

Article

Wealth of Wind and Visitors: Tourist Industry Attitudes towards Wind Energy Development in Iceland

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Abstract: The interest in harnessing wind energy keeps increasing globally. Iceland is considering building its first wind farms, but its landscape and nature are not only a resource for renewable energy production; they are also the main attraction for tourists. As wind turbines affect how the landscape is perceived and experienced, it is foreseeable that the construction of wind farms in Iceland will create land use conflicts between the energy sector and the tourism industry. This study sheds light on the impacts of wind farms on nature-based tourism as perceived by the tourism industry. Based on 47 semi-structured interviews with tourism service providers, it revealed that the impacts were perceived as mostly negative, since wind farms decrease the quality of the natural landscape. Furthermore, the study identified that the tourism industry considered the following as key factors for selecting suitable wind farm sites: the visibility of wind turbines, the number of tourists and tourist attractions in the area, the area's degree of naturalness and the local need for energy. The research highlights the importance of analysing the various stakeholders' opinions with the aim of mitigating land use conflicts and socioeconomic issues related to wind energy development.

Keywords: wind farm; wind energy; renewable energy infrastructure; impacts; tourism industry; nature-based tourism; Iceland



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1. Introduction

The interest in wind energy has increased worldwide due to its potential to mitigate climate change. At the same time, technological advances have made it possible to harness wind energy in areas where this was previously not possible and have resulted in more efficient wind turbines with greater capacity [1,2]. As a result, wind energy harnessing has increased considerably, and in 2019, it constituted around one-quarter of the global renewable power capacity [3].

While public attitudes towards wind energy are generally positive [4], specific plans for building onshore wind farms often meet opposition. Building wind farms can create land use conflicts, in particular when they are located in natural areas used for tourism and outdoor recreation [5]. For the social acceptance of wind farms, the greatest hindrance is their visual impacts, and studies have shown that opposition to wind farms most commonly stems from the fact that wind turbines degrade people's visual experience of the nature [6–8].

Iceland is among the countries which are considering taking the first steps to utilise their wealth of wind to produce electricity. Presently, Iceland is taking advantage of its abundance of hydro and geothermal energy sources so that nearly all electricity produced in Iceland is renewable [9]. However, the options for further utilisation of geothermal and hydro power seem to be getting scarcer [10–12]. In order to increase and diversify the power production as well as to take advantage of decreased production cost of wind power [3], the opportunities for harnessing wind energy are for the first time being considered in Iceland. However, Iceland is not only rich in renewable energy, but also in another kind of natural resource: the spectacular landscape admired by tourists. Prior to the Covid-19

pandemic, tourism had become the country's largest export sector [13], and the number of international visitor arrivals had increased by 22% on average between 2010 and 2018 [14]. Iceland's nature is its main tourist attraction, with 90% of the international visitors stating that it had been one of the main motivations for travelling to Iceland. When asked what in particular about Iceland's nature motivated them, the most common answer is that it is unspoilt and pure [15]. Iceland's tourism industry is therefore heavily dependent on decisions on future land use, which are likely to impact the natural quality of the country. Thus, conflicts between nature-based tourism and wind energy development are foreseeable, and the locations for wind farms have to be considered carefully. The aim of this paper is to analyse what impacts wind farms would have on nature-based tourism from the perspective of the tourism industry and what the tourism industry considers as the key factors that need to be taken into account, when considering an acceptable location for a wind farm. This is done by analysing 47 semi-structured interviews with tourism service providers about their opinion on five wind farm proposals which are currently under evaluation by the Icelandic authorities.

The study is based on a standpoint that beliefs about nature, and the impacts of wind energy development, are a socially produced "reality" [16]. This is in line with Mordue et al. [17] who concluded that "claimed impacts of wind farms on tourism are often social constructions of risk rather than objective facts". Thus, it may be that the tourism industry's perceptions can be conflicting and change over time. Nevertheless, that does not make the perceptions of potential impacts irrelevant. Quite the contrary, it is important to shed light on the beliefs of the tourism industry since tourism service providers are active agents in the creation of wind farms' impacts on tourism [18]. Based on their attitudes and perceptions of wind farms, tourism service providers will adjust their behaviour and decision-making, for example, with regard to further investments in the sector and destination development [19,20], thereby influencing how wind farms impact the tourism industry.

Research reflecting the attitudes of the tourism industry on wind energy development is extremely limited. It is important to address this gap in literature and shed light on the tourism industry's perspective. In the next decades, there will be an increasing demand for sustainable energy such as wind energy [21] and simultaneously demand for nature-based tourism is expected to grow, in particular after the Covid-19 pandemic [22]. Wind farms will inevitably affect the landscape in many natural areas in the world leading to conflicts with industries such as nature-based tourism which depends on the quality of the natural environment. Iceland is a good case for examining the perceived impacts of proposed wind farms on nature-based tourism, as the country is about to start wind energy development and heavily relies on nature-based tourism. This research is therefore an important contribution to the debates in landscape and land use studies related to society and renewable energy development [23].

The paper starts by presenting relevant literature on public and tourism stakeholders' attitudes towards wind energy development and wind farms. Following that, it describes the context of energy harnessing in Iceland and provides an overview of the study areas selected for this research. After an outline of the results from the interviews, the findings of the study are discussed with the aim of highlighting ways towards an improved coexistence of wind energy harnessing and nature-based tourism.

2. Background

2.1. Public Attitudes towards Wind Energy

Wind power production has increased considerably, in particular as it mitigates the effects of global warming and since its cost has decreased [3,24]. In 2019, the overall capacity of renewable power was 2588 GW, of which 651 GW came from wind power, meaning that wind power constituted around one quarter of all renewable energy capacity [3]. Most of the wind power capacity comes from onshore wind farms (621 GW out of 651 GW in 2019) [3], and these are often situated in areas where they have to coexist with other land

uses, for example, in agricultural, residential or recreational areas. As wind farms have a range of negative impacts, such as visual and noise pollution, land erosion, deforestation and bird fatalities [25,26], conflicts between the various land uses can arise.

Studies have shown that the public is generally quite positive towards wind energy [4], but when asked about their attitudes towards specific wind farm proposals, attitudes are often negative. Researchers have used the term NIMBY (not-in-my-back-yard) to explain the opposition to specific proposed wind farms. The term means that individuals may generally support developments such as wind energy infrastructure, as long as they are not in their own locality [27,28]. However, NIMBY has also been criticised for portraying the causes of opposition in a simplified way [29–32], as it may fail to identify other reasons for the lack of support.

There are various factors which have been shown to influence public attitudes towards wind farms, including concerns about noise pollution [4,33], possible health impacts [34] and the perceived need for wind energy [35]. The main factor shaping public attitudes are the visual impacts of wind farms which are generally perceived negative [1,6–8,36–38]. Due to wind farms' visibility, finding a site for wind turbines which is accepted by the public can be challenging since, as argued by Frantál and Kunc, “an ideal area does not exist, only more or less acceptable areas do” [39].

Studies have found that the type of landscape in which wind turbines are placed shapes public attitudes towards wind farms. Devine-Wright [40] points to the need for addressing the question to what extent energy infrastructure is compatible with the symbolic image of a place and the socially constructed ideas of how the area “ought to” look. In that regard, new constructions have to fit the existing place identity and its symbolic dimensions in order to be accepted [41,42]. In a study by Wolsink [43], recreational areas, nature reserves and other natural areas were perceived to be unsuitable sites for wind turbines, whereas it was perceived as more acceptable to place wind turbines in military and industrial areas. In natural areas, the opposition to wind turbines can stem from the need to protect wilderness and preserve the natural character of areas, thereby sustaining their value as areas for relaxation and recreation [29,44]. The distance between the onlooker and the wind turbines also plays a role with regard to the perception of visual impacts. A study by Molnarova et al. [45] found that wind turbines with a larger distance from the observer (4.5 km to 8 km) were considered to have a less negative impact on the landscape, whereas wind turbines close to the observer (1.5 km) were considered to degrade the landscape more severely. The number of wind turbines can also shape the perception of visual impacts and the same study by Molnarova et al. [45] found that respondents were more positive towards one instead of four wind turbines in the landscape. However, in a study by Riddington et al. [46] the participants preferred fewer wind farms with more turbines over many small wind farms.

