

RSPB

Lewis Wind Power Economic Assessment

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Private and Confidential

DTZ C
No. 1 Marsden Street
Manchester
M2 1HW

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Executive Summary

1. This report provides an independent assessment of the potential economic impacts of the revised (as of December 2006) Lewis Wind Power project. The report has been commissioned by the Royal Society for the Protection of Birds (RSPB) and undertaken by DTZ Consulting & Research (DTZ). The chief object of the report is to review the economic analysis included in the Lewis Wind Power (LWP) environmental statement, but it also draws upon other relevant analysis commissioned by Western Isles Council and others.
2. The assessment relies on the specification of the LWP project found in the environmental statement. Essentially this is for 181 wind turbines with a total 651.6 MW generation capacity. Development costs are anticipated to be £512 million.
3. Regeneris Consulting have undertaken an economic assessment of the LWP project for the developer. They estimate that 86 full time equivalent jobs will be created in the Western Isles as a result of the development phase of the scheme. A key assumption is that the fabrication of the towers and possibly the turbines will take place in the Western Isles at the Arnish point facility. DTZ has assessed the attributes of this facility and likely competitors, and concludes that on balance it is probable that the fabrication will take place at Arnish point. However, we consider that there are some flaws in the Regeneris Consulting analysis, in that:
 - Much of the development costs have been misattributed as construction activity instead of manufacturing.
 - Their method of converting the temporary jobs associated with the development phase into FTE jobs is not, as claimed, endorsed by HM Treasury.
 - The method of calculating indirect and multiplier impacts from the development phase is not transparent and cannot be replicated.
4. In the Environmental Statement, Regeneris Consulting state that around 39 full time equivalent (FTE) jobs will be required for the on-going operation of the LWP windfarm, with an associated annual salary cost of £1.31 million. The number of local workers required to operate and maintain the wind farm is stated to be 37, including 5 posts at a wind farm visitor centre. (The other two posts are apparently ecologists involved in the monitoring of environmental impacts who are assumed to be based elsewhere in Scotland). However, a justification for the number of operational jobs is not provided, and nor is there a breakdown of this number by occupation, grade or skill. It difficult, therefore, to assess the potential capacity of the Western Isles labour market to fill the operational posts that Regeneris Consulting expect to be created during the operational phase of the project.
5. Three sources of indirect economic impact are considered in the Environmental Statement. The first two of these are:
 - Economic activity stimulated by the purchase of goods and services as inputs into the windfarm operation by the operator. These are primarily the procurement (supply chain) impacts, and depend on the type and geographical source of purchases by the operator. Regeneris Consulting estimate 14 FTEs from this source. However, because of a lack of transparency in the methodology used, it is difficult to assess whether this estimate is realistic.

- Economic activity stimulated by the recycling of land lease payments made by the operator to the estates and to the crofters whose land is required to host the windfarm. Regeneris Consulting estimate 14 FTEs from this source. Again, a lack of transparency in methodology makes it impossible to replicate these results. A particular area of concern is the apparent assumption that the payments would not be subject to taxation, which leads DTZ to conclude that the economic benefit estimates (in terms of jobs) is probably overstated by at least 20%.
6. The most significant source of economic benefits from the LWP that are estimated by Regeneris Consulting derive from a third source of indirect benefit, namely economic activity stimulated by the spending of payments from the windfarm operator to the community to be spent on schemes “benefiting the communities of the Western Isles”. These comprise payments to four Trust funds – the three estates and the Western Isles Development Trust. Collectively, Regeneris Consulting estimate 142 FTEs from these funds.
 7. DTZ has concerns about the method used by Regeneris Consulting to calculate these estimated impacts. The concerns are as follows:
 - Regeneris Consulting estimate that the community and economic development activities supported by the community fund payments would support a total of 142 jobs over the same 20 year period.
 - However, Regeneris Consulting then make a fundamental major error by claiming the 142 jobs (over 20 years) as FTEs, and add these to the annual FTE estimates for direct and other indirect effects.
 - DTZ suggests that the Regeneris Consulting approach to assessing deadweight and displacement is inappropriate and appear to have been underestimated by around 15%.
 8. If, as appropriate, the 142 jobs were divided by 20 to obtain an average annual estimate of employment generated from the community and development trust payments, then the total would be something like 7 FTEs per annum. Adjusting for a more appropriate assessment of deadweight and displacement would reduce this to a number closer to 6 FTEs per annum. The net result of all these comments, therefore, is that DTZ considers that a more likely estimate of impact is 6 full time equivalent jobs per annum rather than the 142 claimed by Regeneris Consulting.
 9. In terms of the potential effects on LWP on the area’s tourism economy, Regeneris Consulting acknowledge that there may well be an overall net negative impact but they do not attempt to quantify this. The evidence from various surveys of residents and visitors is mixed, but on balance DTZ considers that a reduction of around 10% in the area’s tourism economy would be a reasonable working assumption. A reduction of this magnitude would result in the direct loss of about 120 jobs, with a further loss of 20 jobs assumed through indirect and multiplier impacts.
 10. The employment impact estimates predicted by DTZ for the LWP (before tourism displacement effects are factored in) is 73 FTEs, which is almost 70% less than the 233 FTEs claimed by Regeneris Consulting. Almost all of this difference derives from the alternative approaches made in assessing the effects of Community Fund expenditure. There is also some difference in the approach to the effects of the land lease payments, but this only accounts for a difference of 4 jobs. There is also a knock-on impact on the predicted number of induced jobs (DTZ: 6; Regeneris Consulting: 26) that flows from these two sources. This difference is

mainly due to the different assumptions regarding the Community Fund rather than the land lease payments.

11. It is worth pointing out that given that LWP is likely to generate, at most, 73 new permanent FTE jobs, any subsequent reduction in the size of the islands' tourism economy greater than 5% will result in a net negative overall impact for LWP, at least in employment terms. (i.e. the 73 jobs is approximately equivalent to 5% of the employment base associated with tourism).

1. Introduction

Background to the Report

- 1.1 This is an independent assessment of the potential economic impacts of the Lewis Wind Power project proposed for Lewis. The report has been commissioned by the Royal Society for the Protection of Birds (RSPB) and undertaken by DTZ Consulting & Research (DTZ).
- 1.2 The object of the commission is to review the economic analysis included in the December 2006 Lewis Wind Power (LWP) environmental statement. The analysis also draws on the economic analysis contained in the environmental statement produced for the earlier (234 turbine) design of the proposed LWP project. It also considers the separate assessments of economic impact of the proposed scheme undertaken by Reference Economic Consultants on behalf of Western Isles Council, as well as a further study undertaken by Halcrow commissioned by the local authority on the potential impact of LWP on the island's tourism economy.¹

Terms of Reference

- 1.3 The terms of reference for the assignment focused on four questions, which can be summarised as follows:
- i. The likelihood of wind turbine manufacture taking place on Lewis and the importance of this to the economic impact results presented in the environmental statement.
 - ii. The likely overall level of job creation associated with LWP, and the robustness of the assessment contained in the environmental statement.
 - iii. The likely net job creation impacts attributable to LWP, taking on board the potential for the windfarms to affect tourism activity on the island.
 - iv. Assessment of the potential for the local labour market to meet the labour requirement generated by LWP.
- 1.4 Where appropriate we have commented on Regeneris Consulting's estimates for the potential impact of the proposed LWP project on the Scottish economy as a whole, but the main focus of the analysis in this report is on the potential impact of LWP on the Western Isles economy.

Method Used

- 1.5 The research undertaken by DTZ has been desk based and has consisted of the following tasks:

¹ Reference Economic Consultants - *Independent Review of Wind Farm Proposals* (2005); Halcrow Group Ltd - *Impact of Wind Farm Development upon Tourism* (May 2005); Regeneris - *Socio-economic Assessments* (2004 & December 2006).

- ❑ Review of the socio-economic assessment of LWP undertaken by Regeneris Consulting (Chapter 9 of the environmental statement).
- ❑ Review of the economic and tourism impact assessments commissioned by Western Isles Council, as well as other background reports on the tourism economy of the Western Isles.
- ❑ Assessment of standard socio-economic data sources available for the Western Isles.
- ❑ Consultations with Western Isles Council; Western Isles Enterprise; and the Office for National Statistics.

Structure of Report

1.6 The remainder of this report is structured as follows:

Chapter 2	sets out the salient features of the LWP project
Chapter 3	considers the potential development phase impacts of the LWP project.
Chapter 4	assesses the potential operational phase impacts of LWP
Chapter 5	assesses the potential interactions between LWP and the tourism economy of the Western Isles
Chapter 6	examines the potential impact of LWP on labour market and demographic characteristics of the Western Isles
Chapter 7	provides DTZ's assessment of the quantifiable economic impacts of the LWP project
Chapter 8	presents overall conclusions

2. The Lewis Wind Power Project

DEFINITION OF THE PROJECT

- 2.1 The specification of the LWP project that was the subject of the socio-economic assessment (SEA) produced by Regeneris Consulting is for a 651.6 MW development requiring 181 wind turbines across the Barvas, Galson and Stornoway Trust estates (SEA, para 1 & 19).
- 2.2 This compares to the previous version of the project, which was for 234 wind turbines with a total generating capacity of 702 MW.
- 2.3 The anticipated development costs for LWP is stated in the environmental assessment to be £512.17 million, comprised of the following:

Table 2.1: Anticipated Development Costs, LWP

Development Cost Item	Estimated Cost (£m)
Design and Development	10.95
Electricals (civils contractor element)	26.58
Electricals (grid on the island)	30.00
Civils	79.75
Towers	43.79
Blades	32.58
Wind turbines	270.28
Installation	18.24
Total	512.17

Source: SEA, Table 9.5

- 2.4 DTZ is not in a position to comment on the likely accuracy of the latest set of estimates provided in the Environmental Statement. However, we note that the previous (234 turbine) version of the project was costed at £411 million, and as a consequence the estimated average cost per MW has increased from £0.59 million to £0.79 million under the revised proposals.

