OceanSET Knowledge Sharing Workshop

OceanSET H2020 project presentation

8th December 2021

Gianmaria Sannino (Chair SETPlan - IWG group 'Ocean Energy')

ENEA - Italian National Agency for New Technologies, Energy and Sustainable Economic Development

The **European Strategic Energy Technology Plan** (SET Plan) is the technology pillar of the EU's energy and climate policy since 2008. It is a key stepping-stone to boost the transition towards a climate neutral energy system through the development of low-carbon technologies in a fast and cost-competitive way.

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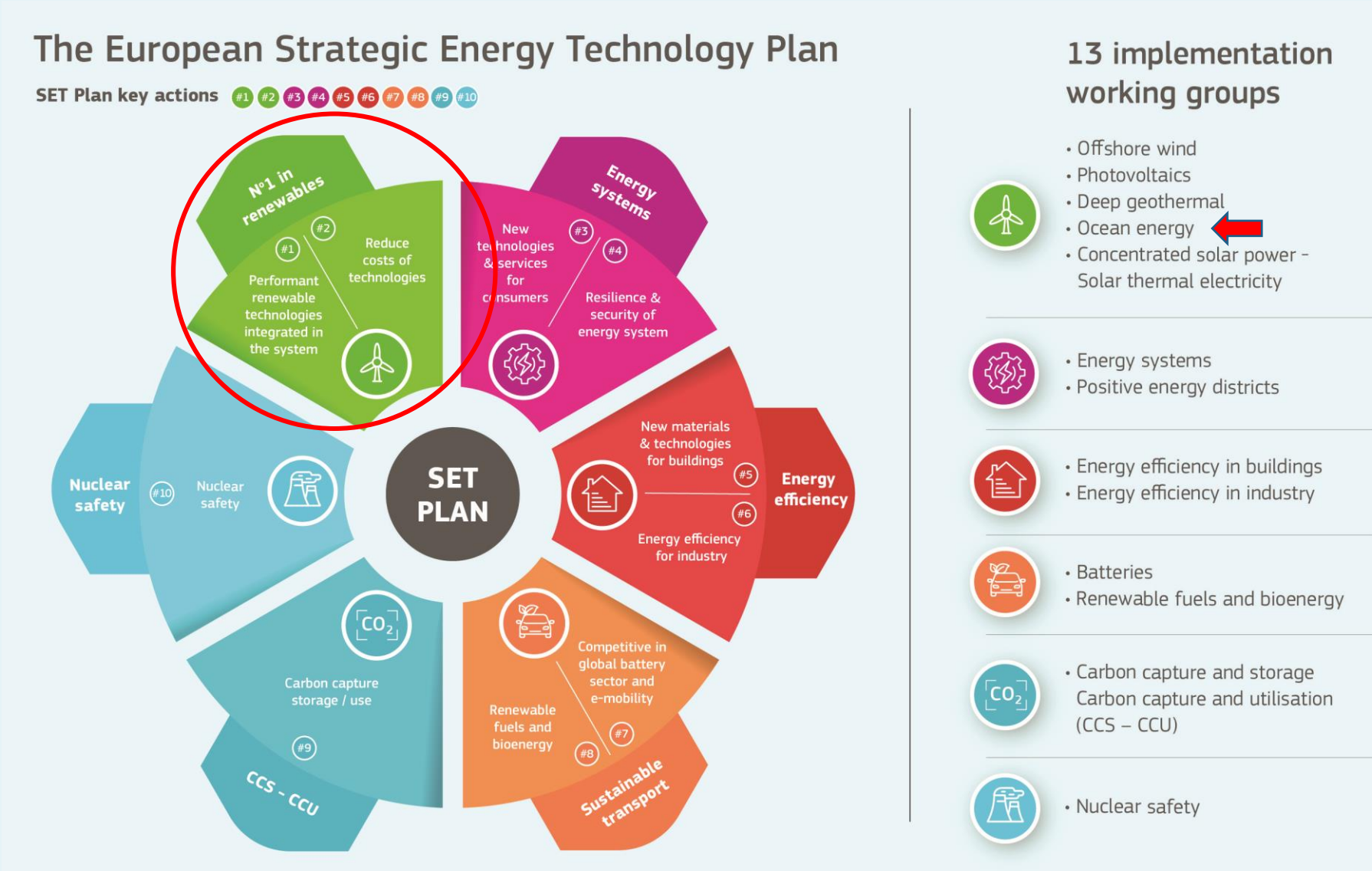


SET Plan Ocean Energy: Temporary Working Group

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 **Temporary Working Group** will deliver actions

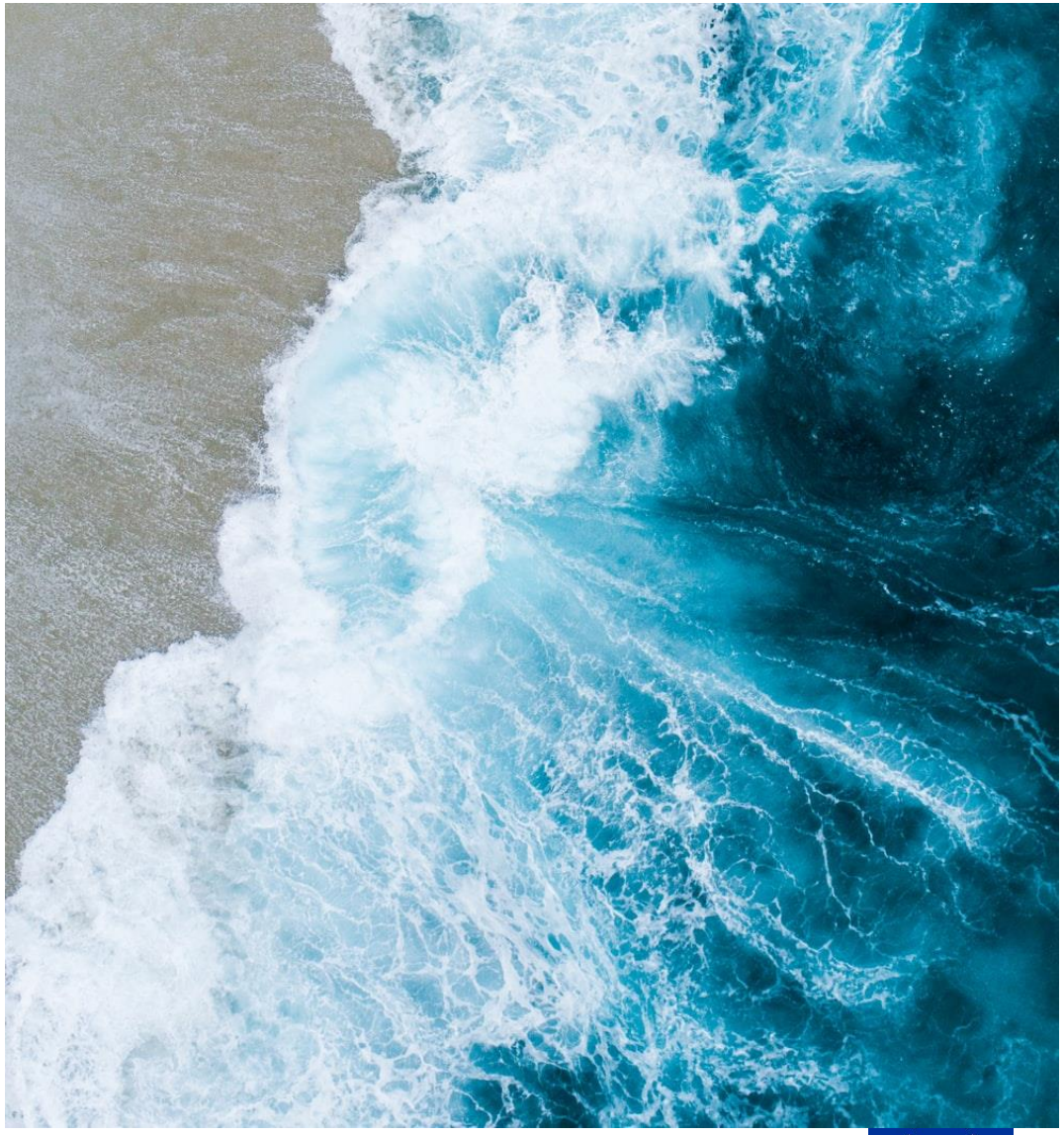
A Set Plan Temporary Working Group (TWG) was formed in 2017 with the aim of developing an Implementation Plan (IP).