2.2. Tourism and Wind Energy Infrastructure

While there is extensive literature on public attitudes towards wind energy infrastructure, studies on the attitudes of tourism stakeholders towards wind farms are scarce. Those which exist focus disproportionately on tourists' perceptions of wind energy infrastructure and neglect other stakeholders, such as the tourism industry. Much like public attitudes, tourist attitudes towards wind energy are generally positive, as it is perceived as sustainable, renewable and green [47,48]. However, tourists tend to be less positive when expressing their opinion on particular wind energy projects due to the visual impacts of wind turbines on the landscape, and they prefer the construction of wind turbines in agricultural areas rather than in areas of pristine natural quality and wilderness [39,49,50]. This is in line with findings from studies on public attitudes towards wind turbine installations, as outlined in Section 2.1 [29,43,44]. A study from Iceland [49] also showed that tourists thought that it should be prohibited to install wind turbines in national parks or other protected areas. Moreover, another study from Iceland concluded that tourists are

more sensitive than residents towards wind turbines in pristine nature, as the nature is the reason for their trip to Iceland [50].

The main threat that wind farms pose to tourism stems from their visual impacts [39,47,51,52], which can lead to a degradation of the tourist experience, in particular at destinations of nature-based tourism as it relies on the aesthetics of the environment and landscape [51,52]. As a result, tourists may not want to visit areas with wind farms, which in turn can result in economic losses for the tourism industry and local communities [53]. Due to the complexity of the tourism sector, analysing the impacts of wind farms on tourist visitation to an area can be difficult, as there are various other factors which influence tourism demand, e.g., the value of the local currency, supply of activities, services and attractions, trends and weather [39]. The studies investigating whether tourism demand would be affected by a wind farm construction report different results, with some showing results that tourists tend to avoid areas with wind farms (see, e.g., in [49]) while most conclude that wind turbines would not influence tourists' destination choice (see, e.g., in [48]). However, even a small decrease in tourism demand can quickly have large repercussions for local economies [46].

Shedding light on the perceived impacts of wind farms from the perspective of the tourism industry is a needed contribution to the existing knowledge, as the beliefs of tourism service providers shape how they behave and make decisions, for example, when it comes to further investments and destination development [19,20]. Only few studies have focused on the perceived impacts of wind farms on tourism from the perspective of tourism service providers. A study by Frantál and Kunc [39] set out to investigate the possible negative impacts of wind turbine construction on tourism in two areas in the Czech Republic. It was based on a questionnaire survey among tourists, but also on interviews with local entrepreneurs from the sphere of tourism. The results revealed that entrepreneurs assumed that the wind energy infrastructure would not have a significant negative impact on the tourism industry, as they believed that tourists would not be disturbed by it, in particular, as many of the foreign visitors in the Czech Republic come from countries where wind farms are a common sight. Instead, they believed that the success of the tourism industry depended on the quality of services and the currency exchange rate. A recent study by Mordue et al. [17] about impacts of onshore wind farms on rural tourism in the UK reported that around two thirds of the participants (tourism-related businesses) said that onshore wind farms had not impacted their business in a negative way, while one-third said that they had. The findings with regard to impacts on turnover of tourism companies were quite neutral, as 34% said that turnover had increased, 30% said it had decreased and another 36% said it stayed the same. When asked whether wind farms would influence decision-making with regard to future business investment, almost half said that it was unlikely, whereas one-third said it was likely.

Other studies, however, concluded that tourism service providers perceive the impacts of wind farms on tourism to be negative. Silva and Delicado [48] conducted a study on attitudes towards wind turbines near a heritage site in Portugal. The results showed that residents in the area, including some with links to the tourism sectors, worried that the wind turbines would have a negative impact on the tourist experience, since the wind farms' modern appearance clashed with the historic site. In a study from Iceland [52] about a proposed wind farm in the southern Highlands, tourism service providers emphasised that the area's attraction stems from its pristine nature. Despite its proximity to seven hydro power plants, the area is perceived as natural, but adding highly visible wind turbines would transform the landscape of the southern Highlands from natural to more anthropogenic. The authors argue that "consequently, the area will attract different types of tourists groups—groups that will have a dissimilar connection to the landscape, and thus different planning as well as management requirements" [52]. The tourism service providers preferred the wind turbines to be placed in a more suitable area, one where the image of unspoilt nature which the industry is selling would not be impacted. In addition, the tourism service providers stressed the importance of maintaining vast and open land-

scape as a part of Iceland's image and therefore they regarded the proximity of the wind turbines to the onlooker as more important than the number and size of the turbines.

Studies have also discussed wind farms as potential tourist attractions and Frantál and Kunc [39] reported that 65% of their respondents expressed an interest in visiting wind farms with information centers. Silva and Delicado [48] argue that modern wind farms can become interesting tourist attractions in industrial areas, but that they would not generate the same interest in areas with natural or cultural heritage. In contrast to old windmills, which can be an important tourist attraction as, for example, in the Netherlands, where they are part of the cultural landscape and an element of the country's image [54,55], modern wind farms are standardised and look similar in most countries [47]. Thus, they are most likely to be "one visit" attractions. International tourists seek unique experiences and destinations, meaning that the attractiveness of standardised wind farms is low [47].

3. Methods

3.1. The Study Areas and Background

Iceland's wealth of renewable energy resources has been the base of the country's hydroelectric and geothermal power production, which started in the latter half of the last century. Of the total electricity produced in 2019, approximately 70% stems from hydro power and 30% from geothermal power, with less than 0,1% coming from non-renewable energy sources [9]. Furthermore, about 84% of the national energy consumption is based on hydro and geothermal power produced in Iceland [56]. The majority (80%) of electricity produced in Iceland is used for about seven international energy intensive factories, such as aluminium smelters [9]. While the electricity transmission system is largely built to ensure a steady supply of electricity to those heavy industry companies, certain areas of Iceland, e.g., in the Westfjords and some parts in the north, are excluded from the main transmission system and lack a stable and adequate supply of electricity [57].

There have been divergent ideas on the use of Iceland's bountiful renewable energy resources. In order to create greater consensus on the use of energy resources in Iceland, a governmental project called the Master Plan for Nature Protection and Energy Utilization (*Áætlun um vernd og orkunýtingu landsvæða*) was launched in 1999. It evaluates and ranks all proposed power plants with respect to their economic, social and environmental impacts and classifies them into three categories: energy utilisation category, protection category and on hold. The overall aim is to "reconcile the often competing interests of nature conservation and energy utilisation on a national scale and at the earliest planning stages" [58]. The power plant proposals which are put in the energy utilisation category are not automatically given permission to be built as they also have to go through an environmental impact assessment. Those which fall into the protection category are excluded from energy utilisation in the future and those which are on hold need further research for a final evaluation.

The Master Plan project is split into phases which last for about four years: phase 1 was from 1999 to 2003, phase 2 from 2004 to 2010, phase 3 from 2013 to 2017 and phase 4 began in 2017 and finished in March 2021. Phases 1 and 2 only evaluated hydro and geothermal power plant proposals, and in phase 3 two wind farm proposals were evaluated in addition to hydro and geothermal power plants. In phase 4, a total of 34 wind farm proposals were handed in to the Master Plan, reflecting the increased interest among energy companies to harness wind energy. The steering committee of the Master Plan assessed that only five of the proposals had sufficient data to be evaluated by the Master Plan. Three of them are in the west of Iceland, one in the north and one at the edge of the southern Central Highlands (Figure 1).

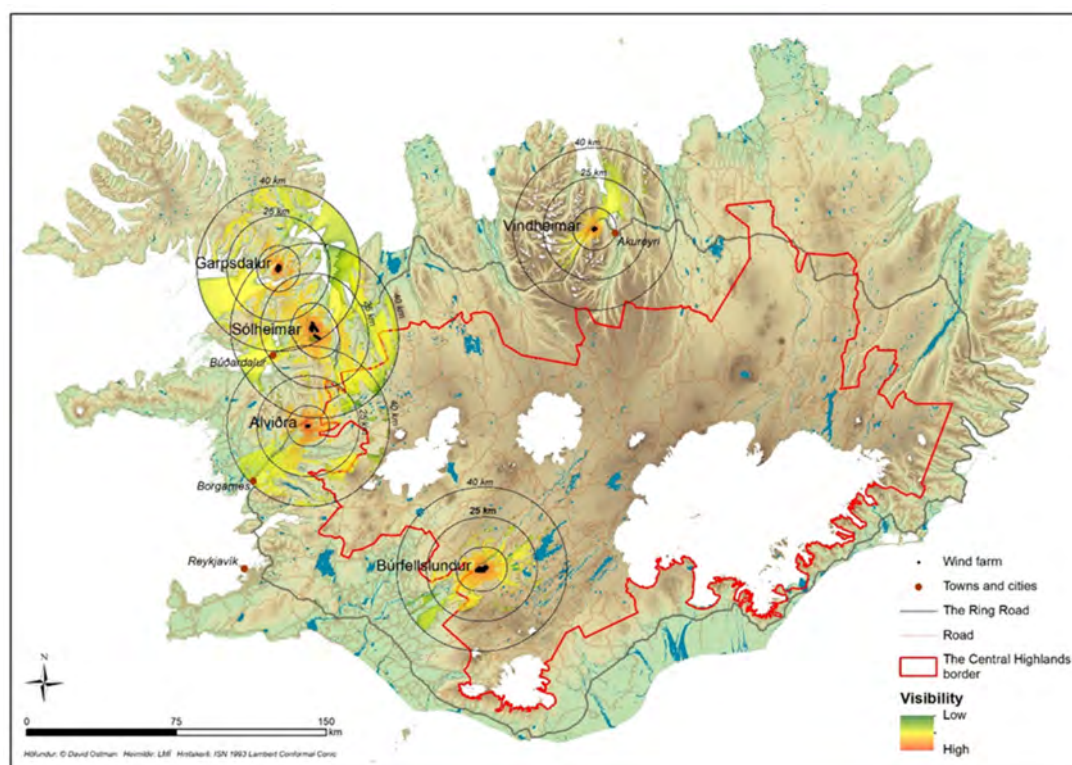


Figure 1. The five wind farms from the 4th phase of the Master Plan and their visibility.

