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Is coastal tourism ready for the next generation?

Wind energy and tourism

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Abstract

This paper is part of a trilateral research project: A cooperation of the Universities of Oldenburg Bremen and Groningen. This research projects forms one of three different studies on the theme ''tourism in the next generation''. This study is about the effects of wind energy on tourism and the main question is: *''How is wind energy affecting tourism in the Harlingen, Bolsward and Makkum triangle area in the Netherlands and how can negative effects be prevented?''*

Wind energy can have many effects on the surrounding environment such as noise disturbance, shadow disturbance or loss of landscape quality. Although the effects on locals have often been researched the effects on tourism in a region is lessen known.

To answer the main question a mixed approach of in-depth interviews and a survey among tourists in the area itself is used. Interviews are conducted with organisation and people dealing with tourism and recreation. The survey was meant to provide an insight in what tourists themselves think about wind energy on their holiday destination.

It appeared that different organisations speaking on behalf of different types of tourists (water recreation, hiking and cycling etc.) have different wishes on where wind turbines should be placed. As expected organisation involved in water recreation would rather see new turbines on land, an organisation involved in land recreation would like to see new wind turbines on sea. However all organisation agreed it would be possible to place new turbines in area's were the disturbance would be less. You could think of areas like retail parks and industrial areas or near highways.

Of the tourists themselves it appeared that almost three quarters (74%) of the respondents are feeling disturbed by wind turbines on their holiday destination. 22,6% indicates that the construction of a new large wind farms will influence their choice holiday destination. They will stay shorter or will avoid the area at all. Also about 63% preferred one large wind farm instead of multiple smaller farms.

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1. Introduction

1.1 The trilateral project

This paper is part of a cooperative trilateral project between the universities of Groningen, Oldenburg and Bremen. Main theme of this project is 'is coastal tourism ready for the next generation?'. A total of seven students are participating in this project from all three universities. Within this cooperation a total of three studies have been carried out: A study on the economic impact of a holiday park, a study on the impact of climate change on tourism and finally a study on the impact of wind energy on tourism. This paper is about this final study: wind energy and tourism.

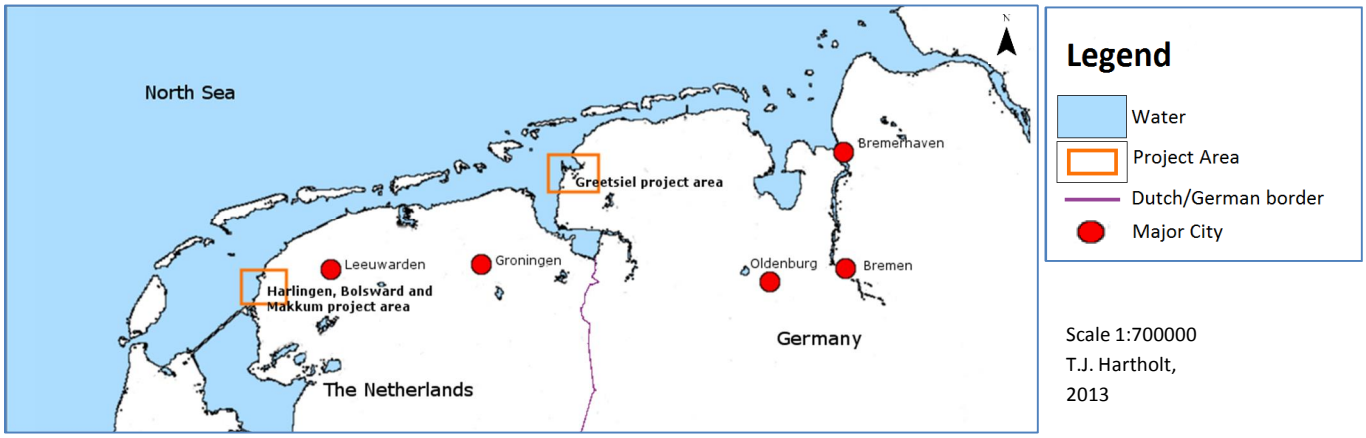
First of all, the reason wind energy is the object of research is because energy has always been an important issue in many disciplines. One of the disciplines where energy is also very important is the field of spatial sciences and this importance will only grow bigger in the near future. This is because we are at the starting point of a transition from fossil fuelled society towards a society that will use more sustainable energy sources. This transition will also change the landscape around us as energy production will be more visible in the landscape. Wind energy is at this point the most implemented and most developed type of sustainable energy. Therefore this is also the type of sustainable energy which will have the biggest impact on tourism (Devine-Wright, 2005).

The issue of tourism and wind energy is present in many more countries such as Denmark, Scotland, Germany and not only in the Netherlands. Because the problem is present in many other countries it is worthwhile to do a comparison. That's why this research project is being done in Germany with similar methods. Germany is especially interesting because of the EEG (Erneubare Energien Gesetz) law. Main thing of this law is the regulation of sustainable energy, and thus also wind energy on the national grid. Sustainable energy always goes first and owners of sustainable energy sources are therefore assured of selling their excess energy. This will make it much more attracting to build your own wind turbine. So will it be the case that this issue of wind farms disturbing tourism is much greater in Germany than it is in the Netherlands?

For the Dutch research project I will conduct multiple in-depth interviews and a questionnaire. The interviews are used to get a better insight in policy around wind farms and the planning process. The questionnaire will be used to find out what the opinions of the tourists are. The data collection on the German side will mainly rely on questionnaires.

1.2 Project areas

Within this study, two regions have been chosen (see map 1): One in the Netherlands and one in Germany. The research in Germany is being done in an area near Greetsiel. The study in the Netherlands has been done in an area near Harlingen, Bolsward and Makkum. Both areas share a lot of characteristics as both areas are favourable among tourists. Both areas are also part of the mainland Waddensea coast. This means that many tourists will pass both areas on their way to the ferries to the Wadden Islands. All these similar characteristics make the acquired data rather comparable. In both countries, the Netherlands as well as Germany similar methods will be used in order to be able to make a comparison between the areas.



Map 1: overview of the Waddensea area. The two research project areas have been highlighted in orange.

Planning of new wind farms in the Netherlands is in hands of the provinces and the central government. In Fryslân, a province in the north of the Netherlands, multiple areas are assigned for the construction of new wind farms. This is all described in the document 'windstreek 2012'. Two assigned areas are of particular interest in this project: Firstly an area near the Frisian side of the 'Afsluitdijk' for an offshore wind farm and secondly, an area not far land inwards for an onshore wind farm. Both sites are close to the towns of Harlingen, Makkum and Bolsward. These areas however are also a very popular tourist and recreational destinations. Especially water recreation and activities like cycling are popular in these areas. So can it be the case that, if these wind farms are to be constructed, tourists will avoid the area? Will it be possible to combine wind energy and tourism in this area?

