Support to the realisation of the Ocean Energy implementation plan for the SET-Plan

Deliverable D6.9

Report on the 2nd dissemination workshop

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EXECUTIVE SUMMARY

Dissemination and communication activities are a core part of the OceanSET project. Among these activities, one dissemination workshop per year is planned to ensure a wide dissemination of the key findings presented in the annual report. The second dissemination workshop was first planned as a side-event of ICOE 2021 to benefit from the presence of the target audience and therefore maximise impact. However, the overall conditions were not entirely satisfying and it was instead decided to organise a webinar in close collaboration with ETIP Ocean, the European Technology and Innovation Platform for Ocean Energy. Indeed, the first webinar, which was very successful, was organised with ETIP Ocean. The e-worshop was scheduled for 26 May 2021 from 11:00 AM to 12:00 PM CEST.

The workshop was organised to provide an update on the European Ocean Energy sector, based on recent information on costs, technologies, revenue support and other facts across European countries as presented in the first annual report produced by the OceanSET project. After presenting the OceanSET project and the second annual report key findings, presenters gave an update on the new European Commission targets for the Ocean Energy sector before offering a vision of the sector in 2030. The webinar ended with a Q&A session and lasted a total of 1 hour and 6 minutes.

The webinar was a success with 121 participants (105 unique persons) out of 147 registrations. Almost half of the audience belongs to the industry sector, which means that the original target audience objective has been achieved. Another important aspect is that 41% of the participants came from the academic sector. Government sector and inter-governmental institutions represented 10% of the audience. Beyond the number of attendees, the participants' interest was reflected through the time spent in session. 65% of them attended the webinar for over an hour and 24% of them for a duration between 40 minutes and one hour. Overall, these figures are very much similar to the first webinar's statistics. The number of questions asked during the Q&A session is also significant. Not all of them could be answered due to a lack of time. A dedicated document that lists all the questions with the appropriate answers was prepared. The recording and the slides of the webinar are available on the OceanSET and ETIP Ocean websites.

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ABBREVIATIONS AND ACRONYMS

CAPEX: Capital Expenditure

CEST: Central European Summer Time

ETIP: European Technology and Innovation Platform

EC: European Commission

EIC: European Innovation Council

FEM: France Energies Marines

GW: Gigawatt

IRENA: International Renewable Energy Agency

JRC: Joint Research Centre

LCOE: Levelized Cost of Energy

OECD: Organisation for Economic Co-operation and Development

OEE: Ocean Energy Europe

OPEX: Operational Expenditure

PCP: Pre-Commercial Procurement

Q&A: Questions and Answers

R&D: Research and Development

SEAI: Sustainable Energy Authority of Ireland

SET: Strategic Energy Technology

SIDS: Small Island Developing States

TRL: Technology Readiness Level

WES: Wave Energy Scotland

1. CONTEXT

Dissemination and communication activities are a core part of the OceanSET project. They aim to promote project outputs and provide easily accessible information to key players in the European Ocean Energy field and beyond. Among these activities, one dissemination workshop per year is planned to ensure a wide promotion of the key findings presented in each annual report.

The second dissemination workshop was first planned as a side-event of ICOE 2021 to benefit from the presence of the target audience and therefore maximise impact. Two side-event options were available: a 60-minute live session or a 30-minute pre-recorded educational session. The former had the advantage of allowing live questions, but was limited to 50 attendees for technical reasons. Although the latter had no limit of attendees, it did not offer the desired interactivity with the participants and its duration was a limiting factor. Overall, these conditions were not sufficient for efficiently disseminating the annual report's conclusions to the target audience who are industrial stakeholders such as technology and farm developers, certification institutes, design offices, etc.

As a compromise solution, it was decided to organise a webinar in collaboration with ETIP Ocean, the European Technology and Innovation Platform for Ocean Energy. The webinar thus benefited from the promotion carried out both by the OceanSET project partners and ETIP Ocean (see Figure 1.1). It was scheduled for 26 May 2021 from 11:00 AM to 12:00 PM CEST. Registrations were made via the ETIP Ocean website.

FIGURE 1.1. PROMOTION OF THE WEBINAR ON SOCIAL MEDIA

2. THE E-WORKSHOP

2.1 OBJECTIVE

The workshop was organised to provide an update on the European Ocean Energy sector, based on recently gathered information on costs, technologies, revenue support and other facts across European countries as presented in the second annual report produced by the OceanSET project.

2.2 PROGRAMME

The programme of the workshop was defined as follows:

1 - Introduction (Gianmaria Sannino, ENEA)
2 - OceanSET second Annual Report findings (Patricia Comiskey, SEAI)
3 - 100MW of Ocean Energy in Europe by 2025 (Matthijs Soede, DG Research & Innovation, EC)
4 - 2030 Vision: The Growth Pathway for Ocean Energy (Lotta Pirttimaa, OEE)
5 - Q&A session

2.3 CONTENTS

The webinar slides are in ANNEX I.

2.3.1 Introduction

- The **European Strategic Energy Technology Plan (SET Plan)** which is the EU's main research and innovation policy has identified six priorities. One of the aims is to position Europe as N°1 in renewable energy.
- The ocean is fast becoming the new arena for renewable energy production. For wave and tidal energy, the European Commission has set ambitious targets.
- The **Implementation Working Group** was created to help reach the targets and monitor the evolution of the Ocean Energy sector. It is composed of representatives from the European Commission, Member States, regions and other stakeholders.
- In March 2018, the first **Ocean Energy Implementation Plan,** which is a collection of high-level actions for technology development in the Ocean Energy sector, was published.
- **OceanSET** supports delivery of the SET Plan for Ocean Energy. This H2020 project aims to obtain a solid understanding of the evolution in the European Ocean Energy sector in order to optimally tailor future funding for Member States, regions and the European Commission.

2.3.3 OceanSET second Annual Report findings

Context

- The OceanSET project has the overall goal to support the realisation of the Ocean Energy SET Plan Implementation Plan.
- OceanSET is focusing on assessing the progress of the Ocean Energy sector and monitoring funded projects in delivering successful supports.
- Relevant data is being collected annually to inform Member States and the European Commission on the progress of the sector.

OceanSET methodology, an annual process with 4 key stages

- **Mapping** to gather information on the Ocean Energy sector across Europe.
- **Analysis** to compile and analyse the data collected from stakeholders and to conduct a gap analysis.
- **Monitoring** to assess the progress of the Ocean Energy sector by tracking key metrics and to consider other factors (identification of best practices, state-of-the-art…).
- **Review** to provide recommendations on the next steps required to progress the implementation of the SET Plan and suggest approaches to stimulate industry and research progress in key priority areas.

Mapping using a survey: what information?

Four types of information aligned with the requirements of the Implementation Plan:
- General information (Policy, revenue support)
- Technical information (Technology deployment, supply chain, LCOE analysis)
- Financial information (Pre-commercial procurement)
- Environmental information (Measures for consenting)

Mapping using a two-section survey: what targets?

- A first section targeting the **Member States** to obtain high-level information on their Ocean Energy sector that will feed into the annual report for the European Commission.
- A second section targeting the **technology developers** to collect specific information on devices or projects to develop technology to a TRL 7 or above.