EU Objectives for the Ocean Energy sector

In 2018 invited stakeholders and SET Plan countries reached an agreement on common objectives specifically for the ocean energy sector.

These are:

- to bring ocean energy to commercial deployment,
- to drive down the levelised cost of energy (LCOE),
- to maintain and grow Europe's leading position in ocean energy
- to strengthen the European industrial technology base, thereby creating economic growth and jobs in Europe and allowing Europe to compete on a global stage.



SET Plan Ocean Energy: #1 Action Plan

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 (2018)

SET-Plan

Ocean Energy - Implementation Plan

Final

21 March 2018

adopted by SET-plan steering committee

A Set Plan Temporary Working Group (TWG) was formed in 2017 with the aim of developing an Implementation Plan (IP). In March 2018, the TWG published the Implementation Plan which set out targets, and actions for the OE sector

https://setis.ec.europa.eu/ocean-implementation

Implementation Working Group – Ocean Energy

The **Implementation Working Group** is composed of representatives from the European Commission, Member States, regions and other stakeholders.

Chair: G. Sannino

Co-Chair: T. Hurst

Directorate-General for Research and Innovation (DG RTD)

12 **Member States** (**BE, CY, DE, DK, ES, FI, FR, IR, IT, ND, PT, SE**) + **NO & UK**

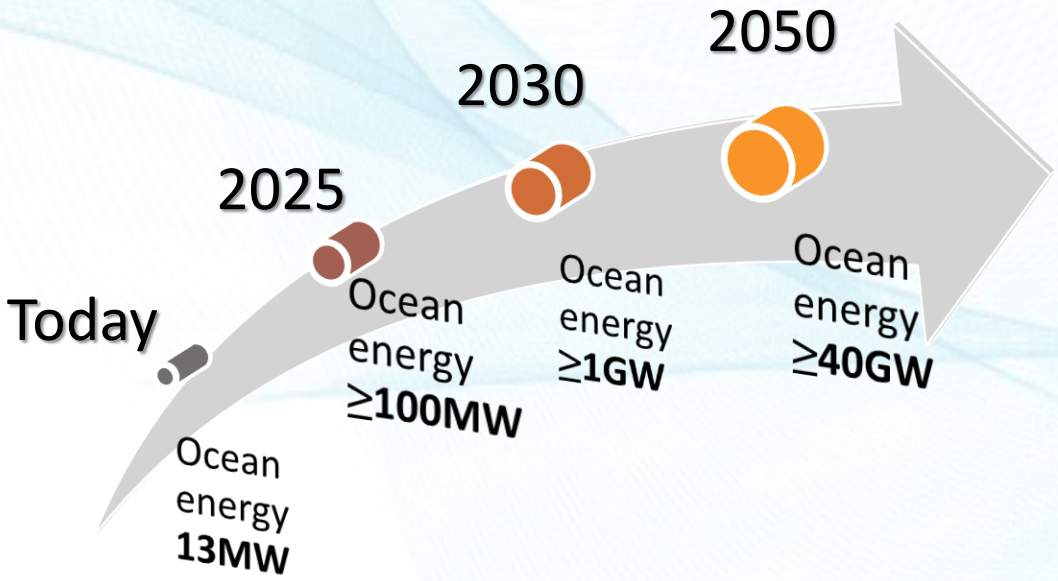
Stakeholders

The new Implementation PLAN – Ocean Energy

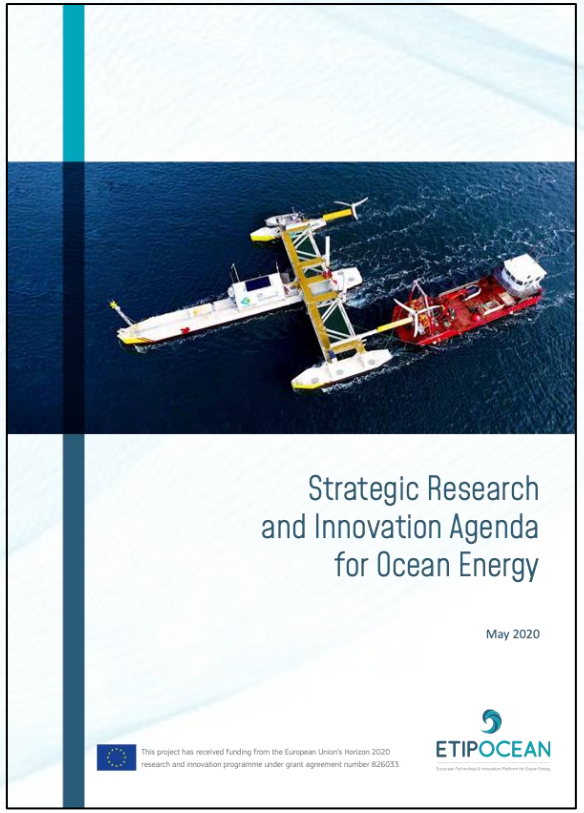
The actions listed within the Implementation Plan are primarily based upon two key sources:

THE EU STRATEGY ON OFFSHORE RENEWABLE ENERGY

The EU 'Offshore Strategy' was released in November 2020 by the European Commission. It sets out the EU's potential and ambitions in the field of offshore wind and ocean energy.



THE EU TECHNOLOGY AND INNOVATION PLATFORM FOR OCEAN ENERGY (ETIP-Ocean)



https://setis.ec.europa.eu/ocean-implementation

The new Implementation PLAN – Ocean Energy

The EU objectives for Ocean Energy are supported with two sets of quantitative targets for tidal stream and wave energy:

- Deployment targets aligned with those in the EU Offshore Renewable Energy Strategy (Nov. 2020):
  - **100MW** of deployed wave & tidal capacity in EU waters by 2025
  - Around **1GW** of deployed wave & tidal capacity in EU waters by 2030

- LCOE targets, maintained from the 2018 Implementation Plan:
  - The LCOE for tidal stream energy should be reduced to **€0.10/kWh in 2030**.
  - The LCOE for wave energy should be reduced to **€0.10/kWh in 2035**.

Ocean Energy - Implementation Plan – Revised version

This plan outlines three high level actions:

- Co-ordination between Member States (MS) and Regions to share and track critical information annually that will demonstrate the clear development of the ocean energy technologies.
- Collaboration between MS, Regions and the European Commission to ensure the effective use and appropriate blending, if possible, of funds to drive large scale deployment.
- The need for annual monitoring of progress with a progress review carried out at the end of each phase to determine Go/NoGo to the next phase.

OceanSET: The H2020 Project assisting the IWG

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
www.oceanset.eu

OceanSET

www.oceanset.eu

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)

+

Budget of
€1 million

+

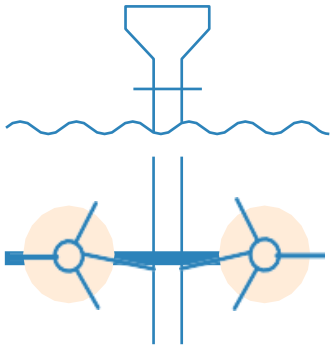
Funding from
Horizon2020

seai SUSTAINABLE ENERGY AUTHORITY OF IRELAND
wave energy SCOTLAND
FRANCE ENERGIES MARINES
ENEA
THE UNIVERSITY of EDINBURGH
Direção-Geral de Energia e Geologia
European Ocean Energy
ENERGIAREN EUSKAL ERAKUNDEA ENTE VASCO DE LA ENERGÍA
PLOCAN consorcio

