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The Impact of Offshore Wind Energy on Tourism

Good Practices and Perspectives
for the South Baltic Region



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Chapter 1

Offshore Wind Energy and Tourism
in the South Baltic Region

1 Offshore Wind Energy and Tourism in the South Baltic Region

The South Baltic area offers the ideal natural and economic preconditions for a promising perspective for the offshore wind development. Overall objectives of the EU-funded project “South Baltic OFF.E.R” are to foster the development of this renewable energy, strengthen South Baltic offshore competitiveness on the market, and create more and better jobs in the wind industry for this region.

Between March 2010 and May 2013, ten partners from Denmark, Germany, Poland, Lithuania and Sweden have set up a strong network dedicated to promoting the coherence of policies and the development of standard-setting practices, and to thus increase efficiency and speed up the growth of a highly competitive offshore wind industry in the South Baltic Region (South Baltic OFF.E.R, a).

Until recently, offshore wind energy was, both geographically and quantitatively, not broadly developed in the South Baltic Region. Denmark led the way with its first wind farm built in 1991, 2.5 kilometres off the Danish coast at Vindeby. The eleven wind turbines installed at Vindeby had an installed capacity of 4.95 MW (EWEA, 2011b). Over the next 20 years, the exploitation of offshore wind capacity in this region was vastly expanded, so that in 2010 it was possible to feed 10.6 TWh of electricity into the European grid (EWEA, 2011b).

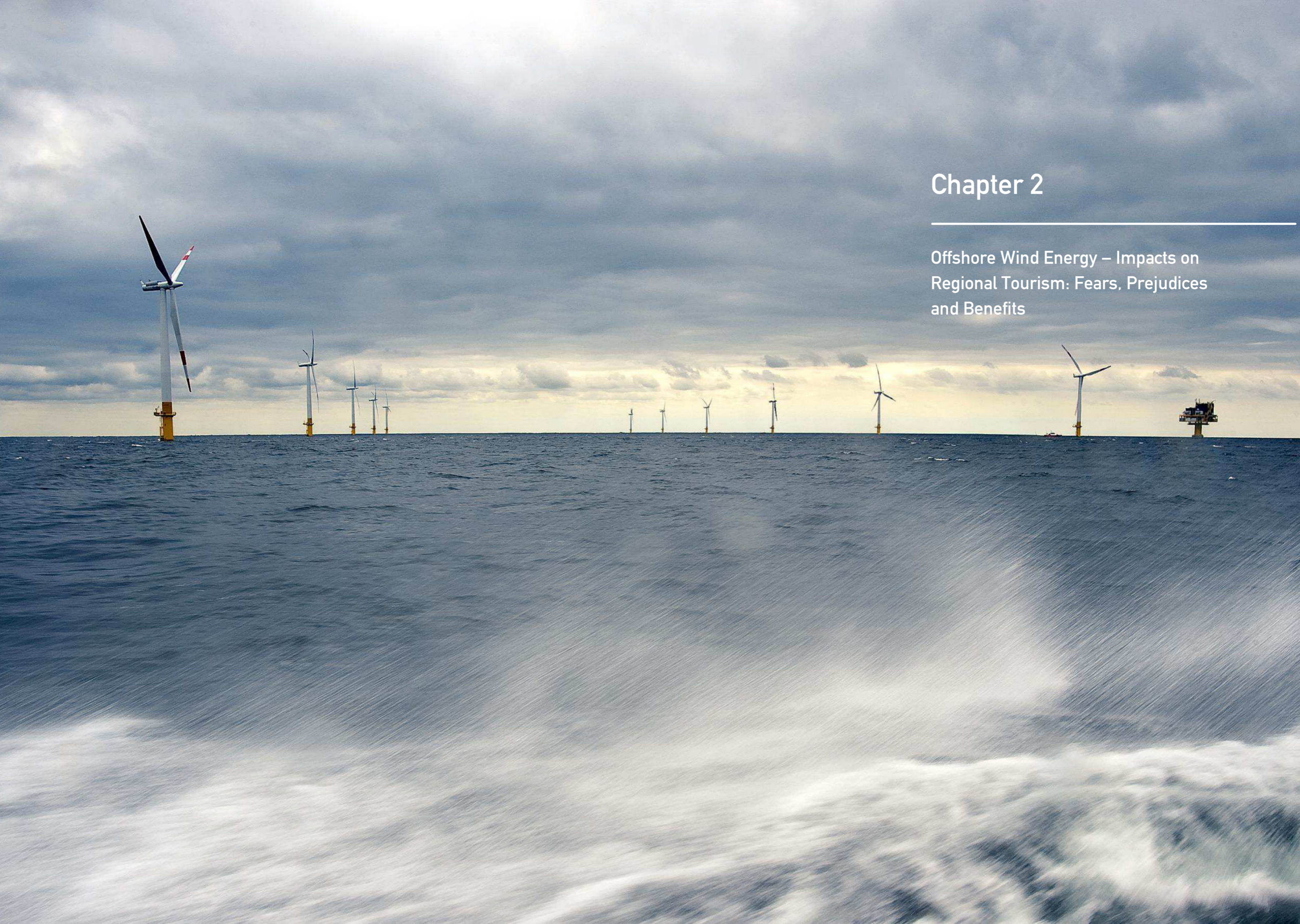
So far, about 16 % of the whole European offshore wind capacities are installed in the Baltic Sea. In the medium term, significant developments are foreseen (21 % of total consented capacity). Looking at the current country figures, the majority of installed offshore wind energy capacity is located in Denmark (921 MW, thereof 552 MW in the Baltic Sea), Germany (280.3 MW, thereof 50.8 MW in the Baltic Sea) and Sweden (163.7 MW) (EWEA, 2013). Germany has the highest offshore wind energy capacity target, with up to 10 GW planned for 2020 in North and Baltic Sea (EWEA, 2011a). For the German Baltic Sea alone, the Baltic Offshore Forum predicts about 2.1 GW until 2023 (Baltic Offshore Forum, 2012).

Poland and Lithuania so far have no installed offshore wind energy capacity at all, although Poland plans to reach a capacity of 500 MW by 2020. On the other hand, Lithuania has not yet formulated an offshore wind energy target within the framework of its NREAP (National Renewable Energy Action Plan). Nevertheless, according to the EWEA, an unofficial target of 100 MW offshore wind capacity is anticipated for Lithuania by 2020. Although Poland has no offshore wind energy

capacity installed yet, the positive outlook regarding development of this sector could signal a need to expand the qualified workforce. Indeed, 14 site-approval procedures for offshore wind farm projects in Polish maritime areas have been finalized and a further 62 have been initiated, allowing for a possible 0.5-1 GW new offshore wind capacities by 2020, 3.5-5 GW new capacities by 2025, and 6-10 GW in 2030 (FNEZ, 2012). Thus, although not all of the countries involved in the South Baltic OFF.E.R project at this point already have an offshore capacity, they are currently working towards attaining one, with this situation likely to develop positively in the future.

In parallel, the general public has recently become more familiar with the topic of offshore wind energy due to rising exposure in the media and an increasing attention paid to renewable energy sources in general. These developments form the backdrop for this study, which represents part of the project’s objective of “Bringing together Tourism and Offshore Wind Energy”, examining how various aspects of offshore wind energy may be used to attract new and greater numbers of tourists to the South Baltic area. In the following, potential fears and prejudices on the one hand, as well as benefits of combining offshore wind industry and tourism on the other hand, will be outlined. Furthermore, existing attractions related to offshore wind energy will be portrayed. Good practices from the Baltic Sea and the North Sea should provide coastal regions and islands facing the construction of new offshore wind farms with useful examples which can help them to successfully integrate offshore wind energy into their regional tourism concepts. Since no offshore wind energy capacity has yet been installed in Poland and Lithuania, best practice examples are taken from the project partners Denmark, Germany and Sweden. In addition, one example from the United Kingdom will be presented.

The methodology of this study is based on secondary research and the evaluation of relevant reports and projects. In addition, questionnaires were distributed to project partners as well as the contact persons of representative best practice examples in order to better understand their specific features. Furthermore, some experts were interviewed by telephone.



Chapter 2

Offshore Wind Energy – Impacts on
Regional Tourism: Fears, Prejudices
and Benefits

2 Offshore Wind Energy – Impacts on Regional Tourism: Fears, Prejudices and Benefits

Aside from their impact on the local population, offshore wind farms affect tourists visiting coastal regions or islands, and also persons touring the area with their sailing or motor boats. Fears and prejudices, as well as the potential benefits offshore wind energy might have for the tourism industry in a given region are summarized in the following table and will be the focus of this section.

TOURISM AND OFFSHORE WIND ENERGY	
Fears and Prejudices "damage to image due to disturbing emotions"	Benefits "better image due to the value of experiencing entertainment and prosperity of the region"
Impacts on the landscape	Fascination with technology
Use of sea space	Event character
Noise and shadow flickering ¹	Contribution to active environmental protection
Risk of ship collisions ²	General attractiveness of region

¹ influence only on ship and boat tourism in close proximity to the farm
² influence on tourism cannot be predicted with reliable methods

Fig. 1: Tourism and offshore wind energy – Impacts.
 German Offshore Wind Energy Foundation closely following Hilligweg & Kull, 2005, p.11; ARCADIS, 2010, p.23

2.1 Fears and Prejudices

Due to the importance of tourism for coastal regions, locals will have a number of fears and prejudices regarding offshore wind energy. Hilligweg and Kull (2005) summarize possible disadvantages as **damage to image due to disturbing emotions**. Concerning the offshore wind industry, this includes impacts on the landscape, use of sea space, noise, shadow flickering and impacts on tourism due to ship collisions.

Since tourism depends on an attractive environment, locals fear that **impacts on the landscape**, e.g. the agglomeration of several and/or very big wind turbines, might negatively affect the leisure zone. This again could result in a loss of recreational value and less demand for the tourism area. Important factors are therefore the location of turbines and their visibility from shore. However, according to Hilligweg and Kull (2005), only 9 % of interview respondents are disturbed by

offshore wind energy farms regardless of their position. More than half of the respondents would not even be disturbed if the wind energy farm would be visible.