Key findings from mapping for year 2019
- A total of 127 Ocean Energy projects supported.
- €42.7M in public funding from Member States and regions.
- 8 Member States have an Ocean Energy budget.
- 10 Member States have test site facilities.
- 9 Member States have an Ocean Energy policy.
- 9 out of 10 Member States were funding Ocean Energy projects of TRL 7 or above.

- 25 Ocean Energy projects were identified as TRL 7 or above.
- The supply chain in most Member States is considered self-sufficient or well complemented.

Overall comments

- More data available, but still gaps that need to be addressed.
- Good momentum built with Member States and industry gathering data, need to continue this by reducing reporting challenges.
- Inclusion of EU projects is important to reflect overall activity.
- Research timelines can differ depending on programme, year on year analysis can be a challenge.
- Good collaboration on projects noted.
- Overall sector was well supported in 2019.

Next steps

- The next survey will go out to Member States, they will have access to data gathered to date.
- Data to be gathered on actions not yet sufficiently addressed.
- The Implementation Working Group will consider current Implementation Plan Actions for review and update.
- OceanSET will work with developers to improve data collection.
- OceanSET will align with work being done on other projects (e.g. IEA-OES).

2.3.4 100MW of Ocean Energy in Europe by 2025

Context and objectives

The Offshore Renewable Energy Strategy aims to:
- Set ambitious targets for the growth of the offshore renewable energy sector;
- Encourage public and private investment in new infrastructure and research;
- Provide a clear and stable legal framework.

The entire EU is considered:
- Energy potential in all EU sea basins;
- Industrial potential in all EU Member States.

All offshore renewable technologies are considered.

The Offshore Renewable Energy Strategy focuses on three areas:
- Maritime Spatial Planning;
- Grid and Market Framework and Industry;
- Value Chain, Jobs and Research & Innovation;

Implementation of the strategy

- Modelling of future energy systems (technology/market readiness) using the data of the OceanSET project;
- From demonstration to large scale pilot projects (4-5 projects of 20-25 MW?);
- Large scale investments (regional/national/EU public/private funding);
- Need for reliable data.

2.3.5 2030 Vision: The Growth Pathway for Ocean Energy

Context

Industry analysis of future deployment costs and the supply chain by 2030, requested by the European Commission to feed into the Offshore Renewable Energy Strategy.

About ETIP Ocean

- Promotes Ocean Energy development – EU & globally;
- Recognised European Commission advisory body & part of SET Plan;
- Strong Influence on policy & funding opportunities;
- Knowledge-sharing: wide network of Ocean Energy professionals.

Tidal – Pilot farms are driving progress

Tidal stream in 2030:
- 2.4 GW of capacity deployed;
- 93% in European waters;
- Costs down to €90/MWh.

Tidal farms at utility scale will be deployed in France, the Netherlands, United Kingdom and specific sites in the Mediterranean. Capacity will continue growing with the exploitation of early lower-flow sites with improved technology and tidal kites. European companies will continue exporting to international markets such as Canada, Indonesia and Japan.

Wave – Race to reach the markets

Wave energy in 2030:
- 494 MW of capacity deployed;
- 87.5% in European waters,
- Costs down to €110/MWh.

Large wave farms will be deployed at utility scale along the Atlantic coast. Smaller farms will be deployed at utility scale in the Mediterranean and North Sea. There will be some floating wind co-locations as niche market applications (e.g. decarbonising islands, offshore platforms, aquaculture). First exports are expected to international markets such as the US, Chile and India.

<u>Opportunities for all Europeans</u>

- Revitalises underused ports and maritime infrastructure;
- Uses specialised manufacturing expertise from automobile & aerospace sectors;
- Services supplied from across Europe.

<u>Solutions are well known</u>

- Clear and ambitious market signals;
- Unlock next phase of deployments;
- Financial instruments to reduce the cost of capital;
- Continue technology push.

2.4 Q&A SESSION

As you are taking 2019 figures, is UK still considered as a member state?

Yes, UK will be considered in the data until the end of the OceanSET project. Our last year of data collection is indeed 2020.

Last year, OceanSET reported the following figures for wave: 12.7 MEUR/MW for CAPEX, and 0.7 EUR/W/year for OPEX. Today, these figures have been reported at 2.01 EUR/W and 0.32 EUR/W/year. Is this correct? How have these cost-reductions been achieved so fast, in a year time?

Although it is tempting to say that we are seeing significant reductions in costs, the reality is that we would probably see more realistic figures the more data we would get from the more projects. The figures are a reflection of the data that we receive, of the amount of information we had in the first year compared to the amount of information we got in the second year, as well as from the number of projects. In the first year, we received data from 12 projects. In the second year, we received data from 25 projects. We can only report the figures that we receive. If projects aren't engaged and providing us with figures, we can't include them in our analysis. If projects and technology developers don't agree with our data and analysis, we would ask you to contact us and provide us with that information. The more data we have, the more confident we can be.

Is Deliverable 2.2. "Annual mapping and analysis report" public?

No, this report is only submitted to the European Commission. Three reports looking at different aspects (mapping and outcomes of the surveys, financial gap analysis, monitoring report) are produced at the same time. We extract and combine the information from these three reports and put them out publicly in the annual report. We ensure that the information published are anonymized, aggregated and give a general reflection of what's going on.

Do you plan to include more regional organisations in future surveys and if yes, how? Regions can have a more detailed view on ocean energy projects funded and implemented on their territories.

Absolutely. During the last period that we were collecting information, we found that reaching out to the regions was really beneficial to get the information, especially the most detailed ones. In a couple

of situations where we weren't getting responses initially, we identified other contacts or regions that we could reach. We are more than happy to work with the Member States and to contact the regions directly, provided that we get contact points. However, our first contact is the Implementation Working Group (IWG) that is in place for the SET plan. If we don't get responses, we then try to contact the regions. If there are regions that want us to contact them directly, we will be happy to facilitate that while keeping the SET plan contact informed in order to ensure that we are getting as much information as we can from each country.

How does EU/SETplan communicate with Member States to get their commitment on the targets for Ocean Energies at political level?

We discuss the strategies with the Member States in different settings (SET-plan steering committee, energy working parties, etc.). We also have separate meetings with Member States about the NECPs, Marine Spatial Planning… We consider joint meetings with Member States around one of the sea basins. There, we will check if ocean energy is getting enough attention. National governments need to be convinced that they have sufficient developers in their country.

How does the ocean energy SET Plan engage with stakeholders beyond Europe?

the European Commission is part of the IEA-OES Technology Collaboration Programme in which the United States and Canada are present as well. Within this framework, we are having discussions about what we can do together. IEA-OES is a very good platform for having a constructive dialogue. We are also exchanging through Mission Innovation, the G20, etc. There are actually many different platforms where we are meeting non-EU countries.

Why are the 2030 deployment figures higher than the EU Offshore strategy?

OEE's figures are higher, because as an industry we can be a bit more ambitious. We know the technology, that's why we can be more confident about its potential. This is what we believe can be achieved. We are looking forward to seeing who gets the most accurate predictions.