1.3 Research questions

The main goal of this project is to find out how much tourism is being affected by wind farms. More and more wind turbines are being constructed in the landscape and therefore this is becoming an important issue (see fig. 1).

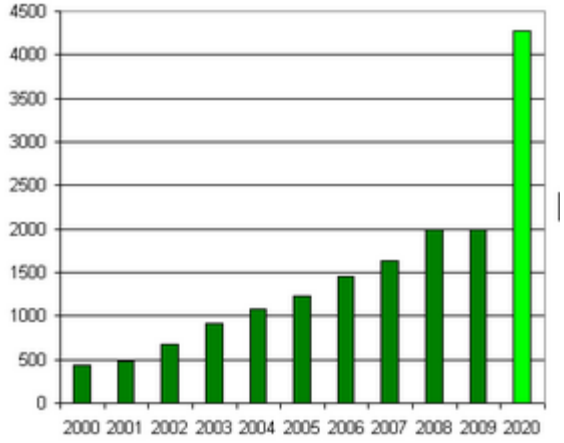


Fig. 1: Total amount of installed wind power capacity (MW) in the Netherlands. The amount at the year 2020 is a target. Data: Agency of economic affairs, the Netherlands (2012).

However this increased use of wind energy will not always be judged as a positive development. Many people are increasingly worried that 'their' landscape will change and possibly be disturbed by wind turbines. This was already the case in Fryslân were plans for new wind turbines had been unfolded:

''Bewoners van het gebied voelen zich compleet overvallen door de plannen. Piebe Piebenga uit Schraard: "De kroonjuwelen van Friesland zijn water, land en horizon. Het is voor mij volkomen onbegrijpelijk dat de Provincie die op zo'n manier verkwanselt.''(Groot Sneek, 22-10-2012)

Were many research has been done about local residents in this discussion not much is yet known about the implication of wind farms on tourists. Therefore in this research I will concentrate mainly on the effects wind turbines can have on tourists and the tourist industry. This in order to increase knowledge about this topic and to make it possible to make tourism a factor to keep in mind during the planning process of new wind farms.

In the German part of the project, slightly different research questions where used. This was due to different requirements at the two universities. However the main question on the Dutch side of the research project will be:

- ''How is wind energy affecting tourism in the Harlingen, Bolsward and Makkum triangle area and how can negative effects be prevented?''

Questions which will help to answer the main questions are:

- 'Where is wind energy already being generated in the region?'
- 'are there any new plans for new wind farms in the region?'
- 'When are wind turbines experienced as annoying by tourists?'
- 'In which ways are wind turbines having negative effects on the region?'
- 'How are possible negative effects from wind turbines to be prevented?'

2. Theoretical framework

2.1 Energy landscapes

The landscape in the Netherlands will and already is changing rapidly due to new types of energy production. More often energy will be produced with the use of solar panels, bio mass installations and wind turbines. Especially because of the implementation of these types of energy on even bigger and bigger scales it results in more visibility in the everyday landscape. A landscape wherein the visibility of energy production is clearly visible is also known as an energy landscape according to Noorman and de Roo (2011). I will touch upon the different types of energy landscapes shortly.

1st generation:

This type of energy landscape is one on a very small scale. Energy is mostly generated were it is also used. For example wind energy can be directly transferred into energy to be used at site. This was used for various reasons such as pumping water, grinding grains. Before the invention of the steam engine and alternating current in the 19th century, this type of energy landscape was very common. Overall it had very little impact on the landscape.

2nd generation:

This generation of energy landscapes is the generation were we are still in today. Energy is generated at one central location and can be distributed for miles before it reaches its final destination were it is consumed. This means that the production of energy is not that visible in the landscape. Only the transportation of energy is visible in the form of high voltage power lines.

However the drawback of this type of energy production is the high dependency on fossil fuels. In order to build a large scale power plant which is capable of generating enough electricity is to use fossil fuels (or uranium). These fuels however are going to be depleted in the near future and besides that they are contributing on global warming and pollution of the environment. On the long run we need to look out for alternative energy sources.

3rd generation:

This generation is describes as a landscape where energy can be produced all over the landscape. Wind turbines, solar panels and various other types of sustainable energy sources are very suitable for the 3rd generation energy landscape. It also has been described as a decentralised energy landscape by de Boer and Zuidema (2013). The mean with this that energy can virtually be generated anywhere and can be consumed anywhere. The hierarchy in the energy system as we know it today will cease to exist. However, the production of energy will be very visible in the landscape.

2.2 The transition

At this point we are at a transition between a 2nd and a 3rd generation of energy landscape. While most energy is still being produced by large power plant fuelled by fossil fuels, more and more energy production is being decentralised in the form of wind farms and solar panels.

Nevertheless, this development can have negative effects. People may find wind turbines in the landscape disturbing because of for example noise or visibility in the landscape. People might therefore protest against plans for new wind farms, especially when the plans are close to their homes. This is also called the NIMBY (not in my backyard) effect. However, besides homeowners also tourists can be affected by these negative effects (Gordon, 2001). A landscape scattered with wind turbines will never have the quality it had before according some people or tourists.

2.3 The impact of wind energy

The above described 3rd generation energy landscape forms the very basis of the developments that can have an impact on tourism. While there are many other types of sustainable energy suitable for a 3rd generation energy landscape I will only research wind energy in this project as I stated in the introduction. This because wind energy at this point, is often implemented on a much larger scale than other sustainable energy sources. Therefore it is most likely wind energy will have a much bigger impact on tourism than many other types of energy. Wind energy is also economically very sustainable. This has lured many investments to the wind energy industry. To explain this in the words of Devine-Wright (2005):

''Since wind turbine technology has been more technically advanced in comparison with many other renewable energy technologies, and therefore most economically profitable, wind turbines, often deployed in arrays called wind farms, have been most often developed.''

Wind turbines can affect their surrounding environment on many different ways. However there are also researches showing that the impact of wind energy on people is not that big at all or this resistance is only temporally. In the model of the approval of big projects this temporally disagreement with new projects is shown (see fig. 2).

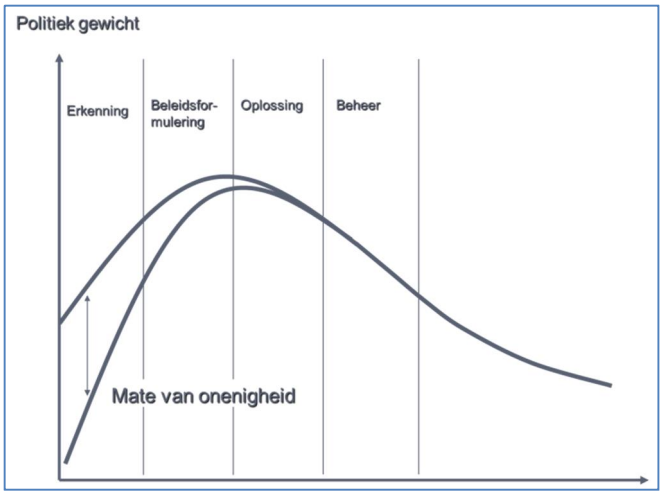


Fig. 2: Approval of a project (Winsemius, 1986)

According to this model, in the beginning when a new project is announced, such as a new wind farm, disapproval is large. However when time goes by and the project has been constructed the disapproval diminishes as all the people living in this region are getting used to wind farms. Also some of them may discover that many negative effects which they feared are actually not affecting them. So it is not always the case that negative effects will be perceived when a wind farm is finally being build.

