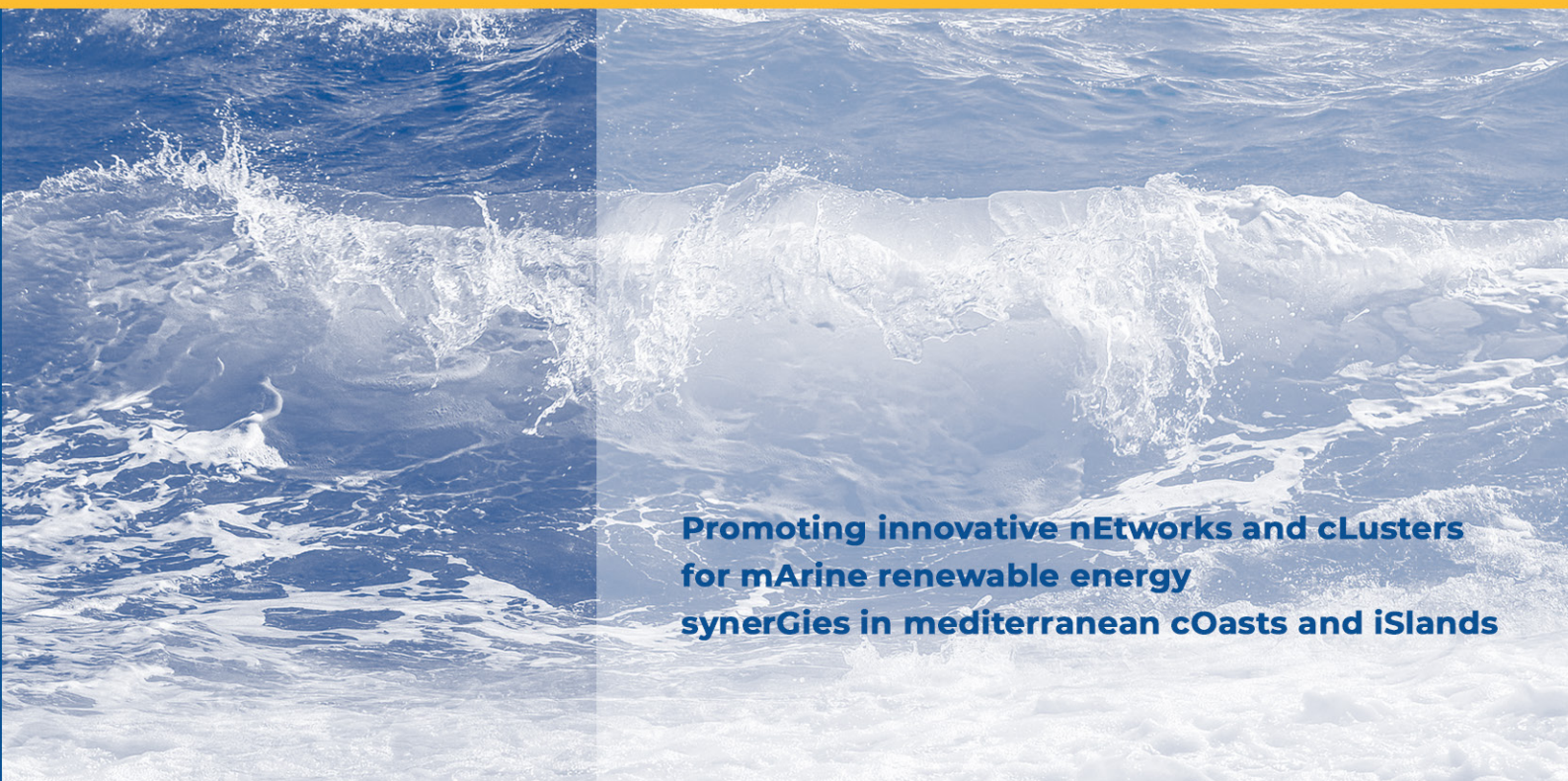
Interreg Mediterranean

EUROPEAN UNION

PELAGOS

Project co-financed by the European Regional Development Fund

Plan for the transferability of the Blue Energy Cluster and service to other emerging sectors



Promoting innovative nEtworks and cLusters for mArine renewable energy synerGies in mediterranean cOasts and iSlands

Title: **Plan for the transferability of the Blue Energy Cluster and service to other emerging sectors**

Programme: **MED INTERREG 2014-2020**

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Objective: 1.1. **To increase transnational activity of innovative clusters and networks of key sectors of the MED area**
Project Title: **Promoting innovative nEtworks and cLusters for mArine renewable energy synerGies in mediterranean cOasts and iSlands**
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Interested to know more about PELAGOS initiative, visit our website:
https://pelagos.interreg-med.eu/

You can also apply to become a member of the Blue Energy Cluster in the Mediterranean, 456 actors from 7 European countries are already involved: *www.be-cluster.eu*

