East Anglia ONE North Offshore Windfarm

Appendix 30.2

Literature Review: Windfarm Impact on the Tourism Industry

Environmental Statement
Volume 3

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Glossary of Acronyms

AONB	Area of Outstanding Natural Beauty
GCU	Glasgow Caledonian University
JMT	John Muir Trust
MCoS	Mountaineering Council of Scotland

Glossary of Terminology

Applicant	East Anglia ONE North Limited.
Cable sealing end compound	A compound which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Cable sealing end (with circuit breaker) compound	A compound (which includes a circuit breaker) which allows the safe transition of cables between the overhead lines and underground cables which connect to the National Grid substation.
Construction consolidation sites	Compounds associated with the onshore works which may include elements such as hard standings, lay down and storage areas for construction materials and equipment, areas for vehicular parking, welfare facilities, wheel washing facilities, workshop facilities and temporary fencing or other means of enclosure.
Development area	The area comprising the onshore development area and the offshore development area (described as the 'order limits' within the Development Consent Order).
East Anglia ONE North project	The proposed project consisting of up to 67 wind turbines, up to four offshore electrical platforms, up to one construction, operation and maintenance platform, inter-array cables, platform link cables, up to one operational meteorological mast, up to two offshore export cables, fibre optic cables, landfall infrastructure, onshore cables and ducts, onshore substation, and National Grid infrastructure.
East Anglia ONE North windfarm site	The offshore area within which wind turbines and offshore platforms will be located.
European site	Sites designated for nature conservation under the Habitats Directive and Birds Directive, as defined in regulation 8 of the Conservation of Habitats and Species Regulations 2017 and regulation 18 of the Conservation of Offshore Marine Habitats and Species Regulations 2017. These include candidate Special Areas of Conservation (cSAC), Sites of Community Importance (SCI), Special Areas of Conservation (SAC) and Special Protection Areas (SPA).
FTE	Full Time Equivalence is the number of jobs that would be sustained if all of the people were employed full time for a defined period of time. This assessment uses one year as the standard period of time. For example: if 20 people worked for half a year each that would be equivalent to 10 full time jobs – 10 FTE. Whereas is 10 people worked full time for a year that would still be 10 FTE.
FTE Year	Full Time Equivalent years is the sum of FTE per year over the duration of a project. If a project had an annual FTE of 10 for 5 years then it would sustain 50 FTE Years. This is an important concept when calculating regional value as a high employment for a short term could have the same number of FTE Years as a low employment over a long term.
Gross Domestic Product (GDP)	A measure of the total value of market goods produced and services provided in the country in one year. It should be noted that GDP was developed to measure the market production of a nation and, as such,

	does not capture the value from non-market goods such as services provided by nature and non-salaried services provided by households.
Gross Value Added (GVA)	A measure of the value of goods and services produced in an area, industry or sector of an economy. It is a component of GDP growth and, similarly, does not capture value added from non-market goods such as services provided by nature and non-salaried services provided by households.
Horizontal directional drilling (HDD)	A method of cable installation where the cable is drilled beneath a feature without the need for trenching.
HDD temporary working area	Temporary compounds which will contain laydown, storage and work areas for HDD drilling works.
Jointing bay	Underground structures constructed at intervals along the onshore cable route to join sections of cable and facilitate installation of the cables into the buried ducts.
Landfall	The area (from Mean Low Water Springs) where the offshore export cables would make contact with land, and connect to the onshore cables.
Link boxes	Underground chambers within the onshore cable route housing electrical earthing links.
Local Enterprise Partnerships (LEPs)	Voluntary partnerships between local authorities and businesses set up in 2011 by the Department for Business, Innovation and Skills to help determine local economic priorities and lead economic growth and job creation within the local area.
Lower Super Output Areas (LSOAs) and Middle Super Output Areas (MSOAs)	LSOAs and MSOAs are a geographic hierarchy designed to improve the reporting of small area statistics in England and Wales following the 2001 Census. These are built from groups of contiguous Output Areas and have been automatically generated by the Office for National Statistics. LSOAs have a population of 1,000 to 3,000 and from 400 to 1,200 households. MSOAs have a population of 5,000 to 15,000 and from 2,000 to 6,000 households.
Mitigation areas	Areas captured within the onshore development area specifically for mitigating expected or anticipated impacts.
National electricity grid	The high voltage electricity transmission network in England and Wales owned and maintained by National Grid Electricity Transmission
National Grid infrastructure	A National Grid substation, cable sealing end compounds, cable sealing end (with circuit breaker) compound, underground cabling and National Grid overhead line realignment works to facilitate connection to the national electricity grid, all of which will be consented as part of the proposed East Anglia ONE North project Development Consent Order but will be National Grid owned assets.
National Grid overhead line realignment works	Works required to upgrade the existing electricity pylons and overhead lines (including cable sealing end compounds and cable sealing end (with circuit breaker) compound) to transport electricity from the National Grid substation to the national electricity grid.
National Grid overhead line	The proposed area for National Grid overhead line realignment works.