The proposed wind farm Búrfellslundur is at the periphery of the southern Highlands and is the largest one with regard to the number of wind turbines (Table 1). It is located next to a road which functions as “the gateway” to the Central Highlands, an uninhabited natural area characterised by wilderness. This road leads to the most popular Highland destination called Landmannalaugar as well as many other Highland destinations. The proposed wind farm is furthermore close to the most developed power production area in the country, which includes six hydro power plants and their appendant infrastructure such as reservoirs and transmission lines. In addition, there are two experimental wind turbines which were set up there in 2012 to examine the practicality of wind energy utilisation in Iceland.

Table 1. The characteristics and locations of the five proposed wind farms.

	Búrfellslundur	Vindheimar	Alviðra	Sólheimar	Garpsdalur
Number of wind turbines	30	8–12	6	27	21
Estimated capacity	120 MW	40 MW	30 MW	151 MW	88 MW
Max. height of wind turbines	150 m	160 m	150 m	200 m	160 m
Location	At the gateway to the Central Highlands and popular wilderness areas	By the Ring Road, 15–20 km away from Akureyri (town)	By the Ring Road, 30–35 km away from Borgarnes (town)	Rural area, 20 km away from Búðardalur (village)	Rural area, 25 km away from Hólmavík (village)
Tourism and outdoor recreation	Hiking, jeep, bus, bike and horse tours	Hiking and skiing	Fishing, hiking and nature gazing	Very little use	Hiking
Nearby tourist attractions	Landmannalaugar, Hekla (volcano) Háifoss (waterfall)	Hraundrangar conical peaks	Grábrók (crater) Glanni (waterfall) Baula mountain	Very limited	Very limited

The wind farm in the north is called Vindheimar. It is located in a wide and fertile agricultural valley, just by the so-called Ring Road which is the main travel road in Iceland

as it circles the island and connects the capital Reykjavík with many towns and tourist destinations. One of those towns is Akureyri, the largest town in North Iceland. It is within a 15-min drive from the proposed wind farm. However, Vindheimar is not visible from Akureyri. The Hraundrangar conical peaks are the valley's most prominent tourist attraction. In addition, hiking and skiing activities are practised in nearby mountain areas.

Three of the proposed wind farms are located in the west of Iceland. One of them, called Alviðra, is, like Vindheimar, located in an agricultural valley next to the Ring Road. The area is a one-hour drive away from Reykjavík, there are a lot of second homes in the area and various recreational opportunities such as hiking and fishing. Based on the number of wind turbines, Alviðra is the smallest of the five proposed wind farms (Table 1).

The other two in the west, Sólheimar and Garpsdalur, are further to the north and more off the beaten track, especially Sólheimar which is located in a very sparsely populated rural area and by a road travelled by few. The wind farm Garpsdalur is even further to the north compared to Sólheimar. It is close to a road which goes to the Westfjords and is travelled rather frequently, though much less than the Ring Road. Few people live in the area of the proposed wind farm and there are some venues for outdoor recreation in the vicinity, mostly related to hiking.

3.2. Interviews

This study's aim was to investigate the perceptions and opinions of the tourism industry, and thus it adopted a qualitative approach with the aim of "interpreting phenomena in terms of the meanings people bring to them" [59]. Semi-structured interviews were chosen as the method in order to allow the participants to express what they see as relevant and important [60]. Overall, 47 interviews were conducted until theoretical saturation was reached [60] and the participants were sampled based on a purposive strategy in order to include different perspectives and thus ensure quality [60,61]. The aim was to interview tourism service providers which offer tours and/or other tourism services in the areas where the proposed wind farms would be built. As such, the study included both representatives from companies whose headquarters are close to the sites of the proposed wind farms as well as companies in other parts of the country, e.g., in the capital Reykjavík, but which use the wind farm sites for their business. When selecting participants, emphasis was put on interviewing managers of companies offering different tours, for example bus, jeep, helicopter, hiking, horse riding, skiing, glacier, whale watching and fishing tours, as well as accommodation service providers. The size of the companies varied as well, as some participants were self-employed while others worked in companies with 2–20 employees.

At the beginning of each interview, the aim of the study was presented to the participants, it was explained that the researchers would aim to preserve the participants' anonymity to the best of their ability and participants gave their consent. The participants were asked to express their personal opinion and perception of the impacts of the proposed wind farms on nature-based tourism, rather than company perspectives.

Then, the interviewer presented the various wind farm proposals to the participants, gave an overview of their installed capacities, and clarified where they would be located. In addition, the participants were presented a visibility map of each proposal, showing from which areas the wind turbines would be visible. The tourism service providers were then asked to specify which of the sites they used for their business, i.e., which areas they took their customers to. Naturally, some used only one of the sites while others took their customers to multiple sites. Overall, participants only expressed their opinion on wind farm proposals which were in areas they were familiar with. The length of the interviews varied in accordance with how many of the sites were familiar to each participant, but most lasted between 30 and 60 min. During the interview, participants were asked to describe how they use the proposed site(s), what the attraction of each area is for their customers and how the construction of a wind farm in the area(s) could impact their business and the Icelandic tourism industry in general. Those who were able to discuss more than one proposal were also asked to rank the wind farms according to how they evaluated their

impacts on tourism, from the proposal they preferred the most to the one they preferred the least.

The interviews were conducted between June and November 2020. During most of this time period, social distancing regulations were in place because of the Covid-19 pandemic. Therefore, many of the interviews were conducted via phone or through online meetings instead of in person. A limitation of particularly the phone interviews was that it did not allow for observations of facial expressions and body language, while online meetings provided at least the opportunity to see facial expressions [60]. The interviews were conducted either in Icelandic or English, depending on the preference of the participant. Most of the interviews were carried out by two researchers, but due to scheduling conflicts some were conducted by only one. All interviews were transcribed, and their analysis was conducted based on the grounded theory method using the software Atlas [62]. Open and axial coding were used, as well as diagrams for mapping out relationships [62,63]. The coding process was “cyclical rather than linear”, as described by Saldaña [63]. The definition and selection of codes was done by one of the researchers, but during the process of creating diagrams of the relations between the different codes, emerging ideas were discussed within the research team, as recommended by Saldaña [63].

4. Results

4.1. Perceived Impacts of the Proposed Wind Farms on Nature-Based Tourism

The attitudes of the participants towards the proposed wind farms were mostly negative due to their visual impacts on Iceland’s main attraction, i.e., its nature. The participants stated that all wind farm development would result in a decrease in the natural quality, which inevitably is negative for nature-based tourism. One of the participants said:

I think windmills are, in terms of tourism, speaking for myself, always negative because they look ugly and they just ruin the visibility.

The participants claimed that wind farms have severe visual impacts. One described that Icelandic nature was like “a beautiful painting” and that wind turbines would “rip apart the image of nature”. Another participant said:

Windmills, they’re kind of gross and vulgar. They’re so big and they are so humongous. They tower over the area.

Some also found that “windmills are always so visible because they are on the move. The blades are turning like crazy”. The visual impacts were regarded as particularly negative in landscape characterised by unspoilt nature. By building windmills in pristine nature, the landscape would be transformed into an industrial area and as such be less appealing to tourists. The participants argued that the visual impacts together with potential noise pollution would have a negative impact on tourists’ experience, as they would not experience the pristine nature they came to see in Iceland. The tourism service providers commonly said that tourists did not come to Iceland to see wind turbines. When asked about how wind turbines would affect the experience of tourists, one of the participants answered: “Negatively. They are big, ugly, man-made structures and not what they [tourists] came to see”. Another said:

The people are searching for this, this that you can stand somewhere and don’t see anything, except the grass and the rocks and the water. But if you see something like that [a wind farm] and you’re just ... it’s just fake, as I call it, just fake. It is not anymore what we are trying to sell, if I can put it like that, you know, the wild untouched wilderness.

