

Ocean wave energy: *challenges and perspectives*

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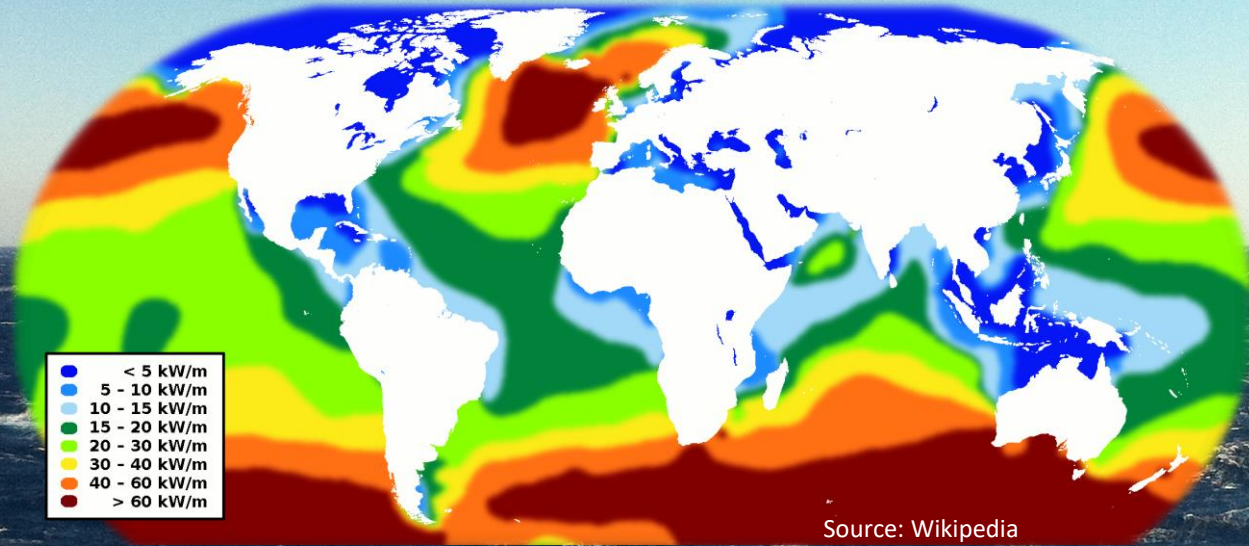
June 29, 2021

Sustainable Water and Energy Solutions Network Webinar on Ocean Energy

Wave energy resource

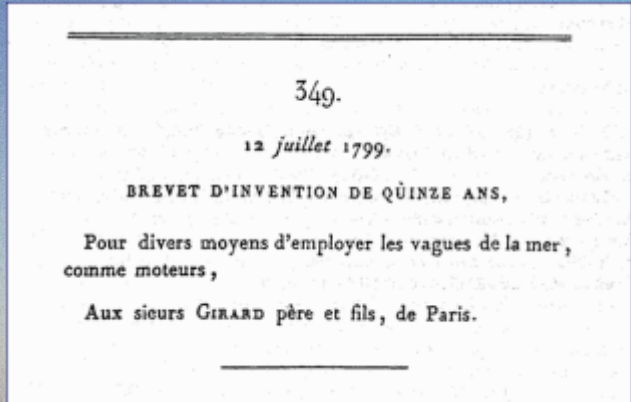
Oceans cover 71% of the Earth's surface

Nearly 2.4 billion people live within 100 km of an oceanic coast



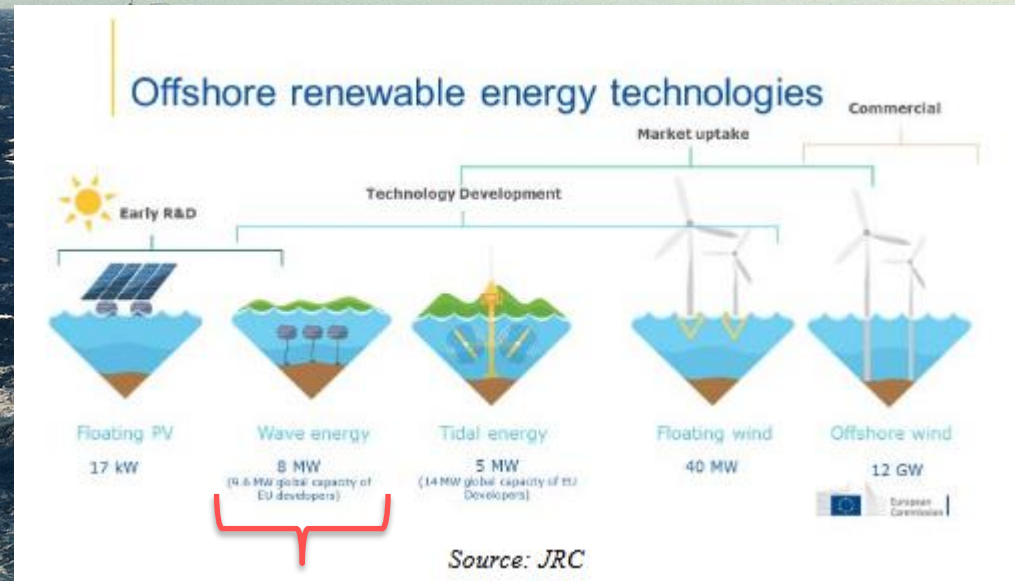
Waves are a **huge, predictable** but largely **untapped**, **source of energy**

