EUROPEAN CLIMATE, INFRASTRUCTURE AND ENVIRONMENT EXECUTIVE AGENCY (CINEA)

CINEA.D - Natural resources, climate, sustainable blue economy and clean energy
**D.3 - Sustainable Blue Economy**

# Synergies and Clustering between Maritime Projects (EASME/EMFF/2020/3.1.12) – SI2.850620

# Workshop Report:

## *"Offshore Renewable Energy"*

# Contents



**Credits:** Report written by lead workshop organiser and consortium member Cogea.

# 1. Executive Summary

CINEA, the European Climate, Infrastructure and Environment Executive Agency is implementing an initiative titled **"Synergies and clustering between maritime projects"** with the aim to provide a platform for exchange of information, best practices and synergies between EMFF funded projects as well as with other funding programmes in support of the Integrated Maritime Policy's goals. Running from June 2021 for two years and supported via a consortium of consultants through a tender contract, a key component of the initiative is to run a series of workshops to facilitate and foster networking, cooperation, sharing of experiences and to maximise the impact of relevant thematic clusters of EMFF funded projects.

The fifth workshop, on **"Offshore renewable energy"** took place on Tuesday, 4 October 2022 (10:00-13:00 CET). The workshop sought to explore exchange of information, synergies and clustering between offshore renewable energy projects, funded by both the EMFF/EMFAF and other funding programmes. It presented success stories, information and funding options for project coordinators to consider with the objective of establishing synergies and stimulate potential cooperation in the field of offshore renewable energy.

The EMFF funded 14 projects dealing with offshore renewable energy:

| Project name | Start date | End date | Total budget in € | EU contribution in € |
|---|---|---|---|---|
| North Sea Solutions for Innovation in Corrosion for Energy (NeSSIE) | 01/05/2017 | 30/04/2019 | 845,855 | 676,684 |
| Enabling Technologies and Roadmaps for Offshore Platform Innovation (ENTROPI) | 01/04/2017 | 31/03/2019 | 743,890 | 595,114 |
| Strategic Environmental Assessment of Wave energy technologies (Sea WAVE) | 01/11/2018 | 31/12/2021 | 956,763 | 764,646 |
| Wave Energy in Southern Europe (WESE) | 01/11/2018 | 31/10/2021 | 929,606 | 743,687 |
| Leading Edge Advanced Protection using novel thermoplastic materials and processes for offshore Wind turbine blades (LEAPWind) | 01/01/2019 | 31/12/2020 | 1,502,103 | 988,067 |
| VPS for Tidal Turbine Generators (VPSTTG) | 01/01/2019 | 31/12/2020 | 1,527,594 | 992,937 |
| Offshore Robotic Wind Turbine Blade Care System (Aerones) | 01/10/2020 | 30/09/2023 | 2,494,459 | 1,746,121 |
| Auxiliary Towable Operation and Maintenance System for Offshore Wind Towers (ATOMS) | 01/09/2020 | 31/08/2022 | 3,545,109 | 2,481,576 |
| Digitalization Of Critical Components in OFFshore wind turbines (DOCC-OFF) | 01/11/2019 | 31/10/2021 | 1,001,736 | 651,127 |
| Floating Solar Energy mooRing: Innovative mooring solutions for floating solar energy (FreSher) | 01/11/2019 | 30/04/2022 | 1,091,402 | 709,409 |
| Streamlining the Assessment of environmental efFEcts of WAVE energy (SafeWave) | 01/10/2020 | 30/09/2023 | 1,893,370 | 1,514,696 |
| Engineering and upscaling of new floating renewable wind energy platform (SATHScale) | 01/11/2020 | 31/10/2023 | 3,456,062 | 2,418,896 |
| Sustainable Innovation in la Martinique: BIOfouling Solution for clean Energy (SIMBIOSE) | 01/11/2019 | 31/10/2022 | 1,300,927 | 845,603 |
| WaveRoller Wave Farm Scale-Up – Preparing to deploy the world's first commercial wave energy farm (WaveFarm) | 01/11/2020 | 31/10/2023 | 3,556,064 | 2,489,244 |

Further, one more project, ESENSE, albeit not focusing primarily on energy, is dealing with survey, inspection, maintenance and repair of offshore infrastructure, also including renewable energy facilities.

