

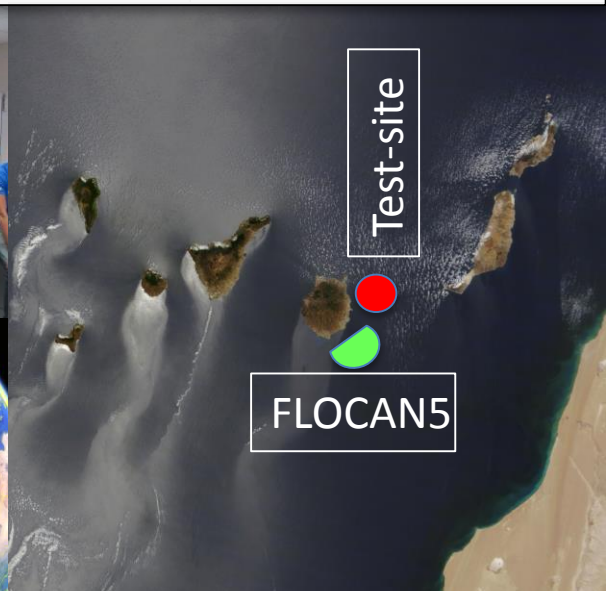
PLOGAN consorcio

Plataforma Oceánica de Canarias

Ciencia y Tecnología para la Sostenibilidad del Océano Profundo



Opportunities for testing and demonstration of marine energy technologies in the Canary Islands.



