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## Offshore wind power development as affected by seascape values on the German North Sea coast

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### ABSTRACT

In Germany, the first permits have now been issued for the construction of large-scale offshore wind farms in the German Exclusive Economic Zone (EEZ). This paper focuses on perceptions of the local seascape and the role of aesthetic seascape qualities in shaping local attitudes to offshore wind farming. Based on a survey of local residents in the districts of Dithmarschen and North Frisia, it shows that aesthetic seascape perception alone cannot account for local attitudes to offshore wind farming. Three main aspects seem to come together to determine these attitudes: deeply held convictions of the sea as a natural space, deeply held views of the local landscape and linked to this local identity, and also perceptions of renewable energies in combination with attitudes to issues such as climate change and sea level rise. The paper draws some conclusions on the future of the sea as a natural space or energy space.

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### Introduction

Offshore wind farms have been established off the UK, French, Spanish and Danish coasts. Germany is also riding this trend, although it is lagging behind in terms of actual construction. 18 offshore wind farms have so far received planning consent, but technical, financial and procedural difficulties have meant that none have so far become operational.

Some of this delay is due to lengthy discussions about the prospective impacts of offshore wind farms. Whilst offshore wind farming receives widespread political and institutional support at the regional (federal Länder) and national level, there has been some vociferous local opposition in Germany to specific proposals. Looking at institutions, organisations and interest groups at district level on the West coast of Schleswig-Holstein, [Licht-Eggert et al. \(2008\)](#) found that only half of the stakeholders investigated explicitly support offshore wind farming, compared to a figure of 83% of similar stakeholders at a national and regional level. Visual impacts of offshore wind farms, damage caused to the marine environment and the uneconomical nature of the proposed projects are quoted as the main reasons for local rejection of offshore wind farms. Concern about expected impacts of offshore wind farms is not restricted to Germany, as other areas without any previous offshore wind farm experience show. On Cape Cod, [Firestone and Kempton \(2007\)](#) found that the majority of local residents expect negative impacts

from offshore wind farms, quoting damage to marine life, increases in electricity rates, aesthetics and impacts on fishing or boating as the main reasons.

### The case of visual impact of offshore wind farm development

Contrary to early expectations ([Gaudiosi, 1996](#)), one aspect that emerges strongly in local debates about offshore wind farming is that of visual impact. Negative impacts on the view and the coastal landscape seem a favourite reason for opposing proposed developments, although expected impacts appear worse than reality. On Cape Cod, aesthetics was given as the most frequent reason for opposing a proposed offshore wind farm ([Kempton et al., 2005](#)). Working in Denmark, however, where offshore wind farms are already established, [Ladenburg \(2008\)](#) found that the visible presence of offshore wind farms did not reduce resident's willingness to accept more. Although offshore wind farms have received less attention than their land-based cousins, the problem of visual intrusiveness has been picked up by research and planning. [Bishop and Müller \(2007\)](#) found that older people were likely to consider offshore wind farms more intrusive, whilst [Sorensen et al. \(2002\)](#) note that public involvement early in planning processes enhances overall acceptance. Much focus has also been given to the question of actual visibility from the coast, with some attempts to quantify the visual impact of offshore wind farms through variables such as distance from the shore, different forms of placement in the water and turbine colour ([Runge and Nommel, 2006](#)). In the UK, guidance has been published for assessing the visual impact of offshore

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Fig. 1. Madness! Giant wind turbines in front of Timmendorf beach. Would you still come on holiday here? BILD daily newspaper, 19.12.2003.

wind farms on the seascape in an attempt at restricting their visual impact and enhancing public acceptance (DTI, 2005).

In Germany, the most vociferous critics of offshore wind farm proposals are those that make use of specific land- and seascape services. These include tourism operators, who rely on a specific image of the coast or sea, visitors to coastal holiday areas and also residents of coastal communities who enjoy the coast and sea for their amenity and recreational value. On the German island of Sylt, a local campaign was founded to oppose offshore wind farms on the grounds that it would despoil the horizon, not only constituting a visual nuisance but also severely impacting on tourism because it would remove the essential landscape qualities tourists come to enjoy (Gegenwind Sylt, no date). Although the tourism argument is not borne out by research (N.I.T., 2000; Benkenstein et al., 2003), concerns about visual impacts have persisted in newsletters, newspapers (Fig. 1) and specific statements during the consultation phase of offshore wind farm planning consent procedures. This particularly applies to those coastal communities that are physically closest to proposed offshore wind farms.

The intensity of the visual impact debate raises questions concerning the driving forces behind the visual aesthetic argument. Although real doubt exists about the actual visibility of the German offshore wind farms, a strong sense of threat appears to persist. On the mainland, an important driver of local resistance to wind farm proposals is specific views of place. Perceived threats to existing landscape values have been identified as one contributing factor (Hoppe-Klipper and Steinhäuser, 2002), with links between the perceived beauty of a landscape and memory as another (Short, 2002). Pasqualetti (2000, 2002) found that local residents value the landscape permanence of an area, expecting this landscape to continue unchanged and unwilling to pay the price of spatial change for the wider benefit of renewable electricity generation. Whether these would equally apply to the sea is an open question. Kempton et al. (2005, p. 132) were first to conclude that values about the ocean in general and about specific sea areas represent a

key source of opposition to offshore wind development. As a special place, with unique qualities that set it apart from the mainland, the sea thus does possess its very own distinct sense of place, as anyone who has spent time on the coast will be able to confirm. As a place, the sea would appear to be just as complex in its construction than places on land, with elements of the natural landscape (flora, fauna, water, etc.), human use of the sea (including traditions and history) and personal experience all playing a role (Schmidt-Höhne, 2006). The relationship between acceptance of offshore wind farming and perceptions of the sea as a particular place and/or space is therefore a topic that merits further investigation, not least because offshore wind farming could be taken to represent the emergence of an altogether new type of marine landscape.

