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Programme Area: Offshore Wind

Project: Helm Wind

Title: Final Feasibility Study


## Abstract:

Offshore Wind has huge potential to reduce carbon emissions and create economic prosperity, as well as increasing energy security of supply. For this potential to be unlocked, significant challenges that need to be overcome: a) Electricity costs need to be competitive with current (2010) onshore wind costs by 2020 and with conventional generation by 2050, b) Increased yields: annual offshore farm availability to be increased to 97%-98% or better, c) Reduce technical uncertainties to allow farms to be financed in a manner, and at costs, equivalent to onshore wind today. Helm Wind was one of three ETI Offshore Wind projects looking at new turbine design concepts, which were commissioned in support of the aims outlined above. The other two were NOVA and Deep Water. The focus of all projects was on enabling technologies that would have a significant impact on offshore wind cost of energy from 2020 onwards.


## Context:

The Helm Wind project carried out an unconstrained investigation into the concepts and technologies required to deliver significant cost of energy reductions for offshore wind. This included rotor diameter, geometry and speed,number of blades, upwind and downwind orientations, drivetrain options and support structures. Led by E.ON, the consortium also included BP, Rolls-Royce and the University of Strathclyde.

**ETI Programme:** Offshore Wind
**Project Name:** Helm Wind
**Deliverable Reference:** Final Feasibility Study
**Consortium:** Led by E.ON Engineering

## Context

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- Electricity costs need to be competitive with current (2010) onshore wind costs by 2020 and with conventional generation by 2050
- Increased yields: annual offshore farm availability to be increased to 97%-98% or better,
- Reduce technical uncertainties to allow farms to be financed in a manner, and at costs, equivalent to onshore wind today.

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## Project

The Helm Wind project carried out a “fresh and unconstrained” investigation into the concepts and technologies required to deliver significant cost of energy reductions for offshore wind. This included rotor diameter, rotor geometry, rotor speed, number of blades, upwind and downwind orientations, drivetrain options support structures and intra field electrical systems. They have also investigated the impact of using a twin rotor on a single structure.

Led by E.ON Engineering, the consortium also included the following participants: BP Alternative Energy, Rolls-Royce and the University of Strathclyde.

## Key Project Findings

This project has provided the ETI with valuable information: this has helped shape the next stage of the ETI Offshore Wind programme.

The consortium indentified that sufficient improvements could be made through technology innovation to deliver energy costs that are comparable with current (2010) onshore wind costs: one of ETI’s objectives for this programme. This involves innovation in rotor aerodynamics, rotor diameter, drive train technologies and electrical systems. The consortium also indentified that the optimum turbine size for offshore is significantly larger than the current ‘state of the art’.

## Further Information

Full information on the results of the project is available to ETI Members in the confidential technical report.