This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 952966.

An ambitious H2020 innovation project

FIBREGY, SUSTAINABLE AND COST-EFFECTIVE TIDAL AND OFFSHORE WIND ENERGY PLATFORMS

FIBREGY is an ambitious European innovation project that will enable the deployment of Fibre Reinforced Polymers (FRP) for the next generation of offshore wind and tidal turbine platforms.

Led by the International Center for Numerical Methods in Engineering (CIMNE, Spain), the FIBREGY consortium is working on the development of novel construction procedures and design and production guidelines to enable the extensive use of FRP materials in the offshore wind and tidal turbine platforms. Furthermore, the project will develop and validate advanced numerical analysis tools for the purposes of design, operation and monitoring. The final aim is to validate the replacement of steel with FRP materials in those structures, which can provide significant advantages thanks to its immunity to corrosion and superior fatigue performance.

The different technologies developed in the project will be demonstrated through the use of advanced simulation techniques and the construction of large and real scale prototypes.

This project has received funding from the European Union's Horizon 2020 research and innovation program with a total budget of €8 million, including €6 million from European funds.

Strengthening EU leadership in renewable energies and the blue economy

According to the Organization for Economic Co-operation and Development (OECD), the value added generated by ocean based industry globally could double in size from €1.3 trillion to €2.6 trillion in 2030[1]. The European Union ambition is to become a major player on the international market and home to successful clean ocean energy companies. FIBREGY will strengthen the EU's leadership in renewable energy and the blue economy.

Due to the reduction of the maintenance and production costs, FIBREGY expects to increase the target market by 10-15% and the profit margin by 20-25% at the end of the project. Offshore wind and tidal energies play a key role in achieving the European Greenhouse Gas Emissions 2030 and 2050 targets[2].

Europe wants to increase its offshore wind capacity from 24.3 GW to 111 GW by 2030. It will set aside €26 billion for the development of novel technologies for new offshore wind farms[3]. The European target for 2050 is that offshore power generation (wind and tidal) will account for 25% of total electricity generation.

[1] https://www.oecd.org/ocean/topics/ocean-economy/
[2] https://ec.europa.eu/clima/eu-action/european-green-deal/2030-climate-target-plan_en
[3] https://windeurope.org/policy/topics/offshore-wind-energy/

Media contact: Comunicamos con Sentido
Marta Gómez Ramírez: +34 628128755/ marta@comunicamosconsentido.com
Cristina García Santamaría: +34 616762000/ cristina@comunicamosconsetido.com
Website: https://fibregy.eu/
Contact: info@fibregy.eu

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Floating Offshore Wind Energy[4]	Tidal Energy[5]
In 2020 the wind power capacity in Europe was 24.3 GW. It represented 72% of the worldwide offshore wind power capacity.	In 2020 the tidal power capacity in Europe was 27.9 MW. It represented 77% of the worldwide tidal power capacity.
By 2030, Europe will achieve the target of 111 GW of offshore wind power capacity.	By 2030, Europe will achieve the target of 2.38 GW of tidal power capacity.
Europe expects to achieve the target of 300 GW by 2050.	Europe expects to achieve the target of 100 GW by 2050.

Table 1: Installed capacity and 2030/2050 targets for offshore wind and tidal energies.

Significant cost savings and reduced environmental impact of offshore wind and tidal platforms

The benefits resulting from the application of FRP-materials to build the structure and components of offshore wind and tidal platforms, as well as the different design, production, analysis and maintenance solutions developed in FIBREGY, will result in a superior life cycle performance and thus in a positive impact in the Levelized Cost of Energy (LCoE).

Floating Offshore Wind Energy[6]	Tidal Energy[7]
In 2020, the LCoE was 64€/MWh.	In 2020, the LCoE was around 200€/MWh.
By 2025, the LCoE is expected to be reduced to 60€/MWh (depending on the scenario)[8].	By 2025, the LCoE is expected to be reduced to 150 €/MWh.
By 2030, the LCoE is expected to be reduced to 50€/MWh (depending on the scenario).	By 2030, the LCoE is expected to be reduced to 100 €/MWh.

Table 2: The Levelized Cost of Energy (LCoE) for offshore wind and tidal energies

According to the Intergovernmental Panel on Climate Change (IPCC) experts, offshore wind technology has the lowest lifecycle emissions of all existing power generation technologies[9]. FIBREGY will further reduce the carbon footprint of offshore platforms thanks to the use of FRP materials, instead of steel, in the offshore structures, the increase of the structure lifespan due to innovative maintenance and monitoring strategies. The project FIBREGY expects to lay the foundations to reduce the carbon footprint of offshore platforms by 35%.

