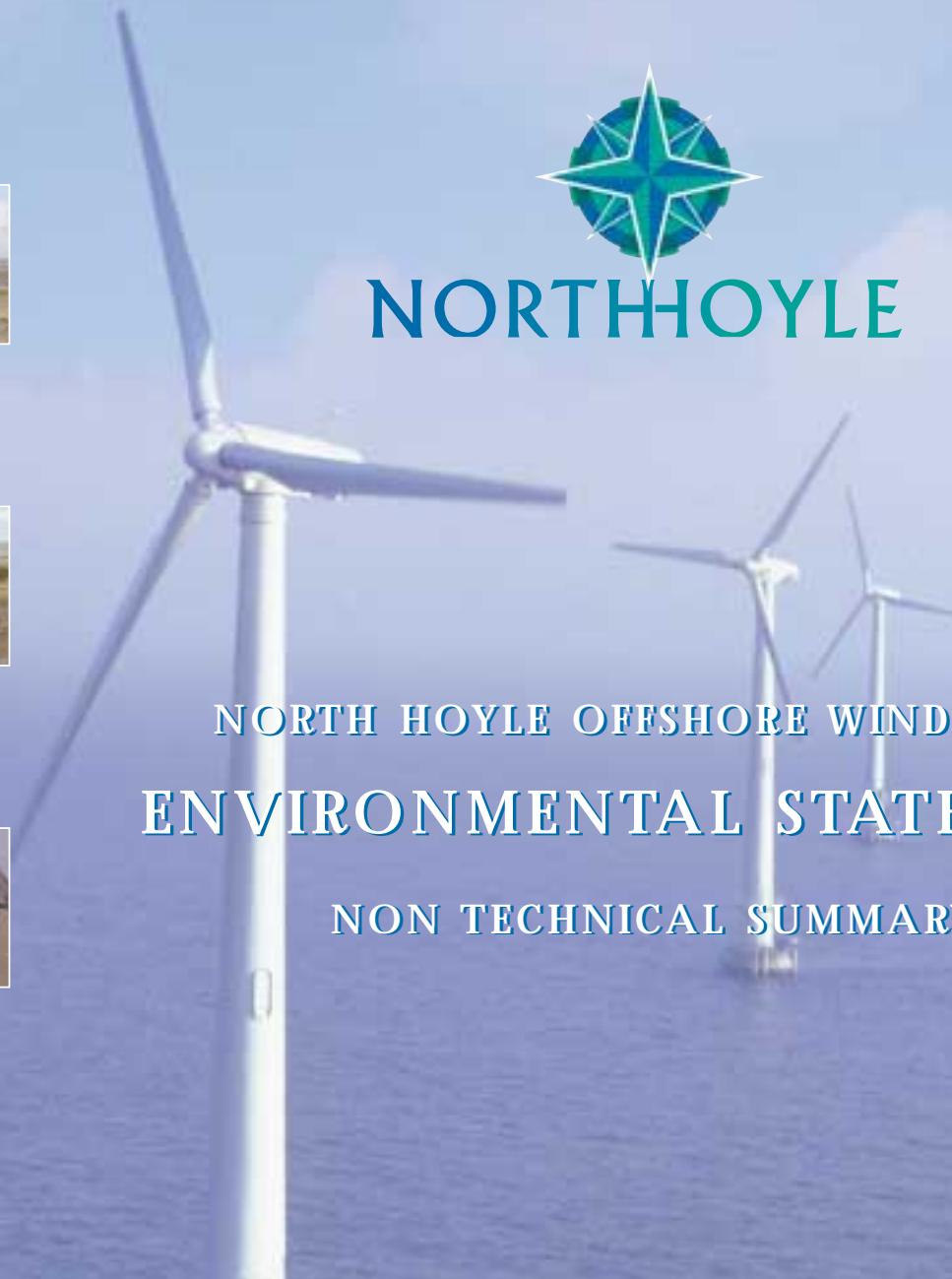




**NORTH HOYLE**

**NORTH HOYLE OFFSHORE WIND FARM  
ENVIRONMENTAL STATEMENT**

**NON TECHNICAL SUMMARY**





Location of proposed North Hoyle Offshore Wind Farm

## NORTH HOYLE OFFSHORE WIND FARM ENVIRONMENTAL STATEMENT NON-TECHNICAL SUMMARY

### Summary

NWP Offshore (NWPO) Ltd, a subsidiary of the major energy business Innogy plc, is submitting an application for consents to construct and operate an offshore wind farm located approximately 7.5km from the North Wales coast off Prestatyn and Rhyl. The development will be known as North Hoyle Offshore Wind Farm ("North Hoyle").