When asked about what impacts the installment of wind turbines in Icelandic landscape would have on their business, one of the participants said:

It would mean that Iceland was less interesting because people are coming here to see untouched nature. They are only, almost only, coming to see that. They are not coming here to sleep or eat. So what are they doing here? Why did you choose Iceland then? Because it’s different from what they are used to. It has so much variety of landscapes, so

many things to see in one day. So, installing a windmill anywhere will have a negative impact on my business.

Some mentioned that certain hydro and geothermal power plants in Iceland function as tourist attractions for visitors, as they provide an educational experience for tourists. However, because wind farms are common in many countries, the tourism service providers doubted that they would be an interesting attraction. In fact, they said they would try to avoid wind farms should they be built. Where possible, they would choose routes from which the wind turbines would not be visible in order to still provide their customers with a positive nature experience in Iceland. Some said that they would stop visiting areas with wind turbines altogether, as the area “would then die as a recreational area”. One of the participants said:

You come into a beautiful area which has been polluted with such structures. The structures destroy it. You stop coming there. That is the risk.

Moreover, some pointed out that seeing wind turbines in the landscape could have a negative impact on Iceland’s image:

Tourists have their cameras up in the air, all days, in all weathers, everywhere along the way. And they are posting worldwide. This is marketing which we cannot control. They say that Iceland is great, but it will not stay this way if they start posting pictures of wind farms.

Another said:

Tourists want to see the cute image of Iceland and not some blades of wind turbines spinning on top of some mountain. That is never great for the image.

If the image of Iceland would be negatively impacted, it would create a “chain reaction”, since it might decrease tourists’ motivation to travel to Iceland and thus ultimately result in economic losses for the tourism industry and the country as a whole.

Still, according to the participants, certain benefits of building wind farms can outweigh the negative impacts on the tourism industry, particularly in areas with a shortage of energy. In areas where the demand for energy exceeds the supply, participants showed a greater understanding for the development of wind farms. Participants claimed that local energy production could provide areas with opportunities to develop new businesses, including in tourism, as well as support already existing businesses. Moreover, strengthening local businesses and employment opportunities counteracts outmigration from the rural areas, which is necessary if the tourism industry wants to be able to thrive in sparsely populated areas. The participants pointed out that renewable energy, including wind energy, generally has a positive image, which the tourism industry could use to their advantage. By telling the “the right story” about wind energy, tourism service providers could mitigate the negative impacts on the tourist experience and thus try to limit the damage of the construction of wind farms. One of the participants described how he was “telling this story” when travelling with his tour group in an area with hydro power plants and how the same could be applied to wind farms:

I cannot take these energy constructions down. Instead, I need to be creative and tell this story in a positive way and make the constructions become friends rather than enemies of the tourists. So, then I am always looking for ways to tell this story, highlighting the positive and trying to strengthen this relationship: “Okay, here is a power plant and it has also done a lot of good. It did this and this and that”.

If the wind farm would be built in an area with energy shortages, it would make it easier to highlight the benefits of the installation. However, if the participants felt that there was generally no need to increase energy production, they perceived that the impact of wind farm constructions would be mostly negative.

There were also a few tourism service providers who believed that wind farms would have no effect on the tourist experience because wind energy production is common in

the home countries of many tourists. Moreover, due to wind energy's positive image as a "green" energy source, they did not believe that tourists would be negative towards potential wind farms. One of the participants, for example, said:

One thing you say about it [wind energy production] is that it is green energy and it is something that people are used to seeing from their home countries, very much in Europe. Although it is probably not beautiful to have it in your backyard, it is something that people have an understanding for and that we are creating green energy and it can be removed at any time and without any trace. So, I do not think there is any damage to the nature. Actually, I would say it will not really have an impact on peoples' travelling plans.

Last, a few participants also hoped that the development of wind farms could have a positive impact on the tourism industry in the form of improved access.

One good thing about all power plants—especially the ones in Þjórsá [hydro power plant], Kárahnjúkar [hydro power plant] and many of the other ones—they have improved roads. They have built roads, they have opened up areas for us that are not driving a 4 × 4 or a super jeep and monster tyres. We can get there, we can see these beautiful areas. [...] That's why I said in Gilsfjörður [location for Garpsdalur]: "Yeah, okay. If you build the power station there, maybe the roads will be better, and I will not have two flat tyres there."

4.2. Locations of Wind Farms

Following the conclusion that the impacts of wind farms on nature-based tourism would be mostly negative, this research aimed to determine which of the five proposed wind farms would lead to the least negative impact compared to the wind farms in other proposals, according to the tourism service providers. The results revealed that the participants evaluated and ranked the proposed wind farms and their impacts on tourism based on five factors.

The first factor was the degree of visibility and the number of wind turbines. The participants were generally of the opinion that the less the wind farms would be visible, the better. As such, flat landscape where "you can see it from 20–30 km when you are driving there, and then the other 30 when you are driving away" was not a good location for a wind farm, as this participant explained:

I see it then all day when I drive out here and then back again. So, I do not want to be driving to the windmill park for three hours and always have it in front of my car.

Four of the wind farms were regarded as having a high degree of visibility, which was due to either a flat landscape and/or a high number of wind turbines. Vindheimar, on the other hand, would have the second fewest wind turbines and would also be located in a valley where the turbines would be "locked in by mountains", which meant that the wind turbines would be less visible compared to the remaining four wind farms (see also Figure 1).

Second, the number of tourists that visit the area of a proposed wind farm or nearby areas, either by staying or travelling through the area, was considered to play a role in determining the wind farm's impacts on tourism. Those areas which are visited by many tourists were regarded as less suitable locations for wind farms, since the wind turbines could create a negative experience for a large number of tourists. Vindheimar and Alviðra would be located along the busy Ring Road, which runs around the island, and it is very popular among tourists to drive the circle. Consequently, "everybody will see it [the wind farm], that is for sure", one of the participants said. The wind farm Búrfellslundur has also been proposed along a popular tourist route crossing the Highlands. These three wind farms were, thus, said to have a negative impact on many tourists, as opposed to Garpsdalur and Sólheimar which would be outside of the main travel routes and far fewer tourists would travel by. When asked how tourists would perceive wind farms in Iceland, one of the participants said:

It all depends on where you put them. But, I mean, of course, if you put them in out-of-the-way places like in Gilsfjörður [location for Garpsdalur], where no one actually travels because everyone uses the new bridge, I don't think it will affect them that much.

As the third aspect, the participants made a distinction between the wind farm proposals based on whether the wind farms would be in areas with tourist attractions. Of the five proposals, most participants agreed that the area where the wind farms Sólheimar and Garpsdalur would be located was “a drive through part of the country where you don't really stop” and had no special tourist attractions. One of the participants said that the area around Sólheimar “is commonly known among us tour guides as the area where we let the group sleep”, as they considered the landscape to be quite monotone. With regard to Garpsdalur, another participant said:

In that area, there just is not a lot of interesting nature nor are there interesting attractions. There hasn't been any success in creating interesting attraction for tourists there and that will always remain difficult, since it is not along the Ring Road nor close to any popular places.

The wind farm Vindheimar in the north was said to be in the proximity of areas interesting for adventure tourism such as skiing, hiking and climbing in challenging terrain due to its “artic and alpine atmosphere”, but for the “general” tourist interested in sightseeing the area was said to have no special attraction. Therefore, while some participants claimed that the area was experiencing a tourism boom with a lot of innovation in nature-based tourism, others described the area as an uninteresting “transit area” for tourists on their way to or from Akureyri. Most participants agreed that Alviðra and Búrfellslundur were proposed in areas with many tourist attractions nearby, making them less suitable locations for wind farms in comparison to the other three. With regard to Alviðra, one of the participants said:

The area around Grábrók [volcanic crater] is very beautiful. The lava field and of course Grábrók itself are attractions at which many people stop. Groups stop and walk up Grábrók so it is a very sensitive area, I would say.

Another described the reactions of tourists who they had accompanied to Grábrók near Alviðra in the following way:

They always say like “Wow, this is a beautiful view”. [...] I am sure that every single person who goes to this valley and walks up to Grábrók and looks down [on the wind farm] would say: Ugh, it is a shame that that is there.

Most participants agreed that Búrfellslundur was “close to such valuable natural wonders”, such as the volcano Hekla and the waterfalls Háifoss and Gjáfoss, and many used the area for tours with their customers:

It's really weird to choose this point. Why don't you put it somewhere else? This is actually surrounded with amazing nature, all around. I mean this is one of the few places in Iceland that are just like crowded with amazing nature. And we are here a lot [with our customers].

