and the spatial plan. Instead of a third sheet with the business case we chose to make a different sheet for the business case of each actor. The spatial and participation plan are for the whole park, but the business cases are actor-specific. Because for the actors profits are not their only goal, we added the other goals per actor to these sheets. The goals can be scored and weighted in a multi criteria table in the tool to come to total scores for every actor. This total score reflects to what extent the chosen package of options contributes to reaching the goals of the actors.

This approach means that the tool can add to the understanding of each other's goals and the way these goals are influenced by decisions by other actors. More openness about the goals and more insight in the complexities of wind parks can help to reduce the lack of trust and the lack of information. By introducing everybody to the same tool and making them familiar with it the problem of different languages of actors can also be reduced.

3. *How can we improve the prototype to be useful for the process manager?*

The prerequisite for the use of the tool is that the actors involved in wind park processes acknowledge that the tool is useful. Only then they would want to invest their time in meeting in which the tool is used. Therefore, and because these actors have their own expert knowledge, we conducted interviews with the civilian initiatives, the municipality, the province and the project developers (section 6.1). We let these actors assess the tool using the program of requirements, so we could see whether they thought the tool met these requirements. This led to improvements of the prototype so we could make it into a useful tool in section 6.2.

From this review of the prototype we can conclude the following; the actors would use the tool primarily in the beginning of the process to get all the actors up-to-speed, the dependency between the products could be emphasized more, the creation of jobs should be included and the legal context of the project should be included.

One of our preliminary assumptions was that the tool should be used throughout the process by all actors supporting the process. Getting feedback from the actors, this was changed into a tool that is used in the beginning of the process controlled by the process manager. Later in the process it could still support the process, but still controlled by the process manager and not as a negotiation tool. It should be used to clarify what decisions will do for the project, but this should only be explained at the negotiation table, prepared by the process manager.

The creation of jobs was included in the tool using an addition in Excel, as explained in section 6.2. The legal context and the dependency should be stressed more in the introduction of the tool. The legal context is really case-specific, so this should be analyzed per case. The dependency between the products is on the one hand legal, but on the other hand the dependent variables are explaining a lot. Therefore the sections 3.4 and 4.5 could be used and especially Figure 11 to visualize the dependencies.

We added an overview sheet of all important variables of the tool, because the process manager stated that this would be helpful during presentations of results for the tool (section 6.2.1). Also a sheet is included in the tool that provides an example of the mutual gains of the actors in a project in which participation is an option (section 6.2.1).

Conclusions for the design question

Going back to the design question, we can conclude that the process can be improved by decreasing the lack of trust, lack of information and the difference in languages. By showing the interdependencies between the characteristics of the products, people can get insights in what a wind park project is all about. The tool can be used to show the interdependencies and complexities of a wind park project, as well as to form one language for all actors, namely the language of the tool known by every actor. The tool will help to objectify which questions should be asked by the actors to each other. The tool can show where in the project the difficulties are, so the actors can discuss exactly these aspects.

The addition of the goals to the tool can help to understand the other actor in such a way that each other's motives are known and the lack of trust is decreased. Talking about the goals and making them more explicit, as well as knowing what influences these goals, can help to make the impacts of decisions clearer. This can lead to a situation where actors start to see in which direction the best options are and can lead to a broader support of the project by all actors.

9 Reflection on Thesis Research

In this section we reflect on this thesis research by analyzing the value of the tool, the potential pitfalls of the tool, the process of research and the lessons learned during the research.

9.1 Value of the Tool

The tool has to assist the process manager in managing the complex process of decision-making of wind park projects. The value of the product is already tested in chapter 6, in which all actors including the process managers reflected on the usefulness of the tool. All actors stated that the tool could be very useful during the process.

The tool succeeded in connecting hard and soft aspects of the decision-making process. The contested knowledge on the one side and the non-objective aspects, like opening conversations and giving insights, is new in comparison to the existing support tools available for process managers of wind-on-land projects. Especially in the starting stages of the process the tool can be useful to help to get inexperienced actors up-to-speed. The complexities of wind park development and the links between decisions and the goals of the actors can be clearly addressed. The tool will help to objectify which questions should be asked by the actors to each other. The tool can show where in the project the difficulties are, so the actors can discuss exactly these aspects.

The overview sheet enables the process manager to use the tool during the process to check the feasibility of proposed options. This will add the needed information to the process and in that way speed up the decision-making process. At the same time the trust in each other can grow as much more clarity about both the wind park and the other actors is developed.

It is important for the process manager that the tool can be used in multiple cases. In that way the process manager can get more familiar with the tool and can implement the lessons learned from other projects in a new project. The tool is perfectly usable for a wide range of projects inside the boundaries set in section 2.3. Because the tool is made in Excel small additions can easily be made and because of the wide range of different spatial, business case and participation options, the tool is usable for the process manager in most cases.

9.2 Potential Pitfalls for the Tool

Although the WINST has clear value for the process manager, as is indicated in section 9.1, we can identify three potential pitfalls for the tools; Critique on the Tool, More knowledge can be a danger, Actors can be unwilling to participate and Scores can become leading.

Critique on the Tool

The *Blokkendoos Ruimte voor de Rivier* tool was criticized because it was supplying incomplete information and was supposed to be a black box model (Zhou & Mayer, 2010). Critique on the WINST can be a potential pitfall, as this could decrease the value actors give to results of the tool. Although the WINST could be more complete (see section 7.3), the Excel tool is definitely not a black box model. All links and variables can be checked easily, so if there should be a mistake in the tool, it can be found and improved quickly. Before the tool is used in real processes, it should go through a thorough verification and validation. This research can then be presented to the actors criticizing the tool to show the validity of the tool.

More Knowledge can be a Danger

The WINST adds information to the process and with that the knowledge on wind parks of the involved actors grows. Although this certainly has positive effects, more knowledge can also slow the process of decision-making down. Actors can get in discussions about insignificant details, while the process could be helped more by focusing on the main decisions that have to be made. The process manager can have the strategy to first build trust among the actors and after that discuss the content of the process. Introducing the tool in the early stages of the process, as was preferred by the interviewees, can lead a discussion about the content right away and skip the building of trust. The process manager faces the delicate task to balance adding knowledge to the process and building trust among the actors.

Unwillingness of Actors

Scoring and weighing the goals in such an explicit way, as in this tool, uncovers much about the motives and the room to maneuver of the actors. Therefore actors might not be willing to participate in the process or might show strategic behavior by supplying false information. One of the core values of a good process design is the 'protection of core values' (Appendix 11). Using this tool without enough trust among the actors can invoke the feeling that their interests can be harmed by opening up too much during the use of the tool. For instance a project developer can feel that, if he reveals his lowest accepted profit by giving that goal a medium score, he might end up with just that amount. Therefore the project developer could try to behave strategically or be unwilling to join the process of using the tool. The process manager has to be certain that the needed level of trust is reached, before introducing the tool during the negotiation rounds. The tool can already be used to explain the complexities of a wind park within the actor groups. It can also help to emphasize the possible results of working with the tool, for instance by showing the mutual gains in the example on the Optimization sheet in the tool.

Scores become Leading

The WINST is a process-support tool and not a decision-making tool and this means that the focus of the discussion should not be about the scores of the tool. This can lead to strategic behavior of actors who want to see their proposals to turn out as the best options. The tool can best be used to speed-up the beginning of the process and in the rest of the process to guide the process by letting actors ask the right questions. The process manager has to emphasize that no final decisions will be made based on the tool.

9.3 Process of Research

The first stages of the research were the most time-consuming, as not much specific information was available on the wind-on-land processes we analyzed. Therefor much time was spent on chapters 2 and 3, because these chapters form the basis for the rest of the research. These chapters also helped form ideas about the objectives and requirements for the tool. Because no clear choice for the tool was made in the early stages of the research, the chapters took more time than was perhaps needed.

