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MARINE RENEWABLE ENERGY

BASQUE COUNTRY

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Overview of the region

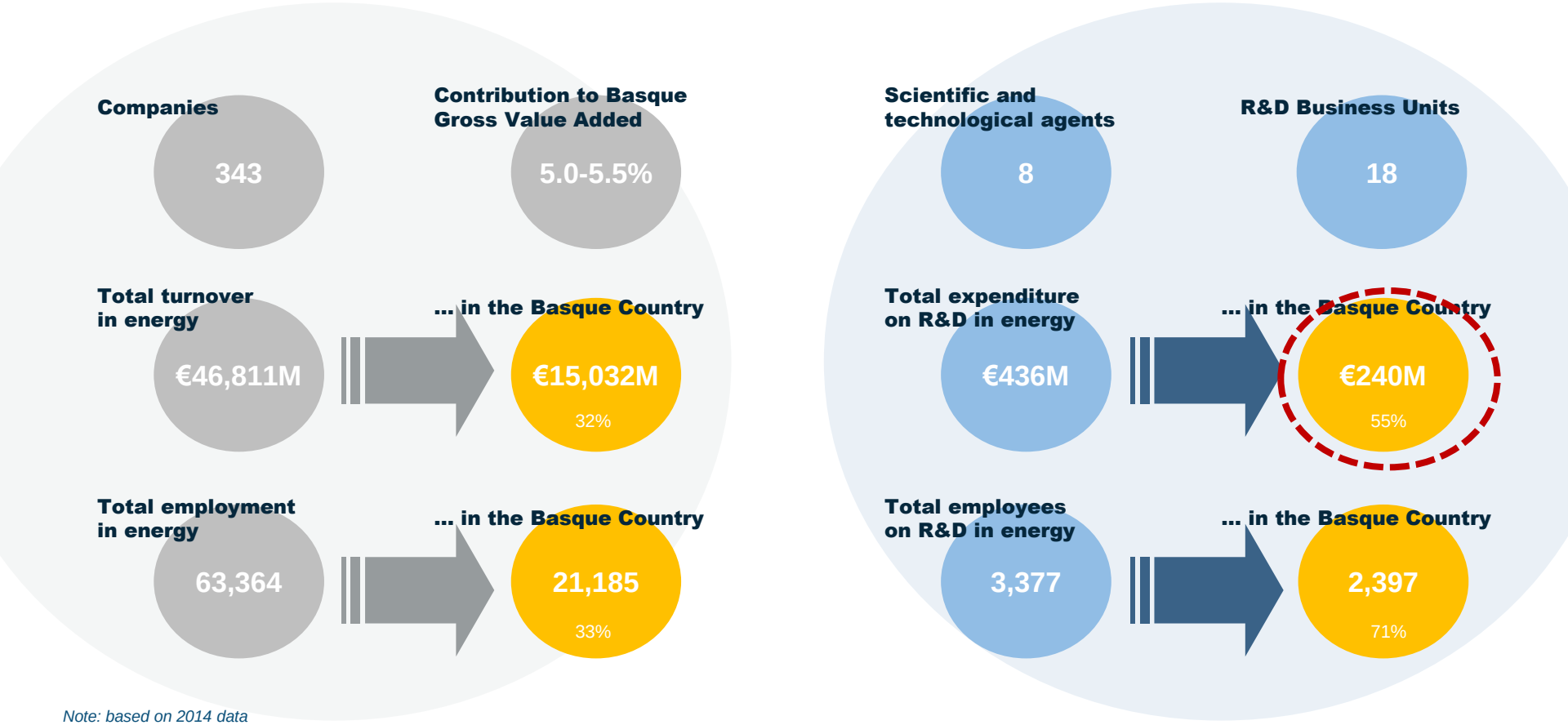
Objectives of the Basque Energy Strategy 3E2030