Running project in Europe

Annual report key findings – 2019

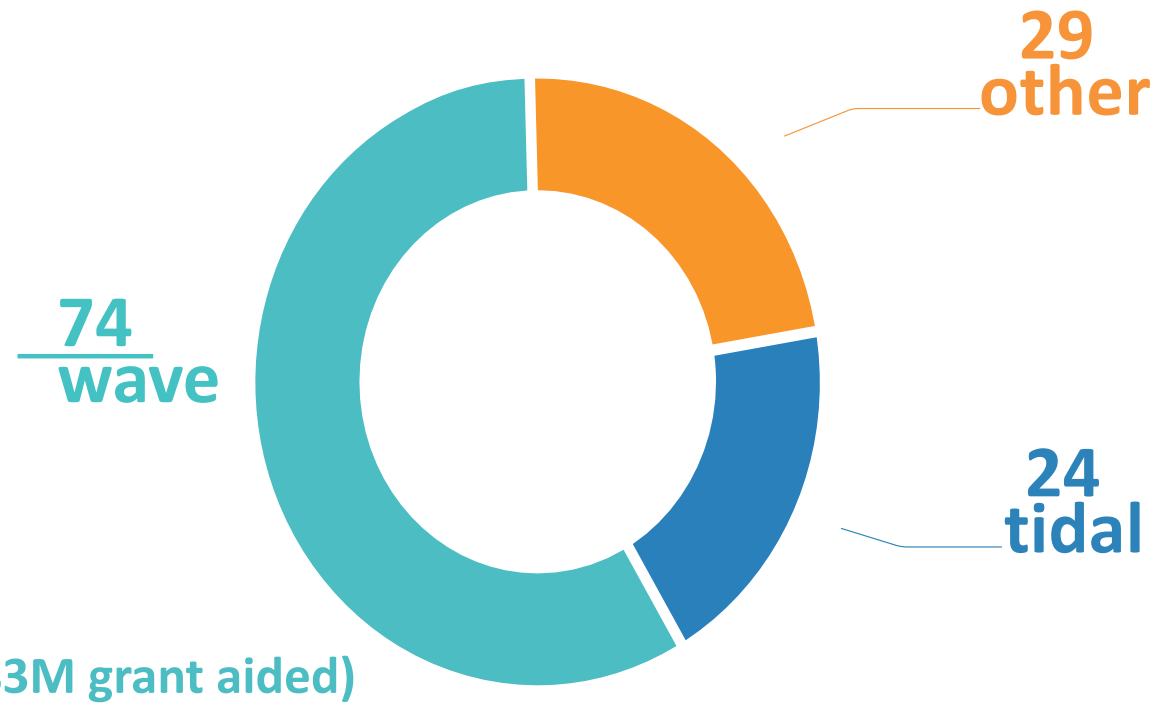
16 responses received (from 14 member states). Ref year 2019.



A total of

127

ocean energy projects
supported

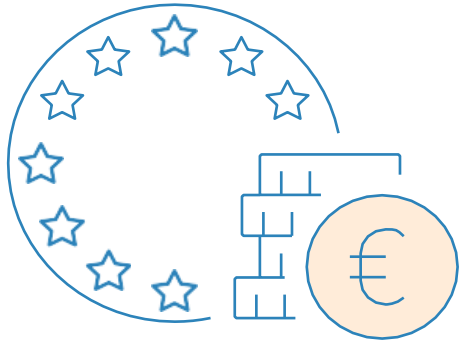


- **16 projects EU Funded (€115M total value; €83M grant aided)**
- **11 Projects were ERANET with 26 partners**
- **Strong collaboration being built in the sector**

Summary of Results

Annual report key findings – 2019

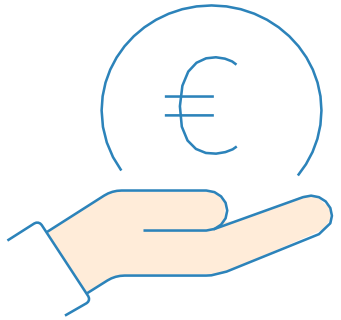
16 responses received (from 14 member states). Ref year 2019.



€42.7

million in public funding from member states and regions

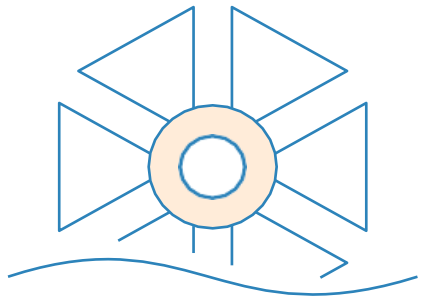
8 member states have an **ocean energy budget**



10 member states have **test site facilities**

9 member states have an **ocean energy policy**

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



Programme

1. **OceanSET H2020 project presentation - Gianmaria Sannino,** IWG Chair and Head of Climate Laboratory, Italian National Agency for New Technologies, Energy and Sustainable Economic Development (ENEA)
2. **Review of the results of the third annual survey addressed to the Member States – Rachel Power,** Ocean Energy Programme Manager at Sustainable Energy Authority of Ireland (SEAI)
3. **Update on the third annual survey addressed to the technolgy developers- Ana Andrade,** Researcher at Directorate-General of Energy and Geology (DGEG)
4. **Update on the EuropeWave pre-commercial procurement programme and the upcoming wave energy projects being selected to progress the Ocean Energy sector – Tim Hurst**, Wave Energy Schotland.
5. **Q&A session**

Please write your questions in the question box on the right of your screen indicating the number of the speaker: [1,2,3,4]_question

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.

What targets for such a survey?

A two-section 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

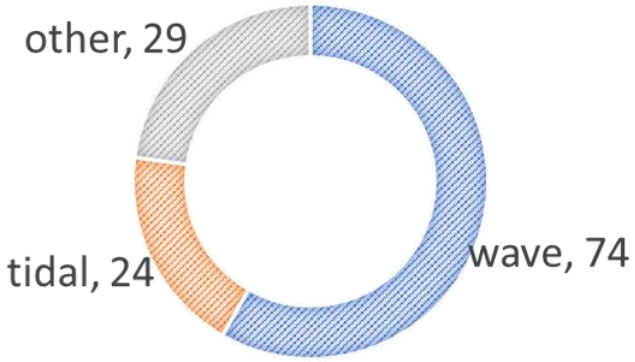
Information

that will feed into the annual report for the European Commission

Annual report key findings – 2019

16 responses received (from 14 Member States)
Ref 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 had **test site facilities**

9 member states have an **ocean energy policy**

10 Member States reported **funding ocean energy projects** and 9 were funding TRL 7+

Annual report key findings – 2019

Member States report 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 absorbers 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
> **0.3 €/W/year** average operational expenditure

2 other projects

Initial Results of 3rd Survey - 2020

Member States Survey

- 14 out of 14 MS and partnering non-EU countries responded
- 12 countries completed a survey
  - 1 partially completed
  - 1 did not complete
- 11 provided data on projects

Initial Results of 3rd Survey - 2020

Member States Survey

- A total of **141** Ocean Energy projects are reported as being supported in 2020
  - **82** wave projects
  - **28** tidal projects
  - **31** projects categorised as “Ocean”

- **11** MS said they funded Ocean Energy projects of TRL 7+ in 2020 (**34** projects in total)

Initial Results of Survey 3 - 2020

141 projects

Total agreed grant aid (€M)	Applicant/private funding contribution (€M)	Total project cost (€M)
€334M	€162M	€507M

	Average project duration (yrs)	Stage prior to the project (mode)	Stage at the end of the project (mode)	Uplift
Wave (82)	2.5	2	3	1
Tidal (28)	3.2	3	4	1
All (141)	2.6	2	3	1

Task 12 IEA OES: Performance Metrics International Framework for Ocean Energy
https://www.ocean-energy-systems.org/oes-projects/performance-metrics-international-framework-for-ocean-energy/

Initial Results of Survey 3 - 2020

IEA/OES Stages (Prior to commencement of project)	No of Projects
Stage 0 - Concept creation (TRL 1)	7%
Stage 1 - Concept development (TRL 2-3)	17%
Stage 2 - Design optimisation and feasibility (TRL 4)	20%
Stage 3 - Manufacturing and operability demonstration in representative environment (TRL 5-6)	16%
Stage 4 - Commercial-scale demonstration (TRL 7-8)	4%
Stage 5 - Commercial-scale demonstration in a small array (TRL 9)	0%
Unknown / Not applicable	**36%**

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Initial Results of Survey 3 - 2020