This paper sets out the results of an investigation into the acceptance of offshore wind farming in the context of key sea and landscape values. The first part shows how local residents on the West coast of Schleswig-Holstein describe the sea, the seascape and the coastal landscape. The second part discusses whether the meanings given to the sea and the coastal landscape influence acceptance of offshore wind farms.

### Materials and methods

The specific case study area is the administrative districts of Dithmarschen and North Frisia (Fig. 2). It was chosen because its communities have a long relationship with the sea, so that distinct views of the sea, the coastal landscape and a strong sense of place can be expected (see below). Specific visual characteristics of the landscape (e.g. wide, expansive horizon) are frequently employed to describe the essential character of place, not least in marketing the region to tourists (Fig. 3). Although coastal communities may stand to benefit from offshore wind farm development in terms of local employment, there has been some controversial debate of offshore wind farming in the local media (Licht-Eggert et al., 2008).

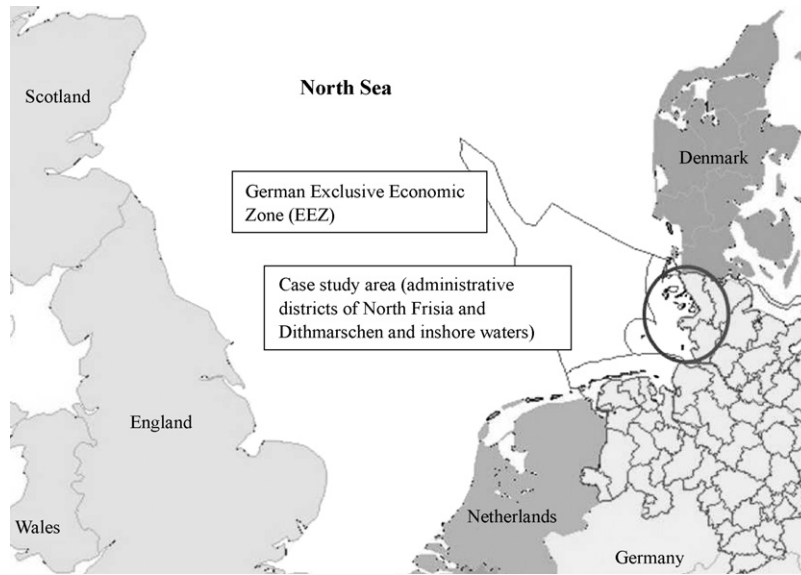


Fig. 2. The administrative districts of Dithmarschen and North Frisia and the German EEZ.

Results are based on a two-stage sampling process and a postal questionnaire survey that was mailed out to residents in October 2005. The first sampling stage was non-random and involved the selection of 15 municipalities that represented a comprehensive cross-section of local conditions. The sample thus included municipalities on the North Frisian islands, coastal tourist destinations on the mainland, towns and small rural communities in the hinterland. Within the selected municipalities a random sample of residents was then drawn using the local telephone book (private households) as a sampling frame. Names were picked at random until a pre-set quota of 1% of the respective total number of residents was met. The rate of return varied slightly, but averaged at 22% across the 15 municipalities. A total of 387 returned questionnaires forms the basis for the analysis presented here.

Despite random sampling, responses clearly reflect a bias towards men and women aged 45–65, with very little representation of younger residents. The sample contained slightly above-average representation of the well-educated and slightly more men than women, but no other significant bias. No dis-

tinction was made between long-standing residents and recent arrivals.

The questionnaire was divided into two parts. The first was designed to reveal the relative significance of different elements of the landscape in local perception. Residents were asked to describe the sea and the local landscape in open questions. “Sea” was understood to mean the coastal waters off Dithmarschen and North Frisia and the wider North Sea, whilst ‘landscape’ meant the terrestrial environment of Dithmarschen and North Frisia. The term ‘seascape’ was introduced later for the specific purpose of analysis and refers to the visual qualities of the coast (marshland, intertidal flats) and adjoining areas of open water as mentioned by the respondents. In the second part of the questionnaire, based on a mixture of open and closed questions, residents were asked to describe the risks and opportunities they associate with offshore wind farming.

In placing seascape perception into the context of offshore wind, analysis attempts to identify not only the things that are valued in the local landscape and/or environment, but also the reasons these elements are valued. ‘Value’ is used here to mean



Fig. 3. View of a typical Wadden Sea island.