Test-site

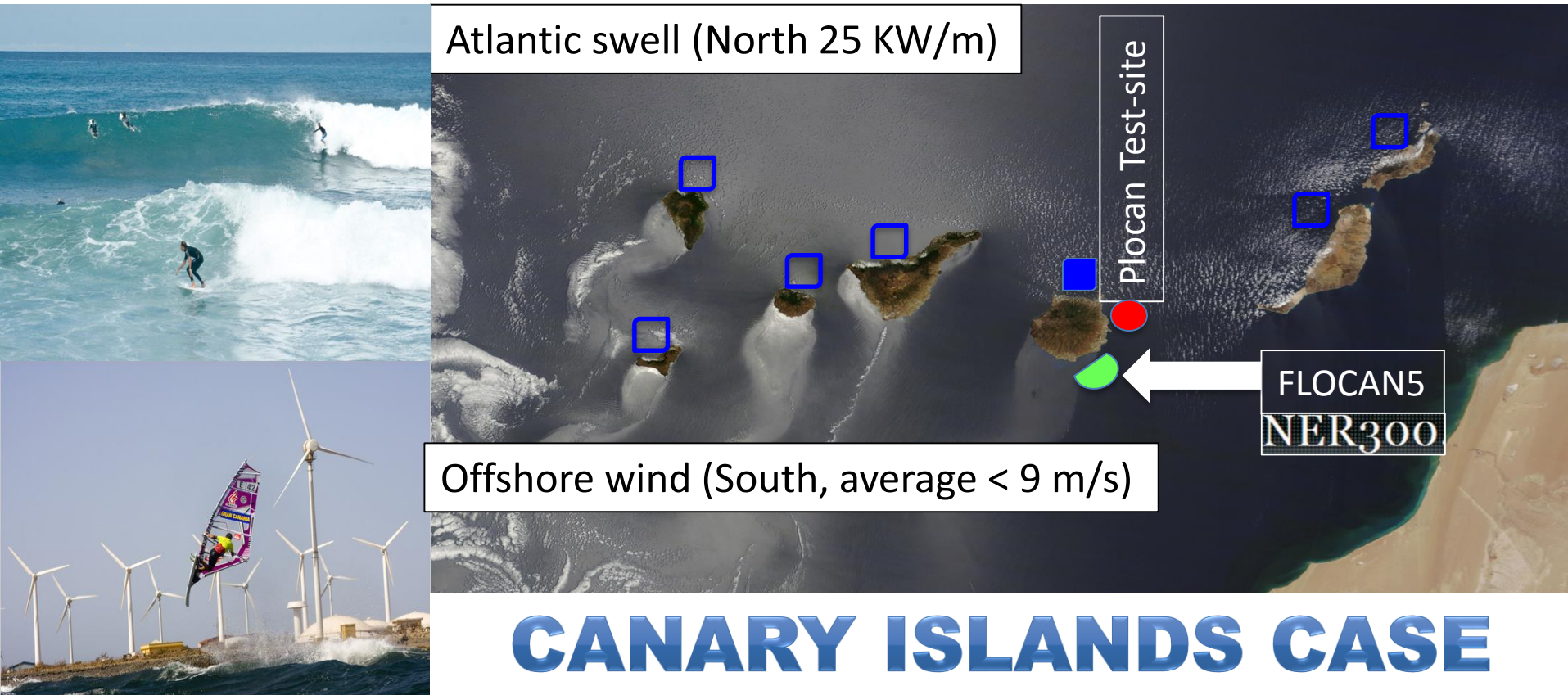
FLOCAN5

José Joaquín Hernández Brito - Manager

Summary : Marine Renewables in Canary Islands

- ✓ Islands: early adopter markets for marine energy
- ✓ Canary Island: excellent test site for wave and offshore floating wind energy (PLOCAN)
- ✓ RES are superb at Canary Islands, test sites, shipyards and port facilities are also available.
- ✓ Conventional generation cost are over 20 c€ KWh
- ✓ Support for demonstration projects: push prototypes to the market
