

Non-Technical Summary

Introduction

1. In June 2003 Ail Wynt Cyf (Ail Wynt) applied for planning permission to extend the existing three turbine wind cluster at Moel Maelogen by the addition of eleven 1.3 MW turbines. The application was accompanied by an Environmental Statement. Amended development proposals were submitted to the Council in September and November 2003 and this has required the re-consideration of the environmental effects of the proposed development. A revised Environmental Statement (ES) has therefore been prepared and is contained in two volumes as follows:

Volume 2 contains the written text of the ES.

Volume 3 contains the Figures and Drawings

2. This document is the non-technical summary of the ES and copies of this document can be obtained free of charge from West Coast Energy Ltd at the address below, while stocks last.

West Coast Energy Ltd, The Long Barn, Waen Farm, Nercwys Road, Mold, Flintshire, CH7 4EW.

The application for planning permission

3. Ail Wynt have now requested planning permission from Conwy County Council to erect nine 1.3 MW wind turbine generators on land at Maelogen Fawr Farm at Moel Maelogen, 5.0 kilometres to the east of Llanrwst in the Bro Garmon area of Dyffryn Conwy. These additional turbines will create a wind farm comprising of twelve turbines in all. The Company is a partnership of three hill farming families, established to seek additional income to support

their agricultural businesses and strengthen the socio-economic structure of rural communities in the area.

Location and description of the site and surroundings

4. The extension site is situated at Ordnance Survey (OS) Grid Reference (GR) SH 852605 in an area bounded by the A548 to the north, Gwytherin 2.8km to the east, and Mynydd Hiraethog to the south-east. Pentrefoelas and the A5(T) are 9.0km to the south, and the Snowdonia National Park, at its nearest point, is 3.5km to the south-west. Moel Maelogen is a ridge composed of Silurian shales rising to 424m above ordnance datum (AOD).
5. From the site there are views to the west of the Snowdonia National Park. Moel Siabod, at a distance of some 16km, is the nearest of the main peaks. The Denbigh moors are visible in an arc joining points to the south-west, south-east and north-east. Looking north, farmland lies between the site and the hills behind Conwy and the Denbighshire coast.
6. Moorland has been converted to agricultural grassland in many places around Mynydd Hiraethog, including the Moel Maelogen site. These farm improvements have lowered the quality of the land as a wildlife habitat.
7. The project site is on a farm where the improved grassland retains only a few areas of vegetation that contain species of native fauna and flora. These are isolated wet patches of Rush (*Juncus* spp.) and a small mire (peat bog), which are not protected by nature conservation designations. The structures associated with the extension of the site would be located on agricultural grassland. The site selection procedure has involved several interrelated issues including land use, planning and environmental considerations, and technical and commercial criteria for economic viability.

Need for the development

8. About 70% of electricity in the UK is generated from the burning of fossil fuels, but only some 3.0% from renewable sources. Carbon dioxide (CO₂), the main “greenhouse” gas produced by fossil fuels, is the primary cause of climate change and is predicted to result in a raising of global temperature by 0.2°C - 0.5°C, per decade, at the current rate of production. Such global warming will have serious effects on the environment and the well being of humanity.
9. Burning fossil fuels also releases sulphur dioxide (SO₂) and nitrogen oxides (NO_x), resulting in atmospheric acid depositions that cause ecological damage in Wales by altering the condition of soils and water and threatening the survival of wild fauna and flora, especially mire habitats. Nuclear power is an alternative but poses a number of problems, for example, difficulties associated with the disposing of radioactive waste, fears of accidents, for example Chernobyl in 1986 (farming activities at Maelogen Fawr farm continue to be restricted because of the fallout from that incident which has polluted the area), as well as recent fears of terrorist attacks.

Renewable energy

10. Renewable energy schemes reduce dependence on resources that generate pollution; however, there are environmental, social and economic consequences resulting from the implementation of renewable energy schemes. Local planning authorities, in determining such schemes, have to strike a balance between the need for renewable energy and the potential environmental, social and economic impacts and benefits of such schemes.

Wind energy

11. Producing one kilowatt hour (1.0kWh) of electricity from wind turbines saves the quantity of pollutants that would otherwise be released into the atmosphere by the generation of the same quantity of electricity from a conventional power station. In approximate figures, that amounts to 1000 grammes (g) of CO₂, 15g of SO₂, and 4.0g of NO_x. Wind turbines are also safe, with no recorded case of injury to humans. Opinion surveys in the UK show that a majority of the public do not oppose wind energy developments.

International, European Union (EU) and UK energy policies

12. Following the United Nations (UN) Conference on Environment and Development (Earth Summit, Rio de Janeiro 1992), the UK are a signatory to the UN Framework Convention on Climate Change that committed developed countries to reduce emissions of CO₂ to 1990 levels by the year 2000. The EU also aim to reduce emissions, by 8% below the 1990 level by 2010. The UK have set a target to reduce emissions by 20% of 1990 levels by 2010, and a further target of producing 10% of electricity from renewable sources by the same date. These targets were restated in the Energy White Paper published on 24th February 2003, with the Paper suggesting that 10% of electricity should come from renewable sources by 2010, up from today's 3%.
13. The UK government's energy policy objective is to ensure secure, diverse and sustainable supplies at competitive prices. Onshore and offshore wind will need to be used as the main source of renewable energy if the policy targets are to be met. A statutory obligation, known as the Non-Fossil Fuel Obligation (NFFO), while in force until April 2001, encouraged the development of renewable energy projects through the purchase of electricity at a guaranteed premium price. The initial Moel Maelogen project secured an NFFO contract,

which guaranteed a fixed price per unit of electricity sold to the buyer for 15 years. However, since April 2002 the NFFO contracts have been superseded by the Renewables Obligation (RO) as required by the Utilities Act 2000.