METHODOLOGY USED TO ASSESS ECONOMIC BENEFITS

- 2.5 In this report we have followed the structure used by Regeneris Consulting in presenting the potential quantifiable socio-economic effects of LWP. That is, the quantifiable benefits can be broken down into the following three categories:

Types of effects/ impacts	Examples of Activities
Direct impacts	<ul style="list-style-type: none"> ❑ Expenditure, income and employment arising from the development and commissioning of the windfarm ❑ Expenditure, income and employment arising from the operation of the windfarm and associated visitor centre ❑ Expenditure, income and employment arising from the decommissioning of the windfarm
Indirect effects	<ul style="list-style-type: none"> ❑ Additional activity and employment supported through expenditure placed with suppliers during both the development and operational phases of the windfarm ❑ Additional activity and employment arising from the payment of rental income to land owners and crofters upon whose land the windfarm is located ❑ Additional activity and employment arising from the payment of rental income to community trusts that are intended to be established to fund projects that will be of social and/or economic benefit to the host location
Induced effects	<ul style="list-style-type: none"> ❑ A further economic stimulus arising from the spending and re-spending of income associated with the direct impacts and indirect effects described above.

2.6 In the following section we review the potential temporary, development-phase impacts of the proposed LWP project before going on to consider the potential longer-term impacts from its operational life in subsequent chapters.

3. Development Phase Impacts

Direct Impacts

- 3.1 The direct impacts of the development phase are those arising from the design, construction, manufacture and commissioning of the windfarm. That is, the costs incurred in getting the windfarm to the stage where operations can commence.
- 3.2 Regeneris Consulting conclude that 86 full time equivalent (FTE) jobs in the Western Isles will be attributable to the proposed LWP project. The following are the key steps taken by Regeneris Consulting to reach this figure:
- They assume that £77.29 million of development expenditure (15.1% of the total) will be expended in the Western Isles (SEA para 98). Of this, £30.65 million (39.6%) is associated with the fabrication of the towers (SEA, Table 9.6).
 - They obtain an estimate of the number of person-years' employment involved in the development. This is done by dividing the figure of £77.29m by the average value of gross output per employee in the construction sector in Scotland (cited as £90,000 per employee). That is, $£77.29m/£0.09m = 858.8$ person years of employment.
 - The number of person-years of employment has been converted into FTEs by applying (based on 'the Treasury convention')² that 10 person years of construction employment is approximately equal to 1 FTE job.
 - So, using this approach in the case of the proposed LWP project, 859 person-years is equivalent to 86 FTE jobs.
- 3.3 A key assumption in the Regeneris Consulting approach is that the towers are manufactured within the Western Isles, whilst the wind turbine components are manufactured elsewhere and assembled locally. This assumption is based on a further assumption that a suitable fabrication and assembly facility is provided at Arnish Point near Stornoway.
- 3.4 DTZ has tested this assumption by revisiting research undertaken for a private sector client in 2004 into offshore structure fabrication facilities in Scotland. This research found that there are probably only four locations in Scotland that would be able to undertake the sort of mass production and storage required for the production of large (>100 metre length) towers these being:
1. The linked facilities at Methil and Burntisland in Fife operated by Burntisland Fabrications Ltd.
 2. Nigg (north of Cromarty).
 3. Arnish Point, Lewis.
 4. Campbelltown.

² SEA paragraph 101

- 3.5 The attributes of these locations are set out in the table overleaf.
- 3.6 Based on the information set out in Table 3.1, DTZ feel that Campbeltown can be discounted from consideration due to the fact that the development of the New Quay is focused only on the assembly processes involved in wind turbines, while there is also the possibility of a ferry service returning to the pier. Moreover, manufacturing is already taking place nearby at the Vestas-Celtic facility at RAF Machrihanish.
- 3.7 The facility at Nigg has the size needed for the manufacturing and assembly of the wind turbines. However, the location of the yard (on the mouth of the Cromarty Firth) counts against the site because it could make the transportation of the towers and turbines to the Isle of Lewis more challenging.
- 3.8 From a size point of view, either of the Burntisland and Methil facilities could be suitable for the manufacture and assembly of the wind farm components, especially with the development of Methil as an Energy Park. However, as with Nigg, the location of the sites means that Arnish Point is a far more suitable location for the processes to take place.
- 3.9 On balance, therefore, DTZ conclude that it is plausible to assume that Arnish Point is the most likely place for fabrication of towers and final assembly of turbines to take place. It is not guaranteed, however, with Nigg and Burntisland being other possible contenders for some or all of this work.
- 3.10 There are current concerns, discussed in the SEA (paragraph 93), regarding the financial health of CamCal, the business that has established at Arnish Point for the design and fabrication of steel structures for the wind sector. The SEA acknowledges these difficulties, but stresses that LWP considers that tower fabrication is feasible at Arnish Point even if CamCal itself were no longer trading.
- 3.11 DTZ's view is that assuming that the fabrication of towers and final assembly of turbines does take place on Lewis, then the assumption made by Regeneris Consulting – that approximately 15% of project development value (£77.29 million out of a total of £512 million) could be sourced from the Western Isles – appears to be plausible.
- 3.12 However, DTZ does have concerns regarding the method used by Regeneris Consulting to estimate the development phase impacts of the proposed LWP project. These concerns are discussed under appropriate sub-headings below.

Table 3.1: Site Comparison Table

Site	Size & Site Description	Recent Investment/ Financial Information	Location/Proximity to Lewis Site & Other Information
Arnish Point	<p>Arnish Point is being promoted as a major centre for renewable energy manufacturing and assembly. Main features of the site include:</p> <ul style="list-style-type: none"> ▪ 20ha of industrial land under construction. ▪ Deepwater berthing. ▪ Wide land use planning classification. ▪ Loan packages/grants available to tenants. <p>A refurbished main workshop (at a cost of £4.5 million) provides 12,000m² of manufacturing/assembly space, a 30,000m² yard/storage area, in addition to other facilities.</p>	<p>Project being funded by Highlands & Islands Enterprise and Western Isles Enterprise, with support from the European Regional Development Fund. Total cost will be £12 million, including a £600,000 award from the Highlands & Islands Special Transitional Programme.</p>	<p>Located on the outskirts of Stornoway on the Isle of Lewis. Daily air services operate to Edinburgh, Glasgow and Inverness.</p> <p>A masterplan for the site was commissioned by local agencies, with the creation of a multi-use site envisioned over the longer-term. The plans for the site also include the potential for the development of a hydrogen plant.</p> <p>Cambrian Engineering (now CamCal) was identified as a key client and a funding & lease package of £5.7 million was provided for the company. The first major contract for Arnish was awarded in June 2003 – 16 piles for the Scroby Sands Wind Farm.</p>
Methil/Burntisland	<ol style="list-style-type: none"> 1. Burntisland yard – facilities include 2 undercover assembly halls (5,470m²), 3 pre-fabrication shops (4,700m²) and an open assembly/storage area (60,000m²). 2. Methil yard – facilities include 1 undercover assembly hall (6,400m²), 3 pre-fabrication workshops and an open assembly/storage area (277,000m²). 	<p>The plan to turn the Methil yard into an Energy Park has been successful in gaining high impact project status within the Scottish Enterprise Five Year Investment Plan and has secured £1 million in funding from the European Regional Development Fund.</p>	<p>Burntisland yard is 27km from Edinburgh Airport, the Methil yard is 48km from the Airport.</p> <p>Plans have been approved to transform the Methil yard into an Energy Park - representing a collaborative project between government and private industry. The announcement was made in August 2005. The Methil yard is currently working on the Beatrice offshore wind project.</p>
Nigg	<p>Approximately 82ha. Nigg has a number of facilities, including admin offices, workshops, fabrication shops and warehousing. Excluding the BAE Systems yard in Barrow, Nigg is double the size of the next largest remaining UK yard – it possesses approximately 25% of currently operated UK major yard capacity.</p>	<p>With the help of EU funding in 1996, Nigg underwent an £8 million upgrade.</p>	<p>The Nigg Fabrication Yard is located on the foreshore of Nigg Bay with return frontage to Cromarty Firth. Vehicular access is via the B9175, which runs 6 km from the A9.</p> <p>The yard is currently being marketed to prospective buyers.</p>
Campbeltown	<p>The pier is currently 21m wide. It will be extended to 40m as part of the development of Campbeltown New Quay, while the overall length of the berth will be 130m.</p> <p>The site is currently used for the export of wind turbines and timber. The turbines are assembled wherever they are taken to. Begun in March 2005, the harbour will see significant change as part of the development of Campbeltown New Quay.</p>	<p>Argyll & Bute Council has agreed a funding package worth £4.77 million to upgrade Campbeltown's New Quay. The funding has come from the Council, Highlands & Islands Enterprise and the European Regional Development Fund. The aim is to allow expansion of wind turbine production in the area.</p>	<p>The Argyll & Bute Local Plan 2003 lists the harbour area as an Area for Action, stating that effective use should be made of the investment in Campbeltown Harbour to service the needs of the Vestas-Celtic wind turbine manufacturing plant at RAF Machrihanish. The upgrading will allow Vestas-Celtic to pre-assemble wind turbines on the quay before export by sea. The development of Campbeltown New Quay will provide Vestas-Celtic with the length and berth space they need to tie up to. They actually manufacture the turbines approximately three miles away at RAF Machrihanish. They tend to use ship board/mobile cranes.</p>