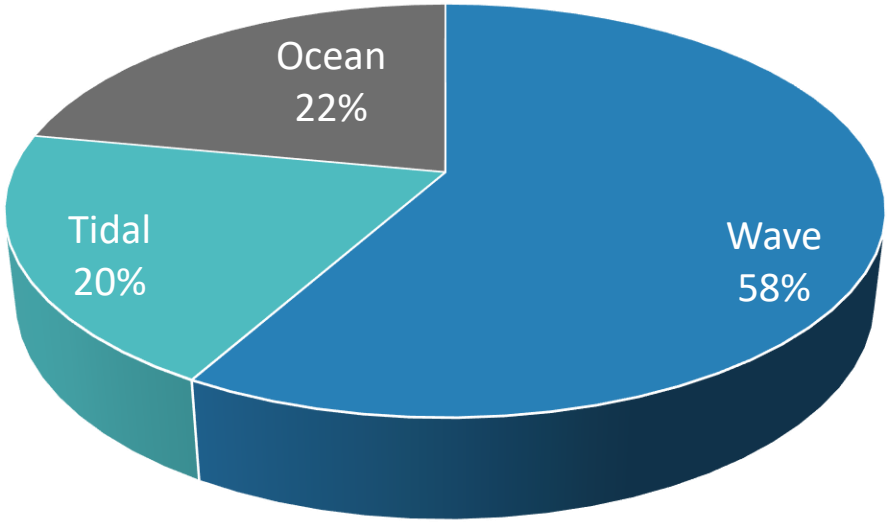
IEA/OES Stages (Expected to be achieved at end of the project)	No of Projects
Stage 0 - Concept creation (TRL 1)	0%
Stage 1 - Concept development (TRL 2-3)	6%
Stage 2 - Design optimisation and feasibility (TRL 4)	11%
Stage 3 - Manufacturing and operability demonstration in representative environment (TRL 5-6)	22%
Stage 4 - Commercial-scale demonstration (TRL 7-8)	18%
Stage 5 - Commercial-scale demonstration in a small array (TRL 9)	5%
Unknown / Not applicable	**38%**

Task 12 IEA OES: Performance Metrics International Framework for Ocean Energy
https://www.ocean-energy-systems.org/oes-projects/performance-metrics-international-framework-for-ocean-energy/

Initial Results of Survey 3 - 2020

Data for MS for 2020- value of projects funded

Budget (€M)	Spend (€M)
€28.66M	€30.91M



Initial Results of Survey 3 - 2020

Country	Is there an assigned ministry/department owner for ocean energy at government level?	OE (wave/tidal) Budget in 2020	Amount actually spent on OE in 2020 (excluding private funding)
Germany	No	Not specified	Not specified
UK*	Yes	€16m	€16m
Belgium**	No	No earmarked budget	€0,216 (estimated)
Denmark	Yes	€0	€2.3m
Sweden	Yes	€2.1m (also covers osmotic power and temperature gradient power)	€5.3m
Portugal	Yes	No specific figure for ocean energy	Insufficient data
Netherlands	No	Unknown	Unknown
Italy	Yes	€2,259,625	€1,835,125
Spain	No	€3m	€1,168,000
Ireland	Yes	€3.5m	€2.316m
Norway	Yes	Unknown	Unknown
France	No	€1.8m	€1.8m
Cyprus	Yes	Unknown	Unknown

Qualitative results

Funding Supports for national/regional programmes to support ocean energy:

- Yes: 10
- No: 3

Policy Mechanisms

- No major changes compared to 2019 (when 2 MS reported having a dedicated ocean energy policy; and 7 MS reported having a general renewable policy that includes ocean energy)

Qualitative results

Test Infrastructure:

- **5** MS reported changes to testing facilities in 2020
- In 2019 **80%** of MS believe there is sufficient test infrastructure
- **95%** MS believe testing facilities are sufficient to support the sector development

Steps taken in 2020 to speed up Consenting:

- **1*** MS inside a test site
- **1** MS outside test sites

Qualitative results

No change to 2019 results:

Port facilities

- 80% of MS identified port facilities for OE as '*Good*' or '*Adequate/requires some upgrades*'

Grid Access

- 90% of MS identified grid access as '*Good*' or '*Adequate/requires some upgrades*'

Supply Chain

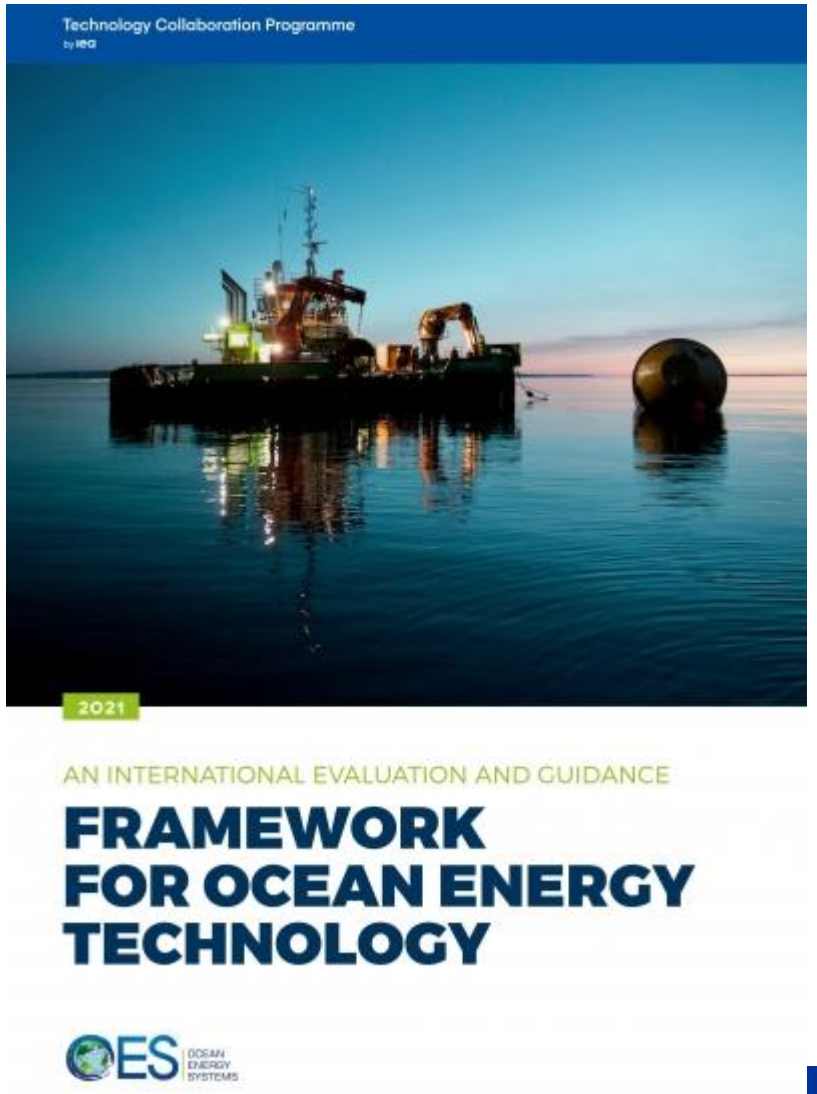
- 90% identified Supply chain as '*part of a supply chain which is partially or well complemented by suppliers from other sectors*'
- One response identified '*dedicated/self-sufficient supply chain*'

Qualitative results

The IEA-OES published an internationally supported framework for the evaluation of ocean energy technology performance.

In your opinion, is the framework suitable for adoption in your Member State's funding programmes?