- Achieve **primary energy savings** of 1,250,000 toe per year between 2016 and 2030, equivalent to a saving of **17%** in 2030.
- Increase the use of **renewable energy by 126%** to achieve a utilisation of 966,000 toe by 2030.
- Promote an exemplary commitment by the **Basque public administration** that allows a **reduction in the energy consumption in its facilities by 25%** in 10 years.
- Achieve a **25% share for alternative energy use in road transport**, contributing to the progressive breaking of the dependence on oil and the use of more sustainable vehicles.
- Increase the contribution of **cogeneration and renewable energy for power generation** so that this **rises from 20% in 2015 to 40%** in 2030.
- **Improve the competitiveness** of the network of companies, technology centres and Basque scientific agents, promoting 9 priority areas for research, technological and industrial development in the energy field, **in line with the RIS3** strategy for smart specialisation in the Basque Country.
- Contribute to the mitigation of climate change by **reducing greenhouse gas emissions** by 3 Mt per year through energy measures, representing a reduction of **35%** of energy-related GHG emissions relative to 2005.

Overview of the region

The Basque Energy Cluster comprises 350 companies, with a total turnover of nearly €50 billion and more than 64,000 jobs worldwide, …

Key figures of the Basque energy cluster (2013)

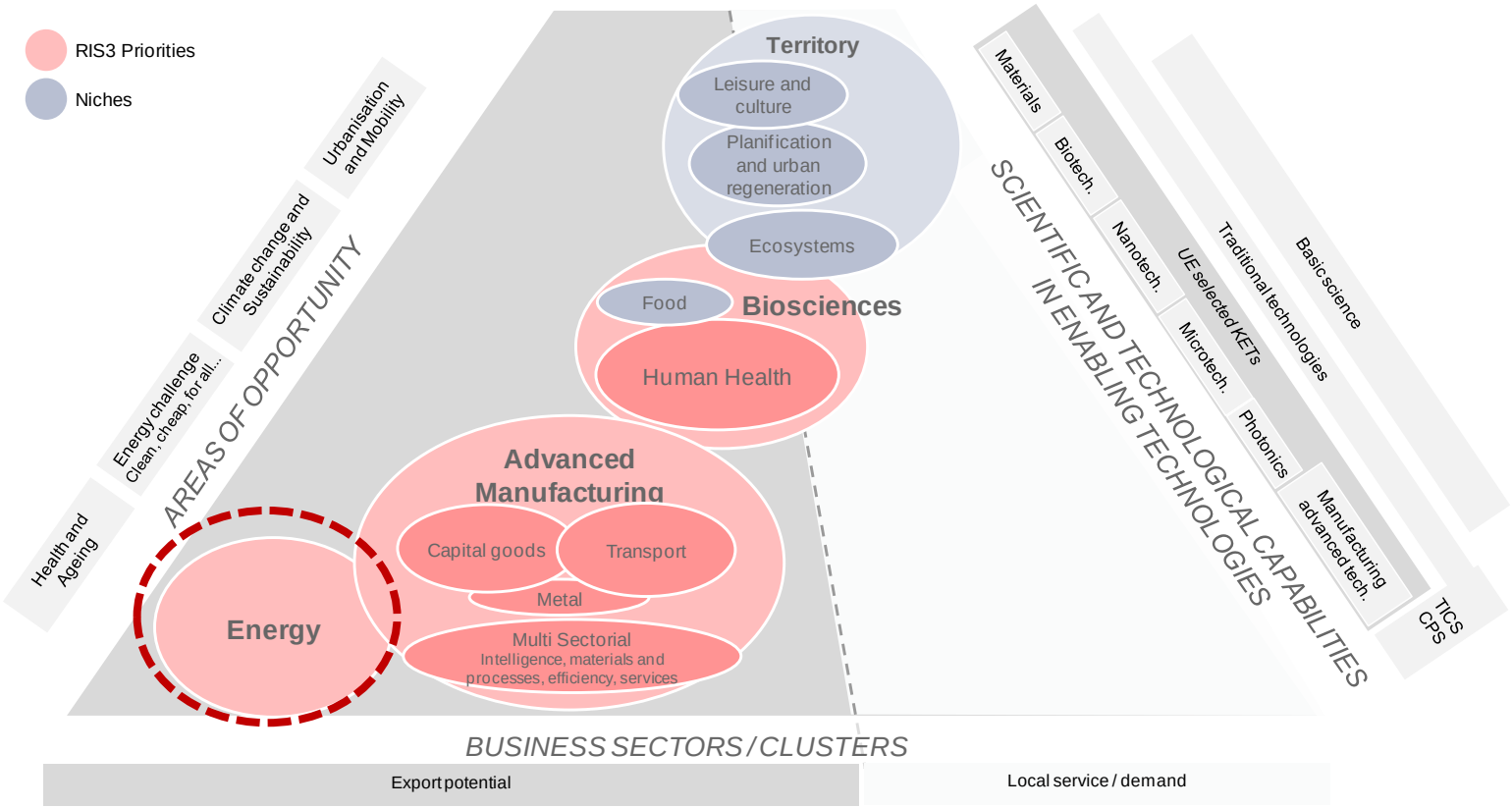


Note: based on 2014 data

RIS3 Energy

Based on these competitive advantages, the Basque Country has chosen Energy as one of its top three priorities within its RIS3 strategy

Priorities of Basque RIS3 strategy



RIS3 Energy

The Energy priority has been defined through an exhaustive Entrepreneurial Discovery Process that has involved agents from the triple helix

8
Grupos de Trabajo

234
participantes

136
organizaciones

7
agentes I+D

tecnalia Inspiring Business
IK4 Research Alliance
MONDRAGON UNIBERTSITATEA
azti tecnalia
UPV EHU
CIC energiGUNE
bimep

3
entidades

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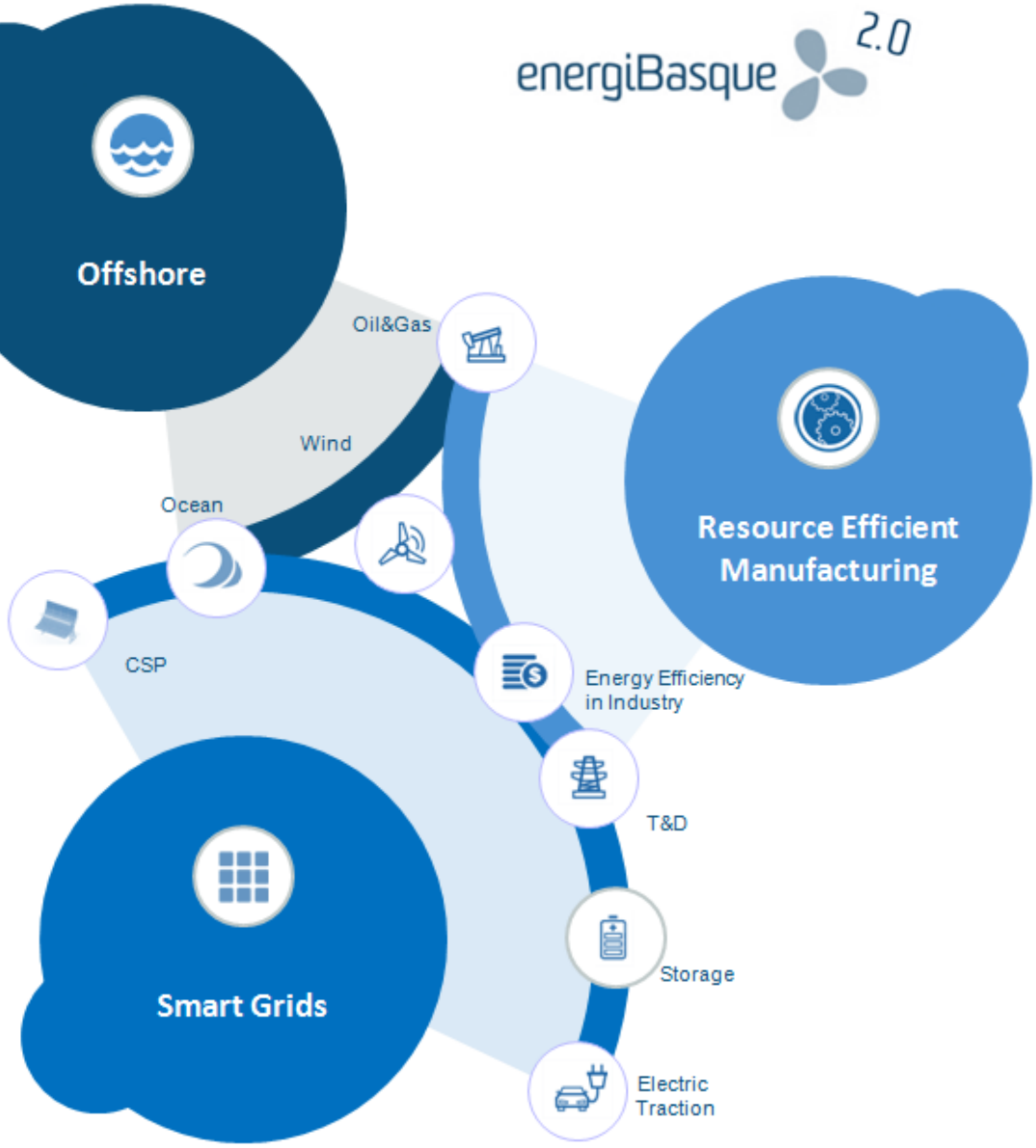
EVE
innobasque