2.4 Negative effects of wind turbines

From other research projects which did have found evidence of wind turbines affecting the landscape these are the most common effects:

Firstly wind turbines can cause noise disturbance. Especially when people live in the vicinity of the turbine this noise can be very tiresome. Especially in the early morning after a clear night when due to inversion layers in the atmosphere the noise of the wind turbines is trapped inside the lower colder layer of air resulting in even more noise disturbance for people living close to the wind turbine. This effect is has been described by Verheijen et al. (2011). This noise disturbance can cause sleeplessness, and related health problems.

Secondly, People living at the foot of a wind turbine can be affected by the shadow effect caused by the wings of the turbine. Also this effect can cause different types of health problems like sleeplessness (Westerberg et al., 2013).

These first two effects are also named as major health problems for locals as the wind turbine syndrome (Piermont, 2009). Piermont conducted a research among 30 people living in the vicinity of a wind turbine. She described effects caused by wind turbines such as sleeplessness, dizziness, migraines, concentration problems and more. However this research received some critical notes. Amongst these critics were the British National Health Services (NHS). They stated that the relative small sample of 30 persons can never be seen as representative for the whole population. Also some of the test subjects already had health issues before the wind turbines were built.

Thirdly wind farms can cause trouble for the local wildlife. During construction of the foundations of the offshore wind turbines many fish will die because of the major sounds waves hitting the water (Drewit et al., 2006). However the research of Atrill (2012) and also the Danish National Institute of Marine Resources (2011) oppose this statement. They state that the local fish population will even be boosted by offshore wind parks as the foundations of wind turbines act as artificial reefs.

While this is just a temporally effect but when the wind turbine is finished other species are being affected permanently. Birds stay away from the finished turbines (Drewit et al., 2006). Thus, construction of wind turbines is shrinking the habitat for certain species of birds. Other species of birds are not avoiding the wind turbines but can get killed by them due to a collision with one of the wings. Crossing a row of wind turbines can be as dangerous for a bird as crossing a highway (Lindeboom et al., 2011). Bats can get killed in the vicinity of a wind turbine because of the sudden drop of air pressure also caused by the moving wings of the turbine. However the research of Sovacool (2009) claims that fossil fuelled energy sources pose a much bigger threat for birds and bats than wind turbines: ''*The study estimates that wind farms and nuclear power stations are responsible each for between 0.3 and 0.4 fatalities per gigawatt-hour (GWh) of electricity while fossil-fuelled power stations are responsible for about 5.2 fatalities per GWh''.*

Finally wind farms tend to be very prominent in the landscape. This can be experienced by people as ugly and therefore can cause a decreased quality of the landscape. Unlike the other effects this effect is also experienced by people not living or staying close to the wind turbines. This means that at first sight this final effect of a wind turbine seem to have the biggest effect on tourism.

Because of all these negative effects it is not surprising that when new plans are revealed the locals are going to demonstrate against these plans. However a peculiar detail is that most of these people are in supporters of sustainable energy but they just do not want it close to their homes. This NIMBY effect can be reduced when a new wind farm is developed together with the local population. If the local population also receive some of the benefits of wind farms such as cheaper energy, they are more willing to allow a wind farm in the vicinity of their houses (Devine-Wright, 1999).

2.5 Impact of wind energy on tourists

Category	Aspect
Physical	Turbine colour
	Turbine size
	Turbine acoustics
	Farm size and shape
Contextual	Proximity to turbines
	Landscape context
Political and institutional	Energy policy support
	Political self-efficacy
	Institutional capacity
	Public participation and consultation
Socio-economic	Shareholding
Social and communicative	Social influence processes (media, social networks, trust)
Symbolic and idealogical	Representations of windturbines
Local	Place and identity processes
	Local or community benefit and control
	NIMBY-ism
Personal	Previous experiences and knowledge

Table 1: A summary of factors identified in past research as affecting public perceptions of wind farms and renewable energy (Devine-Wright, (2005)

Devine-Wright (2005) made from all the available literature at that time an overview of all possible factors which can contribute to the impact a wind turbine can have on the landscape (table 1.). Many aspects from this table also can have their influence not only on local residents but also on tourists.

First of all, aspects which also influence the tourists are factors which contribute to the visibility in the landscape such as the colour of the wind turbine, the height, the shape and scale of the wind farm itself. Besides that also the distance of the wind farm from the tourists plays an important role and the way the wind farm is being implemented in the landscape (for instance in rows, scattered or in clusters). Secondly the background of the individual tourists is a factor which can be important. Tourists who are already got used to wind farms from in their hometown are less likely to find wind farms on their holiday destination disturbing (see ''previous experiences and knowledge'' in table 1).

Also a case study from Langenbroek and Vanclay (2012) made clear that the main reason why the tourists, or in this case the whole tourists industry is protesting against new wind farms: The fear for overall loss of landscape quality. This case study on a new offshore wind farm project near the Dutch town of Urk was a very complete overview of all the effects a wind turbine can have on such a small and tight community.

The most interesting however was, that due to the presence of wind turbines in the landscape the prices of real estate in that area, especially along the waterfront, would decline according to this research. This could result in a lower profit from the rents, and a lower standard of tourist facilities. This was also the outcome of a study from the Caledonian University (2008) but in this research they calculated it on a quantitative way.

In both studies the conclusion is therefore not about the effects of one individual wind turbine, but about the overall landscape quality which might decrease if a new wind farm would be built. The effects wind turbines have on tourism are therefore not that easy to measure as it is about the overall picture of a landscape in which are more elements involved than wind energy only. Also other occurrences such as the economic development of an area are participating on this overall picture. So it is often hard to say if a decrease in the number of tourists in an area is due to new wind turbines or due to the economic crisis or a combination of both.

2.6 Mitigation

Tourists have little opportunity to protest against wind farms. They are not living in the area and they are most likely not even that interested in having an influence, they just want to have a good time. However, there are organisations which are speaking on behalf of the tourists. From various stakeholder analysis it becomes clear that there certainly is a huge interest to keep attracting the tourists because of the economic benefits but the tourists themselves have a very small voice about the plans (RWS, 2010).