The choices for the tool we made in the preliminary assumptions turned out to be quite naïve, when we presented them in the interviews. All interviewees thought the tool could best be used in the earliest stages of the process instead of after the intention agreement. The process manager should be the only one working with the tool, because if all actors would use the tool this would probably invoke strategic behavior. We could conclude that although a thorough

analysis was conducted in chapter 2 and 3, the preliminary assumptions helped design the tool, but had to be adapted later. Therefore we could have made preliminary assumptions earlier to speed up the research.

After chapter 2 and 3 the designing of the tool started and because of the large amount of input and insights found in these chapters, the development of the tool was relatively smooth. The tool was developed an in an iterative way, because of the complexity of the projects the tool could be expanded after obtaining new information.

For the expert interviews more time was planned than we actually needed, because we expected that it would cost more time to make appointments and process all interviews. It also helped that most actors pointed at the same flaws or weaknesses in the tool, so only a few improvements had to be made that were not drastically different from the existing tool.

In the first couple of months the research was not well-structured enough. Because of the lack of clarity about what a good solution could be for the identified problems, we started to do more research into both literature and cases. If clear assumptions were made in the beginning, the literature research have been more structured and in that way more effective. Also the way of keeping track of all the analyzed literature could have been improved, as now sometimes statements were made in the research that could not be linked back directly to the literature. The literature was analyzed, but not always well-documented, so in later stages we had to search again for the same literature. After some time in the research we drastically improved the way of documenting the literature, using the standard Microsoft Word 2010 references system for all literature, especially for the literature not immediately used.

9.4 Lessons Learned

The lessons learned can be divided between the lessons learned from the process of doing research and the content of the research. The following lessons were learned from the process of researching and developing the tool:

- Sources of Literature. As was already mentioned the documentation of literature is very important in a research of this scale. Without decent documentation you could get into problems later in the research, when it is not clear where information is coming from.
- Structure. A more structured approach in the beginning of the research could have brought more speed in the research. It was hard to structure the research, as the problem was still very broad, but by making assumptions the literature could have been more focused.
- Focusing on Main Findings. During the development of the report we included all research in the main text, so all steps in the research were thoroughly explained. This led to a huge report, which was hard to read because of the high level of detail. In future research the focus should be on the main findings from the start, because this will save a lot of time in rewriting the report.

Doing the research important lessons were learned on process management and wind park development. The most remarkable experience was seeing the decision-making rounds during the process on wind park Deil. The way actors could stay in their classic role without looking to the other actors was most striking. Every actor had his one truth about developing a wind park and because of the long history of the development of the project the tension between the actors was high. The first negotiation rounds were tough as nobody wanted to give an inch in negotiation, but after coming closer to each other just by sharing information and getting to know each other; the actors saw that working together was probably the best option. At the same time they saw that their proposals actually were not that different from the other actors.

The way that a process manager by facilitating and guiding conversations could lead a project from a complete impasse to a project that is likely to be finished in the foreseeable future was completely new for me and has made the general theories of process management of the SEPAM program come to life during this research.

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Tables

Figures

Appendix 1: Wind Park Comparison

In the table below the comparison is made between different wind parks in the Netherlands. This is the input for table 2 in the report. The input for this has come from the following web sites; (Oostermeer, 2014), (Overijssel, 2014), (Daalder, 2014), (Dura Vermeer, 2014), (Delta Wind, 2014), (Goeree-Overflakkee, 2014), (Nijmegen, 2014), (Houten, 2014).

Table 28 Comparison wind parks

	Wind park	# Turbines	MW/turbine	MW/wind park	kWh	Start process	Start construction	End construction	# Municipalities	# Project developers	Fin. participation	Fin. compensation	Process participation
1	Deil	12,5	3	37,5	Unknown	2008	Unknown	Unknown	2	7	Yes, most likely	Yes, most likely	Unknown
2	Houten	3	2	6	1,64 E+07	1997	2012	2013	1	1	Yes	No	Yes
3	De Drentse Monden-Oostermoer	43,875	4	175,5	3,50 E+08	2011	Unknown	Unknown	2	2 (cooperatie and raedthuys)	Yes	Unknown	Yes
4	Dedemsvaart-Zuid/Ommen-Noord.	10	3	30	Unknown	2012	2016	Unknown	2	2	unknown	Unknown	Unknown
5	West Brabant A16	50	4	200	Unknown								
6	Oost-Flevoland			0									
7	Energie-U			0									
8	Wieringermeer	100	3,5	350	1,00 E+09	2011	2017 (expected)	Unknown	1	3	Yes	Yes	No
9	Noordoostpolder	86	3	258	1,40 E+09						Yes	Yes	
10	Dronten	6	2,3	13,8	2,50 E+07	1997					Yes		
11	Barendregt	10	3	30									
12	Zuidlob	36	3,4	121,3									
13	Goer,Over: Piet de Wit	12	3	36	1,27 E+06			2003					

Legend

# Turbines	Number of turbines in this wind park
MW/turbine	Power per turbine
MW/wind park	(Mw/turbine)* # Turbines
kWh	Actual production of electricity
Start process	First mentioning of location in structure/wind vision
Start construction	Date of operation wind park
End construction	Number of municipalities directly involved

	# Municipalities	Number of project developers involved in project	
	# Project developers	Are there ways for local actors to participate financially?	
	Fin. participation	Are the local residents financially compensated?	
	Fin. compensation	Are citizens able to participate in the decision-making process?	

Appendix 2: Process vs. Project Approach

In several wind park projects, such as Deil and Dronten, a process approach of developing a wind park and making decisions is used. Process management is the opposite of project management and is used in networks instead of hierarchical systems. The difference between a hierarchy and a network is presented in Table 29.

Table 29 Hierarchy versus network (ten Heuvelhoff, de Bruijn, & in 't Veld, 2010)

Hierarchy	*Network*
Dependence on superior	Interdependency
Uniformity	Pluriformity
Openness	Closedness
Stability, Predictability	Dynamic, Unpredictability

In a hierarchy a project approach is applicable as the system is controllable and all the aspects of a project are well-known. A superior can instruct his employees or other organizations and manages the project in a top-down manner. In the network a process approach is more useful, because it embraces the complexity of the system. It focuses on the process of decision-making, because a clear-cut solution to the problem is not available. Therefore the process management approach focuses on interaction between the different actors to come to a good foundation of a solution.

Because the different land owners, municipalities, project developers and citizens all have their own goals and influence, there is not one actor that can steer such a project top-down. The relationship between a province and a municipality can be seen as a hierarchy, but the municipalities themselves clearly are acting in a network. Therefore in several recent projects a process approach is used and we will look at wind-on-land projects from this point of view.

Decision making in a network is fundamentally different than decision making in a hierarchy as is shown in the Table 30. In the following chapters we are basing the decision making in a wind park development process on the characteristics of decision making in a network.

Table 30 Decision-making hierarchy versus network (ten Heuvelhoff, de Bruijn, & in 't Veld, 2010)

Hierarchy	*Network*
Regular	Irregular
Phases	Rounds
Actors are stable, behave loyally and are involved in formulating the problem and choosing a solution	Actors join and leave, behave strategically; there are often winners and losers when the problem is formulated
Starting point and end clear	No isolated starting point and end
Problem → solution	Solution → problem

Because the wind park is developed in a networked context it is important to see what the factors are that might influence the decision making in a process. These factors are according to (ten Heuvelhoff, de Bruijn, & in 't Veld, 2010):

- Dynamics: New developments that call for a redefinition of the problems or solutions can be introduced by actors, causing dynamics.
- Compensation of losers and coupling can occur during decision making (loser in decision A gets compensation in decision B).

