

**Broad Character: Industry**

**Character Type: Energy Industry**

**Irish Sea Regional Perspective**

**Introduction: Defining/Distinguishing Attributes**

There is a series of gas and oil fields offshore in the southern half of England's sector of the Irish Sea. The Douglas Oil Field was the first to be developed in the east Irish Sea Basin, in 1996 (Yaliz 1997). The field was discovered in 1990, at the same time as the nearby gas fields of Hamilton and Hamilton North (Yaliz 1997, 399). The Douglas Field also acts as the control for the other fields in the area, and a subsea pipeline takes crude oil to an offshore loading platform. It handles gas from the Hamilton fields and gas and oil from the Lennox field (Yaliz 1997, 400). The most northerly field is the Morecambe Bay Gas Field, which lies some 30-40 km west of Blackpool. It is one of the largest gas fields found near the UK, with the South Morecambe field discovered in 1975 and developed by British Gas, now Centrica. The North Morecambe field opened in 1994 (<http://mininghistory.thehumanjourney.net/edu/MorecambeBay.shtml>), and gas from both is taken to a gas terminal at Roosecote, Barrow-in-Furness.



*The Burbo Bank wind farm, Liverpool Bay*

Next to the Roosecote Gas Terminal is the Roosecote gas-powered power station. It was built as a coal-powered station, but was converted to gas in 1989-91 (<http://www.centrica.com>). There are only two other coastally based fossil-fuel power stations in use in the region: Fiddler's Ferry at Cuerdley near Widnes, and Rock Savage gas-powered station near Runcorn. Fiddler's Ferry is a coal-fired station, opened in 1971, and its cooling towers form a prominent landmark on the north bank of the River Mersey (<http://www.sse.com>).

There is one operating nuclear power station on north–west England’s coastline, at Heysham in Lancashire, which has two plants, Heysham 1 and Heysham 2 (<http://www.british-energy.com>). The Calder Hall nuclear power station at Sellafield, Cumbria was closed in 2003, but sits within the wider Sellafield nuclear reprocessing plant. Cumbria, and the area around Sellafield, have been identified at one of the possible locations for at least one new nuclear power station.

A number of windfarms have been built, both in offshore and onshore locations. The most southerly offshore windfarm is Burbo Bank. Further north, there are five large windfarms operating or in development off the coast of south Cumbria: Barrow, Walney I, Ormonde and Walney II and West of Duddon Sands. The two Walney windfarms and West of Duddon Sands site are contiguous, and there are plans to extend the area with a possible further 750 turbines (<http://www.4coffshore.com/offshorewind/>). A proposed windfarm for 180 turbines at Shell Flats, off the coast of Blackpool, has been cancelled. The most northerly windfarm, Robin Rigg, lies just outside the survey area, but the submarine power cables to it come ashore just north of Workington.



*The Haverigg wind farm, on the site of a World War II airfield. This is also the site (now rejected) of one of the proposed new nuclear power stations*

### **Historical Processes; Components, Features And Variability**

The energy industry in this region has been dominated by coal, and there were a number of coal-fired power stations in the region supplied by fuel from local. Offshore, gas is the main hydrocarbon, though oil was the first to be found in the Douglas Field, and oil is produced with gas in the Lennox Field. Oil is taken from the oil fields from an offshore loading platform, whilst the terminal at Roosecote, was developed to handle the processing and transport of gas from the Morecambe Bay fields. The fields are all still in use, and the North Morecambe Bay Field is still in development (<http://mininghistory.thehumanjourney.net/edu/MorecambeBay.shtml>). Oil is also imported into the region and refined, through the oil terminal and refineries at Ellesmere Port. The area has been associated with chemical production since the early 20<sup>th</sup> century, when a small

works was established on the site. Refining started in 1924, (<http://www.energyinst.org.uk/education/refineries/stanlow.htm> when a small bitumen plant was built, and the operation has grown into a major refinery covering over 860 ha. Oil is brought into the oil terminal at Tranmere and transferred by pipeline to Stanlow, where it is refined. It is then piped to Eastham for storage. Half of the refined oil is distributed by road, and 30% by pipeline, but the remainder is taken out on the Manchester Ship Canal (<http://www.shell.co.uk>).

The world's first full scale nuclear power station to be connected to a national electricity grid was opened at Calder Hall, Cumbria by the Queen in 1956 (W.S. Atkins 2007). At the time, the Lord Privy Seal, Richard Butler, described the event as "epoch-making" ([www.news.bbc.co.uk](http://www.news.bbc.co.uk)). The site is of national and international significance as the world's first Magnox reactor. It was commissioned by the British Government as part of the country's political and defence following World War II, and helped maintain Britain's security during the Cold War (W.S. Atkins 2007, 11). The power station went out of use in 2003, but survives intact within the larger nuclear reprocessing facilities at Sellafield. Heysham power station has two plants, known as Heysham 1 and Heysham 2. Heysham 1 has two reactors, built between 1970 and 1984, and is estimated to be decommissioned in 2014. Heysham 2 was built between 1979 and 1988 and is expected to be decommissioned in 2023.

