

OCEAN AND ENVIRONMENTAL TECHNOLOGIES AND SERVICES

Part 1 : Ocean Focus

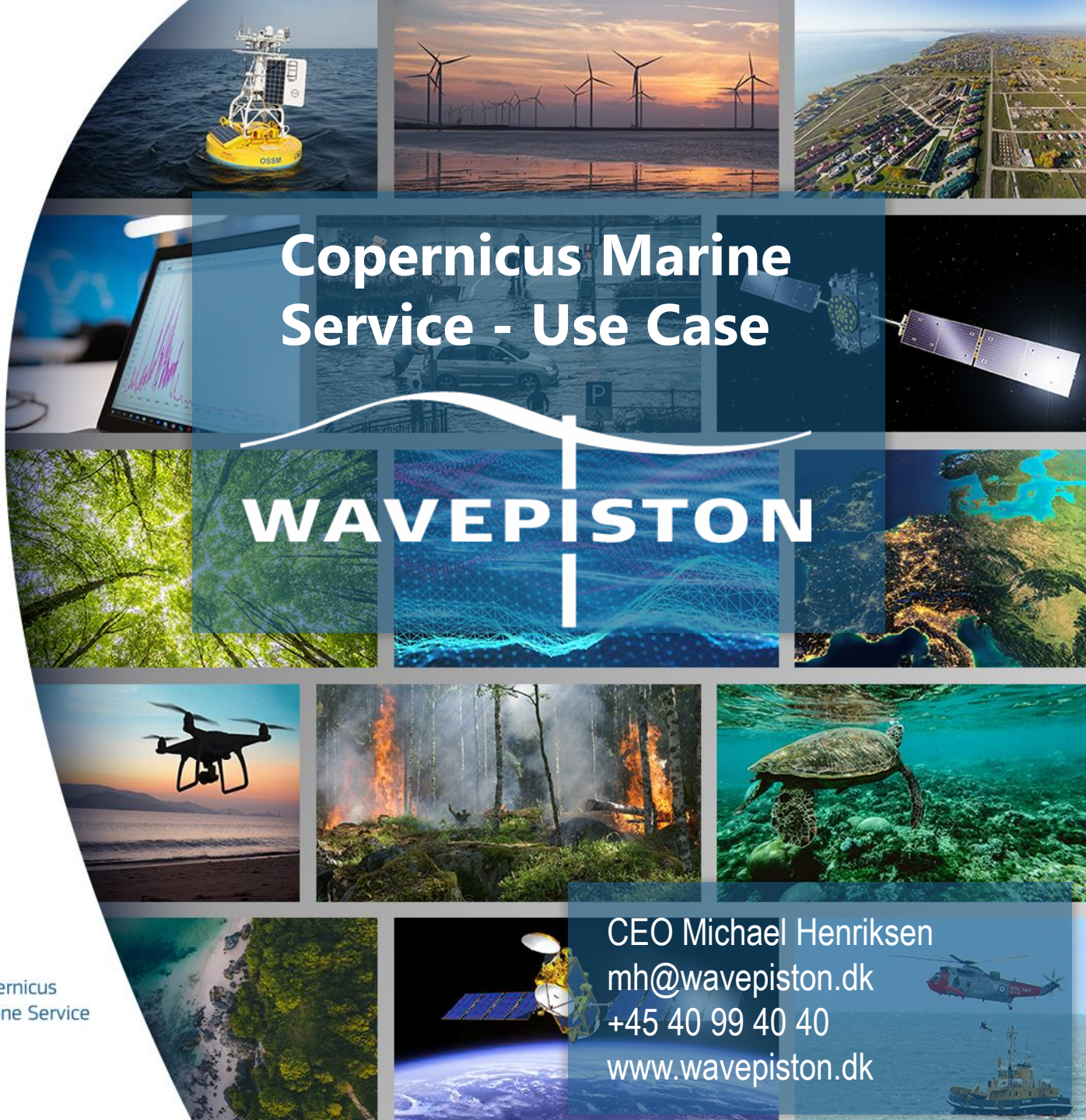
Wednesday 20 October
9:00 AM to 01:15 PM



Copernicus Marine Service - Use Case

WAVEPISTON

CEO Michael Henriksen
mh@wavepiston.dk
+45 40 99 40 40
www.wavepiston.dk



Experienced Team



CEO,
Michael Henriksen



Lead Engineer,
Kristian Glejbøl



Head of Production,
Oscar Helmersen



Chairman of the Board,
Jesper Højer



CTO,
Steen G. Thomsen



Chief Specialist,
Martin von Bülow



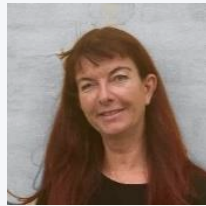
Development Engineer,
Troels V. Lukassen



Member of the Board,
Torben Arnth Nielsen



CFO,
Lars Bonnichsen



Head of Admin.,
Tina H. Christensen



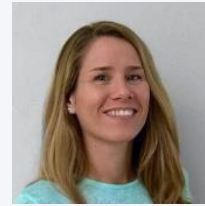
Development Engineer,
Morten M. Jakobsen



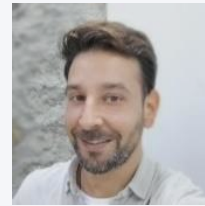
Commercial Director,
Peter N. Svendsen



Gran Canaria Manager,
Noelia Pericon



Operational Coordinator,
Esther Capote Kerr



Technical Coordinator,
Alberto C. González

Experienced Team and Board – Competences:

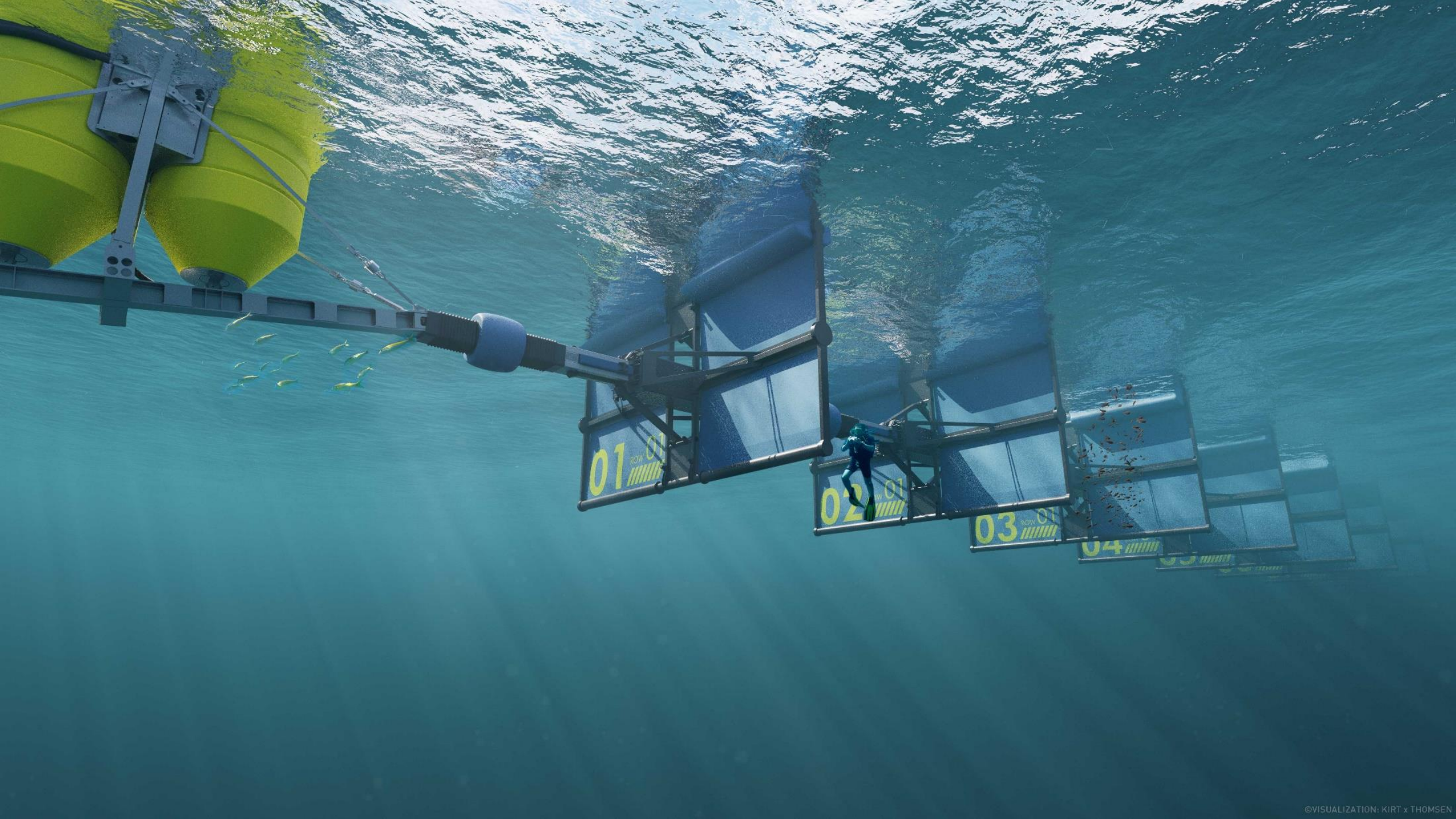
- Offshore
- Energy
- Taking an Idea to a Viable Product
- Management
- Execution Power
- Engineering

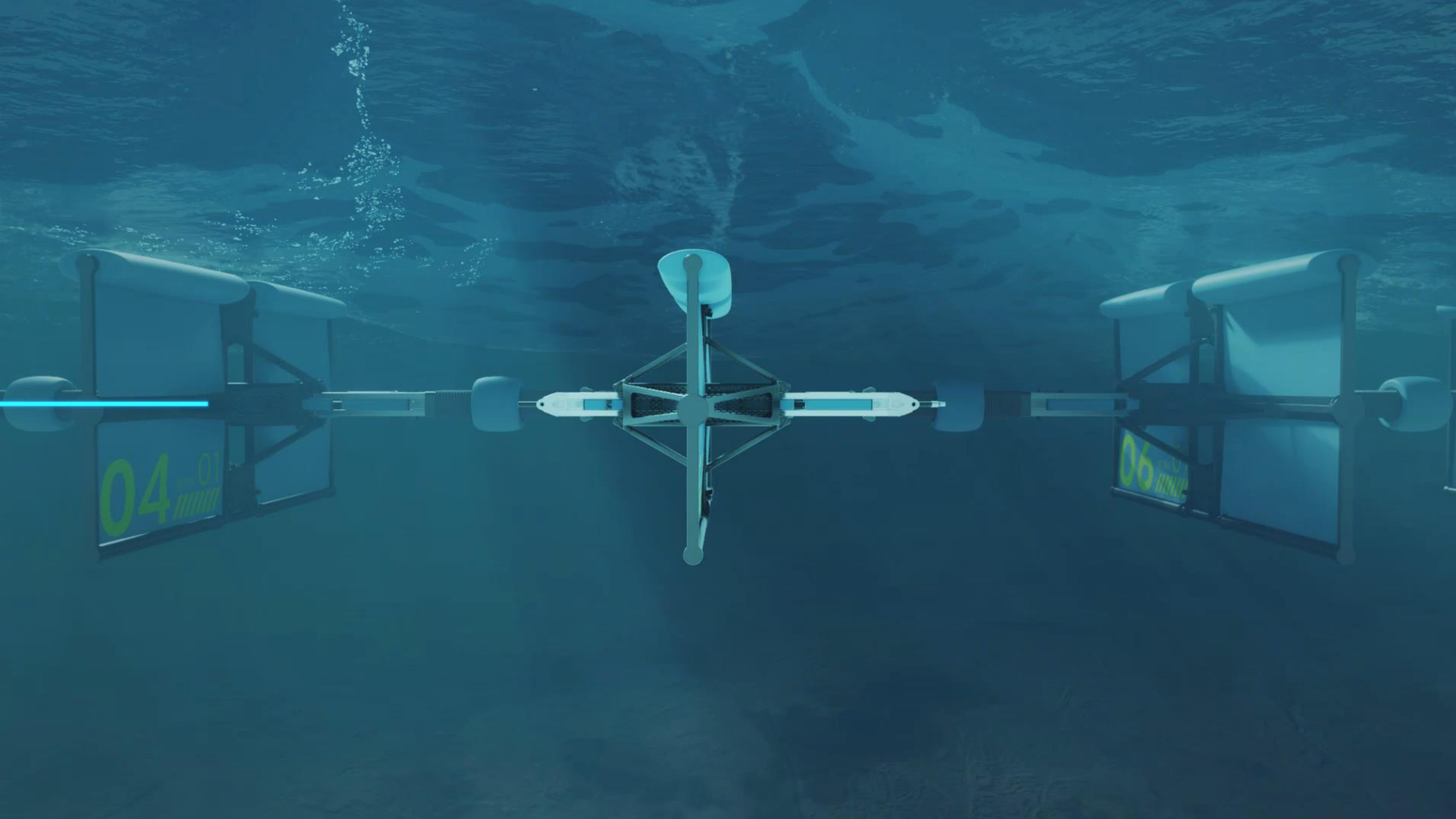


Renewable Energy

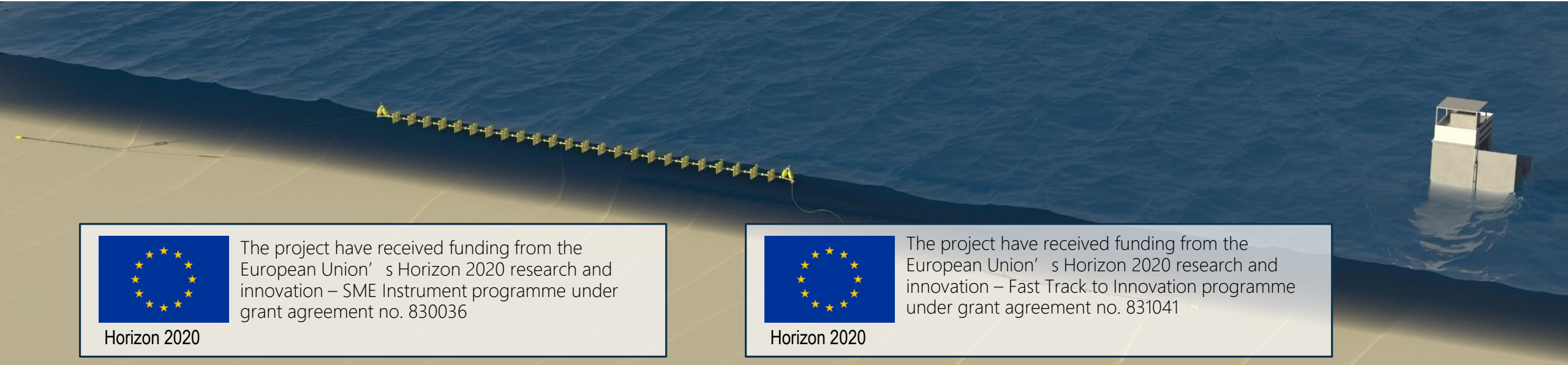


Fresh Water





Full Scale Pilot Projects – Gran Canaria, Atlantic Ocean



Horizon 2020

The project have received funding from the European Union' s Horizon 2020 research and innovation – SME Instrument programme under grant agreement no. 830036