A study on the wind farms Nysted, 10 kilometres from shore, and Horns Rev, some 14-20 kilometres from shore, undertaken by the Danish Energy Authority, showed that "local and national populations are generally positive towards wind farms. On the other hand there is also a significant willingness to pay to locate future wind farms at distances where visual effects on the coastal landscape are reduced." (DEA, 2006, p.36) Apparently "more than 40 % of the respondents in both the Horns Rev and Nysted samples stated that they would prefer future wind farms to be moved out of sight. In the national sample more than half of the respondents stated that they would prefer wind farms to be moved out of sight." (DEA, 2006, p.38) In addition "more than 70 % of local and national respondents stated that they would prefer larger and fewer farms" over "wind farms in several small groups." (DEA, 2006, p.39) Identification of the visual impacts before construction of a wind farm, together with public involvement, can help to lower fears regarding destruction of the landscape. However this effect is especially relevant where offshore wind farms are located nearshore or not very distant from the shore (mainly in Denmark and Sweden).

Contrary to Denmark, most German offshore projects are planned and implemented outside the 12 nautical mile zone in the exclusive economic zone where they cannot or only hardly be seen from the shore. The transmission of electricity to the load centres inland is another factor potentially impacting the landscape since an increased number of overhead lines might become necessary (Janßen, Hilligweg & Kull, 2006). An alternative would be the hauling of underground cables, but this might be more cost intensive.

In order to **reduce negative impacts due to aesthetics** of offshore wind farms and overhead lines, they could be constructed in a manner which make them suitable to the landscape and represent a landmark. The Federal Ministry of Transport, Building and Urban Development in Germany argues for the capacity of building culture to emphasize positive effects and minimize negative impacts, and therefore create buildings which engender pride and a desire for their conservation, and which become a part of the region (BMVBS, 2011). A good practice example in this context is the unique shape of the Middelgrunden offshore wind farm in Denmark. In addition, advertising could be used to emphasize the aesthetics of offshore wind farms in a positive manner, since the opinion of the observer is ultimately always subjective. The German Energy Agency (dena) regards an offshore wind farm as a neutral structure. Most critical for its acceptance is not the fact of its visibility, but the associations it elicits in the viewer (dena

2008a; 2008b). Therefore a good communication strategy is a crucial factor before and during the construction of offshore wind farms, since the main problem concerning their acceptance is a lack of information. It is important to treat existing fears seriously, to alleviate them, and to draw attention to benefits as well the disadvantages. In addition, the possibilities and limits of civic participation and/or involvement should be openly communicated. The visibility and accessibility of the responsible authorities, as well as the organisation in charge of project execution, should be guaranteed throughout the entire project's duration (Hübner & Pohl, 2012; Albrecht, 2008).

Use of sea space might pose a problem for boat tourism (ARCADIS 2010). The encroachment on an area by offshore wind farms, and the traffic laws and safety regulations that follow, result in impacts on ship and boat tourism. An area previously freely accessible is now restricted for shipping and boat traffic. To which extent a transit through offshore wind farm areas is possible depends on safety issues and its ease of access. Examples from Denmark, where transit through offshore wind energy farms is possible via certain routes, showed that sea usage due to offshore wind farms did not have any negative impacts on boat traffic. On the contrary, the offshore wind farm Nysted was regarded by sailors as an inducement to choose that route over others (ARCADIS, 2010; Weickmann, 2005). In Germany, it is allowed to navigate as close as 500 meters to an offshore wind farm. However, it is not allowed to cross it by boat (except installation and service vessels). For example, amateur sailors will be able to reach the offshore wind farm Riffgat in the North Sea easily from the nearby island of Borkum.

Noise and shadow flickering only affect ship and boat traffic in close proximity to the offshore wind farm, as they are not perceivable in the coastal areas. Thus minimal impact results from noise and shadow flickering in offshore wind farms (ARCADIS, 2010). A higher acoustic emission only arises temporarily during the construction phase. Due to the rebound effect under water, this has greater significance for the maritime environment than it does for tourists. A large amount of ecological research has been initiated in Germany to develop strategies for noise mitigation strategies during the construction phase.

Another fear is the **risk of ship collisions**, and the associated potential leakage of harmful substances, which potentially could have enduring negative effects on the environment, and therefore on tourism (ARCADIS, 2010; Bartels, 2010; dena, 2007). In a study by Hübner and Pohl (2012), inhabitants and tourists in four coastal regions of Germany were asked whether or not construction of the offshore wind farms had led to the impacts they had feared. During the workshops held for the locals, the main issue was always their fear of possible ship collision and its impacts. Despite statutory license regulations, locals criticized the

close proximity of some offshore wind farms to sea-lanes with intensive traffic. Hübner and Pohl (2012) further state that the participants of the workshops were particularly critical of the fact that human failure, which is the most frequent cause of ship collisions, was not among the criteria for the approval certification. In addition, their research showed that the fear of ship collisions is bigger for wind farms in close proximity to the coast. The participants of the workshops called for compulsory pilots, control of shipping traffic, as well as – in the event of a ship collision – a sufficient number of local towboats. According to ARCADIS, there are no reliable methods to predict the likelihood of such an occurrence (ARCADIS, 2010). However it is not only in the interest of the tourism industry, but also of the offshore wind energy industry, to attach a significant value to environmental protection and nature conservation. This is due to the fact that an ecological disaster would have enduring negative impacts on the industry's image. Therefore the offshore wind industry will do everything to avoid such an event (dena, 2008b).

A number of examples demonstrate that these fears and prejudices which arise prior to the construction of offshore wind farms, are mostly unjustified. In most cases, it was possible to incorporate the offshore wind energy project into the local tourism concept, and several representative studies verified that there was no decrease in the number of tourists after construction of an offshore wind farm (Benkenstein, Zielke & Bastian, 2003). The assumption that tourists might stay away due to the existence of offshore wind farms is more a subjective fear than a measurable fact (May, 2004). The research of Hübner and Pohl (2012) showed that the fears held by locals ahead of construction were mostly eliminated after completion of the wind farms.

2.2 Benefits

Despite all the fears and prejudices, offshore wind energy has numerous benefits for tourism regions. Several of them are summarized in Hilligweg and Kull's (2005) category **better image due to the value of experiencing entertainment**. This includes the items "fascination with technology", "event character", as well as "contribution to active environmental protection". Another benefit is the **general attractiveness of the region due to its prosperity**.

According to the authors, **a fascination with technology** could lead to an increased number of visitors and day-trippers (Hilligweg & Kull, 2005). Hübner and Pohl (2012) also state that the locals' curiosity about offshore wind energy is based on the fascination with its technology. In addition, the German Energy Agency (dena) finds that

the technical aspects related to offshore wind energy are a fascinating subject, which can turn into a distinctive segment of the tourism industry (dena, 2008b). Apart from the highly impressive wind turbines, sea ports, construction sites and jack-up vessels offer much to see. A good example is the “Tour de Wind” sightseeing tour in Bremerhaven, which connects 20 stations related to onshore and especially offshore wind energy.

Hilligweg and Kull (2005) state that the promotion of offshore wind energy might create added value for a region by providing entertainment experiences. An **edutainment event** can give background information on offshore wind energy, linking it with entertainment and adventure (Hauschild, Hilligweg & Kull, 2008). Offshore wind energy therefore has an **event character**. Further attractions, for instance an information centre on offshore wind energy, could enduringly increase both the amusement value of the trip and the attractiveness of the region (Hilligweg & Kull, 2005). In his review study of a number of papers, Weickmann (2005) concluded that independent of the date and focus of the study, a strong demand for information was seen. He states that 60-75 % of respondents indicated a desire for more information regarding offshore wind energy.

In addition, research conducted by Hübner and Pohl (2012) shows that 32 % of the respondents in 2011 would be interested in an information centre, and 15 % of respondents would be interested in boat tours. This would require a close proximity of the wind farm to the coast, since completion of the round trip between harbour and the offshore wind farm site within an acceptable time would be a precondition for making a day trip (Weickmann, 2005). Besides their profitability for the region, these edutainment events have benefits concerning education policy, such as education on climate change and the need for alternative energy sources (Weickmann, 2005). These educational events could have a multiplier effect, when the information gained is spread to family members, friends or other people.

Tourists with a positive attitude towards offshore wind energy perceive an accordance of their own values with the bundle of services offered by the holiday destination as very positive (congruent ideals). Thus the holiday region becomes an expression of their existing values (Hilligweg & Kull, 2005). Among others, dena (2008a) proposes that tourism concepts could focus on topical “wind holidays” (e.g. offshore wind energy, kite flying and sailing) or zero emission holidays, which could even be linked to major events related to wind farm construction phases. Moreover, Hilligweg and Kull (2005) argue that the promotion of **active environmental protection** can lead to long-term customer retention. Therefore a well-targeted open information campaign must stress both the aspects related to climate protection and also the

An **edutainment event** is an event which both educates and entertains. The word edutainment is a coinage from the words education and entertainment. Hauschild, Hilligweg & Kull, 2008

