

The Economic Impacts of Wind Farms on Scottish Tourism

Economic Research Findings

Glasgow Caledonian University was commissioned in June 2007 to assess whether Government priorities for wind farms in Scotland are likely to have an economic impact – either positive or negative – on Scottish tourism. The objectives of the study were to:

- *Discuss the experiences of other countries with similar characteristics.*
- *Quantify the size of any local or national impacts in terms of jobs and income.*
- *Inform tourism, renewables and planning policy.*

Key Findings

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.

- In total, three-quarters of tourists felt wind farms had a positive (39 per cent) or neutral (36 per cent) impact on the landscape.
- If the renewables target is met via substantial wind farm development, Scottish tourism revenues in 2015 are forecast to be 0.18 per cent lower (£7.6 million) than they would have been if there were no wind farms in Scotland.
- This change in tourism expenditure would mean that in 2015 there will be £4.7 million less Gross Value Added in the Scottish economy than there would have been in the absence of all the wind farms that would be required to meet the renewables target through wind power alone (at 2007 prices). This effect will be offset or reinforced by other economic or environmental impacts of wind farms and a part of the adjustment may have already occurred.
- Four parts of Scotland were chosen as case-study areas and the local effects were also found to be small compared to the growth in tourism revenues required to meet the Government's target. The largest local effect was estimated for 'Stirling, Perth & Kinross', where the forecasted impact on tourism would mean that Gross Value Added in these two economies will be £6.3 million lower in 2015 than it would have been in the absence of any wind farms (at 2007 prices). The majority of this activity is expected to be displaced to other areas of Scotland, and the local effect on tourism should be considered alongside other local impacts of the developments – such as any jobs created in the wind power industry itself.
- Based on survey responses and research findings, the report makes recommendations for the planning authorities which could help to minimise any negative effects of wind farms on the tourism industry. From a tourism stand point, larger developments may be preferable to a number of smaller developments, particularly when they occur in the same general area. There is also an opportunity for the renewables and tourism industries to work together to protect certain areas from development (e.g. National Parks or National Scenic Areas) and to market other areas - with a number of developments - as "green" to make use of the positive perceptions of wind farms.

Methodology

The methodology for the study had four main elements:

1. Desk-based review of around 40 studies in the UK and Ireland, in addition to international reports from Denmark, Norway, Sweden, Germany, the United States, and Australia.
2. Intercept survey of 380 tourists at locations in 4 case study areas: '*Caithness and Sutherland*', '*Stirling, Perth and Kinross*', '*Scottish Borders*', '*Dumfries and Galloway*'.
3. Internet survey of 600 people in the UK and 100 people in the US who had been or were likely to go to Scotland in the near future.
4. Geographical Information Systems (GIS) analysis to identify the number of tourists that are likely to see wind farms during their stay: while travelling (by road) or from their accommodation.

Introduction

Scottish Ministers are committed to generating at least 50 per cent of Scotland's electricity from renewable sources by 2020, with an interim milestone of 31 per cent by 2011. The 2011 target implies around 5,000 megawatts of installed capacity and wind farm developments are expected to make a significant contribution. In turn, these developments will affect the country's landscape, which is often cited by tourists as their primary motivation for visiting Scotland. In light of the tourism industry and the Scottish Government's shared ambition to grow tourism revenues by 50 per cent in the 10 years to 2015, it is vital that the potential impact of wind farms on tourism is accurately assessed, to allow informed, appropriate decisions to be made on their suitability and location.

Findings from the Literature Review

The number and quality of published studies of actual measured effects is very limited. The evidence that exists from the UK suggests there is often strong hostility to developments at the planning stage on the grounds of the scenic impact and the perceived knock on effect on tourism. However developments in the most sensitive locations (such as National Parks and National Scenic Areas) do not appear to have been given approval so that where negative impacts on tourism might have been a real outcome there is, in practice, little evidence of a negative effect.