Wave energy development



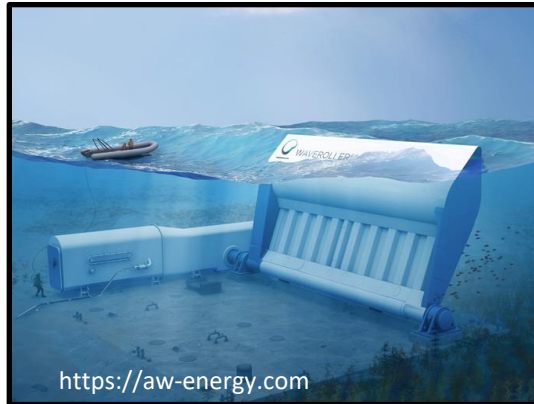
First attempts to exploit wave energy came as early as 1799

Lower technological maturity compared to other ocean energy sources



Wave energy – Technology & challenges

WAVEROLLER



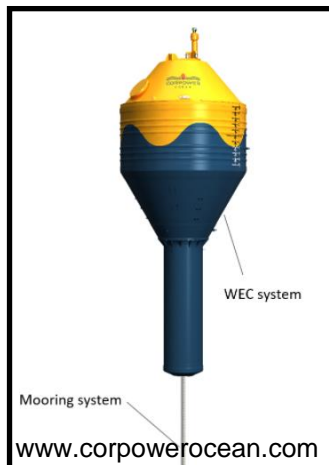
WELLO-PENGUIN



MARMOK



CORPOWER



High concept diversification
Frequent need of tailor-made solutions

*“The limited amount of electricity generated by wave energy converters suggests that designs still need to be optimized; and that conversion technologies, in particular reliable **Power Take Offs (PTO)** need still to be **validated**”*

Magagna, D., Ocean Energy Technology Development Report 2018, EUR 29907 EN, European Commission, Luxembourg, 2019, ISBN 978-92-76-12428-3, doi:10.2760/158132, JRC118296

Ways to deployment

Open sea test sites

NETHERLANDS

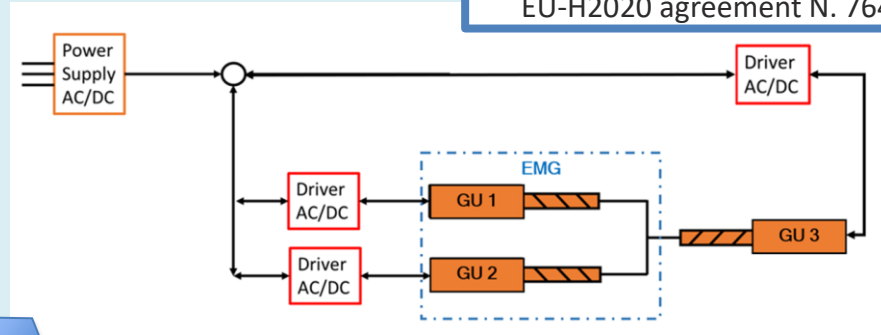
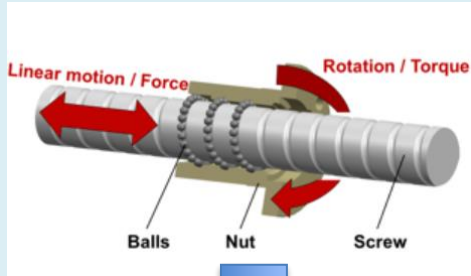
TEST SITE NAME	LOCATION
REDstack	Abbludijk
Tidal Test Centre (TTC)	Grevelingen barrier

UNITED KINGDOM

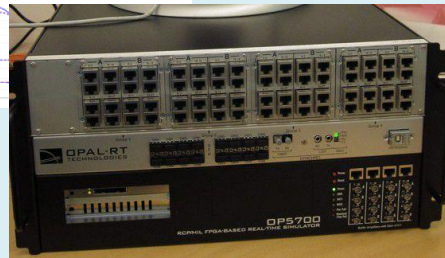
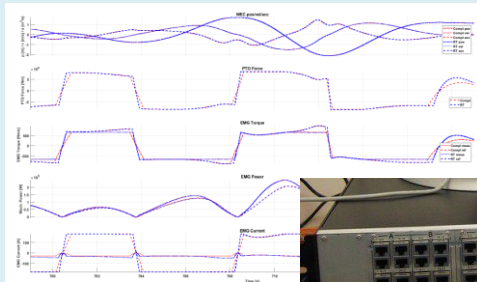