- Solution seeks problem. A party will look for other parties' problems that will be solved by using their solution → gaining support from others
- Blocking power: Party doesn't participate in the decision making until the end of the process. Only then they start blocking all solutions in the final stages.
- Strategic behavior: Actors know that decisions are taken in rounds → strategies

Koppenjan and Klein (2004) state that trust between the different actors is the most important factor influencing the outcome of a process. Because of this and the development of more dynamics a change of the role of public actors is needed in these kinds of problems. In the graph below we see the two different roles that the government can play in projects such as wind park projects. On the left we see the primacy of politics role and on the right the democratic mediation role.

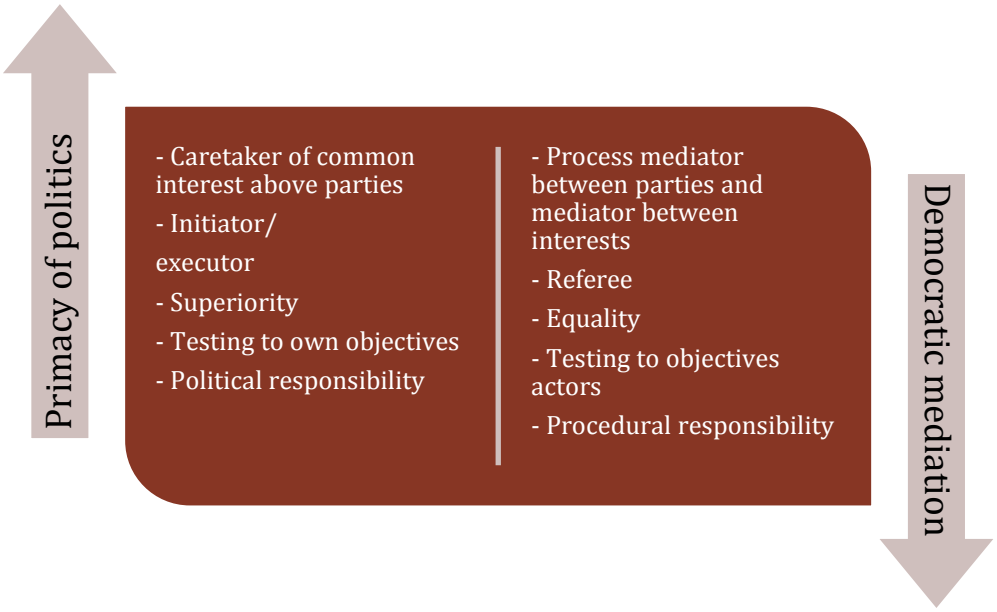

Figure 28 Two roles of public actors: adapted from (Koppenjan & Klein, 2004)

By using process management instead of project management all important actors can join the process and consensus between all the actors can be the outcome. By implementing a more open process approach to the development of wind parks with process management a role of democratic mediation by the government wind parks might be developed with more support (Grin, Hajer, & Versteeg, 2006) make clear that the current model of provinces to develop projects like wind parks is not working, because of the changed context mentioned earlier. The current approach is lacking:

- Legitimacy: Governments want act from a feel of urgency, but the citizens don't have insights on the problem, the goal and the approach.
- Implementation: When governments are the only ones in charge, they have all the responsibility and will find the citizens to have an opposite opinion.
- Learning effects: Linear policies that don't address the learning capacity of the society and don't use the societal dynamics for realizing the public goals.

Appendix 3: Functions of a Process Manager

The Process Manager According to Klaassen (1995)

The process manager has the following functions as described by (Klaassen, 1995, p. 114);

- objectifying function
- translating function
- signaling function
- initiating function
- role changing function
- stabilizing function

These rather general terms form an indication of the activities a process manages has to execute designing and managing a process. He then analyses the wind project the Markerwaard and the coal gasification at the Maasvlakte to see how these functions of a process architect are executed in the real world. On the basis of these cases Klaassen fills in the points above with more specific functions (Klaassen, 1995, p. 184) presented in Figure 33.

If we compare this to the problems of the development of wind parks we see that process management with these values in mind can be very effective. Klaassen mentions trust between actors, specifying the effects of certain alternatives and looking at negative externalities. These points can be a standard for improving process designs and management in wind park projects, but first we will look at the viewpoints of other authors.

The Process Manager According to ten Heuvelhoff, de Bruijn & in 't Veld (2010)

Ten Heuvelhoff, de Bruijn & in 't Veld are stating arguments for process management, which are comparable to the functions stated by Klaassen (1995), are presented in Figure 33. We see that some points match exactly with the points of Klaassen, such as for the *transparency* aspect and *keeping the information open*. Other aspects, such as *incorporating dynamics*, is mentioned in by ten Heuvelhoff, de Bruijn & in 't Veld and is not explicitly mentioned by Klaassen.

The Process Manager According to Koppenjan & Klein (2004)

Koppenjan & Klein identify different strategies for influencing and changing rules in networks. These strategies are more focused on the game of interaction between the different actors and how change the composition of a network. The strategies that are identified are presented in Figure 33. Although these strategies are different in their form than the aspects mentioned in the two previous parts, we can still see clear similarities.

Combination of perspectives

Nr.	*(Klaassen, 1995)*	*(ten Heuvelhoff, de Bruijn, & in 't Veld, 2010)*	*(Koppenjan & Klein, 2004)*	*Combination of views*
1	Bring balance in the arena	De-politicizing decision making	Fix actor positions	Bringing balance in the arena
2	To act as a countervailing power	Enriching problem definitions and	Influence network information	Influencing information about

		solutions		effects of solutions
3	Make sure that there is support	Support	Change actor positions	Influence actors to gain support
4	Keep the information open for all the actors	Transparency in decision making	Change access rules for games	Openness of information in rules
5	Make the financial room to maneuver explicit	Reducing substantive uncertainty		Reducing the uncertainty by adding information
6	Make sure actors get compensated		Add actors	Add the actors with little influence, but who experience downsides
7	Look and propose solutions for nature that can get affected			Look and propose solutions for nature that will get affected
8		Incorporating dynamics	System changes	Incorporating the dynamics to coop with system changes
9			Enhance self-regulation	Enhance self-regulation

Functions of Process Manager to Requirements for the Tool

To develop requirements for the tool we took the functions of the process manager in the table above and analyzed if we could translate these functions in requirements. In Table 31 we see the functions of the process manager in the left column and the requirements in the right column. Some functions are not translated in requirements, because an Excel tool cannot help with all the functions of the process manager. We developed the following requirements; Give insight in the goals of actors, Define the financial room to maneuver, Give insight in the effects on surroundings

Table 31 From Functions to Requirements

Function	*Requirement (Yes/No)*
Bring balance in the arena	No: By adding information about goals the trust can be increased. The tool can help to decrease the inequality of the information distribution. But it is not a requirement of the tool to bring balance in the arena. This remains a task for the process manager.
Influencing information about effects of solutions	Yes: **Provide insight in the goals of actors** (see for explanation Table 16)
Influence actors to gain support	No: There is no intention to gain support for a specific solution by using the tool. The tool is not a decision-making tool, but a process-support tool for the decision-making process.
Openness of information in rules	No: The advantage of the tool is that the actors don't have to bring in a lot of information on for example their business cases. If rules were developed, they should be part of a process design and will not be a requirement for the tool.
Reducing the uncertainty by adding information	Yes: **Provide an overview of the financial room to maneuver** (see for explanation Table 16)
Add the actors with little influence, but who experience downsides	Yes: **Provide insight in the goals of actors** (see for explanation Table 16)
Look and propose solutions for nature that will get affected	Yes: **Provide insight in the effects on surroundings** (see for explanation Table 16)
Incorporating the dynamics to coop with system changes	No: Described in Table 17.
Enhance self-regulation	No: This can help the process, but has to be incorporated in a process design, not in the tool.

Appendix 4: Actor Analysis Business Case

To answer this question the most important actors will be analyzed using a critical actor analysis on the case studies (Lei T. v., Enserink, Thissen, & Bekebrede, 2010). By identifying the critical actors we can see which business case will be crucial for the success of developing a wind park. In the table below the different actors that can influence the development of a wind park.

