BEATRICE
DEMONSTRATOR PROJECT
TESTING THE POWER OF DEEPWATER WIND FARMS

Weighing 750 tonnes each, with rotor blades more than 61 meters (200 feet) long, two recently installed five megawatt (5MW) wind turbines off the coast of Scotland are central to a project to test the technical and economic feasibility of deepwater wind farms.

The turbines, manufactured by German company REpower Systems, are part of the $72 million Canadian Dollar (€50 million) Beatrice Demonstrator Project, in turn part of Europe's largest research and development programme in the field of renewable energies.

The Market

Installing offshore wind farms is nothing new. However, it is only recently that developments in technology have enabled deepwater farms to offer the realistic prospect of making wind energy competitive against established power generation technologies. With governments across the world setting ambitious targets for renewable energy, we can expect to see more wind farm installations.

Denmark is leading the world in installed offshore locations, with other countries such as the UK, installing more offshore farms.

Beatrice Demonstrator

The two new turbines in the North Sea, which can generate enough electricity for up to 10,000 households, are being used to power the Beatrice oil platform, operated by Talisman about 25km (15 miles) off the Scottish coast. If the project proves successful, around 200 turbines could eventually be installed with enough capacity to produce approximately 20 percent of Scotland's total electrical power needs.

Placing wind turbines in an offshore corrosive environment places severe demands on the exterior of the structure. To provide a durable solution against this, an anti-corrosive system from International Protective Coatings was chosen. The North Sea is one of the most corrosive environments in the world and a proven background and experience in coating both offshore structures and wind turbines was a key factor in the decision.

Protecting By Experience
International Protective Coatings work to the highest standards, formulating products to conform to ISO 20340 and NORSOK protocols and working with global oil and gas customers to ensure long term protection of their assets in some of the world's harshest offshore environments.

Around 3,000 litres (790 gallons) of coatings were supplied for REpower's two 5MW turbines, (the average turbine needs 1,000 litres) and applied in accordance with ISO standards. The specification included zinc rich epoxy primer Interzinc®, intermediate coat Intergard® and an Interfine® finish. As well as coating the towers, coatings were also used on the nacelles and jacket. Piles were driven into the seabed to support each 85 metre (280 feet) structure.

A total of 6,000 litres (1,600 gallons) was supplied to the jackets, designed by OWEC Towers AS in Norway. Amec in Aberdeen specified standard offshore specifications for the jackets, Interzone® glass flake epoxy was chosen for the submerged zone and Intertherm® 50 was chosen for the sealer on TSA metal spray in the splash and atmospheric zone. Both coatings were selected by Burntisland Fabrications, based in Fife, Scotland.

With the knowledge and technical expertise to specify the best coating systems to protect both offshore and coastal wind farms and onshore locations, International Protective Coatings ensures wind farm projects like this can:

- avoid premature coating breakdown;
- benefit from the sustainable design credentials;
- achieve lower lifetime costs
- utilise proven protective coatings technology
- benefit from NACE qualified technical representatives to support the project

Europe has set the target of having 8% of all its energy supplied from wind power by 2010 and 12% by 2020, with the US and Asia also setting ambitious targets. Forming part of these targets, the offshore element is set to play a bigger role in the overall market: by 2020 it is expected that 50% of wind power will come from offshore farms.

Fabrication Locations
A coating supplier with global standards and local expertise.

As the market grows, the fabrication of turbines is increasing across the world, particularly in fast growing economies such as India and China. It is vital to ensure the best coating protection for your asset by using a truly global supplier.

International Protective Coatings operates 19 wholly owned manufacturing sites around the world, including facilities in India, China and Korea, offering a seamless global service to reduce the complexity of coatings specification:

- standardised procedures;
- standardised quality control; and
- a range of global products manufactured to the same standards worldwide.

Remember, not all 'global' coatings suppliers are truly global. Some operate through licensees and joint venture arrangements, potentially delivering products that could have varying compositions marketed under a single global brand.

Static Fabrication Capacity
Solutions to increase shop productivity

As the global demand for wind turbine installations increases, fabrication capacity is under pressure. Increased demand, combined with little or no increase in fabrication capacity, inevitably results in a backlog of orders.

International Protective Coatings is able to help by providing a choice of coatings and systems for fabrication facilities to:

- reduce application time and minimise costs - such as man hours, scaffolding and equipment hire;
- increase productivity and throughput with reduced handling times; and
- ensure HSE compliance, with reduced Volatile Organic Content (VOCs) against traditional alkyd, epoxy and polyurethane primer finishes.

Photos courtesy of: REpower Systems