The wind farm will generate up to 90MW (megawatts) of clean, pollution free electricity, equivalent to the average domestic demand of approximately 70,000 homes; equivalent to over one third of all the homes in the nearest three counties to the wind farm (Denbighshire, Flintshire and Conwy) combined, or 1.5% of Welsh electricity demand.

The UK Government has a target of generating 10% of UK electricity energy supplies from renewable sources by 2010. The electricity generated by North Hoyle Offshore Wind Farm will contribute to this Government target, and will offset the annual release of approximately 250,000 tonnes of carbon dioxide, the main greenhouse gas.

### Strategic Need for Harnessing Wind Power

The UK has a commitment of reducing greenhouse gas emissions by 12.5% by 2008-2012, and a target to reduce carbon dioxide (CO<sub>2</sub>) emissions by 20% by 2010. The generation of electricity from renewable energy sources (such as the wind) produces no emissions, and when consumed at the expense of fossil fuels will help to reduce emissions of environmentally harmful gases.

The UK Government also has a target of generating 10% of UK electricity energy demand from renewable sources by 2010. The Government has stated that wind, both onshore and offshore, will be significant contributors to achieving this target. The report by the Royal Commission on Environmental Pollution confirms the widely acknowledged fact that the development of wind energy both onshore and offshore will be needed in order to achieve these targets.

Energy Minister Brian Wilson has predicted that 2002 will be "the year of renewables" in which the potential contribution of power generated from clean sources will finally be recognised in the UK. He said recently: *"I certainly want to see us aiming higher than 10% in the years beyond 2010. However, the reality is that we are starting from a low base it will take a lot of commitment, not least by government itself, to reach the 10% [target]"*

The development of North Hoyle and other UK offshore wind farms is a part of the Government's drive to tackle climate change and encourage a more sustainable approach to energy consumption. The development will also contribute to Innogy's responsibilities under the Renewables Obligation.

### Offshore Wind Power

With recent technological developments, the potential exists for locating wind farms economically in offshore locations. Eight offshore projects are currently operational worldwide. Early projects were relatively small scale and located in shallow or sheltered waters. However, more recently projects have been constructed in more challenging seas, for example the Blyth Offshore wind turbines, installed in 2000.

The UK offshore wind market is still in its infancy. North European offshore wind farms are more advanced than the UK with a number of operational Dutch, Swedish and Danish schemes including the latest twenty turbine (40MW) wind farm located several km from the centre of Copenhagen and the forthcoming projects at Horns Rev (160MW) and Rødsand (150MW).



At present Ireland, Belgium, Germany and the Netherlands are also expressing serious intent in developing their offshore resource.

### North Hoyle Offshore Wind Farm

NWP Offshore Ltd selected North Hoyle as the location for the offshore wind farm as the site has the following attributes:

- As an offshore location, the proposed site is currently undeveloped;
- An excellent wind resource (which has been measured by a 50 m tall mast on site for over two years);
- Relatively low exposure to large waves from the predominant wind direction (SW/W);
- Relatively low water depth (7-11m LAT) for the corresponding distance from shore;
- Good seabed properties for foundations and sub-sea cables;
- Strong electrical infrastructure near to the coast;
- Port facilities suitable for construction and operations (Liverpool, Mostyn, and Rhyl);
- No known environmental sensitivities.

The wind farm will feature thirty modern, efficient wind powered turbines each with a rated capacity of up to  $3\text{MW}_e$ , totalling up to ninety megawatts electrical ( $90\text{MW}_e$ ). The wind turbines have preliminary dimensions not exceeding a maximum tip height of 130m above Mean Sea Level with a nominal 80m-hub height and 100m-rotor diameter. The wind turbines will be supported by offshore support structures, which will also provide personnel access to the wind turbines.

The wind turbines will be inter-connected with others by buried sub sea cables. These cables will also comprise internal fibre optic communication links for wind farm control purposes.