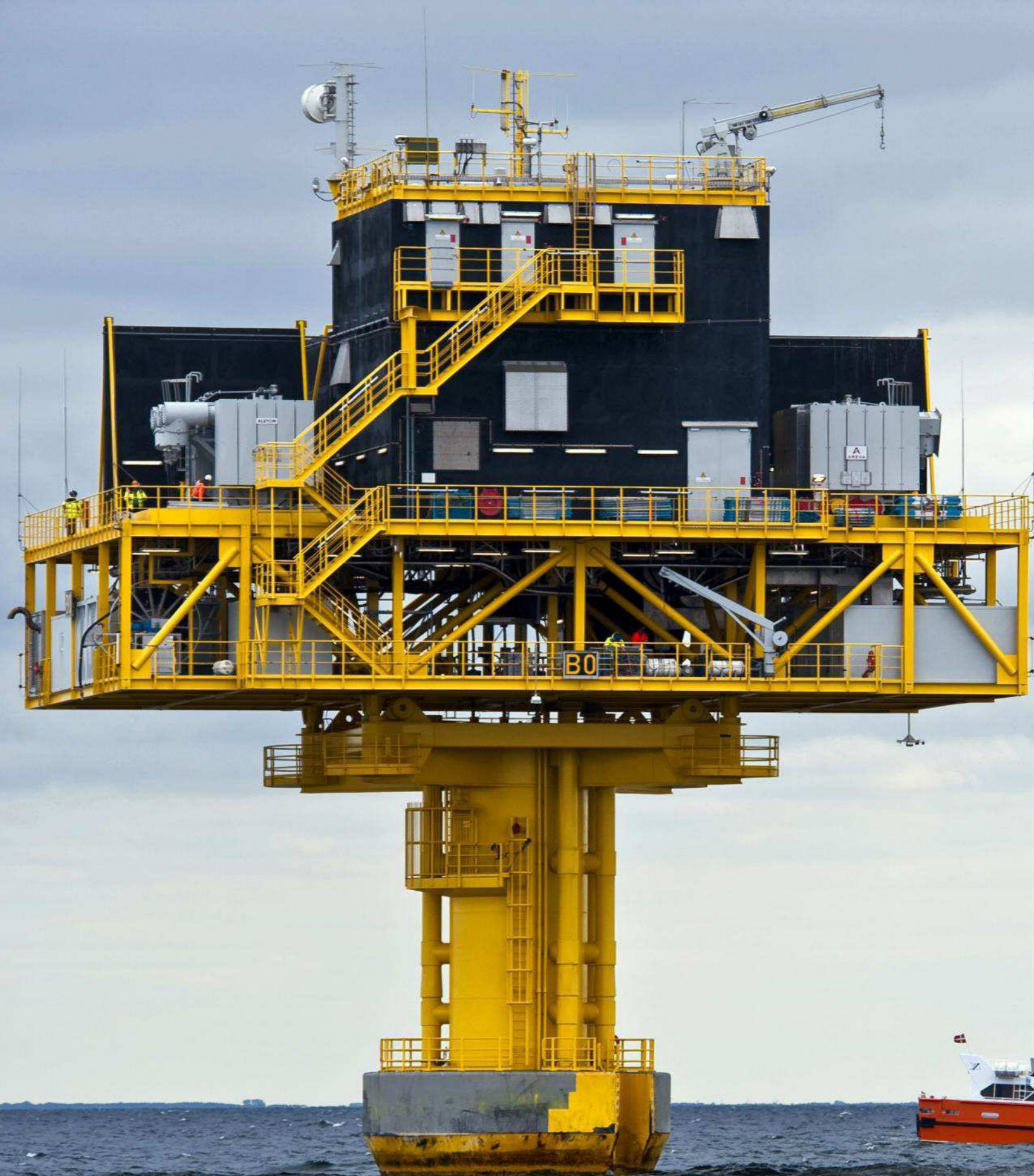
importance of offshore wind energy for a region’s prosperity (dena, 2008a).

In addition to the obvious benefits stemming from attractions and values, the offshore wind energy industry spawns regional **value creation**. New job opportunities result in higher employment rates and thus an increase in purchasing power. Furthermore, both the offshore wind industry itself, and a higher employment rate, lead to higher tax revenues. This in turn may contribute to growing prosperity for the region, attracting more and particularly younger tourists (Albrecht, 2009; dena, 2008a).

Up-to-date public opinion polls on offshore wind energy present an important basis for further discussions. Over the last years, several representative studies have revealed the assumption that tourism will suffer due to offshore wind farms to be more of a subjective fear than a measurable fact (Hübner & Pohl, 2012; Benkenstein, Zielke & Bastian, 2003). In light of this, offshore wind farms can serve as a tourist attraction, which should be incorporated into regional tourism concepts (Bartels, 2010; Hübner & Pohl, 2012; May, 2004). This creates an opportunity for the municipality, city, or village to differentiate itself from others in a highly competitive tourism industry and to find a **niche market**. An increased number of day-trippers and the greater prosperity of a region can influence its development and appeal in a positive manner (Weickmann, 2005).

“A fundamental part of the communication process is psychology. For the entrepreneur to understand that people are worried about the possible change in their living situation and deal with that is essential for how people are going to react to the plans of a potential wind farm.”

Karlsson, 2008, p.2



Chapter 3

Combining Tourism and Offshore Wind Energy – Good Practice Examples



3 Combining Tourism and Offshore Wind Energy – Good Practice Examples

This section presents good practice examples from the Baltic and North Sea regions, where tourism services and offshore wind energy have already been successfully combined to integrate offshore wind energy into regional development concepts. The table below illustrates that a wide range of attractions related to offshore wind energy is already available which can increase public attention and attract tourists in the long-term. Subsequently, these examples will be considered in more detail.

TYPE OF ATTRACTION	SPECIFICATIONS	GOOD PRACTICES
Offshore information centre	Temporary exhibition	Lillgrund, Cuxhaven, Heligoland
	Permanent exhibition	Boat exhibition in Rostock, Nysted, Scroby Sands, Bremerhaven, Cuxhaven
	Travelling (boat) exhibition	„Fascination Offshore“ on museum ship, „Offshore goes Onshore“
	Lectures	Middelgrunden
	In combination with other topics	Guldborgsund Norderney
Viewing platform with telescopes	Temporary exhibition	Scroby Sands, Nysted
Information boards		Blekinge, Hvidovre
Boat tours	Nearshore wind farms	Lillgrund, Middelgrunden, Nysted, Scroby Sands, Riffgat
	Offshore	alpha ventus
Sightseeing flights		alpha ventus, Riffgat
Combined offshore and onshore wind energy tour		Bremerhaven
		Cuxhaven
Routes for motor and sailing boats		Nysted, Riffgat
Offshore restaurants and merchandising products		Middelgrunden

Fig. 2: Offshore Wind Energy as an Attraction – Good practice examples.
German Offshore Wind Energy Foundation

3.1 Baltic Sea



Fig. 3: Map of good practice examples in the Baltic Sea.
German Offshore Wind Energy Foundation

3.1.1 Blekinge Offshore AB (Sweden) – Developing Offshore Wind Energy while Balancing Interests

Project
Blekinge Offshore AB (not yet installed)

Location
Baltic Sea, 12 km from shore

Area
215 km²

Number of turbines
500 (each 5 MW)

Foundation
not yet decided

Water depth
15-35 m

Total output
2,500 MW

The Blekinge Offshore Company was founded for the purpose of building a wind farm in Hanöbukten which may become one of the largest in the world. In Karlshamn, Sweden, a capacity to connect at least 2.500 MW of wind energy to the electricity grid exists. This equates to 500 wind turbines with a power of 5 MW each. Starting in 2008, the company has looked into the conflicts of interest in this area that may potentially result from the project. Blekinge Offshore submitted the environmental permit application to the Environmental Court in 2010; the response from the authorities is expected in 2013. The wind farm is still under development, and therefore not yet in production mode (South Baltic OFF.E.R, b).

From the very outset, Blekinge Offshore has launched its **own website** (www.blekingeoffshore.se) which offers a great deal of information: Updates on the status of the licensing process, a document library where documents on licensing and other sources of interest are made public, a picture gallery with visualisations of the offshore wind farm, a question-answer section, and contact details. Additionally, further information is provided by a marketing brochure, and information boards at a nearby harbour. Unfortunately, the website, the brochure and the information boards are only available in Swedish (Blekinge Offshore AB, 2012).

The municipality of Sölvesborg is very sympathetic to the project and believes it to be of national interest. Therefore, an open dialogue between stakeholders was established. For example, the Sölvesborg and Karlskrona municipalities organized a wind power seminar in May 2012 called “**Developing the offshore wind industry while balancing interests**” as part of a South Baltic OFF.E.R project. Among the 75 participants were politicians from the local, regional and national levels, as well as businesses and local inhabitants. Additionally, a speaker from EWEA was present. The Mayor of Sölvesborg outlined the local perspective, while a member of parliament spoke about balancing the interests from a national perspective. Both agreed that offshore wind energy creates new job opportunities and thus leads to an increased purchasing power in the region. Additionally, the offshore wind industry and a higher employment rate raise the tax revenues. This all leads to greater prosperity for the region, thus attracting more and particularly younger tourists. The concern that Blekinge Offshore might frighten off tourists was rejected by the Blekinge Offshore project manager. Instead, he argued that the wind farm will attract more tourists - from the building period to the completed power plant. Entrepreneurs and tourism businesses who see the benefits are needed.



Area of the offshore wind farm with view from Hällevik.
© Blekinge Offshore AB

Possible attractions are boat tours to the wind farm or packages with other experiences.

Another special feature is that the Blekinge Offshore Company will start a foundation to support development in the environmental sphere. This includes “**green tourism**”. Blekinge Offshore intends to annually reinvest 1 % of total revenues from the wind farm in a fund for local environmental and economic development projects, which also can strengthen employment in the county. The fund will be open to associations, corporations and private initiatives. Cooperation on the fund's objectives and orientation has already been initiated with the Swedish Society for Nature Conservation in Blekinge (SSNC). Existing enterprises from the business sector have to play an active part in the creation of new opportunities and ideas which can be realized with the support of the foundation. Examples are the support of the development of a nearby harbour and projects regarding recreational fishing.

The best practice example Blekinge Offshore AB highlights the importance of an open communication strategy and the early involvement of the public in making a project successful. Nevertheless, it might have a greater appeal for foreign tourists if the information on the website, the brochure, and the information boards are not only provided in Swedish but also in English.

3.1.2 Lillgrund (Sweden) – Improving Acceptance by Using a Proactive Communication and Information Strategy

The energy supplier Vattenfall invested significant human and financial resources into its **communication and information strategy** for Lillgrund, at the time of commission in 2007 the third largest offshore wind farm in the world. The aim was to improve acceptance among the local residents and authorities and make them comfortable with both the project and Vattenfall. An increased acceptance by the locals would in turn lead to positive impacts on the local tourism industry. An important task was to recognize and deal with the fact that locals were worried about the possibility of changes to their living situation. This was essential in order to understand how people might react to the construction of the wind farm. Therefore “a humble tone and availability were two key components in the way in which the project group approached local residents, authorities and the general public.” (Karlsson, 2008, p.2)



Information boards at the harbour.
© Christina Albrecht

The Lillgrund model has been described in a book called “**Lillgrundmodellen – för kommunikation för acceptans i vindkraftprojekt**” (The Lillgrund model – communication for acceptance in wind power projects).