Table 32 Overview of actors and their interests (Lei, Enserink, Thissen, & Bekebrede, 2010)

Actors	*Interests*	*Desired situation/ objectives*	*Existing or expected situation/gap*	*Causes*	*Possibilities to influence/ courses of solution*
Project developer	More profits	Max. profits	Low profits, because of problems during development	Opposition against wind parks	Participation for other actors
Provinces	More wind turbines	Goals of central government reached	Low amount of turbines installed, because of problems during development	Opposition against wind parks	Force the development of wind parks
Municipalities	More development in municipality	More economic activity, without harming inhabitants	Slowing down of development and non-sustainable municipality	Opposition against wind parks, low participation	Involve citizens and interact with project developers
Civilian initiatives	Add value to region	More development in the region	Slowing down of development in the region	No activity in the region	Participate in wind parks, develop own wind turbines
Land owners	More profits of land	Increase their profits on land substantially	Low increase without wind park development	Wind turbine increases income much more than other activities	Make land contracts for the highest possible price
DSO/TSO	Provide connection to wind park	Low connection costs and high security of supply	Connection costs for wind park and changes in the volatility of supply	Connection is obligatory and wind has a high volatility	Discuss impacts of wind park with project developer
KNMI/Army	Maintain radar connectivity	No interference of wind park in radar signals	Interference with radar	Height of wind turbines	Discuss with developer
Construction companies	More profits by constructing wind park	Earn profits by constructing the wind park	No profits, when wind park is not developed	Wind parks are large project, lot of potential profit	Present your own company as experts
Turbine suppliers	More profits by selling wind turbines	Earn profits by selling turbines	No profits, when wind park is not developed	Wind parks are large project, lot of	Present your own company as

				potential profit	experts
Environmental organizations	Protect local environment	No damage to the local environment	Possible damages of flora and fauna	Cast shadow, noise and rotor blades	Demonstrate, legal actions
Local residents	Maintain living standard	No degradation of the living standard	Cast shadow, noise and interference with view cause degradation	Rotor blades and height of the wind turbines	Demonstrate, legal actions (for instance "Planschade" regulation)

Appendix 5: Different Stages of Participation

During the history of wind turbines in the Netherlands there has been a development in the ways of participating of citizens. In the beginning of wind turbine development the wind turbines were only ten to twenty meters high and were placed mostly on the land of farmers. This sort of wind turbines didn't lead to much annoyance in the neighborhood, because most negative aspects were for the owner of the land (van Lierop, 2014).

When the wind turbines started to grow in size the need for information for the citizens started to grow simultaneously. First this information was just handed to citizens in the form of a flyer, but later this changed in an information evening at which the project developers or municipalities also heard the opinions of the citizens.

The next stage in civilian participation is the involvement in the process of decision-making. This can be either by letting them sit at the negotiation table with the project developers and the municipality or by letting them participate financially. The choice of financial participation can also give people the opportunity to participate in the decision-making process, for instance with shares. In the figure below the different stages of participation are shown as they evolved in the Netherlands.

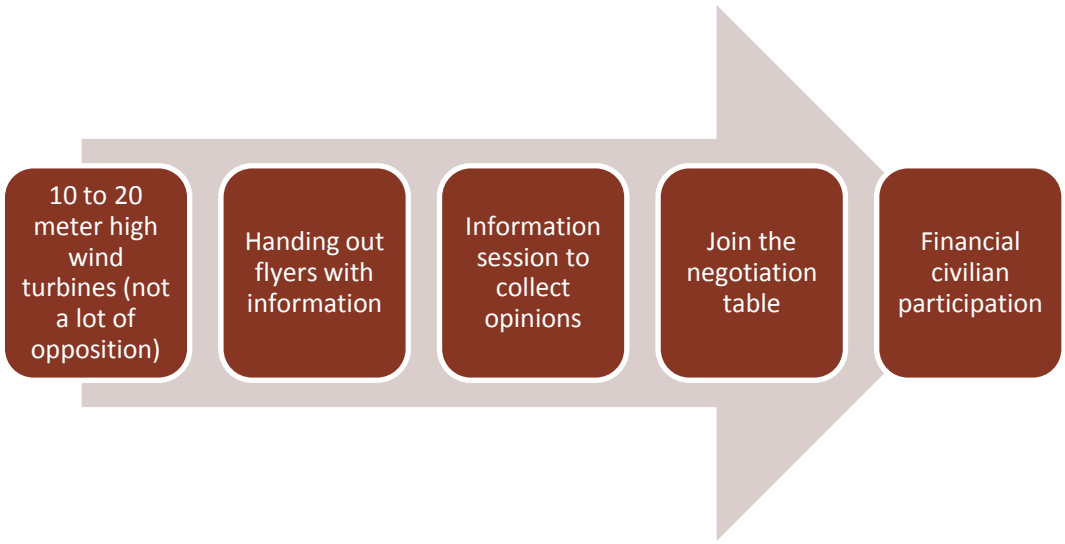

Figure 29 Stages of participation of citizens

Appendix 6: Goal Trees Actors

Citizens

In the goal tree below the goals of the citizens are presented. The difference between the different types of citizens is not displayed here. Different types of citizens will see some goals as more important than others, but we assume that they all have the same goals.

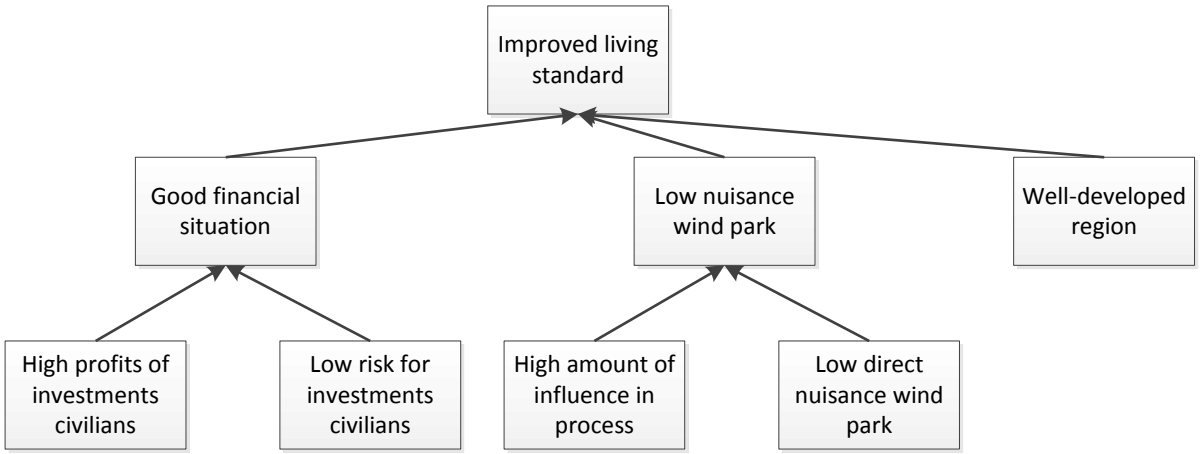

Figure 30 Goal tree citizens

The goals that will be included in the rest of this report are the lowest level goals, so; high profits of investments citizens, low risk for investments citizens, high amount of influence in process, low direct nuisance of the wind park and well-developed of the region. It is important to note that the distance of citizens to the wind park might lead to conflicting goals as one might prefer high profits above low direct nuisance, where another doesn't. Direct nuisance is caused by cast shadows, noise and a changed view that can lead to degradation in house values or recreational value of an area.

Municipalities

The municipalities involved in the wind park project have goals that include the development of the region, the generation of income and a broad acceptance for wind parks. This is shown in Figure 31. It is important to note that broad acceptance is necessary, because otherwise the citizens might think that the municipality council didn't come up for their goals in negotiation with the project developers. This will cost them votes in the next election and has thus to be avoided.