However, in literature wind farms are most likely to cause negative reactions among tourists. As study in Scotland shows that a tourist is not willing to pay the same amount of money for a hotel room when the view is disturbed by wind turbines (Riddington et al., 2009). In the same study it was possible to reduce the negative effects for the landscape with the use of GIS software. In that way it became possible to make visible from which points in the landscape new turbines will be visible.

Also the attitude of the local residents on wind energy can be a factor of how the tourists think about it. Communities which are positive towards wind energy can transfer this to tourists. Also a community proud of its own efforts to implements wind energy to become a more environmental friendly destination can attract new tourists. A good example of this is the Danish island of Samsø. The island made itself famous because they succeeded to generate all of their energy needs from renewable energy sources. Due to media attention, which is a form of promotion the island is attracting thousands of tourists from around the globe every year (Samsø: Renewable Energy Island, 2011). This effect was also described in the research of Pasqualetti (2001) where he perceived many wind farms which became tourist attractions themselves instead of disturbing tourists.

Also from the study of Kostakis et al. (2012) it appeared that tourists are even willing to pay more when they now their accommodation is using sustainable energy. So if the sustainable energy is

being used in the local hotels, it might have a positive effect as long this is being promoted so the tourists know about it. But there was no further research about the negative effects of the sustainable energy used in this particular study.

3. Methodology

As stated in the introduction this is a project in cooperation with the University of Bremen. This means that partly the same methods will be used in the two studies in order to be able to make a comparison in the conclusion. On the Dutch side I choose to do a two-way approach: interviews as well as a survey among tourists. On the German side only a survey has been conducted.

3.1Interviews

First I want to answer multiple questions with the in-depth interviews. I want to gain an insight in how tourists see wind energy in multiple different levels. First I've had an interview with a researcher from the University of Groningen which is specialized in decentralised energy landscapes. This because I wanted a more neutral opinion about wind energy from someone not directly involved in the region Harlingen, Bolsward and Makkum. As the gained information of Zuidema is mainly to test literature this interview will not be described as the other interviews

Secondly I've had an interview with A. de Vries from millieufederatie Fryslân. He could tell more about the liveability near wind turbines and the effects on recreation.

Thirdly I've had an interview with J. Sikma from 'het watersportverbond' region north. He could tell more about the direct effects of wind farms on the water recreation/tourism which is the most important type of tourism in this region. On the German side no in-depth interviews have been conducted.

3.2 Questionaire

I also conducted a questionnaire in this region. This survey was meant to ask the tourists themselves about wind energy and their opinion about new wind farms on their current tourist destination. The same questionnaire will also be filled out by German tourists in Greetsiel as part of the German project.

Combined, the interviews and the survey, will give the answer to the main question.

3.3 Ethics

The people who were interviewed for the purposes of this research project have been asked and agreed to be named in this paper as the number of people being interviewed was too small to guarantee anonymity. J. Sikma and A. de Vries both spoke on behalf of their organisation and not as a person. The people who filled out the survey shall be kept anonymous and it won't be able to trace back any individual on the basis of this survey. The sample in the questionnaire is big enough to assure anonymity.

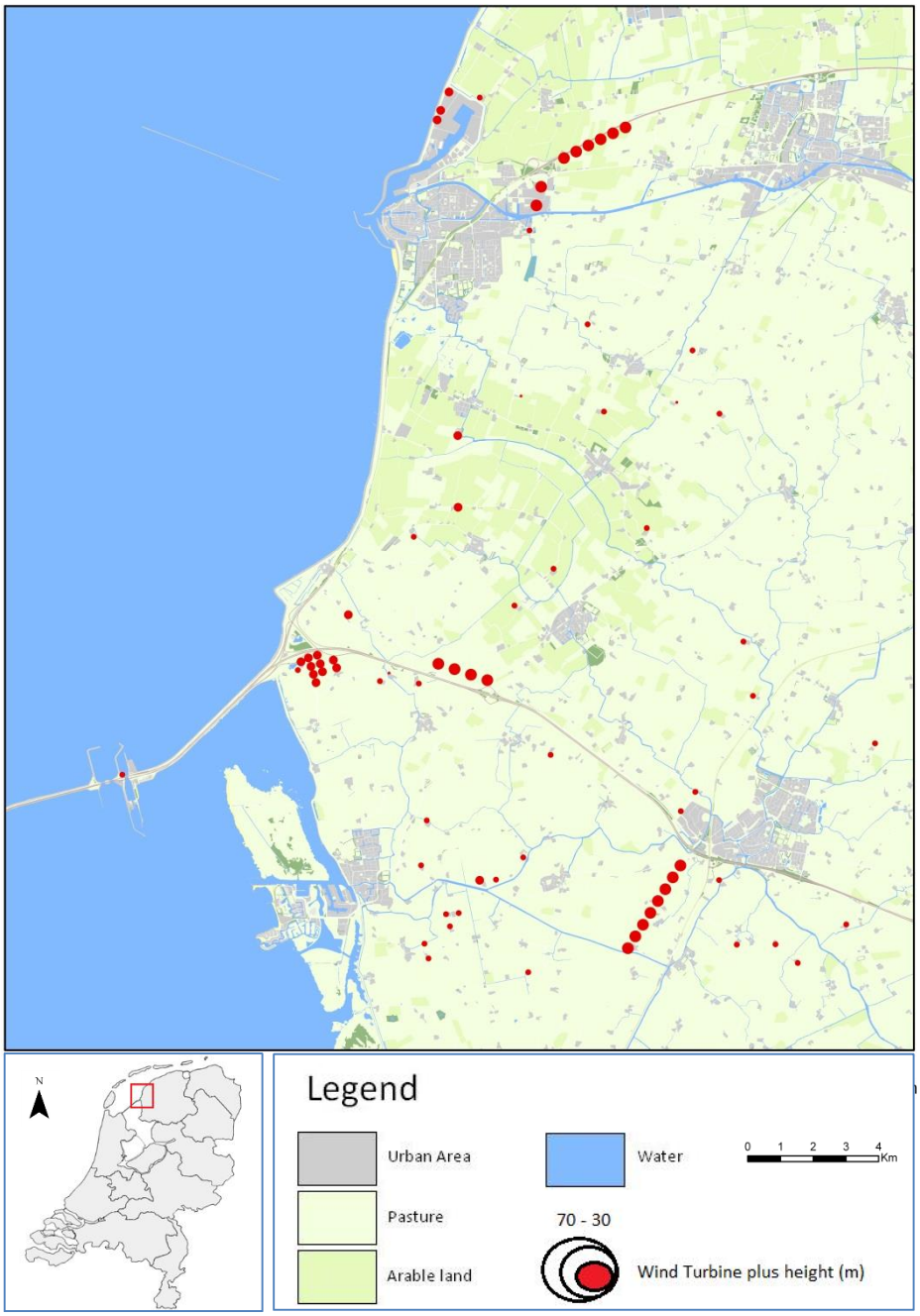
4. Results

4.1 Existing and planned wind turbines in the study area

All the existing wind turbines in the study area are highlighted in Map 2. It becomes clear that this study area is already densely populated with all kinds of different wind turbines. We can clearly say that an energy landscape such as described in the theoretical framework is developing in this area. But what about the possibility of new turbines?