realignment works area	
National Grid substation	The substation (including all of the electrical equipment within it) necessary to connect the electricity generated by the proposed East Anglia ONE North project to the national electricity grid which will be owned by National Grid but is being consented as part of the proposed East Anglia ONE North project Development Consent Order.
National Grid substation location	The proposed location of the National Grid substation.
Natura 2000 site	A site forming part of the network of sites made up of Special Areas of Conservation and Special Protection Areas designated respectively under the Habitats Directive and Birds Directive.
New Anglia LEP	New Anglia Local Enterprise Partnership which works with businesses, local authority partners and education institutions across the counties of Norfolk and Suffolk.
Nomenclature of Territorial Units for Statistics	Nomenclature of Territorial Units for Statistics (NUTS) are statistical divisions of areas of the United Kingdom (UK) based on population. Within the UK, NUTS1 is generally regional. NUTS2 is generally at a county level. NUTS3 is generally at a grouped local authority and district level.
Non-market goods	Most environmental goods and services, such as clean air and water, and healthy fish and wildlife populations, are not traded in markets. Their economic value (i.e. how much people would be willing to pay for them) and societal value (i.e. how much they contribute to society) is not captured in market prices.
Onshore cable corridor	The corridor within which the onshore cable route will be located.
Onshore cable route	This is the construction swathe within the onshore cable corridor which would contain onshore cables as well as temporary ground required for construction which includes cable trenches, haul road and spoil storage areas.
Onshore cables	The cables which would bring electricity from landfall to the onshore substation. The onshore cable is comprised of up to six power cables (which may be laid directly within a trench, or laid in cable ducts or protective covers), up to two fibre optic cables and up to two distributed temperature sensing cables.
Onshore development area	The area in which the landfall, onshore cable corridor, onshore substation, landscaping and ecological mitigation areas, temporary construction facilities (such as access roads and construction consolidation sites), and the National Grid Infrastructure will be located.
Onshore infrastructure	The combined name for all of the onshore infrastructure associated with the proposed East Anglia ONE North project from landfall to the connection to the national electricity grid.
Onshore preparation works	Activities to be undertaken prior to formal commencement of onshore construction such as pre–planting of landscaping works, archaeological investigations, environmental and engineering surveys, diversion and laying of services, and highway alterations.

Onshore substation	The East Anglia ONE North substation and all of the electrical equipment within the onshore substation and connecting to the National Grid infrastructure.
Onshore substation location	The proposed location of the onshore substation for the proposed East Anglia ONE North project.
Productivity	Productivity is an economic measure of output per unit of input. Inputs include labour and capital, while output is typically measured in revenues and other gross domestic product components such as business inventories.
Transition bay	Underground structures at the landfall that house the joints between the offshore export cables and the onshore cables.

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30.2 Windfarm Impact on the Tourism Industry

30.1 Executive Summary

1. This literature review uses existing studies, in its objective to understand the potential impact of windfarm development on the tourism industry in East Anglia. This review focusses upon 24 publications from 2002 until 2017, 16 UK based and eight reports from outside of the UK for comparison. The majority of these studies focussed on tourist's perception of windfarms and how this would affect their likelihood of revisiting the area. This was often coupled with stakeholder surveys including tourist boards and local businesses. Additionally, the reason for people's views and suggestions of how to create benefits or mitigate fears was also explored. One study focussed specifically on major infrastructure constructed by the National Grid undertaken in 2014.

2. Studies found that around 75% (Glasgow Caledonian University (GCU) 2008) and 78% (NFO World Group 2003) of tourists surveyed either had a neutral or positive view of windfarms. As such, between 86.7% (Aitchison 2004) and 99% (Glasgow Caledonian University 2008) of people said the construction of both onshore and offshore windfarms would not affect their decision to return or go to the area in the future.

3. Some surveys explored the perception of associated infrastructure and found a significant negative view of this. The National Grid study showed that neither businesses owners nor recreational users of an area expected the projects to change their business performance or behaviour, respectively (National Grid 2014). Although, all groups surveyed (including in the National Grid study) did perceive negative impacts to the local area due to landscape and visual change. The National Grid study groups however indicated that this would not lead to behavioural change.

4. Studies also considered the size of both offshore and onshore windfarms and found no common trend. Some people preferred more smaller windfarms and some people fewer larger ones. It is assumed this is to do with locality. The results of all surveys showed people were concerned around the cumulative impacts of continued windfarm development. (NFO World Group 2003, Glasgow Caledonian University 2008, and Northumbria University 2014).

5. There are two notable exceptions to the positive / neutral attitudes generally found. The Mountaineering Council of Scotland (MCofS) surveyed their members in 2014 and stated that 56% of people would not revisit an area with

windfarms (MCofS 2014). Following criticism of their survey methodology, MCofS conducted another survey in 2016 and found that 77% of people had not in fact changed their behaviour (MCofS 2016). The second exception is a 2017 poll conducted by YouGov for The John Muir Trust. Although their results suggested that industrial development would deter visitors, their work pooled windfarms with quarries and pylons.

6. The majority of those surveyed stated that landscape and natural beauty is one of the key factors that would attract them to rural tourist areas of the UK. Therefore, they preferred windfarms to be constructed where they had the least visual impact – e.g. preferring bog land or farm land locations to mountains and beaches. However, the majority of people also preferred offshore windfarms to onshore because they perceive there will be a lower visual impact. (NFO World Group 2003, Glasgow Caledonian University 2008, and Northumbria University 2014).

7. Some studies explored the connection between visual impact and value or likelihood to return. A Scottish survey found that people would return to an area with windfarms but would expect to pay less for hotel rooms with views spoiled by windfarms – by about 10%-20% (Glasgow Caledonian University 2008). A study in Delaware, US, showed that people are more likely to not visit a beach with wind turbines in close proximity (Lilley et al. 2010). A study in North Carolina also showed a connection between proximity of offshore windfarms and a reduction in the cost of renting a beach front apartment (Luzeyer 2016). The Delaware study found that at a distance of 22km, return visits to the beaches would not be affected in 95% of cases and the North Carolina study showed that after 13km from shore rental prices were not affected. Therefore, the proximity considered is not comparable to the East Anglia ONE North windfarm site, located approximately 36km offshore.

8. Studies that showed a minority of people were less likely to visit an area because of windfarms also showed a larger proportion of people would actively be attracted (NFO World Group 2003, and Lilley et al. 2010). Therefore, if efforts are made to promote wind energy through “Edu-tourism” it may be likely there will be a net gain for the area. This can be seen by the success of visitor centres such as Scroby Sands, near Great Yarmouth. It should also be noted that a coastal offshore windfarm is featured in the 2016 Visit Norfolk video advert that auto-plays on their website and specifically promotes the unspoiled beauty of the Norfolk coast (Visit Norfolk 2016).