Fig. 4. View of the coastal hinterland in the district of Dithmarschen.

objects of value – the ‘what’ we value in the environment (Brown, 1984; McFarlane and Boxall, 2000) –, as well as basic human values in the sense of a more universal motivating force – the ‘why’ or ‘how’ we care about things and what is fundamentally important to us (Schwartz, 1992; Brown, 1984). Basic human values refer to both end states of existence, qualities and modes of conduct are understood to have an ‘ought’ character (Rokeach, 1973), which is the greater the more widely shared a value is in society and the greater societal insistence that we behave in a certain way or achieve a certain state. As will become apparent below, this sense of ‘oughtness’ is a strong motivating force when it comes to weighing up between different options for land- and seascape development and can cause respondents to take up position either in favour or against offshore wind. ‘Oughtness’ in the sense of a morally right end state or behaviour is sometimes linked to other non-instrumental or ethical values, such as the belief that nature

has a right to exist or it is the duty of humans to protect creation. In the sense of Leopold (1966) it can also be interpreted as a moral or ethical value that arises from regarding an object with affection, reverence and respect. Attitudes that result from a sense of ‘oughtness’ are therefore different to those that are based on a purely utilitarian perspective on the environment, e.g. when weighing up between different material benefits that can be derived from the seascape.

A difficult category is that of aesthetics in that aesthetics can denote both a basic human value and an object of value. Here, the term is used to refer to the visual qualities of the landscape. Aesthetics in the sense of scenic character or scenic beauty is therefore primarily considered an object of value (Xu and Bengston, 1997)—an instrumental one at that because it is seen as yielding direct benefits at a personal level (e.g. inspiration) and community level (e.g. tourism).



Fig. 5. View of the Wadden Sea in North Frisia with onshore wind turbines in the background.

## Results

### *Views of land and sea on the West coast of Schleswig-Holstein*

#### *Man and the sea: a complex relationship in Dithmarschen and North Frisia*

The history of Dithmarschen and North Frisia and the lives of its inhabitants are inextricably linked with the sea. Today's Dithmarschen and North Frisia is a man-made landscape, which was continuously fought over against the might of the North Sea. Geologically, the landscape consists of hill land shaped by the one but last Ice Age (geest) and alluvial land (marsh). Before the advent of human activities, the marsh gradually gave way to saltmarshes and then the Wadden Sea, a vast expanse of sand- and mudflats, which in recent times has come to be considered of outstanding ecological importance.

In prehistoric times, settlers were extremely dependent on their environment. Unpredictable changes in sea level and flood surges reached far inland. Around 0 BC the sea calmed and storm surges became less frequent, allowing people to settle in the flat and fertile marshlands. Later, when storms became more frequent again, housing hills were constructed, representing a first step towards conquering the marshes and still visible as key landscape features today (Bähr and Kortum, 1987). Pliny the Elder gives an impressive description of early life the marshes: "Twice within a day and night the sea rushes in with incredible force and stretches into infinity; it covers land that is continuously battled over with nature, so that it is impossible to say whether (this land) is part of the mainland or the sea. The humble inhabitants live on high hills that have been constructed by hand above the level of the highest flood surge". (author's translation of a quote in Meier, 2003, p. 15).

Human control over the environment increased with the construction of the first dykes in the 11th century. Through the advent of new drainage technologies, moorlands were cultivated first, followed by older marshland. A range of social, economic and landscape changes ensued, driven by increases in agricultural productivity, population growth and trade. Co-operative farmers associations took on responsibility for dyke construction and land reclamation, whilst parishes became a significant political power in the region. In terms of landscape, a planned and well-structured landscape began to emerge in the former marshes, containing settlements, a system of drainage ditches and regulated agricultural land holdings. Many of these features are still visible in the landscape today.

Whilst the inner areas of marshland were comparatively secure, the low sea dykes afforded little protection to the inhabitants of the outer marshland which continued to be threatened by storm surges. Historic storm floods continued to claim coastal land, often wiping out entire islands. Nevertheless, the conversion of marshland into polders continued unabated. Initially created by local inhabitants in order to claim the land rights, the Danish King, then ruler of the area, introduced a more planned approach to land reclamation in 1559, creating polders with the express aim of increasing the amount of taxable land. Polders continued to emerge until the 19th century, each containing large and rectangular fields that are separated by drainage ditches. The current coastline and current line of sea defence is the result of a national sea defence policy, which has been in place since the late 1970s (Meier, 2003).

The battle against the ferocious power of the sea has dominated life on the West coast of Schleswig-Holstein ever since the first settlers arrived in the marsh. It has contributed to shaping local perceptions of the sea, which is expressed in a wide variety of local art, literature, legends and tradition. Best summarised as a mixture of fear, threat, respect and love, it is a relationship which is difficult to compare to the relationship that modern visitors might have to

the sea. Also, it is only partly comparable with notions such as the "romantic sea" or "picturesque sea" (e.g. Corbin, 1994; Schmidt-Höhne, 2006), which emerged elsewhere from the 17th century onwards and is present in contemporary imagery of the North Sea as a holiday destination. Although threatening aspects of maritime perception have receded in favour of more positive imagery, there is still a healthy suspicion in most local residents and a latent sense of vulnerability, expressed in fierce concerns over maintaining the current line of sea defence and resisting any attempts at managed retreat.

#### *Local views of the landscape and seascape*

To establish local views of their local environment, and in particular the sea, two open questions were asked: "What do you spontaneously think of when you hear 'North Sea'?", and "What do you spontaneously associate with 'West coast of Schleswig-Holstein?'". Although unwieldy, this latter term readily identifies the two districts of Dithmarschen and North Frisia to local residents and was open enough to encompass social and economic features, lifestyle as well as the natural environment. The term 'landscape' was consciously avoided in the questionnaire to prevent focus on particular preconceptions of landscape or restricting responses to visual landscape elements.