Classifying the Project as a Construction Project

- 3.13 Regeneris Consulting has identified the development costs associated with the windfarm as ‘construction’. This is an important assumption because, as noted already, their approach is to divide the total development cost budget by the value for average output per employee in the construction sector (£90,000 per employee, according to paragraph 100 of the SEA) to obtain an estimate of the number of person-years’ activity associated with the development of the windfarm. The answer that Regeneris obtain is 859 person years.
- 3.14 As can be seen in Table 2.1, the majority (around 81%) of development cost expenditure is associated with the fabrication of the towers and assembly of the turbines. DTZ has checked with the Office for National Statistics (Classification Unit), who confirm that these types of business activity should not be classified as construction (as appears to be assumed by Regeneris Consulting). Instead, the classifications recommended by ONS are as follows:

Table 3.2: Standard Industrial Classifications for Wind Farm Fabrication

Activity	2-digit SIC Code Classification	4-digit SIC Classification
Fabrication of the wind farm towers	28: Manufacture of fabricated metal products, except machinery and equipment.	28.11: Manufacture of metal structures and parts of metal structures.
Assembly of the turbines	29: Manufacture of machinery and equipment not elsewhere classified.	29.11: Manufacture of engines and turbines, except aircraft, vehicle and cycle engines.

Source: UK Standard Industrial Classification of Economic Activities, 2003, ONS

- 3.15 That is, wind farm tower fabrication and turbine assembly are correctly covered by manufacturing classifications rather than construction.
- 3.16 The most up-to-date data on the average output per employee in Scotland for the industrial sectors under discussion are as follows (for comparison the up-to-date value for the construction sector is also provided in the table):

Table 3.3: Average Output per Employee in Scotland for Relevant Sectors

Activity	2-digit SIC Classification	Average Output per Employee
Fabrication of the wind farm towers	28: Manufacture of fabricated metal products, except machinery and equipment.	£81,783
Assembly of the turbines	29: Manufacture of machinery and equipment not elsewhere classified.	£88,550
Construction	47: Construction	£92,356

Source: Scottish Executive Statistics, from ABI2 published by ONS 2003

Converting Person-years into FTEs

- 3.17 A key component of the Regeneris Consulting analysis is the level of employment associated with the development of the proposed wind-farm. The report argues that the construction

phase will generate 859 person years of employment for the Western Isles, equivalent to 86 full time permanent jobs. These estimates are said to be based on 'the Treasury convention' that equates one permanent full time equivalent (FTE) job to the equivalent of ten years of employment.

- 3.18 There are several weaknesses surrounding these arguments:
- a) The appropriateness of including construction employment in a standard regeneration assessment.
 - b) The derivation of FTEs based on job years.
 - c) An apparent lack of any formal analysis of additionality for construction jobs.
- 3.19 In terms of (a), although economic appraisals for regeneration projects do, by convention report the level of construction employment, this is not usually included as a direct output for appraisal purposes. This is because construction employment is temporary, and the official view has been that new projects have the potential to 'crowd-out' other investments.
- 3.20 For example, in advice currently issued to the Regional Development Agencies, OFFPAT (Office of Project Advice & Training) makes it clear that construction jobs 'integral to the delivery of a project, should be excluded from assessments of job creation even if they last for more than one year' (Core Outputs – Technical Note). The OFFPAT advice is endorsed by DTI, ODPM and HM Treasury.
- 3.21 This point is also made clear on page 133 of the 3Rs Guidance (Assessing the Impacts of Spatial Interventions Regeneration, Renewal and Regional Development). This guidance is published by ODPM and sanctioned by HM Treasury, and governs all regeneration appraisals undertaken in England and Wales.
- 3.22 It is also clear from the Scottish public finance Manual published on the Scottish Executive Government website that guidance on appraisal found in the Treasury's Green Book has been adopted in Scotland.
- 3.23 In regard to translating temporary employment to full time equivalents, it is unclear from where the report's authors have adopted their 'ten year rule'. In particular the Green Book makes no mention of this convention, while the 3Rs Guidance is also silent. While it is correct that the 'ten-year rule' is in widespread use, it would have been helpful if the report's authors could have provided a specific reference to endorse their methodology.
- 3.24 It also appears that the assessment of construction jobs analysis lack a formal treatment for all of the normal components usually required to transform gross outputs to net outputs. In particular the figures should be adjusted to formally account for leakage, substitution and displacement. A statement merely suggesting that 'the local economy on the whole, would be able to meet this increase [in labour]' (p18) would not normally be sufficient to satisfy project appraisers.

Indirect Effects

- 3.25 Regeneris Consulting calculate that the four-year development programme for LWP would produce the following indirect effects in the Western Isles:

Table 3.4: Estimated Indirect Effects of the Development Phase of LWP, Western Isles

	Output (£ million)	Employment Income (£ million)	Employment (FTEs)
Western Isles	13.8	8.8	51

Source: SEA, Table 9.8

- 3.26 The latest estimates of indirect development phase impacts – at least, for income and employment – are very much higher than the equivalent figures from the 2004 environmental statement produced in support of the larger, 234 turbine (702 MW) project proposal (the figure for output, on the other hand, is lower). The previous (2004) SEA set out (in Table 9.7 of that document) the following estimates for indirect development phase impacts for the Western Isles:
- Output - £18.94 million (37% greater than the revised estimate)
 - Employment income – (£2.73 million, 31% of the figure now assumed by Regeneris)
 - Employment FTEs – (17, one-third of the figure now assumed by Regeneris)
- 3.27 DTZ’s main concern about the Regeneris approach is that because they have mis-categorised the project as ‘construction’ (rather than recognising that it is predominantly ‘manufacturing’) then an inappropriately high value for the multiplier has been used in their calculations. For example, the value of the construction sector multiplier used by Regeneris is 1.179. If the multiplier for ‘other manufacturing’ was used (1.111) then the output impact estimates would fall by over a third, from £13.8 million to £8.6 million, and from 51 jobs to 32 jobs.
- 3.28 Table 9.8 suggests that an additional 51 permanent FTE jobs would be generated through indirect effects. This implies a multiplier effect of 1.593 $[(86 + 51) / 86]$. However, the employment multiplier for construction shown in the Western Isles Regional Accounts is 1.243. If this multiplier was used this would imply only an additional 21 permanent FTE jobs, not the 51 claimed by Regeneris. Moreover, if the multiplier for ‘other manufacturing’ were to be used (1.138) then the number of additional jobs would fall further still to just 12 permanent FTE jobs.
- 3.29 Fundamentally, it is inconceivable for Regeneris to claim, as they do, that a project that is expected to create 86 FTEs in the Western Isles during its development phase can be capable, in turn, of supporting as many as 51 jobs through indirect development phase impacts. It is noted that in their previous assessment of the 234 turbine project proposal, indirect construction related output worth an estimated £18.94 million was estimated to generate employment in the extent of 17 jobs. However, Regeneris now claim that a smaller injection

of construction related output (£13.8 million) is capable of supporting 3 times as many jobs (51, up from 17).

- 3.30 DTZ consider that at best the likely number is 21 jobs, and we suggest that 12 is more realistic given the largely manufacturing nature of the development process.
- 3.31 Although it is not possible to be absolutely sure of the method used by Regeneris to generate their results, DTZ's has investigated the available data and considers that it has been able to replicate the Regeneris results using data referenced elsewhere in the SEA report and the 2003 Regional Accounts. However, this process of investigation has highlighted two points of concern both suggesting the number of claimed job impacts in Table 9.8 is overstated:
- 3.32 Firstly, the report appears to apply the construction "employment effect" for the Western Isles economy (0.037) taken from the regional accounts to the additional £13.8m of knock-on output. The employment effect measures the total employment impact per unit of additional (direct) demand, the correct application would be to divide the employment effect by the employment coefficient, thus removing direct impacts and double counting from the indirect impact calculation. This gives the construction employment multiplier (1.24), which can be applied to the direct jobs to give the total effect (direct + indirect) i.e. $86 * 1.24 = 106.6$. Subtracting the direct effect leaves 21 additional indirect jobs.
- 3.33 The employment effect figures are used in the report in such a way to allow double counting, since the employment effect includes direct, indirect and induced impacts (and the direct part is already accounted for in the SEA).
- 3.34 The second point of concern is the low level of output per worker attached to the impact figures. This may be explained in part by the double counting effect but it also appears that output at 2006 prices has been used to estimate employment.
- 3.35 Multipliers are without units of measurement (using them to model inputs in 2006 prices produces outputs in 2006 prices). Employment *coefficients* however measure the ratio of jobs per unit of output and in the case of the Western Isles Regional Accounts, they are shown in 2003 prices. HM Treasury deflators are available to adjust such calculations accordingly.
- 3.36 Although it unclear where the balance of error lies, it is clear that the employment impact is overstated and is likely to results in 12 additional jobs instead of 51 claimed in the report (not withstanding reservations highlighted earlier in the reports calculations).
- 3.37 In any case, DTZ considers that it is misleading for the indirect development phase employment outputs, whatever level they are, to be considered as 'permanent' jobs, as Regeneris claim in both paragraph 103 as well as Table 9.8 of the December 2006 SEA. This is because the impacts are entirely related to the construction, fabrication and installation of the wind farm machinery and other equipment, and by essence is a temporary phenomenon.
- 3.38 It would seem to be much more appropriate for the indirect, construction phase employment effects to be discounted by the '10 to 1 rule' that Regeneris deploy elsewhere in their analysis

of construction phase impacts. On that basis, the maximum amount of FTE employment created in the Western Isles would be something like 5 (on the basis of the latest Regeneris calculations) or less than 2 (on the basis of their 2005 calculations).