RIS3 Energy

energiBasque 2.0



The result consists on 8+1 strategic areas (power electronics as key enabling technology) around 3 main value chains

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Cluster Energía
BASQUE ENERGY CLUSTER

The Marine Renewable Energy capabilities in Basque Country

	Companies in the value chain	Turnover (M€)	Employees (Basque Country)	R&D expense (Basque Country, M€)	Examples of Leading Companies
WIND	**105**	713	3.013	39	Gamesa, Ingeteam, IBERDROLA
WAVE	**31**	8	74	7	IBERDROLA, OCEANTEC, bimep

State of play MRE

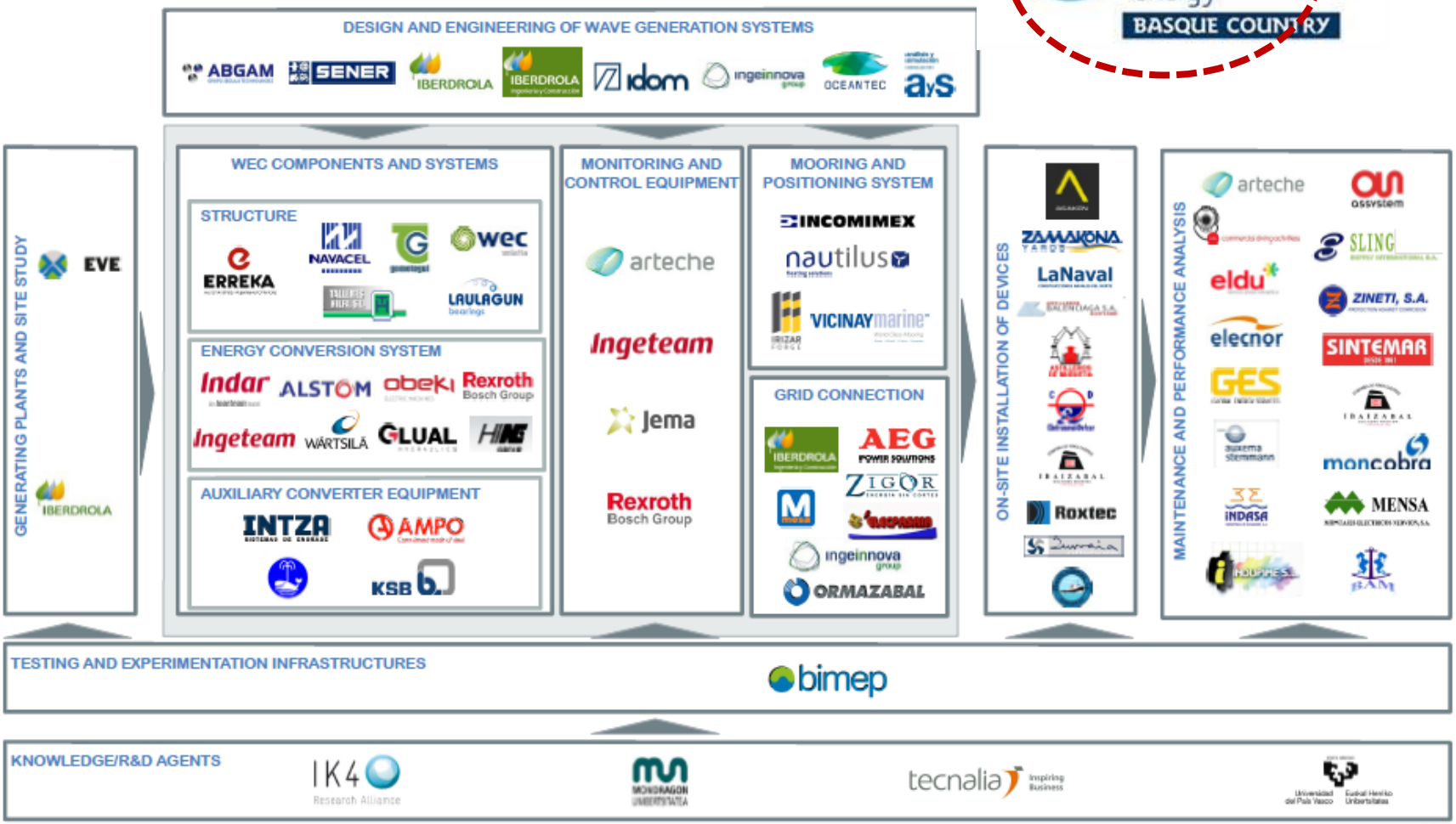
Offshore Wind value chain

offshore wind energy BASQUE COUNTRY

State of play MRE

Wave energy value chain

wave energy BASQUE COUNTRY



State of play MRE

Challenges for European offshore energy industry

MAIN INDUSTRIAL CHALLENGE

ADDED VALUE AT COMPETITIVE COST

TECHNOLOGY CHALLENGES

- IMPACT IN INVESTMENT COSTS
- IMPACT IN OPERATING COSTS
- MANUFACTURING OF LARGE COMPONENTS
- SENSING, INSTRUMENTATION AND MONITORING
- POWER TRANSFER AND CONVERSION
- O&M OPTIMISATION
- CORROSION IN WATER
- TESTING AND DEMONSTRATION IN REAL ENVIRONMENT