There is, however, evidence that – on balance – individuals (tourists or otherwise) place a higher value on the landscape when a wind farm is not included in the view than when it is. What is less clear from the literature though is whether this change in value affects a tourist's decision to visit that location (i.e. whether there is a resultant impact on tourism). Over time hostility to wind farms appears to lessen and they become an accepted even valued part of the scenery, particularly by those closest to them. In some countries an established wind farm appears to be able to act as a tourist attraction in the same way as a hydro-electric power station. Overall, there does not appear to be any robust evidence to suggest a serious negative economic impact of wind farms on tourism.

General Attitudes of Current and Potential Visitors towards Wind Farms

This research sought to assess the opinions of tourists towards wind farms in order to supplement the economic impact findings. The findings in the four case-study areas included:

- In total, three-quarters of tourists felt wind farms had a positive or neutral impact on the landscape, of which:
 - 39 per cent of respondents were positive about wind farms,
 - 36 per cent had no opinion either way, and
 - 25 per cent were negative (including 10 per cent who were strongly negative).
- Compared to 10 other structures in the landscape (including pylons, mobile phone masts and fish farms) wind farms received the joint lowest number of “no impact” responses. Opinions on wind farms amongst tourists appear to be heavily divided relative to other structures with the majority of respondents (64%) offering either pro- or anti- wind farm views. The level of *negative* response to wind farms (25%) was the fourth highest of the 11 structures; the level of *positive* responses (34%) was third highest.
- Overseas visitors seemed to be more positive about wind farms than domestic tourists.
- 68 per cent of tourists were positive about the statement “A well sited wind farm does not ruin the landscape” with a further 12% neutral.
- 48 percent of visitors were positive about the statement “I like to see wind farms” with a further 24% neutral.
- Importantly, respondents that had seen a wind farm were less hostile than those who had not.
- The results confirm that a significant minority (20% to 30%) of tourists preferred landscapes without wind farms. However of these only a very small group were so offended that they changed their intentions about revisiting Scotland.

The internet survey of current and potential tourists (600 based in the UK, 100 from the US) found that:

- The perception is that turbines are as prevalent in areas designated as areas of natural beauty as they are in other non-scenic parts of the country.
- The youngest respondents (ages 16-25) in general appear to think that wind farms have less of an impact than potential visitors in other age ranges.
- A much higher percentage of respondents indicated that they would not visit an area if a wind farm was constructed (17.8%) than was found in the intercept survey. It should be noted that compared to the results of the intercept survey, this estimate is less robust and should therefore be treated with caution, as, unlike the intercept study, respondents were not made aware of what constituted the “local area”. Instead, the result is indicative of the level of negative feeling some people have towards wind farms.
- As in the intercept survey, wind farms appeared to be more favoured by foreign tourists than UK visitors.
- Most individuals appear to prefer a landscape from their accommodation without a wind farm (63%) but there is also a substantial proportion that is neutral (28%) and a few who positively like wind farms (9%). Most people appear to believe that, from the hotel bedroom, it is better to face an open hillside, rather than a wind farm.

- There appears to be a diminishing marginal loss of value associated with increasing size of wind farms. In effect, it appears that once there has been an intrusion into the scenery, the effect on the value of the landscape of expanding the size of the wind farm is relatively small.

Economic Impacts

Sources of Economic Impacts

Two main economic impacts may occur when a wind farm is constructed. First, there may be a change in the number of tourists going to an area. This was estimated using the responses to the intercept survey. Secondly, the views from some accommodation will be affected by the construction of wind farms. Under certain assumptions, economic theory predicts that in the short run a change in demand for a “room with a view” will result in a proportionate change in the average price actually paid by the tourist. Consequently, any rise or fall in expenditure on accommodation can be calculated using the findings of the internet survey. Bringing together the two effects allows the estimation of the net changes in tourism expenditure at the local and Scottish levels.

Changes in Visitor Intentions (to Return)

The vast majority (93-99%) of tourists that had seen a wind farm in the local area suggested that the experience would not have any effect on their decision to return to that area, or to Scotland as a whole. The net result of the changes in intentions at both the area level and nationally is therefore relatively small and not significantly different from zero in a statistical sense. Only when respondents were shown images of hypothetical extensions to the wind farm did they become negative in their responses. The extended development scenario at the area level shows a very small but statistically significant (at the 10 per cent level) fall of 2.5 per cent in the likelihood of revisiting an area and an even smaller (less than 0.5 per cent) fall in the likelihood of revisiting Scotland. These are believed to be the maximum negative response that might be expected. Indeed, there were some tourists for whom the experience increased the likelihood of return rather than decreasing it. The assessed change in likelihood combines both decreases (**negative** impacts) and increases (**positive** impacts). The report applies this percentage change in likelihood to the estimated number of tourists that will see a wind farm during their visit and assesses the related fall in expenditure.