- ✓ Coordinated R&D activity at the international level: viability of the industry

- 2.2 Million citizens, 13 Million visitors => 3.2 GW- 9400 GWh
- 7 Islands, 6 isolated electrical systems, 2 islands interconnected, weak grids
- Oil-based generation (Diesel and fuel-oil) 93%, 144 MW OW- 152MW PV
- Electricity generation cost around 200 € MWh (v. islands)
- 600.000 m³ desalinated water/daily, consuming 770 GWh (yearly)

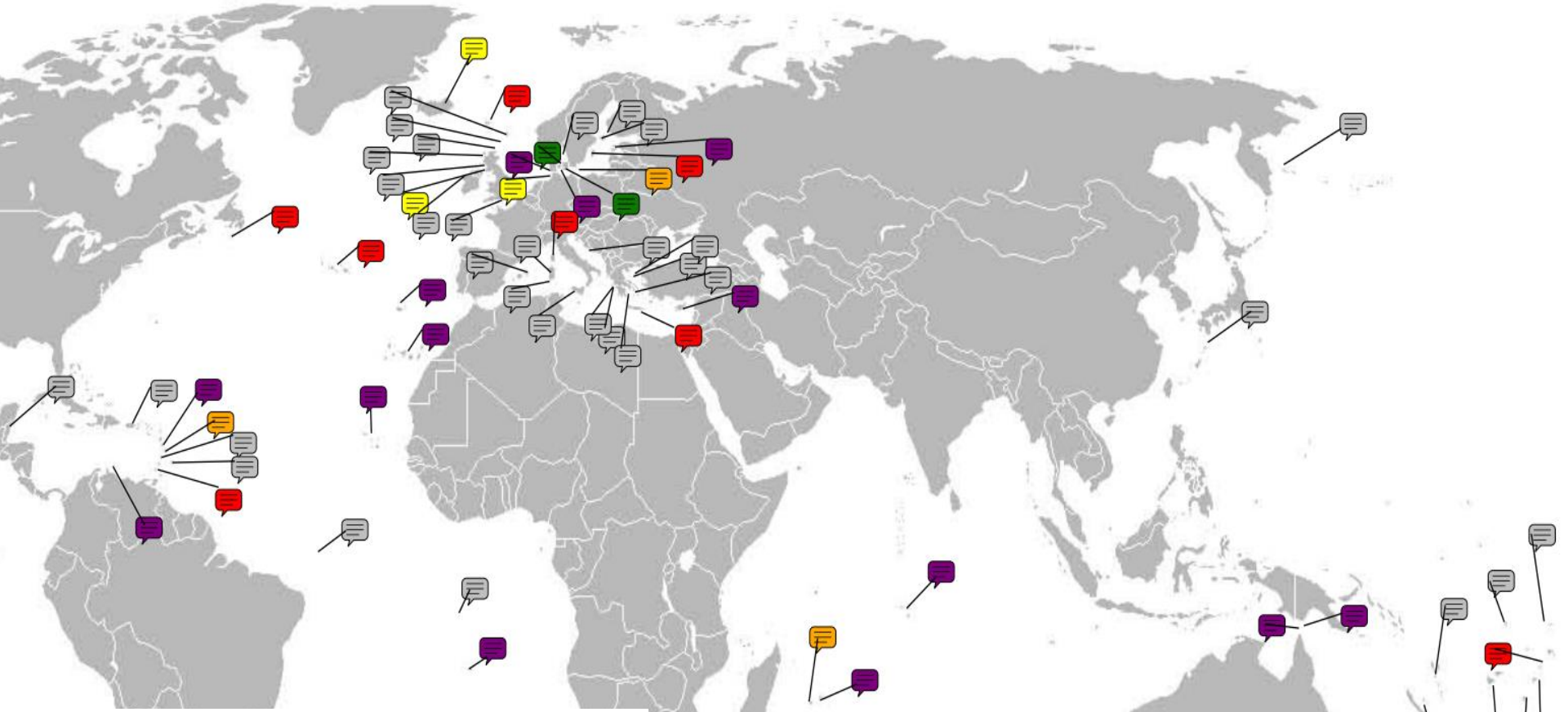


Islands- Early adopters for ocean energy converters

“Island factor”