14. The RO requires electricity suppliers to supply an increasing proportion of their electricity from renewable sources. The target for 2010-11 is 10.4% but on December 1st 2003, the Government announced proposals to increase this target to 15.4% by 2015-16. The RO will remain in place until 2027 providing a guaranteed market for renewable energy. To achieve these obligations and taking account of the predicted growth in UK electricity demand, the production of electricity from renewable sources will need to increase from 9.4 Terawatt hours (TWh) in 2002/3 to 33.6 Terawatt hours in 2010/11. This is likely to require more than 500MW of wind generation capacity to be installed each year in the UK for the next seven years.

National Energy Policy

15. Wales is also set to play its part in assisting the UK to meet its goals for renewable energy and climate change commitments. The National Assembly has set Wales on a path to achieve a 20% reduction in CO2 emissions by 2020. In addition, following a review of renewable energy policy in Wales, the Assembly Government has now endorsed a benchmark target for renewable energy production of 4TWh hours by 2010 and an aspiration of 7TWh by 2020. On-shore wind is expected to play a significant part in meeting these targets.

The environmental impact assessment (EIA) and the environmental statement (ES)

16. Conwy County Borough Council (Conwy CBC), as planning authority, determined that an EIA was required for the project. The

guidance given by the Department of Environment, Transport and the Regions (DETR) Circular 11/99 were followed in carrying out the EIA and in preparing the revised ES.

17. The EIA process adopts a systematic approach to the presentation of information as followed in the first application. The information presented relates to the characteristics of the site, environmental effects of the project and their significance, and proposals to avoid, offset or reduce adverse impacts. The procedures adopted were reported in Chapter 1 of the original ES.
18. The scope and contents of the EIA and ES were determined by Cynefin Consultants and agreed through consultations with Conwy CBC, as planning authority, and Countryside Council for Wales (CCW), Environment Agency (EA), Snowdonia National Park Authority (SNPA) and community councils in the area. The issues are covered in the non-technical summary and in the 11 chapters, appendices and associated plans. The ES contains descriptions and reports of assessments relating to subjects that include the specifications of the project, landscape, geology, soils, landform, hydrology and ecology, archaeology, noise evaluation, electromagnetic interference, safety and shadow flicker, public access infrastructure, and social and economic aspects.

Development specifications

Site selection and wind characteristics

19. The quality of the landscape, visually and ecologically, had a strong determining influence on site selection and the specifications of the project.
20. Site wind speed is almost invariably the determining factor when assessing the economic viability of a wind power project. In 1991 a

wide-ranging study of wind resources in North Wales indicated that Maelogen Fawr and another farm in the area (Mwdwl Eithin), also owned by one of the partners of Ail Wynt, emerged as being worthy of further investigation. Further studies were carried out in 1992. The evaluation indicated that no sites in the area that were not already in the hands of energy companies are as suitable for development as these two farms, on technological or economic grounds. Economically, there is little difference between them; however, Mwdwl Eithin was rejected in favour of Maelogen Fawr because it is surrounded by lower ground whereas the Moel Maelogen site lies on an extensive upland plateau and is suitable for a wind turbine development. The site selection for the extension was a natural progression from the initial development, with three turbines and all infrastructure now in place.

Turbine configurations

21. Various options were considered and a configuration chosen aimed to provide balance between energy efficiency and environmental impact. Nine turbines are now proposed to be erected in close proximity and to the south of the three existing turbines. A smaller number of relatively large turbines were chosen in preference to a larger number of small turbines so as to lower the potential visual impact, particularly as viewed from Dyffryn Conwy. This consideration took precedence over choosing a configuration that would yield the maximum power output obtainable at the site.

Site layout

22. With the addition of nine turbines, the site will contain a total of twelve turbines on towers between 43m and 50m in height, several access tracks, an anemometry mast (50m high), on-site control building, cable trenches, construction site compound accommodation and storage facilities, and a borrow pit for road building material.

The original and revised layout proposals are shown on the Plans on page 6 of this report.

23. The nine Bonus 1300 (1.3 MW), or similar, wind turbines to be used will now be located in an arrangement to the south of the existing turbines and positioned to utilise the prevailing south-westerly wind. Each turbine will be mounted on a tower of 50m, tapering from 3.3m diameter at the base to 2.1m at the top. The rotor would have a diameter of 62m, making a maximum height for tower and turbine of 81m when one blade is in a vertical position. The power produced will feed into the existing control building by cables laid in trenches generally following the access track route.
24. Each tower will sit on an octagonal shaped foundation of mass concrete, mixed off site by a local contractor, 12m across and 1.2m deep and enclosed in PVC sheeting to prevent leaching of chemicals, and with a final surface that would be mostly 1.3m below ground level. The surface will be backfilled, covered with topsoil and incorporated into the surrounding grassland. The total land take will be 17.5m² per turbine.

Access road and site tracks

25. The A548 (Abergele-Llanrwst) and the B5113 (Colwyn Bay-Pentrefoelas) roads, and an unclassified county road that is a *cul-de-sac* ending at a former estate lodge, lead to Maelogen Fawr farm. The access route from the public highway to the project site carries on for 60m from the estate lodge on the farm accommodation road towards the project site.
26. Approximately 2.3km of new tracks will be built on the farm as access for construction and maintenance work and a further 1.0km of existing track will be upgraded to carry construction vehicles. The access track will have a running width of 4.5m, during construction, then narrowed to 2.5m and be built with crushed shale obtained from

the farm borrow pit. Each turbine will be reached either from the main access track or along *cul-de-sacs*. Surface water will be discharged to each side while avoiding disturbance to the drainage of wetland areas of value to wildlife.