Horizon 2020

The project have received funding from the European Union' s Horizon 2020 research and innovation – Fast Track to Innovation programme under grant agreement no. 831041

Competitive Wave Energy on Islands



2019 – 2023



EUR 3.8M



200 kW, 547,000 kWh/year

Wave to Energy and Water (W2EW)



2019 – 2022



EUR 5.2M



150 kW, 350,000 kWh/year (80%)
28,000 m3 water/year (20%)



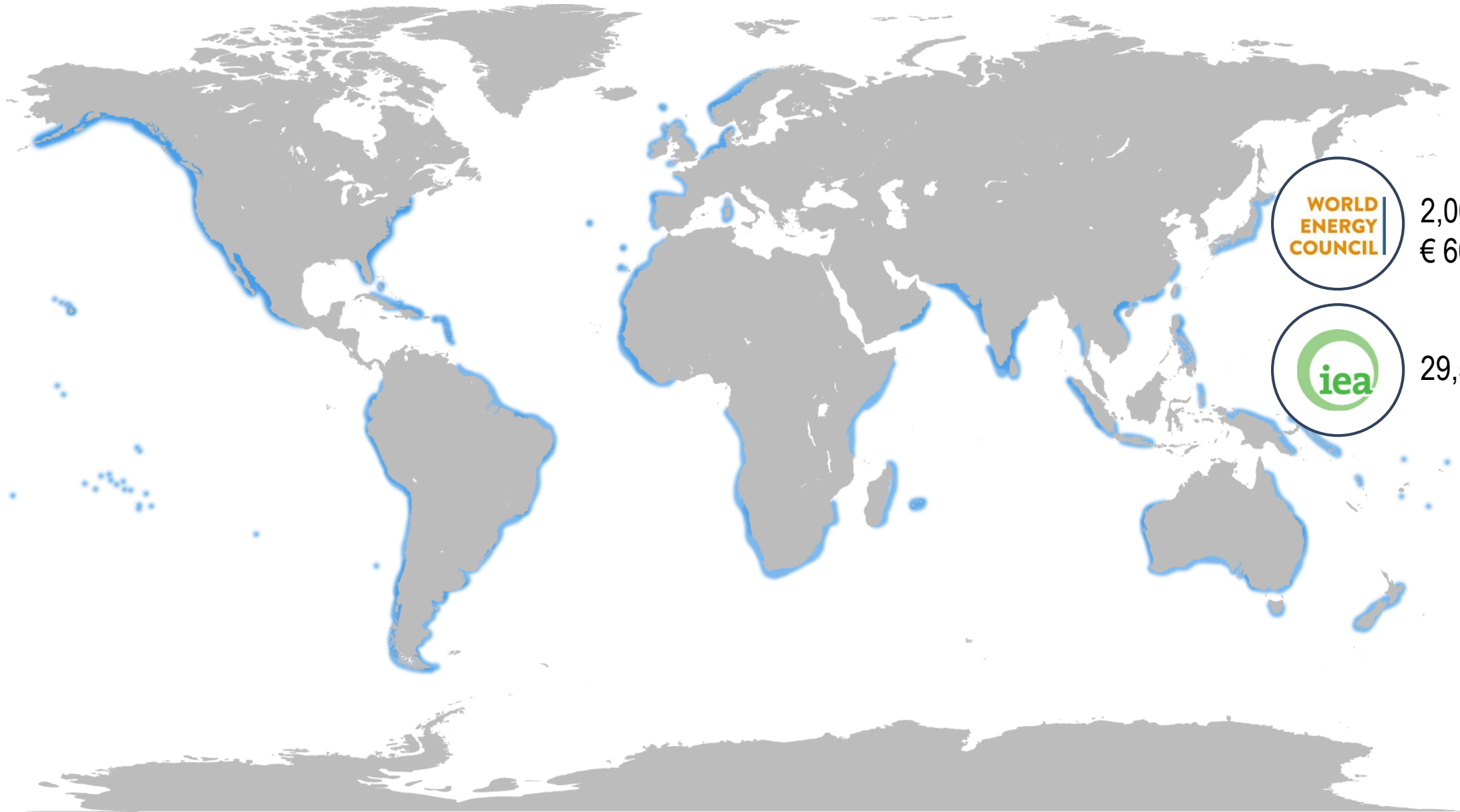


Full-scale installations 2021 – 2023

SHOW RESULTS



Waves – A Very Large Potential



2,000 GW
€ 600 Bn/year



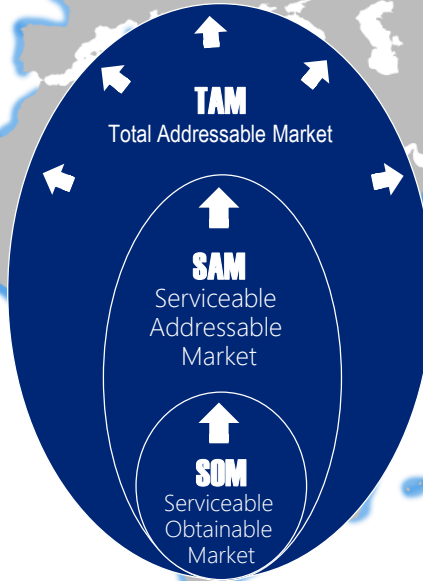
29,500 TWh/year

Waves – A Very Large Potential => (Pre-)Commercial Projects?