Based on the experience gained thus far, it seems that not all EMFF-project beneficiaries are determined to seek cooperation with other projects. In fact, carrying out projects in silos is far from being ideal to advance the blue economy and to achieve the sea-basin strategies objectives. However, previous experience shows that there is ample room for cooperation between project beneficiaries.

A total of 56 attendees participated in the workshop. A mixed methodological approach was used to drive engagement and participation in the virtual setting.

## 2. Introduction

This was the fifth in a series of thematic workshops being held under the "Synergies and Clustering between Maritime Projects" initiative. The 'Offshore renewable energy' workshop took place on Tuesday, 4 October 2022, and aimed to explore options and opportunities for cooperation between offshore renewable energy projects, funded by both the EMFF/EMFAF and other funding programmes.

A comprehensive agenda included an overview of the policy context and landscape, as well as a series of successful stories (COREWIND, SETIPWIND and EuropeWave) presented by beneficiaries. Further, the workshop was supported by an interactive session to enable participants to share their own experiences on whether and to what extent cooperation between project beneficiaries is possible.

## 3. Workshop Objectives

The objective of the workshop was to utilise a co-creation and participatory approach to achieve a common understanding as well as gain insights and knowledge on the following elements:

- **Clarity**: Understanding of the direction of EU policies going forward and how future projects should be orientated to support this.
- **Foresight**: Insights to help inform the work of the policy.
- **Knowledge Sharing:** Sharing between beneficiaries on experiences and insights focused on legacy/impact.
- **Synergies:** Identify opportunities for collaboration among beneficiaries for future collaboration.

## 4. Target Participants

For this thematic workshop the following groups were the primary targets:

a) **EMFF project beneficiaries**
b) **Other funding programmes project beneficiaries**
c) **Coherence Panel members,** especially those with an interest in energy-related projects

A total of 56 participants attended the workshop, out of 61 who registered. Attendance consisted of members of the coherence panel and beneficiaries from both EMFF funded projects and other funding mechanisms.

**Breakdown:**

| **Total Participants: 56** |
|---|
| Coherence Panel Members: 16 |
| Project Beneficiaries: 26 |
| Other: 14 |

## 5. Workshop Methodology

The three-hour workshop took place online via Zoom. Participation was free and open to all relevant stakeholders. The event was advertised via multiple channels.

In order to engage all participants and encourage participation, the methodology included a mix of presentations and plenary discussions.

The workshop began with an introduction on the purposes of the workshop, an overview of policy context and landscape and an overview of the funding opportunities. Subsequently, three presentations were given by successful project beneficiaries. In the first session, interaction with the audience was mainly via chat.

The second session was entirely dedicated for the discussion.

The agenda for this workshop can be found in **Annex 1 – Event Agenda**.

## 6. Workshop Execution

The workshop took place as scheduled on Tuesday, 4 October from 10:00-13:00 CET. The workshop had two parts - Part 1 focused on policy context, landscape and example of success stories, while Part 2 facilitated discussion with project beneficiaries.

A short narration of the presentations and case studies delivered during Part 1 of the workshop are provided below. A recording of the whole workshop and copies of each presentation are available on the **Maritime Forum**.