[4] Offshore Wind in Europe: key trends and statistics 2020
[5] Ocean Energy: key trends and statistics 2020
[6] https://windeurope.org/policy/topics/economics/
[7] Low Carbon Energy Observatory: Technology Development Report
[8] WindEurope: our energy, our future
[9] Poujol, B., Prieur-Vernat, A., Dubranna, J., Besseau, R., Blanc, I., & Pérez-López, P. (2020). Site-specific life cycle assessment of a pilot floating offshore wind farm based on suppliers' data and geo-located wind data. Journal of Industrial Ecology, 24(1), 248-262

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12 partners from 7 countries, with more than 40 researchers

The consortium led by CIMNE (Spain) is composed of a network of 12 research, engineering and industrial organizations from 7 European countries with a proven track record in research and technological innovation, which creates an ideal ecosystem for an optimal dissemination and exploitation of the results of the FIBREGY project.

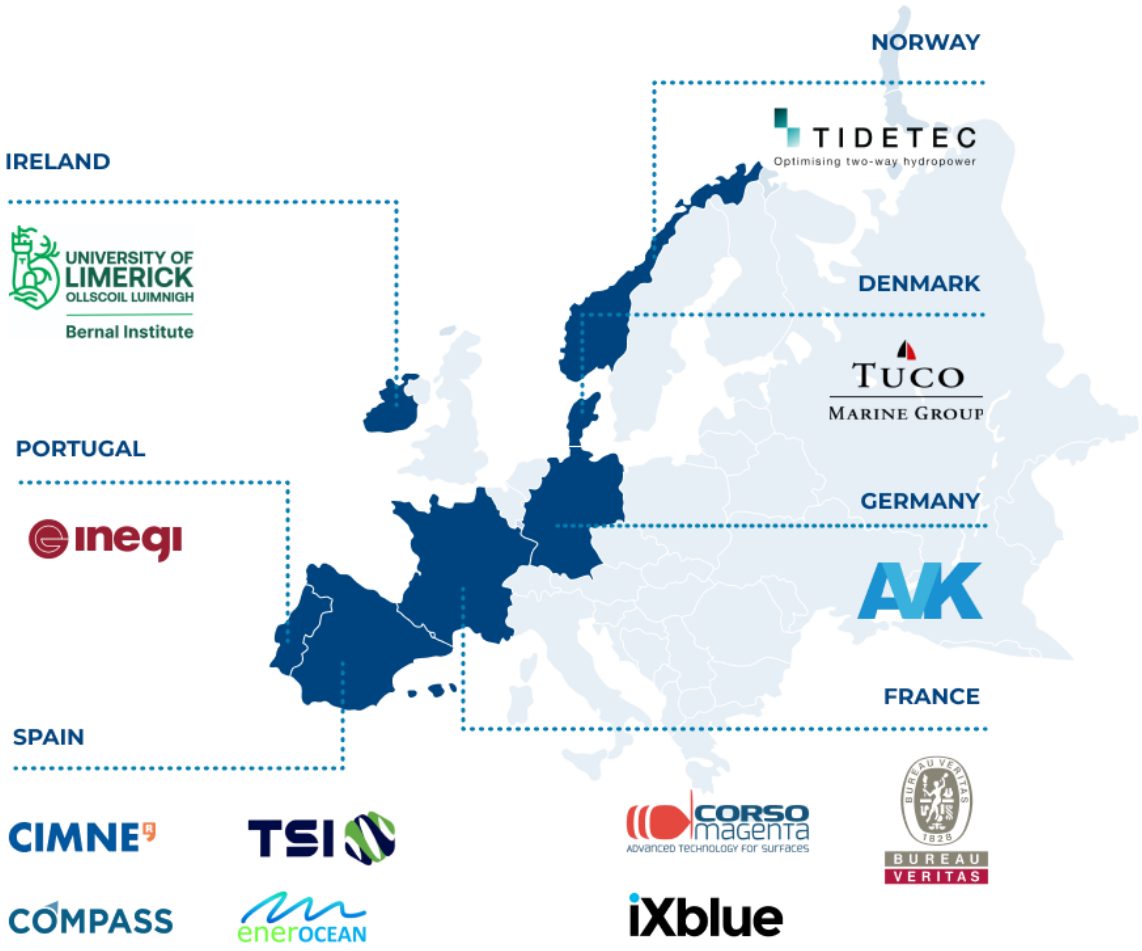

Figure 1: Fibregy's consortium

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Contact: info@fibregy.eu