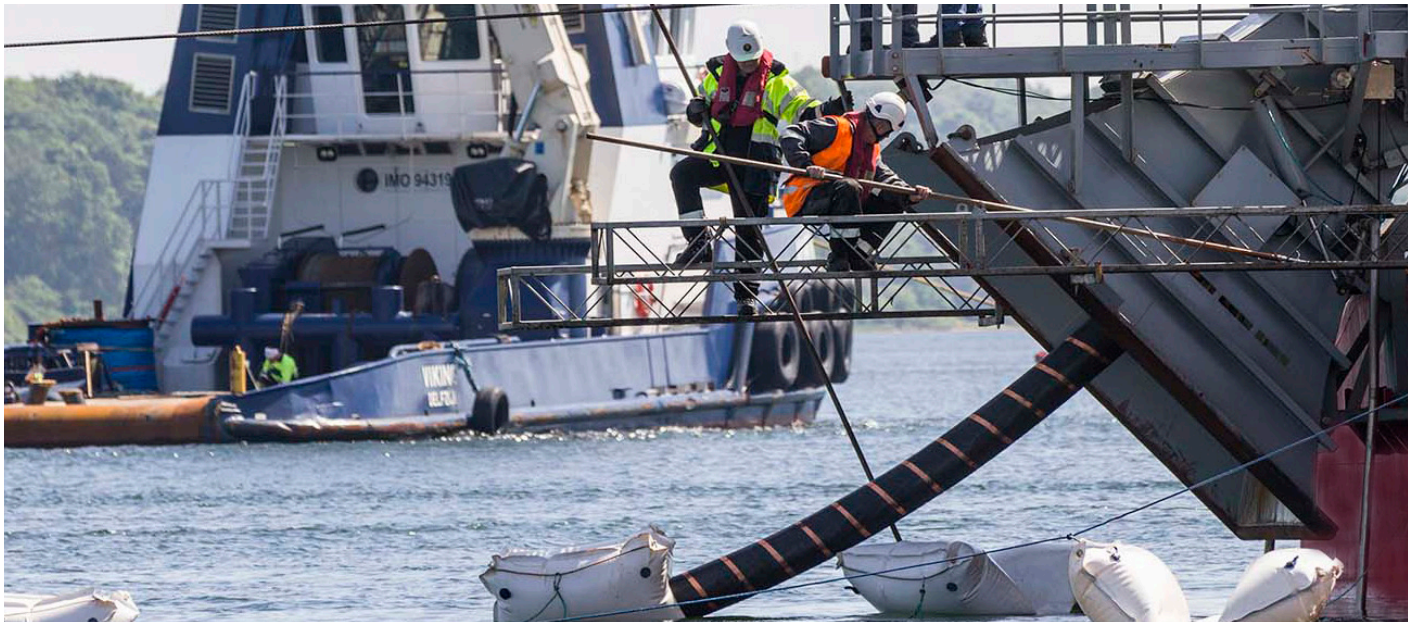
Little Belt factsheet

World's most powerful three-core submarine cable
Little Belt Visual Enhancement Scheme, Denmark



- 420 kV cable system displaces overhead towers from environmentally sensitive area
- Three-core submarine cable system significantly reduces project costs
- World-first solution sets new power rating record

Scope of supply

– Turnkey high voltage AC cable system
– Cable system design and engineering
– Type testing and fabrication of cables and cable accessories
– Submarine cable laying and installation

Cable Data

Voltage	420 kV AC
Capacity:	1,100 MW
Cables:	6 x 4.5 km single-core underground cables 6 x 1 km single-core underground cables 2 x 7.5 km three-core submarine cables
Diameter	285 mm
Weight	107 kg/m
Customer	Energinet.dk
Completion	2013

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Customer need

Energinet.dk is the Danish national transmission system operator for electricity and natural gas. It owns and operates the 400 kV, 150 kV and 132 kV electricity transmission systems and is the co-owner of the country's electrical interconnections with Norway, Sweden and Germany.

Energinet.dk is currently implementing a long-term program for the undergrounding of Denmark's 150 kV and 132 kV transmission systems. Around 3,200 km of overhead transmission lines are being replaced with 2,900 km of underground cables. Several sections of the 400 kV transmission grid have also been identified for undergrounding projects.

One of these is a visual enhancement scheme for the transmission corridor that crosses the Little Belt straight and is now designated an environmentally sensitive area. Little Belt is a channel that connects the North and Baltic seas and separates the island of Funen from the Jutland Peninsula. The scheme enables 82 overhead transmission towers on either side of the straight to be decommissioned and replaced by an underground and submarine cable system that has zero visual impact.

The ABB solution

Energinet.dk selected ABB for proposing an innovative solution that significantly reduces Energinet.dk's project costs. Whereas other cable suppliers proposed single-core submarine cables, ABB was the only company able to deliver three-core submarine cables at such a high power rating (420 kV). A single-core solution requires six submarine cables, each of which has to be laid at a depth of 1-2 meters and 10 meters apart along a distance of 7.5 km. The ABB three-core solution requires just two cables, thereby reducing the cost and footprint of the submarine cable laying process.

The ABB solution sets a new power rating record for three-core AC submarine cables, up from the previous record of 245 kV. It has a power rating of 420 kV and the capacity to transport 1,100 MW of electric power. The cable system replaces two overhead trans¬mission lines and a total of 82 transmission towers on Funen and the Jutland Peninsula.
ABB's scope of supply includes design and engineering, type testing and manufacture of the cables and cable accessories, and cable laying and installation of the accessories. The project is scheduled for completion in late 2013.

Similar ABB solutions

Energinet.dk and ABB have a long and close relationship based on the successful completion of numerous transmission projects in Denmark, including all three HVDC (high voltage direct current) interconnections that link Denmark with neighbors Germany, Norway and Sweden. In 2010 ABB delivered on behalf of Energinet.dk the Great Belt (Storebaelt) submarine and underground HVDC cable system that links Denmark's eastern and western power grids. The solution creates Denmark's first nationwide power network, stabilizes power supply in both grids, and improves the performance and competitiveness of the Danish and Nordic energy markets.

ABB has supplied several other three-core submarine cable systems in this part of Europe. They include cable connections that transfer the power generated by large offshore wind farms in the North Sea to mainland transmission grids - the 325 MW Thornton Bank offshore wind farm and the 120 MW Q7 Princess Amalia Wind Farm – and a solution that increases the capacity of the existing transmission corridor between the Danish islands of Lolland and Zealand.

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