> € 300Bn/year



> € 20 Bn/year



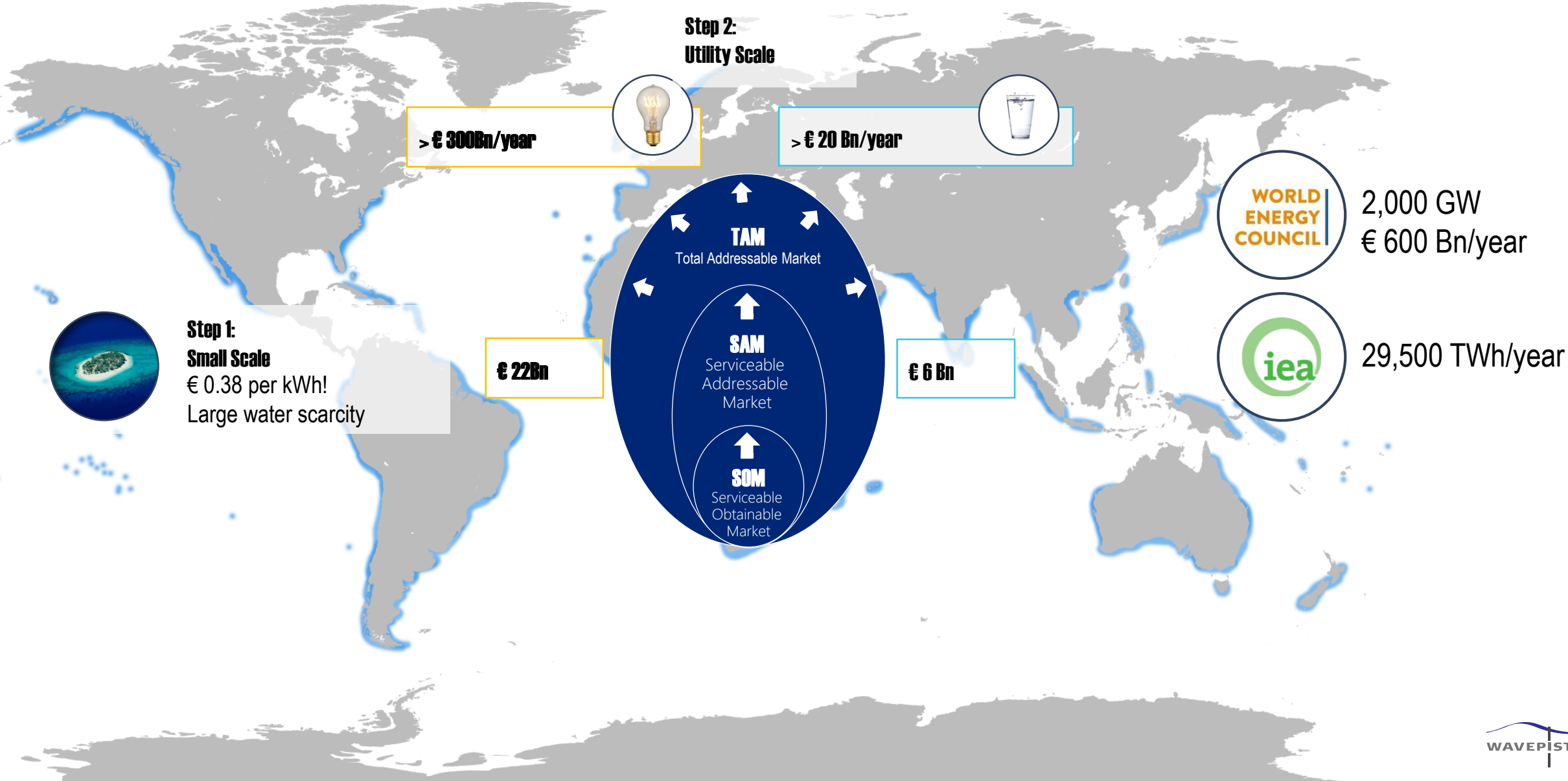
WORLD
ENERGY
COUNCIL

2,000 GW
€ 600 Bn/year

iea

29,500 TWh/year

Waves – A Very Large Potential => (Pre-)Commercial Projects?



Waves – A Very Large Potential => (Pre-)Commercial Projects?

A world map with a grey background and blue outlines of continents and oceans. A white rectangular box with a black border is centered over the Atlantic and Indian Oceans, containing the text 'But where should we focus?'.

But where should we focus?

Bermuda
Black Sea
Canary Islands
Cap Verde
Caspian Sea
Dominican Republic
Fiji
Galapagos
Guadeloupe
Malta
Maldives
Martinique
Mauritius
Mozambique
Marshall Islands
Nauru
Nouakchott
North Sea
Pohnpei
Philippines
Sardinia

Assess the Best Locations

Pre-studies on Wavepiston Potential

- Wave
- Current
- Tide



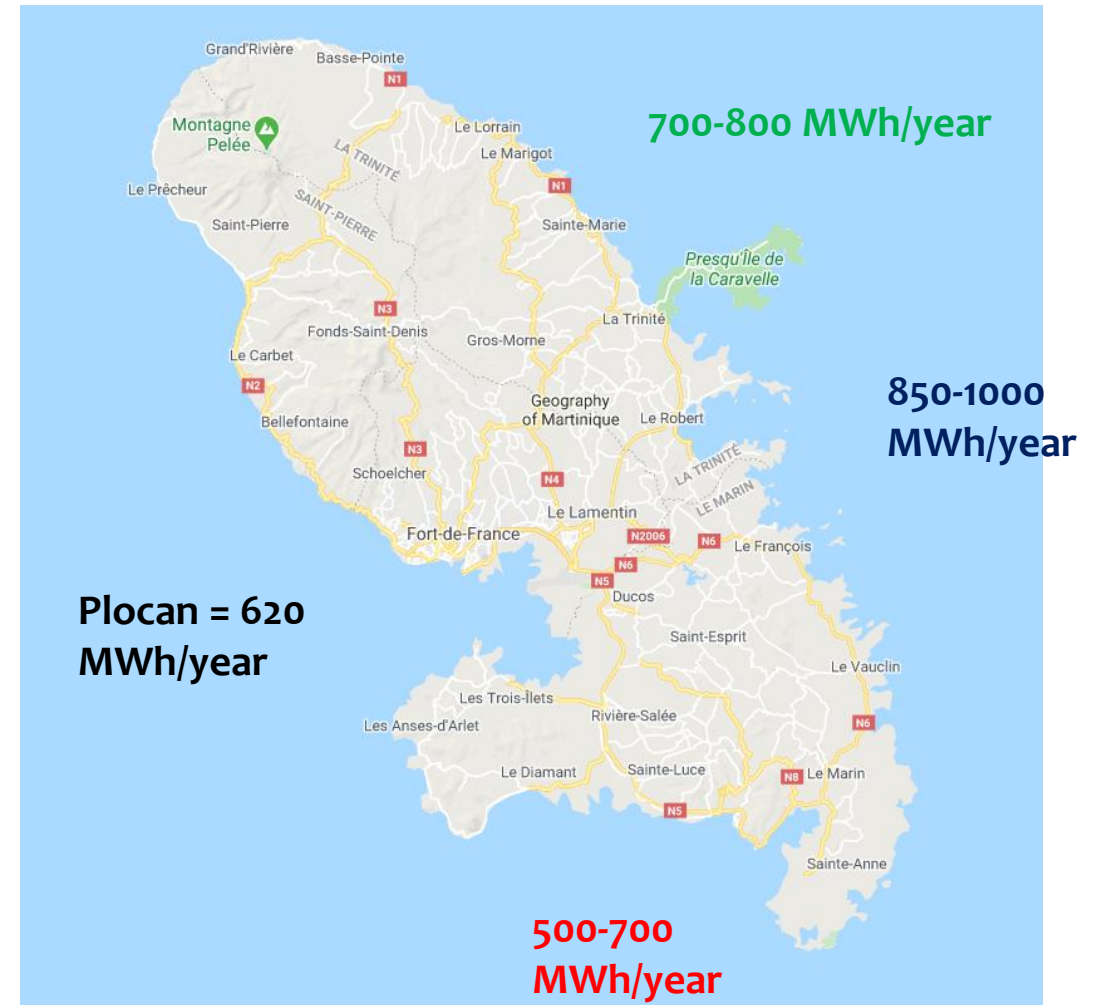
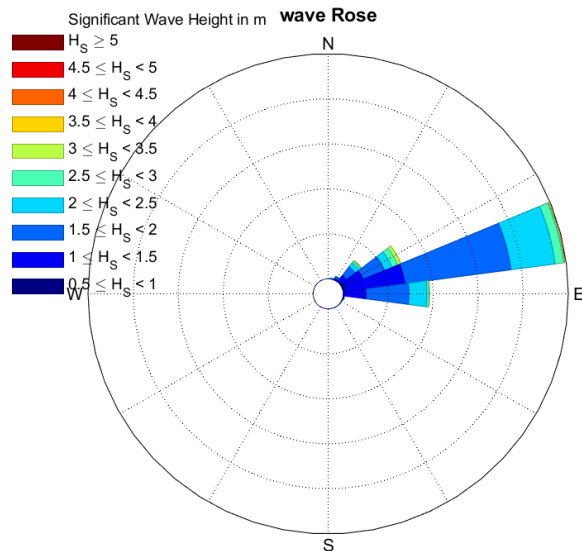
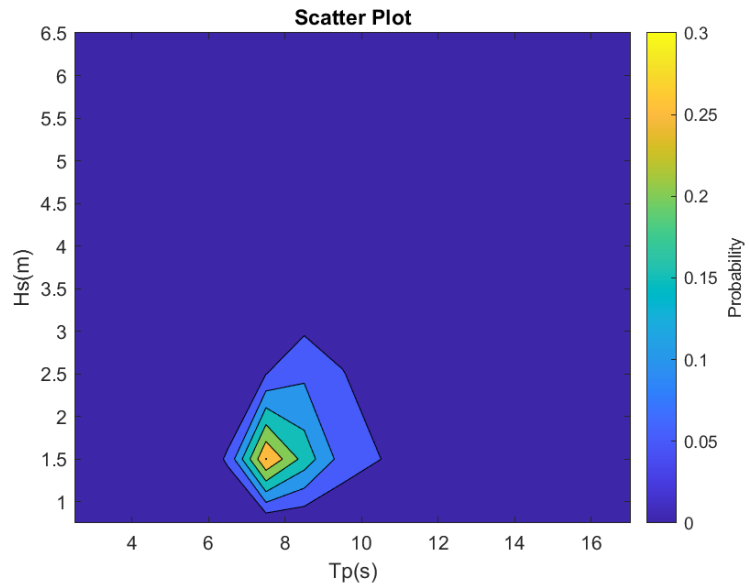
Copernicus
Marine Service