Do you think that co-location with offshore wind farms of other ocean energy technologies may improve the diffusion of ocean energy?

It would certainly help the Maritime Spatial Planning or the space issue often faced by offshore renewable energy projects.

Why does wave energy become cheaper than tidal energy at some point in the cost reduction curve that you have shown before?

In the cost reduction curve, you can see that wave energy is more expensive than tidal in the beginning. Wave subsequently becomes cheaper than tidal as more capacity is deployed, as there is more scope for design convergence and increases in the size of individual units. In the report, you can find an annex where you can see how we got all the figures and predictions.

We are a small company and we are developing a new concept for a point absorber to wave energy. Our concept can be used in cogeneration with offshore wind. We submitted a project to Portugal P2020 to develop a proof-of-concept prototype, but the project was not financed (because we are a

small company). Do you think that there will be funding in the future so that small companies can have the capacity to develop their ideas to harness wave energy?

Obviously, different Member States have different mechanisms, but there tends to be funding mechanisms for the lower TRL technologies. Of the Member States surveyed, a high proportion had funds in place for ocean energy technologies (9 out of 14). There are also European opportunities and under the Horizon Europe programme, there will be calls for wave and tidal technologies. The European commission, through the European Innovation Council (EIC) has also specific calls for lower TRL projects. It is worth having a look.

What ambitions on Ocean Energy, like the number of MWs mentioned in the 'offshore renewable energy strategy', are embedded in EU-policy already? In short: what are ambitions and what is policy?

The European Commission's overall objective for Ocean Energy is to reach 1GW by 2030 and 40GW by 2040. This is set out in the Offshore Renewable Energy Strategy. As part of the strategy, the future energy system is being modelled to help inform policy. Discussions will be held with each Member State as part of this process. Each Member State in turn will need to deliver their own policies including National Energy and Climate Plans (NECPs) and Marine Spatial Plans.

The data collected in projects like OceanSET also help inform decisions in terms of investment and funding that will be needed. The Ocean Energy Implementation Plan is currently being reviewed and updated to align the plan with the Offshore Renewable Energy Strategy, specifically to target 100MW by 2025.

Have you monitored the distribution of the wave projects in terms of the kind of technologies involved? e.g. on-shore, off-shore, sea-bed based buoys etc

As part of the OceanSET data mapping and analysis we consider wave and tidal technologies only. Of the 25 projects identified as TRL 7 or above in 2019, 11 were tidal, 12 were wave and 2 were ocean/other projects. In the Annual Report, we further categorised these types of technology as follows:

- **Wave Whole-System Project** which focuses on developing a technology in the wave energy subsector
- **Tidal Whole-System Project** which focuses on developing a technology in the tidal energy subsector
- **Ocean/Other Whole-System Project** which focuses on developing a technology in another ocean energy subsector (non-tidal, non-wave)
- **Wave Sub-System Project** which focuses on developing a subsystem for wave technology/technologies
- **Tidal Sub-System Project** which focuses on developing a subsystem for tidal technology/technologies
- **Ocean/Other Sub System Project** which focuses on developing a subsystem for technology/technologies in more than one ocean energy subsector
- **Wave Support Project** which focuses on developing support mechanisms for the wave energy subsector (technology & non-technology)
- **Tidal Support Project** which focuses on developing support mechanisms for tidal energy subsector (technology & non-technology)

- **Ocean/Other Support Project** which focuses on developing support mechanisms for the ocean energy sector generally or more than one ocean energy subsector

Tidal stream projects reported in the Developers survey were either whole-system or sub-system at Stage 4 (TRL 7-8) of development. All whole-system and most sub-system projects involved horizontal axis turbine technology, while one sub-system involved vertical axis. Tidal-stream projects reported the installation of devices through technologies like floating taut and semi-taut moored or fixed gravity base.

For wave projects, the data showed no clear frontrunner. Whole-system wave projects identified in the Developers survey involved devices mainly in the 0.15 to 1.15 MW range and included several categories of technologies including attenuator, oscillating wave surge converter, point absorber and 'other'. All sub-system projects reported were related to point absorber technology.

A full breakdown of the technologies analysed is in Section 5.2 of the Report

This data mapping exercise is indeed challenging, how do you ensure consistency with other data compilations done for instance by OEE in the annual ""Key trends and statistics"" report or by JRC in their technology/market development reports ?

The Implementation Working Group (IWG) which manages the SET Implementation Plan for Ocean Energy comprises representatives from the European Commission, Member States, regions and other stakeholders including Ocean Energy Europe and Directorate C - Energy, Transport and Climate which is part of the Directorate General Joint Research Centre (JRC) of the European Commission. OEE and JRC are regularly informed of data as it is compiled as part of the OceanSET project mapping and analysis exercise. The work of the OceanSET project also involves checking that the data is consistent with OEE and JRCs reports.

Has the EU assessed the OTEC potential of overseas EU dependencies such as in the Caribbean?

The European Commission is not aware of any specific assessment of the OTEC potential of its overseas EU dependencies. As outlined in the Ocean Energy Strategic Roadmap, being aware of the potential of the Carribean, the European Commission has supported the development of demonstration plant in EU overseas territories (The construction of a 14MW OTEC project (NEMO) in Martinique, France), but unfortunately this project has been put on hold.

Reference: Finding NEMO proves challenging for the French - Offshore Energy (offshore-energy.biz)

