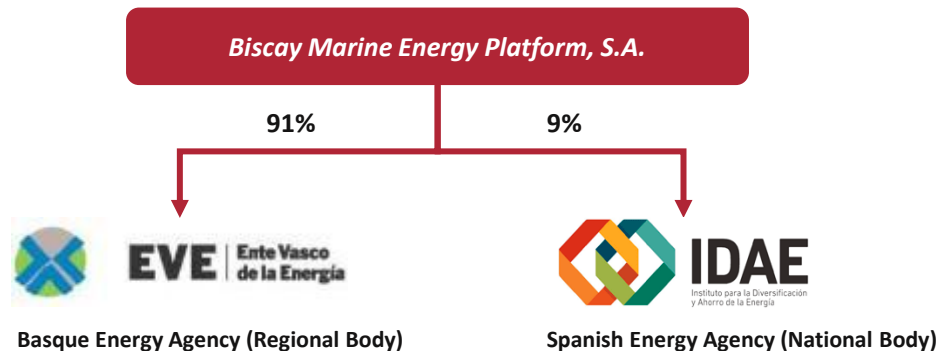


Biscay Marine Energy Platform, *bimep*



MANAGING BODY

- Biscay Marine Energy Platform, S.A.
 - Established in December 2011
 - To develop, install, operate and manage the *bimep* facility.
- The development and construction of this infrastructure amounted a total investment of €20 million.