- ✓ Limited range of resources
- ✓ High energy prices
- ✓ Major reliance on imported fossil fuels
- ✓ High distribution costs
- ✓ Small-scale generation of electricity
- ✓ Under-use of renewable energy resources in comparison with the potential
- ✓ Small markets
- ✓ Specialisation of economies
- ✓ Diseconomies of scale
- ✓ Fragility of eco-system

Islands- Early adopters for ocean energy converters



Renewable Percentage

- 80-100% from Renewable Energy
- 60-79% from Renewable Energy
- 40-59% from Renewable Energy
- 20-39% from Renewable Energy
- 0-19% from Renewable Energy
- No percentage available; some data may be provided.

Canary islands: natural test site for marine energies

Vision

By 2050 Europe could source up to 50% of its electricity needs from Marine Renewable Energy. This would have a profound impact on the European economy and European citizens. It would contribute to energy supply and security, reduce CO2 emissions and their impact on the oceans, improve the overall state of the environment, improve quality of life, create jobs in a range of innovative sectors and herald a new era of environmentally sustainable development.”

European Science Foundation

Testing the first 5MV offshore turbine (GAMESA)





Demo for EL HIERO

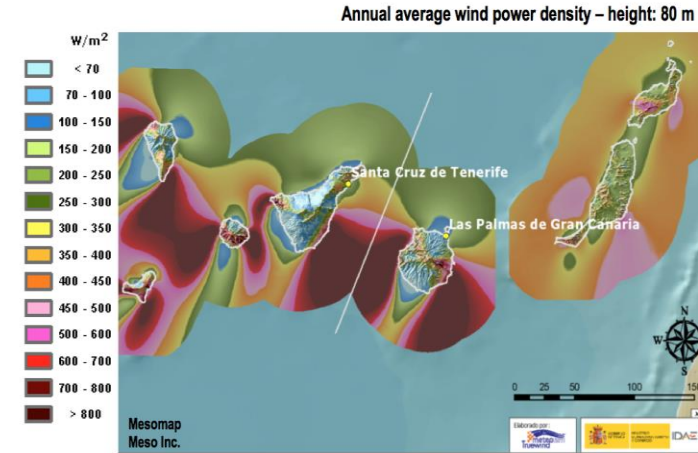




Key Challenges: Harnessing Renewable Energy in the Ocean



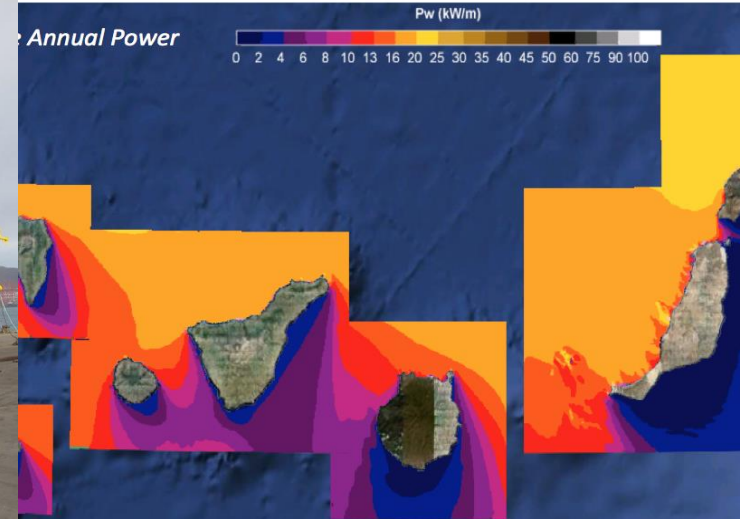
Canary Islands: Wind Energy



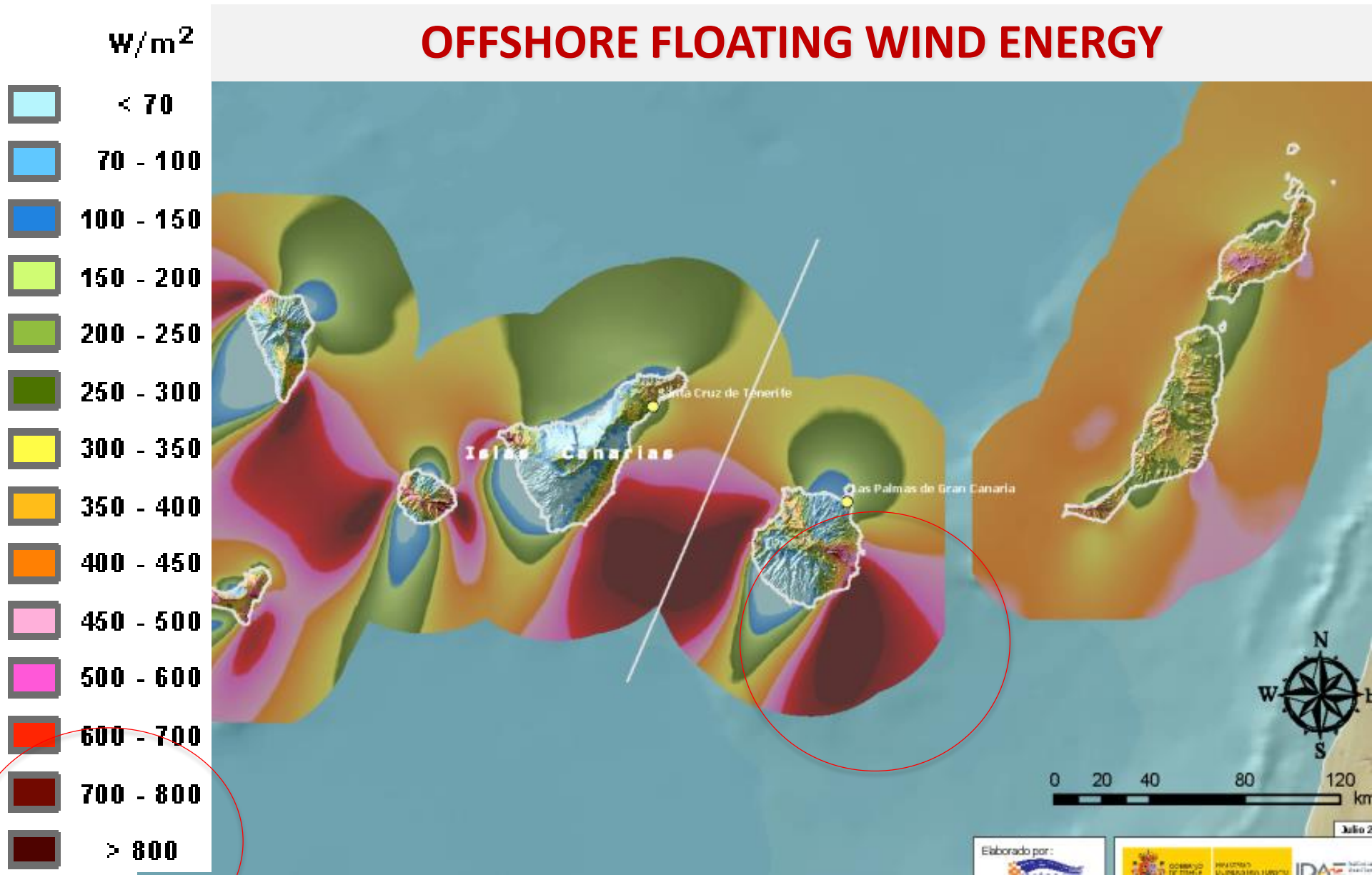
DEMONSTRATION & TESTING SITE FOR RESEARCH & INNOVATION



Canarias: Wave Energy

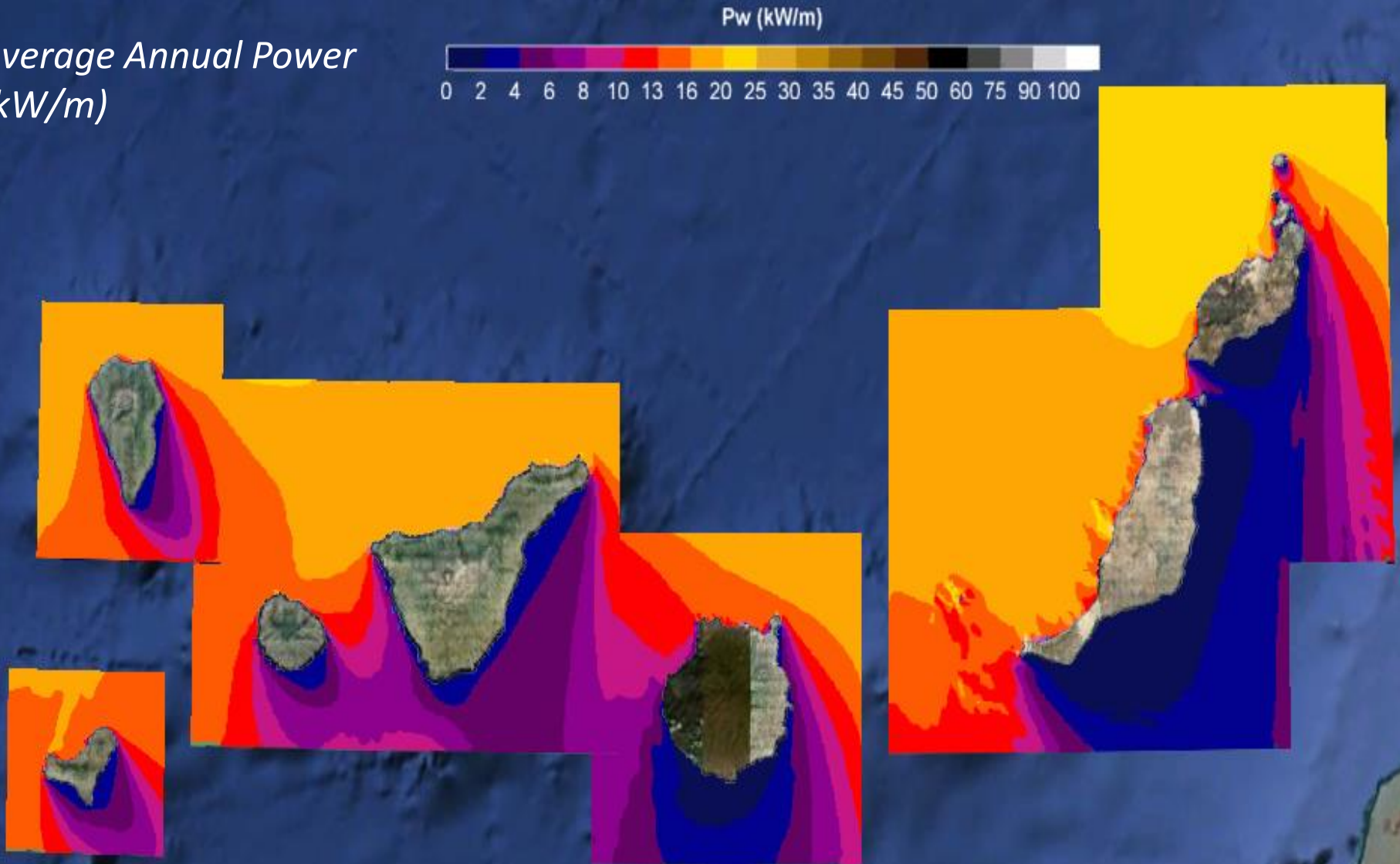


Offshore wind: ... even more but in deep waters



Canarias: Wave Energy

Average Annual Power
(kW/m)



Canarias: Wave Energy

Technology Readiness Levels: A Disciplined Protocol for Technology Development

DOE TRL 1-3
Discovery /
Concept Definition /
Early Stage
Development,
Design and
Engineering