3. FEEDBACK ON THE EVENT

The workshop was a success with 121 participants out of 147 registrations. Almost half of the audience belongs to the industry sector, which means that the targeted audience has been reached. Another important aspect is that 41% of the participants come from the academic sector. Government sector and inter-governmental institutions represent 10% of the audience. These numbers are summarised in Figure 3.1.
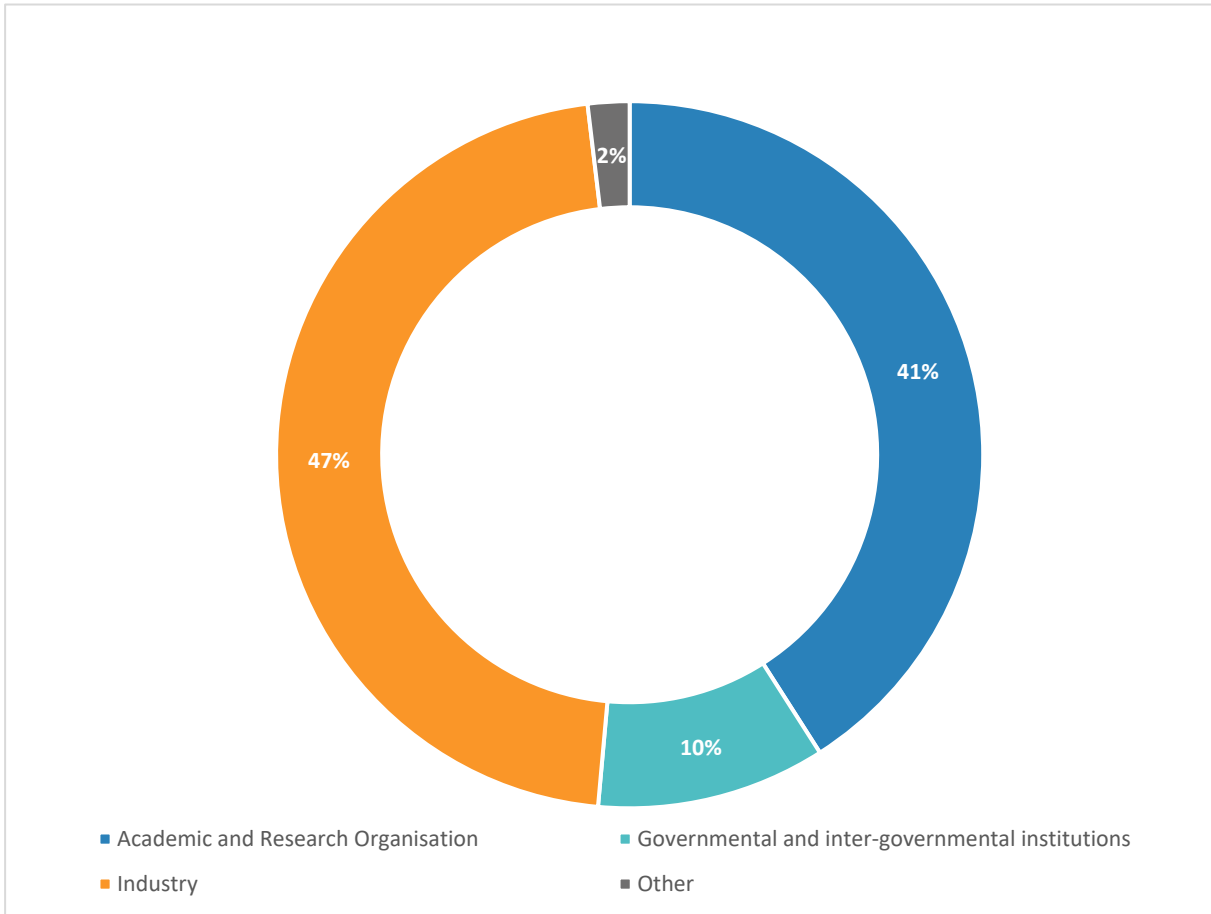

FIGURE 3.1. BREAKDOWN OF WEBINAR PARTICIPANTS BY ACTIVITY SECTOR

Beyond the number of attendees, the participants' interest was reflected in the time in-session. 65% of them attended the webinar for over an hour and 24% of them for a duration between 40 minutes and one hour. The webinar lasted a total of 1 hour and 6 minutes. All this data is summarised in Figure 3.2.
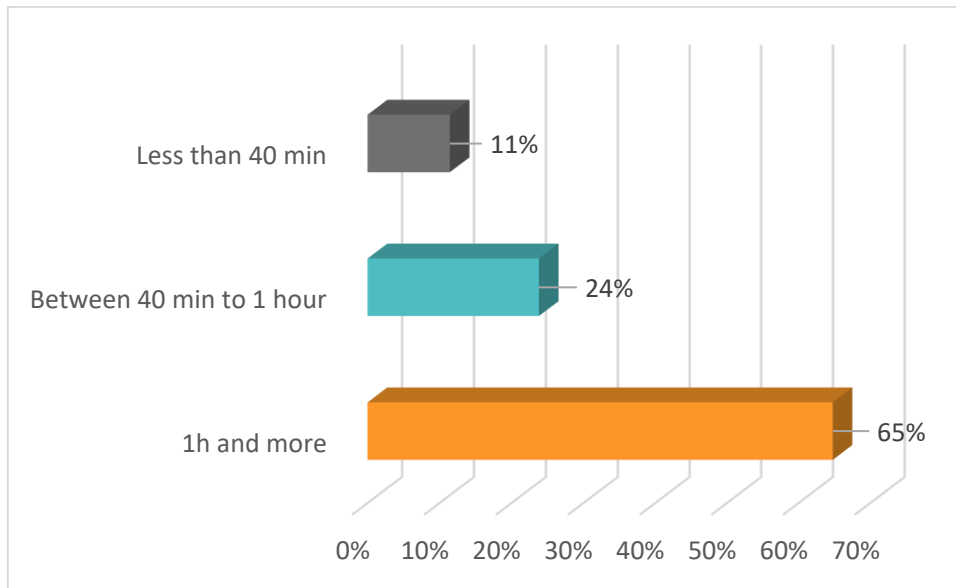
FIGURE 3.2. BREAKDOWN OF AUDIENCE DURATION OF WEBINAR PARTICIPANTS

Another indicator of the participants' interest is reflected through the significant number of questions asked during the Q&A session. Not all of them could be answered due to lack of time. However, all the questions with the appropriate answers are available in this report.
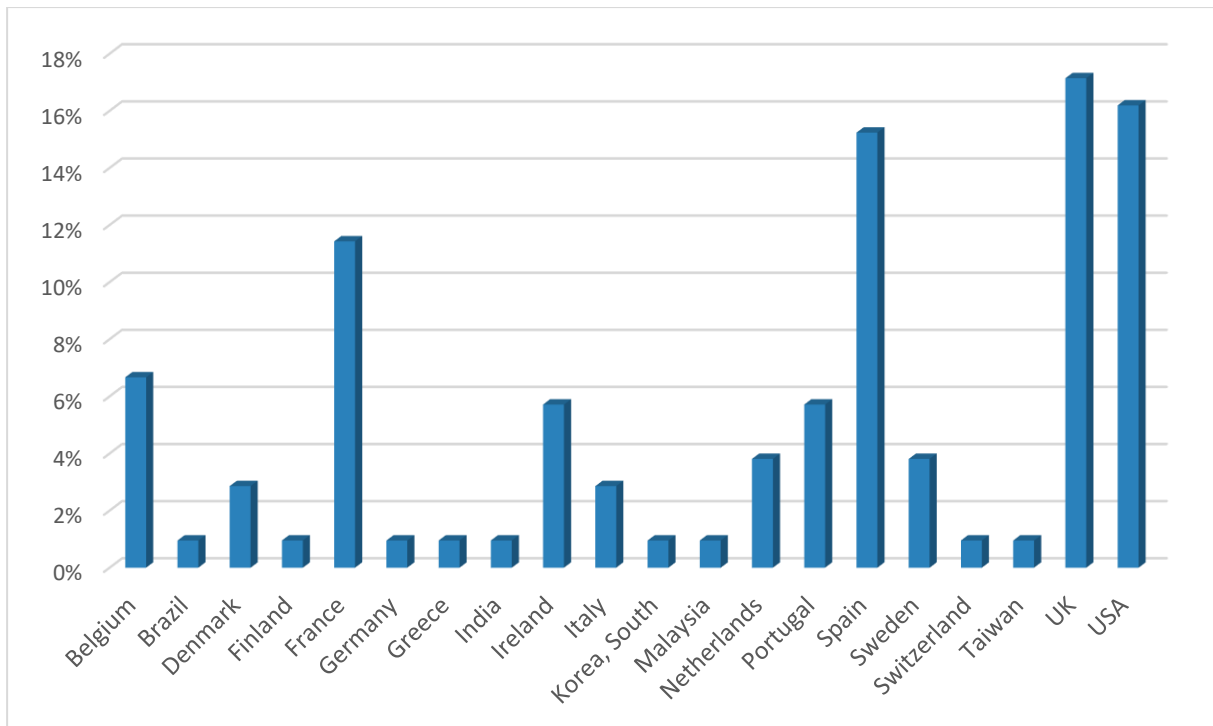
FIGURE 3.3. BREAKDOWN OF AUDIENCE BY COUNTRY

The participants connected from numerous countries, yet almost half of the audience was represented by three countries: UK, USA and Spain. Many attendees also connected from France and, to a lesser extent, other European countries such as Belgium, Denmark, Ireland, Italy, Portugal and Sweden.