Closely related to whether an area has tourist attractions, is the fourth aspect brought up by the participants, namely, whether or not a wind farm site and its surrounding areas are perceived as unspoilt by travellers. Unspoilt natural areas have the potential to be attractive to tourists and therefore building a wind farm in areas which currently have no human-made structures was perceived to have a more negative impact, compared to wind farms in agricultural or industrial areas. For instance, one of the participants explained that the pristine Highlands would be an unsuitable location for wind farms:

We should preserve the Highlands as a place of unspoilt nature or minimise the human touch to it. I think it's our duty to do that as we still have this part of land and we're able to do it.

When discussing the proposal of Búrfell, another said:

I would rather put them [wind farms] in the lowlands. I would prefer not to put them in areas which we have defined as unspoilt wilderness, one of the world's treasures. If we have enough space, do we then need to put it there [at the edge of the Highlands]?

Many found areas with human-made structures to be more suitable locations for wind farms, such as this participant who said:

I would just say, why not build it closer to Reykjavík? Because then it just integrates in the city infrastructure. And I think, if you want to build windmills, then just do it more in a city infrastructure and not like out in nature.

However, the perception of what constitutes an unspoilt area varied greatly between participants. For some an unspoilt area was equal to an uninhabited area where there were no houses and roads. For others, an unspoilt area could still contain farms and roads, but if it had energy infrastructure (e.g., boreholes, dams, powerlines, etc.) or other industrial infrastructure it could not be regarded as unspoilt anymore.

For example, some perceived Sólheimar, Garpsdalur, Vindheimar and Alviðra to be located in anthropogenic landscapes with houses and roads and as such they did not believe that these landscapes had a high value for tourism. However, others regarded the areas as beautiful agricultural landscapes due to their natural appearance and lack of industrial infrastructure. One participant, who opposed Vindheimar, said:

I think this is a terrible place [for a wind farm]. This is in the middle of agricultural landscape which in itself is, how can I say it, low-key and charming. The Icelandic agricultural landscape is most often low-key and beautiful and it would be terrible to get such big windmills in there. I think that would be very bad.

Furthermore, due to the high visibility of wind turbines their impacts on the landscape and consequently on tourism were perceived by some participants to exceed the areas of their construction. As such, some participants supported the installation of Búrfellslundur wind farm based on the fact that its proposed location is next to existing hydro power infrastructure and believed that the area had already been “destroyed”. Others opposed its construction since the wind turbines would also be visible from pristine natural areas in the proximity of the wind farm site:

This is in an area we are selling as being one of the most remote areas in Iceland where you go up in the nature and we have very little houses and signs of civilisation. So, that is definitely in a part where you are going to look to experience the desert and have nothing. And then of course a windmill park is something that does not really fit to that.

Some participants stressed that the impacts of wind turbines on the tourist experience would extend beyond their visual impacts and would be felt in natural areas reached by travelling past the wind farms. One participant discussing the impacts of Búrfellslundur said:

[The impacts] would reach the ones that are going up from Búrfell [a mountain by the main road into the Highlands] definitely—the ones that are going to Gjáin [canyon], to Háifoss [waterfall], the ones that are going across to Sprengisandur [the main road through the Highlands] and over to Fjallabak Nature Reserve which is the Landmannalaugar area [the most popular Highland destination], the ones that are going for a trip up Hekla [volcano], both Hekla and Veðivötn [fishing lakes] and all of that area. It would definitely affect the people going to these areas.

The last determining factor for the suitability of a wind farm site was if the nearby area is suffering from a lack of energy or not. Overall, many found that there was no need to increase the production of electricity and believed that the plans for new power plants were in the interest of power intensive industry instead of the local population. One of the participants said:

If we absolutely desperately need more electricity, not for another aluminium smelter but something else, simply the population of Iceland, ok, then we must sacrifice these areas. But to export or to build another aluminium smelter... No, we don't need that.

As already mentioned, participants stated that the construction of wind farms is justifiable in areas where there is not enough energy for the population and businesses. In the context of the study areas, many participants believed that the energy production is sufficient in all areas, but out of the five wind farms three (Vindheimar, Garpsdalur and Sólheimar) were found to be in areas with a higher need for more energy compared to the other two. This was due to the lack of steady electricity supply in the west and north of Iceland. One of the participants described the need for electricity in Akureyri, close to Vindheimar:

Many times a year we get power cuts in Akureyri. Many times a year. That is only due to the fact that there is not enough supply of electricity towards this area nor within it. When these power cuts happen, we have the hospital running on diesel engines. [...] That is totally unacceptable.

Based on these five factors, the tourism service providers perceived that Búrfellslundur and Alviðra would have the most negative impact on tourism, while Sólheimar and Garpsdalur would have the least negative impact (Figure 2). Most participants found that Búrfellslundur and Alviðra would be located in areas where the wind turbines would be very visible from important tourist attractions, thereby impacting the experience of many tourists. Sólheimar and Garpsdalur, on the other hand, were considered to be more acceptable, as they would be located in areas with fewer tourists and attractions. Vindheimar was perceived as having neither the most nor the least negative impact of the five proposals. Its main advantage was the low visibility of the wind turbines, while its main disadvantage was the proximity to the busy Ring Road.

Proposed wind farm	Sólheimar	Garpsdalur	Vindheimar	Alviðra	Búrfellslundur
Factors					
Visibility of wind turbines	High	High	Low	High	High
Number of tourists	Few	Few	Many	Many	Many
Tourist attraction(s)	Few	Few	Disputed	Many	Many
Unspoilt nature	Disputed	Disputed	Disputed	Disputed	Disputed
Need for energy in the area	Disputed	Disputed	Disputed	No	No
Perception of impacts					
	Least negative			Most negative	

Figure 2. The tourism industry's ranking of the proposed wind farms according to their impacts on nature-based tourism.

5. Discussion

This study aimed to analyse what impacts wind farms would have on nature-based tourism as perceived by the tourism industry and what key factors need to be taken into account when considering an acceptable location for a wind farm with regard to the interests of the tourism industry. The findings revealed that the tourism service providers identified visual pollution as the most severe impact of wind farms on nature-based tourism, which is in line with previous studies, showing that both the public and tourists

regard visual impacts of wind turbines as the most negative ones [1,6–8,36,38,39,47,51]. Wind farms change the character and appearance of the landscape and since the quality and aesthetics of Iceland's nature are the key elements for the success of the tourism industry [15,20,52], wind energy development was generally considered as a threat to the tourism industry. In other words, pristine nature is the most important resource for Iceland's tourism industry and thus a degradation in the natural quality will inevitably impact tourism in a negative way. In line with Ólafsdóttir and Sæþórsdóttir [52], the tourism service providers in Iceland feared that wind energy development in relatively pristine nature would have a negative impact on the image of the country. This, in turn, could lead to a change in the composition of tourists travelling to Iceland, repelling those who seek to experience pristine nature and wilderness and attracting target groups who are not as sensitive to human-made structures [52]. Moreover, the participants feared that wind farms could also decrease Iceland's attractiveness and competitiveness as a tourist destination, thereby affecting both individual businesses as well as the tourism industry as a whole. Similarly to de Sousa and Kastenholz [47], the tourism service providers considered the potential of wind farms in Iceland to become tourist destinations as low.

These findings are in contrast with some previous studies (see, e.g., in [17,39]) which found that most tourism service providers do not perceive wind farms as a threat to tourism demand nor business turnover. In Frantál and Kunc's study [39] in the Czech Republic, the tourism entrepreneurs believed that the success of the tourism industry depended first and foremost on the quality of services and the currency exchange rate and that tourists' destination choice was not dictated by the installation of wind turbines. In the case of Iceland, as this study as well as others [15,20,52] show, the aesthetics of the nature and landscape play the most important role in shaping tourism demand [52]. This points to the need for shedding light on what the tourism industry perceives as its most valuable resource, when evaluating potential impacts of wind farms on the tourism industry. If the tourism industry relies on the natural quality and appearance of the landscape, the industry might perceive wind farms as a greater threat, compared to tourism destinations where the demand is shaped by other factors, such as the quality of service provided.

Furthermore, the study identified five factors which determine the severity of the negative impacts of wind farms on nature-based tourism according to the tourism industry. Consequently, these factors should be taken into careful consideration when selecting sites for wind farms in order to ensure the least negative impact of wind farms on the tourism industry: wind turbines should not be located in areas (1) where they would be highly visible, (2) where many tourists go or travel through, (3) where there are (many) tourist attractions, (4) which are characterised by pristine nature and (5) where there is no need for increased electricity production (Figure 3). The attitudes of the tourism industry towards wind farms thus align to some extent with public attitudes, since previous studies found that the public prefers to install wind turbines in industrial or military areas rather than in recreational areas, nature reserves and wilderness areas [29,43,44]. In addition, public and tourist industry attitudes towards wind farms are both impacted by the degree of visibility, i.e., how far the wind turbines are from the onlooker [45] and how many wind turbines are installed [45,46].