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Glossary

Array	Series of 4 or more devices experiencing wake interactions
BE	Blue Energy: it comprises Marine Energy and energy from marine biomasses
BG	Blue Growth: EU long term strategy to support sustainable growth in the marine and maritime sectors as a w Sustainable use of ocean resources for economic growth hole
Blue Economy	Sustainable use of ocean resources for economic growth
EU	European Union
Farm	Wind/Ocean Energy Power plant composed of two or more turbine/arrays
FID	Final Investment Decision
FOW	Floating Offshore Wind
ICT	Information Communication Technology
kW	Kilo Watts
LCoE	Levelized Cost of Energy
ME	Marine Energy: Offshore Wind and Ocean Energy
MRE	Marine Renewable Energy
MW	Mega Watts
O&G	Oil and Gas
O&M	Operation and Maintenance
OE	Ocean Energy: energy from the ocean (wave, tidal, thermal/salinity gradients)
OEE	Ocean Energy Europe
PTO	Power Take Off
R&D	Research and Development
R&I	Research & Innovation
Real sea condition	Deploy at sea, there is no control over the environment
Relevant environment	Deploy at sea, there is no control over the environment. Experiencing all the complex phenomena relevant to an ocean energy farm
SET Plan	Strategic Energy Technology Plan
SRA	Strategic Research Agenda
SRIA	Strategic Research and Innovation Agenda
TRL	Technology Readiness Level
WE	Wind Energy
WEC	Wave Energy Converter

TRL Definition

TRL 1	Basic principles observed
TRL 2	Technology concept formulated
TRL 3	Experimental proof of concept
TRL 4	Technology validated in lab
TRL 5	Technology validated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 6	Technology demonstrated in relevant environment (industrially relevant environment in the case of key enabling technologies)
TRL 7	System prototype demonstration in operational environment
TRL 8	System complete and qualified
TRL 9	Actual system proven in operational environment (competitive manufacturing in the case of key enabling technologies; or in space)

1. PELAGOS - A metacluster project for the development of Blue Energy in the Mediterranean

The oceans and seas play an essential role in the present and the future of humanity due to their significance of controlling natural conditions, the services they provide to citizens, and their potential to provide the resources to meet the demands of a growing population. All this poses the oceans as a major source of opportunities and technological challenges, but also as an environment likely to be altered and impaired by human activities and their substantial and irreversible consequences on a planetary scale.

The European Commission has launched several initiatives to maintain and further develop the leadership that European countries have historically had in the expertise and application of knowledge and technologies for the use and exploitation of the ocean. Among them, it is worth noticing the long-term strategy on Blue Growth, which intends to support sustainable growth in the marine and maritime sectors as a whole on three components:

- Develop high potential sectors for sustainable jobs and growth (Aquaculture, coastal tourism, marine biotechnology, ocean energy & seabed mining);
- Provide knowledge, legal certainty and security in the blue economy (marine knowledge, maritime spatial planning and integrated maritime surveillance);
- Define sea basin strategies to ensure tailor-made measures and to foster cooperation between countries.

*Harnessing the ec*onomic potential of this energy in a sustainable manner has been highlighted in the Blue Growth Strategy as one of key areas, where in order to build the necessary capacity and critical mass, it is necessary to involve a wide range of stakeholders.

The Mediterranean Sea bears 30% of global sea-borne trade[1] in volume from or into its more than 450 ports and terminals, and a quarter of worldwide sea-borne oil traffic. Its coasts are home to more than 150 million inhabitants, a figure that doubles during the tourist season.

Taking into considerations these factors and the lack of terrestrial space, Marine Renewable Energy are an appropriate answer to address these challenge. The importance of exploitation of ocean energy resources is due to the rapidly increasing need to replace fossil fuels with sustainable energy.

The sea represents a huge resource for renewable energy (Blue Energy, BE) such as wind, waves, tides and marine currents.

In this context, PELAGOS project has been selected in 2015 by the INTERREG MED Programme to increase the innovation capacities and cooperation of BE actors in MED through promoting the creation (or enhancement) of national hubs and of a transnational Mediterranean cluster, the Blue Energy Cluster.

This document intends to provide to other maritime clusters and business networks an overview of the activities developed, the innovative approach followed and the results achieved.

1.1. The clustering approach

PELAGOS has facilitated the deployment of targeted solutions and products tailored to Mediterranean profile through the creation of local hubs and a Blue Energy cluster. The consortium was composed by heterogeneous actors and most of the countries represented in the PELAGOS initiative did not have any cluster initiatives and/or supported policies dedicated to marine renewable energy.

[1] Mediterranean Connections : Maritime Transport Containers and Seaborne Trade in the Bronze and Early Iron Ages - 2016

One of the first activity of the project was dedicated to increase the awareness of the project partners about the main characteristics and benefits to implement a clustering approach.

A jointly agreed methodology defined that each represented country has to create local hubs which can be defined as national clusters gathering actors from the 4 helix (Industry, Research and Academics, Public authorities and the civil society).

Based on these local hubs, a transnational Mediterranean cluster is created, the so called **Blue Energy Cluster**. It aims to connect Regions and key actors of the Blue Energy value chain such as technology and service providers, large enterprises, power distributors, financial operators, policy makers, NGOs and of course citizens at the Mediterranean sea basin level.

The aim is to strengthen the networking opportunities between its various players in the perspective of stimulating innovation, project development, technology transfer and economies of scale.

In this framework, 7 national hubs were launched in 7 European countries: *Croatia, Cyprus, Greece, France, Italy, Portugal and Spain* gathering local actors from the industry, research and academics, public authorities and civil civil society.

1.2. The initiative in a nutshell

PELAGOS followed a two-step approach. Firstly, a studying phase was performed consisting in capitalizing and fine-tuning previous experiences and knowledge from and outside the consortium. Relying on this analysis, in a second step, an implementation phase was launched to start the local hubs and the Blue Energy cluster, as well as to deliver services to their members, in order to support their development.

1.2.1 Study and definition of the Marine Renewable Energy potential in the Mediterranean

- **A portfolio of technologies**

The purpose of this activity was to review the technologies in the Marine Renewable Energy sectors, both those currently used and those under development. This analysis allowed to identify the most innovative domains and the technologies that could be fully adapted to the Mediterranean context.