- Geophysical

Incl. extremes



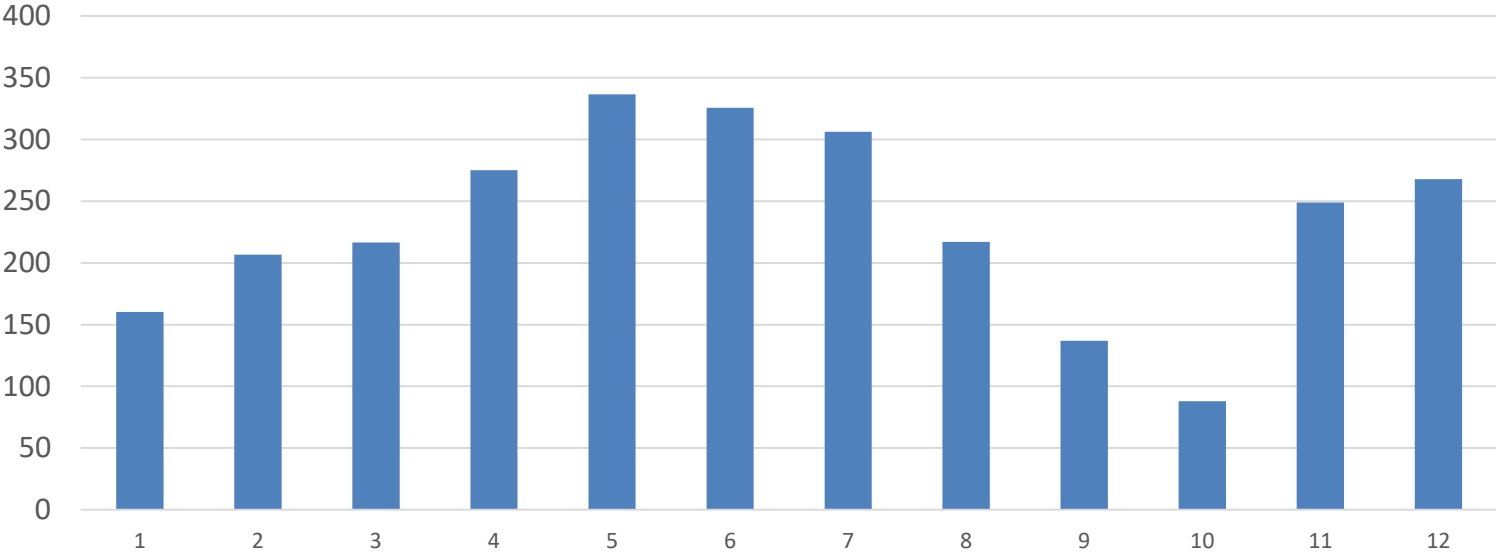
Isolate the data for the best locations



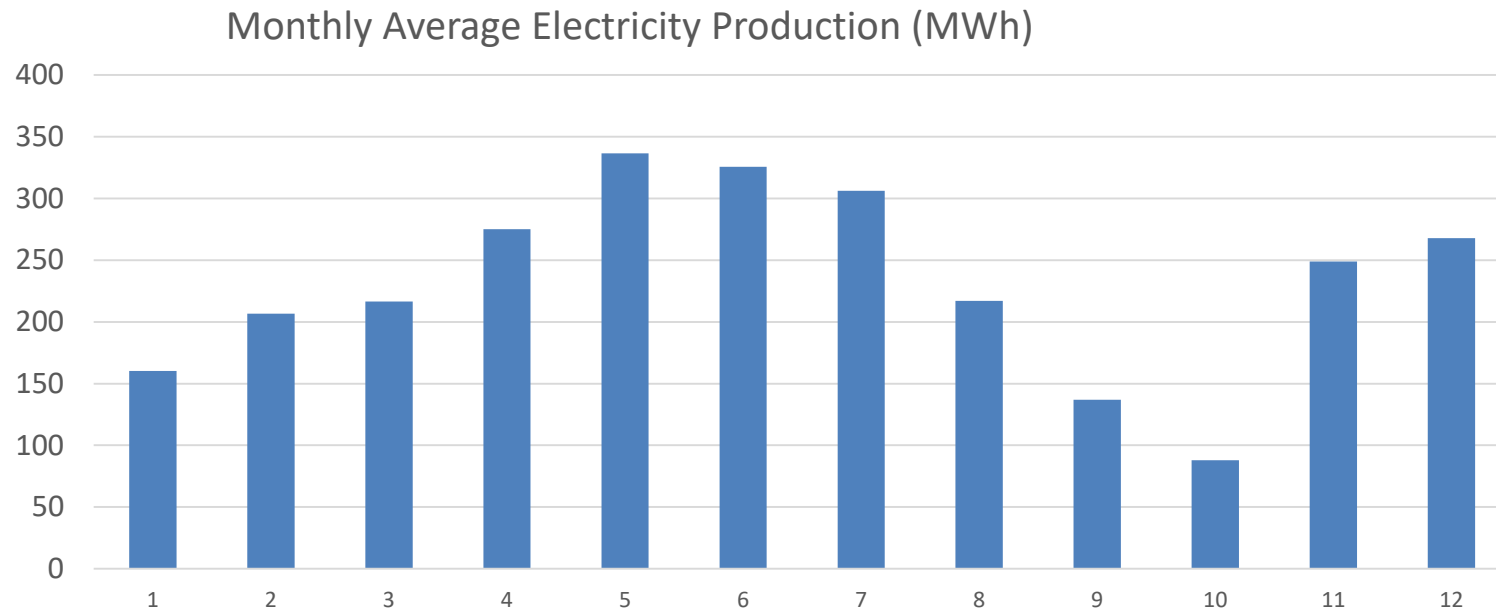
Plocan = 620 MWh/year

Conclusion Based on the Wavepiston Energy and Cost Tool

Monthly Average Electricity Production (MWh)



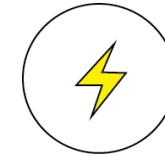
Conclusion Based on the Wavepiston Energy and Cost Tool



GO / NO GO?