Iceland is in the enviable position of being bountiful in terms of its pristine landscape which attracts tourists to the country. At the same time, the country's climate is characterised by strong winds, making wind farm development feasible. In light of this, and as Iceland is at a crossroads regarding future land use for wind energy development and nature-based tourism, it is an interesting case for examining the interplay of the wind energy sector and the tourism industry. It provides an opportunity to address potential conflicts between the two industries and influence planning strategies right from the start. It is likely that wind turbines will become a new feature in the Icelandic landscape. In fact, in between the time that the data for this study was collected and this article was written, the Master Plan for Nature Protection and Energy Utilization completed the evaluation of the five wind farm proposals discussed in this study. Three of them—Garpsdalur, Vindheimar

and Alviðra—were put in the energy utilisation category and the remaining two were put on hold [64]. The huge increase in the interest in wind energy development in Iceland has also called for some changes in the legal environment regarding renewable energy development in Iceland. The Minister for the Environment and Natural Resources has suggested a change to article nr. 48/2011 concerning the protection and energy utilisation plan. The proposal suggests to divide Iceland's surface into three categories: (1) areas where wind farms would be prohibited, (2) areas where wind farms would need to be evaluated by the Master Plan for Nature Protection and Energy Utilization, and (3) areas where permissions for building wind farms would only be in the hands of the local municipality [65]. If the amendment will be accepted, the lack of restrictions for building wind farms in specific areas could lead to a significant impact on tourism in the country, with wind turbines becoming a common sight. The findings of this study point out that this would pose a threat to Iceland's image and thereby to the tourism industry. Iceland's competitive advantage in the global tourism industry is based on its pristine nature, and an abundance of wind turbines could lead to a loss of Iceland's attraction. Furthermore, giving municipalities full control over the permissions for building wind farms in certain areas can result in negligence of the impacts that wind farms can have beyond the boundaries of the municipality. For instance, a municipality may decide to give a permission for building a wind farm within its boundaries in order to take advantage of the wind farm's economic benefits. However, while the wind farm may be located in a municipality without tourist attractions and services, the wind farm can impact the experience of tourists travelling through the municipality on their way to nearby areas which are rich in tourist attractions and services. Thereby, the wind farm can cause economic losses for tourism businesses in adjacent municipalities.

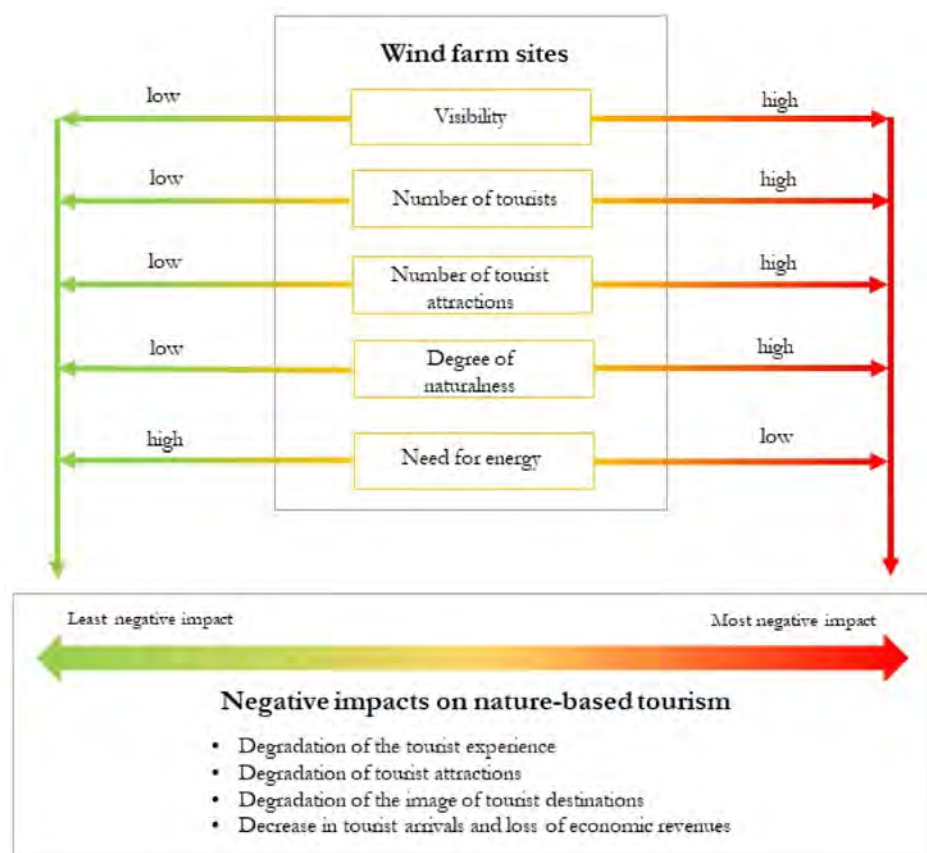


Figure 3. Factors affecting the severity of negative impacts of wind farms on nature-based tourism as perceived by the tourism industry.

The participants in this study also discussed the need for building more power plants in Iceland and many feared that the motivation behind new power plants was rather in the interest of large multi-national companies than the local population. They stressed that wind energy development should only be allowed if there is a local need for increasing electricity production. Overall, the findings of this study thus emphasise the importance of holistic planning of wind energy development, which takes into consideration the need for further electricity production, the wide-reaching impacts of wind farms and the needs of the diverse stakeholders, including the tourism industry.

Installing wind turbines in more suitable areas, i.e., areas where the turbines would have a low visibility, where the number of tourists and tourist attractions is low, where nature has already been partly spoilt and where the need for energy is high, does not mean that all conflicts with the tourism industry will be avoided. From the perspective of the tourism service providers, wind farms have a mostly negative impact on the industry, regardless of their location. Moreover, defining which areas are more suitable for wind farms according to the five factors is not unproblematic. For instance, while all participants agreed that protecting pristine nature was of vital importance for the success of the tourism industry, their perception of what constitutes unspoilt nature varied. For some, an unspoilt area could still contain farms and roads as long as there was no energy or industrial infrastructure, whereas others believed that a natural area was only unspoilt if it did not contain any human-made structures. Similarly, an area can contain attractions for customers of a particular tourism business, whereas other businesses might see no appeal for their customers in the area. Furthermore, even if wind farms are placed in an area which is perceived as industrial, high wind turbines are likely to visually impact surrounding areas, some of which may be perceived as natural or unspoilt [66]. This points to the importance of including tourism stakeholders in the planning process, when deciding on locations for wind farms. Wind farm sites can be perceived in different ways by their users, and in order to ensure greater compatibility between the tourism industry and the energy sector, these multiple meanings assigned to the sites and to the wind energy infrastructure need to be identified, analysed and considered.

6. Conclusions

This study has provided an understanding of the conflicts which can arise between two land use sectors, that is wind energy harnessing and nature-based tourism. Furthermore, it has identified ways in which both parties can mitigate potential conflicts and minimise the negative impacts of wind farms on nature-based tourism. By identifying five factors which make certain locations more suitable for wind energy development with regard to the interests of the tourism industry, this study facilitates the decision-making of energy companies and policy makers and provides them with tools to achieve stronger tourism stakeholder support for the individual wind energy projects. Energy companies can make an effort to situate wind turbines in areas, where they would have less of a negative impact on the tourism industry compared to other areas. Similarly, the tourism service providers can adjust their operations, either by “telling a positive story” about the importance of renewable energy or, in some cases, change the travel routes of their customers. Overall, this study thus supports Frantál and Kunc’s [39] conclusion that there are no ideal wind farm sites, only “more or less acceptable areas”. It provides an understanding for how to define a “more acceptable area” in the hopes of highlighting ways towards higher compatibility of wind energy harnessing with the tourism industry and preservation of the natural resources which the tourism industry relies on.

A limitation of this study is that the participants were asked to express their opinion on something which does not yet exist and may never exist. This study focused only on proposed wind farms as there are currently no wind farms in Iceland. Previous studies focusing on tourism stakeholder attitudes towards energy infrastructure [66–68] have shown that they tend to be more negative towards proposed renewable energy infrastructure compared to the existing one. Thus, it is possible that the opinions of tourism service

providers will change if/once the wind farms will be constructed. This provides great opportunities for conducting research in the same study areas after the construction of the wind farms to investigate the potential changes in tourism service provider attitudes and the factors causing these changes.