Project	Lillgrund
Location	Baltic Sea, 11 km from shore
Area	6 km ²
Number of turbines	48 (each 2.3 MW)
Foundation	Gravity-Base
Water depth	4-8 m
Total output	110.4 MW

From the very beginning, personal dialogue was the key to success. With **local presence and availability**, the dialogue was initiated as openly as possible. This was also communicated by the website, where anyone could post questions and would receive an answer within a short period of time, usually within 24 hours. This opportunity was used by a large number of people, and a selection of the most common questions was then published on the website (Karlsson, 2008).

A communication strategy specifically tailored to the target group was identified to be the essential foundation during the entire process. The goal was to reach as many individuals as possible and to “keep and develop the acceptance for wind power on a local and national level by providing facts on wind power and dispelling existing myths”. (Karlsson, 2008, p.5) Among the activities that were carried out were media activities, open meetings for the public, exhibitions, advertisement, meetings with authorities, internal and external study visits to the site, cooperation with the city of Malmö, participation in conferences, and a grand opening ceremony. Media activities included the provision of publications, press releases and exclusive contact information to journalists and newspapers. This proactive public relations work resulted in a great deal of positive attention, drawn to the project through various articles in local newspapers (Karlsson, 2008). The communication strategy was tailored to every phase, from its planning to the building of Lillgrund. A long-term strategy and a well-founded plan were helpful tools, allowing for a quick response when new information needs were identified throughout the evolution of this project.

“These activities were not only supposed to increase the acceptance of the Lillgrund wind farm, but to build up a sense of pride around hosting a project like this one, so it becomes a symbol of pride for the local region”.

Karlsson, 2008, p.5&6

In order to provide additional information, two **exhibitions** on the details of Lillgrund were launched in the summer of 2006, at City Hall and at the main library in Malmö. The exhibition at City Hall consisted of a lit billboard wrapped around a pillar; the exhibition at the main library consisted of a model of the Lillgrund wind farm on a podium, combined with text information and a reference to the website. Both exhibits were complemented with brochures on Lillgrund, wind power technology and energy issues in general, as well as with printed post cards which included information on Lillgrund. These exhibitions were very well received, especially the one located at the library, with 2,000-4,000 visitors daily. “Both the public and the personnel of the library responded positively to the tasteful appearance of the exhibition.” (Karlsson, 2008, p.14)



Lillgrund wind turbine in front of the Øresund Bridge.
© Siemens press image

Summing up, the Lillgrund example demonstrates the positive outcomes of a proactive communication and information strategy, but also the sizeable investment of manpower and financial effort necessary for the realization of such a large number of activities.

3.1.3 Fascination Offshore (Germany) – Supporting Offshore Wind Energy with a travelling exhibition

Stiftung OFFSHORE-WINDENERGIE, the German Offshore Wind Energy Foundation, is the initiator of a unique project aimed at raising public acceptance, a “sailing” exhibition called “**Fascination Offshore**”. The exhibition was installed on the museum ship “MS Greundiek”. Over the summer months of three consecutive years, starting in June 2009, the ship has called on more than 40 harbours in the North and Baltic Seas. In 2009, 2010 and 2011, almost 86,000 people visited the exhibition on board the Greundiek, including 16,000 visitors during a complementary exhibition onshore in Büsum. The project received financial support from the German Ministry of Environment, as well as from the EU’s INTERREG IV B North Sea Programme, as part of “POWER cluster”, and from the EU’s INTERREG IV A South Baltic Programme, as part of “South Baltic OFF.E.R”.

One successful approach of the exhibition was to plan a **series of kick-off events** in different harbours, where offshore-related talks were organised in cooperation with local partners such as regional wind energy networks. In this context, many companies from the offshore wind energy sector presented themselves, and held discussions with politicians from local and regional, state and federal, and the EU levels. The exhibition was often combined with other events, like harbour festivals or other promotional activities. It has been used productively as the backdrop for several press conferences and panel discussions. A total of more than 35 press releases and over 170 articles in newspapers, magazines and on the internet have been published.

The exhibition space of 200 m² contained **audio-visual presentations and interactive exhibits**, e.g. maps of offshore wind farms, models of offshore turbines and vessels, a touch-screen terminal, as well as job descriptions and a quiz. Key target groups included the inhabitants of coastal regions, tourists, the media, schools, decision-makers in politics and industry, as well as the general public. Regular updates of the exhibition reflected developments in the offshore wind industry, as well as feedback from visitors. Opinion polls among visitors have clearly indicated that the exhibition has contributed to a more positive perception of offshore wind energy.



Exhibition ship “MS Greundiek”.
© German Offshore Wind Energy Foundation

“With about 102,000 visitors the travelling exhibition “Fascination Offshore” was very successful.”
Andreas Wagner, CEO German Offshore Wind Energy Foundation



Exhibition “Fascination Offshore”.
© German Offshore Wind Energy Foundation

Additionally, the exhibition was shown as part of the "Open Days" of the Federal Government in Berlin (20-21 August 2011). The Federal Environment Ministry presented itself at the Potsdamer Platz, and welcomed over 16,000 guests. The travelling exhibition, which was set up in a custom-built pavilion, contributed to this success and led to the German Offshore Wind Energy Foundation again being present at the Federal Environment Ministry as part of the "Open Days" in 2012.

Due to the overwhelmingly positive feedback received on the touring exhibition, the "Offshore Infocenter Rostock" (OIR), a **permanent exhibition on a museum ship in Rostock** harbour, was planned for 2013. The ship already houses a Shipbuilding and Maritime Museum, covering the entire spectrum of seafaring and shipbuilding tradition. The addition of an offshore exhibition, with a space of 300 m², is organized by Rostock Business in close cooperation with the German Offshore Wind Energy Foundation, Wind Energy Network e.V. and the Hanseatic City of Rostock. In terms of content, it closely follows the original touring exhibition. However, a greater focus is placed on the Baltic Sea and the regional situation in Mecklenburg-Vorpommern. Cooperation and involvement of the agency which developed the touring exhibition on behalf of the German Offshore Wind Energy Foundation was enhanced. This will lower costs and can take advantage of synergy effects. The permanent boat exhibition has been financially supported by the project South Baltic OFF.E.R, in conjunction with Rostock Business, the Wind Energy Network, and the offshore industry. The opening of the permanent exhibition will take place along with the international conference and exhibition "Wind & Maritim" and the final conference of the South Baltic OFF.E.R project in April 2013.

The touring exhibition "Fascination Offshore" and the permanent exhibition in Rostock are best practice examples for promoting greater acceptance of offshore wind energy by actively informing the public. An exhibition located on a museum ship has the advantage that the ship is itself a magnet for visitors, therefore attracting additional tourists. One limitation might be the fact that a ship requires a well situated berth in a harbour and is very expensive to rent. For this reason the German Offshore Wind Energy Foundation plans another travelling exhibition, without a boat, in 2013/2014, which will be shown in different German cities – also in the Centre and Southern parts of Germany. Its goal is to spread information on offshore wind energy at different public locations, including schools and universities (project "**Offshore goes Onshore**").



Exhibition logo.
© German Offshore Wind Energy Foundation

3.1.4 Middelgrunden (Denmark) – Public Involvement as Key to Acceptance

The Middelgrunden Offshore Wind Farm was established in the year 2000, about 3.5 kilometres outside of Copenhagen harbour and was at the time the world's largest as well as the **first cooperatively owned offshore wind farm**. 50 % of the wind farm is owned by the approximately 10,000 investors in the Middelgrunden Wind Cooperative, and 50 % by the municipal utility company (Larsen, Soerensen, Christiansen, Naef & Volund, 2005). The farm can be seen as a best practice example for public involvement, which created local dialogue and acceptance. Besides, the **unique shape** of the wind farm has made Middelgrunden a distinctive landmark of Copenhagen harbour, which is even featured on a Danish postage stamp from 2007.

Although **active public involvement** is a time- and resource-intensive challenge, in their study "Experiences from Middelgrunden 40 MW Offshore Wind Farm", Larsen et al. (2005, p.1) conclude "that it is to be recommended as it may lead to mitigation of general protests, blocking or delaying projects, and increase future confidence, acceptance and support in relation to the coming wind farms in Europe". Larson et al. (2005) further argue that political decisions may be influenced by social acceptance, for which it is crucial to engage in open public dialogue from the very beginning.

In the case of Middelgrunden, **critical reactions from authorities and interest groups**, especially regarding the visual impact of the project, led to the original plan of 27 turbines, placed in three rows, to be downgraded to 20 turbines (CEE0, 2003). After a demonstration tour to a modern onshore wind turbine, locals, who had been worried about potential noise from the farm, were convinced that there would be no such impact from the Middelgrunden turbines (CEE0, 2003; Larsen et al., 2005). The new proposal consisted of 20 turbines placed in a slightly curved line. This design was chosen to harmonize with the historically evolved Copenhagen defence system surrounding the city. Due to developments in wind turbine technology, the reduction from 27 to 20 wind turbines had been fully compensated by the use of larger turbines. Therefore the changes did not affect the installed capacity of the wind farm. In order to understand the visual impact of the 20 turbines, an in-depth analysis was undertaken. The resulting visualizations were extensively used as demonstration aids during a new mandatory public hearing which focused on visual impacts. In addition, several reports and brochures about the visual impacts were published (CEE0, 2003).

The Middelgrunden case showed that notwithstanding the substantial amount of work involved, public involvement can lead to a number of

Project	Middelgrunden
Location	Baltic Sea, 4.7 km from shore
Number of turbines	20 (each 2 MW)
Foundation	Gravity-Base
Water depth	3-6 m
Total output	40 MW



Middelgrunden offshore wind farm.
© Siemens press image

advantages, and forms a cornerstone of public acceptance. Local ownership creates local dialogue and acceptance, raises public awareness, solves problems and conflicts, and is democratic, to name but some of its benefits (CEEQ, 2003).

