Challenging Offshore Wind

Make better use of wind power offshore

The intermittent nature of windfarms requires specialised systems for high power quality and maximum grid stability. Alstom Grid offers efficient and reliable solutions.
Barrow - UK

Client & Operator:
Barrow Offshore Wind Ltd.
(Centrica & DONG Energy)

Completion date: September 2006

Project scope:
90 MW offshore wind farm
with 30 wind turbine generators
(Vestas V90/3.0 MW)

Our scope of supply

Electrical connection modelling and system studies

Onshore substation at Heysham to connect to the grid

Onshore cable system
- 2.8 km of single circuit, 3 cable, 132 kV system

Module supply and installation onto deck
- 132 kV & 33 kV GIS switchgear including protection
- Power transformer
- Relay and control panel suite room
- LVAC and DC plant room, refuge, mess and workshop modules
- Capacitor bank modules (2x MVar)

Electrical system commissioning

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Robin Rigg - UK

Client & Operator:
E.ON UK Solway Offshore Ltd. and E.ON UK Offshore Resources Ltd.

Completion date: spring 2009

Project scope:
180 MW offshore wind farm total
with 60 wind turbine generators
(Vestas V90/3.0 MW)

Our scope of supply

2 separate platforms - Robin Rigg East and Robin Rigg West

Connected in 4 groups at 33 kV to offshore 132/33 kV substation

Onshore 132 kV substation
- Connection to United Utilities Network
- 132 kV substation equipment
- 33 kV reactive compensation equipment and control

Offshore module supply
Fit out of modules with all substation and platform equipment

Offshore modules and equipment fitted onto platform at Barrow docks

Electrical system commissioning

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alpha ventus - Germany

Client & Operator:
DOTI GmbH (E.ON Climate & Renewables, Vattenfall Europe
New Energy GmbH, EWE AG)

Completion date: September 2008

Project scope:
60 MW offshore wind farm
with 12 wind turbine generators
(6x AREVA Multibrid M5000 & 6x REpower 5M)

Our scope of supply

Turnkey delivery of substation and platform equipment including
- 110/30 kV power transformer
- Substation protection & control, PACIS solution
- 110 kV & 30 kV GIS switchgear
- Cabling on platform
- AC/DC equipment
- Diesel generators
- Marine equipment
- Fire protection
- Commissioning
Our scope of supply

Onshore 132 kV GIS substation.
Turnkey delivery including:
- Civil works of two bays to receive the
  transmission cables from the offshore
  substation plus connection towards EDFE
  system at Norwich
- 2 offshore 132/33 kV GIS substations
- Design and fabrication of an integrated
topside including load out
- 132 kV power transformer (4x 90 MVar)

System design
- System studies
- Liaison with WTG and cable suppliers
- Liaison with National Grid and EDFE
- Provision of data for National Grid,
  including compliance statements

Commissioning

Borkum West II -
Germany

Client:
TWB TRIANEL Windkraftwerk
Borkum GmbH & Co. KG

Forecasted completion date:
December 2011 onshore,
June 2012 offshore

Project scope:
400 MW offshore wind farm
with 80 wind turbine generators
(AREVA Multibrid M5000)

Our scope of supply

170/33 kV substation on platform
Turnkey delivery of platform topside
including:
- Power transformers (2x 225 MVA)
- Substation protection & control, PACIS
  solution
- 170 kV & 33 kV GIS switchgear
- Cabling on platform
- AC/DC equipment
- Diesel generators
- Marine equipment, fire protection
- Commissioning
- Steel structure including foundation

Ormonde - UK

Client & Operator:
Ormonde Energy Ltd. (wholly owned
by Vattenfall Wind)

Forecasted completion date: 2010

Project scope:
150 MW offshore wind farm
with 30 wind turbine generators
(REpower 5M)

Our scope of supply

System level
- Overall system electrical design
- Electrical system SCADA
- Telephony system
- Substation commissioning

Offshore substation
- Design, supply, and install into modules of
  4 bays 132 kV GIS including local control,
  8 bays 33 kV GIS switchgear including
  protection, transmission connection pro-
tection and auxiliaries (LVAC, batteries)
- Assembly onto the deck of equipment
  modules, 33/132 kV transformers
  (2x 85 MVA), lighting, signage, lightning
  protection, earthing, cabling, sea
  measurement

Onshore substation
- Turnkey construction of: 132 kV AIS bay
- Dynamic reactive compensation system
2009 - Veja Mate - Germany

Client & Operator: BARD Engineering GmbH

Forecasted completion date: August 2011

Project scope: 400 MW offshore wind farm with 80 wind turbine generators (BARD 5.0)

Our scope of supply

Turnkey delivery of substation and platform equipment including:
- 155/33 kV power transformer (2 x 240 MVA)
- 170 kV & 33 kV GIS switchgear
- Substation protection & control, PACIS solution
- Cabling on platform
- AC/DC equipment
- Diesel generators
- Fire detection and protection system
- Erection & commissioning (onshore and offshore)

2009 - Global Tech 1 - Germany

Client: Wetfeet Offshore Windenergy GmbH

Forecasted completion date: End 2011

Project scope: 400 MW offshore wind farm with 80 wind turbine generators (AREVA Multibrid M5000)

Turnkey delivery of a 155/33 kV offshore substation on platform (AOP)

Our scope of supply (in liaison with partner)

Self-floating and self-installing substation platform

155/33 kV power transformer (4 x 120 MVA)

170 kV & 33 kV GIS switchgear

Substation protection & control, PACIS solution

Cabling on platform

AC/DC equipment

Diesel generators

Erection & commissioning of substation (onshore and offshore)

Manufacturing and fit-out of the hull including substructure

Self-contained with large working deck

Helicopter landing deck

Boat landing

Permanent accommodation facilities for 32 persons and 5 day guests

Onshore erection and offshore installation

Main features of AOP

Minimised risk of installation

High configuration flexibility

Meets highest safety requirements