The wave energy sector is by far the richest of innovations, mainly due to the variety of different solutions proposed, however due to a lack of convergence in the proposed technologies, each of them at a prototypal stage of development.

This analysis also pointed out that, in the case of already commercial technologies such offshore wind energy, the main obstacles to its large-scale diffusion in the Mediterranean

Sea are the different policies and regulatory frameworks in these countries.[2]

- **A diagnostic study of the Mediterranean marine energy resources potential**

This activity intended to define and analyse each MRE domain and their level of maturity in the Mediterranean. The main conclusions of this activity led to these findings:

Offshore wind industry is the most promising sector for development while the use of floating wind turbines seems to be well-adapted in the geomorphologic conditions of the basin. Offshore areas of Greece, Italy, France and Spain have high wind energy resource; however, this asset should be combined with other technical, socio-economic and environmental characteristics in order to provide a viable and sustainable solution.

The commercial development of the tidal energy sector is not feasible yet in the Mediterranean. Only specific spots may satisfy the current speed limits for the existing technology of tidal turbines; strait of Messina and straits of Dardanelles are characteristic examples. Subsequently, further studies are essential.

Due to the low maturity level of wave energy converters technology, at the moment it is not possible to identify a best performing device for the Mediterranean basin.

Although the estimated potential of the resource in the Mediterranean Sea is low, the reduced impact of extreme events on devices can make their operational costs affordable. Moreover, hybrid systems such as Multi Use Offshore Platform, combining exploitation of offshore wind and wave, may provide an alternative solution.

Applications of ocean thermal energy and osmotic power in the Mediterranean Sea are currently unlikely due to the high installation and operation costs and the maturity of the corresponding technologies.[3]

Overall, experience has shown that improvement of policy frameworks, simplification of licensing procedures, financial stability and effective financing tools are key parameters to facilitate marine energy in the Mediterranean Sea. Additional significant drivers towards sustainability in the examined basin is the development and establishment of Marine Spatial Planning and Integrated Coastal Zone Management that will confront possible conflicts among the marine/maritime users, combined also with environmental impact assessment studies.

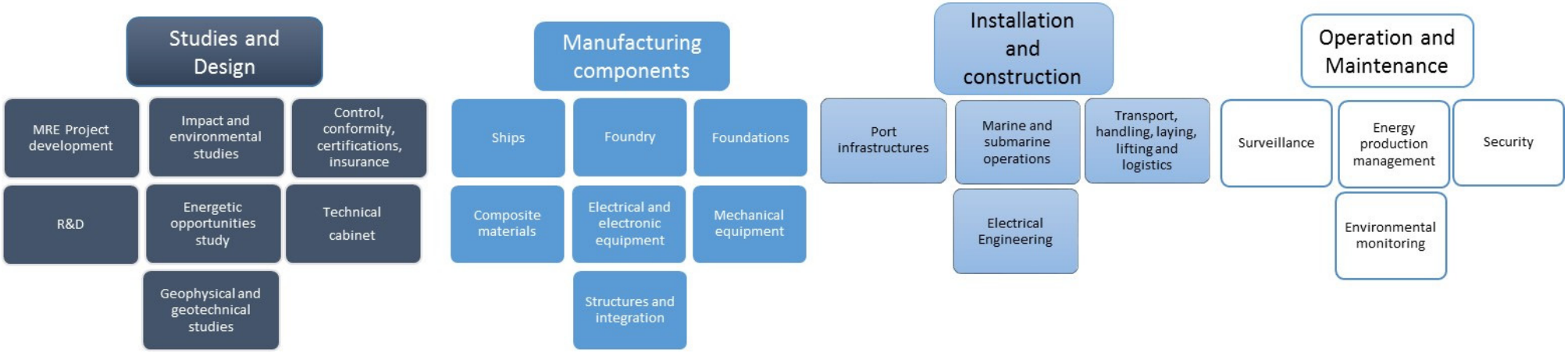
- **Marine Renewable Energy Value chain definition**

The value chain around the development of MRE projects has been defined and detailed at an early stage of the project.

[2] PELAGOS D.3.1.1 Technologies Portfolio Study

[3] PELAGOS D.3.1.2 Diagnostic study of the Mediterranean marine energy resources potential

Marine Renewable Energy Value Chain



- **A collection of past and current MRE demonstration projects**

45 past and current prototyping and/or demonstration projects have been collected and assessed in a single document. The analysis provided an overview of the MRE systems currently developed, their degree of maturity and their level of adaptation to the Mediterranean context. As MRE is at a development stage, the collection of these demonstration projects enables us to study the blue energy technologies developed and their applications to key maritime industries of Mediterranean insular, coastal and marine areas.

Blue energies, with the notable exception of wind energy laid on the sea floor which is broadly deployed in Northern European countries, are at an infant stage with most of the existing technologies still in need to demonstrate their reliability at sea.