There are numerous **attractions** offered along with the Middelgrunden Offshore Farm. First of all, **lectures** on the Middelgrunden Wind Turbine Cooperative are available. Some lectures are held in the office of the Cooperative and others during a trip to Middelgrunden wind farm, with a guide from the Cooperative on board. There are different types of presentations, adjusted to the specific audience's background. For those with a general interest, a presentation on the beginnings of the wind energy farm and the ownership of Middelgrunden Wind Turbine Cooperative is available. These presentations can be supplemented, either for persons with some familiarity with the topic with details on grid connections, foundation and environmental issues, or for students, with a focus on energy policy, plans and other current issues. The presentations/lectures are held mainly in English or Danish.

Moreover, **boat tours** to the offshore wind farm are organized by the Cooperative, weather permitting (no ice in the harbour and acceptable wind conditions). The charge for a tour depends on the number of people, duration, time of day, and availability of boats. Tours take about 1.5-2 hours and can be arranged on a small boat, with up to nine passengers, or a bigger one with up to 170 persons. In addition, external companies offer tours around the turbine, with dinner either on board or in a restaurant, in the summer. For National Turbine Day, every two years, members and guests are given the opportunity for a visit inside the turbines.

Furthermore, every **harbour cruise** inevitably passes by the wind turbines, which allows the tour guides to relate some facts about offshore wind energy and the Middelgrunden wind farm (Middelgrundens Vindmøllelaug I/S) in particular.

To sum up, the fact that Middelgrunden is in part cooperatively owned was crucial to achieving its high level of local acceptance. Not only the presentations and boat tours, but especially the unique layout of the wind farm, contribute to touristic attractiveness. Due to public involvement, it has become a true landmark for Copenhagen and for Denmark.



Postage Stamp of Middelgrunden Wind Farm from 2007.

© Bertil Skov Jørgensen/Martin Mörck

“For most Danes these towering turbines are anything but an eyesore, and anything but a threat to the environment. In fact, they are featured on postcards and proclaimed attractions by tour guides on ferry boats.”

International Herald Tribune, 2003 in Larsen et al., 2005, p.3

3.1.5 Hvidovre Offshore Wind Farm (Denmark) – Promoting Offshore Wind Energy by Demonstration Turbines

Another attraction south of Copenhagen is the “Hvidovre Offshore Wind Farm” on the coast of Avedøre. Three large 3.6 MW wind turbines with a height of up to 155 meters were constructed during 2009 and 2010. One of the turbines is owned by the “**Hvidovre Wind Turbine Cooperative**”, which has sold 10.700 wind turbine shares to private individuals. The remaining two are owned by DONG Energy.

These nearshore turbines act as **demonstration turbines** for new offshore turbines – both from a technical point of view and as an example for a shared development and ownership between utilities and NGOs. The communication strategy employed here proved to be a success, since very little protest has been registered. In fact, a high degree of acceptance was obtained via an active approach which was quick to respond to questions raised in public meetings, newspapers or via the website (Hvidovre I/S; DONG Energy, b; Sørensen, 2009).

The three wind turbines are positioned in shallow water close to the shore, making it possible to reach them with the help of a footbridge and walk around them at no cost. This allows a close-up experience of offshore wind turbines, where a visitor can actually hear the sound of the rotating rotor blades or feel the vibration of the turbine tower. This **experience** showcases that modern offshore wind turbines need not produce problematic noise levels. Information boards at each turbine display additional information (SB OFF.E.R study visit in September 2011).

The project “Hvidovre Offshore Wind Farm” is meant to promote offshore wind energy and make the technology tangible for locals and tourists. It presents a concrete example of how public acceptance can be fostered by the use of demonstration turbines.



Project
Hvidovre Demonstration Turbines

Location
Baltic Sea, < 10 m from shore

Number of turbines
3 (each 3.6 MW)

Foundation
Gravity-Base

Water depth
2 m

Total output
10.8 MW

Demonstration turbines at Avedøre Holme.

© DONG Energy

3.1.6 Nysted (Denmark) – Permanent Information and Activity Centre as a Tourist Attraction

Project
Nysted Offshore Wind Farm

Location
Baltic Sea, 10.8 km from shore

Area
26 km²

Number of turbines
72 (each 2.3 MW)

Foundation
Gravity-Base

Water depth
6-10 m

Total output
165.6 MW

The Nysted Offshore Wind Farm did not have any negative impacts on the local tourism industry. On the contrary: A number of tourists already came to visit during the construction phase. Thus the **permanent exhibition, “The World of Wind”**, was opened.

Nysted’s mayor affirms that no tourists said they would not return due to the offshore wind farm. Before construction of the wind farm, locals were afraid that sailors might decide not to come if they found the wind farm to be in their way. But the mayor states that the opposite was the case – more sailing boats dock in Nysted’s harbour since construction of the wind farm than did before. The mayor’s explanation is that the offshore wind farm leads the sailors into the harbour (Lönker, 2004). And according to Nysted’s harbour master, the fact that sailing boats are allowed into the wind farm on certain routes enjoys **great popularity among the sailors** (Weickmann, 2005).

The study “Offshore Wind Farms and the Environment – Danish Experiences from Horns Rev and Nysted”, by the Danish Energy Authority, showed that “more than 80 % of the respondents from the local areas were “positive” or “very positive” towards the wind farms” and “almost two thirds of the respondents stated that they found wind farms’ effect on the landscape either “neutral” or even “positive”” (DEA, 2006, p.7).

The permanent exhibition “The World of Wind” is located at Nysted harbour, adjacent to the tourist office, and opened in the year 2003. It is owned by DONG Energy, E.ON and Guldborgsund Municipality and is open throughout the entire year. Entry is free of charge. On an exhibition area of about 100 m², one can find general information about wind energy and about the Nysted Offshore Wind Farm in particular. There are exhibits on the Nysted Wind Farm at Rødsand and exhibition boards explaining how offshore wind turbines are made, on environmental impact assessments, and electricity’s path from a wind turbine to a hair drier.

There are a number of **interactive elements**: On three PCs, visitors can view a film featuring the offshore wind farm, browse the Offshore Wind Farm website or use a joystick to take a virtual helicopter ride through a 3D simulated version of the wind farm. In addition, one can experience how wind feels at different speeds inside a miniature wind tunnel; visitors can generate power with a crank and there is an interactive quiz. Moreover, one can have a view of the Nysted Wind Farm through a pair of strong binoculars.

Originally, the exhibition’s main focus was aimed at local citizens. Nowadays, it can be considered an **attraction of interest to any type of tourist visiting Nysted Harbour**. The visitors are normally families (children with parents and sometimes grandparents) visiting Nysted Harbour, including those coming from the seaside on a sailing holiday. As a special feature for young visitors, children can construct their own small wind turbine with scissors and glue. In addition, there are occasional professional study tours for companies, and educational and other institutions visiting the Information Centre. Boat tours set out from Nysted Harbour to Nysted Offshore Power Plant, and many of these tourists visit the Information Centre. However, there is no regularly available package with a boat tour which includes a visit to the Information Centre, except for what is organized by the local citizens group “Nysted and Vicinity Association” and DONG Energy, who arrange tours on request. Visitor numbers are not kept track of systematically, but the staff of the Harbour Office provides a general estimate during the summer months: there are 20-25 visitors on a normal day, plus occasional school classes – adding up to approximately 4,000 visitors a year.

The **financing costs** for the building, the interior and some renovations are covered by DONG Energy, E.ON and Guldborgsund Municipality. There are no separate costs for maintenance and staff. Existing operating expenses are for electricity, cleaning, and opening and closing the Centre, which is located within the building of the Harbour Office. The Centre is opened in the morning and locked up in the evening by the staff of the Harbour Office. Its cleaning staff is also responsible for cleaning the Information Centre (approximate two hours a week in total). The limited expenses incurred are paid through the Harbour Office budget. A semi-annual thorough cleaning is carried out by a group of local volunteers from the citizens group “Nysted and Vicinity Association”. In addition, DONG Energy sometimes also provides this and other support services (DONG Energy, a; Information provided by Frede Danborg, EU Coordinator Municipality Guldborgsund; SBO study visit in June 2010).

In conclusion, this best practice example illustrates that the Nysted offshore wind farm had no negative impact on the tourism industry. On the contrary; it enjoys great popularity among tourists, particularly with sailors. Especially the information centre has become a real tourist attraction.



Rødsand I and II.
© Koppelius/wikimedia

3.1.7 Guldborgsund (Denmark) – Developing an Offshore Wind Energy Information Section in Combination with a Centre for Renewable Energy Sources

As **part of the EU-funded South Baltic OFF.E.R project**, one aim was to discuss concepts for an improved Offshore Information Centre in Nysted/Guldborgsund and to strengthen links between offshore wind energy and tourism. Over the course of the project's implementation, the Municipality of Guldborgsund not only found a way to facilitate an exchange of ideas and the discussion of initial concepts with relevant stakeholders, but also managed to establish an Offshore Wind Energy Information Section in **combination with a Centre for Renewable Energy Sources** at South Falster. Throughout the implementation period, the exhibition "Fascination Offshore" serves as a think tank. Furthermore, there has been a fruitful exchange between the project partners German Offshore Wind Energy Foundation and the Municipality of Guldborgsund.

The lessons learned from visiting a number of other information centres on offshore wind energy during the project's duration, is that the most important feature is its **location**. It should be situated in a place which people will pass or visit anyhow. Thus, the chosen location along the traffic corridor between Scandinavia and South-Central Europe (E55), which runs from Scandinavia to the Adriatic Sea, is well-suited to attracting international travellers and informing them on offshore wind energy in the South Baltic.

The opening of the information section is planned for spring 2013. Information will be provided on offshore wind energy, the current situation, and the potential for further development, which will support public acceptance. It will include posters, boards and pictures, various artefacts, as well as some interactive media. Additionally, two information boards along the coast near Gedser and an electronic signboard displaying information on power production at Nysted offshore wind farm will be installed. Furthermore, **joint marketing activities** by the Municipality of Guldborgsund and local tourism service providers will support the effort of raising social acceptance of offshore wind energy and increase the role of offshore wind energy for tourism purposes.

All in all, this project provides an example of how an information section can be established, what the required elements are, and how visitors might be attracted. Although the original idea had only been to develop a concept for an information centre (i.e. a report or a plan), the support of the EU-funded project opened up the chance to not only develop this concept, but to actually establish the information section.