DOE TRL 4:
Proof of Concept



DOE TRL 5/6:
System Integration and
Laboratory Demonstration



DOE TRL 7/8:
Open Water System Testing,
Demonstration, and Operation

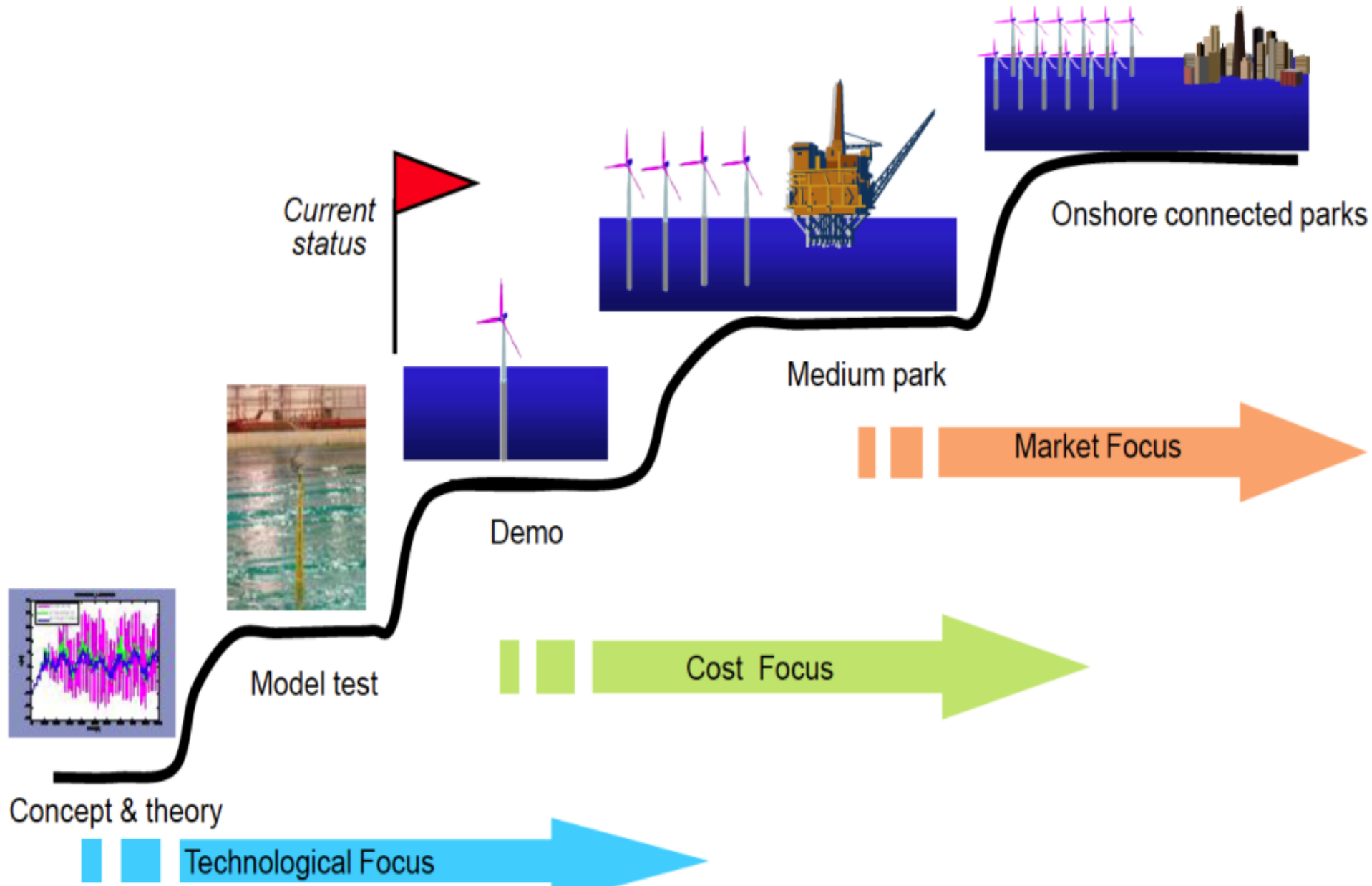


DOE TRL 9:
Array Testing



DOE TRL 10:
Commercialization

Canarias: offshore floating wind energy



Vision: speed up the commercial phase

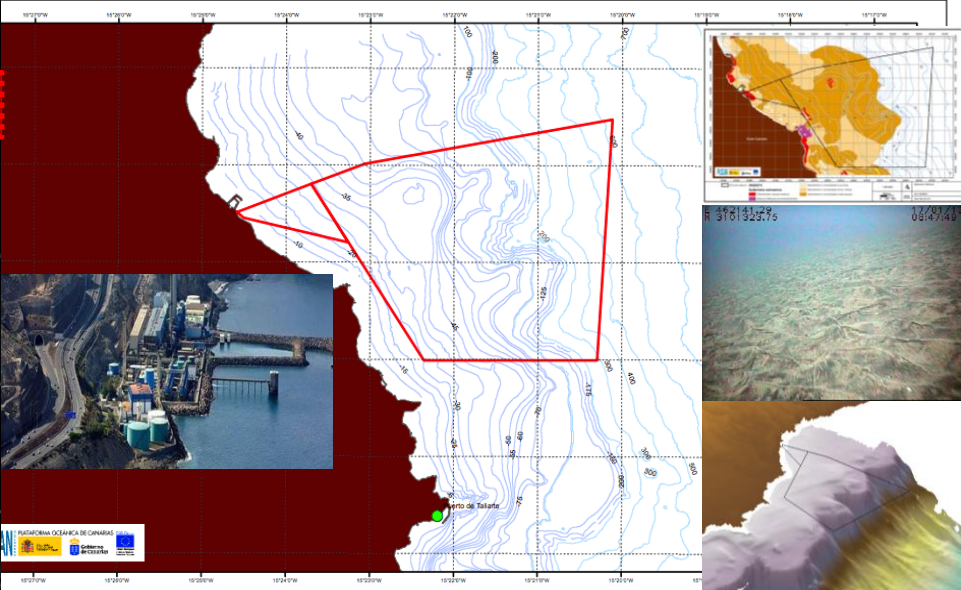
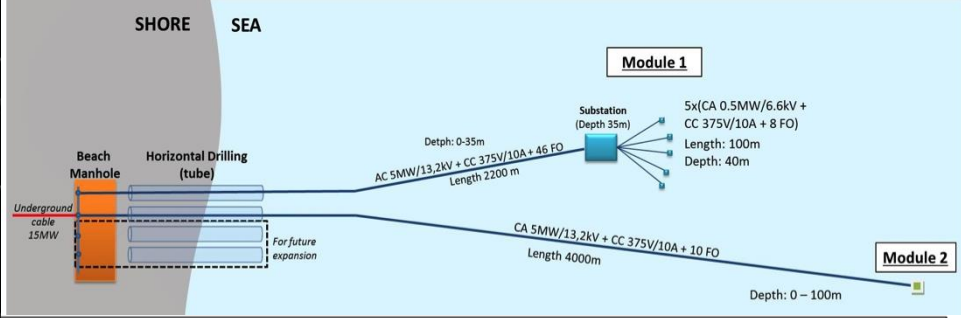
Technological services