Induced Effects

- 3.39 The same comments apply regarding Regeneris Consulting's estimates of induced effects. Unfortunately, Regeneris Consulting have not been sufficiently transparent in their use of input-output tables to enable replication of their results.
- 3.40 Therefore, we suspect that in mis-categorising the project as a construction activity (rather than a predominantly manufacturing activity) then inappropriate values may have been used to assess the wider multiplier effects of the development scheme.
- 3.41 Moreover, the number of induced construction phase job outputs claimed for the project by Regeneris in their latest (December 2006) report is now remarkably high, compared to the equivalent analysis found in their assessment of the (larger) 2005 LWP project.
- In 2005, induced output of £3.69 million was estimated to be generated in the Western Isles, which it was claimed would support around 8 permanent jobs
 - By 2006, Regeneris had changed their position to the extent that £13.2 million of induced output in the Western Isles was claimed to be capable of supporting 33 'permanent' FTEs
- 3.42 Again, it seems that the estimates have changed to such a great extent because of a misapplication of multipliers.
- 3.43 Moreover, it is in our view also entirely dubious to claim these impacts as 'permanent' when they are entirely related to the development phase. Use of Regeneris' recommended '10 to 1' rule would deflate the estimated jobs to a maximum of three FTEs only.

4. Operational Phase Impacts

DIRECT EFFECTS

4.1 Regeneris Consulting correctly suggests that the permanent economic impacts associated with the operation of the wind farm is dependent on two main considerations:

- The geographic source of materials, equipment and other inputs on the one hand.
- The residential location of the workforce employed in the operation of the windfarm on the other.

4.2 The method used by Regeneris Consulting to estimate the direct impact of the operational phase of the development is straightforward. In the Environmental Statement (paragraphs 107-108) Regeneris Consulting identify that:

- Around 39 FTE jobs will be required for the on-going operation of the windfarm.
- Of these jobs, five are assumed to be required to run the proposed visitor centre. A further two jobs are apparently the ecologists involved in monitoring environmental impacts.
- The remaining 32 jobs are apparently required to manage and operate the wind farm itself, but this estimate is not justified, and nor is it broken down in terms of the grade, occupation or qualification level of the staff expected to be employed.
- This labour requirement is stated to produce an annual salary cost of £1.31 million.
- The average salary cost per FTE is slightly more than £35,100.

4.3 The revised proposals from the developer feature a pledge to attempt to fill all 37 jobs locally. The previous assessment by Regeneris was predicated on an assumption that 80% of jobs would be filled locally.

4.4 However, the lack of detail in the Environmental Statement concerning the nature, type and skills required for the workforce of the proposed windfarm makes it difficult to provide any detailed analysis on whether the assumption that 100% of jobs can be filled locally is realistic or otherwise.

INDIRECT ECONOMIC IMPACTS

4.5 Three sources of indirect economic impact are considered in the Environmental Statement. These are:

- Economic activity stimulated by purchase of goods and services as inputs into the windfarm operation by the operator. These are the procurement (supply chain)

impacts, and depend on the type and geographical source of purchases by the operator.

- Economic activity stimulated by the recycling of land lease payments made by the operator to the estates and to the crofters whose land is required to host the windfarm.
- Economic activity stimulated by the spending of payments from the windfarm operator to be spent on schemes benefiting the communities of the Western Isles.

4.6 The quantum of indirect economic impacts identified by Regeneris Consulting for the spatial area of the Western Isles is summarised in the table below. The numbers are sourced from Table 9.15 of the December 2006 SEA.

Table 4.1: Predicted Indirect Economic Effects from LWP, Western Isles

	Output (£ million)	Employment Income (£ million)	Employment (FTEs)
Supply chain	0.42	0.23	14
Land rental payments	0.39	0.21	14
Sub-total	0.80	0.44	28
Community funds	4.04	2.23	142
Total	4.85	2.67	170

Source: SEA, Table 9.15

4.7 As is clear from the above table, the quantum of indirect economic benefits anticipated by Regeneris Consulting is dominated by the estimated benefits associated with the spending of community fund payments (83.5%). Only 8% of quantified indirect benefits are associated with supply chain impacts from the windfarm itself. Below, each of these aspects is examined in turn.

Supply Chain Effects

4.8 The supply chain effects of the proposed LWP scheme are quantified by Regeneris. They identify average annual operating costs of £13.923 million (2006 prices), as follows.

Table 4.2: Predicted Supply Chain Effects, Western Isles, 2006 Prices

	Estimated Cost (£m)
Wages	1.312
Labour on-costs	0.295
Other operational costs	0.469
Administration	0.455
Insurances	1.000
Business rates	3.332
Mechanical and electrical equipment/spares	1.810
Land rental payments community contributions	3.400
Community fund payments	1.850
Total	13.923

Source: SEA, Table 9.11

- 4.9 The analysis of estimated supply chain economic effects presented by Regeneris Consulting is difficult to follow. The key assumptions appear to be as follows:
- Of the non-labour expenditure (but excluding land rental/community contributions), Regeneris Consulting state that around £5.89 million will be made in Scotland, with £1.25 million of this expected to be spent in the Western Isles.
 - The impact of LWP on annual output is given as £1.96 million for Scotland and £0.42 million for the Western Isles.
 - The impact on annual employment income is given as £1.57 million for Scotland and £0.23 million for the Western Isles.
 - The supply chain impact on jobs (FTEs) is stated as 52 for Scotland and 14 for the Western Isles.
- 4.10 It is not clear how the estimate of 14 FTE jobs expected to be created from supply chain effects on the Western Isles has been calculated, due to the general lack of transparency of the Regeneris Consulting method on this topic.
- 4.11 In particular, DTZ notes that Paragraph 115 of the Socio-economic Assessment suggests that £1.57 million of employment income will support 52 FTE jobs and in the Western Isles £0.23 million of employment income will support 14 FTE jobs. The ratio of jobs to income from employment (i.e. wages) suggests that the wages figure used for Scotland (around £30,000) is nearly double that of the figure used for the Western Isles (around £16,000) and represents a significant movement from the figures used in the 2004 Environmental Statement draft economic impact report.
- 4.12 As paragraph 115 assesses indirect effects (across the economy) it would be reasonable to use a figure for average wages across the economy. The latest ONS data for full-time workers for 2006 (source publicly available below) suggests an average annual wage of nearly £21,000 for the Western Isles (which is around 93% of the equivalent Scottish figure).
- 4.13 The ONS data contradicts both the significant difference between the income per worker figures between Scotland and the Western Isles and the overall level of income per worker assumed across the Western Isles economy. Both of these discrepancies serve to increase the employment impact.

Land Lease Payments

- 4.14 The lease payment agreements relevant to the proposed LWP project are summarised in the SEA. Three estates are involved: the Stornoway Trust; the Galson Estate and the Barvas Estate. In essence, the payments appear to be the sum of a fixed payment element relating to the installed capacity of the scheme and a variable payment element relating to the output of the windfarm.
- 4.15 Stornoway Trust is a community owned estate, the community being all those that live on the estate. This numbers over 12,000 people. The Galson estate has agreed to a community

buyout and is expected to be community owned by the time the windfarm could be built. The population of the Galson estate is about 2,000 (SEA, paragraph 117).