By integrating the offshore information section into the Centre for Renewable Energy Sources, several synergies are to be expected, e.g. with regard to maintenance and staff costs, joint marketing activities, and the number of visitors which can be attracted by offering a wider range of information.

3.2 North Sea



Fig. 4: Map of good practice examples in the North Sea.
German Offshore Wind Energy Foundation

3.2.1 Scroby Sands (United Kingdom) – The Most Popular Visitor Centre

Project	Scroby Sands (UK)
Location	North Sea, 2.3 km from shore
Area	4 km ²
Number of turbines	30 (each 2 MW)
Foundation	Monopile
Water depth	0-8 m
Total output	60 MW

The permanent Scroby Sands Wind Farm Information Centre is located on the seafront esplanade at Great Yarmouth. It opened in April 2004, three months before the wind farm officially started generating power. It is very conveniently situated near the tourist information centre, the fair and the piers, making it an **attractive location** for tourists. The information centre is owned by E.ON Climate & Renewables UK, who is also the developer, owner and operator of the wind farm Scroby Sands. Its opening hours are from May until October, Mondays through Sundays from 10am to 4pm. The entrance is free of charge. School visits or groups of ten or more can be organised by prior arrangement. In addition, disabled access and toilets are available (E.ON UK, 2012a).

Scroby Sands is one of the UK's first commercial offshore wind farms. It is located 2.5 kilometres from the coast and consists of 30 wind turbines, each with a capacity of 2 MW. The exhibition area provides general information about renewable energy and about the Scroby Sands Wind Farm in particular. Visitors will find details on how the wind farm works and how it was built, together with a range of audio-visual displays and information about energy and energy efficiency (E.ON UK, 2012b). For example, there are exhibits about the Scroby Sands Wind Farm and exhibition boards explaining how offshore wind turbines are made. Furthermore, information is provided about environmental impact assessments and the route electricity follows from wind turbines to households.

In May 2011, the visitor centre was reopened after an **extensive refurbishment**. Now it includes an interactive **educational area** where children from local and regional schools can visit, experience, and learn about energy outside the classroom. The programme, which supports the science and geography curriculum, offers an interactive website with supporting classroom material to help young people understand the different sources of energy we use, the merits of each, and what their choices will mean locally, nationally and globally. It is also possible to watch a film on the construction of the wind turbines out at sea and to browse the Offshore Wind Farm website. Moreover, one can have a view of Scroby Sands Wind Farm through a pair of strong binoculars.

"The centre has become a real local attraction giving people the chance to learn more about the energy we all rely on every day. By extending it to accommodate educational groups it will provide a fun, interactive learning environment which supports the national curriculum and we hope many children will find this energy experience inspiring for years to come."

Jon Beresford, Scroby Sands Site Manager at E.ON (E.ON UK, 2011)



Scroby Sands Wind Farm.
© Martin Pettitt/wikimedia

In addition to the educational area, the centre offers a collection of **interactive displays** which bring to life the concept of wind power. This for example includes a "human turbine" for visitors to generate their own energy, and a "wind tunnel", which demonstrates the force of wind and how much power it can generate. As an additional feature, **boat tours** are organised to visit the wind farm. Scroby Sands and its visitor centre have become a true local landmark, and every year people of all ages, and from all over the world, visit the centre to find out more about how it works and how it was built. In the UK nearly every wind farm has a visitor centre, but with over 35,000 visitors a year, the Scroby Sands visitor centre is definitely the busiest (BWEA, 2006; Information provided by Keith Cooke, E.ON (SBO study visit in October 2011)).

The **financing costs** for the building and the displays are paid for by E.ON, the content was provided for free. The building is leased and funded exclusively by E.ON. There are additional maintenance and staff costs. E.ON pays the salaries of four permanent staff members per season (mainly retirees) who are trained to take care of the exhibition (Information provided by Keith Cooke, E.ON (SBO study visit in October 2011)).

All in all, the example of Scroby Sands illustrates that offshore wind farms and adjacent information centres can become a genuine landmark and tourist attraction. In this case, the information centre is owned and financed entirely by a company, which is also the developer, owner and operator of an offshore wind farm.

3.2.2 Bremerhaven (Germany) – Guided Bus Excursion "Tour de Wind"

The Bremerhaven Economic Development Company Ltd. (BIS) offers a guided bus excursion, named **Tour de Wind**, which leads along 20 stations through Bremerhaven. The seaside city is a centre for offshore wind energy and attractive for companies from the wind energy sector, e.g. in the fields of research, construction and the maritime industry. The bus tour focuses on providing information on offshore wind energy and its entire supply chain. Parts of the tour are, for example, the offshore security training centre, the wind house, and the offshore-heliport. Another station is the College of Applied Sciences in Bremerhaven, which offers a master's degree program in Wind Energy Technology. The "Tour de Wind" took place in 2012 from late March until early November, every Friday at 5pm and Saturdays and Sundays at 2.30 pm. The price was 9 € for adults and 7.50 € for children. A family fee, including two adults and two children, was available for 24 €, with every additional child charged 2 €. Next to discounted and

"The vast majority of people have been impressed by what they've discovered and our comment book is full of supportive comments for Scroby Sands and renewable energy."

Dave Atherton, Scroby Sands wind farm operations manager
BWEA 2006, p.18



Tour de wind in Bremerhaven.
© BIS Bremerhaven

family fees, it is possible to obtain group discounts or to organise a group tour in a chartered or private bus. Following the success of the “Tour de Wind”, the BIS decided to plan the establishment of a permanent offshore information centre (BIS Bremerhaven Touristik, 2011; Stadt Bremerhaven, 2013; Information provided by Annette Schimmel, BIS).

The idea of opening an **information centre** for offshore wind energy in Bremerhaven has already been under discussion for several years. This is due to the fact that Bremerhaven is a base for offshore wind energy in Germany. In addition, Bremerhaven is becoming more and more attractive for tourists. A well known specialist in the area of consulting and implementation of knowledge centres developed a concept for the exhibition in 2010. The new Offshore Wind Energy Centre will be integrated into the Klimahaus® Bremerhaven 8° Ost, an existing tourist attraction. A separate entrance, which is not open to regular visitors, offers groups and VIP guests direct access to the exhibition. Realization should start in 2013. The aim of the exhibition is to present the offshore base Bremerhaven to the general public and tourists, as well as industry experts. Local offshore companies and research institutions will have the possibility to take part in the development and operation of the exhibition. Exciting aspects of planning, production, construction, operation and maintenance will be illustrated. The main focus of the exhibition will be on the following themes: “Introduction – Wind as Energy Source”, “Construction – a Long Way to a Final Plant”, “Production Site Bremerhaven – Material and Dimension”, “Challenges at Sea – Construction, Operation & Maintenance” and “Conclusion – Energy Output and Prospects”. The visitors will be able to take a glimpse behind the scenes and immerse themselves in a technological adventure set in the midst of the forces of nature. The information centre will offer a thorough overview on the topic and represents a perfect starting point for the “Tour de Wind”. As an event venue, it will also be an attractive location for meetings, receptions and events of all kinds. For the **financing** of the new information centre, it is planned to draw on the European Regional Development Fund (ERDF) and an individual sponsoring concept (Nordsee-Zeitung, 2012; Petri & Tiemann GmbH; Information provided by Michael Gerber (BIS)).

The “Tour de Wind” Bremerhaven highlights the potential for industrial areas/cities with manufacturing capacities related to offshore wind energy to exploit the attractiveness of this new industry. In addition, the development of the Offshore Wind Energy exhibition demonstrates vividly how to combine such an exhibition with an existing tourist attraction and hereby benefit from synergy effects.



One station at the bus tour.
© BIS Bremerhaven



Visiting a manufacturing company.
© Mareike Korb

3.2.3 Cuxhaven (Germany) – From a Temporary to a Permanent Exhibition

The **temporary exhibition “Info Point Offshore Base Cuxhaven”** opened for 5 months at the end of May 2011 and was open from Tuesdays to Sundays from 12 noon to 18 pm. As part of “Hamburg European Green Capital 2011”, the exhibition presented companies and infrastructure related to the Offshore Base Cuxhaven as well as wind energy in general. Partners of the exhibition were the City of Hamburg, the Metropolitan Region Hamburg and the German Offshore Wind Energy Foundation. In addition, several local enterprises made a contribution in form of exhibits. The Info Point combined theoretical knowledge with practical on-site visits. With the Offshore-Terminals I and II in Cuxhaven, including the heavy-duty crane, the heavy-duty platform, the offshore companies AMBAU (production of tower segments) and CSC Ltd. (production of foundation structures) and many other offshore service providers, Cuxhaven offers visitors a wide range of attractions in the area of offshore wind energy. The aim of the exhibition was to make visitors aware of this development, and how it is linked to the issues of environmental and climate protection as well as energy generation. Therefore, the decentralised Info Point provided visitors with the latest information on the topic of offshore wind energy and climate protection, the port infrastructure of the Offshore Base Cuxhaven, training opportunities in the offshore industry as well as information on offshore companies located in Cuxhaven. The attractive exhibition included movie screenings, interactive exhibits, extensive graphical material as well as information brochures. The number of visitors during the summer season 2011 was estimated at around 20,000 persons. In addition, the **guided environmental tour “Tideland explorer”** – for families with children – was offered.

Due to the large number of visitors and the positive feedback, a **permanent exhibition** was planned. Starting spring 2013, an exhibition was placed in the newly opened “Forum Maritim” – an old fish auction hall located directly in the harbour area of Cuxhaven. Like in Bremerhaven, in addition to the exhibition, a guided bus excursion (double-decker bus) was planned, including a bus stop in front of the „Forum Maritim“. Main topics of the exhibition focus on infrastructure, renewable energies as well as the “Offshore Basis Cuxhaven” in general, the presentation of companies located in Cuxhaven, and related job profiles. It includes (interactive) visualization models, information brochures, as well as a movie. Last but not least, staff is well-versed in the topic of offshore wind energy and the “Offshore Basis Cuxhaven”, in order to be able to provide detailed information to visitors. The exhibition is financially supported by the City of Cuxhaven and possible



Info Point Offshore Base Cuxhaven.
© Agentur für Wirtschaftsförderung Cuxhaven



Tripods for offshore wind turbines.
© RaBoe/wikipedia; Licence: CC by-sa 3.0

sponsors (Flyer Offshore Basis Cuxhaven; Stadt Cuxhaven; Information provided by Hilke von der Reith, Economic Development Agency of Cuxhaven County and the City of Cuxhaven).