Biscay Marine Energy Platform

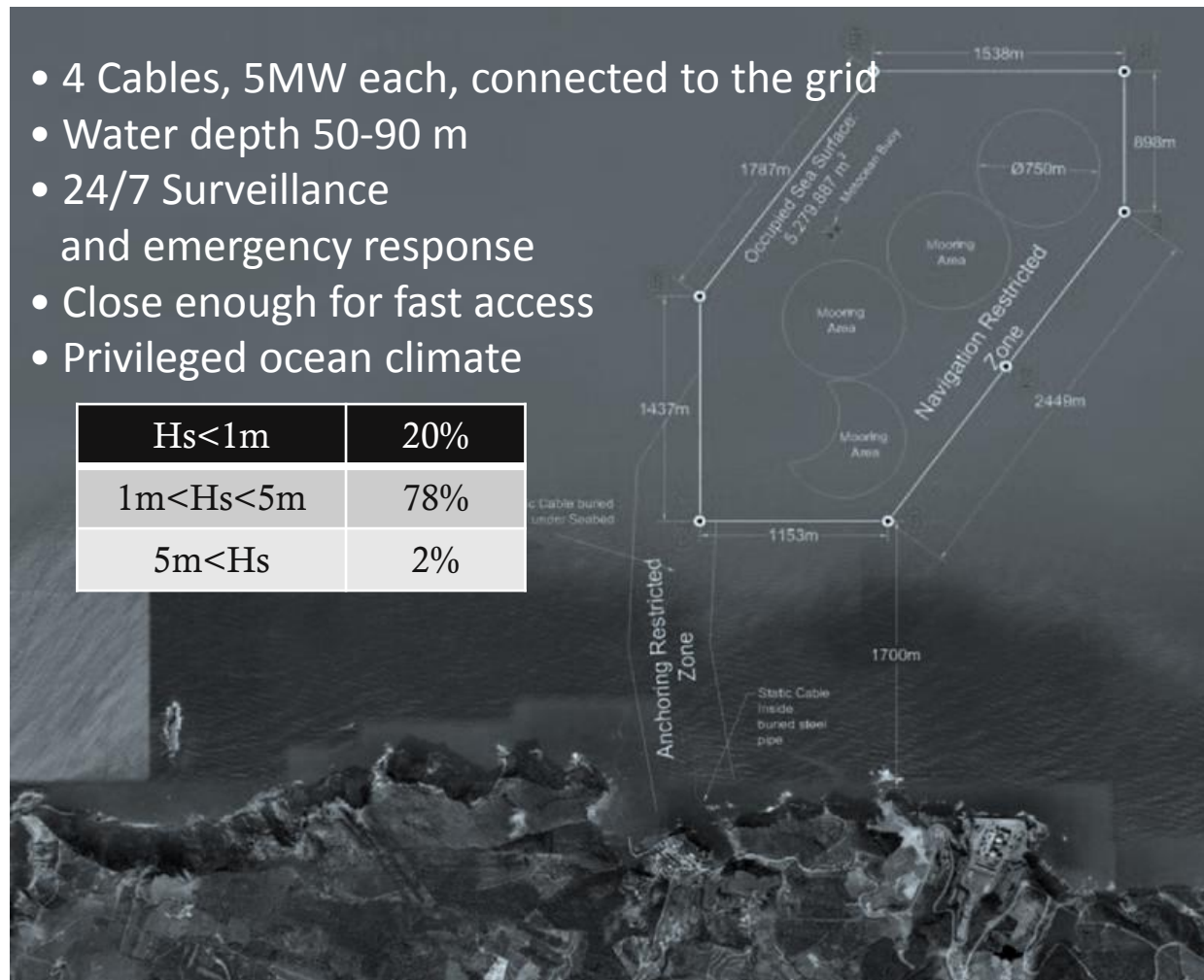


A highly industrialized and dynamic region of Europe

Open sea test centre

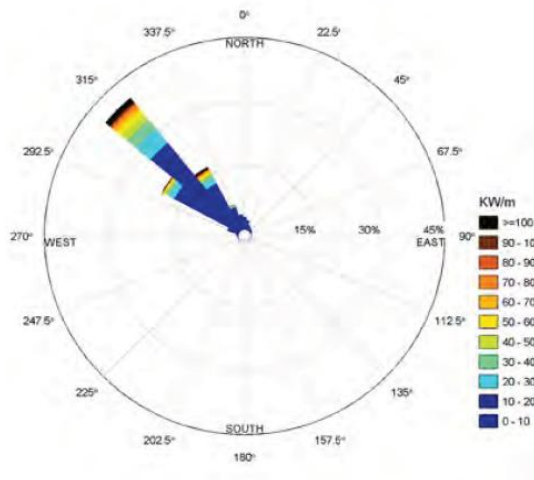
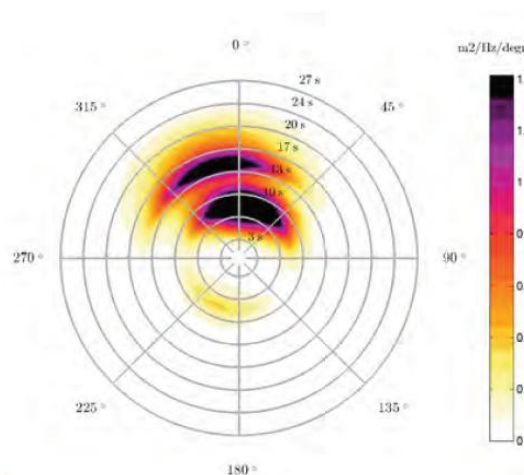
- 4 Cables, 5MW each, connected to the grid
- Water depth 50-90 m
- 24/7 Surveillance and emergency response
- Close enough for fast access
- Privileged ocean climate

Hs<1m	20%
1m<Hs<5m	78%
5m<Hs	2%



RESEARCH CHARACTERISATION

Example of a composed spectrum in the study area. Three different spectral components are observed: one wind swell form the NNE, one swell from the NNW and one sea form the SSW.



Mean annual wave power rose at the BiMEP buoy location.