- 4.16 The leases propose that the crofters affected by the development will receive an equal share of the payments along with the landlord estates. However, it is understood that this proposal is subject to further negotiation and final agreement.
- 4.17 The estimated value of the annual lease rental payments is stated in the Environmental Statement to be £3.40 million (price base not given), subject to RPI indexation and uplift after 14 years.
- 4.18 Regeneris Consulting acknowledge that estimation of the economic impact of the lease payments is difficult. This is because it is necessary to make assumptions about what the rental income will be used for and how much will be retained in the Western Isles or Scotland. Depending on what assumptions are made the potential economic impact of the expenditure at the spatial level of the Western Isles can vary quite markedly.
- 4.19 Given the uncertainty we suggest that the approach that should have been undertaken was to develop a range of plausible assumptions and then present the associated economic impacts of the alternative plausible assumptions as a range of values in the Environmental Statement. Instead, faced with the difficulties Regeneris Consulting made a single set of assumptions, as follows:
- ❑ Half of the income to the three estates and crofters is assumed retained within the Western Isles, with one-quarter retained elsewhere in Scotland and the final 25% is assumed to leak out of Scotland (SEA, paragraph 121).
 - ❑ The rental income that is retained locally is either expended by the estates and crofters on operational activity or re-invested in the properties (SEA paragraph 121).
 - ❑ The impact of this expenditure and/or reinvestment is modelled by Regeneris Consulting by “treating the rental income as an injection into the ‘agricultural’ sector and using the appropriate tables from the Scottish input-output tables, 2002” (SEA, paragraph 121).
- 4.20 It is probable that the assumption that rental income is expended on operational activities or re-invested in the properties is particularly unrealistic given the increasing average age of the crofting community in the Western Isles.
- 4.21 Using these assumptions Regeneris Consulting conclude that the estimated economic effect of the rental payments to estates and crofters will be:
- ❑ generation of additional annual economic output worth £0.39 million to the Western Isles economy; and
 - ❑ 14 FTE jobs supported, with an associated £0.21 million of employment income (average = £15,000).

- 4.22 DTZ is unable to replicate the results achieved by Regeneris Consulting on the basis of the information supplied in the Environmental Statement. Without further detail on the basis of the Regeneris Consulting calculations there is no basis to validate the employment and income estimates shown in the SEA.
- 4.23 We are also concerned that a potentially important sources of leakage have been excluded from the Regeneris Consulting analysis. Assuming that the rental income is taxable then not all of the gross value of the payment will be available for re-investment. DTZ certainly considers it implausible to assume that none of the rental income will be subject to tax.

Community Fund and Development Trust Payment Effects

- 4.24 A further source of economic benefit associated with the proposed windfarm is the payments that are anticipated to be made from the windfarm operator to four community and development funds to be established to support schemes benefiting Western Isles communities. The funds and their relevant details are identified in the SEA (paragraphs 124-126).
- 4.25 The details set out in the SEA indicate that annual payments to the four funds amounting to £1.85 million will be made.
- 4.26 In the 2005 report Regeneris Consulting acknowledged that their approach to estimating the economic impact of the community payments was ‘fairly simple’ (paragraph 79). In their latest report, the same method is now described as ‘fairly straightforward’ (paragraph 128). The following is a brief statement of their method (which is the same in both reports):
- The community payment is ‘*treated as a general injection into the local economy (using average multipliers for the economy as a whole) and makes no distinction between the manner in which the income is used*’ (paragraph 128).
 - The annual income has been aggregated over an assumed 20-year period of the windfarm’s operational lifetime, and then discounted at 3.5% (HM Treasury’s preferred rate for most types of public sector projects).
 - 30% of the gross economic impacts estimated are netted off to take into account deadweight and displacement effects.
- 4.27 The results generated by Regeneris Consulting from this method are as follows:

Table 4.3: Estimated Economic Impact of Community Fund Payment (over 20 years)

	Output (£ million)	Employment Income (£ million)	Employment (FTEs)
Western Isles	4.04	2.23	142

Source: SEA, Table 9.14

- 4.28 However, there are a number of serious problems with the method used by Regeneris Consulting to estimate the potential economic consequences of the Community Fund payments. It is important to emphasise these errors because, as was explained earlier in this report (Table 4.1), this source of impact accounts for over 83% of the overall estimate for indirect impacts estimated by Regeneris Consulting.
- 4.29 Firstly, and most crucially, it is essential to emphasise that these economic impact results are estimates for the overall **20-year lifetime** of the scheme. It is very surprising, to say the least, that Regeneris Consulting go on to add these results to the **annual** estimates for the other sources of indirect impact (supply chain, land rental payments), as they erroneously do in Table 9.15 of the SEA.
- 4.30 In Table 9.15 the 142 person-years' of estimated employment benefit from the community fund effects, are simply added to the annual estimates (totalling 28 FTEs) of employment impacts from (1) supply chain and (2) land rental payment impacts to generate a total employment impact of 170 FTEs.
- 4.31 This approach is entirely erroneous, as it fatally confuses totals calculated for both annual and multi-annual effects. The resulting totals for jobs impacts are mistakenly labelled full time equivalents when they are not.
- 4.32 The correct approach, assuming everything else concerning the Regeneris approach is correct (but see the caveats below), would be to divide the 142 person years of employment from the community fund effects by the assumed 20-year lifetime of the project.
- 4.33 The resulting total (7.1 FTEs) could, in principle, be added to the estimate of employment impacts from the supply chain and lease rental payments. But it is entirely inappropriate to add the 20-year lifetime total for community fund impacts to the estimated annual impacts from the other two effects.
- 4.34 As was the case for the assessment of impacts from the land lease payments, there is a lack of transparency in the Regeneris Consulting assessment on how the values for indirect and induced impacts have been calculated. Given this, it is not possible to replicate the results generated by Regeneris Consulting.
- 4.35 Another concern is that Regeneris Consulting have also used a somewhat arbitrary figure of 30% to net of the potential impacts of deadweight and displacement. Advice from other parts of Government (such as the influential Additionality Guide published by English Partnerships) suggests that in more appropriate figures to use are:
- ❑ Deadweight: 24-28% (average range for development schemes).
 - ❑ Displacement: 25% (for projects where displacement is expected to some limited extent).

- 4.36 The conclusion that can be drawn from this is that an assumption of 30% for both deadweight and displacement in the absence of any detailed analysis may well be too low. A more cautious assumption would be to assume an average of 49% for deadweight and displacement.

INDUCED ECONOMIC EFFECTS

- 4.37 Induced economic effects arise from the knock-on impacts of spending generated from:
- the employment incomes of the workforce required for the operation of the windfarm;
 - employment incomes of the employees of businesses supplying goods and services to the windfarm; and
 - employment incomes of individuals whose jobs are supported by activities funded from the land rental payments and community fund activities.
- 4.38 Regeneris Consulting's estimates for the induced effects of windfarm operation for the Western Isles are shown in the table overleaf. The results are dominated by the induced effects predicted for the Community Funds. As will have been noted, we disagree fundamentally with the method used by Regeneris Consulting to calculate the employment impacts of these payments, so the implication is that these associated predicted induced effects should also be treated with extreme caution.

Table 4.5: Predicted Induced Effects from LWP, Western Isles

	Output (£ million)	Employment Income (£ million)	Employment (FTEs)
Wind farm employees	0.12	0.04	2.4
Supply chain purchases	0.10	0.03	2.0
Land rental	0.09	0.03	2.0
Sub-total	0.32	0.10	6.4
Community Funds	1.00	0.31	20.0
Total	1.31	0.41	26.4

Source: SEA, Table 9.16

- 4.39 But notwithstanding this point there is also the ongoing issue concerning the lack of transparency of Regeneris Consulting's results. As it is not possible to replicate the method they use with the information they have provided, it is difficult to comment very much further on these results.

OVERALL ECONOMIC EFFECTS (POST DEVELOPMENT)

- 4.40 The overall results presented by Regeneris Consulting for the proposed LWP project at the spatial level of the Western Isles are summarised in the table below, which is an extract from SEA Table 9.17. The fact that the (very different) concepts of full time equivalent jobs (an annual concept) and person-years of employment (a project lifetime, or, at least, multi-year concept) has been conflated by Regeneris Consulting is confirmed in Table 9.17 of the SEA (Entitled "Overall Estimated Economic Impact of Wind Farm Operation"). Column 7 of that table provides the overall totals for the estimated economic impacts of the scheme. The results

for the Western Isles – including the Community Fund effects – from Table 9.17 are reproduced for convenience below.

Table 4.6: Overall Predicted Economic Effects, Western Isles

	Output (£ million)	Employment Income (£ million)	Employment (FTEs)
Excluding Community Funds			
Direct	115.00	1.24	37
Indirect	0.80	0.44	28
Induced	0.31	0.10	6
Total	116.12	1.78	71
Including Community Funds			
Direct	116.85	1.24	37
Indirect	4.85	2.67	170
Induced	1.31	0.41	26
Total	123.01	4.33	233

Source: Adapted from SEA Table 9.17

- 4.41 Clearly, it matters hugely whether the community fund impacts are included or not: without the community fund impacts, Regeneris Consulting claim 71 FTE jobs for the LWP project. The inclusion of community fund impacts adds, according to their estimates, a further 162 jobs to the total Regeneris claim for the project. The community fund impacts account, therefore, for 70% of all the employment benefits claimed by Regeneris for the project.
- 4.42 Our comments regarding these results are focused mainly on the employment numbers, as these inevitably receive most attention from interested parties. Our concerns about the derivation of these numbers are summarised as follows:

Direct impacts

- ❑ No justification is provided for the stated number of operating jobs (39).
- ❑ No breakdown of this number by occupation, grade or skill, making it difficult to judge the capacity of the Western Isles labour market to fill the assumed 100% of the vacancies created by LWP.

Indirect impacts – supply chain

- ❑ Because of a lack of transparency it is difficult to comment intelligently on the likely accuracy of the supply chain impact assessment undertaken by Regeneris Consulting.

