



Arklow Bank Wind Park

25 MW Offshore Wind Power Facility

• Project Overview

GE Wind Energy is currently building a 25 MW wind power project approximately 10 km off the coast of Arklow on the Arklow Bank. The 25 MW project, being developed by Airtricity and GE Wind Energy, will be constructed, owned and operated by GE Wind Energy as a demonstration of its new 3.6s MW offshore wind technology. When completed later this year, the offshore wind park will include 7 GE 3.6-megawatt turbines. The 25 MW Arklow Wind Park will be the first offshore application of this technology, the first offshore wind project with wind turbines above 3-megawatt rated capacity, and Ireland's first offshore wind power project. The project is annually expected to generate enough clean, renewable electricity to serve approximately 16,000 Irish households.

The 25 MW Arklow Bank Offshore Wind Park was first introduced by Airtricity as Phase I of a much larger offshore project which Airtricity proposes to build over the coming years. Airtricity's offshore wind park proposals have been made possible under a Foreshore Lease which can provide for more than 520 MW of offshore wind power on the Arklow Bank. The lease was secured by Airtricity in February 2002 following completion of extensive environmental and geotechnical studies. Initially, GE Wind Energy will operate the facility as a demonstration site. Under the terms of the agreement, Airtricity will hold an option to purchase the project after certification, testing and demonstration is complete, approximately two years after first operation.

• Project Details

Project Capacity: 25 megawatts

Wind Turbines: 7 GE Wind Energy 3.6s offshore

Project Location: 10 km off the coast of Arklow on the Arklow Bank.

Grid Connection: The project will connect to ESB Networks via a connection in the Arklow National Grid Substation. Submarine cables will connect the wind park to shore. From shore, connection will occur via underground cables. There will be no overhead lines.

Assembly & Work Locations: Pre-assembly of some equipment will take place at Rosslare port. Rosslare was selected due to its ability to accommodate large ship size as well as draft and space required for large cranes to be used for off-loading & reloading activities. Once offshore construction is completed, it is anticipated that Arklow port will be utilized as the main point of activity for boats, personnel, storage of smaller equipment and operations and maintenance dispatch.

• Project Developers: Airtricity and GE Wind Energy

Airtricity: Airtricity is a world leading, fully integrated renewable energy company focused in three main areas: Wind farm development, finance and ownership of wind farms, and green electricity supply. The company was established in 1999 when it purchased the business of Future Wind Partnership, an independent renewable energy company established in 1997 to develop wind energy in Ireland and abroad. Airtricity is currently developing wind farms in the Republic of Ireland, Northern Ireland and Scotland. As an integrated utility, the company is both a generator and supplier of electricity. For more information about Airtricity, visit their website at www.airtricity.com.

GE Wind Energy (GEWE): GE Wind Energy, a unit of GE Power Systems, is one of the world's leading wind power companies. The company designs and manufactures wind turbines with rated outputs ranging from 900 to 3,600 kW, and offers support services ranging from project development support to operation and maintenance. Worldwide, the company has developed and/or sold over 5,900 wind turbines with a rated capacity exceeding 3,600 megawatts. GE Wind Energy employs approximately 1,700 people worldwide, with design/manufacturing/assembly facilities located in Germany, Spain, the USA and the Netherlands. For more information about GE Wind Energy, visit their website at www.gewindenergy.com.

• Wind Turbine Supplier, Project Installer and Owner, and Operations & Maintenance Provider:

GE Wind Energy will supply wind turbines, build, own and operate the 25 MW Arklow project as a demonstration of its 3.6 MW technology.