Also new turbines have been planned in this area for the near future. These areas are the areas as appointed by the document 'Windstreek' (2012) published by the province of Fryslân. So in this area both existing wind turbines and plans for new wind turbines are present.

Map 2: Existing wind turbines in the Harlingen, Bolsward and Makkum region



4.2 In-depth interviews:

1. **A. de Vries| Millieufederatie Fryslân**

De Vries is working at the 'Friese millieufederatie'. This is an organisation which is promoting a better liveability and environment in the province of Fryslân. De Vries is a policy specialist on the area of environmental quality and is currently occupied with the plans for new wind turbines in the province of Fryslân.

The Friese millieufederatie is in principle a proponent of wind power as wind power in relatively cheap and environmentally friendly. However they are very cautious about the negative effects. Most important are the effects which endanger the local species (bird and bat collisions with the wings) and effects which pose a threat toward the liveability on the area (noise, shadow, visibility in landscape). Especially now wind turbines are getting bigger and bigger the millieufederatie is insisting on more careful planning of new wind farms.

About the effects on tourism he replied that the biggest threat to tourism would be the visibility in the landscape. ''The planned wind farm near Makkum would change the whole feel and look of the landscape. The openness which many tourist like, would be gone because of the huge wind turbines''. Also the historic value of the landscape is not getting the attention it deserves. De Vries said: ''Historic views on the landscape, which are very important for tourism, would be disturbed by modern wind turbines''. Therefore the millieufederatie, which is in principle not against wind power, is not in favour of the plans for the new onshore wind farms proposed by the national government as described earlier.

When asked were wind turbines should be placed according to the millieufederatie de Vries replied: ''they could be placed alongside highways, on retail parks or in industrial areas''. Another option according to him would be offshore. Red line in this vision is that wind turbines should be placed were no one or at least as few as possible people are affected by the negative effects.

If wind turbines are to be placed in populous areas then it shouldn't be done on such a large scale. However due to the policy described in the document 'Windstreek2012' it became pretty much impossible to develop wind turbines in other areas except in the areas appointed by the national government. And the wind turbines which can be build are located in large scale wind farms. Any space for local initiatives, which the millieufederatie favours above large scale wind farms, is not present any longer. This means, according to de Vries, that resistance among the population will increase as they will only get the negative effects.

2. J. Sikma | Watersportverbond

Sikma is chairman of 'het Watersportverbond' or 'Water sports association 'of the northern Netherlands. He is therefore a representative of all water sports and water recreation. This is also by far the most important type of tourism in the study area. The goals of 'het water sports association' are therefore pretty clear: no disruption of water recreation. Sikma was also very clear about wind turbines. In the planned wind farm near Makkum there is also an offshore area appointed just of the coast of Makkum: This plan is disturbing the water recreation and water sports in this area and they are therefore opposing these plans. Addition to this is that the water sports association is not against wind power, only when it disrupts the water recreation.

Sikma had different reasons for this point of view:

Firstly wind farms are reducing the amount of space left for water recreation like sailing. He used the current situation on the North Sea: 'When you want to sail from the Netherlands to Norway nowadays, you need to sail along the coast of Scotland in order to get there. The North Sea is that heavily used that there is little space left for recreational sailing'. Sikma fears that this will also be the case in the IJselmeer when more and more wind farms are being built. Also many sailing competitions cannot be organised anymore due to the lack of space.

Secondly Sikma thinks that, following from the first reason, this diminishing of space for the recreational sailing will cause that safety in the remaining parts of open water is at stake. More often recreational boats are using waters which are also used by the large shipping companies. Last couple of years many investments have been done to create special routes for recreational boats in order to improve the safety. Plans for new wind farms are undermining the efforts already made on this subject.

Thirdly there is the effect wind farms have on the wind itself. The quality of sailing in waters near wind farms will decrease because of the unreliable winds in that area. Wind farms can redirect winds which make it really difficult to anticipate on when sailing.

Finally Sikma mentions the visibility in the landscape. However this is not the main reason why the water sports association is against the plans of new wind farms in the IJsselmeer. The first two reasons are much more important because that are effects which will threat the water sport directly. This last effect only has an indirect effect.

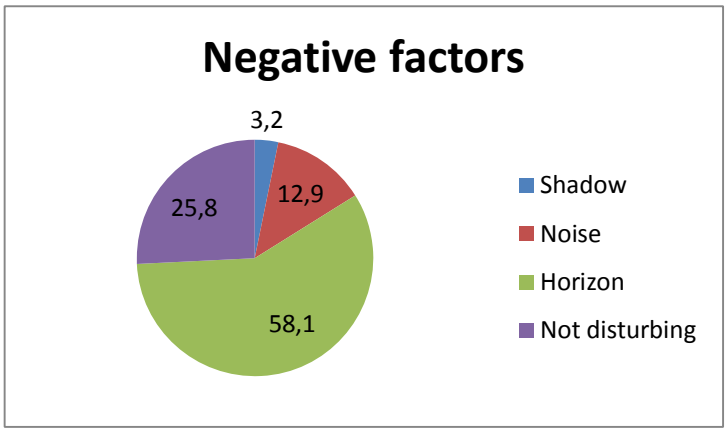
The water sports association would rather see wind turbines onshore. However they realize that will not always be possible. In that case they suggest building wind turbines near or on top of the Dykes. Another option is to build them in waters which are inaccessible for boats in the first place. You could think of areas very close to the shoreline.

4.3 Questionnaire in the Netherlands

Besides the interviews I also conducted a questionnaire. This questionnaire was distributed among tourists traveling through the area on their way to the island of Terschelling. However, as this group might not be tourists visiting the target area, they do represent a group of various types of tourists. Also the total number of tourists (42) who filled out the questionnaire is not big enough to serve as a representative population for all the tourists in this area. Of the total number of 42, 46% is male, 54% is female. Average age was 44.

One of the first things that became clear after analysing the result of the questionnaire is the fact that almost everyone (80 %) supports the implementation of sustainable energy sources such as wind turbines. However when asked if tourists are feeling bothered by wind turbines on their holiday destination 74% says yes. Most of this 74% thinks that the visibility in the landscape is the factor which is most annoying. Also other factors are found to be annoying but these factors are less important (see table 2 and fig. 1).