Analysis of local views of the landscape is based on grouping responses into phenomenological categories which are presented below.

*Views of the physical environment.* Spontaneous associations with "North Sea" most frequently relate to physical elements of the marine environment. Nearly every respondent mentioned waves, clouds, wind, the tides or the Wadden Sea, with some referring to only these in their response and nothing else. In some responses these terms are not qualified by any descriptive terms, but are simply stated as a given fact of everyday life. In most, however, adjectives are used to lend a positive connotation to these essential environmental qualities. Wind for instance becomes refreshing or cleansing, a breeze synonymous with pure air, or waves a symbol of the essential power of nature. Here, the objects of value in the physical environment are clearly linked to personal benefits that can be derived from them. This is well put by one respondent who stated that the North Sea represented

*"pure sea, recuperation, nature, fresh breeze, pure air, influences the soul and physical health, sense of well-being, away from hectic life and a sense of being confined"*.

Very similar responses were received for 'West coast of Schleswig-Holstein', where weather, wind and tides also rank first in terms of description. Virtually all respondents refer to the sea in their characterisation of the West coast, with islands, sand and the Wadden Sea the most frequently mentioned. This is indicative of the fact the West coast landscape, and more generally life on the West coast, is inextricably linked to the all-pervading presence of the sea. Given the history of the region this comes as no surprise. Descriptions of the landscape thus commonly refer to man-made elements speaking of reclamation and sea defence, predominately sea dykes and marshlands. One respondent summarises his view of the West coast as

*"Wadden Sea and North Sea, sea dykes, sheep, dune landscape, heathlands, reed-thatched houses, sea breeze"*

*Views of the natural environment and nature.* Another category in residents' descriptions of the North Sea comprises elements of the natural environment, expressed either as general notions of nature or more specific elements of the natural environment such as sea

birds or fish. Commonly, the North Sea is described as a natural habitat for animal species, although actual species are rarely named beyond general categories such as migratory birds or sea gulls. Some species are specifically mentioned in a commercial context (most frequently, West coast prawns), indicating that residents are well aware of the importance of the natural environment as a provider of market goods. Occasionally, “important” and “threatened” are also mentioned in the context of the North Sea, although no examples are given as to what this threat might be. “National Park” is mentioned rarely and if so, then specifically in the context of the Schleswig-Holstein section of the Wadden Sea National Park.

‘Nature’ or ‘natural habitat’ is much less of a distinguishing feature of the ‘West coast of Schleswig-Holstein’. Reference is made to sheep, cabbage, birds and other agricultural features rather than wild species, confirming the view of the coastal landscape as a cultural rather than a natural landscape (Fig. 4). What is mentioned however is the notion of spatial expanse and openness of landscape, concepts that are closely linked to the spiritual and aesthetic values ascribed to both landscape and seascape (see below).

*Recreational, spiritual and aesthetic characteristics and benefits.* Moving away from descriptions of the physical environment, this category begins to focus on the actual benefits the specific environments provide. Clearly, both land and sea are perceived to be recreational spaces, with nearly every respondent describing their local environment in terms of walking on the seashore, fishing or walking on a dyke. Although some respondents mention specific sports such as sailing or inline skating, most refer to informal recreation or more specifically, the benefits derived from these. Restfulness, recuperation and restoration are most often mentioned when it comes to describing the intangible qualities of the local land- and seascape. The ever-changing cloud formations, the wide expanses of sky, the colours of the sea and the continuous sea breeze can serve as examples of descriptive terms, with some respondents specifically highlighting onshore wind farms as structural elements detracting from these qualities (Fig. 5).

The above also indicates that the visual characteristics of the landscape play a significant part in enjoying it. Aesthetic landscape qualities – used here to denote the scenic aspects of landscape – primarily include openness of the landscape and the fact that ‘you can really look out into the far distance’. Already distinct in the context of ‘West coast’, openness and expanse emerge particularly strongly in the context of ‘North Sea’. With nearly every respondent mentioning these or similar terms, openness appears to be part of the very essence of the seascape, a key characteristic of the seascape that is closely linked to the recreational or spiritual benefits that can be derived from it. Spiritual qualities are more readily associated with the sea than the mainland and are often mentioned in connection with an endless horizon or sunset, the sea epitomises freedom, independence and creation:

*“Expanse, freedom, dreams, eternity”, “creation, openness, silence, peace, relaxation, adventure”*

In an interesting contrast to views of the land, the sea also instils a sense of awe and respect.

*“The sea is life. It is shipping, boats and infinity. It is creation, and unpredictable, but also a calming sense of comfort”.*

Unpredictability is mentioned often and appears to be at the heart of this sense of awe and respect, although this no longer translates into specific fears on account of a well-defended coastline. Quite on the contrary, awe and unpredictability appear to have become something to be treasured as a counterpoint to the well-ordered and mostly predictable nature of everyday life. This appears

to highlight the importance of the seascape as a source of spiritual experience.