9. Stakeholder surveys showed that tourism organisations generally had a positive view on windfarms and did not perceive an impact on the tourism industry. This was caveated with the condition that windfarms are not built in or close to

sensitive areas such as National Parks or Areas of Outstanding Natural Beauty (AONB). (NFO World Group 2003, and Northumbria University 2014). Conversely, businesses had a significant opposition to windfarm development because they perceived that they would ruin the landscape and destroy the tourism industry. Three studies of specific windfarms that show this perception reduces over time (Aitchison 2004, Eltham et al. 2007, and SCIRA 2012) and is heavily influenced by the amount of engagement developers make (Aitchison 2004, and 2012, and Eltham et al. 2007). Once windfarms have been developed, acceptance tends to improve and if additional benefits can be found (such as visitor centres or operational employment) then local and tourism business opinion improves. Eltham et al. (2007) also found that people found unforeseen positive impacts such as using wind turbines as landmarks for navigation.

10. Notably, the majority of tourist perception studies in the UK were completed between 2000 and 2012. Some of these cite earlier research but the level of investigation of tourist perceptions appears to have reduced since 2012 – except by organisations that appear opposed to windfarm development on principle (MCofS 2014, 2016, and the John Muir Trust (JMT) 2017). It is assumed that although the number of studies is relatively low comparative to other policy areas (Aitchison 2012), there is a clear trend to show tourists do not object to the development of windfarms as long as they are undertaken sensitively.

11. There is a clear trend in research across the UK that shows tourists have a positive view of windfarm development and that the development does not deter them from visiting an area. This view is mirrored by the opinion of tourism bodies. Both of these perceptions have the caveat that windfarms must be located sensitively and that community engagement is required to counter the distrust of industrial developers.

12. Studies in the last five years have also found that the development of windfarms in rural areas of Wales (Regeneris and The Tourism Company 2014) and Scotland (Biggar Economics 2016) have not had a measurable impact on the tourism economy. This supports the original findings that tourists themselves would return post-construction. However, tourism businesses still believe that windfarms will reduce their income. As with local communities, effective engagement with businesses is required to counter this fear and the prejudices against developers that this creates.

13. Although there is no evidence of an impact on tourism in other areas of the UK, there is also no evidence of tourism perception studies and economic changes studies being undertaken in either Norfolk or Suffolk. This is possibly because

the offshore windfarm industry is younger than the onshore industry in Wales and Scotland. This is an obvious gap in the research to date and one that advocates against the wind industry in the area could use to their advantage. It is recommended that good practice in research methodologies highlighted in the literature is used to design a study of tourist perceptions and change in the tourism industry in Norfolk and Suffolk.

14. In conclusion, this literature review has found a consistent trend on tourist opinions and actions. These are as follows:

- All studies reviewed show that tourists are not deterred from visiting an area due to windfarms;
- More recent studies of economic impacts show no measurable impact between tourism growth and windfarm development; and
- Recent studies in the US show limited relationship between the proximity of offshore windfarms and tourist perceptions.

30.2 Introduction

15. To understand if the proposed East Anglia ONE North project has potential to adversely impact the tourism industry of Norfolk and Suffolk, the Applicant is developing an evidence base to understand the impact of windfarm development on tourism in other areas and best practice in its assessment.

16. The objective of this report is to review research that has been completed to date in the UK and in comparable countries to identify trends relevant to the tourism industry. The review focusses specifically on tourists' perceptions of windfarms and the measurable impact that windfarm development has had on the local tourism industry.

17. The report first considers research focussed on UK sites before going on to compare this with non-UK research. From this, the main trends are discussed and then compared to the context of Norfolk and Suffolk.

30.3 Methodology

18. This review has been conducted using an internet based search of publicly available documents. Focus has been specifically on documents relating to windfarms and their impact on tourism rather than individual wind turbines. Although the reasons for people's perceptions have been included in the review, the theoretical value of environmental factors (e.g. willingness to pay) has largely been avoided in favour of studies that show actual economic change over time.

19. Although the windfarms in East Anglia are primarily offshore, evaluations relating to onshore windfarms are also included. This is because:

- It is assumed that tourists will be more sensitive to onshore windfarms due to their proximity; and
- There are more studies relating to onshore windfarms.

20. The objective of the search was to identify trends in comparable areas to the East Anglia with regards:

- The opinions of tourists and whether windfarm development will affect their decision to visit an area; and
- Measurable change in tourist numbers or tourist economy in the vicinity of windfarms.

21. Research and reports relating to non-UK sites has also been reviewed.

22. During the review, it became clear that the bias of research was influenced by the organisation that either sponsored it or was the target audience. Therefore, both the authoring organisation and the recipient organisation has been noted with regards the outcomes of the research.

30.4 Literature Focussing on UK Windfarms

23. This study found 15 reports or research documents that are publicly available and focussing on tourism impacts of windfarms in the UK, these are summarised in ***Table A30.1***. The study includes 4 literature reviews that cover earlier research and documents available from academic research journals. As the UK wind industry started to expand from the earlier 2000s, earlier research has not been specifically included.

24. Research included tourism perceptions and empirical evidence of tourism impacts following windfarm construction in Cornwall and Devon; Northumberland; Wales; and Scotland. There is a noticeable absence of research focussing on the East Anglian region, despite a substantial number of offshore windfarms being built since the first (Scroby Sands), 2.5km from shore in 2004.

25. Research conducted between 2000 and 2010 primarily focussed on tourism perceptions of windfarm construction and whether this would deter visitors from either revisiting a site or planning a trip there. As the first offshore windfarm was completed offshore of Blyth in 2000, the majority of research focusses on

onshore windfarms constructed in the previous decade or that were in planning at the time of writing. Therefore, the windfarms in question were of a smaller scale than the proposed East Anglia ONE North project but also much closer to people's vantage points thus potentially providing a similar or greater visual impact.