Only very few demonstration projects are developed in the Mediterranean Sea. This contrast in the deployment of marine energies between Northern and Southern Europe countries is mainly due to the natural characteristics of these two large areas:

- In the North (Atlantic Ocean, North Sea): strong winds, strong tidal currents in certain zones, powerful waves on the Atlantic coast and water depths rather low in general;
- In the South (Mediterranean): only few windy areas, almost no tide, few straits with currents strong enough and coastal areas with relatively deep water.[4]

1.2.2 Implementation and design of the hubs

The first action to implement the hubs has consisted in identifying the key actors, in each country, with an interest and/or the potential and/or an already existing activity in the MRE domains. This identification targeted different types of stakeholders in line with the 4helix concept of clusters:

- Local and Regional Authorities, Ministries, Regulatory Agencies;
- Enterprises (startups, spinoffs, SMEs, large firms);
- Universities, Research Institutions, Research and Technology Centres, individual researchers;
- NGOs, Business Associations or other Business support organizations (such as Chambers), financial organizations, Energy Agencies / organizations and other support actors.

This first identification has been also made taking into consideration the results of the studying phase, which allowed, for each country, to highlight their potential and their approach towards the development of MRE.

The second action concerned the selection of the most relevant actors to be officially invited to join the hub. This selection has been achieved following desk research, interviews and individual meetings with specific questions regarding:

- The involvement or not in the MRE domains;
- Current or potential position in the MRE value chain;
- Specialization area;
- Type of MRE targeted;
- A justification about the added value the organisation could provide to the HUB and to the PELAGOS Cluster.

The third and last action consisted in involving the selected actors in the hubs, which has been achieved through the organisation of launching events to present the Hubs and its forthcoming activities.

[4] PELAGOS D.3.1.4 Deployment potential assessment of Blue Energy technologies for MED key maritime industries

1.2.3 Design and deployment of support services to the members

PELAGOS has coordinated the offering of a consolidated mix of support activities to all relevant stakeholders in Blue Energy value chain, notably SMEs, by bridging push and pull innovation activities and securing social acceptance.

- **Information and Capacity Building services**

Capacity Building on Entrepreneurship & Technology Transfer: This service consisted in the organisation of seminar on Entrepreneurship, Innovation and Technology Transfer targeted to develop skills and competencies of the attendants on a specific topic using group work exercises, case studies, consulting and training techniques.

Capacity Building on Markets & MRE Technology applications: Seminars organised at local level targeted to increase the knowledge and technical expertise of the attendants on a specific scientific/ sector-based topic using education and training techniques. These seminars increased the capacity of SMEs in technological advances, challenges, future needs, new trends and prospects in the area of MREs; market applications of clean technologies.

Capacity Building on innovation soft-skills development: Seminar targeted to develop skills and competencies of the attendants on soft-skills (business planning, HR, finance, marketing, innovation management, networking partnering, decision making problem solving etc.) using group work exercises and training techniques.

Workshops on Spatial planning, Coastal Zone management and social acceptance of MRE/ on the Environmental impact of MRE in MED coastal, insular and marine areas to increase the awareness of the hubs members.

- **Networking Services**

Company Missions to end users in Maritime Industries: Selected SMEs have participated to missions abroad and had direct contacts with international partners, arranged by PELAGOS team.

Study Visits to installations, which have consisted of visits of key European actors and facilities dedicated to MRE.

Blue Energy match-making "Team-Up" services: A B2B meeting bringing SMEs closer to Regional, National & International Clients and users, aiming to grow SMEs network in BE and increase their extroversion.

Investor Ready Business Plans through mentoring & pitching services with investors: Preparation to meet potential investors through webinars open to the members of the node and one SME selected per hub to design a proper investment plan.

- **Innovation services**

SMEs Innovation profiling performed: This service consisted in designing a up-to 5 pages document presenting the name of the project promoter, contact data, MRE subsector of its project, brief description of the activities and services of the SME, brief description of its idea or project or technology offered on MRE, brief description of SME experience in the sector, short description of the innovation of the idea/project/product/technology, the main objectives of the idea/project/product/technology, what kind of cooperation or partners the SME is looking for, and what is the estimated total amount requested. Support services profiling of the Innovation potential of SMEs allowed an estimation of the readiness level of their technologies (TRL).

Blue energy Market driven Innovation Plans: A service provided to SME for the design of its Business Idea, driven by Blue Energy Market, presenting goals, company/team and action plans for reaching these goals etc. (a shorter version of a Business Plan).