## Part 1: Policy context, funding options, and synergies & cooperation success stories

| Title | Name and Affiliation of speaker |
|---|---|
| **Policy context and landscape** | **Céline FRANK, DG MARE** |
| Ms Céline Frank described the policy context and landscape of offshore renewable energy, and namely RePowerEU and the offshore renewable energy strategy. To ensure that offshore renewable energy can help reach the EU's ambitious energy and climate targets for 2030 and 2050, the Commission published a dedicated EU strategy on offshore renewable energy on 19 November 2020 which proposes concrete ways forward to support the long-term sustainable development of this sector. The strategy sets targets for an installed capacity of at least 60 GW of offshore wind and 1 GW of ocean energy by 2030, and 300 GW and 40 GW, respectively, by 2050.<br>Most developments in offshore renewables are happening in the North Sea and in the Baltic Sea, but the sector is also taking off in the Atlantic Ocean and in the Mediterranean Sea, with emerging technologies such as floating wind.<br>The EU strategy sets several priorities: (i) Maritime Spatial Planning, (ii) grid infrastructure, (iii) regulatory framework, (iv) research and innovation, (v) support a strong supply and value chain across Europe.<br>REPowerEU objectives are: (i) To reduce fossil fuel dependence from Russia to zero by 2027; (ii) additional investment of €210 billion between now and 2027, and revision of the Recovery and Resilience Facility; (iii) preparing for winter by anticipating storage of gas (the objective for gas storage was already overpassed in October), diversification of supply and use of Liquefied Natural Gas (LNG); (iv) large push to solar energy (roof-top initiative), wind energy and heat pump.<br>Medium-term measures (to be completed before 2027) consist of: (i) increasing EU-wide target on energy efficiency for 2030 from 9% to 13%, (ii) increasing the European renewables target for 2030 from 40% to 45%, (iii) new legislation and recommendations for faster permitting of renewables especially in dedicated 'go-to areas' with low environmental risk, (iv) new national REPowerEU Plans under the modified Recovery and Resilience Fund.<br>National ministries are joining forces to set up their own targets (e.g. ESBJERG and MARIENBORG declarations).<br>In order to fulfil these ambitious targets there is increasing need for space. To facilitate access to marine space, the EU undertook a series of actions: (i) Maritime Spatial Planning (EU Directive); (ii) Biodiversity strategy (30%-10% marine protected areas by 2030) ; (iii) new EU restoration law ; all this implies (iv) more co-existence and multi-use, EU MSP projects, non-price criteria for auctions; (v) development and political objectives by MSs. | |

| Title | Name and Affiliation of speaker |
|---|---|
| **Offshore renewable energy projects and opportunities at CINEA** | **Vincenzo GENTE, CINEA** |
| Mr Vincenzo Gente presented funding opportunities for offshore renewable developers.<br>The European Climate, Infrastructure and Environmental Executive Agency (CINEA) support offshore renewables projects via 5 programmes: (i) The **Connecting Europe Facility** (CEF) that aims at supporting cross-border cooperation, marine surveys, studies for transmission infrastructure, grids and cross border-RES generation, ports improvements; (ii) **H2020/HE** – via innovation actions and research innovation actions supports projects that are developing new technology, upscaling and bring to the market new technology, reducing costs and supports commercial uptake of new solutions for offshore | |

renewable energy; (iii) **EMFF/EMFAF** supports offshore energy via specific calls, in particular dedicated for SMEs and projects with high TRL level. It includes projects dealing with OPEX reduction, digitalization and robotics, maritime spatial planning and multi-use; (iv) **LIFE** supports projects dealing with efficiency and environmental impact of ORE solutions; (v) **Innovation Fund** is looking at demonstration of innovative low-carbon technologies.
Examples of projects funded by CINEA via different programmes: North Sea Wind Power Hub (CEF), FLOATECH (H2020), FreShER (EMFF), Life DemoWave (LIFE), GREENMOTRIL (Innovation Fund)
Mr Gente also presented an overview of the current portfolio of projects funded by CINEA in the area of: wave energy (16%), tidal energy (12%), wind energy (41%), regulatory and multi-use projects (15%), key enablers and others (16%).
To get more information on ongoing funding and future opportunities Mr Gente invited participants to consult the website on EU funding for offshore renewables, the funding and tender opportunity portal and the ocean energy CORDIS pack.

| Title | Name and Affiliation of speaker |
|---|---|
| **Synergies & cooperation success stories** | **José Luis DOMINGUEZ, IREC (COREWIND), Iván PINEDA, Wind Europe (SETIPWIND), Tim HURST, Wave Energy Scotland (EuropeWave)** |