*Dislikes, threats and fears.* Apart from these predominantly positive descriptions, a few respondents express considerable dislike of the sea and some of its constituent elements. In the great majority of cases, this has to do with human impacts on the sea, most notably marine pollution and overfishing. There is also dislike of the landscape, most often on account of overuse through tourism, wind farms and agriculture:

*“Filthy cesspit, oil, waste dump, effluent, poisonous, malicious sea – on occasion”*

In a departure from the strictly landscape-oriented view, dislike is also frequently expressed as frustration with the local administration and the perceived lack of opportunities, particularly for young people. The region is perceived as backward and not in touch with wider developments, which is used by some local politicians to make the case for offshore wind farm development. This characterisation of the West coast – everything unhurried, a little behind the times – is a two-edged sword: on the one hand, it is precisely these qualities that are treasured, not least in terms of quality of life, on the other hand they lead to a lack of development and a lack of long-term perspectives (e.g. high unemployment). One respondent describes the West coast as:

*“my home, my roots, but really neglected by regional politicians, few jobs, no lobby, and an objectionable collection of wind turbines”.*

*Heimat—a sense of home.* Land- and seascape cannot truly be separated in the minds of many local residents. This is most apparent in descriptions of “Heimat”, perhaps best translated as a feeling of rootedness and belonging. Respondents use Heimat to encompass everything that surrounds them, including the natural environment, the land- and seascape, the social context, their sense of history, with descriptions revealing a profound sense of attachment and belonging. Here is one example of a personal view of “West coast”:

*“A great diversity of living areas and places with unique flair, historic islands and Hallig islands, loveable people even though they don’t really like one another, natural energy sources right outside the front door, e.g. sun, wind, sea, oil”.*

Another typical response was

*“incredible sunsets, walking along the dykes, peace and quiet, relaxation, the smell of mudflats in your nose, shells, sea gulls, agriculture, unhurried people, wind mills, islands, fresh air, not much industry but high quality of life, prawn sandwiches, dykes”.*

The concept of Heimat is also linked to the idea of survival in the face of harsh environmental conditions.

*“Men fought hard to reclaim their land from the sea. Costs of sea defence are likely to go up in the face of sea level rise”.*

Many respondents feel a sense of pride and privilege, expressed as

*“living in a place where others come on holiday”.*

#### *Evaluation*

Both North Sea and the West coast of Schleswig-Holstein were described in a variety of terms and languages, ranging from a few terse words to flowery and poetic sentences. The variety of terms used in individual responses shows that perception of landscape is constituted by physical landscape elements, subjective impressions



and value judgements, creating multi-faceted images and sometimes contradictory and emotional constructs of 'landscape' and 'sea'. Just like landscape, 'sea' and 'seascape' are not perceived in a passive camera-like sense, but rather constructed as a series of images that emerge in connection with pre-conceived notions of place, previous experiences of the sea and aesthetic perception (Avocat, 1984).

From the total of responses, some fundamental differences become apparent in how people view the West coast landscape and the sea. Broadly speaking, the North Sea tends to be seen as a more untamed and natural place that contrasts with the more ordered and structured man-made landscape. "North Sea" is more often referred to in the context of storms, weather, wind and force of nature, whilst descriptions of "West Coast" reflect human uses through terms such as tourism, sheep farming, walking, relaxation, traditional houses or wind farms. Specific benefits are derived from both, and both are valued for the very qualities they embody. The sea represents both force – an unpredictable, elementary one –, and place which is defined a distinct seascape character, where openness and endless horizon are the predominant and highly valued features. The land, on the other hand, is more readily perceived as a cultural landscape, a place of tradition and of comforting familiarity. Adjectives such as "harmonious", "wonderful" or "beautiful" are commonly used to describe the landscape, none of which are used to describe the North Sea or seascape. Seascape experiences appear to bridge the divide between 'natural and wild' and 'man-made and tamed' in that they rely on both for providing distinct benefits, which are expressed most strongly in the context of recreation and Heimat. Asked how important 'wide, open sea' was for life on the West coast, 56% said this was very important, which is on a par to 'attractive landscape', considered very important by 57% of respondents. The next most important category was 'unspoilt nature', which 40% thought very important. Economic growth, in contrast, was only rated very important by 23% of respondents, although over 50% did consider it 'important'.

The visual qualities of the seascape also emerge strongly in the context of specific questions concerning offshore wind farms. The relationship between attitude to offshore wind farms and perceptions of landscape and seascape is discussed next.

#### *Links between landscape, seascape and attitude to wind farms*

##### *Attitude to offshore wind farms*

The first step in correlating positions on offshore wind farming to views of the local landscape and seascape was to establish what local residents actually thought of offshore wind farms.

In order to separate opinions on specific wind farms planned off the West coast from the concept of wind farming per se, the question was phrased as "What is your position on the construction of offshore wind farms off the West coast of Schleswig-Holstein?" Respondents were given five positions to choose from, ranging from "strongly in favour" to "strongly against". Responses show a majority of opponents, but also a strong block of supporters. 35% stated they were strongly against the construction of offshore wind farms off the West coast, with another 18.5% opposed. In contrast, 21% stated they were in favour and another 19.5% said they were strongly in favour. 6% had no opinion.

