Underground Cable Link

# Horns Rev, Denmark – one of the largest windmill farms in the world

| **Cable data** | |
|---|---|
| Voltage | 170 kV |
| Power | 160 MVA |
| Length | 106 000 m |
| Conductor | 1200 $mm^2$ Al |
| Insulation | XLPE |
| Weight | 9 kg/m |
| Customer | ELTRA |
| Year | 2001 - 2002 |

**Project content**

XLPE cables, joints and terminations
Cross-bonding equipment
Optical fibres
Cable system design
Installation and testing

The wind power farm at Horns Rev with its 160 MW is one of the largest in the world. The 80 wind power plants, each of 2 MW, are to be ready to deliver current to the grid some time during the second half of 2002. It is the first of five offshore wind power farms that the Danish government has decided to build.

Eltra is the company responsible for planning, construction and operating the high voltage grid on Jutland and Fyn. They commissioned ABB to supply the land cable that will link the offshore wind power farm with the electricity supply network on the mainland.

## Demonstration installation

The installation at Horns Rev is a demonstration installation, which is to clear the way for a complete series of private financed wind power farms. It is the intention of the government that the offshore wind power plants are to have a combined output of approximately 4000 MW before year 2030, which is virtually treble the wind power output in the whole of Denmark.

Alternating current is transported from the wind power plants to a transformer platform where it is transformed from 33 kV to 150 kV. From here a sea cable runs to the Hvidbjerg Strand to the south of Blåvand. At the station at Hvidbjerg Strand the sea cable is connected with the land cable, which continues on over the final 34 kilometres to the Karlsgårde sub-station station. Where it is connected to the Jutland-Fyn transmission grid.

## Cable installation

The cables, which have a diameter of 9 cm and weigh 9 kg/m, are plastic insulated (XLPE) and fitted with a screen of copper wire. This cable screen is crossed between the three cables in several places along the cable section to reduce transmission losses. This special method is known as crossbonding. Placing the cables close together in a triangular formation in the cable trench minimises the magnetic field. When the installation is complete and everything has been restored, small red indication piles will be the only thing that discloses the position of the cable.

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