26. Since 2010 and following criticism of earlier studies, research has become more sophisticated and empirical. The 2012 literature review of tourism impacts for Anglesey Council found significant variation in the standard of earlier studies and the reliability of their findings saying:

- *It is important to be clear about the status of the written material available. The coverage of the subject in peer reviewed academic journals or publications is quite limited and is mostly related to the wider context rather than specifically to tourism impacts. Most of the directly relevant original research appears in reports published by research institutes or their client bodies, including tourist boards and other organisations. This is customarily referred to as 'grey literature'. This status does not mean that the evidence is necessarily less admissible and most reported research and analysis appears to be professionally and objectively conducted; and*
- *It is important, however, to be aware of the origin of some of the material. Some primary research and especially some of the written summaries of evidence has been commissioned or presented by parties who are not disinterested in the results. This includes windfarm developers and representative bodies in the field of renewable energy, or local or national groups opposed to specific or general windfarm development.*

27. In her study of tourism impacts on Garreg Lwyd Hill Windfarm Proposal in Wales in 2012, Aitchison also highlights the lack of standard methodology for assessing impacts of other industry on tourism, saying:

- *Whereas the research methodologies designed to assess the impacts of tourism in rural areas have been developed and honed over many decades, the methodologies developed to evaluate impacts of other sectors of industry on tourism in rural areas are still in their infancy. As a result, when considering research into the impact of windfarms on tourism it is vital to scrutinise the methodology adopted, the research methods employed and the research conclusions drawn in each study when evaluating the 'evidence' from each piece of research. The lack of maturity of the field of study has, to date, resulted in a lack of rigorous peer review of research methodology, methods, analysis and findings resulting in some poor*

research and spurious findings being used in planning applications, inquiries and appeals;

- *Two major errors have been identified in previous research and, when primary research containing errors is used to inform secondary research, these initial errors can become compounded. The first error relates to survey methodology and sampling used in primary research and the second to the interpretation and extrapolation of data from secondary research;*
- *Some primary survey research commissioned by local authorities and tourist boards has adopted inappropriate and biased sampling methods that have distorted results. In a number of surveys, such as that undertaken by the Western Isles Tourist Board (2005), tourism businesses rather than tourists have been taken as the sampling frame. These research findings therefore provide some insights into business owners' views but are wholly unrepresentative findings of tourists' perceptions of windfarms; and*
- *The second major error relates to the interpretation and extrapolation of data where, instead of conducting primary research, conclusions have been drawn by extrapolating data, often in a selective or even biased way, in an attempt to demonstrate that conclusions reached in one study at one time and in one location will not only hold true in other temporal and spatial environments but can be applied to much larger areas with an exaggerated effect.*

28. The largest and most cited research is the 2008 study of impacts on Scottish tourism (Glasgow Caledonian University 2008). The study included face-to-face visitor surveys at 4 locations in west Scotland and internet survey of 700 potential visitors. This found that the majority of people visited the area for its scenic beauty yet 77% of respondents had a positive or neutral view of windfarms. Although tourists prefer a landscape without windfarms, 68% said that they believed an appropriately sited windfarm would not impact on tourism. Of those surveyed, 93%-99% said that they would visit an area with a windfarm. This general trend of people valuing the rural landscapes for its beauty yet appreciating that windfarms are important is repeated in every study undertaken. The conclusion of this study is as follows:

- *The overall conclusion of this research is that the Scottish Government should be able to meet commitments to generate at least 50 per cent of Scotland's electricity from renewable sources by 2020 with minimal impact on the tourism industry's ambition to grow revenues by over £2 billion in real terms in the 10 years to 2015.*

29. The 2003 study of potential impacts to Welsh tourism was similarly well regarded for its methodology (NFO World Group 2003). This developed similar findings about perception and also highlighted that 83% of those surveyed would prefer windfarms to be offshore. It also included focus groups of tourism stakeholders and asked people about their perception of comparable infrastructure. Tourism stakeholders were found to have a positive impression of windfarms and would not object to them unless they were situated in protected areas such as National Parks. Visitors surveyed believed the visual impact of windfarms was worse than some other power schemes such as hydroelectricity but far better than the supporting infrastructure such as electricity pylons.

30. That study concluded that although visitors do not have negative views towards windfarms the tourism businesses are concerned that they will destroy the landscape and ruin the tourism industry. This appears to be due to scepticism of local communities to large developers and how their opinions are included in the planning process.

31. In 2014 National Grid commissioned a Business and Recreational User Survey to understand the effect of National Grid major infrastructure projects on socio-economic factors. This included surveys in relation to the following projects

- Electrical infrastructure in operation:
  - South Humber Bank;
  - Norton to Spennymoor; and
  - Hinkley to Melksham.
- Gas infrastructure in operation:
  - Felindre to Tirley; and
  - Wormington to Sapperton.
- Electrical infrastructure in planning:
  - Hinkley C Connection; and
  - Bramford to Twinstead Tee.
- Control sites:
  - Chilterns Area; and
  - Yorkshire Dales Area.

32. Both businesses and recreational users (including local residents and visitors/tourists) were surveyed. The majority of businesses surveyed stated *"that they anticipated no impact to their business operations following the commencement of a National Grid Project"* (National Grid 2014). The majority

of recreational users surveyed stated that *"a National Grid project would not affect their behaviour or spend in an area."* (National Grid 2014)

33. Both survey groups indicated that they felt the main impact was to the area itself due to landscape and visual impacts. However, neither group indicated that this impact would affect their behaviour or the expected performance of their business.

34. Due to the availability of economic data and the ease with which perception surveys can be criticised, latter studies have focussed on measurable economic impacts following windfarm development.