##### *Arguments used to justify attitudes*

Respondents were next asked to justify their attitude expressed above. Because this was an open question, multiple and even conflicting reasons could be given. Analysis was based on identifying distinct arguments, which can exist in the form of a single word or whole sentences and provide a clearly stated reason for either supporting or opposing offshore wind. Since this resulted in a

fairly detailed list of specific arguments, these were grouped into broad conceptual categories (Table 1). Categories that are not self-explanatory are defined as follows:

- *Aesthetics*: This includes all arguments that relate to scenery or specific visual elements of the land- and seascape. Typically, arguments refer to the open horizon or concerns that wind turbines could spoil (or enhance) the view, or use is made of the very German description of wind farms as "asparagus" (mostly employed as a disparaging term).
- *Economy*: arguments related to local jobs and potential benefits to the local economy.
- *Energy*: This includes all arguments relating to energy efficiency, the cost of energy generation, renewable versus traditional, or other specific benefits or disadvantages of renewables.

Respondents use each of these categories to both justify support and opposition to offshore wind. A simple frequency analysis was used to establish how often each argument was used, in what context and by whom. Table 1 gives an overview of the results, also indicating the relative importance of arguments in justifying support or opposition.

Looking at the overall number of arguments, it is clear that those who oppose the construction of offshore wind farms on Schleswig-Holstein's West coast are considerably more vociferous than those who support it. In terms of sheer volume, opponents field almost twice as many arguments than supporters. Interestingly, supporters and opponents often use the same categories to justify their attitudes. Supporters primarily argue from a perspective of aesthetics, economy, energy and technology, whilst opponents base their attitude on the categories aesthetics, economic feasibility, economy, emotional response, energy, nature conservation and shipping safety.

The categories "aesthetics", "energy" and "nature conservation" stand out on account of a particular high number of mentions, with "emotional response" of additional interest because it almost exclusively relates to opponents.

*Energy*. Containing 23% of all arguments used, energy is the category most frequently used to justify positions. Energy arguments are fielded 82 times by supporters, which corresponds to about 60% of all arguments used to justify support. The 82 positive mentions also correspond to 66% of all arguments that are brought to play in the category of energy, making it the most positively charged category when it comes to arguing for offshore wind farms. A detailed look at the individual arguments used shows that this is linked to a positive view of renewable energies in general. In the words of respondents, offshore wind farming represents an 'alternative', 'clean' and 'green' source of energy, which is supported because it is perceived as an alternative to 'dirty' oil, coal or nuclear. Often, offshore wind is supported despite some apparent disadvantages, for instance unknown impacts on the ecosystem, or the view that offshore wind energy is expensive and the technology not fully developed. A group of respondents therefore emerges that accepts offshore wind as the lesser evil, and who feel that they have no choice but accept offshore wind because it is 'better' and less damaging to the environment than conventional forms of energy generation.

*"Fossil fuels are finite and pollute the environment. Much energy is needed to extract them, and nature is destroyed in the process. Wind farms are not exactly pretty, but we need energy, and all other sources have higher risks".*

'Energy' is an interesting category because it refers to both instrumental aspects – renewable energy generation as a source of

**Table 1**  
Arguments used to justify positions on the construction of offshore wind farms on the West coast.

Summary category of arguments	In favour of OWPs	Neutral attitude	Against OWPs	Total number of mentions <sup>a</sup>	Percentage out of all arguments
Aesthetics	22	0	82	104	21.8%
Butendiek (a specific wind park)	0	3	0	3	0.6%
Climate	1	0	0	1	0.2%
Economic feasibility	0	1	21	22	4.6%
Economy	14	3	8	25	5.2%
Emotional response	1	1	36	38	7.9%
Energy	82	0	28	110	23.0%
Energy policy	1	0	0	1	0.2%
Factual statement <sup>b</sup>	0	59	0	59	12.3%
Feasibility	0	0	1	1	0.2%
Nature conservation	2	0	70	72	15.1%
Other	1	2	0	3	0.6%
Politics	0	0	2	2	0.4%
Shipping safety	0	0	17	17	3.6%
Technology	12	5	3	20	4.2%
Total number of arguments	136	74	268	478	100.0%
Percentage of all mentions	28.5%	15.5%	56.1%	100.0%	

<sup>a</sup> Total number of mentions: how often the argument was used in total (respondents were able to give multiple answers).

<sup>b</sup> *Factual statement: a simple description of offshore wind farming which is neither negative nor positive. In most cases this was a statement along the lines of "offshore wind farms mean wind farms in the sea".*

revenue for example – and non-instrumental aspects and ‘oughtness’ in the sense of a moral obligation to reduce pollution and safeguard the planet for the sake of future generations. To the supporters who argue based on the wider benefits of renewables, overall societal gain rates more importantly than the potential visual intrusion of offshore wind farms on the West coast. This attitude is indicative of the fact that certain basic values – such as the moral duty to safeguard nature or responsibility to future generations and society at large – count for more than personal benefits derived from specific seascape character, such as the pleasure derived from an open horizon.

Those who use energy-related arguments to justify their opposition to offshore wind power mainly argue that this form of energy generation is too expensive and inefficient compared to other forms of energy generation.