Renewable energy is of considerable importance in England's Irish Sea region with several large offshore windfarms already in operation or under construction. Barrow Windfarm opened in 2006 and is in full operation (<http://www.bowind.co.uk>) with 30 turbines, as is the more recent Walney I windfarm with 51 turbines (<http://www.4coffshore.com/offshorewind/>). Ormonde, with 30 turbines, is under construction (<http://www.bwea.com/ukwed/offshore.asp>), and approval has been granted for 51 turbines at Walney II and 160 turbines at West of Duddon Sands windfarm. The two Walney windfarms and West of Duddon Sands site are contiguous, and there are plans to extend the area eastwards with a possible further 750 turbines (<http://www.4coffshore.com/offshorewind/>). Onshore, most coastal windfarm development has taken place on brownfield sites, such as the Workington and Siddick Windfarms built on former industrial sites north of the town, and the Kirksanton Windfarm built on an airfield site, both in Cumbria, as well as on the Seaforth Dock in Liverpool.

### **Values And Perceptions**

The use of nuclear power has always been controversial, not least because of the problems of storing radioactive waste for indefinite periods. The potential for severe radioactive contamination by accident or sabotage, and the possibility that its use could indirectly lead to a proliferation of nuclear weapons are also issues for some communities. Conversely, many in the local community value the nuclear industry for the jobs it provides, particularly in West Cumbria where Sellafield is the main employer, and they look forward to the construction of another nuclear power station as a provider of employment.

Renewable sources of energy may be perceived as benign symbols of hope. However, renewable energy complexes are often highly visible features impinging on familiar and highly valued landscape and may add to levels of noise, smell and activity. These aspects generate strong and sometimes polarised views. The windfarms off the Wirral and Cumbria coasts are highly visible from land, and in particular the very large developments off Cumbria will engender strong feelings.

## **Research, Amenity And Education**

Existing research on the development of this Character Type and its typical components is fairly limited. Decommissioning of plants may provide opportunities to undertake research, enabling further understanding of its current impact on the landscape/seascape and the discovery of previous historic Character Types which may still be well-preserved beneath some of these complexes. Considerable numbers of these industrial areas are founded on reclaimed land, often drained saltmarsh and mudflats, infilled from the late 19<sup>th</sup> century onwards. These buried deposits may have considerable potential for preserving palaeoenvironmental material and artefacts and features associated with estuarine environments, although there are likely to be serious issues of contamination. This provides crucial baseline information to enable the understanding of past expressions of this Character Type and its uses contextualised within current impacts.

Public amenity may be limited for health and safety reasons but other possibilities could be explored such as virtual and interactive displays. The former nuclear power station at Sellafield, Cumbria, has a business centre for meetings, exhibitions and conferences, but its visitor centre has now closed (<http://www.sellafieldsites.com/sellafield-centre>).

General policy trends show an expansion of renewable energy with an encouragement of wind power, especially in offshore locations where more consistent strong wind speeds are available. Within this context, some recognition of the historic environment in planning future wind farms is expressed, for example, by the Collaborative Offshore Wind Research Into the Environment (COWRIE), a company set up by The Crown Estate to raise awareness and understanding of the potential environmental impacts of the UK offshore wind farm programme. COWRIE recently published a guidance note for best practice in survey, appraisal and monitoring of the historic environment during the development of offshore renewable energy projects in the UK (Oxford Archaeology and George Lambrick Archaeology and Heritage 2008; Wessex Archaeology 2007). Historic Seascape Characterisation (HSC) can complement that future planning with information on the typical historic seascape character of areas under consideration for renewable energy developments, adding area-based context to the more traditional point-based records of the historic environment. In particular, HSC has relevance to inputs on the 'landscape' environmental theme for EIA Environmental Statements, supplementing those for the 'cultural heritage' theme which is the main focus of the COWRIE Guidance.

## **Condition And Forces For Change**

The need for alternatives forms of energy production has grown rapidly and, as a result, has produced significant changes in the region. In particular, there have been considerable developments in the construction of large offshore windfarms, with the potential for more and larger sites to be developed in the near future. The character of large areas of this sector of the Irish Sea is likely to be one of energy generation. The west coast of Cumbria has been branded as Britain's Energy Coast (<http://www.britainsenergycoast.com/>), which forms part of a master plan for regeneration projects based around onshore and offshore windfarms, the Sellafield nuclear plant and the potential for a new generation of nuclear power stations and tidal energy generation. As one consequence, there could be a major impact on potential submarine archaeological deposits, including shipwrecks and palaeolandscapes. Windfarms, such as Burbo Bank, tend to be located in shallower waters, and these are the areas with the good potential for surviving wrecks.

The vast tidal reach of waters in Morecambe Bay open up the possibility of harnessing tidal power. However, technological understanding of tidal energy is currently at an early stage.

## Rarity And Vulnerability

The former nuclear power station at Calder Hall has an international relevance as the world's first nuclear power station to have been connected to a national electric grid. Its buildings survive intact within the wider Sellafield complex. The Irish Sea is becoming a focus for offshore and coastal wind generation, and is likely to see the construction of at least one new nuclear power station. The former industrial area of the west coast of Cumbria is aiming to become a national leader in energy production, through nuclear and renewable energy installations, including the development of tidal energy (<http://www.britainsenergycoast.com/>).

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