The example of Cuxhaven showcases an approach for making optimal use of the great interest tourists and inhabitants have in offshore wind energy by promoting offshore wind energy as a location factor.

3.2.4 Norderney (Germany) – Combining an Offshore Wind Energy Information Section with a Nature and Adventure Centre

The city of Norderney is planning an **extensive modernization of the information and adventure centre “National Park Wadden Sea”** by 2014. The existing centre, located at the island’s harbour, is supposed to be refashioned into an attractive visitors centre. Apart from information on the World Nature Heritage Site and the National Park Wadden Sea, visitors to the planned “Nationalpark-Erlebniszentrum” (NEZ) will find a museum shop and an aquarium, as well as an exhibition on the nearby offshore wind farms. This exhibition is going to cover technical aspects of offshore wind energy, but also reflect on potential conflicts arising from the economic use of an offshore region, and possible approaches for a sustainable use of the ocean. Further, it will inform visitors about the development and importance as well as the technical challenges and critical points of the German offshore wind energy projects. This exhibition is intended to attract and introduce persons who are mainly interested in technical issues to the subject of environmental protection. An additional appeal will be the energy-efficient building itself, its architecture, and the specific energy saving techniques employed. The usage of solar and wind power is meant to allow the building to be largely energy self-sufficient.

With its location between mainland and ocean, and the large number of visitors it attracts, Norderney is the perfect **location** for an exhibition about offshore wind energy. In addition, the offshore grid system for nine different offshore wind farms is supposed to connect via Norderney. Therefore, the topics “sustainable usage of offshore energy” and “ocean protection” should be presented in an adequate manner.

The positive experiences with the boat exhibition “Fascination Offshore” as well as a market analysis have shown that an exhibition on offshore wind energy could be an **attractive add-on to the information centre**, since only a handful of sites in Germany so far inform on this topic. Further, the market analysis arrives at the conclusion that, depending on the entrance fee, 36,000 to 63,000

visitors per year would come to the new centre. Asked in a survey whether they would visit an exhibition about offshore wind energy on Norderney, 68 % of respondents answered “yes”, 16 % “no” and 16 % “I don’t know”. The answers by tourists follow these numbers. The inhabitants of Norderney showed an even greater willingness to visit the exhibition (75 % answered “yes”), topped by the visitors to the existing information centre, with 94 % in this group answering “yes”.

The **costs for the extensive modernisation** (about EUR 4 million) will be partly financed by the European Regional Development Fund (ERDF), the city of Norderney and the county of Aurich, as well as different foundations. For the offshore wind energy information section, cooperation with the German Offshore Wind Energy Foundation and the offshore industry is envisaged. Since 2012, the Offshore Wind Energy Foundation has been repeated regular contact with the management of the National Park House and with the city of Norderney (Niedersächsisches Ministerium für Umwelt, Energie und Klimaschutz, 2012; BTE, 2010; Information provided by Jürgen Rahmel, Nationalparkhaus Norderney).

The example of Norderney highlights that the subject of offshore wind energy can represent a valuable add-on to an existing information centre. Due to Norderney’s great popularity as a tourist destination, information about offshore wind energy, particularly about sustainable usage and environmental protection, is crucial to obtain broad levels of acceptance.

3.2.5 alpha ventus (Germany) – Boat Tours and Sightseeing Flights to the Test Site

45 kilometres north of the German island of Borkum, at a water depth of about 30 metres, the first German offshore wind farm alpha ventus was built. In its role as an **offshore test site**, alpha ventus operates two types of wind turbines, with two different foundation designs. The rated output of the wind farm is 60 MW. Experience gained during its construction and operation provides an input into the further development and expansion of the German offshore wind industry (DOTI).

In the summer of 2012, **boat tours** to the offshore wind farm alpha ventus were organised by FRS Helgoline GmbH & Co. KG. This undertaking was supported by DOTI, the operator consortium made of EWE, E.ON and Vattenfall. On four dates between June and September, the catamaran “Halunderjet” was to take visitors to the first German offshore wind farm. The excursion included an interesting

Project alpha ventus
Location North Sea, 56 km from shore
Area 4 km ²
Number of turbines 12 (each 5 MW)
Foundation Tripod and Jacket
Water depth 30 m
Total output 60 MW

presentation on the construction and operation of alpha ventus, and a variety of background information. Afterwards the participants were able to test their knowledge of the offshore wind industry with a quiz, and, during the return journey, they could relax while watching a movie which showed the development of alpha ventus. During each trip ten alpha ventus books were raffled among the participants. The official tour started in Helgoland, but the Halunderjet sailed from Hamburg, Wedel or Cuxhaven to Helgoland where it would make a quick stopover at the island. From Helgoland, the tour cost 35 € and lasted about 3.5 hours (FRS Helgoline GmbH & Co. KG). The partner organization for these boat tours was the German Offshore Wind Energy Foundation, which owns the licensing rights for the offshore test site alpha ventus and has accompanied the entire process from the initial stages (2005) to completion (2010). A representative of the Foundation was present on every tour, held a general presentation on offshore wind energy, and was available to answer upcoming questions.

Although about 70-100 participants registered for each tour; unfortunately only one of four tours could be completed due to **weather conditions**. Rough seas with high waves and a strong wind meant the tour had to be cancelled for safety reasons. This shows the difficulty of offering boat tours to wind farms located this far from shore. This notwithstanding, they might allow the experience of an authentic “offshore feeling”, underscoring the fascination of offshore and making the challenges at sea tangible.

Sightseeing flights present a very good alternative, but are more expensive. The FLN (FRISIA-Luftverkehr GmbH Norddeich) has so far conducted several sightseeing flights over alpha ventus. The trip takes about one hour – about 25 minutes each way and two circuits around the wind farm. Although the **sightseeing flights** were mainly conducted for business people and delegations so far, this would also be available to tourists on request (Information provided by Klaus Noormann, FLN).

All in all, the best practice example alpha ventus shows that it can be difficult to offer boat tours to wind farms, which are quite far away from shore. An alternative for wind farms in this type of location could be sightseeing flights.



Offshore wind farm alpha ventus.
© DOTI, M. Ibelier, 2009

3.2.6 Heligoland (Germany) – Creation of Value related to Offshore Base Harbour

Located 40 kilometres from the German shore, Heligoland represents a perfect location for a **base harbour for the operation and maintenance** of offshore wind farms. RWE, E.ON and WindMW plan to build three service buildings with factory workshops and storage depots on an area of 10,000 m² at the South Harbour of Heligoland. In addition, 10 new berths are planned, for which the construction of an additional jetty is planned in the South harbour. The three offshore wind farms which are to be operated from Heligoland in the future are Nordsee Ost, Amrumbank West and Meerwind Süd/Ost. They are all about 25 to 35 kilometres from shore.

If everything goes as envisaged, Heligoland will be the first German island to profit from the development of the offshore wind industry, and to fashion an **image as a “Renewable Energy Island”**. Due to the private and public investments planned for the development of the harbour infrastructure, new industries in the renewable energies sector will open up for Heligoland. In addition to an improvement in its image, Heligoland would profit from higher licence tax revenues, new jobs, and growing purchasing power. About 150 persons would work and live on Heligoland for the period of the offshore wind farms’ operation, at least over the next 20 years. In addition to a number of temporary jobs with suppliers, construction and vessel companies would be established locally. This ensures the prosperity of the island and in return raises its attractiveness for tourists (Kurverwaltung Helgoland).

In August 2011, the German Offshore Wind Energy Foundation's touring exhibition "**Fascination offshore**", on board the museum boat "MS Greundiek", made its final stop over at the harbour of Heligoland for two days. The harbour was added to the tour schedule at the request of the three offshore developers E.ON, RWE and WindMW. At a press conference on the ship, these companies presented their plans to build a base of operations for their planned offshore wind farms located near Heligoland. Cooperation between the touring exhibition and the companies proved to be very successful and productive. Extensive coverage in the press had a multiplier effect on the national level.

The Heligoland offshore base shows the potential for value creation which the offshore wind industry could have for other regions. The future will show which further attractions and events related to offshore wind energy will be offered for tourists visiting Heligoland.

3.2.7 Riffgat (Germany) – Website as Practical Communication Tool, and Potential Tourist Attractions

Project
Riffgat (under construction)

Location
North Sea, 15 km from shore

Area
13.2 km²

Number of turbines
30 (each 3.6 MW)

Foundation
Monopile

Water depth
18-23 m

Total output
108 MW

The German offshore wind farm Riffgat has been under construction since May 2012 and is projected to be completed in the summer of 2013. Located 15 kilometres north-west of the German island of Borkum, it will consist of 30 turbines with 3.6 MW each.

The German **website** of the offshore farm (www.riffgat.de) includes information on the project, its current status, and topics such as environment and tourism. On the main page, a 3D animation shows a bird's eye view of the wind farm and informs on key data. A construction diary, along with images in the press section, gives further insights into the current status of the project. Information on the history of the project and on its partners is also provided. In addition, fact sheets and the FAQ section allow a quick overview on each topic. For viewers interested in technology, the technology section presents information on the construction of the wind turbines, the transformer station, the connection with the grid and the cabling within the farm.

In order to demonstrate the **impact on the view**, a thumb is used for comparison since the turbines will seem to have about this size (2-3 cm) when looking from shore. In the website's fact sheet on tourism, a picture showing people holding their thumbs up against the horizon is used to illustrate this statement. According to the information on the website, the wind turbines will not interfere with the view of the sunset in the summer or the winter. In general, the impact on the view is only significant where offshore wind farms are located nearshore or not very

distant from the shore (mainly in Denmark and Sweden). Nearly all German offshore projects are planned and implemented outside the 12 nautical mile zone in the exclusive economic zone. In these cases, there is very little or no visible impact at all on the landscape, since the great distance between the site and the coast causes the effects of the Earth's curvature to become relevant.