- Yes: 9
- No: 4



Next Steps

- Seek clarifications on data where appropriate/required
- Report to be issued to EU Commission in Feb 2022
- 3rd Annual report to be published in March 2022

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

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

OceanSET

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

Knowledge Sharing Workshop

Developers survey

OEE 2021 Conference

Ana Andrade (DGEG), Ruairi Maciver (WES)

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

3 | Initial results of Developers Survey

Delivered to 27 projects identified in Member-States survey as valid to receive it:

- **Device or Sub-system development**
- **TRL 7-9 / Stage 4-5**

Projects active in 2020 – collecting 2020 data

EU and partnering non-EU countries – 11 of the countries represented in OE IWG

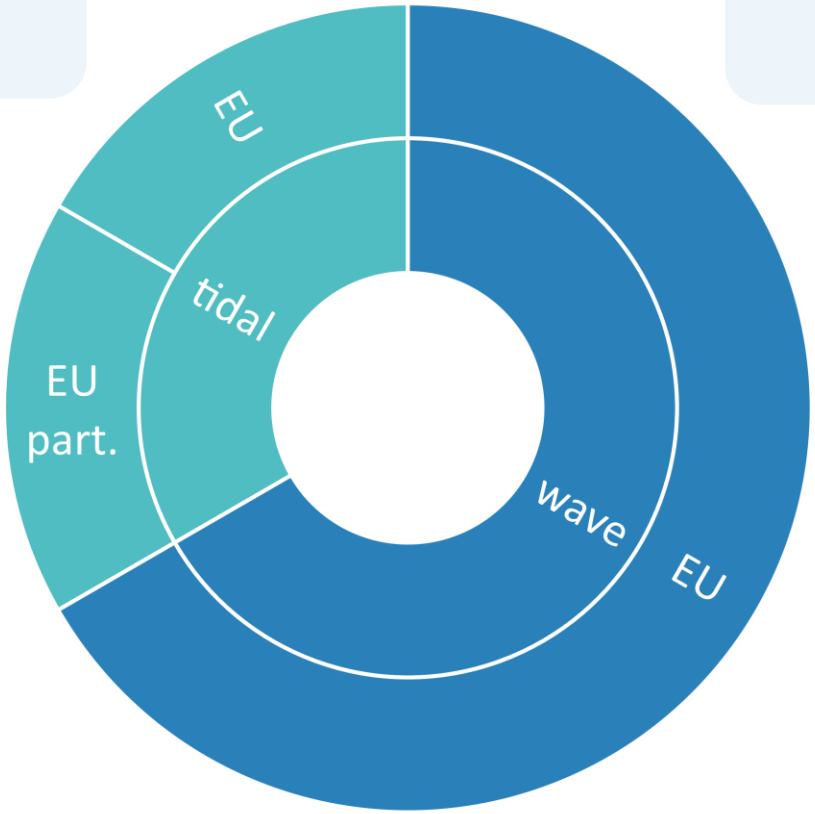
Topics covered

- Sector distribution
- Consortia composition
- Technology transfer
- Funding model
- Device and installation technologies
- Development areas
- Technical performance and cost metrics
- Standards - technical specifications and performance certification
- Suggestions for EC action

Sector distribution

Tidal stream
(6)

Wave
(12)



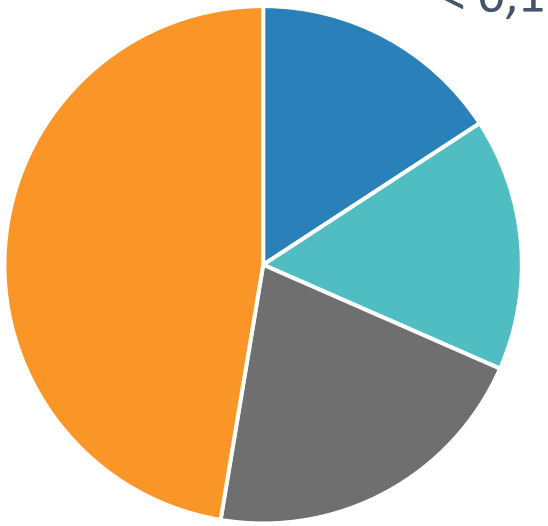
Responses collected so far

Sector distribution

TIDAL / WAVE

Smaller scale devices
< 0,1 MW

Larger scale devices/array
> 0,1 MW



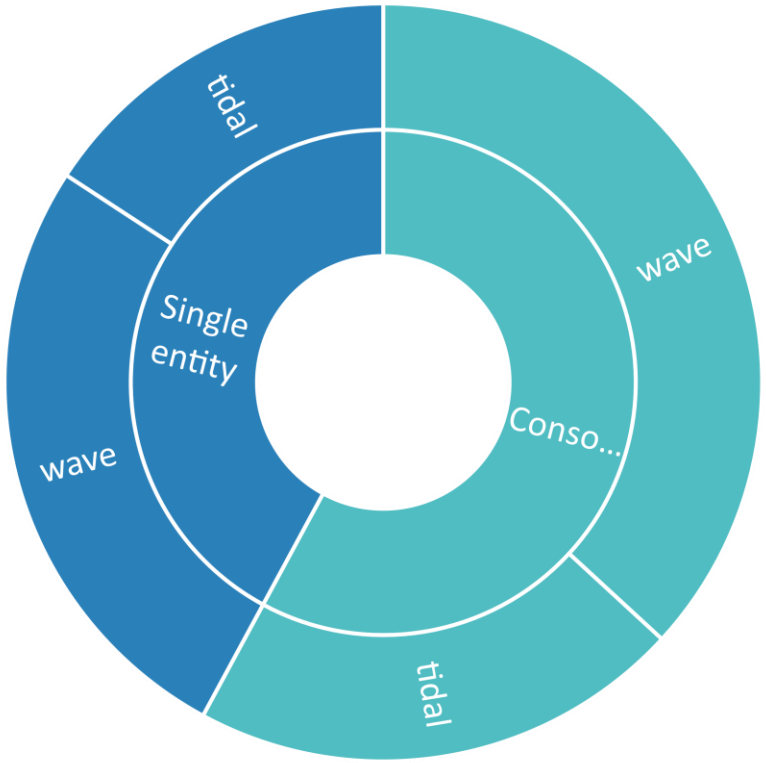
Technology hybrids
wave/tidal
+ wind, solar
+ off-grid application

Sub-systems

Responses collected so far

Consortia composition

Single entity
(7)



Consortium
(11)

Multi-MS Partnership (7)	Multi-MS Lead/Sub-contractor
Single-MS Partnership	Single-MS Lead/Sub-contractor