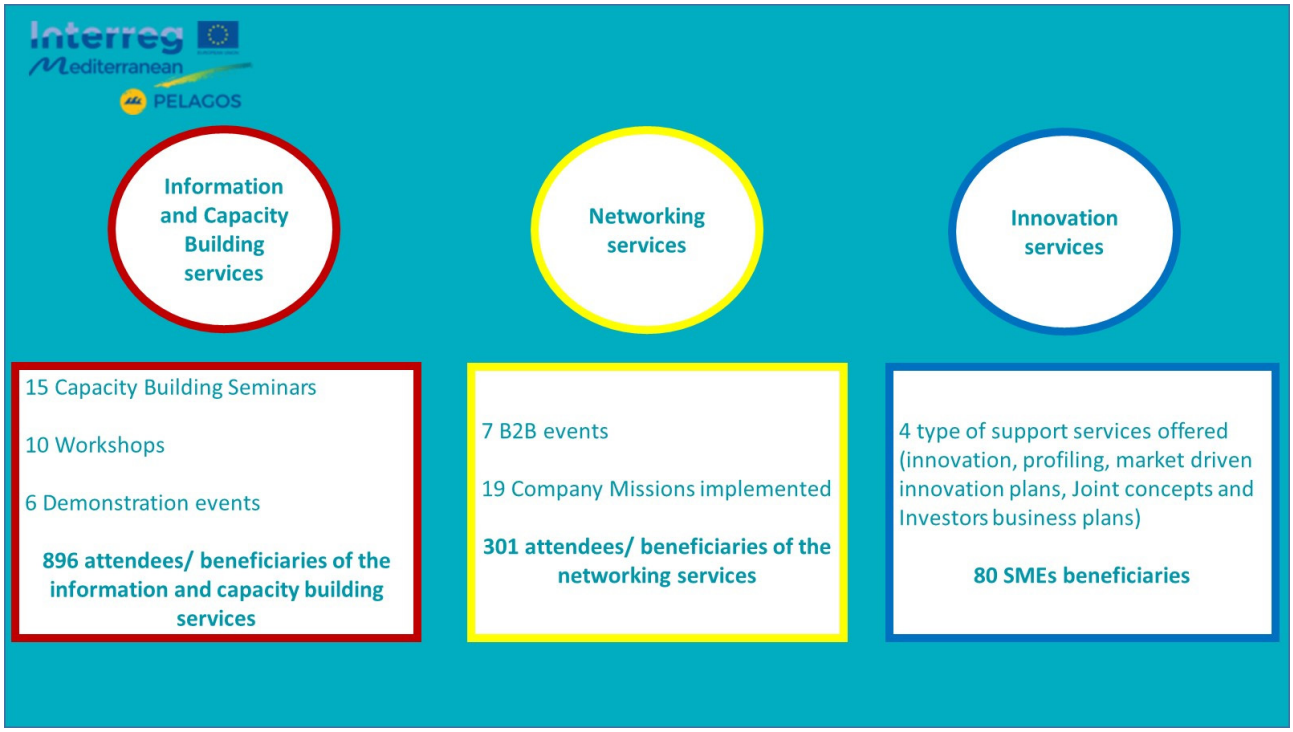
Blue Energy twinning services: joint concepts: this service intended to support SMEs work with RTOs and jointly develop Proof of Concepts / high risks project on MRE.

2. Main Achievements

2.1. A strong community of actors dedicated to Marine Renewable Energies in the Mediterranean

2.1.1 PELAGOS pilot activities impacts

The activities carried out during the project demonstrate the high interest of stakeholders for the Marine Renewable Energies in the Mediterranean.
During its lifetime, the project has benefited directly or indirectly to **455 organisations** that have agreed to join the Blue Energy Cluster platform.



2.1.2 Blue Energy Cluster platform

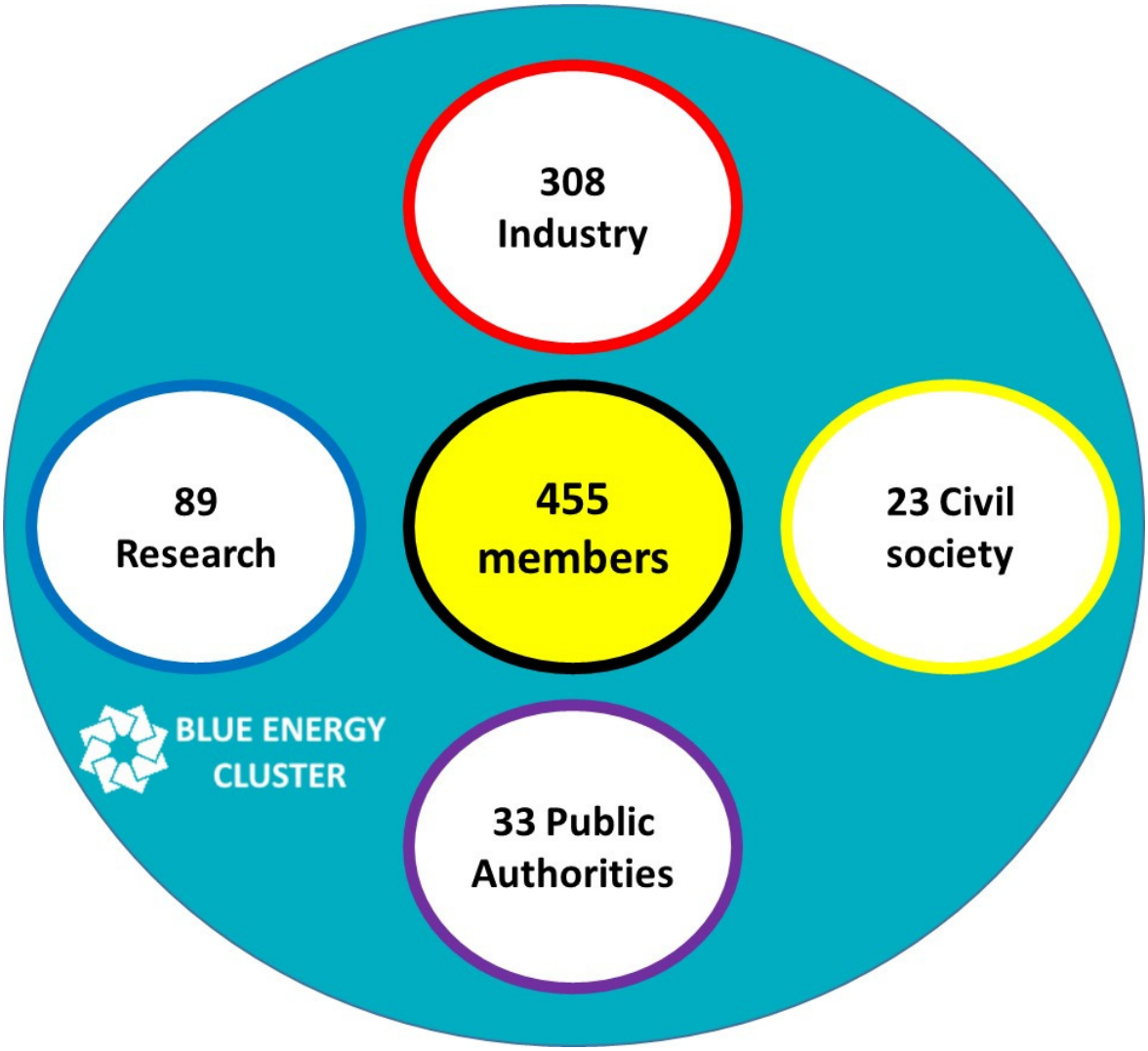
An internet platform *http://www.be-cluster.eu/* was designed to materialise the Blue Energy Cluster and provide a unique environment for collaboration among actors from the Mediterranean, showcasing expertise, products and services and development of scientific or business cooperation.