Since it is permitted to navigate up to a distance of 500 meters from the wind farm, and due to its proximity to Borkum, Riffgat is promoted as the only German offshore wind farm that can be reached in an acceptable time and with reasonable effort. Therefore **boat tours** for tourists are very feasible. Even amateur **sailors** can easily reach the offshore wind farm from the island of Borkum (Offshore-Windpark RIFFGAT GmbH & Co. KG). In addition, the FLN (FRISIA-Luftverkehr GmbH Norddeich), which has already conducted several **sightseeing flights** to alpha ventus, could envision adding sightseeing flights to Riffgat on request as well (Information provided by Klaus Noormann, FLN).

The website of Riffgat is the first step to developing a proactive information strategy and ultimately a successful implementation of the project. Because of its geographical proximity to Borkum, a number of prospective tourist attractions are conceivable, and opportunities exist for exploiting synergies with the tourism concept of the East Frisian Island (with about 300,000 visitors every year).

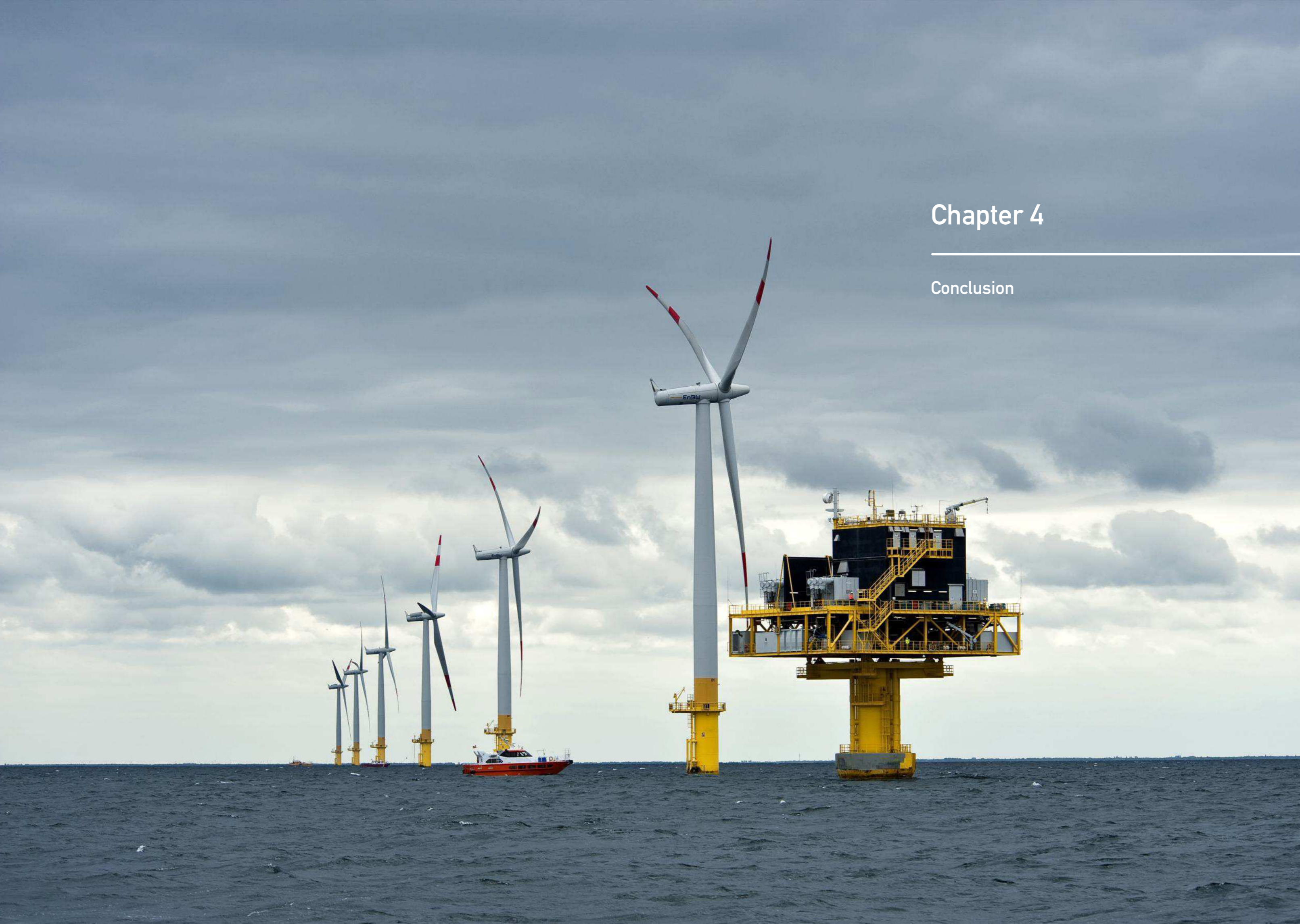


Building of the offshore wind farm Riffgat.

© EWE

Chapter 4

Conclusion



Conclusion

“The offshore industry should take up the interests of the tourism industry and enter into in-depth discussions as soon as possible. Information should be made easy to understand and highlight benefits, opportunities and possible problems. The emphasis should be placed on the reliability of the information.”

dena, 2008b

The good practice examples and the secondary research on the impacts of offshore wind energy on the regional tourism industry confirm that there are very few negative effects. Wind energy has improved its image significantly over the last years, especially due to successful market introduction policies and its increased visibility and acceptance around the world, both onshore and increasingly offshore. Up-to-date public opinion polls and surveys represent a good means for measuring the acceptance of offshore wind energy, and can be the basis for further research. During the last years, several representative studies have shown that the assumption that tourists will avoid an area due to the presence of offshore wind farms is more a subjective fear rather than a measurable fact. The good practices provided highly interesting examples on how to successfully incorporate offshore wind farms into regional development and tourism concepts.

The fascination with offshore wind technology, its event character, and its contribution to active environmental protection were identified as the main **benefits for the tourism industry**. Additionally, the region profits from the value creation generated by the offshore wind industry. These factors can improve the general attractiveness of a region. Attractions related to offshore wind energy can open up the opportunity for a municipality, city or village to stand out and find a niche in the highly competitive tourism market. An increased number of day-trippers and the growing prosperity of a region can influence its development and presentation in a positive manner.

The **multitude of potential attractions** include edutainment events such as information centres, boat tours, sightseeing flights, information boards and viewing platforms with telescopes. Edutainment events should both educate and entertain. Offshore information centres are the most widespread of these attractions. Boat tours to wind farms could include presentations on offshore wind energy which would provide information on the offshore farm itself, the offshore wind industry in general, and the benefits of offshore wind, especially with respect to climate protection. Moreover, short movies, or a quiz which evaluates the knowledge of the participants, could be presented on the

ship. However, these tours depend on favourable weather conditions. Another option for wind farms at greater distance to the coast might be sightseeing flights, which have the advantage of not being as dependent on the weather and requiring less time, although this would only be an alternative for smaller groups, and is more expensive. Since windmill climbing on offshore wind farms is not possible due to safety concerns, a great opportunity could be a combined offshore and onshore wind energy tour. For example, this tour could combine onshore windmill climbing with a boat tour to an offshore farm, and include a visit to an information centre informing about offshore and onshore wind energy or to manufacturing sites related to offshore wind energy. An alternative could be offered by nearshore demonstration turbines together with information boards, such as described in the good practice example of the Hvidovre demonstration turbines in Denmark. Providing a direct view of the offshore wind farm, like in Nysted or Scroby Sands, could help to attract as many people as possible. In addition, the offshore wind farm could offer excellent diving and sailing areas. Offshore restaurants and merchandising products could also be opportunities for the tourism industry.

A crucial factor before, during and after the construction of offshore wind farms is a good **communication strategy, including proactive information campaigns** such as exhibitions and inclusion of the local inhabitants into the planning phase from the very outset, since the main problem concerning acceptance of offshore wind farms stems from the lack of information locals experience. In order to set offshore wind energy in a positive light, the campaign must stress both the aspects related to climate protection as well as the importance of offshore wind energy for the region's prosperity. It is vital to take the fears held by locals seriously, to counteract them and to showcase benefits as well as challenges. In addition, they should be made aware of the possibilities and limits of civic participation. The visibility and accessibility of the responsible authorities as well as the organisation executing the project should be guaranteed during the entire duration of the project.

Implementing a tourism concept with several attractions related to offshore wind energy requires a **significant commitment in terms of personnel and financial effort**. Some projects in this study received financial support from public authorities on regional, national or European levels. As illustrated by the case of Scroby Sands, an information centre can be owned and financed entirely by a company which acts as developer, owner and operator of an offshore wind farm. Mixed funding concepts, with both public support and industry sponsoring, are another promising option.

The use of existing networks and partnerships to exploit a wide range of synergies, could, in many respects, be the most beneficial. It could ensure long-term sponsoring by public authorities or companies and limit operational costs by combining activities with already existing attractions. It may also save time when selecting motivated and trained staff and organizing lectures or events. Furthermore, joint marketing and publicity activities are important for a successful implementation.

No matter which attractions concerning offshore wind energy the region might offer, **the incorporation into regional information** material (e.g. tourism guides) is crucial. Furthermore, the quality, interactivity and freshness of (exhibition) materials are important to increase their attractiveness and satisfy visitors' expectations.

Diversity is a key factor. Apart from tourists, other groups can be targeted as well, e.g. locals, children or students.

To summarize, this study has illustrated that there can indeed be a positive correlation between offshore wind energy and tourism, when realized in a well-considered manner. In doing so, the Southern Baltic could equally profit from such an approach. Timing and quality of communication is crucial.

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Blekinge Offshore (Sweden)

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Bremerhaven - Tour de Wind & Information Centre (Germany)

Study visit: 31st May 2011 as part of a SBO project meeting

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Study visit: 30th May 2011 as part of a SBO project meeting

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Interview: 7th January 2012 with Klaus Noormann, FLN

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Interview: 8th February 2013 with Jürgen Rahmel, Nationalparkhaus Norderney

Nysted - Information and activity centre (Denmark)

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Scroby Sands - Information Centre (United Kingdom)

Study visit: 24th October 2011 with partners from SBO

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