• Technology

Manufacturer: GE Wind Energy

Wind Turbine Type: GE Wind Energy 3.6s offshore. GE Wind Energy's 3.6 MW wind turbine is the first commercially-available wind turbine over 3 MW specially designed for offshore use. The first commercial prototype 3.6-megawatt wind turbine was unveiled by GE during 2002. Installed on land in May/June of 2002 as a test bed and began producing power for Spanish energy supplier Iberdrola in September 2002. For more information on the 3.6 MW wind turbine, visit the GE Wind Energy website at www.gewindenergy.com

Rated output: 3.6 MW

Turbine Height (at highest point): 124 meters (406 feet) to blade tip – taller than a 30 story building

Turbine Hub Height: 73.5 meters (241 feet)

Turbine Weight: 290 tons (complete unit)

Foundation: The turbines are supported by a steel monopile foundation which is driven into the seabed by a hydraulic hammer. This equipment and process is also widely utilized for other similar applications, including installation of monopiles for bridges. The monopile and associated transition piece provide cable access to the tower from the seabed as well as boat access to the actual tower and associated equipment.

Footprint: Each wind turbine utilizes a footprint 5 meters (16 feet) in diameter; the footprints will be spaced 600 meters (1,970 feet) apart.

Tower: Tubular steel

Height: 70.5 meters (231 feet)

Weight: Approximately 160 tons

Diameter: 5 meters (16 feet) at the bottom; 3 meters (10 feet) at the top

• Technology (continued)

Blades:

Length: 50.5 meters (165 feet)

Rotor Diameter: 104 meters (341 feet) – longer than the wingspan of two jumbo jets; a Boeing 747-400 has a wingspan of 64 meters (210 feet)

Revolutions per minute: 8 to 15 (one revolution every 7.5 - 4 seconds)

Swept Area: 8,495 square meters per turbine (91,439 square feet), or 4 times the sail area of a clipper ship. For example: the clipper ship Cutty Sark has 1,970 square meters (21,060 square feet) of sail area (see www.cuttysark.org.uk).

Project Milestones:

- Jul 2000 - Environmental monitoring program commenced
- Dec 2000 - Wind monitoring mast was installed on the Bank
- Jun 2001 - Environmental Impact Statement completed
- Jan 2002 - Foreshore Lease Awarded
- Jun 2003 - Contract signed with GE for 25MW

Construction Activities:

Installation of onshore cable
(underground from Arklow Harbor to the ESB sub station on the Dublin Road)
Construction of electrical switch house at Arklow Harbor
Delivery of wind turbine components
Assembly of components
Installation of foundations
Installation of undersea turbine interconnecting cables
Installation of undersea cable to shore
Erection of turbine towers
Erection of nacelles & rotor blades
Testing & commissioning
Commencement of operation by GE Wind Energy

• Project Benefits

Increased energy independence: Incorporating wind electricity into Ireland's energy mix increases the country's fuel diversity, reducing dependence on foreign fuel imports and their fluctuating costs. It also enhances the country's energy security by allowing production of electricity through Ireland's clean, green and abundant natural energy source...the wind.

Stable energy costs: The project's fuel, the wind, is free. Therefore, project costs can be estimated and will not fluctuate or escalate over the project's life due to increases in fuel cost.

Increased local tourism: Over the past decade, wind project site areas have enjoyed increased local tourism due to growing worldwide interest in wind energy. The Arklow project could also spur tourism opportunities, including boat excursions to view the wind turbines, and other eco-tourism activities.

Households Served: The 25 MW Arklow Bank Wind Park will annually provide enough clean, renewable electricity to serve about 16,000 average Irish households* – the equivalent of approximately 45% of the households in County Wicklow.

• Wind Energy

Wind energy was the world's fastest growing energy source over the last decade, with an annual average growth rate of 35.7% over the past five years alone. In Ireland, wind power installations currently contribute only 175 megawatts, out of which 138 megawatts are installed in the Republic of Ireland. Globally, installed wind capacity increased to 32,000 megawatts during 2002. Today, Denmark and many regions of Germany and Spain now have between 10 and 25 percent of their electricity needs being served by wind energy. Forecasts for wind power continue to be favorable with more than 83,000 cumulative megawatts predicted worldwide by 2007.

*Figures provided by Airtricity