The platform envisions becoming the go-to platform for organizations that want to explore the vast sea of opportunities that the Marine Renewable Energy has to offer.

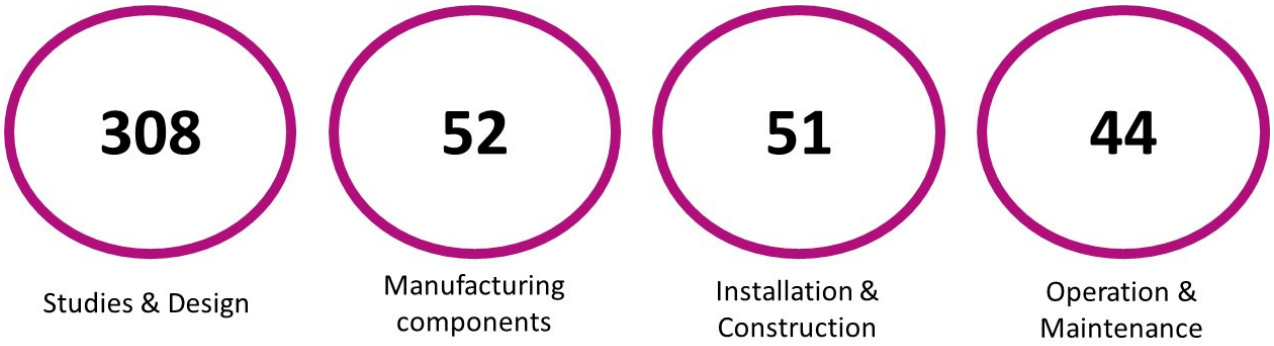
Several functionalities under the Market Place are available such as:

- Cooperation: It offers a unique opportunity to the members of the Blue Energy Cluster to inform offers as regards their activities and promote their organizations.
- Technology: It gives the members of the Blue Energy Cluster the chance to showcase their innovative technologies and services that it includes ground breaking technologies that have the potential to tap into the unlimited power sources of the oceans.

The Blue Energy Cluster platform gathers today 455 members of which a large majority are industrial actors.



Positioning of the Cluster members on the MRE value chain:



2.2. A Strategic Research Agenda for the Mediterranean

A Strategic Research Agenda for the development of MRE in the Mediterranean was designed and shared. The document sets priorities for **three main categories of MREs that present an interest in the Mediterranean: Floating offshore wind, wave and tidal stream**. Cross cutting challenges are considered and specific actions are foreseen for both Marine Renewable energy typology. Those type of MREs have different research and development priorities, although some common features have to be highlighted.

2.2.1 Cross-cutting priorities

To favour the development of MRE in the Mediterranean, the identified cross cutting priorities concern:

Non-technological research priorities

Priority: Standards, Health, Safety and Environment

- Continuous environmental monitoring at all stages of MRE development (design, construction, operation, decommissioning (habitat mapping, Impact assessment, Identification & Monitoring of the physical-biological, open database of environmental variables and indexes);
- Decision making tools to evaluate sites for MREs farms according the multi-criteria approach;
- Environmental impact reduction notably acoustic emissions;
- Decommissioning and recycling with the detection and characterization of anthropic objects;
- Regulatory frameworks with the necessary establishment of a specific regulatory framework and an inclusion of MRE in the Maritime Spatial Plans.

Priority: Knowledge transfer and social acceptance

- High level education with an increase education and research exchange programmes through grants and common platform for sharing environmental and technological data;
- General public education with awareness campaigns and education and schools.

Installation, Logistics and Infrastructures

Priority: Access to ocean energy sites, design adapted processes and vessels

- Development of techniques for O&M in situ with cableless underwater communication and monitoring systems, the development of technology for O&M to mount on Remote Operating Vessels (ROVs) Swarms and In situ measurements for characterization and monitoring of anchoring components.

Priority: Reduce uncertainty, risk and cost of foundations, anchoring system and cables

- Development of advanced mooring systems with design methodology for a flexible anchoring system.

Priority: Power transmission and array cable architecture.

- Optimize electricity transmission to the grid with the development of smart grids for managing all energy sources.

Materials Component and Systems

Priority: Develop high quality seaworthy materials

- Biofouling Characterization and Quantification Methods for Sizing and Maintenance of MRE Systems with target-oriented protocols for

biofouling assessment in MRE contexts and assess the effects induced by biocolonisation on specific MRE components: corrosion and antifouling;

- Develop novel materials with better properties for ocean energy device applications with the development of new materials / applications of new materials to new concepts of Power Take-Offs for MREs and the investigation of possible applications of new materials with particular mechanical and electrical properties to storage devices, components and electrical engineering sector.