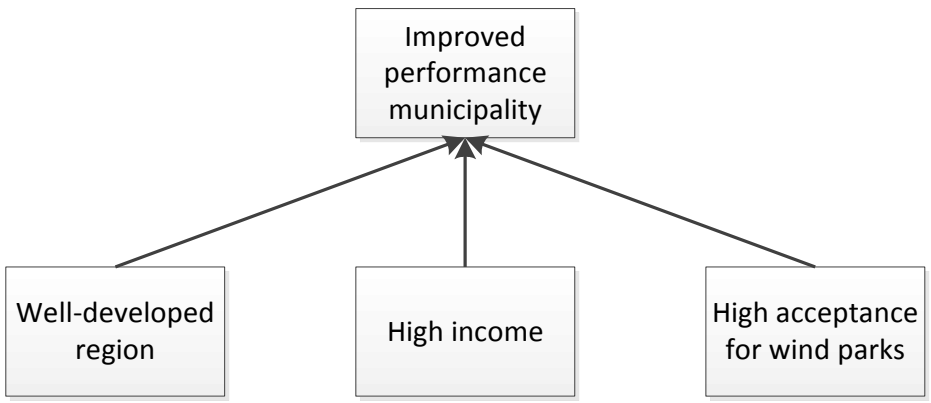

Figure 31 Goal tree municipality

Developing the region can be in different forms that will be described in the next section. The income can be generated from tasks that the municipality has to do and will get retribution for in the form of *leges* or from the land a municipality owns at the potential wind park location.

Provinces

The provinces have similar goals as the municipalities, but the difference lies in the targets of the central government. The provinces have to create enough MW of wind power to comply with these targets. The municipalities don't have these targets, but when the municipality doesn't come up with a permit for a good plan on a designated location, the province can still give the permits. We don't see this as a goal for the municipality, but more as a complication for the process.

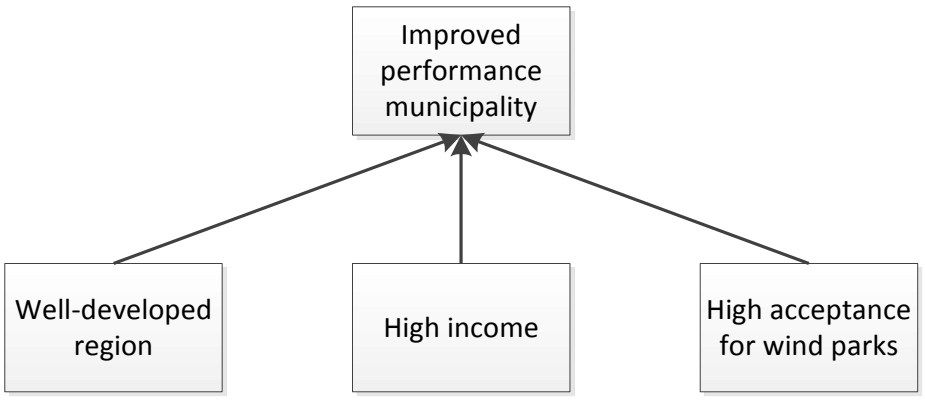

Figure 32 Goal tree province

The province can generate income by *leges* in the same way as the municipality. Developing the region is also a goal of the province, which means that the project has to be in line with the plans of the province for that region.

Appendix 7: Financial Participation 1

Financial means with control

The characteristics of the financial means with control will be described using a table. In this table the type of instrument is given with the prospectus of the return, the risk of the investment and the influence that the type of instrument gives to the citizens. The prospectus of the return gives an indication of what the return on the investment will be and is given in an annual percentage of the investment. The risk is presented on a scale of one to five, representing a low risk to a high risk. The influence in the decision-making process is presented on a scale of zero to four as is shown in the table below.

Table 33 Influence scale

Number	*0*	*1*	*2*	*3*	*4*
Description	No influence	Limited influence after completion	Limited influence from initiation	Influence after completion	Influence from initiation

In this section three main instruments for financial participation with influence in the decision-making process are discussed; shares from initiation, shares after completion and cooperatives as project developers. These are all assessed on the prospectus of the return, the risk and the influence as is explained above. Further explanation of these values is presented in Attachment 2.

Table 34 Characteristics shares from initiation

Type	*Prospectus return*	*Risk*	*Influence*
Shares from initiation	12%	5	4
Shares after completion	10%	4	3
Cooperative as project developer	-	5	4

Just after the initiation of a project the project developer can decide that citizens can buy shares in the project. This means that the citizens also face the risk of failure of the project. In return the expected return will be around 12%, which is considered high. The influence is high, because the citizens can co-decide in the shareholders meeting.

A downside for the project developer is that he will not gain as much as he could, because the citizens bring in private equity. This will take a part of the potential profit of the project developer and at the same time more actors can influence the decision-making, which in terms of the project developer can lead to delays.

For the citizens the main downside is the risk of the investment. Because the track record of wind parks in the Netherlands shows that many parks took around ten years to develop and some are even cancelled, this risk might be too high for normal citizens.

The project developer can also choose to offer shares for sale after the development of the project. This reduces the risk for the citizens and the prospectus of return on investment. But because all the

important choices are already made the influence can only be executed on exploitation issues. For most citizens this will be less interesting than shares after initiation because of the lack of influence in substantial choices.

For citizens who see this just as an investment, this option can be quite profitable as the risk is limited to the phase after the development and the returns are relatively high. These citizens care less about the lack of influence in the development of the project.

The project developer will face the same downside as in the shares after initiation option, namely the reduction of profit, because of the private equity of the citizens.

In recent years different cases can be found where citizens set up a cooperative, which participates in a project and acts as a project developer. The cooperative can for instance buy, build and exploit one wind turbine in a wind park. This of course leads to a high risk profile that is equal to the risk profile of an investment of a project developer. The influence of the cooperative is high. Just as the expected return of the project developer the return for the cooperative is rather case specific, so no estimation is given here. This option will be further discussed in section 4.5.

Financial means with limited or without control

In this section we will look at the most important options for financial participation with limited or without influence in the decision-making process of the development of a wind park. We use the same characteristics and scales as in the previous section to describe the different options.

Table 35 Characteristics local fund. Prospectus return of these types is described in (Kort & Louter, 2011).

Type	*Prospectus return*	*Risk*	*Influence*
Local fund	8%	3	0
Loans	6%	1	2
Bonds	8%	2	0

A local fund aims at bringing money together by citizens, in such a way that the participating citizens share the profits of the investment. The civilian buys a participation proof to take part in the fund. A local fund is comparable to the obligation on risk and expected return. There is no influence of the citizens in the decision-making process.
For the citizens this is a relatively low risk/high return alternative for the more risky instruments that do provide the possibility to influence the decision-making process. For project developers this is a good option, because it doesn't cut in their profits and can decrease the opposition to the wind park.
A civilian can give a loan to a wind cooperative or association. They lend money of their members and finance a wind park. The risk for the civilian is depending on the choice of the liability regime, ranging from full liability for citizens to limited and not liable for a shortage at the clearance of the cooperative. The expected return is in general lower than with a local fund or obligations.
Every member has a say in the cooperative, so the role of the cooperative in the whole project determines the influence the members have in the project. When the cooperative takes the role of a project developer, the members have real influence. If the cooperative is set up similar to a local fund and only bring in equity, there will be no influence of members in the project.
With a bond a civilian faces lower risks than with a share but still directly helps financing a wind park. With this lower risk comes a fixed expected return that will most likely be lower than the expected return of a share. The risk that remains comes from a potential bankruptcy, in which the bond owners will be subordinated to the bank. This means that the bank will get their money first and if there is anything left the bond owners get their investment.

Local instruments

Except for active participation of citizens in a wind park, the project developer can also use other instruments create ties with the local community. The four most important types of instruments will be discussed in this section. Each type will be assessed on an indication of the costs of the instrument. We will also describe the effect these instruments can have on the regional support for the wind park.

