CASE STUDY

Borealis and Hellenic Cables

Working together to ensure success of major offshore wind farm projects like the Dogger Bank

In partnership with

HELLENIC CABLES
Member of CENERGY HOLDINGS

BOREALIS

Borouge

Borealis and Hellenic Cables work together to ensure success of major offshore wind farm projects like the Dogger Bank

New cabling technologies and capacities are needed to reduce the levelised cost of electricity (LCOE) of wind energy. Recent collaboration between Borealis and Hellenic Cables shows that when partners leverage their respective strengths, large-scale offshore wind projects such as the Dogger Bank can be implemented in such a way as to lower the cost per gigawatt (GW), and reduce the overall environmental footprint.

Offshore wind energy can be used to accelerate the energy transition in a more cost and environmentally efficient way

Wind energy is playing an increasingly important role in enabling the transition to renewable energy. The higher voltage gained by switching from the 33 kV to the 66 kV technology has several important benefits. First, twice the power can be transported via one array cable of the same size at this higher voltage level. This reduces the size of cable needed for the same power transmission, and thus the associated costs for both material and installation. Second, larger wind turbine units with higher power output can be used. Third, fewer cables are needed to enter fewer offshore substations. This also results in significant cost savings. Numerous regional and national initiatives – such as the UK's Offshore Wind Accelerator (OWA) programme led by the Carbon Trust – have backed this and other new technologies in order to encourage uptake of 66 kV cable systems.

The type of cable design used in the demanding environment of offshore floating or static wind farms can also help reduce costs and lessen environmental impact. Today's "semi-wet" and "wet" cable design types offer potential for lowering costs and environmental impact. These cable designs eliminate the lead water barrier and enable the modernisation of the cable construction process itself. They help produce lighter cables with better mechanical performance, thus also contributing to lower costs per GW.

The partnership between Borealis and Hellenic Cables on several ventures, and most notably the Dogger Bank Wind Farm project in the North Sea, shows how industry leaders can leverage their respective areas of expertise and experience to ensure the success of major offshore wind projects and thus speed the energy transition.

As a leading global provider of cable products and solutions, Hellenic Cables has in recent years carved out a special niche for itself as the world's leading supplier of inter-array cables for offshore wind farms. It operates one of the largest and most advanced submarine cable plants in the world, enabling it to produce cables in very long continuous lengths; this minimises the need for factory joints, which in turn mitigates risks during, and the costs of, cable installation.

Photo courtesy of Hellenic Cables

Cable manufacturers can rely on high-performance polymer-based solutions for 66 kV inter-array cables

Thanks in part to ongoing investment in its state-of-the-art production facilities and cutting-edge technologies, Hellenic Cables has won numerous major supplier contracts for 66 kV inter-array cables for offshore projects in recent years. These include Sofia and Seagreen (UK); Mayflower (US); and Hollandse Kust South (Netherlands), among others. As of March 2022, after winning the third "C" contract of the Dogger Bank, currently the world's largest offshore wind farm under construction, Hellenic Cables is the main inter-array cable supplier for this enormous undertaking. Having already supplied 650 km of array cables for contracts "A" and "B" of Dogger Bank, it will now deliver an additional 240 km of 66 kV, crosslinked polyethylene (XLPE) insulated inter-array cables and associated cable components.

As a reliable partner to Hellenic Cables, Borealis has supported their successful transition to 66 kV and new cable designs by offering a secure supply of quality-assured material solutions along with the first-class customer service orientation needed to ensure flawless project execution.

It all starts with Borlink™ LH4201R, a unique copolymer, Water Tree Retardant (WTR) XLPE solution used in tandem with Borealis top-quality semiconductive materials. When used together, they become the benchmark for quality and reliability as insulation systems for offshore inter-array applications. When exposed to harsh salt water conditions, the material's best-in-class water tree reduction performance results in improved reliability and safety versus additive WTR solutions. Proof of superior performance may be found in the over 5000 km of inter-array cables of varying cable designs produced using Borlink LH4201R and installed across Europe and Asia to date.

The high quality and reliability of Borlink LH4201R and Borealis semiconductive material is mirrored in the higher productivity it offers in the manufacturing process itself: up to 30% longer production windows for inter-array cables in comparison to conventional XLPE solutions, and considerably lower scrap rates. Longer production runs also mean fewer cable joints, thus limiting the overall risk of cable system failures. Moreover, the Borealis copolymer WTR XLPE insulation system may be produced using the Bornewables™, the Borealis portfolio of premium polyolefins made using renewable feedstocks derived entirely from waste and residue streams. Yet another aspect contributing to the overall lower carbon footprint of the cable system based on Borlink LH4201R is the fact that the XLPE insulation system itself is fully recyclable.

Photo courtesy of Hellenic Cables

"Borealis is a top-tier supplier who can be counted on for on-time delivery of high performance materials of guaranteed quality for our cables. It's so crucial to have a partner you can trust and rely on at every step of the way in production activities and processes. Together, we are realising our vision of truly innovative and sustainable cables and cable systems."

Panagiotis Dimou
Hellenic Cables, Offshore Chief Operating Officer

"The size and number of major infrastructure projects we are carrying out to support the uptake of renewables is constantly increasing. In order to better serve our customers in current and future endeavours, we at Borealis continue to invest in our technologies and assets in order to offer innovative and reliable material solutions. These not only help reduce the LCOE of renewables, but also ensure flawless project execution."

Bart Verheule
Borealis Global Commercial Director, Energy

Borealis and Borouge polyolefin solutions are bringing energy all around

date of issue: **May 2022**

Borealis is one of the world's leading providers of advanced and circular polyolefin solutions and a European market leader in base chemicals, fertilizers and the mechanical recycling of plastics. We leverage our polymers expertise and decades of experience to offer value adding, innovative and circular material solutions for key industries. In re-inventing for more sustainable living, we build on our commitment to safety, our people and excellence as we accelerate the transformation to a circular economy and expand our geographical footprint.

With head offices in Vienna, Austria, Borealis employs 6,900 employees and operates in over 120 countries. In 2021, Borealis generated total sales and other income of EUR 10,153 million and a net profit of EUR 1,396 million. OMV, the Austria-based international oil and gas company, owns 75% of Borealis, while the remaining 25% is owned by a holding company of the Abu-Dhabi based Mubadala. We supply services and products to customers around the globe through Borealis and two important joint ventures: Borouge (with the Abu Dhabi National Oil Company, or ADNOC, based in UAE); and Baystar™ (with TotalEnergies, based in the US).

borealisgroup.com · borealiseverminds.com

Cover photo courtesy of Hellenic Cables

Borealis AG IZD Tower
Wagramer Strasse 17–19, A-1220 Vienna, Austria
Tel +43 1 22 400 000 · Fax +43 1 22 400 333
borealisgroup.com

Borouge Pte Ltd Sales and Marketing Head Office
1 George Street 18–01, Singapore 049145
borouge.com