4. ACKNOWLEDGMENTS

The partners of the OceanSET project would like to sincerely thank the ETIP Ocean team, especially Lotta Pirttimaa.

ANNEX I: WEBINAR SLIDES

Programme

1. **Introduction and Welcome:** **Gianmaria Sannino,** *IWG Chair and Head of Climate Laboratory, Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)*
2. **OceanSET second Annual Report findings: Patricia Comiskey,** *Ocean Energy Programme Manager Sustainable Energy Authority of Ireland (SEAI)*
3. **100MW of Ocean Energy in Europe by 2025**: **Matthijs Soede,** *Policy Officer, European Commission DG Research & Innovation, European Commission*
4. **2030 Vision: The Growth Pathway for Ocean Energy: Lotta Pirttimaa** *Policy and Project Officer Ocean Energy Europe*
5. **Q&A session**

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1 | Welcome

Background

Strategic Energy Technology (SET) Plan

EU Number 1 in renewable energy
1. Sustain technological leadership by developing highly performant renewable technologies and their integration in the EU's energy system.
2. Reduce the cost of key technologies.

Declaration of Intent for Ocean Energy
Levelized cost of energy targets.

	Tidal Stream	Wave
2025	≤15 c€/kWh	≤20 c€/kWh
2030	≤10 c€/kWh	≤15 c€/kWh
2035		≤10 c€/kWh

SET Plan
Ocean Energy Implementation Plan
11 technology development actions creating *"a structured approach ... [for] a development path ... [to] a commercially viable wave and tidal industry"*.

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From the SET Plan to OceanSET

How it works

The **SET Plan** is the technology pillar of the EU's energy and climate policy

An **Implementation Plan** was developed for ocean energy actions in the SET Plan

The **Implementation Working Group** will deliver actions

OceanSET

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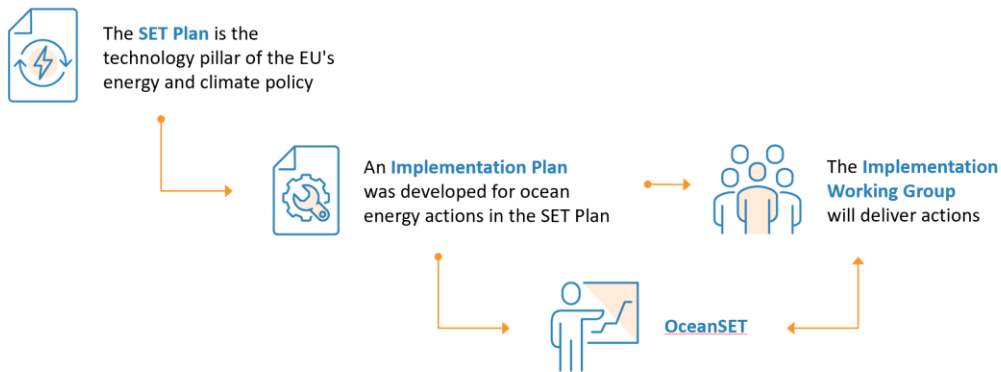
OceanSET

Overview of OceanSET

OceanSET aims to obtain a solid understanding of **evolution in the European ocean energy sector** in order to **optimally tailor future funding** for member states, regions and the European Commission.

3 years
(Mar 2019 – Feb 2022)

+

€1 million

Budget of
€1 million

+

Funding from
Horizon2020

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oceanSET

Support to the realisation of the ocean energy implementation plan of the SET-Plan

OceanSET Report YEAR 2

26th of May 2021

OceanSET has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement N°840651

2 | OceanSET Progress to date

OceanSET

- The OceanSET project has the overall goal to support the realisation of the ocean energy SET Plan IP

- OceanSET is focusing on assessing the **progress of the Ocean Energy sector** and monitoring funded projects in delivering successful supports.

- Relevant data is being collected annually to inform MS and the EC on the progress of the sector.

Work Package	Code	Leader
Ethics requirements	WP1	SEAI
Mapping & Analysis	WP2	SEAI
Finance	WP3	WES
Pre-Commercial Procurement Programme Development	WP4	WES
Monitoring & Review	WP5	DGEG
Communication & Dissemination	WP6	FEM
Management	WP7	SEAI

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OceanSET methodology

An annual process
comprising 4 key stages:

- To **gather information** on the ocean energy sector across Europe
- To **compile and analyse** the data collected from stakeholders and to conduct a gap analysis
- To **assess the progress** of the ocean energy sector by tracking key metrics and to consider other factors (identification of best practices, state-of-the-art…)
- To **provide recommendations** on the next steps required to progress the implementation of the SET Plan and suggest approaches to stimulate industry and research progress in key priority areas

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Mapping using a survey: what information?

4 types of information
aligned with the requirements of the Implementation Plan

General
Policy
Revenue support

Technical
Technology deployment
Supply chain
LCOE analysis

Financial
Pre-commercial
procurement

Environmental
Measures for
consenting

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What targets for such a survey?

A two sections survey

Member States — High-level information on their ocean energy sector that will feed into the annual report for the European Commission

Technology Developers — Specific information on devices or projects to develop technology to a TRL 7 or above

Information that will feed into the annual report for the European Commission

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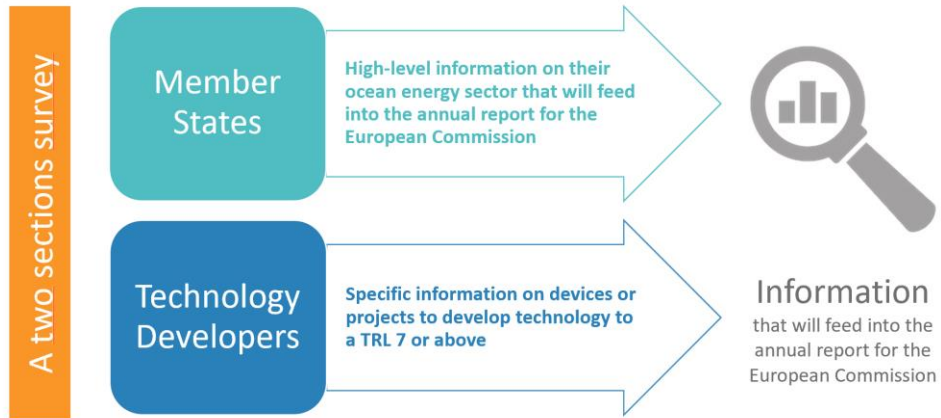
Summary of Results

Annual report key findings – 2019

A total of

127
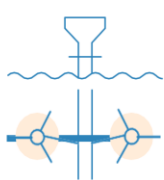
ocean energy projects supported

29 other

74 wave

24 tidal

➢ **16 projects EU Funded (€115M total value; €83M grant aided)**
➢ **11 Projects were ERANET with 26 partners**
➢ **Strong collaboration being built in the sector**

Summary of Results

Annual report key findings – 2019

€42.7
million in public funding from member states and regions

8 member states have an **ocean energy budget**

10 member states have **test site facilities**

10 member states were **funding ocean energy projects** and **9** were funding TRL 7+
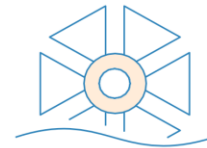
9 member states have an **ocean energy policy**

Summary of Results

Ocean energy projects survey

Member states reported 25 projects over TRL 7 active in 2019. Developers reported target values from a selection of projects.