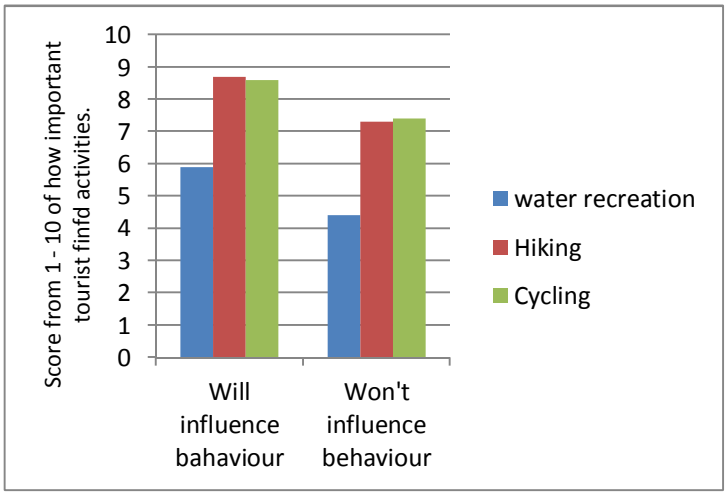
Fig. 3: Negative factors of wind turbines according to tourists in the questionnaire.



As can be seen in fig. 2 the majority of the tourists indicate that they are feeling disturbed when wind turbines are in the vicinity. However when asked if this will influence their choice of destination 77, 4% answers no. So tourists are not positive about wind turbines in the landscape, but it is not influencing the behaviour of the individual tourists, at least they say it won't. The remaining 22, 6% however is indicating that they might stay shorter or will avoid the area at all if wind turbines would be built.

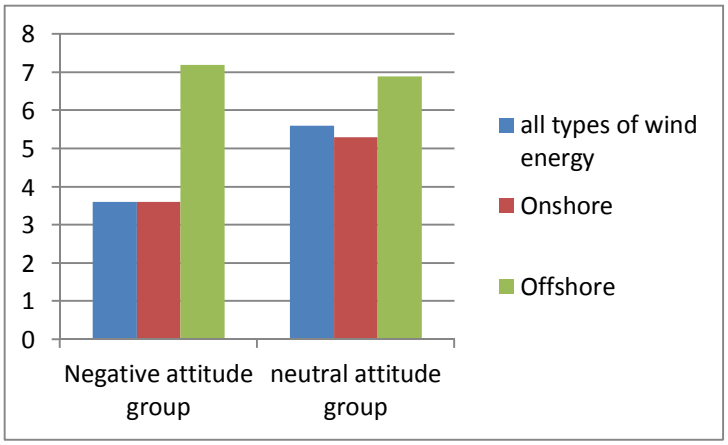
In similar research projects similar results have been published such as in the research of Frantál (2011). Tourists rather don't want to see wind turbines on their destinations, but if there are turbines it won't change their behaviour in most cases.

Fig. 4: Comparison of average scores for various activities between two groups: a group of tourists which stated a new wind farm would have an impact versus a group which stated it wouldn't have an impact on their own behaviour.



However, of the group which indicated that they would stay shorter or will avoid the region at all if a wind farms would be built, are often people which are more interested than average in cycling, hiking, and water recreation (see fig. 3). These are typical activities in which the overall landscape is an important aspect or in other words: activities in which the landscape itself is being used. Wind turbines are being reckoned as a threat to these activities.

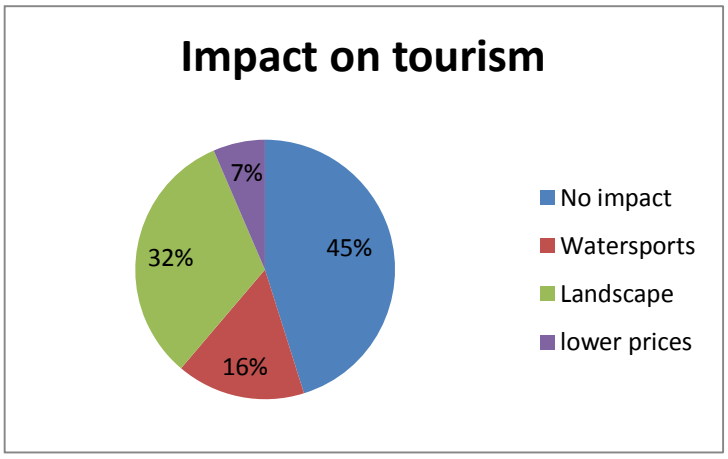
Fig.5: average score (scale 1-10) according to tourists about various types of wind energy and their attitude towards wind energy.



Also the preference between offshore and onshore wind parks was asked. It appeared that when people have a more negative attitude towards wind farms in general they are more in favour for offshore parks if they had to choose between one of the two (see Fig. 4).

The questionnaire also contained a question on whether or not wind turbines have an impact on the local tourism according to the tourists themselves. It appeared that the small majority of the tourists (45, 2%) see little reason to believe it will have an impact. However, the remaining 54, 8% thinks it has an impact (see fig. 5)

Fig. 6: The negative impact on tourism by wind turbines according to tourists in the questionnaire.



It also appears that when the tourists' attitude about wind turbines is less negative, the tourists themselves also expect that there will be less impact on tourism in a region. In the group of tourists which think neutral about wind turbines, only 46 per cent thought wind energy can have an impact on tourism. In the group that thinks negative about wind turbines 68 per cent thinks it will have an impact.

Another thing that became clear in this questionnaire is that the background of the tourists is not an important factor. It appears that it doesn't matter if a tourist comes from an area where wind turbines are already present or not. The attitude towards wind turbines will not be subjected to change, neither positive nor negative. This is the opposite of what Zuidema said in his interview. He stated that when wind farms are going to be a more common good, people get used to them and disturbance due to the presence of wind farms would decline.

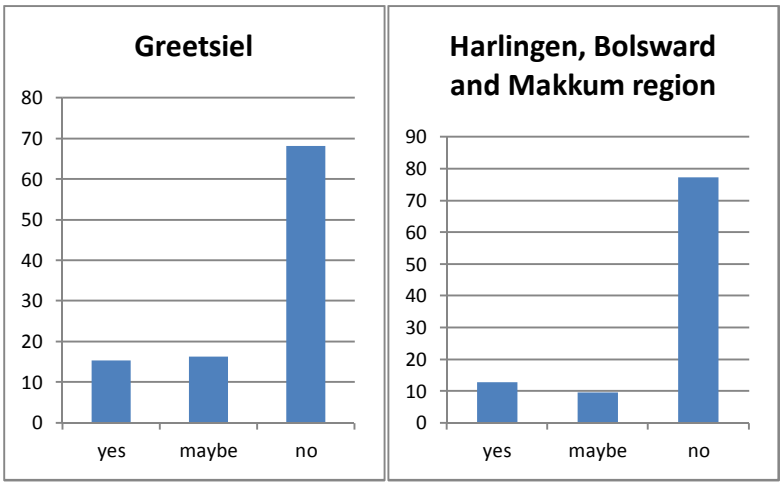
Finally, there was the question whether people prefer one large wind farm or multiple smaller wind farms scattered across the landscape. It appeared that 63,3% preferred one large wind farm, 33,3% preferred multiple smaller wind farms. A study conducted in Czech Republic by Frantál (2011) showed similar results. In that study 60% of the questioned tourists preferred one large wind farm.