CAPEX - OPEX

LCOE



LCOW

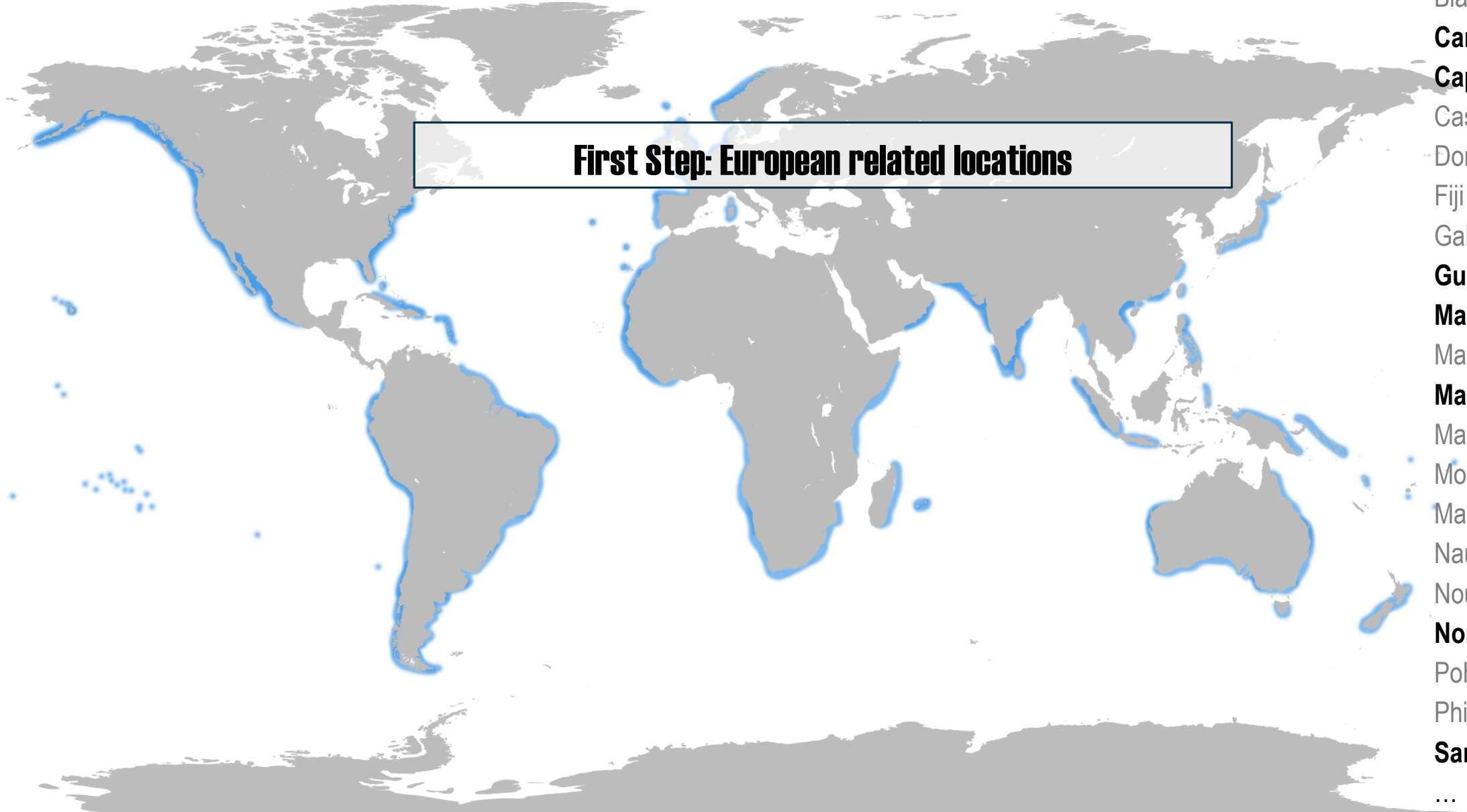


- Wave, Current, Tide
- Extremes
- Geophysical

ALSO

**Other relevant criteria e.g.
Region, Political, Support etc.**

Locations Analysed for (Pre-)Commercial Projects

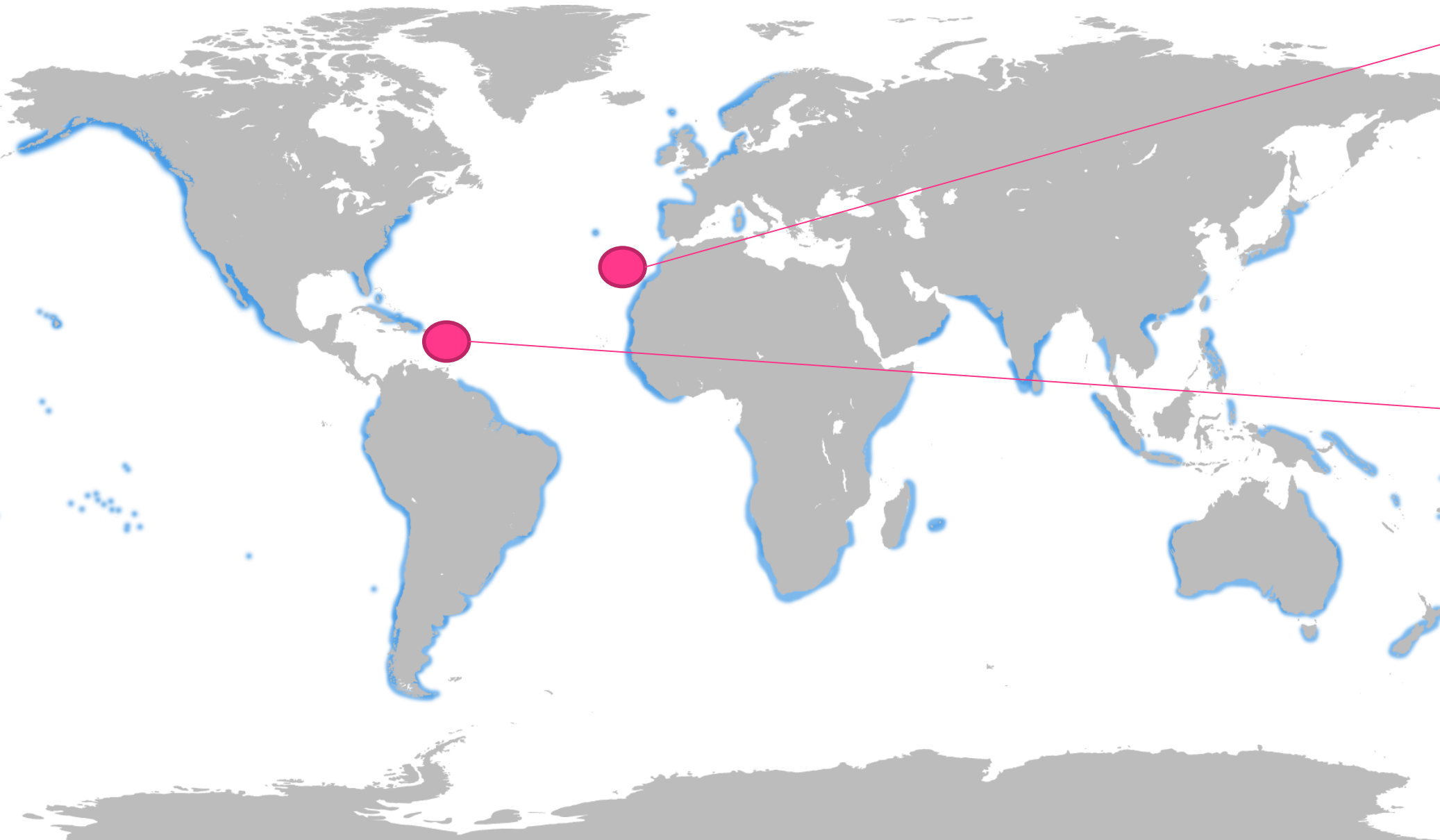


First Step: European related locations

- Bermuda
- Black Sea
- Canary Islands**
- Cap Verde**
- Caspian Sea