27. Turbine pad areas will be required as hardstanding for the crane and other vehicles during construction. They will be left in place afterwards for emergency access and maintenance, and surfaced like the track though little used and likely to be colonised by vegetation.

Control building

28. The existing control building, housing the 33kV switch-gear, metering and control equipment, is located next to the Sitka Spruce plantation close to the site, screened by the wooded area and looking like a traditional farm outbuilding, with stone walls and a slate roof. A small extension will be built on the easterly gable to facilitate the export of the additional electrical capacity.

Cable trenches

29. The control building which houses the existing Manweb sub station will be linked to the turbines by underground cabling. The cabling will be placed in trenches, backfilled, covered with topsoil and seeded.

Site compound accommodation and storage facilities

30. A secure compound, 20m by 15m, will be built next to the substation and screened by the Sitka Spruce plantation. The site will be cleared and restored to agricultural use following construction work.

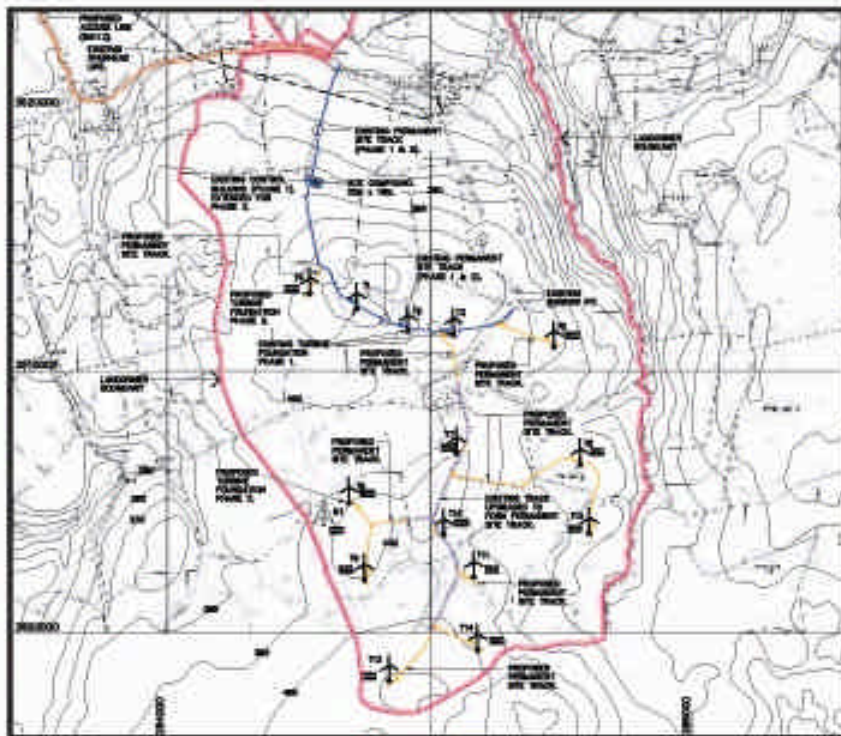
Borrow pit

31. As for the original 3 turbine development, vehicle movement on public highways will be reduced by the utilisation of the existing borrow pit on the farm for all road construction material.

Other specifications

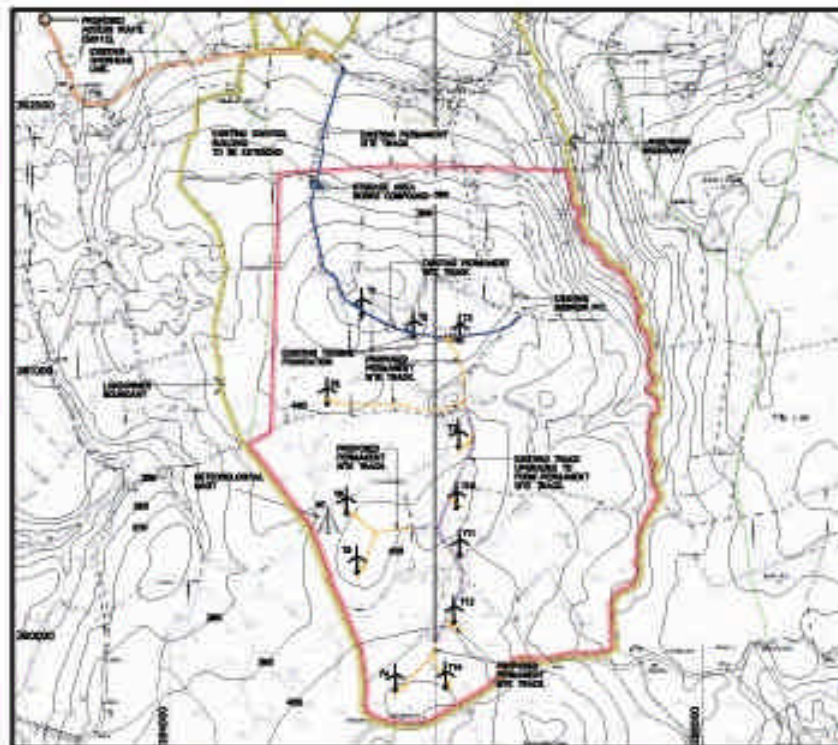
32. On-site works, carried out over a 40-week period, will involve around 622 vehicular movements, an average of under 16 each week. 40 larger vehicles will carry the turbine components and such traffic movement will be co-ordinated with the Police and Highway Authority.
33. Strict onsite procedures are planned to remove the risk of contaminants coming into contact with the land and the water table. After completing the construction phase, site re-instatement will be carried out to restore disturbed land by re-profiling and seeding with grass and incorporating it into the surrounding grasslands.
34. An average of two visits per month of one vehicle will be made to the site for checking and maintenance. This is a low level of traffic blending into the normal movement for farming purposes.
35. Decommissioning will involve removing all major equipment from site if the wind power project ceased to operate. Concrete foundations will be lowered to levels permitting the extension of current agricultural activities. Underground cables and access tracks may be left in place. Vehicles and their movements will be less than those used in the construction phase.