Table 36 Costs of local instruments; 1= (Kort & Louter, 2011), 2= (Windpark Goyerbrug, 2014), 3= (Veghel, 2013)

Local instruments	*Costs*
Local support fund	% of profits or income (for instance between 10% and 30% of exploitation at wind park Noordoostpolder)[1]
Support local sustainable projects	% of profits or income[1]
Sell electricity to region	Has to be assessed per case. Depends on potential in region, transmission network capacity, potential discount.
Discount on electricity for local residents	% of electricity price[2] or deposit for electricity[3] for a wider range of citizens.

In a local support fund the project developer puts a percentage of the profit of the wind park. In most cases the municipalities are the managers of the fund. In cooperation with other actors the municipality can decide on which projects the money is spend. The fund is used to invest in the region surrounding the wind park. These investments can be in many different areas, such as; public space development, local economy and youth. The support fund can be made in such way that citizens can decide (via a cooperative) on what projects the fund should be used. This of course makes this type of instrument to a good option to increase local support for the wind park.

A variation on the previous instrument is that the project developers support local sustainable projects. The project developer can for instance participate in the cooperative, because in that way the cooperative can be helped by an experienced partner. Essent is an example of a project developer that offers this instrument. Another option is that a sustainability fund will be created, which works in the same way as the local support fund described above. Only this fund is aiming at supporting sustainability projects.

There can be no clear indication of the costs, because the first option is hard to quantify and the second option is also a percentage times the profit. The local support will be slightly lower than the previous option, because not all citizens will prefer sustainability initiatives above for instance economic development in the region.

The electricity that is produced by the wind park can be sold in the region. The region can then be powered by *green* electricity and several examples can be found where this increased the local support. The costs for the project developer will be zero, but the District System Operator will have to invest in the net to make this possible. The local support will be less than the two previous examples, because it doesn't financially add to the region.

The local residents of the wind park can be offered a discount on their electricity bill as compensation for the downsides of living next to a wind turbine. It is important that it is clearly defined what local residents are. There is a difference between local residents and citizens, as local residents face downsides like cast shadow and noise and citizens only might face a change in their view and living environment. The local support will grow significantly among local residents, when their financial position is improved by this instrument.

Appendix 8: Financial Participation 2

Financial participation

In the table below the characteristics of the different participation methods are presented. This table is the basis for the tables in section 4.4. We will assess how we can compare the different methods on risk and influence in the process.

Table 37 Financial participation methods; characteristics, from (Kort & Louter, 2011) section 3.

Participation method	*Prospectus return*	*Risk*	*Risk ind.*	*Influence*	*Influence ind.*
Bonds	8%	No risk in realization phase. Risk in exploitation → not reaching 8%. Subordinated loan.	2	"Obligatiehouders hebben geen zeggenschap in de onderneming"	0
Shares	10-15%	Depends on phase in project. More than bonds.	4/5	Depends on phase. Via the shareholders meeting the project can be influenced.	3/4
Local fund	7-10%	Higher risk than bonds, because the return is more linked to profits of the park.	3	No influence, but conditions can be made in the contracts for the goals and the policy.	0
Loans	4-10%	Depends on the chosen accountability regime. Between totally no risk and total risk at bankruptcy.	1	Loans go to cooperative, which has a say in the project. Members meeting in which every member has one vote. Depends on size of total loan.	2

In (Kort & Louter, 2011) the columns prospectus return, risk and influence are described. To compare the risk and the influence of a participation method, we used a risk indicator and an influence indicator. We see that for risk the lowest value is 1 and the highest is 5 in which 1 means limited risk and 5 means high risk. High risk means high risk in comparison to the other participation methods mentioned. For low risk this is the same.

Loans can have the lowest risk factor, because there is a possibility of no accountability at bankruptcy and there is no profit dependency, which means that the return is fixed at a percentage (Kort & Louter, 2011). Bonds have a slightly higher risk, because bonds are coupled to the profits to the park. Also when the project goes bankrupt first the other financers will get their money. More risky is a local fund, because the return is linked more to the profits of the park. The highest risk is for the shares, because the profit of the park is completely linked to the return on the shares. If there are any problems in the park this automatically brings down the return. There is a difference between shares from the initiation phase and shares from the completion phase. The shares from the initiation are more risky than the shares from the completion phase, because a lot of risks are overcome after the completion phase.

In (Kort & Louter, 2011) the influence in the project is clearly indicated for the bonds and the local fund, because there is none. In the structure with a loan to a cooperative there is influence in the project via the board of the cooperative. Contrary to the cooperative that is an owner, the cooperative here is supplying money for the project. This means that there is less influence in the project than with shares, but the citizens can definitely influence the project. With shares the civilian has the largest influence, because he can directly participate in decision-making during the shareholders meeting. When the civilian is buying shares in the initiation phase the influence is larger than after the completion phase, because the most important decisions about the park are made in the earlier phases of the project.

Appendix 9: Interviews

After the prototype has been designed it is important to test it with the opinions of actors currently involved in the development of wind park Deil. We will collect the opinions of a project developer, a civilian involved in the process, a municipality official and a province official. All of these actors will be asked to fill in the program of requirements, as presented in Table 18.

After an introduction on the working of the prototype the following questions will be asked to the interviewees:

> *How do you score the different requirements? Why do you give the different scores to the requirements?*
>
> *In which phase of the process do you see that this tool is used?*
>
> *What are additions or changes you would like to see in the prototype?*
>
> *How useful do you think this prototype will be, including the before mentioned changes?*
>
> *Do you see opportunities for actors to behave strategically? What are these opportunities?*

By improving the prototype with the input of the different interviews with the actors the prototype can be transformed into a working tool. It is important to see the opinion of all the actors, because it can be that for a certain actor the tool is much more useful than for the other.

Interview Arjen Gerritsen of 11Duurzaam – Civilian initiative

How do you score the different requirements? Why do you give the different scores to the requirements?

Table 38 Program of requirements scored by Arjen Gerritsen

Requirement	*Evaluation*
Provides an overview of the financial room to maneuver	8, clearly shows how financial options influence goals of actors
Provides insight in the goals of actors	8, invokes good discussion early in process that gives insight in the goals
Provides insight in dependency different products	8, this makes it an integral tool that can be used in real cases and adds to insights in the process
Provides insight in differences between participation methods	8, can be used later in the process, when participation methods are chosen. Clear and helpful.
Provides insight in the effects of wind parks on surroundings	It is not quantifying the effects, but presenting the most important variables that have to be chosen. This requirement should be changed.
Easy to use	It only should be easy to use by the process manager, because he will only use it. (see last question) Process manager should have knowledge of the problem, so tool will not be hard to explain.
Concise	Not necessary to be concise in my opinion
Adaptable	8, clear indication where additions can be placed. Good

	for new cases.

In which phase of the process do you see that this tool is used?

The tool should be used right from the start to get actors up to speed in their knowledge of wind parks and to analyze the goals of the different actors. Throughout the process the tool can be used to give an indication of how certain options influence the goals of the actors.

What are additions or changes you would like to see in the prototype?

Under the development of the region falls also the work availability that is increased directly and indirectly in the region by the development of a wind park. Two other questions arise:

- Is there a difference between control/influence in the project and ownership for the citizens?
- Is process participation analyzed instead of only participation in the project?

How useful do you think this tool will be, including the before mentioned changes?

The tool can be very helpful in the decision-making process. Now a lot of decisions of the process managers were made ad-hoc and this tool can structure the process. Also the goals of the different actors will be much clearer from the start, as every actor is forced to make them explicit. Actors without a lot of in-depth knowledge about wind parks can also get a crash course with this tool.

Do you see opportunities for actors to behave strategically? What are these opportunities?