- Dominican Republic
- Fiji
- Galapagos
- Guadeloupe**
- Malta**
- Maldives
- Martinique**
- Mauritius
- Mozambique
- Marshall Islands
- Nauru
- Nouakchott
- North Sea**
- Pohnpei
- Philippines
- Sardinia**

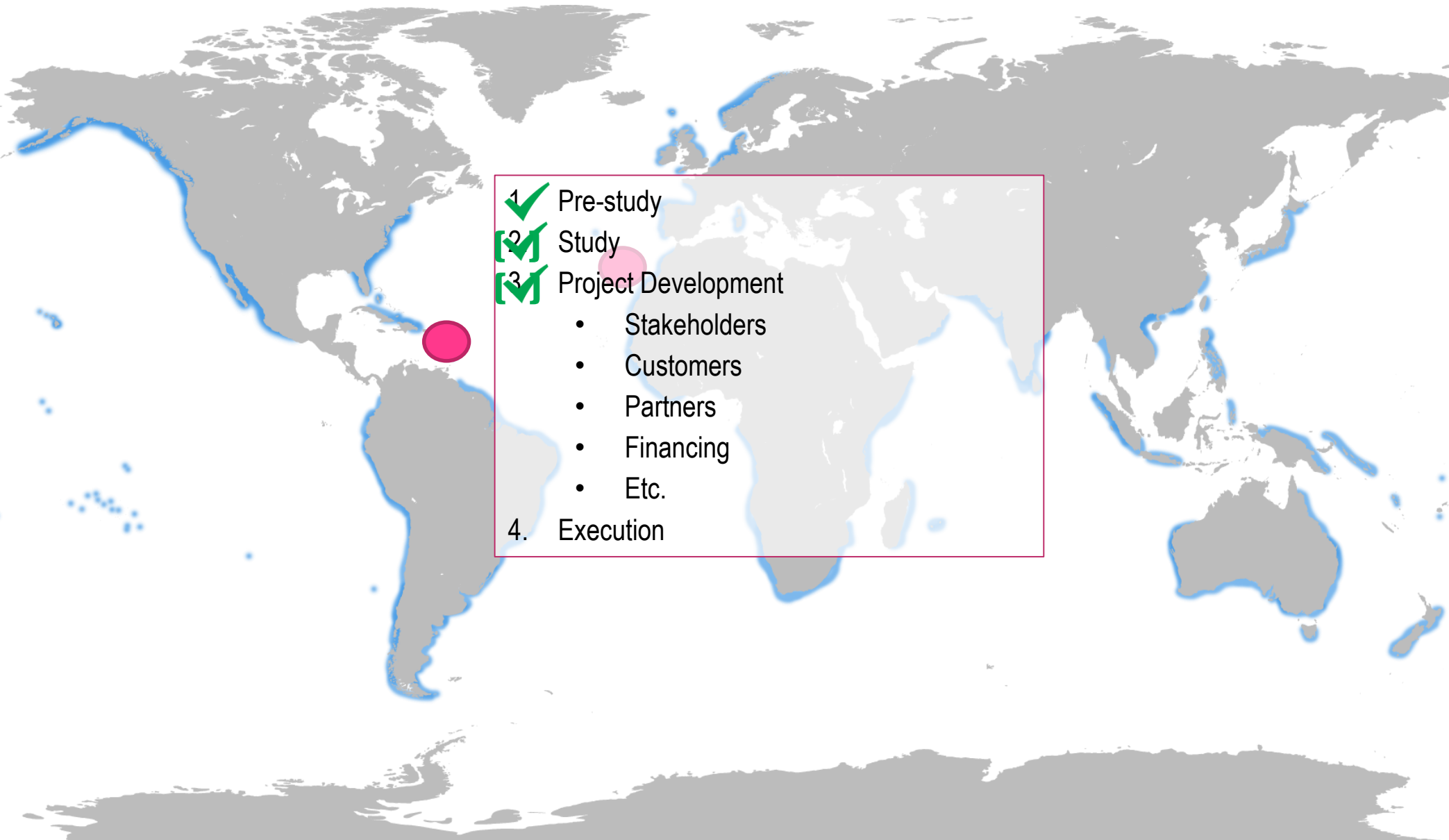
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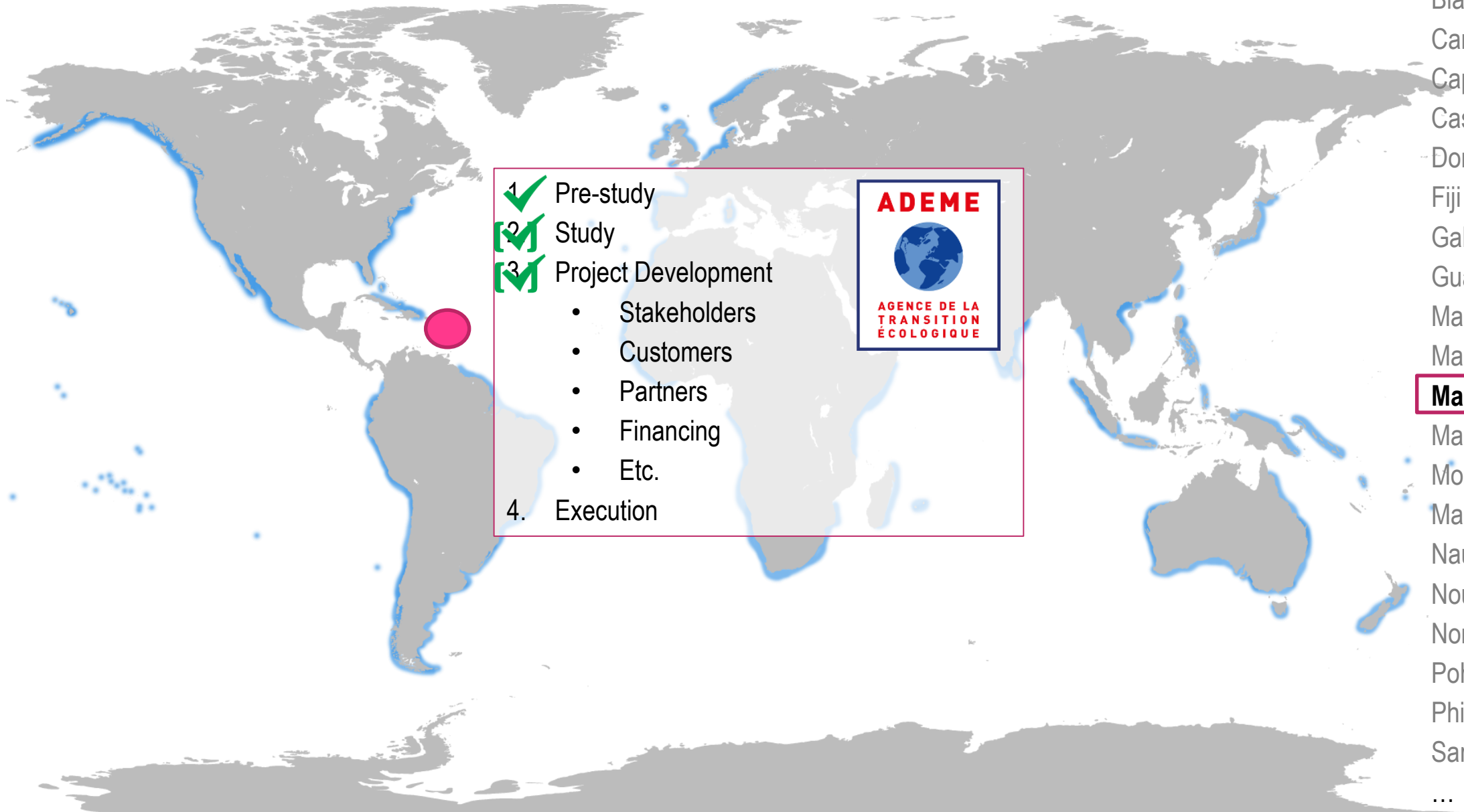
Locations Analysed for (Pre-)Commercial Projects