State of play MRE

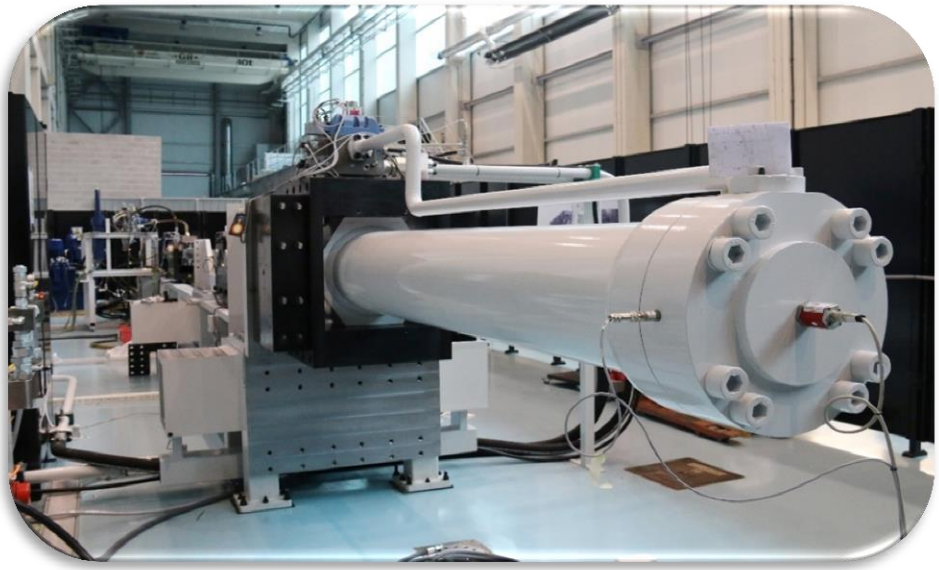
Testing and validation infrastructure for offshore wind

WINDBOX ADVANCED MANUFACTURING CENTRE -public-private collaboration

. Basque Government supports initial investment
. Cluster manages the infrastructure
. Research Center operates the facility
. Industry Consortium supports operation
. Open access to any user

ADVANCED TEST AND VALIDATION CENTRE FOR WIND POWER
Testing capabilities for

- **BLADE AND HUB BEARING**
- **HYDRAULIC PITCH SYSTEM**
- **YAW**
- **GENERATOR**



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Cluster Energía
BASQUE ENERGY CLUSTER

State of play MRE

Testing and validation infrastructure for wave energy

BIMEP provides manufacturers of ocean energy devices with the opportunity to install their equipment in open sea conditions for demonstration and operational (power generation) purposes or for testing.
Key characteristics of the platform include:

- 20 MW of power
- 4 connection points for WECs.
- Easy WEC installation, testing and operation.
- An associated research centre

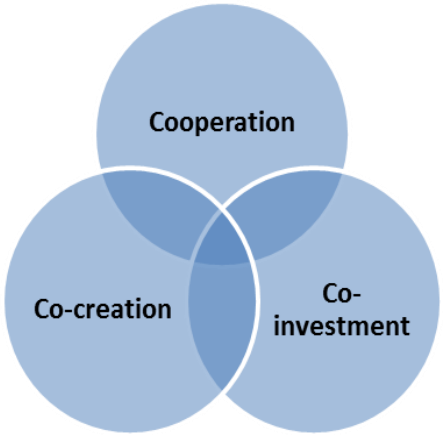
bimep is equipped with modern subsea infrastructure for onshore grid connection and a comprehensive remote monitoring and control system for the systematic compilation and analysis of data on the systems being tested at sea.

Interregional cooperation

Vanguard Initiative

The **Vanguard Initiative** is a coalition of European regions committed to boost the **growth of their companies,** based on technological development, inter-regional cooperation, bottom-up entrepreneurial innovation and industrial leadership.

1. **Advanced Manufacturing for Energy Related Applications in Harsh Environments**
2. **High Performance Production with 3D Printing**
3. **Efficient and Sustainable Manufacturing**
4. **Biobased Economy**
5. **Nanotechnology**



30
regions

VANGUARD INITIATIVE
New growth through smart specialisation

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Interregional cooperation

ADMA for Energy Related Application in Harsh Environments Pilot Action

Which are the critical challenges and trends in MRE value chain?

Which technology developments are needed to tackle them?

Input

Research institutions

Pivotal companies

SMEs

Discussion and analysis

ADMA for Energy technology roadmap

Bottom-up approach

VI regions' industry's opinion and contribution to EC's industrial policy

Capability mapping

Technology roadmapping

Industry challenge mapping

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