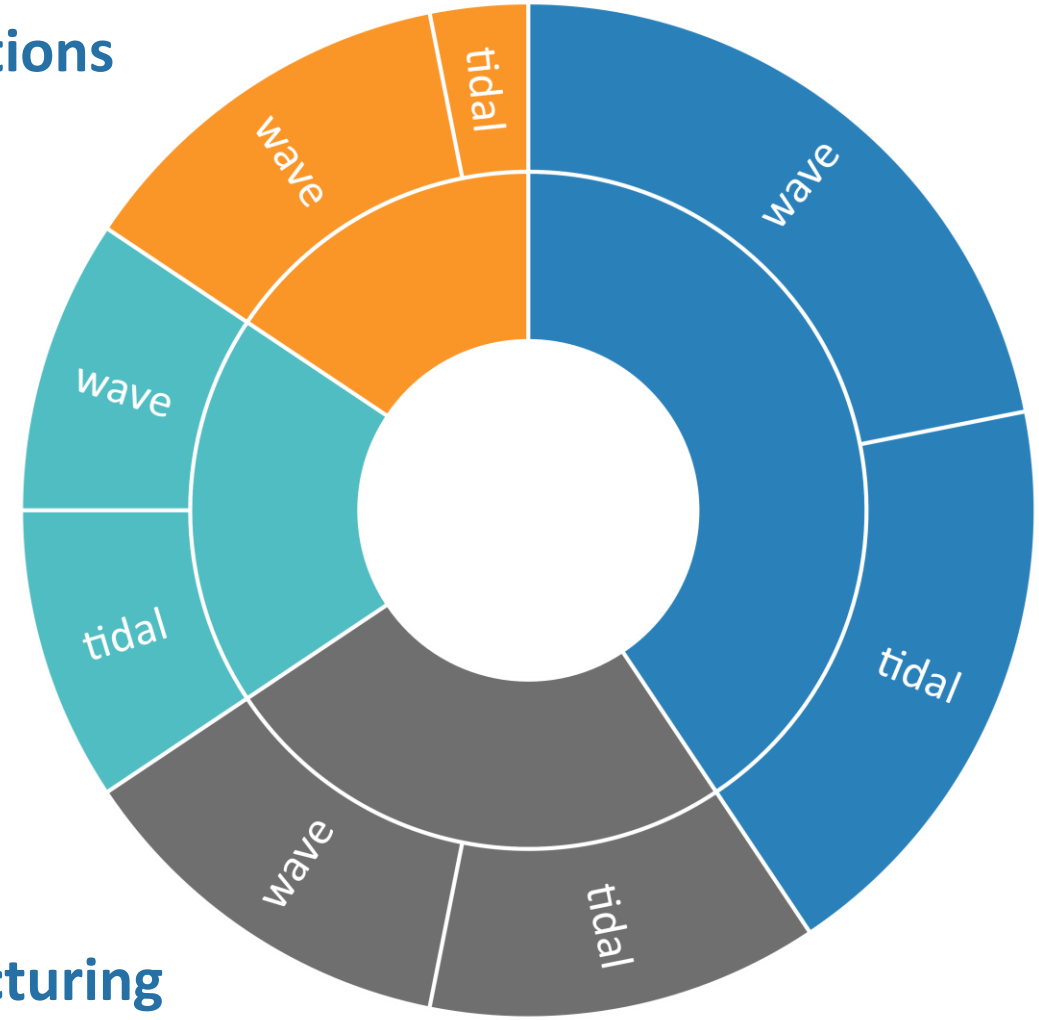
Consortia composition

Marine operations

Industrial R&D

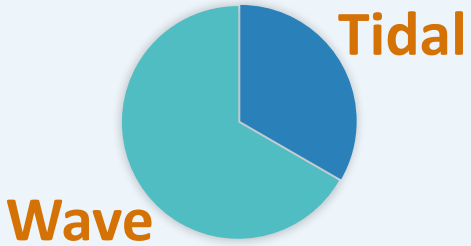
Academic R&D

Manufacturing



Technology transfer

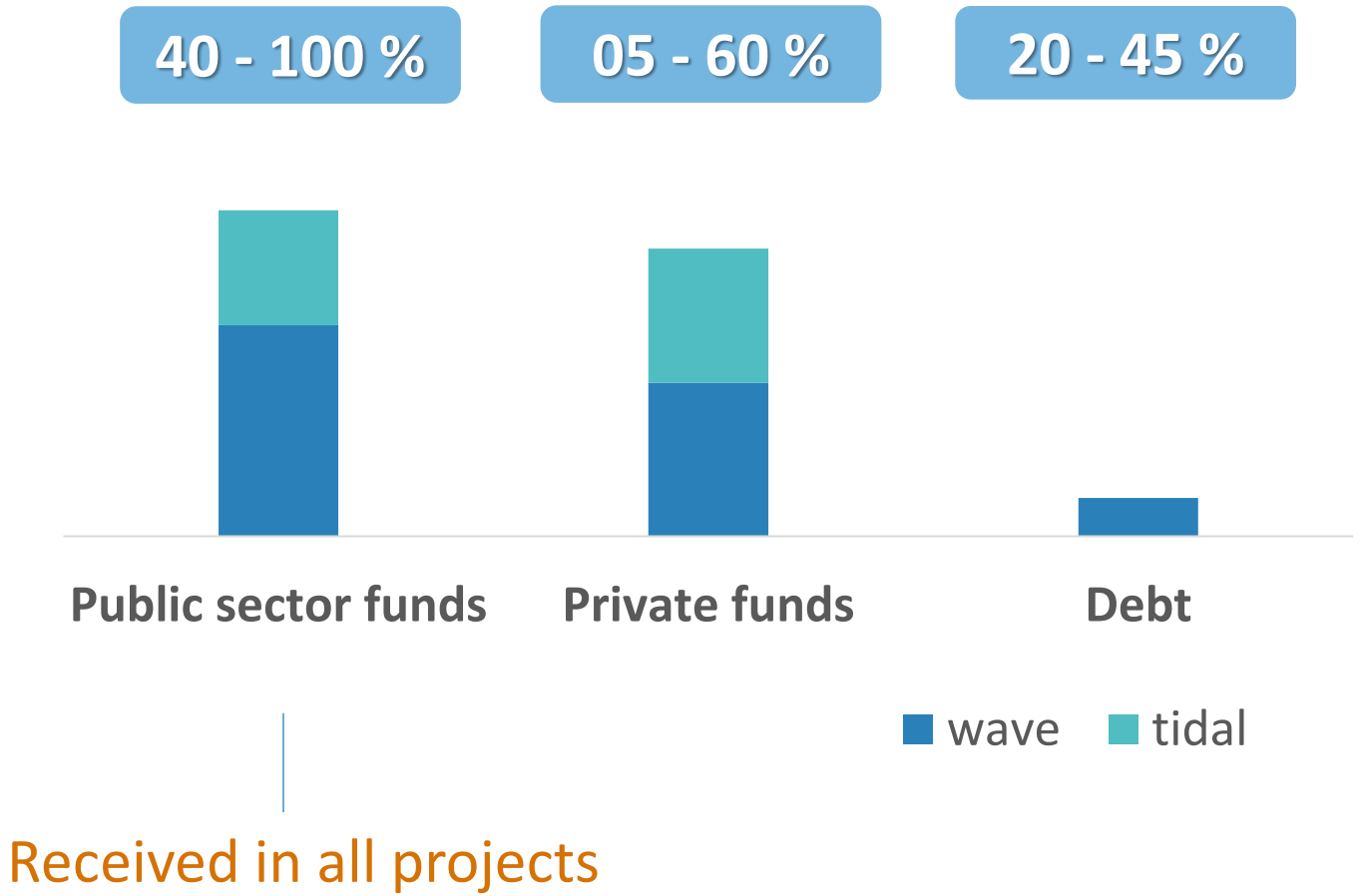
Incidence



Delivery sectors

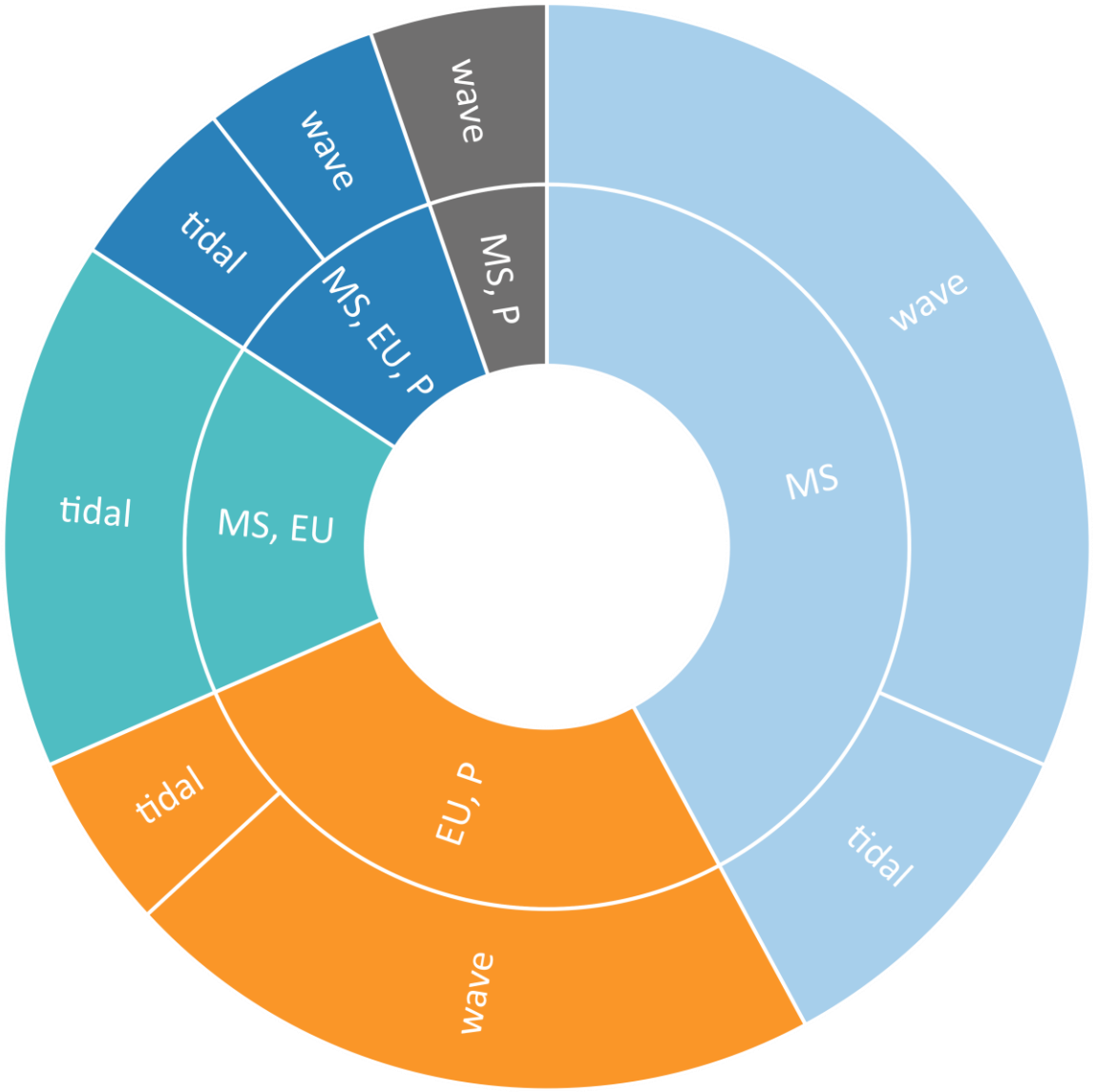
On/offshore wind
Composites
Aerospace
Industrial automation
Oil and gas