35. A 2014 (Regeneris 2014) study of 3 areas of Wales used a literature review, analysis of the visitor economies in nine local impact areas affected by windfarm development, and three case studies in areas which are already affected by windfarm development. This found that:

- *There are a number of areas in Wales where windfarms have been an established presence on the local landscape for a relatively long time. These include Powys, Anglesey and the South Wales Valleys which were all the subject of case studies. The case studies have not revealed any evidence of significant impacts on tourism to date. The few local studies which are available have shown the majority of visitors are positive or indifferent about windfarm development. Although there was some anecdotal evidence of visitors staying away due to windfarms, the vast majority of consultees believed there had been no impact on total visitor numbers and hence on the visitor economies as a whole; and*
- *The evidence base shows a clear majority of people do not react negatively to windfarm developments or change their visiting behaviour as a result. However, it also shows that visitor responses and reactions to windfarms are highly subjective and depend on the individual's own judgements and perceptions of the relative merits of onshore wind as a means of energy production.*

36. A 2016 study of windfarms across Scotland (Biggar Economics 2016) used economic information to determine if the tourism industry had actually been affected at 18 windfarm locations. Having looked for measurable impacts to Scottish tourism the study concluded by saying:

- *The analysis found that there was no relationship between the growth in the number of wind turbines and the level of tourism employment at the local authority level; and*

- *It would be reasonable to expect that any impacts associated with a windfarm development are most likely to be felt strongest in the immediate vicinity of the development. An analysis of the levels of employment in the sustainable tourism sector in the immediate vicinity of onshore windfarm developments did not find any evidence of these areas being adversely affected. On the contrary, it was found that the tourism sector in the majority of areas surrounding windfarms grew faster than in the local authorities where they were situated. Although this study does not suggest that there is any direct relationship between tourism sector growth and windfarm development, it does show that windfarms do not cause a decrease in tourism employment either at a local or a national level.*

37. This empirical data contradicts the opinion shown in the 2008 Scottish study (Glasgow Caledonian University 2008) where people stated they would expect to pay more for a view without a windfarm. It should also be noted that this is not evidence they would pay less for a view with a windfarm.

38. This contradiction between negative opinion and empirical evidence is paralleled in the surveys of members of the MCofS. In 2014 MCofS categorically stated that windfarms would deter visitors because their members stated they would not visit areas where windfarms are built. However, their 2016 member-survey found that 75% of members had not changed their behaviour as originally stated but still held negative views about onshore windfarms.

39. A similar attempt to show public disapproval has been attempted by the JMT. In 2017 they commissioned YouGov to conduct an online poll of over 800,000 participants. In this they asked two leading questions:

- Should Wild Land Areas1 continue to be protected in the future from large scale infrastructure, such as industrial-scale windfarms, major electricity transmission and super-quarries?
- Would you be more or less likely to visit a scenic which contains large scale developments (e.g. commercial windfarms, quarries, pylons etc.), or would it make no difference?

40. The results show that 80% of people agree that Wild Land Areas should be protected and 55% of people would be less likely to visit an area if industrial development were undertaken. However, previous studies have shown that the impact pathway of the industrial development on tourism receptors is a

1 "Wild Land Areas", are defined as places that are rugged, remote and free from major human structures.

reduction in the perceived value of the visual amenity of landscape. Studies have also shown that different industrial developments are perceived differently, for example both Welsh studies (NFO Group 2003, and Regeneris 2008) highlighted that people dislike pylons and quarrying far more than they dislike windfarms. Therefore, it is invalid to conclude that the YouGov study shows people are deterred by a specific industry as all industries were pooled. As with the MCofS study, this only highlights the Trust's position against windfarm development.

41. Studies have found that people's opinion improves with experience of windfarms. Eltham et al. (2007) aimed to determine if people changed their opinion of the Carla Cross windfarm in Cornwall having lived with it for several years. This showed that people generally improved their opinion of windfarms having experienced them and that their original hostility was not an irrational objection. Concluding that:

- *The findings in this study add further support to the concept that objections to a specific windfarm are not due to the traditional definition of NIMBYism but are instigated by social and institutional factors causing distrust and angst during the planning and siting stages of the project.*

42. Professor Aitchison deserves particular mention because she has authored (at least) four studies on the perception of tourists and impacts on tourism. In 2004 she led a study of Fullabrook Windfarm in (Aitchison 2004). Data gathering was carried out at three locations: North Devon, the Newquay area of Cornwall, and Mid-Wales. A total of 379 day visitors and tourists were surveyed using face-to-face interviews. This study found:

- No overall negative impact on visitor numbers;
- No overall detrimental impact on the tourist experience; and
- No overall decline in tourism expenditure.

43. In 2012 Aitchison conducted a study of tourism impacts on Garreg Lwyd Hill Windfarm Proposal in Wales. Having criticised many studies (as discussed above) her conclusions on the general impact of tourism are quite clear:

- *Although tourism research relating to windfarm developments is limited compared with that on policy, landscape, ecology and noise it is increasingly evident that there is an emerging consensus within the research examining the actual and potential impact of windfarms on tourism. The clear consensus is that there has been no measurable economic impact, either positively or negatively, of windfarms on tourism. Similarly, there is*

consensus among researchers of studies that have sought to predict the more specific potential economic impact of windfarms on tourism. Here again, there is no evidence to support the assertion that windfarms are likely to have a negative economic impact on tourism.

44. In the same year, she also conducted a study of Tourism Impact of Windfarms for the Renewables Inquiry of the Scottish Government (Aitchison 2012). Her conclusions were similarly clear:

- *Previous research from other areas of the UK has demonstrated that windfarms are very unlikely to have any adverse impact on tourist numbers (volume), tourist expenditure (value) or tourism experience (satisfaction) (Glasgow Caledonian University, 2008; University of the West of England, 2004). Moreover, to date, there is no evidence to demonstrate that any windfarm development in the UK or overseas has resulted in any adverse impact on tourism: and*
- *The opposition to windfarms on tourism grounds is informed more by fear than fact. The research conducted by GCU stated that 'Importantly, respondents that had seen a windfarm were less hostile than those who had not' (Glasgow Caledonian University, 2008: 3). Starling's and Glasgow Caledonian University's findings therefore lend support to Young's (2003) research; namely, that opposition to windfarms tends to fall after construction.*

45. Following her extensive review of previous research Aitchison also suggests best practice as follows:

- *The research should include a survey of tourists rather than tourism businesses;*
- *The survey methodology and sampling frame must be rigorous, reliable and valid;*
- *The findings obtained from the survey should not be extrapolated across broad geographical areas that will not be impacted to the same degree by any windfarm development;*
- *The findings of all tourism research should be seen within the context of tourism as a growth industry and thus any limited negative impact is likely to be an impact on growth rather than on current levels of tourism; and*
- *The research should acknowledge that the tourism business is dynamic and self-generating such that when a particular type of tourist ceases to visit an area they are frequently replaced by a different type of tourist thus continuing 'the tourist lifecycle' of destinations and resorts.*