11 tidal projects

> Mainly horizontal axis turbines

For 1 – 2 MW rated capacities:
> **67%** **average** annual availability for tidal prototypes
> **8.38** **€/W** average capital expenditure
> **1.08** **€/W/year** average operational expenditure

12 wave projects

> No technology front runner
> Technologies included attenuator, point absorber and oscillating wave surge converter

For 0.15 – 1.15 MW rated capacities:
> **67%** **average** annual availability for wave prototypes
> **2.01** **€/W** average capital expenditure
> **0.32** **€/W/year** average operational expenditure

2 other projects

Results of Survey 2- 2019

	TRL 1-6	TRL 7+	Unknown	Total
Wave	46	12	16	**74**
Tidal	5	11	8	**24**
Other	7	2	20	**29**
Total	**58**	**25**	**44**	**127**

Number of Projects
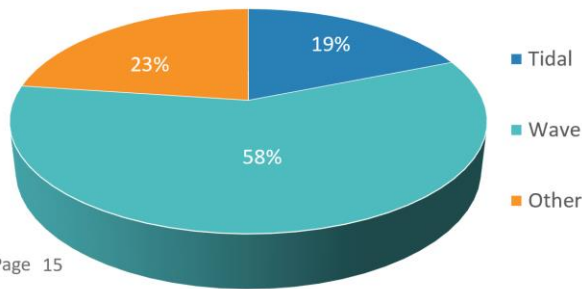
Value of Projects
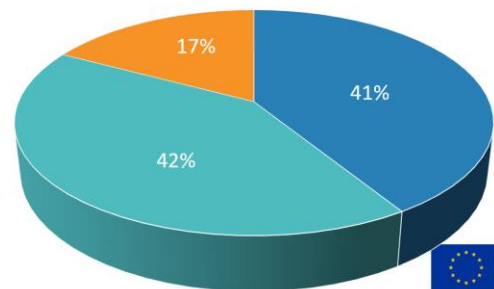
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Results of Survey 2- 2019

Action Title	Details	Period	Proposed IP Funding Total	Discovery Phase (2018-2020)
1.1: Tidal Energy technology device development and knowledge building up to TRL6	Novel systems / sub components tidal technologies	18-25	€145M	€60M
1.2: Tidal energy system (device and array) demonstrations and knowledge building in operational environment (TRL 7-9)	3 x full scale device demonstrations 4 x 10MW arrays	19-22 20-25	€395M	€120M
1.3: Wave energy - technology device development, including system demonstration and knowledge building (up to TRL6)	Novel sub systems / concepts wave technologies TRL4-6	18-30	€222.5M	€60M
1.4: Wave energy – device and array system demonstration at large scale device and early demonstration array scale and leading onto large scale deployment (TRL 7-9).	Full scale device demonstration Implementation of up to 4 arrays	18-25 25-30	€335M	€60M
1.5: Installation, logistics and testing infrastructure as well as supply chain development for the wave and tidal sectors	Infrastructure to support ocean energy Supply chain development	18-30	€100M	~€10M
1.6: Development of stage gate metrics (technical standards and guidelines) for wave technology evaluation.	Definition and implementation of EU-wide agreed stage-gate metrics for wave energy	18-19	€6.5M	~€1.5M
Total			€1204M	€311.5M

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Results of Survey 2- 2019
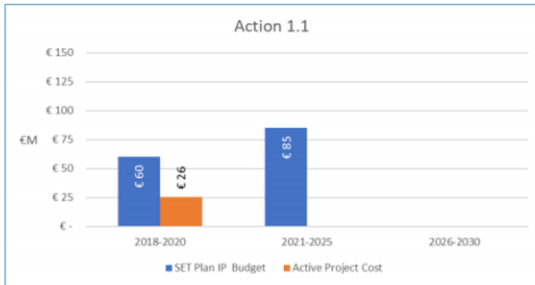
Action 1.1 Tidal Energy technology device development and knowledge building up to TRL 6

■ Proposed budget in Implementation plan

■ Actual data from surveys
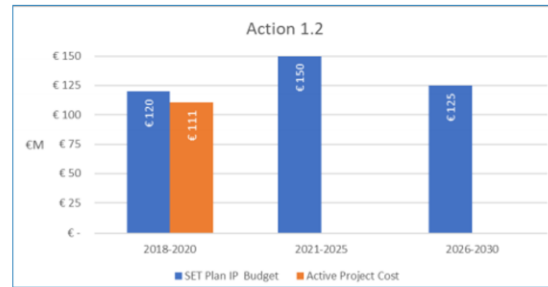
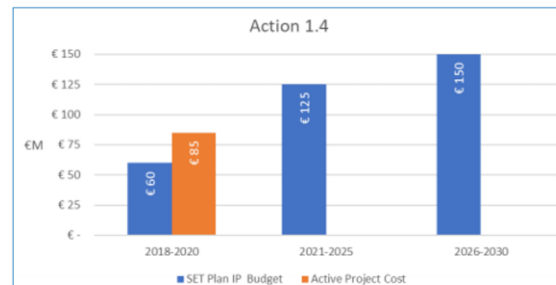Action 1.2 Tidal energy system demonstration in operational environment (TRL 7-9)

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Results of Survey 2- 2019
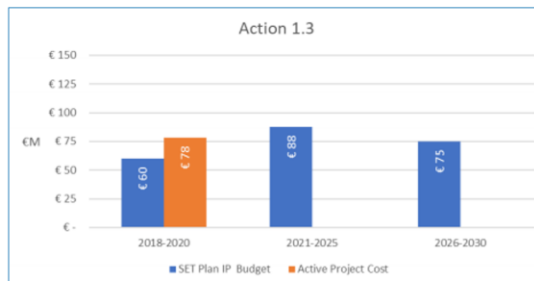
Action 1.3 Wave energy technology development and demonstration up to TRL 6

■ Proposed budget in Implementation plan

■ Actual data from surveys

Action 1.4 Wave energy system demonstration and deployment TRL 7-9

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OceanSET Progress

SET Plan IP 11 Technology Development Actions are outlined below by using a traffic light system to identify the progress OceanSET has made during the first year of the discovery phase. This is a review of the progress OceanSET have made in mapping the Ocean Energy sector against these 11 actions, not of the fulfilment of these actions.