4.4 Questionnaire in Germany

The questionnaire in Germany was done by a colleague student also from the University of Bremen. In total 110 people filled out the questionnaire. Although not all the questions were the same the core of questionnaire however was suitable to compare.

The first result from Greetsiel we can compare with a result from the Netherlands is whether or not wind turbines are affecting the choice of holiday destination. According to figure 6 and 7 this is only the case in about 10 or 15%. In both research areas the number are about the same. This is in line with other literature such as the research of Frántal (2011).

Fig. 7 and 8: Comparison between the questionnaires on the question whether or not wind turbines would change the choice of holiday destination.



The second comparison is on the question whether or not people are feeling disturbed by wind farms (see fig 8 and 9). It becomes immediately clear that there is a huge difference in the results. Where only a 25% thinks that wind turbines are disturbing in Germany, in the Netherlands this is almost 75%.

A possible explanation could be that the Germans are already more accustomed to wind turbines than the Dutch. This would be in line with the interview with Zuidema. He said that a change in the mind-set of people about energy production is necessary in order to truly get into the 3rd generation of energy landscape. In Germany they might be a bit further in this than in the Netherlands.

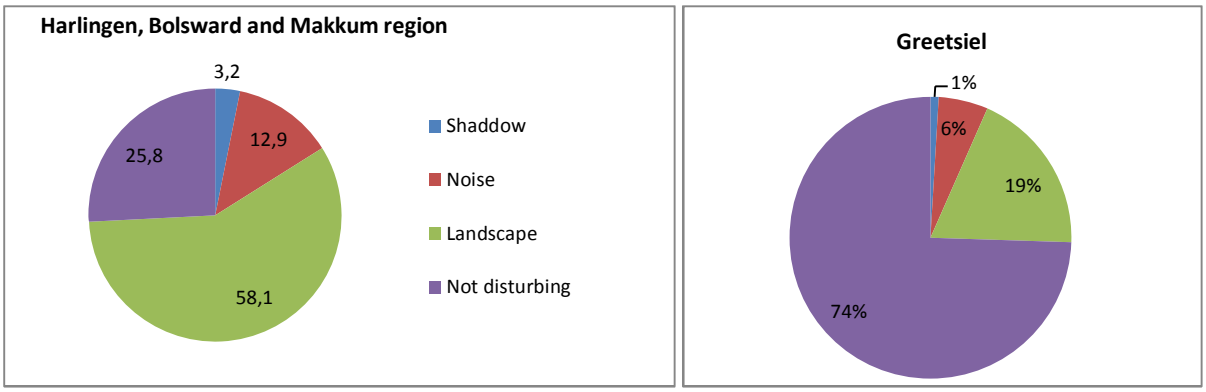


Fig. 9 and 10: Comparison whether or not tourists think wind turbines are disturbing and if so, what is most disturbing about a wind turbine.

However, as a final statement, it needs to be said that the questionnaire has many more respondents (110) as the one in the Netherlands (42), this might cause some troubles but both numbers are high enough to execute some statistical analysis. Secondly however the questions were the same in English, we had to translate them in to Dutch and German in order to make them understandable for our target group. This also might have caused some minor differences in intonation in the question what might have resulted in some differences in answers.

5. Conclusions

The main research question to answer was:

''How is wind energy affecting tourism in the Harlingen, Bolsward and Makkum triangle area and how can negative effects be prevented?''

This question can be answered with the use of the collected data. From interviews it appeared that there is a conflict in reasoning why people and organisations are against wind energy in the study area of Harlingen, Bolsward and Makkum. The most obvious one would be the visibility in the landscape. However the millieufederatie is mainly against the new plans because of the diminishing of the liveability in the region. Then again, the water sports association is against because of the loss of navigable waters with the loss of safety on the waters as a result. Where the water sports association rather would see wind turbines on land, the millieufederatie would love to see them in the water. However there is one common denominator: both organisations also came up with the idea to place wind turbines alongside highways and in industrial areas.

Tourists themselves are not that influenced by the construction of new wind farms according to themselves. If tourists change their behaviour it is most likely they've came to the region for activities such as hiking and cycling. In other words, activities wherein you probably going to see large parts of the region. However, if the government is going to appoint new areas to build new wind turbines most tourists rather see them offshore than onshore. Especially the tourists who were already opposed towards wind turbines in the first place.

So to answer the main question: At this moment, wind energy is not affecting tourism on a large scale. However if the new plans are being executed the water recreation (or water sports) is going to be affected most. Not necessarily because of the visibility, but because of loss of recreational waters. Tourists themselves are most likely not influenced by construction of new wind turbines on a large scale. However tourists which are going to the region mainly to enjoy the landscape in activities such as hiking and cycling could be affected. Main reason why they are affected is the visibility in the landscape. A solution could be building wind farms offshore, but that's against the will of the water sports association and associate organisations.

Best way to counteract the negative effects would be by not creating the negative effects in the first place by building the wind farms on locations were they create fewer problems. This means more wind farms alongside highways and in industrial areas. Both natural protection organisations and organisation speaking on behalf of tourists and local inhabitants would be much more cooperative. I would therefore advice the government to research more locations similar to that near the highway in Heerenveen as projected in Windstreek 2012.

However, if we have a look across the border in Germany we see that people already are more accustomed to wind energy and therefore consider wind turbines as less disturbing than their neighbours in the Netherlands. So it is likely that when more wind turbines are being built, fewer people are feeling disturbed by the wind turbines and the impact on tourism will therefore not be as big as expected by some of the tourists organisations.

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7. Appendix

Appendix 1 |**Format Interview (Dutch)**

De interviews moeten inzichtelijk maken tot in hoeverre toeristen en toerisme worden meegewogen in een besluit om een windmolenpark aan te leggen. Ik zou dit graag vanuit het perspectief van de provincie, de toeristische branche en een wat meer neutrale blik willen bekijken.

Ik wil daarom op de eerste plaats proberen iemand van de provincie Fryslan te pakken krijgen. Dit omdat de provincie verantwoordelijk is voor het aanwijzen van nieuwe gebieden voor windenergie. Een goed startpunt is Jan Jaap van Dicke, beleidsmedewerker voor de provincie Fryslan op het gebied van duurzame energie.