Further buried cables will transfer the electricity generated to shore. The proposed connection point, with the electricity distribution system, is the existing 132kV sub-station at Rhyl, Denbighshire, operated by Scottish Power (Manweb) plc.

An ancillary meteorological monitoring mast (nominally 80m tall) is also proposed, immediately adjacent to the west of the turbine array, for operational monitoring, in conjunction with the existing mast to the east of the turbine array.

The construction of the wind farm is anticipated to last for 8 to 9 months, with 4 to 5 months of work offshore during the summer months. The design, construction and installation of the wind turbines will be undertaken through a competitively tendered Construction Contract.

The wind farm will be serviced and maintained throughout its operational lifetime (20-25 years), from a local port, which will provide full time employment for 6 people, utilising local services where appropriate.



At the end of its life, the wind farm will be decommissioned following discussions between NWP Offshore Ltd and The Crown Estate. It is anticipated that decommissioning will take a similar period of time and undertaking similar construction practices in reverse, when compared to the construction of the wind farm.

### Regulatory and Policy Context

The proposed North Hoyle Offshore Wind Farm is within the territorial seas of Wales with that part above mean low water within the jurisdiction of Denbighshire County Council. Applications for the following consents have been submitted:

- A consent under Section 36 of the Electricity Act 1989 for the wind turbines, anemometry mast, cables between the wind turbines and the cables from the wind farm to the boundary of the Planning Authority (Denbighshire County Council);
- A licence under Section 5 of the Food & Environment Protection Act 1985 for the placement of wind turbine support structures in the seabed, for scour protection if required;
- Planning Permission under Section 57 of the Town & Country Planning Act 1990 for those parts of the development, the Onshore Cables and Cable Interconnection Facility, within the jurisdiction of Denbighshire County Council;
- A consent under Section 34 of the Coast Protection Act 1949 for the erection and maintenance in navigable waters of the wind turbines their support structures and the cables as far as mean high water.

The need for renewable energy generation derives from an increasing appreciation of the harmful consequences of emissions of greenhouse gases and acid rain gases. Wind energy

comprises an inherently sustainable means of electricity generation as it does not produce harmful emissions and is not dependant upon finite reserves of fossil fuels.

Since 1983, successive Governments have made progressively more determined efforts to pursue the development of renewable energy sources, a trend that has been accelerated since the election of a Labour Government in 1997. On numerous occasions, Ministers have advised of the challenges posed by climate change for all forms of life, including humans. The Government has also advised that renewable energy developments, including wind energy, and more recently offshore wind energy, is seen as playing a very important role in combating the emissions which make a major contribution to climate change.

Within Wales, this strong UK energy policy has evolved into a positive approach to wind energy development within national and local planning policies. Planning policy guidance in Wales reiterates the approach of Government, which is "stimulate the exploitation and development of renewable energy sources where there are prospects of being economically attractive and environmentally acceptable".

At a local level, Denbighshire County Council's Unitary Development Plan (UDP) has direct application to those parts of the development above mean low water. Policies within the UDP (MEW 8 and MEW 10) advise on renewable energy in positive terms, reflecting the national approach.

The development proposed is an emphatic expression of the implementation of the UK's policy towards renewable energy and of the planning approach adopted by the National Assembly. The proposed North Hoyle Offshore Wind Farm should be seen in the context of, and as a response to, the strong encouragement of the UK Government to the development of renewables generally, to wind energy specifically, and to offshore wind energy in particular. North Hoyle Offshore Wind Farm will make a measurable and important contribution to the achievement of the Government's policy of delivering 10% of UK electricity requirements from renewable energy by 2010.



## Environmental Impacts

Wide consultations have been undertaken with regulators (DTI, National Assembly for Wales, DEFRA, DTLR, Environment Agency) statutory consultees (i.e. CCW, Government Agencies and Local Authorities), non-statutory consultees and the public (through project briefings and public exhibitions).

No significant environmental impacts have been identified. However all environmentally valuable or sensitive features of the marine environment have been investigated and the potential effects of the wind farm evaluated, with the main conclusions summarised below:

## Physical Environment

The sediments of the eastern Irish Sea are largely derived from eroded boulder clays and comprise gravelly sediments, predominantly sandy gravels and large amounts of sands. Surveys on the North Hoyle site indicate the seabed is comprised of predominantly gravelly sand with some small infrequent pockets of fine sand, gravel and clay.