- ● Green: on track
- ● Orange: behind progress
- ● Red: no activity or progress

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Technical Actions		Year 1	Year 2
1.1	Tidal Energy technology device development and knowledge building up to TRL 6		
1.2	Tidal energy system demonstration in operational environment (TRL 7-9)		
1.3	Wave energy technology development and demonstration up to TRL 6		
1.4	Wave energy system demonstration and deployment TRL 7-9		
1.5	Installation, logistics and testing infrastructure [and] supply chain development.		
1.6	Co-ordinate the development of standards and guidelines for technology evaluation and LCOE analysis.		
Finance Actions			
2.1	Creation of an investment fund for Ocean Energy farms		
2.2	Creation of an EU insurance and guarantee fund to underwrite project risks.		
2.3	Pre-Commercial Procurement (PCP) action for development of wave energy technology.		
Environmental Actions			
3.1	Development of certification and standards to support the offshore renewable technology sector		
3.2	De-risking environmental consenting through an integrated programme of measures		

Overall Comments

- More data available –but still gaps that need to be addressed
- Good momentum built with MS and industry gathering data- want to continue this by reducing reporting challenges
- Inclusion of EU projects is important to reflect overall activity
- Research timelines can differ depending on programme –year on year analysis can be a challenge
- Good collaboration on projects noted
- Overall sector was well supported in 2019

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Next Steps

- Next survey will go out to MS – but will access to data gathered to date
- Data to be gathered on actions not yet sufficiently addressed
- IWG will consider current IP Actions for review and update
- OceanSET will work with developers to improve data collection
- OceanSET will align with work being done on other projects- eg IEA-OES

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Support to the realisation of the ocean energy implementation plan of the SET-Plan

Thank you for your attention!

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oceanset.eu

Meeting Administration

- Microphones and Cameras for attendees will be switched off.
- Please use **Q&A** to send questions to the panel.

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100MW of Ocean Energy in Europe by 2025

Launch OceanSET Annual report 2021 – 26-05-2021

Matthijs Soede

European Commission, DG Research and Innovation

Overall objectives
Offhore Renewable Energy Strategy
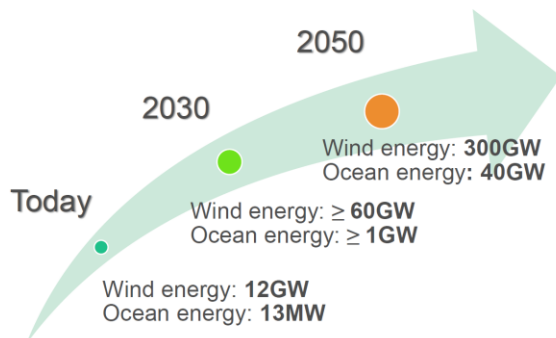
2050

2030

Today

Wind energy: **300GW**
Ocean energy: **40GW**

Wind energy: ≥ **60GW**
Ocean energy: ≥ **1GW**

Wind energy: **12GW**
Ocean energy: **13MW**

- Set ambitious targets for the growth of the offshore renewable energy sector

- Encourage public and private investment in new infrastructure and research

- Provide a clear and stable legal framework

The entire EU considered

Energy potential in all EU sea basins

- Water depth 100-1000m Floating
- Water depth 60-100m Floating
- Water depth 30-60m
- Water depth 0-30m
- 12 nm zone, water depth 0-100m
- EEZ zones includes

Industrial potential in all EU MS

Wind energy manufacturing
Components

Wind sector
- ○ Offshore*
- ○ Onshore

*includes facilities with joint onshore and offshore production
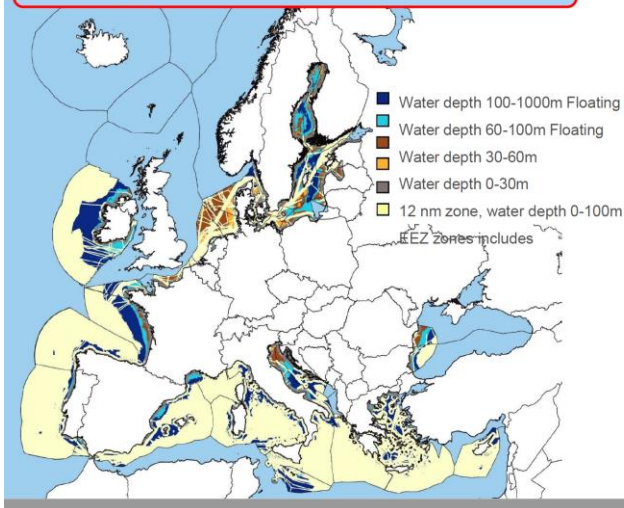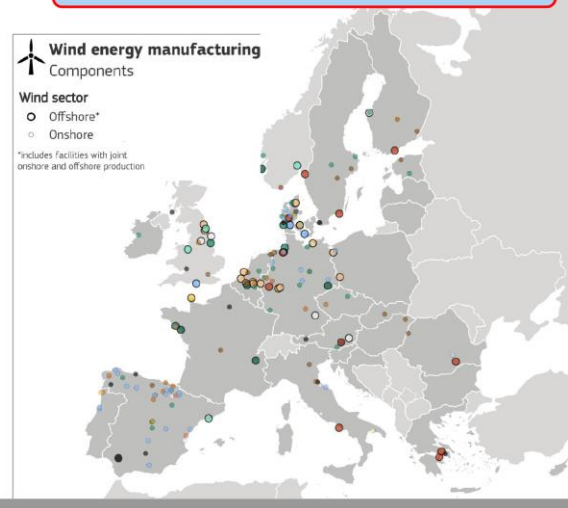
All offshore renewable technologies considered

Commercial

Market uptake

Technology Development

Early R&D

| Floating PV | Wave energy | Tidal energy | DC technologies | Floating wind | Offshore wind |
| 17 kW | 12 MW | 28 MW | High RES penetration | 40 MW | 12 GW |