- Provide facilities and support for testing devices (TRL 3-9)
- Environmental monitoring
- Access to the grid
- Mooring and decommissioning
- Methodology and procedures
- Assistance for certification

Vision: speed up the commercial phase

Non technological services

- Leverage public and private funds
- Facilitate permits and consenting
- Pave the way for commercial developments
- Provide networking and information
- Cooperation and International Challenges
- Business models
- Training





I A S P A I M A S P O R T

UNDIGEN



WELCOME





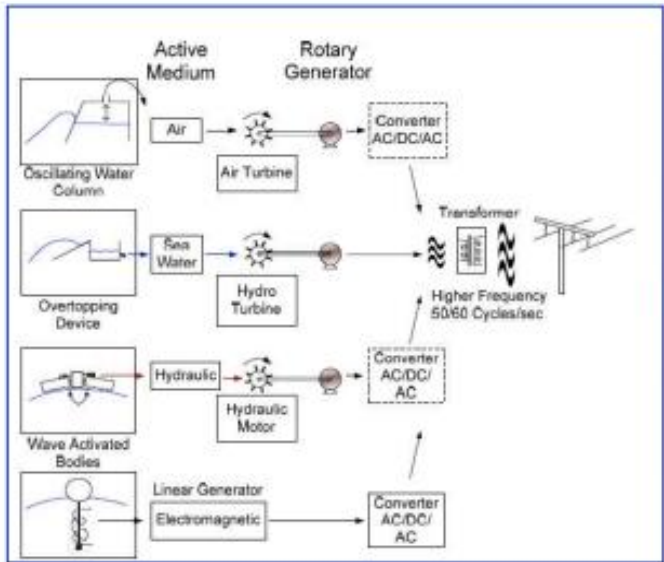
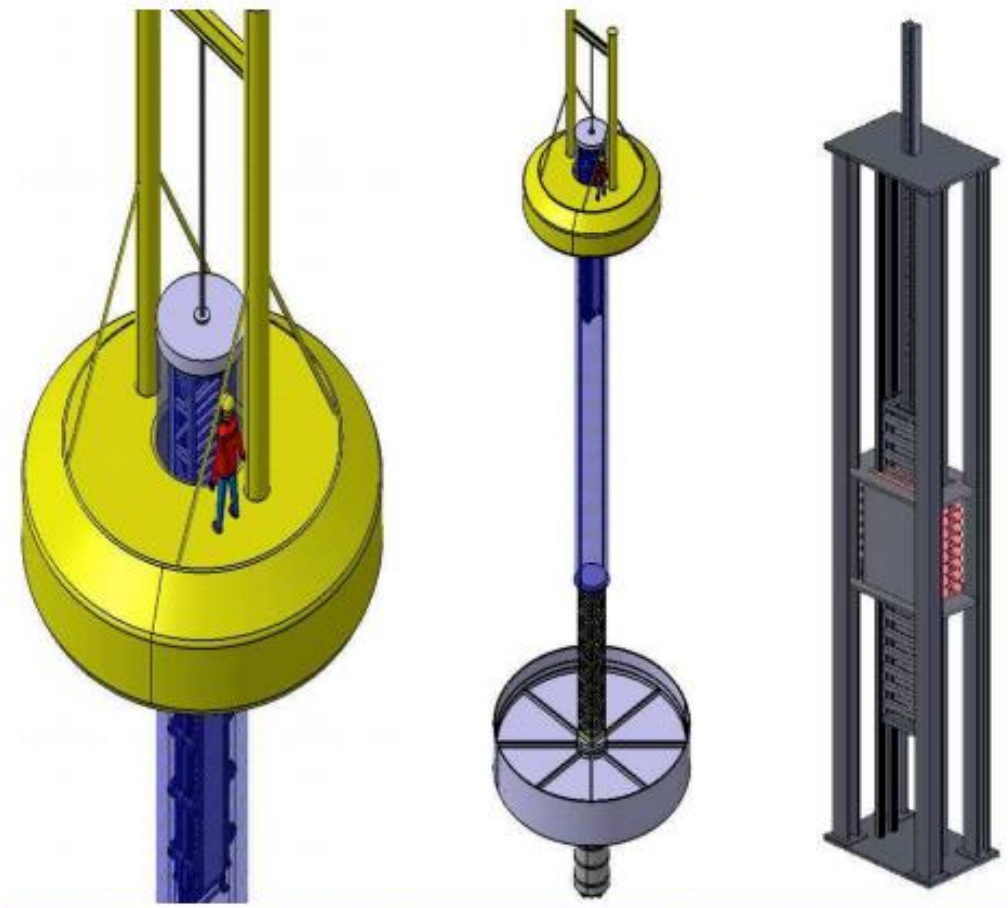