This study focused on nature-based tourism and its interrelationships with wind energy harnessing. In the future, it would be interesting to investigate the opinions of tourism service providers in the sphere of other types of tourism, such as cultural or heritage tourism, to illustrate which areas they would consider as “more acceptable” for wind farms and to what extent the attitudes of tourism service providers from different spheres of tourism differ or align. Similarly, the suitability of areas for wind energy harnessing from the perspective of tourists could be analysed and related to the perceptions of the tourism industry.

Due to the high visibility of wind farms and their vast impact on the landscape, future wind energy development is likely to pose challenges in areas of high-quality nature and with strong nature-based tourism [7,21]. Wind energy development in such areas will therefore raise important public policy questions with regard to the trade-offs between land use for nature-based tourism and for wind energy harnessing.

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References

1. Wolsink, M. Wind power implementation: The nature of public attitudes: Equity and fairness instead of backyard motives. *Renew. Sustain. Energy Rev.* **2007**, *11*, 1188–1207. [\[CrossRef\]](#)
2. Dai, K.; Bergot, A.; Liang, C.; Xiang, W.-N.; Huang, Z. Environmental issues associated with wind energy—A review. *Renew. Energy* **2015**, *75*, 911–921. [\[CrossRef\]](#)
3. REN21. *Renewables 2020 Global Status Report*; REN21 Secretariat: Paris, France, 2020.
4. Rand, J.; Hoen, B. Thirty years of North American wind energy acceptance research: What have we learned? *Energy Res. Soc. Sci.* **2017**, *29*, 135–148. [\[CrossRef\]](#)
5. Felber, G.; Stoeglehner, G. Onshore wind energy use in spatial planning—A proposal for resolving conflicts with a dynamic safety distance approach. *Energy Sustain. Soc.* **2014**, *4*, 22. [\[CrossRef\]](#)
6. Pasqualetti, M.J.; Gipe, P.; Righter, R.W. *Wind Power in View: Energy Landscapes in A Crowded World*; Academic Press: Cambridge, MA, USA, 2002.
7. Smardon, R.; Pasqualetti, R.J. Social acceptance of renewable energy landscapes. In *The Renewable Energy Landscape: Preserving Scenic Values in Our Sustainable Future*; Apostol, D., Palmer, J., Pasqualetti, M., Smardon, R., Sullivan, R., Eds.; Routledge: London, UK, 2016; pp. 108–144.
8. Suškevičs, M.; Eiter, S.; Martinat, S.; Stober, D.; Vollmer, E.; de Boer, C.; Buchecker, M. Regional variation in public acceptance of wind energy development in Europe: What are the roles of planning procedures and participation? *Land Use Policy* **2019**, *81*, 311–323. [\[CrossRef\]](#)
9. Orkustofnun. *Installed Electrical Capacity and Electricity Production in Icelandic Power Stations 2019*; Orkustofnun: Reykjavík, Iceland, 2020.
10. Arnórsson, S. *Jarðhiti og Jarðarauðlindir [Geothermal Energy and Earth Resources]*; Hið íslenska bókmenntafélag: Reykjavík, Iceland, 2017.
11. Gíslason, S. *Lokaskýrsla Verkefnisstjórnar 3.áfanga Verndar—og Orkunýtingaráætlunar 2013–2017 [The Final Report from the Project Management of the 3rd Phase of the Master Plan for Nature Protection and Energy Utilization 2013–2017]*; The Master Plan for Nature Protection and Energy Utilization: Reykjavík, Iceland, 2016.

12. Sæþórsdóttir, A.D.; Saarinen, J. Challenges due to changing ideas of natural resources: Tourism and power plant development in the Icelandic wilderness. *Polar Rec.* **2015**, *52*, 82–91. [\[CrossRef\]](#)
13. Icelandic Tourism Dashboard. Hagstaerðir í Ferðaðþjónustu á Íslandi: Gjaldeyrstekjur Eftir Flokkum [Economic Variables of the Tourism Industry in Iceland: Foreign Exchange Earnings by Category]. Available online: <https://www.maelabordferdathjonustunnar.is/is/hagstaerdir/hagstaerdir-2> (accessed on 21 April 2021).
14. Icelandic Tourist Board. Number of Foreign Visitors. n.d. Available online: <https://www.ferdamalastofa.is/en/research-and-statistics/numbers-of-foreign-visitors> (accessed on 21 April 2021).
15. Óladóttir, O.P. *Erlendir Ferðamenn á Íslandi 2019: Lýðfræði, Ferðahegðun og Viðhorf* [International Tourists in Iceland 2019: Demographics, Travel Behaviour and Attitudes]; The Icelandic Tourist Board: Reykjavík, Iceland, 2020.
16. Demeritt, D. What is the ‘social construction of nature’? A typology and sympathetic critique. *Prog. Human Geogr.* **2002**, *26*, 767–790. [\[CrossRef\]](#)
17. Mordue, T.; Moss, O.; Johnston, L. The impacts of onshore-windfarms on a UK rural tourism landscape: Objective evidence, local opposition, and national politics. *J. Sustain. Tour.* **2020**, *28*, 1882–1904. [\[CrossRef\]](#)
18. Van der Duim, R. Tourismscapes an actor-network perspective. *Annal. Tour. Res.* **2007**, *34*, 961–976. [\[CrossRef\]](#)
19. Shepherd, D.A.; Williams, T.A.; Patzelt, H. Thinking About Entrepreneurial Decision Making: Review, Integration, and Research Agenda. *Acad. Manag. Proc.* **2014**, *2014*, 10205. [\[CrossRef\]](#)
20. Sæþórsdóttir, A.D.; Hall, C.M. Contested Development Paths and Rural communities: Sustainable Energy or Sustainable Tourism in Iceland? *Sustainability* **2019**, *11*, 3642. [\[CrossRef\]](#)
21. Bishop, I. *Preface in The Renewable Energy Landscape—Preserving Scenic Values in our Sustainable Future*; Apostol, D., Palmer, J., Pasqualetti, M., Smardon, R., Sullivan, R., Eds.; Routledge: London, UK, 2016.
22. Spenceley, A. *The Future of Nature-Based Tourism: Impacts of Covid-19 and Paths to Sustainability*; Luc Hoffmann Institute: Gland, Switzerland, 2021.
23. Sovacool, B. What are we doing here? Analyzing fifteen years of energy scholarship and proposing a social science research agenda. *Energy Res. Soc. Sci.* **2014**, *1*, 1–29. [\[CrossRef\]](#)
24. Hevia-Koch, P.; Jacobsen, H.K. Comparing offshore and onshore wind development considering acceptance costs. *Energy Policy* **2019**, *125*, 9–19. [\[CrossRef\]](#)
25. Marques, A.T.; Santos, C.D.; Hanssen, F.; Muñoz, A.; Onrubia, A.; Wikelski, M.; Moreira, F.; Palmeirim, J.M.; Silva, J.P. Wind turbines cause functional habitat loss for migratory soaring birds. *J. Anim. Ecol.* **2019**, *89*, 93–103. [\[CrossRef\]](#) [\[PubMed\]](#)
26. Nazir, M.S.; Ali, N.; Bilal, M.; Iqbal, H.M. Potential environmental impacts of wind energy development: A global perspective. *Curr. Opin. Environ. Sci. Heal.* **2020**, *13*, 85–90. [\[CrossRef\]](#)
27. Dear, M. Understanding and Overcoming the NIMBY Syndrome. *J. Am. Plan. Assoc.* **1992**, *58*, 288–300. [\[CrossRef\]](#)
28. Wüstenhagen, R.; Wolsink, M.; Bürer, M.J. Social acceptance of renewable energy innovation: An introduction to the concept. *Energy Policy* **2007**, *35*, 2683–2691. [\[CrossRef\]](#)
29. Petrova, M.A. NIMBYism revisited: Public acceptance of wind energy in the United States. *Wiley Interdiscip. Rev. Clim. Chang.* **2013**, *4*, 575–601. [\[CrossRef\]](#)
30. van der Horst, D. NIMBY or not? Exploring the relevance of location and the politics of voiced opinions in renewable energy siting controversies. *Energy Policy* **2007**, *35*, 2705–2714. [\[CrossRef\]](#)
31. Wolsink, M. Invalid theory impedes our understanding: A critique on the persistence of the language of NIMBY. *Trans. Inst. Br. Geogr.* **2006**, *31*, 85–91. [\[CrossRef\]](#)
32. Jones, C.R.; Eiser, R.J. Understanding ‘local’ opposition to wind development in the UK: How big is a backyard? *Energy Policy* **2010**, *38*, 3106–3117. [\[CrossRef\]](#)
33. Hoen, B.; Firestone, J.; Rand, J.; Elliot, D.; Hübner, G.; Pohl, J.; Wiser, R.; Lantz, E.; Haac, T.R.; Kaliski, K. Attitudes of U.S. Wind Turbine Neighbors: Analysis of a Nationwide Survey. *Energy Policy* **2019**, *134*, 110981. [\[CrossRef\]](#)
34. Baxter, J.; Morzaria, R.; Hirsch, R. A case-control study of support/opposition to wind turbines: Perceptions of health risk, economic benefits, and community conflict. *Energy Policy* **2013**, *61*, 931–943. [\[CrossRef\]](#)
35. Devlin, E. Factors Affecting Public Acceptance of Wind Turbines in Sweden. *Wind. Eng.* **2005**, *29*, 503–511. [\[CrossRef\]](#)
36. Johansson, M.; Laike, T. Intention to respond to local wind turbines: The role of attitudes and visual perception. *Wind. Energy* **2007**, *10*, 435–451. [\[CrossRef\]](#)
37. Pasqualetti, M.J.; Smardon, R. Conserving scenery during an energy transition. In *The Renewable Energy Landscape: Preserving Scenic Values in our Sustainable Future*; Apostol, D., Palmer, J., Pasqualetti, M., Smardon, R., Sullivan, R., Eds.; Routledge: London, UK, 2017; pp. 17–40.
38. Warren, C.R.; Lumsden, C.; O’Dowd, S.; Birnie, R.V. Green pn Green: Public perceptions of wind power in Scotland and Ireland. *J. Environ. Plan. Manag.* **2005**, *48*, 853–875. [\[CrossRef\]](#)
39. Frantál, B.; Kunc, J. Wind turbines in tourism landscapes: Czech Experience. *Annal. Tour. Res.* **2011**, *38*, 499–519. [\[CrossRef\]](#)
40. Devine-Wright, P. Rethinking NIMBYism: The role of place attachment and place identity in explaining place-protective action. *J. Community Appl. Soc. Psychol.* **2009**, *19*, 426–441. [\[CrossRef\]](#)
41. Devine-Wright, P.; Howes, Y. Disruption to place attachment and the protection of restorative environments: A wind energy case study. *J. Environ. Psychol.* **2010**, *30*, 271–280. [\[CrossRef\]](#)