European Commission
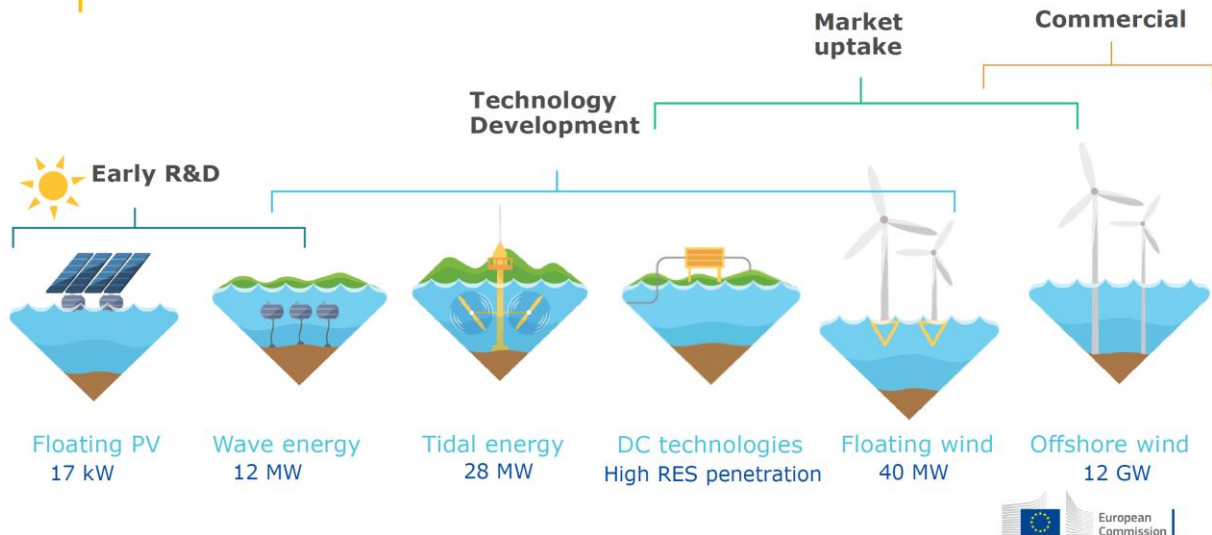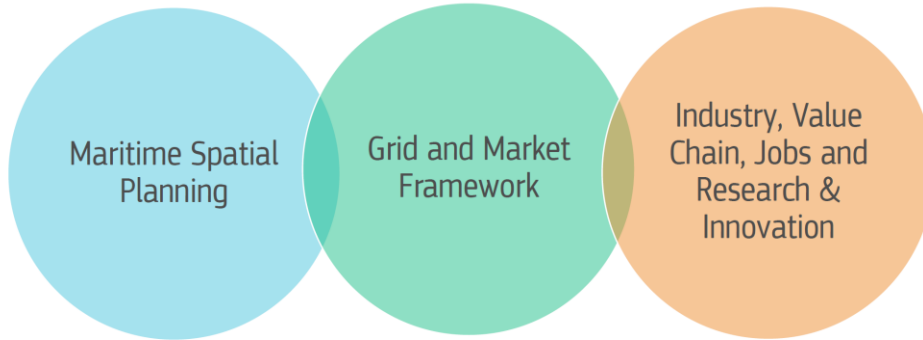
3 focus areas

3 focus areas
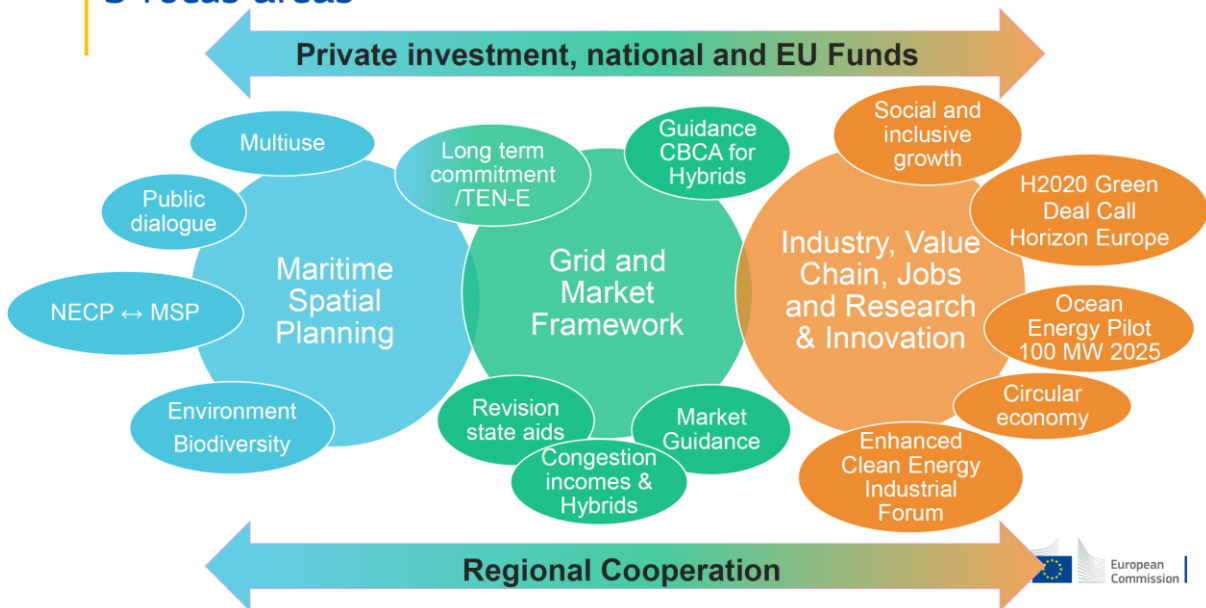
Implementation of the strategy

- Modelling of future energy system
    - Technology/market readiness
- From demonstration to large scale pilot projects (4-5 projects of 20-25 MW?)
- Large scale investments
    - Regional/national/EU public/private funding
- Need for reliable data

Thank you
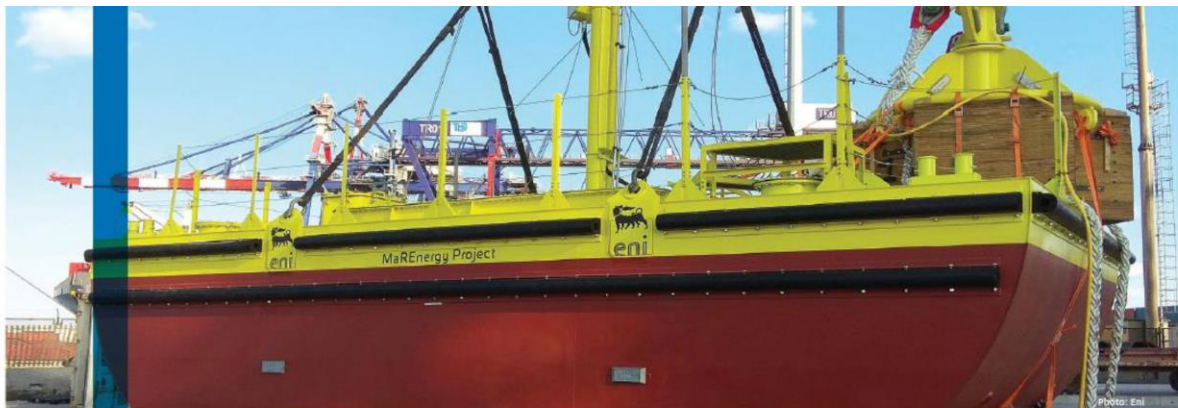
ETIP Ocean brings the sector together

- Promotes ocean energy development – EU & globally

- Recognised European Commission advisory body & part of SET Plan

- Strong influence on policy & funding opportunities

- Knowledge-sharing: wide network of ocean energy professionals

ETIPOCEAN

3

Publications based on consultation & knowledge-sharing webinars

- Strategic Research & Innovation Agenda
- Ocean energy & the environment

Coming soon:
- GVA study
- Socioeconomic study

ETIPOCEAN

4

Deployments reduce costs dramatically

ETIPOCEAN

13

Opportunities for all Europeans

- Revitalises underused ports and maritime infrstructure

- Uses specialised manufacturing expertise from automobile & aerospace sectors

- Services supplied from across Europe

ETIPOCEAN

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CONTACT DETAILS

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