Funding model



Received in all projects

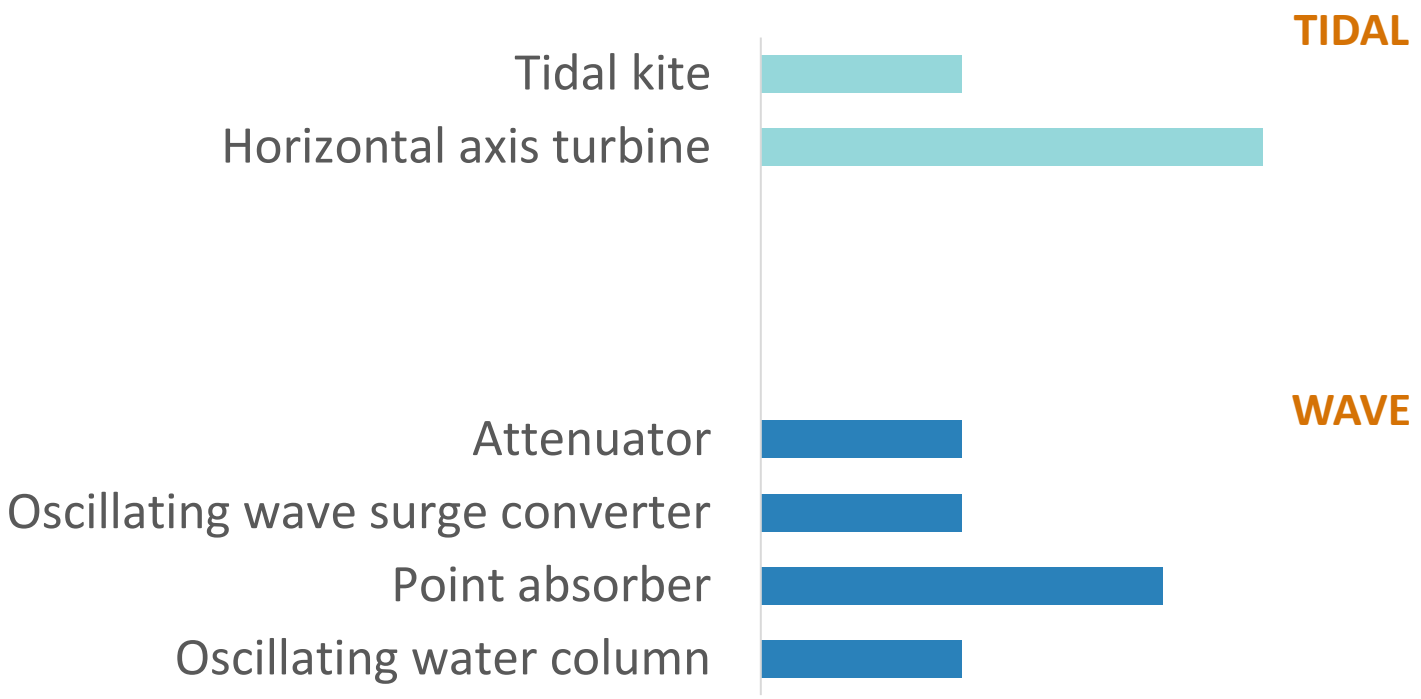
Funding model



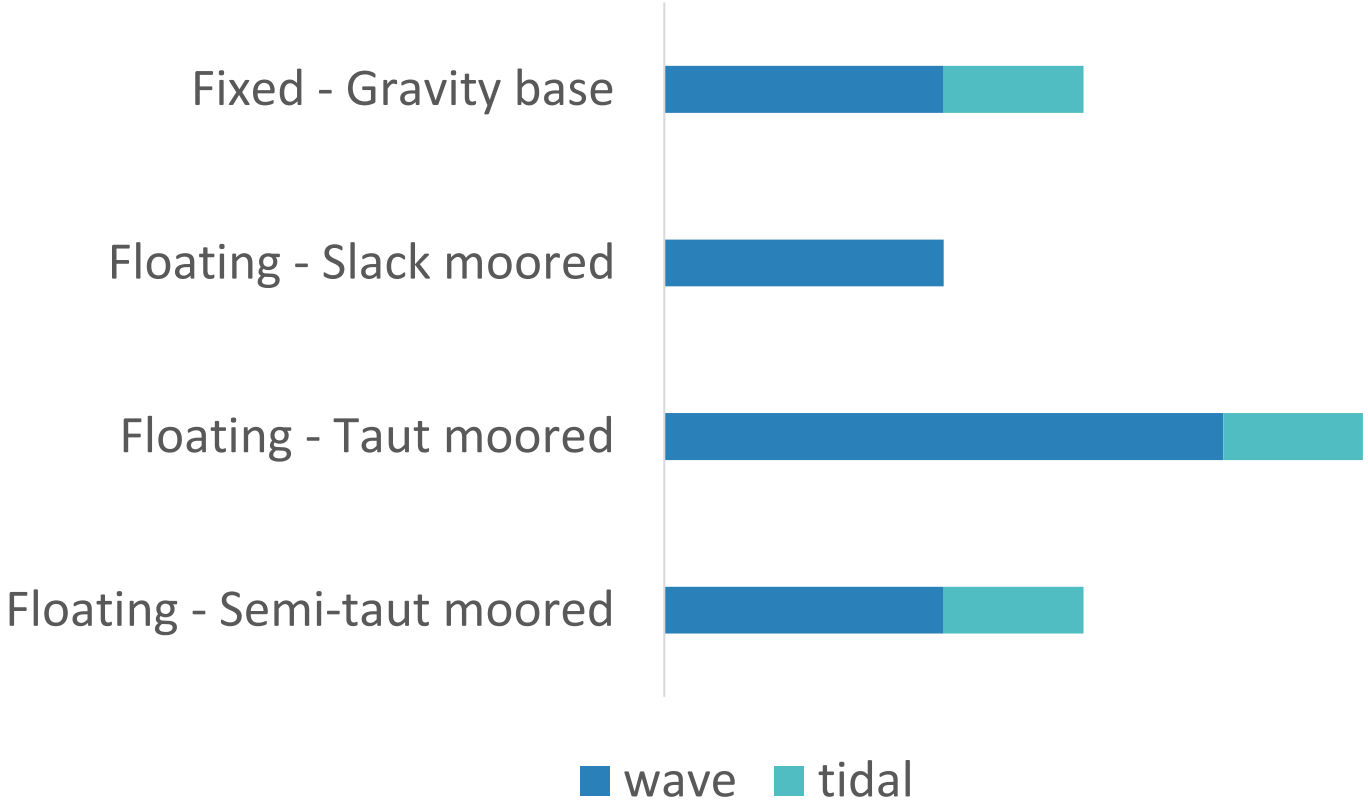
MS – Member State funding
EU – European funding