Table A30.1 Main Findings from UK Focussed Tourism Impacts Research

Title	Focus area	Year	Author	Description	Main finding
Tourist Attitudes towards Windfarms	Scotland	2002	MORI Scotland for Scottish Renewables Forum & BWEA	Face to face visitor survey of 307 tourists in five very rural areas of west Scotland. N.B. since criticised for its methodology	The beauty of the area is the main tourism attraction however 91% of tourists would revisit the area if windfarms were constructed.
Investigation into the potential of windfarms on tourism in Wales	Wales	2003	NFO World Group for Wales Tourist Board	Literature review, stakeholder consultation, case studies in Wales & Spain, and visitor survey of 266 people.	Scenery and beaches were main reason for visiting. 70% of people were aware of windfarms in Wales. 78% of people were positive or neutral towards windfarms. Supporting infrastructure was viewed more negatively than windfarms. 22% of people would avoid an area with a windfarm. 66% of people would not avoid it. 77% of people said there would be no or minimal effect on their decision to holiday in Wales.
Evidence gathering of the impact of windfarms on visitor numbers and tourist experience	North Devon	2004	Aitchison, University of West of England for North Devon Wind Power	Visitor survey relating to the Fullabrook windfarm in North Devon. 379 visitors surveyed.	86.7% of people said the presence of a windfarm would have no effect on their decision to visit the area. 51% said they felt a windfarm could be a tourist attraction.
The impact of windfarms on the tourist industry in the UK	UK	2006	BWEA (now Renewable UK) for the All-Part Parliamentary Group on Tourism	Assessment of change in visitor numbers in areas where windfarms have been developed and a review of studies undertaken across the UK. N.B. Appears to have the aim of promoting the wind industry to Parliament.	Shows a general increase in visitor numbers in Cumbria, Northern Ireland, and Cornwall despite increased number of onshore windfarms.

Title	Focus area	Year	Author	Description	Main finding
Changes in public attitudes towards a Cornish windfarm: Implications for planning	Cornwall	2007	Eltham, Harrison, Allen - University of Edinburgh	Independent research in to the change in attitude of people in Cornwall that have direct experience of windfarm development.	An attitude survey was not taken prior to the windfarm but people recalled mixed feelings. A general increase in positive attitudes towards the windfarm was found with unforeseen benefits noted.
The economic impacts of windfarms on Scottish tourism	Scotland	2008	Glasgow Caledonian University for Scottish Government	Following criticism of earlier study a more in-depth tourist survey was undertaken in Scotland. Included desk based review of international literature, face to face survey of 380 tourists in 4 locations, and internet survey of 600 people in UK and 100 people in US. GIS analysis of visual impact.	39% of tourists were positive to windfarms and 36% neutral. Supporting infrastructure was viewed worse than windfarms. Tourists prefer landscape without windfarms but 68% said a well sited windfarm does not ruin the landscape. 93%-99% of people that had seen windfarms would not be put off returning to an area. The average tourist is prepared to pay 20-35% more for an unspoilt view.
The impact of wind turbines on tourism - a literature review	UK	2012	The Tourism Company for Isle of Anglesey County Council	Literature review of previous studies.	Positive attitude of most tourists to green energy. Statistically significant minority (approximately 10-20%) of tourists are negative about windfarms. People have more negative view to supporting infrastructure. Visitor profiles make little difference to views. Tourism businesses are concerned about impacts of windfarms on tourism.
Tourism impact analysis - Garreg Lwyd Hill Windfarm Proposal	Wales	2012	Aitchison, University of Edinburgh, for RES UK	Academic review of other studies and local analysis of tourism industry.	The clear consensus is that there has been no measurable economic impact, either positively or negatively, of windfarms on tourism. There is no evidence to support the assertion that windfarms are likely to have a negative economic impact on tourism.

Title	Focus area	Year	Author	Description	Main finding
Tourism Impacts of Windfarms	Scotland	2012	Aitchison, University of Edinburgh, for Renewables Inquiry Scottish Government	Academic review of other studies	Conclusions are generally similar to Aitchison's other 2012 report above. Previous research from other areas of the UK has demonstrated that windfarms are very unlikely to have any adverse impact on tourist numbers (volume), tourist expenditure (value) or tourism experience (satisfaction).
Study into the potential economic impact of windfarms and associated grid Infrastructure on the Welsh tourism sector	Wales	2014	Regeneris and The Tourism Company for Welsh Government	Literature review, mapping windfarms across Wales, local analysis of tourism areas using several case studies of Powys, Anglesey, and South Wales Valleys.	The case studies have not revealed any evidence of significant impacts on tourism to date.
A Study into the Effect of National Grid Major Infrastructure Projects on Socio-economic Factors	UK	2014	Ipsos Mori, Bridge Economics, Imperial College London, and ERM on behalf of National Grid	Business and Recreational User Surveys at sites for major electrical and gas infrastructure both in planning and development across the UK.	Businesses surveyed stated that they anticipated no impact to their business operations following the commencement of a National Grid Project. Recreational users surveyed indicated that a National Grid project would not affect their behaviour or spend in an area. Those surveyed perceive negative impacts would occur to the local area, but that these impacts would not affect behaviour or business performance.
Windfarms and changing mountaineering behaviour in Scotland	Scotland	2014	Mountaineering Council of Scotland	Survey of MCofS members	This survey provides clear evidence that mountain-goers do not want to pursue their activity, and spend their money, in areas they regard as spoiled by industrial-scale windfarms. They are changing their behaviour to avoid such areas, and sometimes Scotland altogether. This is consistent with a trend