Moel Maelogen Extension Application Proposals - June 2003



Site Layout for 11 Turbines

Moel Maelogen Extension Revised Application Proposals - November 2003



Site Layout for 9 Turbines

Policy framework

Evaluation of relevant policies

36. Wind power projects, like other development schemes that require planning permission, have to be evaluated having regard to the development plan for the area involved and other material considerations. The development plan relevant to the Moel Maelogen project site is the approved Gwynedd Structure Plan (GSP). The Aberconwy Draft Local Plan (ADLP) has not been adopted and its policies are not, therefore, of such significance.
37. Government renewable energy policy was considered in the EIA along with national planning guidance contained in *Planning Guidance (Wales) Planning Policy 1999 (PGWPP 1999)*. The project is consistent with these aims, provided it is environmentally acceptable. The preparation of an ES ensures that this aspect is fully evaluated. Further guidance is contained in *Technical Advice Note (TAN) (Wales) 8, Renewable Energy*, which identifies the aspects to be considered in respect of wind turbines. These aspects are also taken into account in the ES.
38. More recently the draft new Planning Policy Statement (PPS22) published on 5th November 2003 re-affirms the Government's target to generate 10% of UK electricity from renewable energy sources by 2010 and states that local planning authorities should work to promote and encourage rather than restrict the development of renewable energy resources.
39. Whilst TAN 8 has not yet been updated it is likely to provide appropriate planning advice to indicate how planning authorities can assist Wales to meet its target of achieving some 4 TWh of electricity production from renewable resources by 2010.

The development plans

40. The GSP supports development such as that represented by the Moel Maelogen project, provided it can be demonstrated that its impact on the locality is acceptable. It also indicates that there will be a presumption in favour of such a project if it is located outside a designated conservation area, such as the Snowdonia National Park. In a Landscape Conservation Area (LCA), development will only be permitted if it is capable of being satisfactorily integrated into the landscape. The Moel Maelogen site is in the Conwy Valley LCA and there is a presumption in favour of such development for renewable energy generation provided it does not cause unacceptable damage to the visual quality of the area.
41. The ADLP permits renewable energy projects provided they do not adversely affect a number of locations and interests that are listed in the plan. It indicates the factors that are likely to be considered in any decision making process with respect to the granting of planning consent. The plan also states that developments which would contribute to a healthy economy, including farm diversification, are to be encouraged. The scale of the Moel Maelogen proposal and the low levels of negative impact on the environment make it more likely for it to be accommodated within the policy framework than would be the case with a larger scheme. Having regard to the positive attitude in the ADLP towards renewable energy and farm diversification the presumption should be in favour of the project provided its impact on the landscape and other considerations are acceptable.

Other published policy statements and guidance

42. CCW object to wind farm developments in a National Park, Area's of Outstanding Natural Beauty (AONB), Heritage Coast, marine, national and international nature reserves, SSSI's and other sites of known significance for wildlife conservation. They also indicate that

any proposed projects situated near to such designated areas will require careful consideration. The CCW have published a checklist of questions, which they use in their consideration of wind energy proposals. All the items in the checklist are addressed in the ES. Discussions with CCW have indicated that the revised development proposal is now acceptable.

Landscape and visual assessment

A two-part assessment

43. The landscape and visual assessment is in two parts. The first part assesses the visual impact of the revised proposal as viewed from eight categories of landscape surrounding the site in a circle with a radius of approximately 10km. The second part assesses the visual impact of the project based on what is observed at 16 viewpoints situated at a distance of up to 18.5km from the site. Cumulative impact with other wind farms and the effect on the historic landscape are also considered.
44. The impacts of the project on the landscape arise from visual changes brought about by the appearance of built structures and changes caused by increased human activity at, or near to, the site. In the first part of the assessment, the sensitivity of the eight landscape categories varied considerably with regard to the visual changes that

would occur from the construction and operation of the proposed project. The upland areas within 1.0km of the site, and similar areas from 1.0km to 10km around the site, as well as the eastern slopes of Dyffryn Conwy are sensitive to the project. The bottom of the valley and the western slopes of Dyffryn Conwy, including Trefriw, are moderately sensitive; and the mountains of Snowdonia and the Gwydir Forest, to the west, less sensitive.

45. Aspects of the project likely to have a potential impact on the eight landscape categories in the construction phase are identified. They would be the construction of the access tracks, tower foundations, turbines and towers, works compound and control building and the presence and movement of construction traffic.

Construction phase impacts

46. Impacts that would arise in the construction phase are shown in Table 1 below. Landscape categories are shown in the left-hand column, and the aspects of the project identified as having potential impacts on these categories along the top of the table. The severity of the visual impact is indicated in the assessment and goes along the scale 'nil' – 'minimal' – 'limited' – 'moderate' – 'substantial', as recommended by the Landscape Institute (LI) and the Institute of Environmental Assessment (IEA).

