

Kicking off European Research Project DCDYNAMIC

Accelerating DC DYNAMIC cable technology for sustainable European electricity grid

The DCDYNAMIC consortium brings together researchers, industry leaders, and insurance advisors to advance essential cable technology for a greener power grid. This initiative aims to support the ambitious goal of transferring approximately 17% of total electricity from offshore wind by 2050.



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Manchester, 19 November 2024: Offshore wind generation is essential for achieving the European Green Deal and the EU's target of climate neutrality by 2050, with an EU-wide goal of reaching an installed capacity of 300 gigawatts (35 gigawatts installed in Europe to date). Up to a third of this capacity could come from floating technology, which unlocks wind potential in deeper waters at longer distances. To connect these installations, cables must operate reliably on the European continental shelf, such as in the North Sea, where the average depth is 95 metres and can reach up to 700 metres. While high-voltage direct current (HVDC) cable technology is mature and being deployed, the large-scale manufacturing and supply of dynamic cables required for the interconnection of offshore floating systems have not yet been developed. Current dynamic cables use alternating current (AC) and operate at array-level voltages of 33 kV and 66 kV, which do not have sufficient transmission capacity to meet

the future demands. The lack of dynamic HVDC export cables is potentially a critical bottleneck for future floating offshore wind development.

DCDYNAMIC is funded by Horizon Europe and the Swiss State Secretariat for Education, Research and Innovation (SERI), coordinated by the University of Manchester, and will receive over 6 million euros in total funding over four years starting in November 2024.

Collaborative Effort Uniting Insurance, Industry, and Research Partners to Advance Cable Technology

Dynamic HVDC export cables will be crucial for connecting large offshore wind power plants to the energy grid, but they face various technical, environmental, and financial challenges. The DCDYNAMIC project aims to address these issues by bringing together experts from academia, industry, and insurance, including teams from the University of Manchester, ETH Zurich, the University of Vienna, Universitat Politècnica de Catalunya, NKT Cable Group, Shell Research Ltd, S&B Insurance Advisors, and ARTTIC Innovation.

The team will investigate how electrical, mechanical, and thermal stresses impact cable performance through laboratory tests. They will design, build, and test a 320 kV dynamic export cable prototype. Additionally, they will create real-world testing conditions to validate the cables on a larger scale. The project will also explore recycling options and assess economic risks to make these cables more financially viable. A key goal is to enhance insurability by developing models to predict their lifespan and implementing monitoring methods to ensure reliability.

Dr. Tony Chen, the project coordinator, is confident that:

“The knowledge gained from this project could revolutionise the design and use of HVDC cables and set a new standard for this critical technology. By 2050, it could play a key role in ensuring that about 17% of Europe’s electricity comes from offshore wind, contributing to a safer, more sustainable, and more affordable energy network.”

By using the combined knowledge of its partners, DCDYNAMIC aims to create innovative cable technology that meets the growing needs of offshore wind energy, helping to build a greener and more sustainable future.

The DCDYNAMIC consortium will host its kick-off meeting in Manchester at the National Graphene Institute on November 19, 2024.

DCDYNAMIC Consortium Members*:

ARTTIC Innovation (Germany)

ETH Zürich (Switzerland)

NKT HV CABLES AB (Sweden)

SHELL RESEARCH LIMITED (United Kingdom)

SKOWRONNEK & BECHNAK GMBH (Germany)

THE UNIVERSITY OF MANCHESTER (United Kingdom)

UNIVERSITAT POLITECNICA DE CATALUNYA (Spain)

UNIVERSITAT WIEN (Austria)

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