UNDIGEN PROJECT : Wave Energy Converter

Linear Switched Reluctance Generator



Generador Lineal de Reluctancia Conmutada



REALISMO- SIMPLICIDAD- ESCALABILIDAD- EXPERIENCIA



PLATAFORMA OCEÁNICA DE CANARIAS



canarias OBJETIVO de PROGRESO



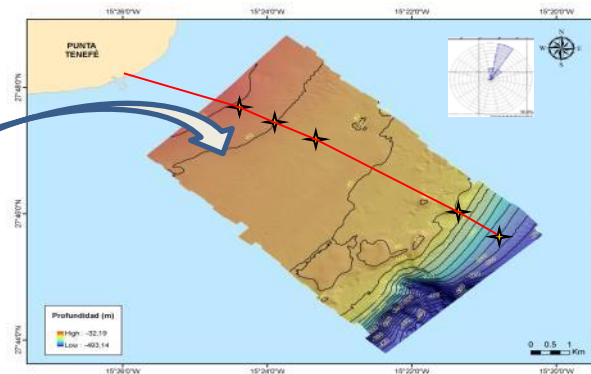




FLOCAN 5 Demonstration Project

- ❑ FloCan5 is a deep-offshore floating wind farm South-East of Gran Canaria Island
- ❑ 5 floating platforms with 5MW wind turbines installed in water depths ranging from 40 to 200m.
- ❑ European Commission granted of 34M€ to FLOCAN 5
- ❑ Expected entry into Operation: Mid 2018

NER300



Location

- Pozo Izquierdo
- SE Of Gran Canaria

Water depth

- 30-300m
- WTGs placed in waters ranging between 40 -200m

Meteorological Data

- > 10m/s
- > 800 W/m²
- Capacity Factor- More than 45%

LEANWIND

Logistic Efficiencies And Naval architecture for Wind Installations with Novel Developments



Marine renewables

Coordinator:

UCC_HMRC (IE)

Partners:

UCC_HMRC (IE) - MRTK (NO) - GDG (IE) - ACCIONA_In (ES) - KM (NO) - MTS-MAR (DK) - NMCI (IE) - A2SEA (DK) - VGG (ES) - MRP (UK) - AAU (DK) - UOPHEC (UK) - EDPI (PT) - UEDIN (UK) - ACCIONA_En (ES) - SINTEF ER (NO) - Fraunhofer (DE) - NTUA (GR) - PLOCAN (ES) - FORCE (DK) - EWEA (BE) - UHULL (UK) - 1-Tech (BE) - AGHO (BE) - OWA (BE) - B9 (UK) - LR (UK) - CESA (BE) - NAAS (NO) - AMS (IE) - Delta Marine (TR)



PROJECTS



OCEANERA-NET

Supporting the coordination of national research activities of Member States and Associated States in the field of Ocean Energy (ERA-NET)

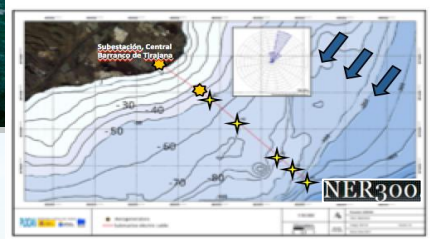
Supporting
research & innovation
in the ocean energy sector



European Union

OCEANERA-NET is a Network of 16 national and regional funders and managers of research and innovation programmes, from 9 European countries.

PROJECTS



Thank you ii