Table 1 Construction phase impacts

Landscape type	Construction phase activity indicated and level of magnitude of the impact assessed for each landscape type					
	access tracks	tower foundations	turbine construction	works / storage area	control building	traffic
(1) Upland within 1.0km	limited	minimal	substantial	limited	limited	limited
(2) Upland 1.0km-10 km	minimal	nil	substantial	minimal	minimal	limited
(3) Eastern Dyffryn Conwy	nil	nil	limited	nil	nil	limited
(4) Dyffryn Conwy	nil	nil	limited	nil	nil	minimal
(5) Trefriw	nil	nil	limited	nil	nil	nil
(6) Western Dyffryn Conwy	nil	nil	moderate	nil	nil	nil
(7) National park upland	nil	nil	minimal	nil	nil	nil
(8) National Park forests	nil	nil	minimal	nil	nil	nil

Operational phase impacts

47. The aspects considered for the operational phase of the project are the access track, the towers and turbines and the control building. The impacts these aspects would have on the eight landscape categories are shown in Table 2 below.

Table 2 Operational phase impacts

Landscape type	Operational phase activity indicated and level of magnitude of the impact assessed for each landscape type		
	access tracks	towers and turbines	control building
(1) Upland within 1.0km	minimal	substantial	limited
(2) Upland 1.0km-10km	limited	substantial	minimal
(3) Eastern Dyffryn Conwy	nil	limited	nil
(4) Dyffryn Conwy	nil	limited	nil
(5) Trefriw	nil	limited	nil
(6) Western Dyffryn Conwy	nil	moderate	nil
(7) National Park upland	nil	minimal	nil
(8) National Park forests	nil	minimal	nil

Visual impacts the project would have on 16 viewpoints up to a distance of 18.5km from the project site

48. In addition to the assessment of the eight types of landscape described, a study was made of the impact on each of 16 viewpoints selected in consultation with the Conwy CBC, CCW and the SNPA. The selection aims to provide representative views covering a range of directions and distances. Table 3 shows the results of this assessment. Detailed description of the location, setting and the impact on the 16 viewpoints, are given in Chapter 4 of Volume 2.
49. Consideration has also been given to the cumulative effect of the extension proposal with the existing 3 wind cluster development at

Hafotty Ucha (17km to the south east) and the permitted, but not yet built 25 turbines proposed for Tir Mostyn (16km to the east) . The view is taken that at these distances there will be no merging of wind farm landscapes and the visual effects will not be sufficient to create any significant overlapping of landscape character effects. The extra nine turbines at Moel Maelogen will therefore have minimal additional cumulative effect.

50. The proposed development will have some impact on the Denbigh Moors landscape of Special Historic Interest. However following the deletion of two turbines and the re-design of the layout, CCW now take the view that the impact will be limited and acceptable.

Table 3 Visual impacts of the project on 16 viewpoints

Viewpoint	OS Grid Reference (GR.SH)	Distance in kilometres from project site	Description	Estimated numbers of viewers scale 1 – 5*	Impact
1 Gwydir Castle	794611	5.5	Castle in Dyffryn Conwy open to the public	modest (3)	minimal
2 B5113 near Giat Bryniog	837599	1	Road near project site	quiet (2)	substantial
3 B5113 near Fferm	833680	8	Road to the north of project site	quiet (2)	limited
4 Tre-pys-llygod	887677	8	Public footpath on elevated moorland	very few (1)	limited
5 B5384 at Cefnbryn-sion	875640	4	Cross-roads between Pandy Tudur and Gwytherin	quiet (2)	moderate
6 Ffrithuchaf- footpath	861610	1	Public footpath on moorland near towers	very few (1)	substantial
7 Penbryn-ci- footpath	873564	5.5	Public footpath on elevated hill	very few (1)	moderate
8 A543 roadside	906554	8	Road between Pentrefoelas and Bylchau	regular (4)	limited
9 Trefriw village	781631	6.5	Bridge in Trefriw off B5106	busy (5)	limited
10 Moel Siabod	705547	16	Mountain south of Capel Curig	modest (3)	minimal
11 Northeast of Ysbyty Ifan	854493	11.5	Unclassified road near Pont Caletwyr	quiet (2)	nil
12 Tynllwyn- car park	765583	9	Viewing point on unclassified. road in Gwydir Forest	modest (3)	nil
13 Cefn Cyfarwydd	759640	10	Rough track in elevated moorland	very few (1)	minimal
14 Ochor Cefn Gwytherin	919622	7	Minor unfenced moorland road	very few (1)	limited
15 Moelfre Isaf	951734	16.5	Footpath on Moelfre Isaf, east of Betws-yn-Rhos	very few (1)	limited
16 A470- Crimea Pass	706500	18.5	Road between Betws-y-Coed/ Blaenau Ffestiniog	regular (4)	minimal

* In Table 3, the number of people likely to view the project has been estimated and scaled as follows.

- 1 Very few, and long periods with none.
- 2 Quiet, with no regular pattern or busy times.
- 3 Modest, with occasional groups, and seasonal variations including busy times.
- 4 Regular, involving a steady stream throughout the year.
- 5 Busy, with large numbers and constant use.