42. van Veelen, B.; Haggett, C. Uncommon ground: The role of different place attachments in explaining community renewable energy projects. *Sociol. Rural.* **2016**, *57*. [CrossRef]
43. Wolsink, M. Planning of renewables schemes: Deliberative and fair decision-making on landscape issues instead of reproachful accusations of non-cooperation. *Energy Policy* **2007**, *35*, 2692–2704. [CrossRef]
44. Meyerhoff, J.; Ohl, C.; Hartje, V. Landscape externalities from onshore wind power. *Energy Policy* **2010**, *38*, 82–92. [CrossRef]
45. Molnarova, K.; Sklenicka, P.; Stiborek, J.; Svobodova, K.; Salek, M.; Brabec, E. Visual preferences for wind turbines: Location, numbers and respondent characteristics. *Appl. Energy* **2012**, *92*, 269–278. [CrossRef]
46. Riddington, G.; McArthur, D.; Harrison, T.; Gibson, H. Assessing the economic impact of wind farms on tourism in Scotland: GIS, surveys and policy outcomes. *Int. J. Tour. Res.* **2009**, *12*, 237–252. [CrossRef]
47. de Sousa, A.J.G.; Kastenholz, E. Wind farms and the rural tourism experience—problem or possible productive integration? The views of visitors and residents of a Portuguese village. *J. Sustain. Tour.* **2015**, *23*, 1236–1256. [CrossRef]
48. Silva, L.; Delicado, A. Wind farms and rural tourism: A Portuguese case study of residents' and visitors' perceptions and attitudes. *Morav. Geogr. Rep.* **2017**, *25*, 248–256. [CrossRef]
49. Sæþórsdóttir, A.D.; Ólafsdóttir, R.; Smith, D. Turbulent times: Tourists' attitudes towards wind turbines in the Southern High-lands in Iceland. *Int. J. Sustain. Energy* **2018**, *37*, 886–901. [CrossRef]
50. Sæþórsdóttir, A.D.; Ólafsdóttir, R. Not in my back yard or not on my playground: Residents and tourists' attitudes towards wind turbines in Icelandic landscapes. *Energy Sustain. Dev.* **2020**, *54*, 127–138. [CrossRef]
51. Lenz, S. Acceptance of wind turbines in the recreational landscape—Background and results of an empirical investigation in the 'Eifel' region. *Naturschutz Landschaftsplanung* **2004**, *36*, 120–126.
52. Ólafsdóttir, R.; Sæþórsdóttir, A.D. Wind farms in the Icelandic highlands: Attitudes of local residents and tourism service providers. *Land Use Policy* **2019**, *88*, 104173. [CrossRef]
53. Fredman, P.; Tyrväinen, L. Frontiers in nature-based tourism. *Scand. J. Hosp. Tour.* **2010**, *10*, 177–189. [CrossRef]
54. Moufakkir, O. Heritage attractions and the case of the Dutch windmills. *Tour. Anal.* **2007**, *12*, 489–493. [CrossRef]
55. van Gorp, B.; Béneker, T. Holland as other place and other time: Alterity in projected tourist images of the Netherlands. *Geojournal* **2007**, *68*, 293. [CrossRef]
56. Statistics Iceland. Gross Energy Consumption by Source 1940–2020. Available online: https://px.hagstofa.is/pxen/pxweb/en/Umhverfi/Umhverfi_4_orkumal_2_framleidslaognotkun/IDN02102.px (accessed on 21 April 2021).
57. Landsnet. Kortasjá [Map]. n.d. Available online: <https://www.map.is/landsnet/> (accessed on 21 April 2021).
58. The Master Plan for Nature Protection and Energy Utilization. n.d. Available online: <https://www.ramma.is/english> (accessed on 21 April 2021).
59. Phillimore, J.; Goodson, L. Progress in qualitative research in tourism: Epistemology, ontology and methodology. In *Qualitative Research in Tourism: Ontologies, Epistemologies and Methodologies*; Phillimore, J., Goodson, L., Eds.; Routledge: London, UK, 2004; pp. 3–29.
60. Bryman, A. *Social Research Methods*, 5th ed.; Oxford University Press: Oxford, UK, 2016.
61. Creswell, J.W. *Qualitative Inquiry and Research Design*; Sage Publications: Thousand Oaks, CA, USA, 1998.
62. Corbin, J.; Strauss, A.L. *Basics of Qualitative Research: Techniques and Procedures for Developing Grounded Theory*, 3rd ed.; Sage Publications, Inc.: Thousand Oaks, CA, USA, 2008; pp. 1–130.
63. Saldaña, J. *The Coding Manual for Qualitative Researchers*, 3rd ed.; Sage Publications: London, UK, 2016.
64. Pétursdóttir, G. Skýrsla Verkefnisstjórnar 4. Áfanga Rammaáætlunar um Vernd og Orkunýtingu Landsvæða 2017–2021. [Final Report of the Project Management of the 4th Phase of the Icelandic Master Plan for Nature Protection and Energy Utilization 2017–2021]; The Master Plan for Nature Protection and Energy Utilization: Reykjavík, Iceland, 2021.
65. The Ministry of the Environment and Natural Resources. Drög að Breytingu á Lögum nr. 48/2011, Um Verndar—og Orkunýtinga-Ráætlun—Málmeðferð Virkjunarkosta í Vindorku [Draft Amendment to act no. 48/2011 on A Protection and Energy Utilization Plan—Handling of Wind Farm Proposals]. 2021. Available online: [https://samradsgatt.island.is/oll-mal/\\$Cases/Details/?id=2888](https://samradsgatt.island.is/oll-mal/$Cases/Details/?id=2888) (accessed on 21 April 2021).
66. Tverijonaite, E.; Sæþórsdóttir, A.D.; Ólafsdóttir, R.; Hall, M.C. Mapping the impact area of renewable energy infrastructure on tourism: Perceptions of the tourism industry. *Energy Res. Soc. Sci.* **2021**, in press.
67. Brudermann, T.; Zaman, R.; Posch, A. Not in my hiking trail? Acceptance of wind farms in the Austrian Alps. *Clean Technol. Environ. Policy* **2019**, *21*, 1603–1616. [CrossRef]
68. Sæþórsdóttir, A.D.; Hall, C.M. Floating away: The impact of hydroelectric power stations on tourists' experience in Iceland. *Sustainability* **2018**, *10*, 2315. [CrossRef]