Changes in the Price of Accommodation

The results of the internet survey suggest that the average tourist is prepared to pay around 20-35 per cent more for a room with an unspoilt view than they are for a room with a view of a wind farm. In the short run this will result in a corresponding fall in the price charged for the room. However, the vast majority of wind farms considered in this study (both current and proposed) did not affect the views from any accommodation. As a result, the impact of wind farms on tourism revenues that may arise through changes in the price of accommodation – even in the short run – was found to be small. The fall in expenditure on accommodation

across the four case study areas ranged from only 0.48 per cent in 'Caithness and Sutherland' to 1.59 per cent in 'Dumfries and Galloway'.

Modelling the Economic Impacts

The impact on tourism expenditure arising through both effects was calculated using VisitScotland spending data and data submitted by local authorities in support of Grant-in-Aid submissions. This was then fed into the Detailed Regional Economic Accounting Model (DREAM) of the region to provide estimates of the employment and income (Gross Value Added) lost to each case study area and nationally. At the national level, DREAM is the same as published Scottish Government Input-Output tables.

Impacts on Local Area Economies

This study identified all wind farms currently in operation or proposed (as at June 2007). While not all of these will be granted acceptance, it is recognised that there are a number of other applications at the scoping stage that might be built. The number of wind farms considered is greater than the additional capacity required to meet the Scottish Government's targets for renewable energy. The results of the analysis compared to a scenario where there would be no wind farm developments in Scotland are shown in the table below.

Economic Impact of All Current and Proposed Wind Farms
on Scottish Tourism at Local Level (2007 prices)¹

	Current Estimated Total GVA		Potential Reduction by 2015 due to Tourism Visits		Potential Reduction by 2015 due to Accommodation Spending		Maximum Total Reduction by 2015 due to Tourism Effects	
	(1)	(2)	(3)	(4)	(5)	(6)	(7=3+5)	(8=4+6)
	GVA £m	Jobs	GVA £m	Jobs	GVA £m	Jobs	Total GVA £m	Total jobs in all industries
Caithness & Sutherland	£466	1,590	£0.6	27	£0.1	3	£0.7	30
Stirling, Perth & Kinross	£2,961	10,600	£5.2	279	£1.1	60	£6.3	339
Scottish Borders	£1,150	3,600	£1.5	75	£0.2	6	£1.7	81
Dumfries & Galloway	£1,661	4,800	£3.0	200	£1.1	77	£4.1	277

These results should be interpreted very carefully. They suggest that slower growth in tourism revenues caused by all current and proposed wind farms², compared to a situation with no wind farms in Scotland, will result in a modest negative economic impact at a local level. By 2015, the effects tourism revenue and value added³ – compared to what they would have been in the absence of any

¹ All effects quoted include direct, indirect and induced effects.

² As at June 2007.

³ 'Gross Value Added' (GVA) is equivalent to local income plus profits.

wind farms in Scotland – will vary depending on the area; ranging from £0.7 million less value added in ‘*Caithness & Sutherland*’, to £6.3 million less value added in ‘*Stirling, Perth & Kinross*’ (at 2007 prices). This is equivalent to saying that tourism revenues will support between 30 and 339 jobs fewer in these economies in 2015 than they would have in the absence of **all** the wind farms required to meet the current renewables obligation. Part of this adjustment will already have taken place.

These estimates should not be considered in isolation – the effect of reduced tourism revenues may be offset or reinforced by other economic impacts. For example, the number of jobs and income arising in the construction and operation of *each* wind farm developed should be considered when assessing the total impact of all current and proposed wind farms on a local economy.