Natural environment and ecological assessment

The study area

51. The study area on Moel Maelogen lies near the northwestern edge of the moorland at Mynydd Hiraethog. Moel Maelogen was drained and improved for agriculture during the last 30 years and is now used mainly for sheep and cattle grazing, which has led to nutrient enrichment of the ecosystem (eutrophication) and a pronounced lowering of the quality of the land as a wildlife habitat. Unimproved moorland still survives as an important wildlife habitat at Mynydd Hiraethog, situated to the south, and is designated a Site of Special Scientific Interest (SSSI) under section 28 of the Wildlife and Countryside Act 1981. Data yielded by ecological field surveys carried out in the spring of 1999 and May and July 2002, together with information obtained from desk studies and consultations with specialists, describe the study area and are used as a basis for assessing its ecological importance, predicting impacts of the revised development on the natural environment and determining mitigation measures.

Geology, landform and soils

Impact- nil or negligible

52. The geological substrate is Silurian shale and the landform is glacially molded rock with gently sloping hills and valleys and wet, rather poorly drained, peaty soils. Some of the depressions contain deeper peat deposits over blue-grey boulder clay. The main impact will be the enlargement of a borrow pit. The impact will be nil or

negligible.

Climate and hydrology

Impact – negligible

53. The rainfall is high and fairly evenly distributed over the months, with extensive cloud cover; these conditions facilitate the development of peatland. Watershed drainage involves field drains that ultimately feed into Afon Derfyn. The project would affect surface and ground water and mitigation is proposed to prevent hydrological damage such as increased sediment loading and nutrient enrichment. By following best practice the impact on hydrology and water quality will be negligible.

Plant communities and species

Impact – negligible or minor

54. Nature Conservancy Council Phase 1 and Phase 2 habitat surveys and National Vegetation Classification (NVC) analyses indicated the presence of five principal habitats, namely improved grassland and mixed woodland, marshy grassland, acid flush and mire, which are remnants of former moorland vegetation. The mire is of conservation value (and is being managed), but none of the species recorded are statutorily protected. Impact on vegetation arising from construction will result in a loss of habitat, however, the structures will be built on improved grassland of low conservation concern.

Mammals

Impact – nil or negligible

- 55 The diversity of mammals at Moel Maelogen is low with only four species noted, namely Brown Hare, Rabbit, Badger and Mole. It is likely that the site is also utilised by other species including Fox, Polecat and Field Mouse, Short-tailed Vole and Bank Vole. However, the impact of the wind farm on the grassland that will be lost will be nil or negligible as this habitat is poor for mammals.

Birds*Impact – negligible or minor*

56. The upland grassland of Moel Maelogen is relatively poor in avian diversity. A total of 35 bird species were recorded of which four are thought to breed in the area. Three species breed in the marshy grassland, including Lapwing, Eurasian Curlew and Skylark, which are of notable conservation status. Golden Plover, which is also of conservation concern, was found to use the grassland for feeding although there was no evidence of breeding. None of the other species listed has a recognised conservation status. Habitat loss resulting from the project will not significantly affect the population. Bird strikes are generally minimal at wind farms in the Welsh uplands. The impact on bird populations will be negligible or minor. Mitigation will involve the avoidance of construction and decommissioning work during the breeding season, and the restriction of construction traffic to tracks and hardstandings.
57. In order to provide enhanced conditions for upland breeding birds, it is also proposed to implement a land management plan to be approved by Conwy CBC in consultation with CCW and RSPB Cymru.

Reptiles and amphibians*Impact – nil or negligible*

58. There is no permanent standing water in the area, but the marshy grassland and mire contain small water-filled depressions and hollows that could be used by frogs for breeding; specimens of the Common Frog were seen. An immature male adder was also seen basking on the access track. The project will be unlikely to have an impact on reptiles or amphibians.

Invertebrates*Impact – negligible*

59. Land reclamation for agriculture has removed much of the natural invertebrate fauna that previously existed in the study area, and the presence of livestock has reduced species diversity. Devil's bit Scabious, the food plant for the Marsh Fritillary, a rare species of butterfly found in the Mynydd Hiraethog SSSI occurs, but neither larvae nor adults were observed during the surveys. Due to lower levels of grazing, the marshy grassland is a more extensive habitat for invertebrates but the species found represent small island populations of negligible importance compared with those on Mynydd Hiraethog. The impact of the project will be direct habitat loss and changes in micro-climate and micro-hydrology but, as the areas of greatest invertebrate interest are not located near the turbine towers and other installations, it will be negligible. Mitigation measures indicated for plant communities and species will also benefit the invertebrate fauna.

Noise assessment*Impact – nil or negligible*

60. The Hayes McKenzie Partnership were commissioned to undertake an assessment of the noise impact of the revised scheme upon the surrounding areas with particular attention to the potential effects upon neighbouring properties.
61. The DTI Noise Working Group (NWG) provides guidance and recommendations and noise criteria developed by NWG have been used as a basis to assess the noise impact of the project. Prediction of the level of turbine noise incident at each of the properties studied has been performed based upon the noise characteristics of a Bonus 1.3MW wind turbine. The predicted turbine noise has been based

upon a source Sound Power Level (SWL) of 98.8 dB(A) \pm 2 dB at a wind speed of 8 m.s⁻¹ when measured at 10 metres height above ground level, the reference wind condition. Dwellings which are more remote and that have not been considered within the noise assessment will experience even lower levels of turbine noise

62. The reduction in the number of proposed turbines from eleven to nine and the movement of turbines away from the nearest dwellings has resulted in a reduction of incident noise at all neighbouring properties in the range of 0.7 – 1.3dB.
63. The revised assessment indicates that for all dwellings neighbouring the proposed development, wind turbine noise will meet the Lower Absolute Amenity Noise Criteria proposed within ETSU-R-97. The analysis indicates that the proposed wind turbines will result in noise levels which meet the requirements of the ETSU-R-97 for day and night-time operation at all dwellings.