Significant volumes of bed material are highly mobile within the proposed development area, due to natural processes. The maximum total volume of sediment that could be released during construction is approximately one thousandth of the level of sediment habitually in motion across the site. Much of this material would settle back to the bed almost immediately, within the vicinity of the site and would be unlikely to be re-mobilised.

Metals concentrations in the sediments of Irish Sea show are well below the relevant environmental standard. An assessment of the release of metals and other organic chemicals indicate very small increases in concentrations arising during construction, less than 10% of background concentrations and well below environmental standards.

In situ, the turbine support structures are likely to result in localised scour (erosion of sediments) around their bases. No overlapping of scour between adjacent turbines support structures will occur. Scour protection may be required around the base of the turbine support structures, primarily for structural stability of the support structures.

The construction, operation or decommissioning of the wind farm is not anticipated to result in any impact on hydrography (water levels, tidal currents and waves). The effect of a single support structure and the array on hydrography, suggest minor effects will be observed only within a few hundred meters of the structures. Outside the turbine array effects on hydrography are not evident.

## Biological Environment

### Marine Ecology

Sea life within and surrounding the site is common and widespread throughout the eastern Irish Sea and Liverpool Bay and has adapted to cope with the high mobility of the sediments. Surveys of sea life in the area have not identified the presence of any rare or unusual species.

A large number of fish species occur in Liverpool Bay and the inshore waters of North Wales some are indigenous or frequent visitors to the proposed North Hoyle site. No 'rare' (i.e. species protected by national and international non-fishery legislation) or 'vagrant' (i.e. species are linked specifically with the North Hoyle area).

The North Hoyle site is not located on any fish spawning or nursery areas. However, on route to shore, the burial of cables will pass through juvenile plaice and sole nursery areas. This transitory activity is not anticipated to affect juvenile fish. In addition, the potential effect could be minimised by laying the cables early in the year.



Sea life will be directly impacted only on areas utilised for construction activities, resulting in a loss of a very small area of seabed. Conversely, habitat will be created through colonisation of the turbine support structures and any associated scour protection, if utilised, resulting in small increases in species diversity and overall productivity.

Sea life may be sensitive, in varying degrees, to any marine noise or vibration generated by the wind turbines, however, it is anticipated they will habituate. Comparably noisy offshore structures such as gas and oil rigs have been shown to attract many species rather than drive them away. In addition, the turbine support structures will provide shelter providing attractive areas within which fish and invertebrate species will congregate.

Marine noise generated by the wind farm is likely to be outside the hearing range of smaller cetaceans, such as the harbour porpoise and bottlenose dolphin. Seals are also unlikely to be sensitive to the noise produced by the turbines at North Hoyle, and following familiarisation with the physical presence of the structures, are expected to be attracted to the wind farm as a feeding area due to aggregations of fish.

In contrast, whales are extremely sensitive to noise in the frequency range produced by wind turbines. However, the only species regularly recorded in the eastern Irish Sea are the minke whale, which have not been reported from Liverpool Bay. No impacts on whales are therefore anticipated.

The transmission of electricity through buried sub sea cables will generate extremely weak electrical fields in the immediate vicinity of the cable. It is not anticipated that sharks, skates and rays, which are sensitive to electrical fields, will show any avoidance behaviour. Some local attraction of individual fish to the cable route is possible, but this would not significantly affect populations of electrosensitive species in the local area.

Temporary disruption of mudflat and riverbank areas within the Clwyd estuary will occur during the installation of Onshore Cables, including an extremely minor area of ditch and hedgerow between the estuary and the electricity sub-station. No significant impacts would arise as a result of these works, but measures will be implemented to ensure restoration of affected habitats and to confirm that no rare or protected amphibians or mammals are using habitats within the construction area.

'Migratory (diadromous) fish' are fish that spend part of their life cycle in fresh water and part in seawater, such as the Atlantic salmon, sea trout and European eel all 'run' in the Clwyd Estuary. It is not anticipated that the presence of North Hoyle Offshore Wind Farm will have a discernible effect on these populations. Similarly, it is unlikely that laying and burying electricity cables through the Clwyd Estuary will have a discernible effect on eels.