Priority: Increase yield with improved Power Take-Off

- Increase yield with improved Power Take-Off with smooth the power output.

Demonstration, Testing and Modelling

Priority: Deploy Demonstration projects to generate "learning by doing" necessary for commercialisation

- Develop large demonstration projects to sustain commercial MREs development with the identification of test facilities for single device and/or array deployment of TRL6 and higher technologies, and/or multi-use platforms.

Priority: Technology development through validated numerical models

- Understanding ocean resources, determining best condition of operation with improved wind-wave-current coupling in numerical models.

2.2.2 Floating offshore wind priorities

Six actions have been identified of foremost importance for the development of Floating Offshore wind:

- Tests of floating wind turbine models in oceanic engineering basin to evaluate the stability, the dynamic loads on the anchors, the optimization of the concepts;
- Design methodology for a flexible anchoring system;
- Develop a socio-ecosystem approach to the environmental and socio-economic impacts of floating wind farms;
- Lower the total cost of ownership of floating wind substations;
- Study multi-use of floating wind substations in various areas such as : safety, scientific observations and measurement continuously, industrial tourism, garage of drones for inspection, repair, maintenance of wind parks, etc.;
- Aquaculture associated with MREs, notably IMTA integrated multitrophic aquaculture.

2.2.3 Wave and Tidal stream priorities

5 actions have been identified of foremost importance for the development of Wave and tidal:

- Improve performance through new control Systems (dynamic tuning);
- Design methodology for a flexible anchoring system;
- Development of sensors and fault detection systems for accurate condition monitoring enabling predictive and preventive O&M processes;
- Improvement on energy storage;
- Development of new materials and components apt to increase performance of PTOs.

2.3. Action plans to integrate Blue Energy on policy priorities

Actions plans at local levels (national) and one at Mediterranean level were designed to prioritize Blue energy in Policy on Regional, National and MED level, integrating Blue energy to Regional Innovation Strategies (RIS3), Operational Programmes and National Strategies and Maritime Spatial Plans.

This activity included the examination of existing regulations and policies and it will provide an Action Plan to be delivered to Regional and other policy makers in order to consider Blue energy as key element towards Blue Growth and development.

It consisted in policy recommendations targeting policy makers at regional, national and European levels to

- Increase awareness about the potential of MRE for the economic development of EU countries for the Mediterranean as well as solutions to comply with the EU 2020 energy objectives;
- Demonstrate the importance of MRE development in the MED;
- Influence strategies and policies implement at regional, national and EU levels.

The main recommendations and related action identified at Mediterranean level are related to six key areas where progress is needed to achieve the MRE sector potential:

Marine Spatial Planning

Minimization of potential spatial conflicts with other maritime activities

- Promote the use of multi-use platforms (MUP) to enhance synergies among different sectors (e.g. energy, aquaculture);
- Adopt policies of multi-use space where MRE installations may coexist with other maritime activities in MSPs;
- Promote suitable temporal and spatial allocation of maritime space access permission among different activities.

Development of technological tools (e.g. web portal) to support MSP

- Include preliminary detailed sea monitoring and analysis (habitat mapping, evaluation of BE potential, analysis of potential conflicts/synergies with other activities);
- Promote the development of Geographic Information System (GIS) based tools for data managing and decision making through multi-objective optimization procedures for the best selection of BE deployment areas.

Use of MSP to actively contribute to meet the decarbonisation targets

- Assessment of the MREs potential and quantification of its potential share in the energy mix to meet the EU obligations in decarbonisation targets (especially for islands).

Identification of potential/prioritised areas for the development of MRE

- Identification of areas suitable for real environment testing facilities for new devices (see also R&I).

Research and Innovation

Encouraging cost-effective deployment of MREs

- Support Technology development aimed to reduce operation costs of MRE farms. For example, development of fewer large sized turbines and infrastructures with the same project capacity/ design tools (biofouling, behaviour of structure/ components in fatigue).
- Support the development of new technologies for floating wind turbines (floaters, anchors) capable to

operate in deep waters and/or far from shore;
- Support to the development of energy storage (Hydrogen);
- Co-location of MRE infrastructures (Floating Wind Turbines, Wave Energy Converters, Solar panels). Substructure technologies supporting the new schemes associated with deeper waters to be innovatively design with materials and geometries that simplify manufacturing and installation operations.
- Support R&I projects aimed to lower manufacturing and/or installation and/or maintenance costs by adopting new materials and new design concepts;
- Support R&I projects for the development of multi-use platform;
- Use of HVDC (high-voltage direct current transmission) grids that has much lower losses and improves the availability of the power. (https://cordis.europa.eu/news/rcn/129564/en)

Strengthening of natural laboratories for testing marine energy devices

- Reinforce the role of existent natural laboratories for the testing of systems in operational environment;
- Promote the realization of a network of natural laboratories with same standards, for an optimal use of the resources;
- Adopt simplified procedures for short term deployment at sea of devices for testing/experimental purposes.

Support the upgrade of low TRL technologies to more advanced levels

- Support demonstration projects to accelerate the development of the sector;
- Support projects and activities in numerical modelling aimed to simulate the hydrodynamic properties of the new concepts in realistic operative conditions;
- Support the development of adequate informatics systems apt to gather, store and manage all the information obtained during tests in indoor laboratories, in natural laboratories, measurement campaigns in order to enhance the sharing and exploitation of the huge amount of data already available (Big Data, Data Mining).