**Mr José Luis DOMÍNGUEZ** presented the COREWIND project that aims at achieving significant cost reductions and enhancing performance of floating wind technology through research and optimization of mooring and anchoring systems and dynamic cables.
The COREWIND project provides disruptive and cost-effective solutions for floating offshore wind technology, leading to cost reduction, by developing innovative research, modelling and optimisation for floating substructure concepts. This is achieved by developing research on mooring and anchoring systems, power dynamic cables, O&M as well as digitalization, standardization and validation.
The project will achieve at least a 15% LCOE reduction by the end of the project (i.e. 100€/MWh approximately) through disruptive technologies and procedures for floating wind sector; paving the way for achieving future cost objectives earlier (i.e. ≈ 80 €/MWh by 2040, 10 years ahead expectations). The COREWIND project has special focus on 2 concrete-based floaters: WindCrete and ActiveFloat.

**Mr Iván PINEDA** presented the ETIPWind project (SETIPWIND is an Administrative name of the EU-funded project and ETIPWind is a public name of the platform). ETIPWind or the European Technology and Innovation Platform on Wind Energy was first established in 2016 by WindEurope with the support of the European Commission. ETIPWind provides a public platform to wind energy stakeholders to identify common Research & Innovation (R&I) priorities and to foster breakthrough innovations in the sector.
Its recommendations highlight the pivotal role of wind energy in the clean energy transition. They inform policymakers on how to maintain Europe's global leadership in wind energy technology so that wind delivers on the EU's Climate and Energy objectives. As such, the platform is key in supporting the implementation of the Integrated SET-Plan. ETIPWind activities and publications are free and publicly available. The platform is overseen by a Steering Committee of both industry, research and academia representatives and supported by a forum comprising the industry's Chief Technology Officers.
Mr Pineda highlighted several challenges, discussed in detail within ETIPWind project, that the wind industry is facing such as permitting rules, raw material dependency and supply-chain bottlenecks, RES-based electrification. Moreover, ETIPWInd identified 5 mega trends in wind energy technology so

that projects can also help to target these mega trends and help to find solutions to develop further wind energy in Europe and maintain technology advantage Europe has built so far.
Mr Pineda invited participants to join their events and workshops and provide their input and feedback on ETIPWind publications.

**Mr Tim Hurst** presented EuropeWave, a H2020 project that is bridging the gap to commercialization of wave energy technology using pre-commercial procurement (PCP). The project focuses on the design, development, and demonstration of cost-effective wave energy converter (WEC) systems for electrical power production that can survive in the harsh and unpredictable ocean environment. Another challenge is to help overcome the "valley of the death stage" and advance promising wave energy converter systems to a point from which they can be developed to commercial exploitation through other national/regional programmes and/or private sector investment.
It was briefly explained how the EuropeWave PCP works. The EuropeWave PCP combines the phased approach of the PCP model, a stage-gated industrial development process, and an international evaluation and guidance framework for ocean energy technology. Each selected operator is awarded a framework agreement that covers up to three R&D phases: phase 1: concept development; phase 2: design/modelling; phase 3: open-sea deployment & testing programme. After each phase, intermediate evaluations are carried out to progressively select the best of the competing solutions. The contractors with the best-value-for-money solutions will be offered a call-off contract for the next phase, under the framework agreement.
7 technologies were brought into the programme and they have just finished phase 1:

- AMOG Consulting
- Arrecife Energy Systems
- Bombora Wave Power Europe
- CETO Wave Energy Ireland
- IDOM Consulting, Engineering, Architecture
- Mocean Energy
- Waveram

5 out of 7 technologies are now moving to phase 2 (September 2022 – June 2023) and the best 3 will be selected to go forward to a real sea testing (phase 3 from September 2023 to May 2026) that will take place in Scotland (EMEC - European Marine Energy Center Ltd) and in the Basque Country (BiMEP – Biscay Marine Energy Platform).