EU-H2020 agreement N. 76406

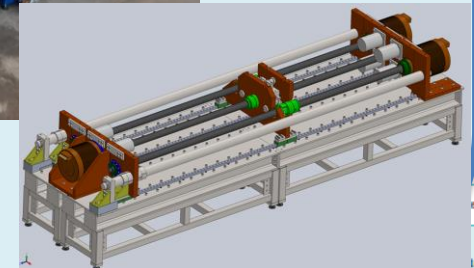
New tools



Small-scale validation/Hardware in the Loop testing



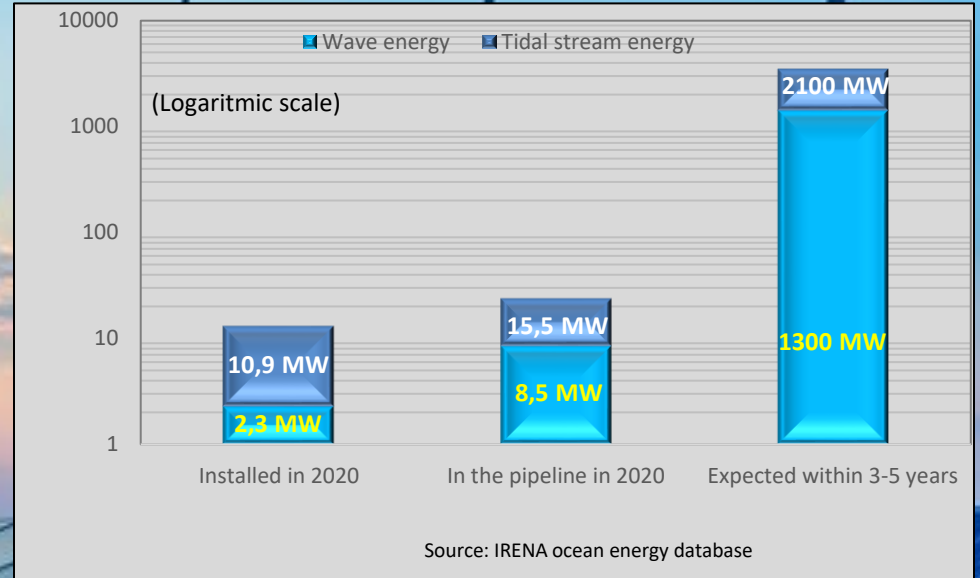
Computer and real-time digital simulations



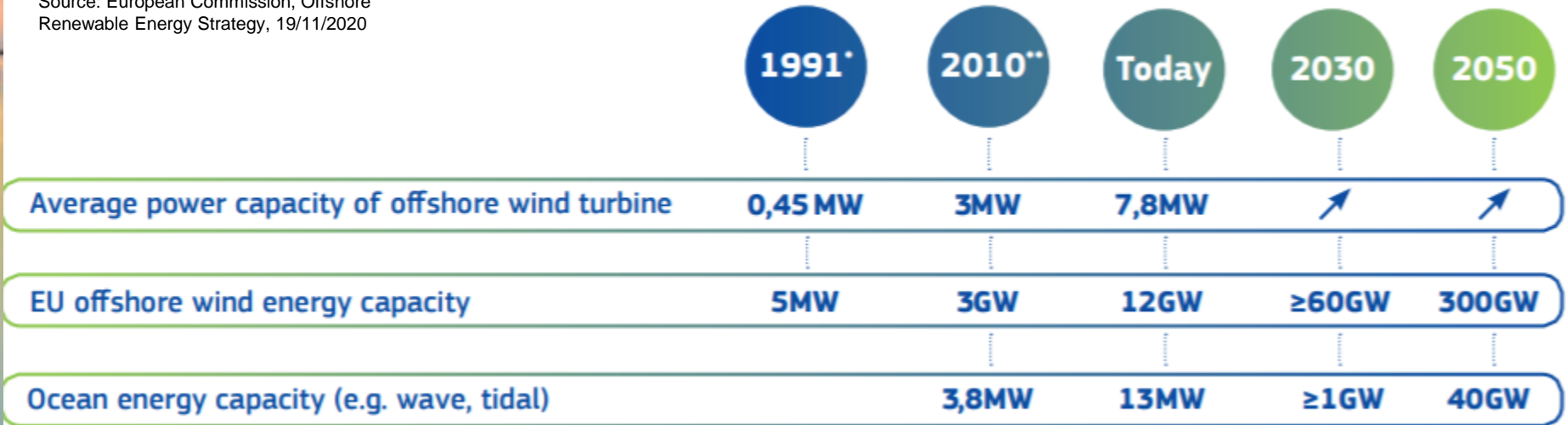
An ambitious goal



Ph: Etienne Ansotte/EC



Source: European Commission, Offshore Renewable Energy Strategy, 19/11/2020



Ocean energy outlook

A photograph of a wind turbine on the ocean surface. The turbine is white and has three blades. In the foreground, there are four yellow buoys floating in the water. The sky is blue with white clouds.

Combining wave energy with other renewables and offshore applications could facilitate the take-off of the wave energy sector

Intersectoral synergies can help accelerate the learning curve

Ocean energy can provide 10% of Europe's current electricity needs and 400,000 jobs by 2050

Renewable energy
wind, waves,

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Thanks for your attention!



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