In contrast, salmon and sea trout may be sensitive to general disturbance and any increase in sediment load generated as a result of these activities. To significantly minimise any adverse effects, cables will be buried during the winter period when the numbers of salmon and sea trout in the estuary are expected to be at their lowest.

During decommissioning, impacts would be similar to those for construction. In terms of invertebrate and fish populations, it is recommended that any rock protection provided around the turbine support structures be left in place, this providing habitat for many species and thus preventing further impacts on the seabed associated with its removal.

## Birds

North Hoyle, some 7.5km from land and in water depths of 6-10m, is beyond the foraging range and water depths preferentially selected by most of the important seabird populations in the Bay.



Surveys of Liverpool Bay during 2000/2001 have demonstrated that the inshore waters of Liverpool Bay have wintering populations of Common scoter and Red-throated diver that could justify classification of parts of the Bay as European Designated Sites for these species. A number of other populations from designated sites of importance for birds use the offshore waters of the Bay.

North Hoyle is of negligible importance as a feeding area for these seabirds and terns during the breeding season. In winter, the nearest significant Common scoter population is 5km to the south of North Hoyle, at Chester Flats/Middle Patch. The nearest high Red-throated diver densities occur 10km to the west, between Rhyl Flats, Colwyn Bay and Constable Bank. No significant movements, through North Hoyle, of important populations have been observed or would be expected.

The River Clwyd, which lies along the cabling route, is a non-statutory wildlife site, noted for migrant and wintering populations of county importance of a number of water bird species.

The surveys on the North Hoyle site have not identified any bird population sizes that could require European designation. In addition, the assessment of impacts, for the Stage 1 scoping opinion required under Article 6(3) of the Habitats Directive (92/43/EEC), has not identified any significant effects on the qualifying populations of classified or potential European Sites, therefore no requirement for 'Appropriate Assessments' is considered necessary. Impacts on populations from SSSIs are assessed to be of low or very low significance. The impact on bird populations on the Clwyd Estuary and Floodplain Wildlife Site will be short-term, confined to the construction period, with no effect beyond the calendar year of construction.

The North Hoyle Offshore Wind Farm will not significantly affect bird populations.

### Designated Sites

There are a number of statutory or non-statutory designated sites within the vicinity of North Hoyle, however the site does not lie within any designation boundaries. Surveys undertaken in and around the wind farm and cable route have also shown that no species populations are of the size or sensitivity that would render designation for nature conservation.

The environmental impacts of the wind farm were assessed, in relation to the European designated sites and any cumulative impacts with other developments. These assessments conclude that an Appropriate Assessment, under the Habitats Regulations, is not required.

### Seascape & Visual Environment

Seascape consists of views from the land to the sea and vice versa; views along the coastline; and the effect on landscape of the conjunction of sea and land. The seascape and visual impact have been assessed in accordance with current best practice, utilising reference guidelines.

The study area comprises one national seascape unit, extending between Great Orme and the Mersey; subdivided into six regional seascapes: Colwyn Bay, Vale of Clwyd, Clwydian Hills, Western Dee, Eastern Dee and North Wirral; with the defining characteristics of each identified. The most important landscape planning designation in the study area is the Clwydian Range Area of Outstanding Natural Beauty (AONB).

The National Seascape Unit has capacity to accommodate an offshore wind farm, with the ability of the six Regional Seascape Units as follows: the Vale of Clwyd and North Wirral units have the highest capacity, with the Western Dee in the same category, assuming that the development site is not within the estuary. Colwyn Bay and Clwydian Hills units have a moderate to high capacity, with Eastern Dee the lowest capacity to accommodate an offshore



development. North Hoyle is proposed to be located in the area where the Vale of Clwyd and Clwydian Hills Regional Seascape Units overlap.

Zones of Visual Influence maps (ZVI's) and photomontages for 12 agreed viewpoints were produced to assess the visual impact of North Hoyle; taking into account the degree of change in the view and the sensitivity of the receptors to that change. Receptors (people experiencing changes in views) are classified according to their perceived sensitivity to visual impact, on a three-point scale ranging from High to Low as follows:

- Highly sensitive receptors; residents and tourists, who value their view and the scenery;
- Moderately sensitive receptors: tourists and some travellers, who are attracted to resorts, non-scenic areas or those participating in seascape activities: yachting, boating, etc.; and
- Low sensitivity, those commercially engaged pedestrians and commercial shipping or fishing vessels.