Indirect impacts – land lease payments

- ❑ It is not possible to replicate the results claimed by Regeneris Consulting that are associated with land lease payments.

- ❑ However, given that there is no leakage assumed for administration or taxation, then the results that are presented in the Environmental Statement are almost certainly overstated.

Indirect payments -

- ❑ Regeneris Consulting have made a serious error by

Community Fund impacts

– after calculating the lifetime impacts associated with the Fund – adding these to the annual FTE estimates for direct and other indirect effects.

- DTZ considers that a more reasonable estimate of the (gross) annual FTEs generated by the community funds would be in the order of 6 FTEs.
- DTZ is not satisfied with the Regeneris Consulting approach to assessing deadweight and displacement. DTZ considers that likely deadweight and displacement has been underestimated by around 15%.
- The net result of all these comments is that we think that a more likely estimate of impact is 6 FTEs (per annum) rather than the 142 claimed by Regeneris Consulting.

Induced impacts

- As mentioned before, the constant theme of lack of transparency in the Regeneris Consulting results very much applies to their calculations of induced effects.
- However, if the comments set out above about the true scale of likely impact from the community fund source are accepted, then the maximum scale of impact from multiplier effects is likely to be in the order of 1-2 jobs, and not the 20 jobs that Regeneris Consulting are claiming.

SENSITIVITY ANALYSIS

- 4.43 The sensitivity analysis undertaken by Regeneris Consulting tests, in turn, assumptions with respect to a single alternative scenario, which is a smaller scale windfarm of 500 MW, whereby the number of turbines is cut from 181 to 139.
- 4.44 However, the problem with the Regeneris Consulting sensitivity analysis is that it isn't possible to assess whether the scenario they have developed covers adequately the most important aspects of uncertainty in respect of LWP. The Environmental Statement does not justify why one single area for consideration was chosen. In the view of DTZ it would have been better if Regeneris Consulting had first presented a criticality assessment for the long list of assumptions used in the Environmental Statement
- 4.45 Criticality assessment is a valuable filtering mechanism in sensitivity testing because it focuses effort on the issues that really matter. In criticality assessment the assessor varies each of the (prima facie) important assumptions that have gone into an economic impact model in turn, to discover whether a (say) 1% change in the value of that assumption produces a proportionate (or greater or lesser than proportionate) change in the value of a key performance indicator. Regeneris Consulting have focused on three indicators throughout their analysis: output; employment income; and employment. So, if prima facie it is considered that "size of windfarm" is an important consideration, then by undertaking criticality assessment one can determine whether a 1% change in the size of the windfarm produces a change in the value of (a)-(c) greater than, equal to or less than 1%. If the answer

is equal to or greater than, then that factor is identified as critical and becomes the subject of more intense analysis.

Alternative Statement of Impact

- 4.46 In Chapter 7 of this report we present DTZ's own gross (and net) estimates of potential impacts that might result from LWP if it proceeds. These estimates are based on what we consider to be more robust assumptions regarding the areas of concern we have identified in this report.
- 4.47 However, there is an obvious caveat that DTZ does not have access to the level of project information that Regeneris Consulting have presumably had access to.
- 4.48 Our alternative assessment also takes into account the potential losses to the island's tourism economy that might result from the implementation of the LWP scheme. The origin and scale of these displacement effects are discussed in Section 5 of this report.

5. Potential Impacts on Tourism Activity in the Western Isles

- 5.1 The latest figures for tourism's value to the Western Isles economy were produced in 2003 by Macpherson Research. However, these estimates are an extrapolation of 1999 survey data. The 2003 study found that the tourism industry contributes £39.3m to the Western Isles economy (15% of total Island GVA) and that 179,700 people visited the islands in 2002. The average spend per tourist stood at £219, with holiday visitors spending a fraction more at £220.
- 5.2 Between 1999-2002 the volume of tourism increased by 8.8% and the value of tourism to the Western Isles economy by 19.7%. It is not explicitly stated but is inferred that the tourism sector is growing more strongly than the general economy, leading to a relative increase in the local importance of the sector since 1999.
- 5.3 The research also include a review of all visitor's (including business travellers and holidaymakers) primary reasons for visiting the Western Isles and found that 44% of people visit due to the area's scenery and outdoor environment.

REGENERIS' FINDINGS ON THE TOURISM IMPACT OF LWP

- 5.4 The Regeneris December 2006 report looks at the potential impact of the Lewis Wind Farm project on the local tourism sector. It takes the Macpherson figures on the size of the local tourism sector as its start point, and based on the 2002 visitor numbers, average spend figures and tourism sector multipliers, the report calculates that the local tourism sector supports 910 jobs directly, 90 jobs indirectly and a further 80 induced jobs. This gives a total tourism employment figure of 1,080.
- 5.5 The report also quotes the Macpherson figure of £39.3m as the total tourism sector GVA figure for the Western Isles.
- 5.6 The accuracy of the employment figures is tested by an investigation of ABI data³ on Western Isles tourism employment. The 2003 ABI figures show that there were 1,230 tourism related jobs in the Western Isles and that tourism sector employment has grown by 18% since 1999, compared to negligible job growth within the overall Western Isles economy over the same period.
- 5.7 Additional Macpherson report information on tourist capacity and transport arrangements is included. The purpose for including such information seems to be to demonstrate where within the Western Isles tourists are most likely to visit (Lewis) and what they are likely to do (sightseeing). However, links between these findings and the reports conclusions are not clearly drawn.
- 5.8 The Regeneris report acknowledges that there has been very little independent research on the impact of wind farms upon tourism numbers. It discusses the factors influencing the extent of

³ The Annual Business Inquiry is the annual survey of employment undertaken by ONS

the impact, including the size and site of the wind farm, the environmental quality of the local area and popular reasons for people visiting the local area. It also mentions how wind farms can attract tourists in their own right through visitor centres and educational facilities, and it refers to the wider impacts of wind farm developments upon stimulating investment during its construction phase and in improving transport accessibility.

- 5.9 The report then considers the findings of nine visitor/business/residents surveys (six more than in their previous report): two undertaken by MORI, two by NFO, two for Tourism Boards and one each by Halcrow, RBA YouGov and the Western Isles Tourism Operators. Three of the surveys are based on a Residents' Survey (and one of Lewis residents).
- 5.10 The conclusions of the various surveys balance each other out, with visitor surveys generally revealing no adverse feelings towards wind farm developments and tourism operator surveys revealing that businesses and residents have greater reservations.
- 5.11 The report provides very brief analysis of experiences elsewhere. Case studies on Cumbria, Wales, Denmark and Sweden (from the Halcrow report) are all reported and favourable findings are highlighted.
- 5.12 The updated report concludes this literature review by stating that:

Most people support the development of wind power in principle, but in various surveys between 2% and 26% of visitors claimed that the presence of a wind farm would make them less likely to visit. (9.7.5, paragraph 247).

- 5.13 The Regeneris work does not consider what impact a 2% to 26% reduction in visitor numbers would have upon the Western Isles tourism sector.

OTHER RESEARCH ON TOURISM IMPACT OF WIND FARMS

- 5.14 There are a growing number of surveys and reports looking at the impact/potential impact of wind farms upon the tourism sector.

Visitor, Residents and Business Surveys

- 5.15 The updated Regeneris report does review a greater number of survey sources than its predecessor. However, the reporting of the findings from these surveys is done in a partial manner, as illustrated below.
- 5.16 For example, the report does mention that in summer 2004 local tourism operators in North West Lewis carried out their own survey on attitudes towards the wind farm project. This survey was based on 276 responses and found that 90% of visitors displayed opposition to wind farm development on Lewis and 54% of all respondents opposed any wind farm development at all on the island. The report also quotes a figure of 86% of local residents

opposing wind farm development on the scale proposed, citing a 2004 local residents survey. Instead, the research found that 36% of visitors would prefer a smaller development. The report concludes by stating that the potential negative impact of wind farm development on Lewis could be a 25% reduction in tourism sector activity. The Regeneris report mentions the 54% figure but none of the other figures. It also omits the 54% visitor reduction figure from its final conclusion, preferring instead to unexplainably limit itself to reporting the 2%-26% reduction in visitors range found in other surveys.

- 5.17 The updated report also mentions the March 2005 *Market Specialists* survey of Tourist Board members on Lewis (on behalf of the Western Isles Tourist Board). The Regeneris report does mention that the survey found that three-quarters of local tourism businesses did not support the Lewis Wind Farm proposals as they stood. It does not mention that only 10% of businesses supported the original proposals, that many businesses felt that the development will not bring the promised long-term economic gains and that 42% wanted to see a smaller scale development brought forward (25-49 wind turbines being the most popular size).