*Economy.* Surprisingly few supporters of offshore wind farms use economic benefits to justify their position. The local economy and jobs are only mentioned 25 times in total, representing 5.2% of all arguments counted. Only half of these however are supportive of offshore wind farms in the sense that their construction and management might lead to more economic growth in the region. This is all the more surprising because economic growth is a favourite argument of local politicians and other organised stakeholders and often quoted in the media as a decided benefit of offshore wind farming. Respondents here also used economy-related arguments to justify opposition to offshore wind farms, expressing fears that they might destroy jobs in other sectors (e.g. tourism) or simply be used as investment opportunities or tax breaks with little local impact, much as was the case with land-based turbines. One reason why the economic argument counts for so little may be the average age of respondents. More than 70% were over 45 years of age and 20% over 65 years old, reflecting the fact that the case study area is an attractive place to retire to but also a structurally disadvantaged region that suffers from gradual out-migration of young people below the age of 30 (BBR, 2005). Although they might be concerned for other members of the family, pensioners are less likely to be driven by economic concerns, so that the trade-off between preserving certain landscape qualities and accepting change for the sake of economic benefits is not one they need to make. Doubt might also result from the fact that production of wind turbines has recently moved out of the region rather than in, and that many

open questions remain regarding the potential for building up a servicing industry for offshore farms in the region.

*Aesthetics.* Contrary to ‘energy’, arguments relating to aesthetic qualities of the seascape are primarily used to justify opposition to offshore wind farms. As a category, aesthetics contains almost 22% of all arguments used. Aesthetic arguments are used against offshore wind farms in 74% of cases, but in 26% of cases the opposite is true. Although they do not necessarily consider offshore wind farms aesthetically pleasing, some respondents perceive offshore wind farms as an alternative to wind farms on land and express hope that offshore developments might take the pressure off the mainland or even lead to onshore parks being dismantled. This, they argue, would have a much desired positive aesthetic impact on the coastal landscape.

*"I support offshore because I hope for less wind turbines on land. There are too many turbine sticks on land already"*

There was only one case where offshore installations were explicitly termed ‘beautiful’ in their own right and therefore considered desirable.

Those that argue against offshore wind farms on account of scenery believe that offshore wind farms would destroy key visual qualities of the sea. The most frequently mentioned are “despoiling the sea”, “loss of the open horizon” and “industrialisation of the sea”. These arguments are used irrespective of whether the respondents support onshore wind farming or not. Some typical examples are:

*"Our coast is covered in wind mills – let's avoid the same fate for the sea!"*

*"An open landscape and the expansive horizon represent the most important capital of this landscape. This is being destroyed for absolutely no gain".*

*"Destruction of our horizon, financial gain for only a handful of people".*

An interesting aspect in the context of aesthetics is the comparison between positions on offshore wind farms and the importance of ‘attractive landscape’ and ‘wide, open sea’ for life on the West coast (see above). 40% of those that rated wide, open sea as very important are also opponents of offshore wind farms. 36% of those



that rated attractive landscape as very important are also opposed to offshore wind farms. In the questionnaire “attractive landscape” did not explicitly differentiate between landscape and seascape, so that it is impossible to determine whether opposition is primarily landscape- or specifically seascape-driven.

*Emotional arguments.* Emotional arguments are almost exclusively fielded by opponents to offshore wind farms. In total, they amount to nearly 8% of all arguments used and are often found linked to aesthetic arguments. “Loss of the open horizon” and “sense of being limited” are stated together for example, as are “loss of everything that is important to me” and “despicable”. Most of these responses are gut feelings, such as “feels wrong” or “can’t imagine it will look right”. Some use very forceful language, expressing a profound dislike and rejection of offshore wind farming. One respondent went as far as associating offshore wind farms with cruelty and psycho-terror; another said “horror” and yet another “rape of the sea”. Clearly, these arguments go beyond mere visual impacts and represent some deep-seated antipathy towards any structures that might detract from the special qualities of the sea. Although it is difficult to pinpoint what these special qualities might be, the expected loss is significant and touches the very core of why these respondents value the sea. The sense of freedom plays a role in this, as does the use of the sea as a counterpoint to daily routine. The arguments fielded in this category, however, tend to speak of personal needs rather than wider societal gain, and although it is the intangible qualities of the sea that are valued, the view of the sea is utilitarian rather than driven by any sense of moral duty.

*Nature conservation.* The greatest degree of concern towards offshore wind farms emerges in the category of nature conservation. Although arguments of nature conservation only make up 15% of all arguments employed, they are almost exclusively used to object to offshore wind farms. The category itself is one of the most diverse, with arguments covering indistinct fears that offshore farms will harm the marine ecosystem and also fears of very specific negative impacts on bird and marine mammal species. The category also comprises indirect impacts, such as oil spills resulting from tanker collisions with wind farms.

*“Offshore wind farms upset nature and animals, never mind the visual impacts”.*

*“Disappearance of the last remaining porpoises, pollution, even more dead birds, danger of shipping accidents and oil spills”.*

Paramount in this category is the desire to see nature protected from harm. Although some arguments are utilitarian in nature – oil spills for instance would affect local beaches and have profound effects on tourism – the great majority is concerned with the existence value of nature, i.e. valuing nature for nature’s sake. Closely linked to intrinsic value, this has also been described as the satisfaction humans derive from knowing that ecosystems exist irrespective of their use now or in future (Eftec, 2006). This is tied to the conviction that humans have an obligation to preserve the sea and all its creatures, acting as stewards to keep them from harm. This conviction is all the stronger where respondents feel that humans have done enough damage already, either to the planet or specifically the North Sea. Clearly, thus, this category is driven by values and moral principles that go beyond personal and even societal gain.