Arjen Gerritsen sees the role of the process manager as very important to decrease strategic behavior as much as possible. The process manager will have to sit with each actor to explain the tool and collect their scores and weights on the goals. Arjen Gerritsen states that the process manager should have the knowledge to see when actors are behaving strategically. The process manager will have to take very much of a "guiding" role in the process.

Interview Jeroen Gelinck - programmaleider Energietransitie at Provincie Gelderland

How do you score the different requirements? Why do you give the different scores to the requirements?

Table 39 Program of requirements scored by Jeroen Gelink

Requirement	*Evaluation*
Provides an overview of the financial room to maneuver	Good overview of financial characteristics. This is important as consequences of financial decisions are not always recognized.
Provides insight in the goals of actors	Very important and good, as between actors and within actor group a lot of uncertainty is present.
Provides insight in dependency different products	Good to operationalize this, but not so clear in tool. Maybe if you read the report it is.
Provides insight in differences between participation methods	Very helpful, as this is exactly what we (the province) is trying to clarify further.
Provides insight in the effects of wind parks on surroundings	Important and good to have soft aspects listed to get an idea of the complexity.

Fast and easy-to-use	(Not discussed, as the tool wasn't used fully. Only explanation to the tool was given.)
Flexible and re-usable	Definitely flexible and re-usable in multiple cases.
Transparent	Indicated as very important, but there was no in-depth analysis of how the tool constructed in this interview.
Interactive	(Depends on the way of using it.) But it is important that is an interactive tool.

In which phase of the process do you see that this tool is used?

In the earlier phases of the process it can be very useful to get actors up to speed both with the content as with thinking about their goals and preferences. This can make soft aspects more explicit and therefore speed up the process. Later in the process it can be used to keep track of the progress that is made and to evaluate on the goals and maybe the changes in preferences. This can lead to questions like: Why do you choose this option, as you first said these were your weights on the goals.

What are additions or changes you would like to see in the prototype?

The profits for the province are not a goal, as it is for the municipalities. The province of Gelderland only looks at the real goals for the region. As an addition the amount of jobs that is created has to be added. This is after the amount of MW of wind energy, the most important goal of the province of Gelderland.

How useful do you think this tool will be, including the before mentioned changes?

This tool can be really useful to add insights and provide a base for discussion of goals. This can be done in an early stage, which can lead to insights in the dilemmas that actors struggle with. Later it can be very useful to see what progress is made in the process using the tool.

Do you see opportunities for actors to behave strategically? What are these opportunities?

Not introducing the tool to everybody immediately at the beginning of the process is crucial, because otherwise there would be no time to study the tool and instead actors will start to negotiate with the tool directly. It is important to start by introducing the tool within the actor groups, so they can think about the goals and their weights in a non-competitive environment. This also reduces the chances for strategic behavior.

Interview Rolf van Os - Municipality Geldermalsen - Author of the "Windvisie" of the municipality of Geldermalsen/involved in negotiation process of wind park Deil

How do you score the different requirements? Why do you give the different scores to the requirements?

Table 40 Program of requirements scored by Rolf van Os

Requirement	*Evaluation*
Provides an overview of the financial room to maneuver	Very important and good insight in the financial room.
Provides insight in the goals of actors	For municipalities this is not seen as very important as the goals are already clear. To

	see what the goals of other actors are is helpful.
Provides insight in dependency different products	This is good, as the interdependency is not mentioned enough. This tool can be very helpful for the municipality to get a view of what the complexities are.
Provides insight in differences between participation methods	Good, as it looks clear and it is good to have one basis for this information, as everybody can find participation methods on the Internet.
Provides insight in the effects of wind parks on surroundings	Important and good to give insight in what causes these effects and what are variables we can play with.
Fast and easy-to-use	For me this is not easy-to-use. Depends heavily on the guideline. A possibility is to give a process manager the tool and fill it in together.
Flexible and re-usable	Clear and good. The highly changeable context asks for these kinds of requirements.
Transparent	OK
Interactive	OK

In which phase of the process do you see that this tool is used?

For the municipality it is good to show the model in the earlier stages of the model to get a grasp of what is going on in a wind park project. In later stages of the process it can be used to inform the "Raad" of the municipality on what the project looks like at that moment. It can be risky to let people work at home with the tool, as they are not experts. This can lead to wrong interpretations of the tool

What are additions or changes you would like to see in the prototype?

The sheet of the municipality is good. It is important to note that the municipality will be involved in the process, but not negotiating. The municipality gets the three products and will decide based on that. "Schoenmaker blijf bij je leest."

How useful do you think this tool will be, including the before mentioned changes?

It can be very useful to get an idea of the complexity and what has to be decided in a wind park project. Also it can force actors to be more explicit about ideas and preferences, which can boost the process. For the municipality it can be used to inform the "Raad" with the current affairs of the wind park and what this means for the different goals.

Do you see opportunities for actors to behave strategically? What are these opportunities?

Rolf van Os states that he actually never plays games like this. That is why it is important to not negotiate on basis of the tool with everybody at the table, because than the project developers will be very influential. It is important to look at the tool within the own actor group first with the help of a guideline for the use of the tool. Filling in the tool will have to be done with the help of the process manager.

Interview Jan Hiemstra – Project developer Wind&Co and advocate at EBH Elshof Advocaten.

How do you score the different requirements? Why do you give the different scores to the requirements?

Table 41 Program of requirements scored by Jan Hiemstra

Requirement	*Evaluation*
Provides an overview of the financial room to maneuver	Yes, this is very important and clearly indicated in the tool
Provides insight in the goals of actors	Yes, it gives insight what the links between options and goals are. Important to see in which areas you can please other actors.
Provides insight in dependency different products	It gives insight in this dependency, but I don't see all products as equally important. Participation plan is asked for, but not on legal grounds. Spatial plan is important, but not leading.
Provides insight in differences between participation methods	Good, clear visualization for inexperienced wind park actors. Also shows impact of participation methods.
Provides insight in the effects of wind parks on surroundings	Clear, but mainly necessary for the other actors to get an indication of the effects.
Fast and easy-to-use	It has to be easy for the process manager.
Flexible and re-usable	This is important and clearly visualized.
Transparent	OK
Interactive	OK

In which phase of the process do you see that this tool is used?

At the starting phase of the process. This can be very helpful to show the inexperienced actors what a wind park is all about. For the project developer it can only be helpful to see what the goals of other actors are and how they are influenced. Most links in the substance of a wind park project are however known by project developers.

What are additions or changes you would like to see in the prototype?

Before the explanation of the tool it can be very good to show the legal context of the project. What is legally binding in for instance a *Windvisie*? So what are the deliverables? What are the actors that have to be included in the process? This shows what the positions of the actors legally are. The positions also show better what the playing field and design space will be.

How useful do you think this tool will be, including the before mentioned changes?

It can be very helpful in the beginning of the process to get inexperienced actors to know what a wind park project is about. It also gives more insight in the dependency between choices and their effects on different actors.

Do you see opportunities for actors to behave strategically? What are these opportunities?

Yes, but in this process all we do is behave strategically. Therefore I don't see this as a problem necessarily. It is important that the process manager keeps the tool for himself and just presents outcomes and changes. This will help to give the process guidance and make goals and effects more

explicit. The process manager will have to translate preferences in a meeting into the tool, so strategic behavior is limited.

Interview Job van den Berg – Senior Consultant at Royal HaskoningDHV, process manager at wind park Deil.

How do you score the different requirements? Why do you give the different scores to the requirements?

Table 42 Program of requirements scored by Job van den Berg

Requirement	*Evaluation*
Provides an overview of the financial room to maneuver	Very useful and good, can help to get a feeling for the financial room for inexperienced actors
Provides insight in the goals of actors	Good, this can invoke a discussion between the actors and forces them to be more specific.
Provides insight in dependency different products	Very useful, inexperienced actors will be helped in the beginning phases.
Provides insight in differences between participation methods	Good, also forces actors to be more specific in their propositions and statements.
Provides insight in the effects of wind parks on surroundings	Clear overview of the effects that influence the surroundings.
Fast and easy-to-use	*I would need somebody with wind park knowledge to fill this in.*
Flexible and re-usable	*OK*
Transparent	*OK*
Interactive	*OK*

In which phase of the process do you see that this tool is used?

