

# The largest offshore wind farm in Sweden

## Cable solution for Lillgrund offshore wind farm



- Cost-effective solution on a turnkey basis
- Minimal impact on eco-sensitive areas
- Rapid delivery in accordance with challenging schedule

### Scope of supply

- Project management
- Cable system design
- Type testing
- XLPE cables and accessories
- Civil works
- Onshore and offshore laying and installation
- Testing and commissioning

### Cable data

Voltage	145 kV and 36 kV AC
Power	110 MW
Length	27 km submarine XLPE cable (Cu) 6 km underground XLPE cable (Al)
Customer	Siemens Wind Power, Denmark for Vattenfall, Sweden



The 48 wind turbines are connected to an offshore substation by 20 kilometers of three-core 36 kV XLPE submarine cable with integrated optical fiber for control and communication. A three-core 145 kV XLPE submarine cable with integrated optical fiber connects the offshore substation to the mainland (a distance of seven kilometers), and three single-core 145 kV XLPE underground cables deliver the power to an onshore substation two kilometers inland.

#### Environmentally sensitive location

Lillgrund is located seven kilometers off the Swedish coast in the Oresund strait, which connects the Baltic Sea with the North Sea and separates Denmark from Sweden. It is one of northern Europe's prime wind power locations, with average wind speeds of 8-10 meters per second and comparatively shallow sea depths of between 4 and 10 meters.

It is also an environmentally sensitive area, home to a rich diversity of marine flora and fauna and an important migration route for many species of fish. ABB's award-winning track record in executing cable projects in eco-sensitive locations and with minimal impact on the environment was an important factor behind the customer's selection of ABB.

#### Rapid delivery and winter installation

ABB successfully completed the project in line with a demanding manufacturing and installation schedule. Cable laying and other offshore operations were performed by ABB in the winter months of November and December when severe winds, storm surges and large variations in water levels were a constant test of ABB's cable installation skills.

Lillgrund began delivering power to the Swedish grid on schedule in November 2007.

*ABB supplied HVDC cables and converter stations to link the world's most remote offshore wind farm – the 400 MW BorWin1 in the North Sea – to the German power grid.*

#### Customer benefits

- Complete turnkey solution from one supplier
- All cables manufactured by ABB
- Supplier expertise and reliability – ABB is a market and technology leader in submarine and underground high voltage cables
- Rapid delivery

For more information please contact:

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Owned by Vattenfall, one of the largest producers of electricity in Europe, Lillgrund is by far the largest offshore wind park in Sweden. Its 48 2.3 megawatt turbines generate up to 330 gigawatt-hours of electricity a year, enough to power 60,000 Swedish homes.

Vattenfall is the largest wind power operator in the Nordic countries and one of the largest in Europe, producing about 2.2 Twh (2010) of electricity from some 700 wind turbines in Denmark, Sweden, Belgium, Germany, Finland, Poland and the United Kingdom. Lillgrund enables Vattenfall to increase its share of the Nordic wind power market, reduce its CO<sub>2</sub> footprint and support its 3C (Combat Climate Change) global initiative.

#### Why ABB?

ABB was selected by Siemens Wind Power on the strength of its long and unrivalled track record as the leading supplier of high voltage cable products and systems, and for its ability to supply the most cost-effective solution on a complete turnkey basis.

*ABB is the world's leading supplier of power equipment and services to the wind power industry.*

ABB and Vattenfall have a long and successful collaboration that extends over many decades and includes such ground-breaking joint-projects as the world's first HVDC link and the world's first transmission of power at extra high voltage over long distance.

#### Scope of supply

ABB supplied a complete cable solution including cable system design, 145 kV and 36 kV cables, cable accessories, submarine and underground cable laying, civil works, installation, testing and commissioning.

*ABB delivered the world's first XLPE submarine cable in 1973.*