Size of the Tourism Sector

- 5.18 From the evidence presented in the updated report there still appears to be some doubt as to the overall size of the tourism sector in the Western Isles. This has implications for any consideration of the economic impact of wind farm development on the Western Isles.
- 5.19 After comparing the visitor survey and ABI results it seems fair to for the report to conclude that the tourism sector in the Western Isles employs something like 1,200 people. However, calculating the economic value of the sector to the Western Isles is more contentious. The Macpherson report figures for 2002 are based on an extrapolation of 1999 visitor number and spending patterns. They do not take account of the external shocks to the tourism industry in 2001, the impact of budget flights upon domestic tourism, changes in the marketing of the Western Isles tourism offer etc. Visitor numbers in reality could, therefore, be significantly different from the forecast figure of 179,700.
- 5.20 There also seems to be grounds for doubting the visitor spend figures, and therefore overall sector value, as proposed in the Macpherson report. As pointed out by the anti-wind farm pressure groups, an average visitor spend £219 spread over an average stay of 6 days gives a daily spend of £36 per visitor. This seems low given that B&B accommodation is typically £25 during the season and that Visit Scotland puts typical daily tourist spend at £56. Furthermore, the Macpherson report does not calculate the indirect and induced spending that results from initial tourist spend. The overall value of the tourism sector to the Western Isles economy is therefore likely to be higher than the £40m figure quoted.
- 5.21 The impacts of these two points work in opposite directions. They suggest that the number of visitors to Lewis could be lower than stated but that those tourists who do visit are spending more money and supporting greater levels of economic activity. Increases/reductions in total tourism numbers will therefore have a relatively greater impact upon the overall economy than under the Macpherson scenario.

Impact of Wind Farms upon Tourism Numbers

- 5.22 Although the updated report makes few claims in regard to the impact of the development upon tourism numbers, its use of survey responses seems selective.
- 5.23 Given the strong opposition to wind farm development found in recent resident and business surveys, and the fact that at least 40% of tourists attribute their visit to Lewis to the quality of its outdoor scenery, DTZ considers that it is fair to conclude that there is likely to be a reduction in the volume and value of tourism on Lewis if LWP goes ahead as proposed.
- 5.24 This conclusion is backed up by Hanley et al. research into sensitivities surrounding renewable energy projects. This research 'found substantial sensitivity [amongst the general population] to the creation of [renewable energy] projects that will have a high impact upon the landscape.'⁴
- 5.25 However, the magnitude of this reduction will probably be smaller than the figures claimed by the anti-wind farm groups, and the Regeneris report does offer a potential reduction in visitors in the range 2%-26% (though this offered range excludes survey figures as high as 54%). What the Regeneris report does not do is calculate what such a decline would mean for the local tourism sector.
- 5.26 If we were to (conservatively) assume that the tourism industry would contract by 10% the economic impact of such a scenario would be, proportionally, the loss of around 120 jobs and at least £4m in direct spending (but a larger figure once the reverse multiplier effect is taken into account).
- 5.27 The evidence to support taking a negative view of the impact of the Lewis Wind Farm project, as opposed to the mildly positive impact seen in areas such as Galicia and Eire, is that:
- ❑ The proposals for the Lewis Wind Farm development would result in a far higher density of turbines per sq. mile than in other case study areas.
 - ❑ The turbines will be more visible in a landscape such as north Lewis than in somewhere such as Galicia. Given the degree of importance attached to the landscape and ecology of the Western Isles by 40% of visitors to the island, the development of the proposed LWP project can be expected to generate a negative response on the part of people contemplating a visit to Lewis. This tendency is likely to be reinforced by publicity surrounding the project, and in particular the high profile opposition to the project expressed by conservation and heritage agencies, NGOs and local groups.
 - ❑ The potential for getting more people to visit Lewis through providing education/visitor centre facilities seems limited (most visitors to Lewis stay in Stornoway and go to the north of the island anyway, so the wind farm is unlikely to open up a 'new' area of the island to tourism).

⁴ Hanley et al., 'Valuing the attributes of Renewable Energy Investments', Applied Environmental Economics Conference, March 2004.

6. Labour Market Issues

6.1 The characteristics of the Western Isles labour market can be summarised as follows:

- ❑ There is a higher prevalence of part-time working on the Western Isles than in Scotland as a whole. Approximately 4,000 people work on a part-time basis – this accounts for 32% of the 16-74 year old resident population, compared to the 23% seen at a national level. In addition, approximately 7,700 people aged 16-74 are working full-time on the Western Isles. This is nearly 10 percentage points lower than the Scotland average.
- ❑ Unemployment on the Western Isles is slightly higher than at the national level – just over 700 people are not working, accounting for 5.6% of the 16-74 year old population. For Scotland the figure is lower at 5.5%.
- ❑ Apart from public sector activities (public administrative, health and education) the most important sectors to the Western Isles are Construction and Distribution, hotels and restaurants. There are 1,067 people working in construction, representing 9.5% of people aged 16-74. This is greater than the proportion of 5.4% for Scotland. In terms of Distribution, Hotels and Restaurants, 2,101 residents of the Western Isles fall into this sector, accounting for 18.6% of total employment, however this is lower than the proportion of 23.3% accounted for by Scotland as a whole.
- ❑ The most common occupation for those aged 16-74 on the Western Isles is for people working in skilled trades occupations – 2,351 are doing so according to the 2001 Census, accounting for 20.4% of all people in the age category. The corresponding figure for Scotland is significantly lower at 12.2%. In addition, the Western Isles has a higher proportion of people working in the last two groupings – process, plant & machine operatives (1,161, representing 10.1% of all 16-74 year olds, compared to 9.7% in Scotland and elementary occupations (1,507, representing 13.1% of all 16-74 year olds, as opposed to 12.7% nationally).
- ❑ The 2001 Census data reveals that the Western Isles faces a skills issue in relation to the proportion of people aged 16-74 with no qualifications. More than 7,000 people in this age group either have no qualification or lie outside the four major groupings outlined in the table above. This represents 37.6% of all people and is higher than the national average of 33.2%. At the higher end of the skills spectrum, 3,506 people aged 16-74 on the Western Isles have a group 4 qualification, accounting for 18.5% of the entire age group. However, this is lower than the Scottish average of 19.5%.

6.2 Unfortunately, it is difficult to relate this broad labour market intelligence to the opportunities that are identified for LWP. This is because the Environmental Statement is vague as to the occupations, skills and qualifications that will be needed to fill the direct and supply chain jobs. It is also extremely difficult to assess what labour requirements might be generated by the land lease and Community Fund payments. On the other hand it is probable that the majority of the induced impacts are likely to benefit sectors such as retail and leisure.

6.3 In the final section of this report we suggest a way forward so that these issues can be considered in a more satisfactory way.

7. DTZ's Initial Assessment of the Net Economic Impacts of LWP

DEVELOPMENT PHASE IMPACTS

- 7.1 As highlighted in Section 3, DTZ considers that Regeneris Consulting have used an inappropriate approach in assessing development stage benefits.
- 7.2 However DTZ also considers that it is inappropriate to attempt to convert this estimate for temporary development stage impact into a FTE estimate and then add this to the estimate for permanent employment impacts. To do this defies current Government guidance on how to assess major projects, and is certainly not consistent with HM Treasury guidance as Regeneris Consulting claim.

OPERATIONAL PHASE IMPACTS

- 7.3 In Section 4 of this document the summary overall permanent (i.e. post-development) economic impact results presented by Regeneris Consulting for the proposed LWP project at the spatial level of the Western Isles were presented. For convenience, these results are repeated below.

Table 7.1: Overall Predicted Economic Effects, Western Isles

	Output (£ million)	Employment Income (£ million)	Employment (FTEs)
Excluding Community Funds			
Direct	115.00	1.24	37
Indirect	0.80	0.44	28
Induced	0.31	0.10	6
Total	116.12	1.78	71
Including Community Funds			
Direct	116.85	1.24	37
Indirect	4.85	2.67	170
Induced	1.31	0.41	26
Total	123.01	4.33	233

Source: Adapted from SEA, Table 9.17

- 7.4 For reasons explained in Sections 4 and 5 of this report, DTZ consider that the results presented by Regeneris Consulting have been considerably overstated. Unfortunately, because of the lack of transparency of the Regeneris Consulting approach, coupled with insufficient breakdown of some key data, it is difficult for DTZ to develop equivalent results (using what DTZ consider to be more appropriate assumptions) for the output indicator.
- 7.5 We can do this for the employment indicator, however, and this Section provides this analysis for FTE jobs. Additionally, we go further than Regeneris Consulting by taking into account the potential displacement effects of the proposed LWP project on the tourism economy of the Western Isles.

7.6 The following table presents DTZ’s assessment of the employment impacts of the proposed LWP project. For ease of reference the equivalent Regeneris Consulting results are also presented for comparison. The results are presented in the first instance for the Western Isles.

Table 7.2: DTZ Assessment of Potential Employment Effects, Western Isles

	Regeneris Consulting Employment Estimates (FTEs)	DTZ Employment Estimates (FTEs)
Direct	37	37
Indirect, of which	170	30
<i>Supply chain</i>	14	14
<i>Land lease payments</i>	14	10
<i>Community Fund effects</i>	142	6
Induced	26	6
Sub-total	233	73
Less tourism displacement effects	0	-140
<i>Direct</i>	0	-120
<i>Indirect & induced</i>	0	-20
Total	233	-67

Source: DTZ estimates; Regeneris Consulting from SEA Table 9.17

7.7 The assumptions DTZ has made in arriving at its estimates for impact in the Western Isles are as follows:

Direct impacts

Indirect impacts – supply chain

Indirect impacts – land lease payments

Indirect payments - Community Fund impacts

- ❑ We have continued to use the assumption set out in the SEA for the number of local operating jobs (37).
- ❑ We continue to use the SEA estimate of 14 FTE local jobs supported by the LWP supply chain
- ❑ We estimate a total of 10 FTE jobs supported by local investment and expenditure generated as a result of the land lease payments to landowners and crofters.
- ❑ This estimate is 4 fewer than the result calculated by Regeneris Consulting, and takes into account leakage from administration costs and taxation.
- ❑ We estimate that an average of only 6 FTEs per annum will be supported from the expenditure of Community Fund resources. This estimate is based on the following assumptions:
 - Average annual Community Fund expenditure as per the level assumed in the SEA (£1.85 million).
 - 20% of Community Fund resources to be used for financial support for business projects, with a further 50% for community projects (see discussion in paragraphs 20-23 of the SEA)
 - Deadweight and displacement effects accounting for 45% of project expenditure
- ❑ The estimate of just 6 FTEs is about 4% of the level

Induced impacts

(142 FTEs) proposed by Regeneris Consulting.