### Part 2: Knowledge sharing and networking

Below is a list of Prompt Questions posed to participants during this session and in the pre-workshop survey. Participants were asked to share their experiences and advice on the specific topics. Responses to these questions have been collated in Section 7 on workshop outputs.

1. **What are the main barriers and main challenges for your project?**
2. **What could facilitate collaboration between ORE projects?**
3. **What prevents collaboration with other ORE projects?**
4. **What refrains private investors from investing in your sector?**
5. **Are there any other technological and/or commercial challenges that you foresee for the near future?**
6. **What synergies can be established with other energy projects (e.g. multi-use in ORE projects)?**

# 7. Workshop Outputs

This section summarises the key points captured during plenary and breakout sessions during the event.

### Question 1: What are the main barriers and main challenges for your project?

Challenges in offshore wind

- Scaling up of large projects;
- How to connect wind farm not only to a single country but to multiple countries still with one line in order to save a space;
- Scaling up of wind turbines (logistic and transportations issues as well as manufacturing and a handling of a very large components for offshore wind);
- Challenges specific to floating offshore wind: cost production of technology development, manufacturing of very large components, having enough space in ports to handle these components, design of different mooring systems;
- There is a need for an appropriate MSP approach to face challenges such as multiuse of space and coexistence of projects;
- Improving knowledge on environmental impacts – there is still a high uncertainty as to what the environmental impact of these kind of technologies (wave and wind) could be;
- Potential public opposition to the development of ORE technologies. It is necessary to make people understand that impact zero does not exist and raise their awareness about ORE;
- There is a lot of dispersion of potential technologies to be used in floating wind farms; different stakeholders in the market are not doing a proper due diligence process to short list technologies to be used in particular projects;
- Supply chain disruptions during COVID-19 and after Russia's aggression of Ukraine, offshore weather conditions, seasonality and testing site availability;

Challenges in wave and tidal renewable energy:

- The valley of the death needs to be overcome. There are full-scale devices in the prototype stage, and what is needed is to reduce costs via economies of scale (large-scale demonstration, precommercial projects and pilot farms). In order to do so, there is a need for a blend of financial instruments and revenue support mechanisms such as public guaranteed loans – that could help attract private investors. One opportunity is to use The European Innovation Fund, but it does not finance ocean energy projects and the criteria are not favourable for renewables such as tidal and wave projects;
- There is a need for standardizing components to reduce costs and overcome the valley of death
- Non-technological barriers that could hinder the wave energy sector development in the EU in the future: (i) environmental risk and uncertainty about the potential environmental impacts of wave energy (WE) developments; (ii) the need for a Maritime Spatial Planning approach to overcome the potential competition and conflicts between WE and other marine uses; (iii) complex and long consenting processes and (iv) opposition from local communities.
- Engage stakeholders in workshops for consenting procedures revision and the implementation of a public education and engagement strategy.

General remarks:

- Integration with other offshore renewables and sharing infrastructure is important to move forward;
- Another important issue is sharing knowledge about monitoring results around ORE projects (example: www.marendata.eu)

### Question 2: What could facilitate collaboration between ORE projects?

- Sharing costs;
- Common purchasing of ancillary elements such as anchors and moorings;
- Common hiring of services such as installation vessels;
- Collaborations need to be user-led so a high-level 'board' of operators and contractors could create a forum for stimulating collaborations that could better deliver real solutions;
- Institutions that are granting projects should facilitate collaboration between projects that are overlapping;
- We should target innovation but in larger scale projects;
- A budget from CINEA to coordinate meetings among projects and an entity that facilitate these meetings. This entity could prepare the methodology to be implemented in the meetings. A methodology to promote the debate and the exchange. This may require prior preparation. Think of a place that is easy to access for all. Make it a one- or two-day meeting maximum;
- Collaboration could be increased thanks to dedicated workshops;
- There are initiatives that are already taking place. CINEA organize a joint review meeting for projects from the same call and with the same reporting period; there are also workshops during which projects can present and share their results;
- Extensive exchange of best practices, capacity build up with partnerships with academia and private sector;
- Finding together solutions for the same problems of several ORE projects;