- 1. ✓ Pre-study
- 2. ✓ Study
- 3. ✓ Project Development
 - Stakeholders
 - Customers
 - Partners
 - Financing
 - Etc.
- 4. Execution

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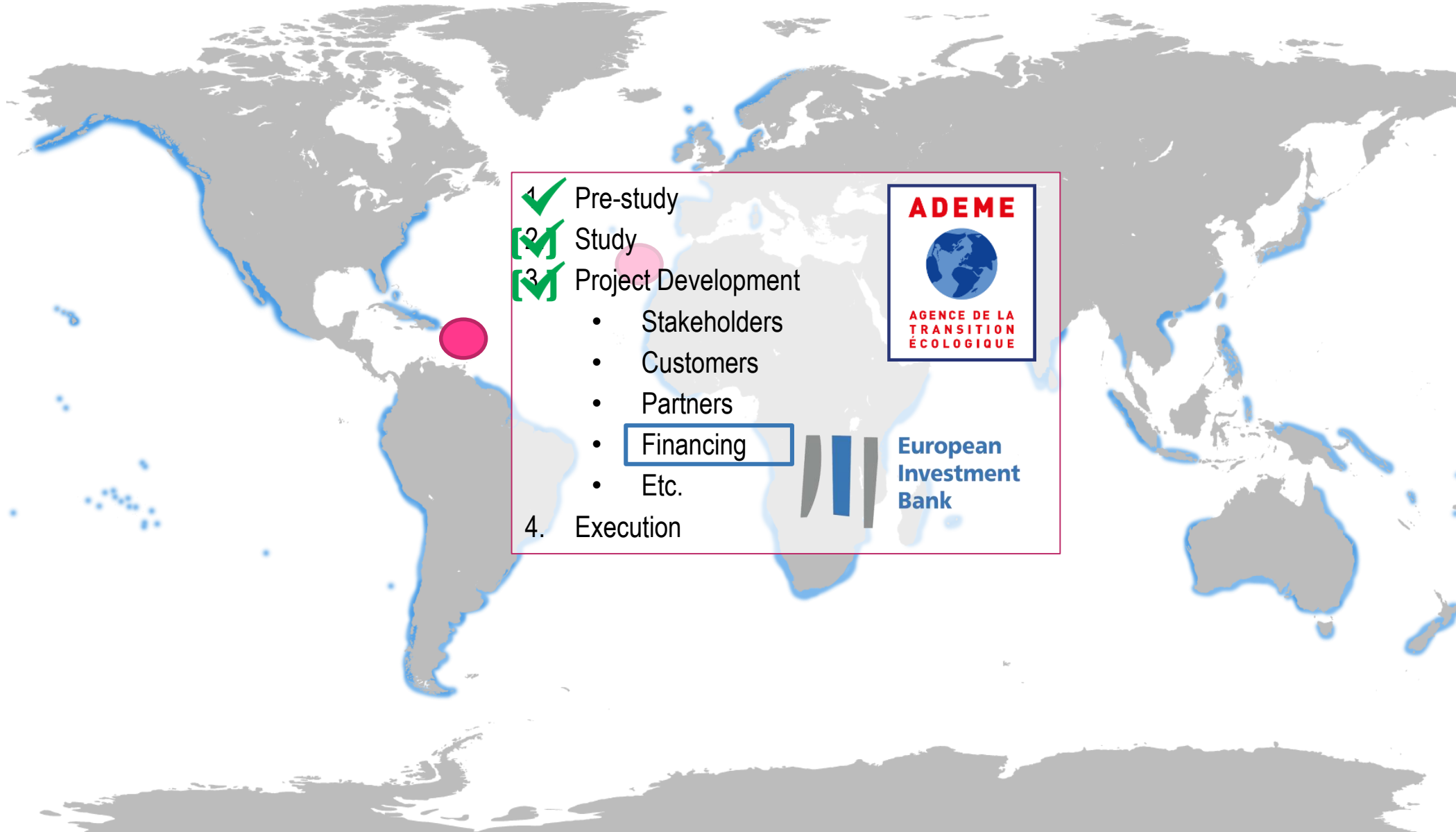
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OCEAN AND ENVIRONMENTAL
TECHNOLOGIES AND SERVICES



Renewable
Energy &
Desalination

Broad,
Conceptual
Patent

Simple, Robust,
Standard,



We Make Wave Energy Competitive

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