The degree of visual impact will be highest from those viewpoints closest to North Hoyle, where sensitivity of receptors is high. Only Point of Ayr falls into this category. Moderate to high impacts are predicted at the car park viewpoint at Bryn-llwyn and from the hilltop of Marian Ffrith, the only inland view of North Hoyle for walkers on Offa's Dyke Path. Moderate impacts are predicted at Prestatyn's Nova Centre, Graig Fawr and Hilbre Point. Low to moderate impacts are predicted at Rhos-on-Sea and Abergele/Pensarn (both on the route of the North Wales Path), Bryn Euryn, Rhyl Aquarium and Thurstaston Common. Finally, low impacts are predicted at Mynydd Marian on the eastern outskirts of Old Colwyn.

Assessments have also been made of the cumulative effect of North Hoyle in combination with wind farms that have been mooted to be proposed for development at Rhyl Flats and Burbo. Four photomontage viewpoints were selected to illustrate the likely appearance of North Hoyle Offshore Wind Farm in combination with those at Rhyl Flats and Burbo.



Alternative layouts were examined, with the preferred layout finalised as a rectangle of 6 rows of 5 turbines, oriented at 350 degrees, which occupies a similar extent of horizon from all viewpoints. The array will appear as a regular pattern in views from land perpendicular to the wind farm but will appear more random in all-oblique views.

A light grey/off-white colour for the turbines will minimise contrast with the sky and generally give an impression of lighter, less substantial forms than would be created by darker shades. Trinity House Lighthouse Service requires navigational lighting for the wind farm, which cannot be modified for aesthetic reasons. However, these lights would be at the limit of their visible range when viewed from land.

Visual impacts arising from the construction of on-shore infrastructure have been avoided by adopting a route for the cabling works that does not require overhead lines.

## Human Environment

### Socio-economic

The proposed wind farm development will provide a major inward investment opportunity to the area, resulting in significant benefits from construction and spin-off effects in other parts of the local economy.

Up to 53 full-time equivalent jobs will be created; the majority (an estimated 44 jobs) would be directly associated with construction activity. Detailed decisions on the management, operation and staffing for the offshore wind farm have not been finalised, however, it is envisaged that around 6 full-time staff would be required during the operation of the wind farm. An additional 2 jobs will be created to provide year round boat access to the wind farm site for maintenance.

Overall, the potential impacts on the local and wider economy are considered positive.

A new green electricity product called Juice, was launched on Rhyl beach in August 2001 by npower, NWP's sister company, in a unique partnership with Greenpeace. Juice is the UK's first non-premium truly green electricity product available to domestic customers. By switching to Juice, people have been given the opportunity to demonstrate their support for North Hoyle. Currently the green electricity is being supplied from an established hydro-electric station in Wales and from wind farms on land. When North Hoyle is built, subject to consent, it will supply 50,000 Juice customers with electricity. Since its launch, Juice has attracted a huge response which is growing daily. By the end of January 2002, registration numbers had reached over 6,000 which has already increased the UK domestic green electricity market by some 25%.

### Traffic

Onshore traffic movements associated with the proposed development will be minimal with the main source of traffic being associated with construction personnel travelling to the area. It has been estimated that the construction workforce would not exceed 50 people at any given time with an assumed occupancy of two persons.

The majority of plant components and equipment is expected to be delivered to the onshore support base by sea. The only onshore heavy goods vehicles (HGV) required would be those associated with the construction of the Cable Interconnection Facility and the delivery of onshore cables. The proposed transport route to be used for this construction equipment is likely to be via the A55T to Pensarn and then west bound on the A548 towards Rhyl.

Traffic generated during the construction and operation of North Hoyle is therefore considered insignificant due to the small numbers of vehicle movements that will be required.

### Military

The Northern Irish Sea is an area of interest for military activity, with submarine, surface vessel and aircraft exercising in the region. Consultations with the Ministry of Defence have confirmed North Hoyle will not impact on their activities.

### Civil Aviation

The two nearest aerodrome/ATS facilities to North Hoyle have been identified as Liverpool Airport (36km) and Hawarden Airport located in Broughton near Chester (39km). Both airports and National Air Traffic Services Ltd (NATS) have confirmed that North Hoyle will not conflict with civil aviation.