### Question 3: What prevents collaboration with other ORE projects?

- Lack of resources to expend significant effort outside the project's budget, so inter-project collaborations tend to be rather superficial;
- Very few companies work on OTEC technology all around the world. This technology is very different from the other marine renewable energies such offshore wind, wave energy, tidal power;
- Different technologies, objectives and time schedules between projects;
- Lack of communication and exchange of information between projects;
- Too different technologies and markets;
- **Mr Lars Brandt** presented an example of how it is possible to establish synergies and collaboration between different projects. Project "Fresher" (Floating Solar Energy moorings solutions for floating solar energy) has as its main objectives (i) to demonstrate an innovative mooring solution in a full-scale PV park that is 50% more cost effective; (ii) more sustainable floating PV parks with eased manufacturing and installation, and lower transport and maintenance needs; (iii) increase the knowledge of the system motions and loads; (iv) reduce risks in planning and executing future projects, including near shore deployments; (v) contribute to standards definition.
  Thanks to the technology developed by antother EMFF project's beneficiary (RDC, OpenMode project), Fresher optimized the layout of the floating platform. As the final result, 20 anchors and primary mooring lines were connected to a continuous pontoon (made of Ultra High Performance Concrete – UHPC) which circumscribes the platform. Each line is further split into 4 more lines, creating 80 attachment points to the pontoons. The Pontoons based on UHPC were produced by RDC.

### Question 4: What refrains private investors from investing in your sector?

- No legislation framework, high cost, isolated area (no grid connections to mainland);
- Totally new technology, while investors want to see income and purchase orders of the new product;
- Technical and commercial risks are still too high, given the costs of demonstrating new technologies in the offshore environment;
- CAPEX is very high;
- High cost of single unit projects; volatility of raw material costs;

### Question 5: Are there any other technological and/or commercial challenges that you foresee for the near future?

- Relative energy market regulation and support;
- Supply availability, inflation, limited funding and demand because of the recession. It might also be harder to find suppliers, due to insolvency (linked to the recession);
- Onshore energy storage will have a major impact on the economics of ORE, depending on the wholesale pricing mechanisms in different countries;
- Mooring systems and dynamic cable for very deep waters.

### Question 6: What synergies can be established with other energy projects (e.g. multi-use in ORE projects)?

- Research and demo projects to examine and determine the specific characteristics of the area of interest;
- Availability of testing sites in sea, coordination and organisation together - it would save the resources;
- Multi-use in terms of seabed use (MSP) with improved valuation of ecosystem services could enhance the socio-economic return on ORE investments;
- Sharing cost of test sites, such as export cables.

## 8. Follow Up Actions

A recording of the workshop and PDF copy of all presentations delivered on the day is available on the Maritime Forum.

# Annex 1 – Event Agenda

**Chair: Alessandro PITITTO, Cogea**

## Part 1: Offshore Renewable Energy strategy and funding opportunities

| | |
|---|---|
| **10:00-10:05** | **Welcome and introduction**<br>*Alessandro PITITTO, COGEA* |
| **10:05-10:15** | **Policy context and landscape**<br>*Céline FRANK, DG MARE* |
| **10:15-10:25** | **Offshore renewable energy projects and opportunities at CINEA**<br>*Vincenzo GENTE, CINEA* |
| **10:25-10:40** | **COREWIND and SETIPWIND**<br>*José Luis DOMINGUEZ, IREC and Iván PINEDA, Wind Europe* |
| **10:40-10:50** | **EuropeWave**<br>*Tim HURST, Wave Energy Scotland* |
| **10:50-11:10** | **Comfort Break** |

## Part 2: Knowledge sharing and networking

| | |
|---|---|
| **11:10-11:15** | **Introduction to Part 2**<br>*Alessandro PITITTO, Cogea* |
| **11:15-12:30** | **Breakout discussion** |
| **12:30-12:45** | **In plenary – Summary of discussions** |
| **12:45-13:00** | **Formal meeting close** |