Archaeological assessment

Impact – negligible or minor

64. The original ES noted that no archaeological features or deposits are presently recorded for the site on the Gwynedd SMR but surveys carried out in 1999 and 2003 did identify a number of landscape features of local archaeological importance.
65. Four of the archaeological features would have been directly or indirectly affected by the original proposal for 11 additional turbines. These features are as follows:
- The low sub-rectangular mound (PRN 13993) located near to turbine No. 4.

- Area used for peat cutting on track to turbine No. 5 (PRN 13994)
- Major bank boundary on track to turbine No. 5 (PRN 13995)
- Pre-historic barrow on track between turbine No. 8 and turbine No. 12 (PRN 13998)

Revised Proposals

66. Following the deletion of turbine nos. 8 and 12 and the relocation of turbine nos. 4 and 5, none of the above features will now be affected by the development proposals. The impact on the known archaeological resource will therefore be minimal.

Mitigation

67. In order to keep any residual impact to a minimum the following actions will be taken:
- The widening of the existing track to turbine No. 2 from the north west which passes through a boundary bank will be kept to a minimum.
 - The break in the boundary bank from the old borrow pit to turbine No. 3 will be kept to a minimum.
 - The two stone built structures (PRN 13999 and PRN 14000) will be marked by protective tape prior to the commencement of the construction works. Any widening of the existing trackway will avoid these structures.
68. In accordance with planning guidance, a watching brief will be carried out during the construction works in accordance with a scheme to be approved by Conwy CBC.

Electro-magnetic communications and services

Impact – nil or negligible

69. Wind turbines have the potential to affect electro-magnetic communications signals by causing interference. Radio, mobile phone, microwave and TV signals are among those that may be affected. This is known as electro-magnetic interference (EMI).

Effects of the project on electro-magnetic communications and services

70. The advisory note TAN 8 lists the organisations that should be consulted in connection with the possibility of EMI from proposed wind turbine sites. Those on the list were consulted and none, including the TV companies, has said that they expect problems with interference arising from the project. In the unlikely event that the turbines do cause interference with domestic television reception the costs of investigating and remedying any reception problems that may arise will be borne by Ail Wynt.
71. Service companies were also consulted. The locations of services on or near the site have been noted and measures will be taken to ensure they are not affected. The project is not expected to have any adverse effects on electro-magnetic signals or the apparatus of the service companies.
72. The impact of the project on electro-magnetic communications and services will therefore be nil or negligible.

Safety and public access

Impact – nil or negligible

Public access

73. The revisions to the scheme have now moved the proposed turbines further away from the public footpath to the east of the site such that the nearest turbine No. 10 is now well over 1km from the footpath. This path is promoted by the Council as part of the ‘Walks around Rural Conwy’ and the amendment to the scheme will, therefore, reduce any perceived adverse visual effect for walkers.
74. The amended scheme has also taken the development proposals further away from the Crown Estate land at Ffrith Uchaf which, as common land, will become ‘Access Land’ under the provisions of the Countryside and Rights of Way Act 2000.
75. The only public footpath right of way which runs near the site is public footpath No. 18 which runs north-south to the west of the site linking Pandy Tudor and Nebo. This footpath is shown on Plan No. MM.01 in Volume 2. TAN8 recommends that the set back distance from footpaths should be at least the height of the turbine to achieve maximum safety. In this case the safety distance exceeds this criteria.
76. Whilst this footpath has limited usage, it is proposed that the definitive route be clearly way marked across the whole of the Maelogen Fawr Farm in accordance with details to be agreed with the Rights of Way officer. This will ensure a safe distance is maintained by the public during the construction and operation of the wind farm.

Wind turbine safety

77. The wind turbines chosen for the site will be certified to an internationally recognised safety standard, and equipped with a sophisticated monitoring system that shuts down the machine if any damage is detected. The turbines are designed to withstand extreme

weather conditions, incorporating a failsafe mechanism to ensure that they shut down in the event of loss of grid connection or in wind speeds over the operating maximum.

Shadow flicker

78. Shadow flicker, caused by the shadow of the turbine blades flickering inside a room, is an environmental impact that may affect humans. The effect is not experienced beyond a distance equal to 10 blade diameters from the turbines, which in the case of this project is 600m. As the nearest inhabited building to the site is more than 900m away this shadow flicker impact will not arise.

Driver safety

79. There is the possibility that vehicle drivers may be distracted by sudden and unexpected views of wind turbines. This is unlikely to arise in this project. As roads on the approach to the site will give drivers intermittent views of the turbines; they will be unlikely to be suddenly faced by the turbines close up. The nearest turbine to the road is in excess of the recommended separation distance and will not represent a safety hazard.

Air traffic safety

80. Whilst the Ministry of Defence has not objected to the development proposal, National Air Traffic Services Ltd did express concern due to direct line of sight between the turbines and the radio station at St Annes, Blackpool, which is some 85 km to the north east. Consultation with regard to the revised scheme is ongoing.

Social and economic assessment

Impact – moderately beneficial (construction phase) and substantially beneficial (operational phase)

An economically disadvantaged rural area

81. The project is situated in a sparsely populated rural area that is facing difficulties caused by falling agricultural incomes, especially among hill farmers. Ail Wynt was set up by hill farming families as an additional source of income to support their agricultural businesses. Unlike the majority of the UK's wind power schemes, a substantial proportion of the money generated by the project will be retained within the local economy. The revised scheme is forecast to produce 30,748,000 (kWh) units annually, calculated at 30% of the development's total generating capacity. This is enough electricity to supply each year 7, 077 homes in the County of Conwy.