### Electromagnetic Interference (EMI)

Wind turbines are substantial vertical structures that could potentially affect electromagnetic communication (radio & microwave) signals being transmitted across the site. No interference to communication has been identified near the North Hoyle site. Consultations have been held with the telecommunications industry; indications are that North Hoyle will not have adverse effects on communications.

### Noise

Construction of the wind farm may involve piling, which may be audible from the shore depending on background noise levels at the coast. However, the noise level and duration are not expected to be significant. Cable laying work in the Clwyd Estuary and the construction of the Cable Interconnection Facility at Rhyl will be undertaken by conventional construction equipment and activities. Noise will be subject to control with noise limited by



exercising a reasonable degree of control over site activities, and by paying attention to the recommendations set out in British Standard 5228 'Noise Control on Construction and Open Sites'.

The distance to shore from the nearest wind turbine is 7.8km. During operation, the noise levels at the coast due to the wind farm will be sufficiently low so as not to affect amenity.

## Offshore Industries and Activities

### Offshore Oil and Gas

BHP Billiton Petroleum Limited operate the Liverpool Bay Asset, a near shore integrated oil and gas production facility, with offshore installations (Lennox, Hamilton, Hamilton North and Douglas) and onshore facilities (Point of Ayr). The proposed wind farm is unlikely to directly impact upon these activities. However, the Offshore Cables will cross the main gas pipeline from the Douglas gas production facility. Due to the proposed construction methods, this will have no detrimental impact on the pipeline or operation of the facilities.

### Aggregate Dredging areas

The Hilbre Swash licensed extraction area lies immediately to the north of the proposed wind farm site. However, extraction only takes place in relatively small area within this licensed area, 1 to 2 NM from the nearest turbine, and therefore the effect of the wind farm on aggregate extraction is not considered significant.

### Sub-sea Cables and Pipelines

With the exception of the BHP Billiton Petroleum Limited pipeline, there are no other

sub-sea cables or pipelines affected by North Hoyle. However, there are a number of cables and pipelines that will need to be crossed during installation of the cables along the Clwyd Estuary. These include gas mains, water mains, power cables, and communication cables. Appropriate protection measures will be utilised to protect the offshore gas pipeline and onshore utility crossings.

### Waste Disposal Sites

The North Hoyle site is not situated within or near any known licensed waste dumping areas and is therefore not anticipated to impact upon their operation. There are anticipated to be no significant solid discharges to the marine environment during the construction and normal operation of the turbine array.

### Shipping and Navigation

North Hoyle has been sited in a relatively low risk area for commercial navigation. In addition, the site will be marked in accordance with Trinity House Lighthouse Service recommendations, and will be marked on Admiralty Charts.

The major shipping routes in Liverpool Bay are to the Ports of Liverpool and Mostyn. Liverpool Traffic utilises routes, between the Skerries and Point Lynas Bar Light Vessel at the mouth of the Mersey channel. These routes carry approximately 70% of Liverpool traffic and the nearest approach to the proposed North Hoyle Offshore Wind Farm would be 5.5 NM to the North.

The main route used by Port of Mostyn, between Constable Bank and Welsh Channel, carries the majority of traffic and passes at least 2.5 NM to the south of North Hoyle. The sea off northeast Wales and the Wirral is also home to a range of marine leisure and recreational pursuits. Despite this, the area of the sea in and immediately around the proposed offshore wind farm is relatively lightly used.



A number of systems are in place within the area from Anglesey to Liverpool to control and monitor vessels entering or leaving the Ports of Liverpool and Mostyn, which cover the area proposed for North Hoyle.

The potential for an impact during the construction and decommissioning is regarded as very low. The impact during operation of the proposed North Hoyle Offshore Wind Farm has been assessed. The analysis, based upon present traffic levels indicates that the risk of collision is lower than once in 1,400 years. It is concluded that the risk of collision from a large vessel is extremely low.

The risk to sailing and amenity vessels is highly dependent on the approach of the skipper and local conditions. Due to the minimal seabed area taken by the turbines, and the regular pattern of the wind turbines (with minimum turbine separations proposed of ca 350m), the presence of the turbines and support structures will not unduly restrict navigation for recreational fishing vessels or sailing vessels. Some skippers may prudently elect to navigate around the turbine array, resulting in longer transit times.