At the Scotland level, the total impact is not equal to all the local area effects added together. Those areas with fewer wind farms are likely to see greater increases in tourism than they would have otherwise and this will act to offset slower growth in other parts of the country. Only a negligible fraction of tourists will change their decision whether to return to Scotland as a whole because they have seen a wind farm during their visit.

This report estimates that if the renewables target is met via substantial wind farm development, Scottish tourism revenues in 2015 are forecast to be only 0.18 per cent lower in 2015 than they would have been if there were no wind farms in Scotland. This change in tourism expenditure would mean that in 2015 there will be £4.7 million less Gross Value Added in the Scottish economy than there would have been in the absence of all the wind farms that would be required to meet the renewables target through wind power alone (at 2007 prices). These jobs are equivalent to £4.7m of Gross Value Added at 2007 prices. In comparison to the current size of the tourism industry, the reduction in growth prospects is very small (0.1 per cent of tourism employment); compared to the economy as a whole they are smaller still. It should also be remembered that these are not job losses that will be felt instantaneously, rather it is a reduction in the number of jobs that will be created in future as a result of tourism spending. These impacts should not be considered in isolation from other impacts of wind farms on employment, the economy and the environment.

The importance of substitution within Scotland should be noted: a bigger loss is estimated for ‘*Perth, Kinross and Stirling*’ than for Scotland as a whole. This can be explained in part because of the exclusion of residents of Scotland from the estimate of national impact – these people would be expected to continue to spend in Scotland even if they are put off visiting a particular area. The local area estimate is also dependent on the maintenance of areas without, or with very few, turbines. If this is not the case then the local area effects are likely to be lower than currently estimated, whilst the impact on Scotland as a whole may be larger.

The report makes clear that all estimated impacts are a worst case scenario, for a number of reasons. The most important of these are:

- The research was based on reactions to hypothetical extensions to existing wind farms,

- The research assumed perfect visibility of wind farms, and
- Wind farms could prove to be a tourist attraction.

Planning Recommendations

This research has found that the negative impact of wind farms on tourism at national level is small and any reduction in employment in tourism will be less than the numbers currently directly employed in the wind power industry. However planning authorities may wish to consider the following factors to ensure that any adverse local impacts on tourism are minimised:

- The number of tourists travelling past *en route* to elsewhere,
- The views from accommodation in the area,
- The relative scale of tourism impact i.e. local and national
- The potential positives associated with the development
- The views of tourist organisations i.e. local tourist businesses or VisitScotland.

In some cases this consideration would be greatly assisted if the developers produced a brief Tourist Impact Statement as part of the Environmental Impact Assessment. The core of the statement would be the tourist accommodation and the number of tourists on roads within the Zone of Visual Impact. However in tourist areas the developer might also be expected to generate proposals to make use of the positive aspects of the development.

At the national planning level the research in this report identifies that from a tourism viewpoint:

- A number of wind farms in sight at any point in time may be undesirable
- The loss of value when moving from medium to large developments is not as great as the initial loss. It is the basic intrusion into the landscape that generates the loss of value for tourists.

This suggests that from a tourism stand point, larger developments are preferable to a number of smaller developments, particularly when they occur in the same general area.

Finally this research found that, in general, the public did not recognise that some areas had been protected from development. Currently those tourists who do find wind turbines an objectionable presence are most likely simply to move to another area in Scotland. To ensure substitution opportunities it is important that areas are retained where turbine development is limited to supplying local needs in small remote communities. Smaller scale community projects clearly have an important role to play in meeting Scotland's energy requirements.

The wilderness nature of any untouched areas should be publicised. Equally the research found some tourists positively attracted to wind turbines, particularly in quiet rural areas similar to Denmark. The research suggests that there may be an opportunity to market these areas as "green" and to view wind farm development positively. Of the case study areas Caithness would appear to be the most vulnerable to tourism losses and equally it is this area that has the greatest opportunity to promote itself as a centre for renewable energy.

Conclusions

Overall the finding of the research is that if the tourism and renewable industries work together to ensure that suitably sized wind farms are sensitively sited, whilst at the same time affording parts of Scotland protection from development, then the impacts on anticipated growth paths are expected to be so small that there is no reason to believe that Scottish Government targets for both sectors are incompatible.