## Conclusions

Results show that attitudes to offshore wind farms are driven by a complex set of values and processes of assigning value. Firstly,

a wide range of objects can be identified in the local West coast landscape and the North Sea that are of value to respondents, including perceptions of scenic beauty and visual preferences for the seascape. Secondly, a number of direct or indirect personal benefits were highlighted that respondents draw from the use of these. These range from direct personal to indirect societal benefits and comprise both tangible benefits as well as intangible benefits, e.g. from knowing a certain course of action has been followed or a desired state achieved. Thirdly, different basic human values act as a motivational force, ranging from the hedonistic (pleasure or enjoyment seeking) to the spiritual (meaning in life or inner harmony) to the universal (concerned with the welfare of all people and nature) (Schwartz, 1992). The constellation of these values differs between individuals, although some patterns can be noted (see below). Internal dilemmas, as well as the trade-offs respondents make when assigning preferences, result from the respective combination of how the landscape and North sea are perceived, what is considered the most important benefit, and the strength of the ‘ought’ value of certain behaviours or end states.

As far as landscape and seascape are concerned, the aesthetic qualities ascribed to the sea appear to be a significant driver of attitudes to offshore wind farms. Half of all arguments raised against offshore wind farms were shown to be based on the idea that offshore wind farms despoil the open horizon, which is considered one of the essential features of the local environment. Experiences with onshore wind farms do seem to exert some influence here and can be observed to swing opinions either way.

Whilst some fears over potential seascape impacts go hand in hand with a highly emotional view of the sea, many are down to a strong sense of it as an untamed place whose constituent elements, in particular flora and fauna, are worthy of protection. Many residents treasure the intangible and sometimes spiritual qualities of the sea, expressed in descriptions such as ‘a place to find peace’, ‘great force of nature’, ‘freedom’ or ‘sense of humility’. This echoes Kempton et al. (2005), which showed that residents treasure the sea for its inspirational qualities and that they consider human intrusion unacceptable for the special environment of the sea (130 ff.). Woods (2003) describes similar feelings in the context of wind farm development in the Cambrian Mountains in Wales. There, wilderness is regarded as an ‘almost spiritual force which enables the visual consumption of a piece of land to be translated into a moving, affecting experience’ (p. 280). In the Welsh example, the natural landscape is valued for its vastness and emptiness and its wild and deserted qualities, its absence of features rather than their presence, very similar to descriptions given in Dithmarschen and North Frisia. To residents, the sea is clearly synonymous with uncharted territory, with wide, expansive horizons and wilderness, which should not be intruded upon but kept as a counterpoint to the developed land.

Not surprisingly, these ideas conflict with images of the sea as an industrial place. Although not explicitly termed “industrial”, many residents do seem to place offshore wind farm development in this category. Whilst traditional and transient activities such as fishing and shipping seem to go unquestioned, this is not the case when it comes to large-scale permanent structures such as offshore wind farms. Explicitly stated, or implied in respondents’ statements, these are seen to destroy the very qualities that make the sea a special place. In case of the seascape, the sense of protecting it is all the more pronounced in those who regard the terrestrial landscape as despoiled by wind farms, a fate they want to see avoided at all costs for the sea. In case of the sea, defined here to be more than just the visual qualities of the sea, the goods to protect include both flora and fauna and the sense of the sea as a form of wilderness.

Amongst the respondents, four distinct groups are suggested based on their justification of attitudes to offshore wind farms.

- “Marine conservationists” who oppose offshore wind farms on account of uncertain impacts on the marine ecosystem. This group is characterised by an overriding sense that humans have a duty to preserve the natural environment and assign value to nature outside any utilitarian or even societal interests. This group’s argumentation is based on the notion that the sea should be a natural space, where negative human impacts should be reduced and nature left to its own devices. Conservation of species and habitats is considered a priority. The perceived danger of shipping accidents, in particular collisions of oil tankers with offshore wind farms, plays an important role in this context.
- “Aesthetic purists” to whom the loss of the wide and open sea represents the most significant threat.
- “Protectors of the mainland”, to whom offshore wind farms are an ideal alternative to wind farms on land, as long as they are ‘not too intrusive’ and far out at sea.
- “Principled supporters of renewable energies”, who support offshore wind farming as a matter of principle irrespective of any consequences to the land- or seascape. Members of this group also have a strong sense that nature or the seascape should be protected, but are willing to trade this for forms of energy generation that are safe and climate-friendly. An important aspect is that wider society stands as a beneficiary here, often in the context of future generations who have a right to inherit a healthy planet.

So what of the consequences for the North Sea as an energy landscape? The results of the survey show an important difference between the views of the local population and the potential views of planners and decision-makers. Whilst the former clearly value the open sea as a natural and even spiritual place, the majority of institutions and organisations at a local, regional and national level place development first, driven in part by ambitious EU plans for maritime development and EU and national targets for renewable energy development (Licht-Eggert et al., 2008). What is missing from the debate surrounding offshore wind farming is the symbolic significance of the sea to local residents and the role these play in sense and quality of place. The approval procedure currently used to grant planning permission to offshore wind farms in the German EEZ also fails to pick up this aspect (Bruns and Gee, 2009). The above has made clear that symbolic and ethical values for treasuring the sea are relevant irrespective of whether individual offshore wind farms are visible from the mainland or not. If broad acceptance is to be secured for offshore wind, greater attention should be given to the many layers of meaning and values associated with the sea, both in terms of individual siting decisions as well as deciding how much offshore wind is acceptable.

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