- ❑ In terms of multiplier effects we consider that this is likely to average 6 FTEs per annum.
- ❑ This is only 23% of the estimate of 26 induced jobs calculated by Regeneris Consulting.

Tourism displacement

- ❑ DTZ has assumed that the scale of windfarm development proposed by the LWP project will reduce the volume and value of tourism in the Western Isles by 10%.
- ❑ This would result in the direct loss of about 120 jobs, with a further loss of 20 jobs assumed through indirect and multiplier impacts.

- 7.8 The assumed 10% negative impact on tourism is consistent with the spirit of the earlier version of the Environmental Statement, which stated that:

we would expect on balance that the development of the proposed wind farm on the scale envisaged will discourage some holiday makers from visiting the Western Isles in the future (Environmental Statement, Chapter 9, paragraph 202).

- 7.9 The employment impact estimates predicted by DTZ for the LWP (before tourism displacement effects are factored in) is 73 FTEs, which is almost 70% less than the 233 FTEs claimed by Regeneris Consulting. As is clear from the Table, almost all of this difference derives from the alternative approaches made in assessing the effects of Community Fund expenditure. There is also some difference in the approach to the effects of the land lease payments, but this only accounts for a difference of 4 jobs. There is also a knock-on impact on the predicted number of induced jobs (DTZ: 6; Regeneris Consulting: 26) that flows from these two sources. This difference is mainly due to the different assumptions regarding the Community Fund rather than the land lease payments.

- 7.10 However, when the likely scale of losses from the Western Isles tourism economy are factored in, it becomes clear that the proposed windfarm is likely to have an overall negative impact on the Western Isles economy. Regeneris Consulting acknowledge that on balance the scale of development envisaged for LWP will result in fewer tourists visiting the island, but they do not quantify this impact.

- 7.11 From desk-based research DTZ has suggested that the potential scale of this impact is a reduction of 10% in the Western Isles tourism economy. If this is correct then the resulting cumulative impact (once indirect and induced effects work through) is likely to be an annual reduction of about 140 jobs in the Western Isles.

- 7.12 It is worth pointing out that given that LWP is likely to only generate 73 gross new FTE jobs, then any subsequent reduction in the size of the islands' tourism economy that is greater than about 5% will result in a net negative overall impact for LWP, at least in employment terms.

(i.e. 73 jobs is approximately equivalent to 5% of the employment base associated with tourism).

- 7.13 In addition, in the table below we present the employment impact estimates for Scotland as a whole.

Table 7.3: DTZ Assessment of Potential Employment Effects, Scotland

	Regeneris Consulting Employment Estimates (FTEs)	DTZ Employment Estimates (FTEs)
Direct	39	39
Indirect, of which	207	78
<i>Supply chain</i>	52	52
<i>Land lease payments</i>	14	10
<i>Community Fund effects</i>	142	6
Induced	51	12
Sub-total	297	129
Less tourism displacement effects	0	0
<i>Direct</i>	0	0
<i>Indirect & induced</i>	0	0
Total	297	129

Source: DTZ estimates; Regeneris Consulting from SEA Table 9.17

- 7.14 For Scotland, DTZ estimate that the potential net employment generation impact of LWP will be around 129 jobs. This is significantly less than the equivalent estimate produced by Regeneris consulting (297 jobs). The main area of difference is once again the employment estimates from the community fund payments – and the knock-on impact for induced jobs – which DTZ considers to be massively overstated by Regeneris.
- 7.15 However, in taking into account potential the negative impacts on tourism, we tend to agree with Regeneris that for Scotland (unlike the Western Isles) these effects are likely to be negligible. The reason for thinking that the overall impact on Scottish tourism is likely to be insignificant is that there are a large number of locations within Scotland – both on other island groups and on parts of the mainland – that provide substitutes for the type of visitor experience to be found on Lewis.
- 7.16 In other words, the 140 or so tourism jobs that we estimate (in Table 7.2) to be likely lost to the Western Isles if LWP goes ahead will likely be in effect transferred to other parts of Scotland if LWP proceeds.

8. Other Issues and Conclusions

- 8.1 In this chapter we review briefly the analysis presented by Regeneris Consulting on the non-quantifiable aspects of the LWP proposals.

NON-QUANTIFIABLE ISSUES

- 8.2 The Environmental Statement sets out a number of other potential impacts of the proposed LWP project. The topics identified include labour markets and skills, and DTZ has already discussed these issues in an earlier chapter of this report. The other issues raised by the Environmental Statement are summarised (and discussed in turn) below.

Infrastructure and transport

- *The SEA (Table 9.20) ranks as highly significant the potential role of LWP as a catalyst in the provision of a connection between the Western Isles and the National Grid. The interconnector is presented as an important benefit in allowing further exploitation of the renewable energy resources of the Western Isles.*
- *Movement of towers and structures requires investment in improved roads between Arnish Point and the construction compounds. This amounts to 5km of upgraded road, with some other improvements (e.g. at corners) on a further 5 km of road.*
- *It is suggested that the 140km of non-metalled roads that are required could be an asset if these open up previously inaccessible areas for recreation.*

DTZ Comment:

- Any potential impacts of road improvements are impossible to quantify, and Regeneris Consulting have not attempted to do so. Moreover, we note that the Environmental Statement itself acknowledges that there may be consequent negative impacts resulting from the deterioration of the island's heritage and ecological values.

Demographics

- *It is suggested that the development and operational stages of the proposed LWP development may be sufficient to arrest to some degree the predicted long-term depopulation trend facing the Western Isles.*

DTZ Comment:

- The potential resonance of this claimed benefit with the island's political leadership is appreciated. We note that Regeneris Consulting do not predict that such an effect will be created by LWP, although they seem to suggest (SEA paragraph 161) that this is a reasonable expectation.
- The problem is that the scale of gross potential job creation benefits – particularly in the post-development stage – have been considerably overestimated by Regeneris Consulting.

This means that the island's economy will not in reality receive the scale of stimulus that Regeneris Consulting envisage.

- We acknowledge that the development phase of the project will create a net additional demand for labour that will require additional labour to be brought onto the island. Some of these workers may well be natives of the Western Isles who have migrated to the mainland or further afield in search of employment opportunity. But it needs to be stressed that such an impact is likely to be only temporary, and will dissipate once the development stage is complete.
- The skill sets needed for the fabrication and development of the windfarm are likely to be largely different to those needed to operate the facility. So although some individuals employed in the early stages may be retained in the operations, for the majority the opportunity is likely to be limited.
- The down-side of reduced tourism impacts means that the LWP development is likely to result in a net overall reduction of employment opportunity on the island. This implies that the LWP development could become a force for further depopulation of the Western Isles rather than a catalyst for repopulation.
- *The report also discusses the potential consequent impacts on the need for housing on the island, in terms of both the temporary need to house development- phase workers and the longer term impact from the operational phase*

Housing

DTZ Comment:

- For the reasons discussed under the previous heading, DTZ does not consider that the operational stage of the LWP project is likely to generate any significant additional demand for housing on Lewis.
- We agree with Regeneris Consulting (paragraph 165) that the requirements to house a temporary workforce during the development stage is likely to put a strain on the island's accommodation resources. Indeed, the sentiment of this paragraph of the SEA appears to tacitly acknowledge that a good proportion of the workforce required for the development of LWP will need to be brought on to the island from elsewhere. DTZ agrees this is likely to be the case.

Local services

- *The Environmental Statement suggests that the increased population base of the island (temporary and permanent) will lead to improved service provision.*

DTZ Comment:

- The logic of the argument put forward by Regeneris Consulting is essentially linked to the arguments set out

above: LWP might lead to an increase of population (or at least it will help to stem depopulation) which will in turn increase demand for provision of services.

- Aside from the fact that the predicted stimulus has been overestimated, and that the net impact is likely to be negative, the logic used by Regeneris Consulting here is flawed because:
 - Any stimulus to private services (retailing etc.) on the island that is attributable to LWP has already been accounted for in the estimates of indirect and induced impacts.
 - Any stimulus to demand for public services attributable to the project is potentially a cost to society and it is dubious to claim this as a project benefit.

- 8.3 The further implication of DTZ's assessment is that, whereas Regeneris Consulting describe scale of impact across the categories as being either 'medium' or 'high', we would suggest that in the majority of cases they should be more correctly described as 'insignificant' or 'low'.