Awareness raising activities

Introduce the MRE concepts and advantages at the educational community and the public

- Increase awareness about the benefits provided from MRE exploitation through education, campaigns and public engagement in MRE processes

Introduce the MRE concepts and advantages at the regional and governmental authorities

- Introduction of the strategy for a Blue growth or inclusion of this concept in other national strategies like RIS3 or similar. The Ministry in charge for introducing RIS3 strategy for 2021-2027, should establish communication with all relevant stakeholders related to the Blue economy in order to produce an integrative, comprehensive document

Develop tools and methods for information dissemination and awareness raising support

- Study and improve the acceptability of MRE project through an enhanced knowledge of their environmental interactions and a throughout multidisciplinary evaluation including socio-economic dimension;
- Identification of the public attitude before the initiation of the project using software platforms that are able

to simulate various views and evaluate public reactions in order to minimize future public oppositions.

Access to funding

Support non-mature MRE projects development

- Part of the tax on energy paid by the consumers to finance MRE development;
- Tax rebates plan for MRE projects, granting of loans from banks.

Build an incentive policies and mechanisms

- Issuance of power purchase agreements in order to avoid high upfront capital costs, systemic risks, complexity in designing and permitting processes;
- Introduction of production-based incentives (PBIs) which exploits the electricity generated from offshore renewable energy sources.

Simplification of procedures

Accelerate the processes to develop a MRE project

- Development of "one-stop-shops" to facilitate and accelerate the administrative processes, with a single organization responsible for providing guidance through the administrative, planning and consenting process.

Increase awareness on how to develop MRE projects

- Communicate in a clear and precise way the procedures and documents required to obtain needed permission for MRE projects.

Grid connection

Re-engineering of the electricity services industry

- Adaptation of the existing networks to the specificities of MREs;
- Acceleration of grid construction/joint actions/infrastructures for the non-interconnected Mediterranean islands;
- Support clean islands sustainable solutions to reduce their dependency on imports.

3. What's next?

3.1. Sustainability and stakeholder's commitment

A sustainability plan was designed to identify and explore the possible actions that could be implemented to support and ensure the sustainability of the PELAGOS Cluster after the end of the funding period. It defines the activities for the sustainability of PELAGOS Blue energy Cluster targeting its continuation and establishment of agreements among the members of the Cluster's HUBs ensuring the sustainability of their service.

3.1.1 Methodology

A four-stage methodology was designed and followed to define a sustainable overall approach:

- **Stage 1 - The identification of three building blocks (strategy and competitive positioning, services, and organizational plan) and the use of external sources** to gather general information about each element of the building block. As external sources were used information from the European Commission, white papers, documents and tools that produced during the project. All these sources helped identifying trends, patterns and best practices in the Blue Energy sector;
- **Stage 2 - the stakeholders' point of view presents information from surveys, interviews**. National hubs were asked to fill out questionnaires and face-to-face/Skype interviews were contacted to collect more information about each main block;
- **Stage 3 - Present how specific clusters deal with subjects related to each building block**. Also, a comparison of best practices was held to present an overall picture of the competition;
- **Stage 4 - The final stage is the proposal for PELAGOS sustainability plan** which includes the most suitable solutions for cluster's development.

3.1.2 Approach

The most suitable legal form for PELAGOS Cluster is a Non-profit organization because it is in line with clusters strategy. It gives access to public (EU and national) funding both, for the cluster and for its members while offers the chance to the cluster to develop a commercial activity. Furthermore, this type of legal form has minimum formation cost and there is no need for capital for the establishment.

PELAGOS development will be separated into two stages.

- **Stage I will be the initial stage of the operation by creating a virtual cluster**. The virtual cluster will continue the current approach mainly relying on the Blue Energy Platform, which will be the main component of cluster operations and the mean of promoting services. The fulfilment of clusters needs will be assisted by each national Hub in physical or digital form according to their nature (e.g. Digital matchmaking events, physical and virtual workshops, etc.).
- **Stage II will be dedicated to the development is the creation of the physical cluster with a legal form**. The physical cluster will provide autonomous services to members and Hubs. In this stage, members will be served by the Multinational Cluster and each national Hub will have a supporting role according to the recognized specific needs.

A three-level hierarchical structure is proposed, which will be extended in national and multinational level since the cluster consists of businesses based in Mediterranean countries.

The Cluster Management Team is the higher hierarchical entity of the cluster and is in multinational level.

In the national level, there are the HUBs and individual members such as third-party organizations. As a third-party organization is defined clusters, associations, and networks from other countries.

The last level of hierarchical structure concerns the members such as SMEs, startups, spinoffs, Large firms, Research bodies (Research Institutions, Research & Technology Centers, Universities), Public Authorities (Local/Regional Authorities, National Governments, Regulatory Agencies), Civil society organizations (NGO, BSO, Energy Agency/Center/Org, Consultants/lawyers), which are supported by the Blue Energy Platform and multinational and local services.

3.2 Join us now

The Blue Energy Cluster welcomes companies (SMEs, startups, spinoffs, Large enterprises), Research and Technology Organisations (Research Institutions, Research & Technology Centers, Universities), Public Authorities (Local/Regional Authorities, National Governments, Regulatory Agencies), Civil society organisations (NGO, business support organisations, Energy Agency/Center, Consultants/lawyers) as well as individuals (researchers and citizens), which are involved or interested in the Blue Energy sectors and willing to contribute to the development of MRE.

If you are interested to join the Blue Energy Cluster, fill in the application form on http://be-cluster.eu/who-we-are/become-a-member/join-us

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