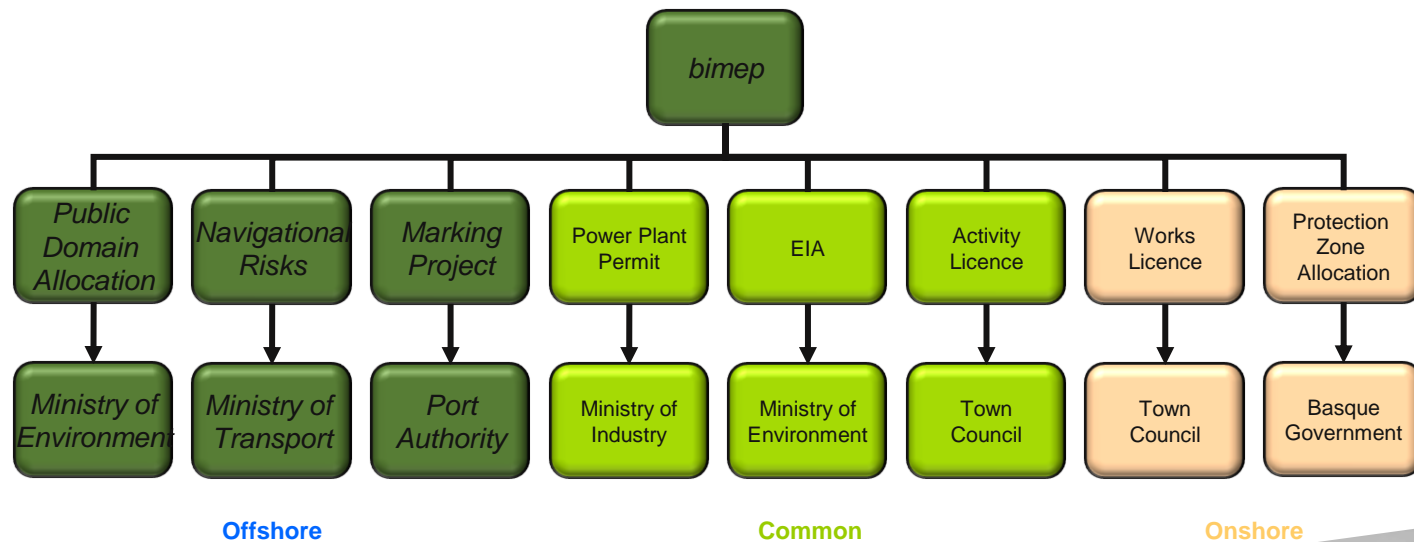
Return Period (yrs)	1	10	50	100	200
<i>H_s</i> (m)	6,54	8,39	9,68	10,23	10,79
<i>95% confidence interval</i>	[6,23-6,84]	[7,67-9,09]	[8,6-10,75]	[8,99-11,47]	[9,39-12,19]
<i>T_e</i> (s)	14,78	16,51	17,72	18,24	18,76
<i>95% confidence interval</i>	[14,5-15,1]	[15,9-17,13]	[16,79-18,64]	[17,18-19,29]	[17,57-19,95]

Return Level estimates of *H_s* and *T_e*.

OTHER ASPECTS

Pre-permitted test site

- Minimum red tape
- *bimep* liaises with and reports to the authorities (before and after the trials)



High safety standards

- **Risk based approach to identifying potential risks**
- **Preventive measures**
 - Cardinal buoys according to IALA
 - SCADA system to monitor WECs' position and alarms
 - Surveillance of the area (by means of personnel, video and rapid intervention boat)
 - Tow boats available 24/7 for emergencies
- **Guidance on Safety Considerations for the installation of MREDs at *bimep***
 - Developers to provide a detailed risk assessment and full documentation
- **Protocol to Respond to Navigational Risks Incidents**

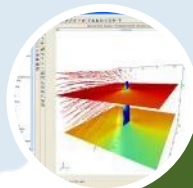


ALLIANCE WITH IH CANTABRIA

Our joint technological offer covers the life cycle of MRE new concepts:

- Metocean conditions assessment
- Advanced numerical models
- Commission and decommission plans
- Operation and Maintenance
- Techno-economical feasibility assessment

01 >



TRL 1 - 3

Short and long term metocean condition assessment, Advanced numerical models, Design Engineering, techno economic feasibility

02 >



TRL 4 - 5

Concept validation, Small and large scale testing, numerical model calibration/validation

03 >



TRL 6 - 8

Proof of concept, sea trials, detailed monitoring, advanced engineering

04 >



TRL 9

Installation plan, O&M strategies, Business model assessment...

OUR PROPOSAL | **TRL+**

BASQUE COUNTRY VALUE CHAIN



DESIGN AND ENGINEERING OF WAVE GENERATION SYSTEMS



WEC COMPONENTS AND SYSTEMS STRUCTURE



ENERGY CONVERSION SYSTEM



AUXILIARY CONVERTER EQUIPMENT



MONITORING AND CONTROL EQUIPMENT



MOORING AND POSITIONING SYSTEM



GRID CONNECTION



ON-SITE INSTALLATION OF DEVICES



MAINTENANCE AND PERFORMANCE ANALYSIS



GENERATING PLANTS AND SITE STUDY



TESTING AND EXPERIMENTATION INFRASTRUCTURES



KNOWLEDGE/R&D PLAYERS



OUR FIRST WEC

- OCEANTEC



- 3 year trials starting this summer
 - The last 2 under Open Sea Experience to Reduce Wave Energy Cost, OPERA, project (H2020)



An excellent place to get your feet wet

Thank you very much

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