The earlier the better. This tool can help to get actors up-to-speed and show them what the complexities of wind parks are. First the process manager has to discuss the tool and its input within the actor groups, before using it with all actors present. At the stage in which a partnership agreement is signed this tool can help to make the effects of different options transparent.

What are additions or changes you would like to see in the prototype?

An overviewing dashboard that shows the business case of the park, the participation options present and a box per actor can be added. This will help to quickly assess the wind park and show it to a group during the process without having to go through all the sheets.

How useful do you think this tool will be, including the before mentioned changes?

The tool can be very helpful in giving guidance to the discussion between the actors about goals and interests of the different actors, as well as getting them to know how wind park cases work. We saw in earlier phases of the Deil project that discussing a calculation model similar to the Agentschap Nl model already helped to grow trust between the actors and share knowledge. This tool can help in the same way, only add even more knowledge and growing of trust.

Do you see opportunities for actors to behave strategically? What are these opportunities?

There will always be strategic behavior, but by discussing the tool within the actor group first and then using it as guidance for the process, the tool can decrease the strategic behavior. Much more clarity can be given and propositions can be tested immediately.

What does a process manager need to use this tool?

A thorough knowledge of wind parks and their business cases has to be present. In the Deil project one experienced process manager (Job van den Berg) manages the project, while an expert on wind parks (Hans-Peter Oskam). An expert is needed, but a guideline that presents very clearly what has to filled in the tool can already help a great deal.

Interview Hans-Peter Oskam – Junior Consultant at Royal HaskoningDHV, process manager at wind park Deil.

How do you score the different requirements? Why do you give the different scores to the requirements?

Table 43 Program of requirements scored by Hans-Peter Oskam

Requirement	*Evaluation*
Provides an overview of the financial room to maneuver	Clear and useful
Provides insight in the goals of actors	Good
Provides insight in dependency different products	OK, but it seems to be cherry-picking of dependencies. A lot more dependencies are present that are not pure mathematical.
Provides insight in differences between participation methods	OK
Provides insight in the effects of wind parks on surroundings	OK, gives a good overview
Fast and easy-to-use	OK, with clear user guide
Flexible and re-usable	OK
Transparent	OK
Interactive	OK, translate the tool to practical usability by using total scores (see additions/changes question)

In which phase of the process do you see that this tool is used?

In the earlier stages of the process the tool can be used best to improve the understanding of a wind park project for all actors. In this stage the tool can also be used to make boundaries for the design space, so no unfeasible options are investigated. Later in the process the tool can be used to give an indication of the effect for different options.

What are additions or changes you would like to see in the prototype?

Show in a sheet what the total scores of different scenarios are. This can refer to the mutual gains theory. This can improve the understanding of the working of the tool and will add much to the usability of the tool in real life. The tool can be filled in with hypothetical values, just to give a feel of what the tool can be used for.

How useful do you think this tool will be, including the before mentioned changes?

The tool can be very useful, but then the translation to practical usability has to be shown, as indicated in the previous chapter. If this is done the tool can be used in real cases.

Do you see opportunities for actors to behave strategically? What are these opportunities?

This tool can help to reduce strategic behavior, because statements that are used in a strategic way can be checked immediately. At the same time strategic behavior is part of this process and is not unwanted.

What does a process manager need to use this tool?

A short user guide can help the process manager to understand how the tool has to be used. A process manager typically doesn't have the time to read the full report, so a separate guide can be helpful.

Appendix 10: Requirements Rated

In this process of interviewing two important improvements to the interview were made. First we changed the grades for each requirement to an evaluation, because grades were too hard to give and an evaluation seemed more valuable for the improvement of the prototype. The second improvement is indicated by the italic requirements and answers. First we defined the last three requirements ourselves, but when the work of (Geurts & Joldersma, 2001) was analyzed, these were changed to the four italic requirements.

The requirement 'Quantify the effects of wind parks on surroundings' was changed into 'Give insight in the effects of wind parks on surroundings', which is displayed in table 13 as the italic requirement and answers. This was done after the feedback of the civilian initiative that made clear that this requirement was not literally translated in the tool. Because we addressed all spatial issues we desired in the tool, we changed the requirement instead of the tool. The project developer clearly indicated that this requirement was especially important for other inexperienced actors. In more general sense he made this remark to more aspects of the tool. This is explained quite easy as the project developers are the most familiar with developing wind parks and therefore issues like participation methods and effects on surroundings are day-to-day business. For a municipality the development of a wind park is in most cases completely new.

Table 44 Requirements rated by different actors

Requirement	*Citizens*	*Province*	*Municipality*	*Project developer*	*Process manager*
Provides an overview of the financial room to maneuver	8	Good overview	Good insights	Clear	Good, useful
Provides insight in the goals of actors	8	Good	Not very important; goals are already clear. See goals other actors is helpful.	Good	Good
Provides insight in dependency different products	8	To be improved, make this clearer	Good	Gives insight, but products are not equally important.	Very useful
Provides insight in differences between participation methods	8	Very helpful	Good	Good	Good
Provides a quantification of the effects of wind parks on surroundings (*Provides insight*	Requirement must be changed, as it is not quantifying the effects	*Good*	*Good*	*Good, especially for other inexperienced actors.*	*Clear overview*

in the effects of wind parks on surroundings)					
Easy-to-use (*Fast and easy-to-use*)	Tool should be used by process manager, so not necessary to be easy-to-use	*Not discussed*	*Not easy-to-use. Depends heavily on the guideline. Possibility: process manager fills it in.*	*It has to be easy for the process manager.*	*I would need somebody with wind park knowledge to fill this in.*
Concise (*Flexible and re-usable*)	Not necessary to be concise in my opinion	*Definitely flexible and re-usable in multiple cases.*	*Good*	*Good*	*OK*
Adaptable (*Transparent*) (*Interactive*)	8	*Very important*	*OK*	*OK*	*OK*
		Important, but depends on way of using the tool.	*OK*	*OK*	*OK*

Appendix 11: Core Elements of a Good Process Design

The four core elements of a good process design according to ten Heuvelhoff, de Bruijn & in 't Veld (2010) are shown in the figure below. It is clear that these core elements correspond with the aspects of a good process manager shown in the previous section, but now we look at the design of the process which is done before the process starts.

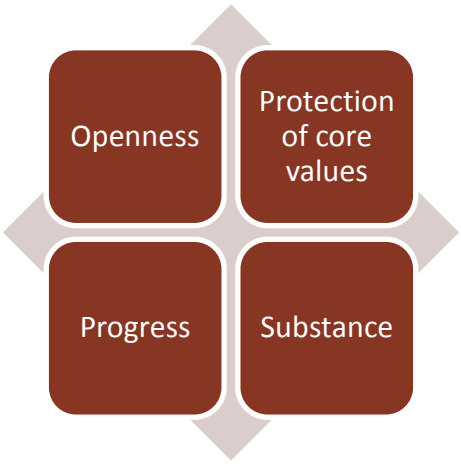

Figure 33 Four Core Elements of Process Design

Openness: no unilateral decisions, but an open attitude to other parties to participate
Protection of Core Values: protection of the participating parties and their interests, they must be certain that their core values will not be harmed regardless the outcome of the process
Progress: to guarantee an eventual clear result, a process must show sufficient momentum and progress
Substance: the progress in a process should meet certain substantive quality standards

These core values can be used to check whether the tool can fit in a good process design. It is possible that the tool will make for instance progress happen, but at the same time violates the protection of core values. In the evaluation of the tool the core values will be helpful to see if this tool can be useful.