Ten tweede zou ik dus graag iemand uit de lokale middenstand willen interviewen die werkzaam is in het toerisme. Dit omdat zo'n iemand erg afhankelijk is van toerisme in de regio. Daarom zal hij/zij zich zeker laten horen indien deze persoon van mening is dat windenergie het toerisme schade kan toebrengen. Op het moment van schrijven heb ik hiervoor echter nog geen concrete kandidaat.

Tot slot zou ik graag iemand willen interviewen die wat verder van de discussie af staat. Dit om zo ook vanuit een helicopterview de discussie te kunenn bekijken. Ik denk dat iemand met expertise op het gebied van duurzame energie en/of energielandschappen binnen de universiteit een geschikte kandidaat zou kunnen zijn.

Hoewel niet alle vragen altijd voor elke geinterviewde van toepassing is zal ik dit format gebruiken als uitgangspunt. Per verschillende interview zal ik echter enkele vragen weg laten of toe voegen om gerichter aan informatie te kunnen komen.

Format: Het planningsproces van windmolenparken

Wat is uw rol in het planningsproces van windturbine?

Wat is de rol van uw organisatie in het planningsproces van windturbine?

Wat zijn de nadelige effecten waarmee omwonenden te kunnen krijgen indien er een nieuwe windmolen wordt gebouwd?

Hoe kan een windmolen(park) zoal ingepast worden in het landschap?

Wordt er tijdens het planproces rekening gehouden met de wensen van toerristen die het gebied bezoeken?

Kunnen toeristen of recreanten invloed uit oefenen op de besluitvorming omtrent windmolenparken?

Is er binnen de toeristische branche ook sprake van een weerstand tegenover windmolens?

En hoe wordt dit verzet gemotiveerd?

Format: Bestaande windmolenparken

Zijn er aanwijzingen dat bestaande windturbines of windmolenparken een effect hebben op het toerisme in zo'n gebied?

Zo ja, wat voor effecten zijn dit?

Is er bij de aanleg van de nu bestaande windmolenparken nagedacht hoe deze in het landschap moesten worden ingepast?

Is er tijdens de planning van deze windturbines ook overleg geweest met bewoners over alternatieven en oplossingen voor mogelijke problemen?

Indien ja, wat waren deze problemen en hoe zijn ze destijd opgelost?

Appendix 2 | **format questionaire (Dutch)**

De enquete wil ik afnemen onder toeristen in de driehoek Harlingen, Bolsward en Makkum volgens de definitie genoemd in opdracht 2. Ik wil dit gaan doen door middel van een online vragenformulier. Het webadres naar deze enquete wil ik verspreiden onder deze toeristen. Dit kan ik doen door middel van het benaderen van bedrijven werkzaam zijn in de toeristische branche die deze kunnen verspreiden onder hun klantenbestand.

Mocht dit lukken kan ik nog persoonlijk mensen benaderen door een dag veldwerk te aan verichten in het gebied. Met deze laatste methode weet ik ook beter wat voor personen ik voor me heb. Dit komt de resultaten ook ten goede. Het vereist echter wel veel meer tijd.

N.b.: Deze enquete wordt met precies dezelfde vragen ook in het studiegebied in Duitsland uitgevoerd. Hoewel deze vergelijking niet direct nodig is voor dit onderzoek is het wel van belang voor de workshop in Oldenburg eind mei.

Enquête over toerisme en windenergie.

1: Geslacht: Man/Vrouw

2: Leeftijd: _____

3: Bent u een voorstander van duurzame energie zoals windenergie?

- ja
- nee
- niet voor en niet tegen
- weet niet

4: Bent u lid van een organisat ie of vereniging die zich inzet voor natuurbehoud en/of beheer? (bijvoorbeeld natuurmonumenten, WNF oid.)

- Ja
- Nee

5: Kunt u voor de volgende activiteiten zeggen hoe belangrijk ze voor u zijn tijdens een vakantie door middel van het geven van een cijfer. 1 is niet belangrijk, 10 is zeer belangrijk.

Fietsen	_____	Wandelen	_____
Varen	_____	Cultuur	_____
Zonnen	_____	Restaurants	_____
Zwemmen	_____	cafés/uitgaan	_____

6: Woont u nu in een omgeving waar al veel windturbines staan opgesteld?

- ja
- nee

7: U ervaart windturbines in het landschap over het algemeen als....

- Mooi
- Neutraal
- Lelijk

8: Hoe beoordeelt u windturbines op een schaal van 1 tot 10 op de volgende punten? Hierbij is 1 zeer lelijk en 10 zeer mooi.

Windturbines over het algemeen _____

De inpassing van windturbines in het landschap over het algemeen _____

offshore windturbines (turbines in het water) _____

onshore windturbines (turbines op het land) _____

9: Ervaart u windturbines soms ook als storend en zo ja wat ervaart u dan als meest storend aan een windturbine?

- ja, namelijk het schaduw effect van de wieken
- ja, namelijk de geluidsoverlast
- ja, namelijk de horizonvervuiling
- ja, iets anders namelijk _____
- nee

10: Indien er goed is nagedacht over de plaatsing van windturbines in het landschap blijft de landschappelijke kwaliteit hetzelfde of wordt deze zelfs versterkt .

- eens
- oneens

11: Het is goed mogelijk om windenergie met toerisme en recreatie te combineren

- eens
- oneens

12: Denkt u dat de komst van windturbines in een regio een grote invloed kan hebben op het toerisme en recreat ie van deze regio? (meerdere antwoorden mogelijk)

- nee, windturbines zullen geen merkbare invloed hebben op het toerisme en recreatie in een regio.
- ja, indien windturbines in het water worden geplaatst zullen watersporters het gebied mijden.
- ja, de regio zal z'n landschappelijke waarde verliezen en dus ook z'n toeristen.
- ja, toeristen willen lagere prijzen voor dezelfde voorzieningen zoals fietsverhuur en accommodatie omdat de 'gebiedsbelevenis' achteruit is gegaan.
- ja, namelijk (licht toe) _____

13: Vind u dat er in een toeristisch gebied, bijvoorbeeld de Waddeneilanden, windturbines mogen worden gebouwd?

- ja, dit zou altijd moeten kunnen
- ja, Windturbines mogen gebouwd worden mits er goed wordt nagedacht over inpassing in het landschap.
- nee, dit zou nooit moeten kunnen.

14: Zal de komst van windturbines op uw favoriete vakantiebestemming uw recreatief gedrag (fietsen, watersport etc.) beïnvloeden?

- ja, ik ga deze bestemming voortaan mijden
- ja, ik zal minder lang op deze bestemming verblijven
- nee, ik blijf vakantie vieren op deze bestemming.

15: Op u favoriete vakantiebestemming ziet u liever...

- Één groot windmolenpark met een grote impact op een klein gebied.
- Veel los van elkaar geplaatste windturbines met een kleine impact op een groot gebied.