Title	Focus area	Year	Author	Description	Main finding
					in other surveys showing a rising proportion of discouraged visitors.
Evaluation of the impacts of onshore windfarms on tourism	Northumberland	2014	Northumbria University for Northumberland County Council	Literature review, online survey of potential visitors, online survey of businesses, and stakeholder focus group	89% of people said that it would not affect their decision to visit Northumberland. 63% of businesses said windfarms had not affected their business. Focus group is sceptical of developers.
Windfarms and tourism trends in Scotland	Scotland	2016	Biggar Economics	Empirical assessment of the changes in tourism sector between 2009 and 2013 in areas that have had windfarm development.	The analysis found that there was no relationship between the growth in the number of wind turbines and the level of tourism employment at the local authority level. An analysis of the levels of employment in the sustainable tourism sector in the immediate vicinity of onshore windfarm developments did not find any evidence of these areas being adversely affected.
Windfarms and mountaineering in Scotland	Scotland	2016	Mountaineering Council of Scotland	Following criticism of their first survey the MCofS conducted another survey which had largely contradictory findings.	Although 56% of people in the previous survey stated they would avoid areas with windfarms, 77% of people in this survey stated that they had not avoided areas with windfarms.
Community Research	Sheringham Shoals	2010 and 2012	SCIRA	Telephone survey of people in Wells-next-the-Sea in 2010 and in 2012	Reactions to the Sheringham Shoal Wind Farm in 2012 were very positive, with 63% considering it a good idea with benefits for the community (but down from 70% in 2010), 29% thinking it a good thing but with concerns about possible negative effects for the local area (up from 22% in 2010), and just 7% considering it a bad idea with negative effects for the local area (the same as in 2010).

Title	Focus area	Year	Author	Description	Main finding
YouGov wild land survey results	Scotland	2017	YouGov on behalf of John Muir Trust	Online survey of 800,000+ correspondents that asks 2 questions. 1) Should Wild Land Areas continue to be protected in the future from large scale infrastructure, such as industrial-scale windfarms, major electricity transmission and super-quarries? 2) Would you be more or less likely to visit a **scenic area** which contains large scale developments (e.g. commercial windfarms, quarries, pylons etc.), or would it make no difference?	"Wild Land Areas", are defined as places that are rugged, remote and free from major human structures. 52% of respondents strongly agree that Wild Land Areas should be protected, 28% tend to agree. Showing that 80% of people agree with protecting Wild Land Areas 55% said that they would be less likely to visit the area, 3% said it was more likely to visit, 26% said it would make no difference, 6% would definitely not visit, and 10% were unsure. It should be noted that other studies have shown the impact pathway to be a reduction in the perceived value of landscape due to visual impacts. Therefore, it is considered that including Super-Quarrying or Pylons in the same category as Windfarms is incorrect because the former has a far greater visual impact and previous studies have shown people have a more negative view of them. Therefore, the survey is invalid when considering a specific industry such the wind industry.

30.5 Literature Focussing on Non-UK Windfarms

46. More recent studies that focus on the impacts of offshore windfarms on tourism have been found outside of the UK. The European studies have largely been written by or for bodies that represent the interests of the wind industry. Although UK studies by the wind industry (such as the 2006 British Wind Energy Association report to UK Government) were largely omitted from the review it was seen that similarly positive impression were presented in the UK and overseas.

47. To counteract obvious bias, the German Offshore Wind Energy Foundation (2013) primarily focussed on best practice in promoting or protecting tourism as part of offshore windfarm development. This concluded that early engagement with the tourism industry could find benefits for the sector. This approach appears to have created tangible benefit in Denmark (Renewables UK 2016) where visitors can now take “wind safaris” of nearshore windfarms. This is paralleled in Scroby Sands where an information centre was constructed about the clearly visible windfarm and received a considerable number of visitors. The German report recommends viewing platforms and information boards at a minimum so that people can understand more about the windfarm development.

48. This approach to engaging tourists with the positive benefits of windfarms is echoed in a 2010 study of over a 1,000 people at beaches in Delaware (Lilley et al. 2010). This found that people were put off by nearshore windfarms but only at a distance of less than 10km. Unsurprisingly, if a windfarm were to be constructed 1.5km offshore of a beach then only 55% of those surveyed are likely to return. At a 10km distance this figure increases to 74% and at a 22km distance 94% of people are likely to return to the beach.

49. When asked if they would be likely to come to an area for a boat trip to visit a windfarm 10km offshore, 44% of people surveyed say they would be likely to visit the area. This is in comparison to 26% of those surveyed that would be likely to not return to the beach. This finding is similar to UK surveys that show people are interested to visit an area if there are educational facilities (Glasgow Caledonian University 2008) and that this proportion is greater than those who say they would not visit the area due to the windfarm.

50. The most recent study is from December 2018 (Smythe et al.) which assessed the effects of a visible offshore windfarm on the tourism and recreation activities tourists chose to engage in. Another recent study conducted a choice experiment focussing on whether people would rent beach front property if a large windfarm was constructed within visual range (Lutzeyer et al. 2016). This found a similar correlation to the Delaware study between value and proximity of offshore windfarms, the windfarm had to be relatively close to warrant a

change in perception. It was found that renters would not expect a reduction in price if the windfarm was further than 8 miles (13km) from shore.

51. Although these findings are interesting, the studies were promoted by the wind industry. Also, the negative correlation between perception and offshore windfarms are at distances less than 13km. It should also be noted that findings in Scotland show no actual correlation between tourist actions and the presence of windfarms even when they are a sensitive group that states the opposite in perception tests.