Wider benefits to society

82. Developing wind turbines is in line with the government's wider social and economic policies concerned with encouraging sustainable development, reducing emissions of greenhouse gasses, and promoting renewable energy sources. Over a 25 year period carbon dioxide emission savings alone would amount to over 661,000 tonnes.

Attitudes of local communities

83. Ail Wynt have carried out consultations among their own and surrounding communities. The majority of local people support the project. An independent telephone poll of 1,000 commissioned by the Conwy Energy Agency in September 2003 found that some 79% of the respondents in the Conwy area were supportive wind projects

in their locality.

Effects of the project on the social and economic fabric of the area

84. The impacts of the project on the social and economic fabric of the area will be moderately beneficial during the construction phase and substantially beneficial during the operational phase. Ail Wynt will offer to the general public in the county of Conwy a minimum of £1,000,000 as investment in the scheme. This is expected to generate an annual return of some £80,000 to the investors. In addition, Ail Wynt proposes to donate £50,000 per annum, towards a programme of energy efficiency in the Upper Conwy Valley. The donation will be eligible for match funding and the total fund will be administered by the Conwy Energy Agency for the benefit of rural Conwy. Ail Wynt will also donate an annual sum of £15,000 to be shared between the Community Councils of Bro Garmon and Bro Cernyw. The above benefits are in addition to the economic spin-off resulting from the owners of the wind farm residing and operating other businesses locally. Opportunities for longterm additional direct employment of 1 to 2 people resulting from the construction and operation of the wind farm are also being investigated by Ail Wynt.

Summary Table

85. Table 4 on the following page shows the levels of significance of the identified impacts as assessed in the revised ES. Full details of the methodology used to determine the levels of significance are given in Chapter 1 of the original ES.
86. The geographical level of importance of the feature affected is rated using the following terms.

I	International
N	National
R	Regional
D	District
L	Local

87. The level of significance and duration of the impact is quantified using the following terms.

Beneficial	A beneficial impact
Adverse	An adverse impact
St	Short term
Lt	Long term
R	Reversible
IR	Irreversible

Table 4 – Summary Table of identified impacts for the Moel Maelogen Wind Farm extension

Impact description	Location / Habitat/ Receptor	Geographical level of importance					Nature of impact	Significance of impact
		I	N	R	D	L		
<i>Visual impacts</i>								
Visual impacts of the development	Gwydir castle				v		Adverse, Lt, R	minimal
	B5113 near Giat Bryniog				v		Adverse, Lt, R	substantial
	B5113 near Fferm				v		Adverse, Lt, R	Limited
	Tre-pys-llygod				v		Adverse, Lt, R	nil
	B5384 at Cyfnbryn-sion				v		Adverse, Lt, R	moderate
	Ffrithuchaf footpath				v		Adverse, Lt, R	substantial
	Penbryn-ci footpath				v		Adverse, Lt, R	moderate
	A543 roadside- Pentrefoelas				v		Adverse, Lt, R	limited
	Trefriw village				v		Adverse, Lt, R	limited
	Moel Siabod				v		Adverse, Lt, R	minimal
	Northeast of Ysbyty Ifan				v		Adverse, Lt, R	nil
	Tynllwyn car park				v		Adverse, Lt, R	nil
	Cefn Cyfarwydd				v		Adverse, Lt, R	minimal
	Ochor Cefn Gwytherin				v		Adverse, Lt, R	limited
	Moelfre Isaf				v		Adverse, Lt, R	limited
	A470- Crimea Pass road				v		Adverse, Lt, R	minimal
<i>Natural environment and ecological impacts</i>								
Habitat loss	Improved grassland					v	Adverse, Lt, IR	minor
Changes to the hydrological regime	Marshy grassland					v	Adverse, Lt, IR	negligible
	Blanket bog	v	v			v	Adverse, Lt, R	negligible
Eutrophication	Marshy grassland					v	Adverse, Lt, R	negligible
	Blanket bog	v	v			v	Adverse, St, R	negligible
Pollution risk	Marshy grassland					v	Adverse, St, R	negligible
	Blanket bog	v	v			v	Adverse, St, R	negligible
Increased agricultural access	Marshy grassland					v	Adverse, Lt, R	negligible

Impact description	Location / Habitat/ Receptor	Geographical level of importance					Nature of impact	Significance of impact
Construction and operation of development	Mammals		v			v	Adverse, St, R	negligible
Bird mortality	All bird species	v	v	v	v	v	Adverse, Lt, R	negligible
Disturbance to birds in construction and operation	Ground nesting birds	v	v	v	v	v	Adverse, Lt, R	minor
	Other species					v	Adverse, Lt, R	negligible
Construction and operation of development	Invertebrates					v	Adverse, Lt, R	negligible
Noise								
Noise during operation	Surrounding dwellings					v	Adverse, Lt, R	minor
Archaeology								
Widening existing gap in boundary bank						v	Adverse, Lt, IR	negligible
Making gap in boundary bank						v	Adverse, Lt, IR	minor
Electro-Magnetic interference								
Electro-magnetic interference					v	v	N/A	nil
Services					v	v	N/A	nil
Safety and public access								
Public footpath						v	N/A	nil
Shadow flicker						v	N/A	nil
Driver distraction					v	v	Adverse, Lt, R	negligible
Air traffic safety)				v			uncertain	uncertain
Social and economic effects								
Construction phase					v	v	Beneficial, St, R	moderate
Operation phase		v			v	v	Beneficial, St, R	substantial