There will be no exclusion zone during wind farm operation.

### Commercial Fisheries

Many of the fish and shellfish species near North Hoyle are exploited commercially mostly by local vessels. Recorded fishing effort data in the vicinity is very small compared to that recorded elsewhere in the Irish Sea. Only three full time commercial fishing vessels fish the site on a regular basis, one from Rhos, one from Rhyl and one from the Wirral, employing five fishermen on a full time basis.

Construction of the wind farm will result in a loss of access to the site for fishing vessels. During operation, smaller inshore trawlers will be able to manoeuvre and fish within the site.

There will be a loss of fishing grounds to local netters known to fish the area, albeit small given the low intensity of fishing on the site.

By way of mitigation, the position of the proposed wind farm has minimised the potential impact on commercial fisheries. The level of fishing activity on and around the site is extremely low in comparison with the rest of the Eastern Irish Sea.

NWP Offshore Ltd, through their independent fisheries liaison, will attempt to ensure that all parties related to the fishing industry will receive advance notice of all works to be undertaken.

### Wrecks and Archaeology

The area around Rhyl has considerable potential for buried archaeological deposits, generally associated with past changes in sea levels and the advance and retreat of the coastline since the end of the last glaciation (about 10,000 BC). It is possible that further such deposits may lie beneath agricultural land at the southern end of the proposed on-shore cable route and a programme of sampling has been recommended in mitigation.

The on-shore cable route will result in a cutting being made through a 19th-century reclamation embankment at the point of landfall, resulting in only minor damage to this site, and appropriate mitigation measures are recommended.

A number of wrecks lie within Foryd Harbour and the Clwyd estuary. An exclusion zone will be established around the wreck of the Ottawa to protect this archaeological feature.

Analysis of survey data of the seabed in the area of the proposed turbine array, as well as for the on-shore cable route, has produced no evidence for further wrecks.

No existing known wrecks will be impacted by the proposed wind farm.



## Cumulative Impacts

The impacts of the proposed wind farm were assessed in conjunction with other wind farm projects mooted for development in Liverpool Bay. In particular the cumulative effects on seascape character, coastal processes and birds were assessed, and it was concluded that the proposed North Hoyle Offshore Wind Farm will not give rise to cumulative impacts in combination with these other mooted developments, if they proceed.

## Conclusions

In order to reduce emissions that are harmful to our environment and which result, in part, from the generation of electricity, NWP Offshore Ltd is committed to the new and strong drive to develop wind power and other forms of renewable energy. Wind power also forms the major part of the Government's renewable energy programme, in parallel with energy efficiency measures.

The construction and operation of North Hoyle Offshore Wind Farm will have some direct and indirect environmental impacts, but none of these are considered significant. An assessment of cumulative impacts with other wind farm projects mooted for development in Liverpool Bay has been undertaken, which has concluded that there will be no cumulative impacts in combination with any other projects impacts.

The surveys undertaken in and around the site of the wind farm and cable route have not shown any species populations which are rare, sensitive or would render it necessary for any part to be designated for the purposes of nature conservation.

The environmental impacts of the wind farm were assessed, in relation to the European designated sites and any cumulative impacts with other developments. These assessments conclude that an Appropriate Assessment, under the Habitats Regulations, is not required.

## Further Information

If you would like to find out more about the North Hoyle Offshore Wind Farm proposal and its effects, you can read the full Environmental Statement at the following locations:

- Flintshire County Council, County Hall, Mold, Flintshire, CH7 6NB
- Denbighshire County Council, Council Offices, Wynnstay Road, Ruthin, LL15 1YN
- Conwy County Borough Council, Civic Offices, Colwyn Bay, Conwy, LL29 8AR
- Prestatyn Library, Nant Hall Road, Prestatyn, Denbighshire, LL19 9LH
- Rhyl Library, Museum & Arts Centre, Church Street, Rhyl, Denbighshire, LL18 3AA

Alternatively, for further information access the web page [www.northhoyle.co.uk](http://www.northhoyle.co.uk) or please contact:

NWP Offshore Ltd, Riverside House, Meadowbank, Furlong Road, Bourne End, Bucks, SL8 5AJ.  
Tel 01628 532 300. Fax 01628 531 994. Email [northhoyle@natwindpower.co.uk](mailto:northhoyle@natwindpower.co.uk)