52. Main findings are summarised in ***Table A30.2***.

Table A30.2 Main Findings from Non-UK Focussed Tourism Research

Title	Focus area	Year	Author	Description	Main finding
Conflicts with other economic interests including tourism	Ireland	2010	Sustainable Energy Association Ireland	Case study of several European onshore windfarms	Engagement and spatial planning are essential
The Effect of Wind Power Installations on Coastal Tourism	US	2010	Lilley, Firestone, Kempton, University of Delaware	surveyed more than 1,000 randomly sampled, out-of-state tourists at Delaware, USA beaches in 2007	Proximity of windfarms is related to likelihood not to return. After distance of 22km off shore 95% of those surveyed would return to the beach. Also at 10km range, those interested in boat tours exceeds those that would consider a different beach.
Effects of wind power on human interests	International	2013	Ryberg, Bluhm, Bolin, et al.	The purpose of the report was to summarise, analyse and evaluate existing international and national research on wind power's impact on human interests.	Cites the Scottish 2008 study
The impact of offshore wind energy on tourism	Baltic Sea	2013	German Offshore Wind Energy Foundation	Review of good practice in linking offshore wind power to tourism	Offshore industry should enter in to discussion with the tourism industry. Focus should be on the reliability of evidence.
The Impact of Windfarms on Tourism in New Hampshire	US	2013	Polecon Research	Study used a natural experiment in the form of the commissioning of a windfarm in Lempster, New Hampshire to assess windfarm impacts.	Results support the findings of visitor survey-based studies of windfarm impacts that have found little or no impact on tourism activity in response to the presence of windfarms.
Offshore Wind Turbines Part of Danish Touristic Offer	Denmark	2016	Renewable UK	Article on "Offshore Wind Safaris" in Denmark	Windfarms can produce tourism opportunities

Title	Focus area	Year	Author	Description	Main finding
The Amenity Costs of Offshore Windfarms: Evidence from a Choice Experiment	US	2016	Lutzeyer, Phaneuf, and Taylor	a choice-experiment with individuals that recently rented a vacation property along the North Carolina coastline to assess the impacts of a utility-scale windfarm on their rental decisions.	Viewing a windfarm reduces the amount that people would be willing to pay for rental accommodation on the coast. 50% of people say they would not return to a beach rental if a utility scale windfarm is constructed offshore.
Analysis of the Effects of the Block Island Windfarm on Rhode Island Recreation and Tourism Activities	US	2018	Smythe et al., 2018 for the U.S. Department of the Interior Bureau of Ocean Energy Management Office of Renewable Energy Programs	Ongoing study to understand how tourism may be impacted by the development of offshore wind energy facilities	Research revealed that existing recreation and tourism businesses near the Block Island Windfarm have incorporated the windfarm into existing programs and tours on land, sea, and air were experiencing benefits. Further research will be needed to assess whether the benefits are short term and temporary or whether they are long term and consistent.

30.6 Application to East Anglia Wind Industry

53. No UK study to date has found demonstrable impact on the tourism industry by onshore windfarm development. It is also clear that the limited number of non-UK studies focussing on offshore windfarm development show a very limited impact on the tourism industry. This section discusses, how relevant this is to windfarms in East Anglia.

54. Studies of Norfolk and Suffolk tourism show that people generally visit to enjoy beaches, countryside, and AONB; such as the North Norfolk Coast or The Broads. The literature shows that the majority of those surveyed visited the areas in question to enjoy the natural landscape and beauty of nature. Therefore, it is reasonable to suggest that visitors to East Anglia value the visual amenity of landscape to a similar level as those surveyed in rural Wales, Scotland, Cornwall, or Northumberland would do. Considering that over 75% of people in every survey conducted stated that windfarms would not affect their decision to return, it is reasonable to assume that people visiting Norfolk and Suffolk would hold a similar view.

55. It is unclear, however, how people would view the cumulative effect of onshore electricity infrastructure. Many studies alluded to this risk but few studies have investigated this and those that have found a very negative perception of individual elements like pylons. Although the proposed East Anglia ONE North project specifically aimed to reduce this type of visual impact by installing buried cables it is clear that people have reservations about the accumulation of large electrical infrastructure onshore.

56. Studies have shown a possible connection between the visual impact of windfarms in unspoilt landscape, the reduction people would expect on accommodation, and the likelihood of visiting a beach with a view of an offshore windfarm. However, findings show that windfarms would need to be closer than 10km from the shore for this to affect coastal tourism. Considering the East Anglia ONE North windfarm site is 36km from shore at its closest point it seems unlikely that there would be any effect on tourism.

57. Although reports on the benefits of windfarms on tourism are primarily produced by the wind industry they do parallel the good practice stated in documents that demonstrate less bias. However, the benefits relate to windfarms that are much closer to shore, such as Scroby Sands, that are clearly visible. A windfarm (believed to be Scroby Sands) appears in the Visit Norfolk video where they are advertising the beautiful coast line.

58. No literature was found that specifically investigates the relationship between the windfarm industry in East Anglia and the tourism industry there. Considering

the scale of offshore windfarm development and the cumulative effect that this may have, this appears to be a significant omission from the evidence base[2]. It is assumed that the trend will follow the same pattern as studies of other areas and best practice is now available to guide a rigorous investigation. Therefore, it is proposed that to confirm the findings of this literature review a similar study is undertaken of visitors and the tourism sector in Norfolk and Suffolk.

30.7 Conclusion

59. In conclusion, this literature review has found a consistent trend in tourist opinions and actions. These are as follows:

- All studies reviewed show that tourists are not deterred from visiting an area due to windfarms;
- The only study found to focus on electrical infrastructure showed that recreational users are unlikely to change their behaviour due to the presence or planning of supporting infrastructure for offshore windfarms;
- More recent studies of economic impacts show no measurable impact between tourism growth and windfarm development; and
- Recent studies in the US show limited relationship between the proximity of offshore windfarms and tourist perceptions.

60. Although it appears that these findings can be applied to the tourism sector of Norfolk and Suffolk it is noted that there are no publicly available studies that confirm this.

61. It should also be noted that the number of studies of both perception and economic change are relatively limited when compared to other impact areas. There are few studies that are universally regarded as high quality or at large enough scale to be used as evidence for other areas. The 2003 study of Wales, 2008 study of Scotland, and 2010 study of Delaware beach visitors were noted to be cited more than other studies. However, newer studies of economic change will not have been included in previous literature reviews because they are too new.

62. Therefore, it is reasonable to assume that a study of potential and observed impacts of the offshore wind industry on the East Anglian tourism industry would find broadly similar trends.

[2] It should be noted that Scroby Sands and Sheringham Shoal, both of which have well attended visitor centres, may have undertaken studies or have data on visitor attitudes which are not public.

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