P – Private funding

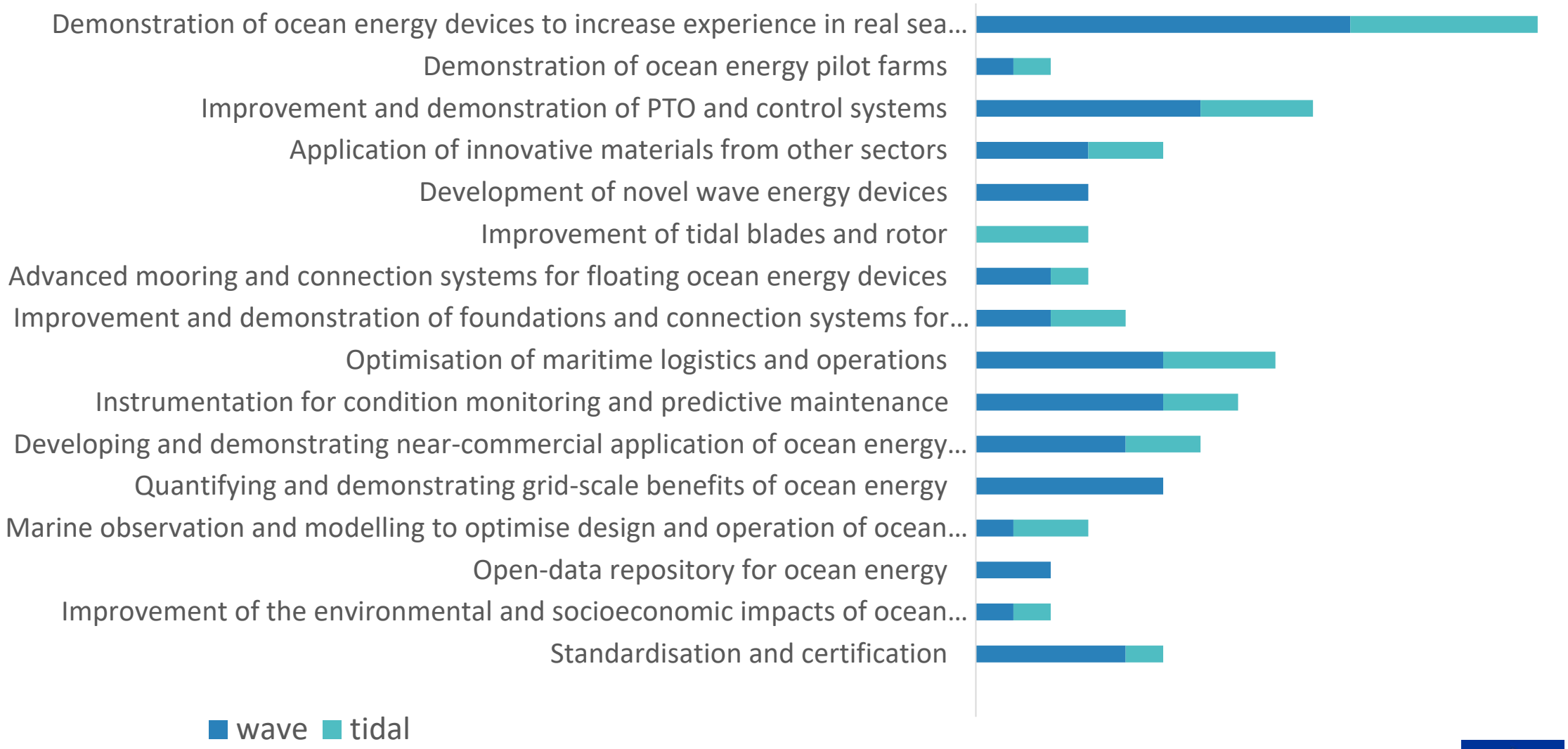
Device technologies



Installation technologies



Development areas



(2020 SRIA priority challenges for ocean energy – ETIP Ocean)

Performance metrics

Smaller scale devices (< 0,1 MW)

Larger scale devices (> 0,1 MW)

Technology hybrids

Data asked in terms of:

- given ranges
- target / achieved

Estimated metrics:

Individual values assigned by averaging the maximum and the minimum in the range
- in the lowest range, lower than…, averaging between zero and its higher value
- in the highest range, higher than…, its minimum was considered instead of an average

Metrics obtained by averaging individual values

n.a. – data considered insufficient when:

- not available at all
- the few data available would lead to a possible identification of the project(s) involved

Performance metrics

Smaller scale devices (< 0,1 MW)

	Wave	Tidal
	Target	Target
Rated Power (MW)	n.a.	n.a.
CAPEX (€/W)	9,5	11
OPEX (€/W per annum)	2,1	0,35
Average annual energy production (MWh)	50	n.a.
LCOE (€/MWh)	n.a.	n.a.
Availability (%)	87,5	92,5
Design life (years)	20	25

Estimated metrics: individual values assigned by averaging the maximum and the minimum in the range; in the lowest range, averaging zero and its higher value; in the highest range, its minimum was considered instead of an average.

Performance metrics

Larger scale devices

	Wave	Tidal
	Target	Target
Rated Power (MW)	0,62 (0,2 – 1,5)	1,15 (0,25 – 2)
CAPEX (€/W)	5,92 (<0,5 – 11)	3,4 (<0,5 – 5,5)
OPEX (€/W per annum)	0,51 (<0,05 – 1,25)	0,54 (<0,05 – 1,25)
Average annual energy production (MWh)	2458 (500 – >6001)	2933 (<100 – >6001)
LCOE (€/MWh)	265 (80 - 531)	n.a.
Availability (%)	78 (35 – 92,5)	78 (55 – 92,5)
Design life (years)	20 - 30	20 - 25

Ranges in brackets: between the minimum and maximum values of ranges answered in responses received so far.
Estimated metrics: individual values assigned by averaging the maximum and the minimum in the range; in the lowest range, averaging zero and its higher value; in the highest range, its minimum was considered instead of an average.

Performance metrics

Technology hybrids

	Wave/Tidal* + Wind/Solar/Off-grid application
	Target
Rated Power (MW)	0,74 (0,1 – 1)
CAPEX (€/W)	7,1
OPEX (€/W per annum)	0,23
Average annual energy production (MWh)	4125
LCOE (€/MWh)	587,5
Availability (%)	90
Design life (years)	20 - 25

Averages encompassing wave and tidal data.
Estimated metrics: value assigned by averaging the maximum and the minimum in the range; in the lowest range, averaging zero and its higher value; in the highest range, its minimum was considered instead of an average.
Had into consideration some historical data (marqued *)

Performance metrics

Technology hybrids

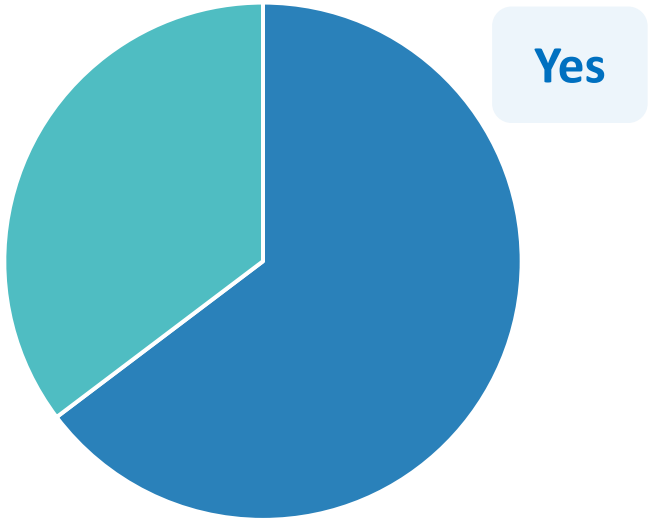
	Wave + Wind/Solar/Off-grid application
	Target
Rated Power (MW)	0,48
CAPEX (€/W)	5,25
OPEX (€/W per annum)	0,20
Average annual energy production (MWh)	6001 (>6001)
LCOE (€/MWh)	275
Availability (%)	92,5
Design life (years)	20 - 25

Averages encompassing wave data.
Estimated metrics: value assigned by averaging the maximum and the minimum in the range; in the lowest range, averaging zero and its higher value; in the highest range, its minimum was considered instead of an average.

Standards

- Technical specifications (*i.e.* draft technical standards) for ocean energy technology are in development.

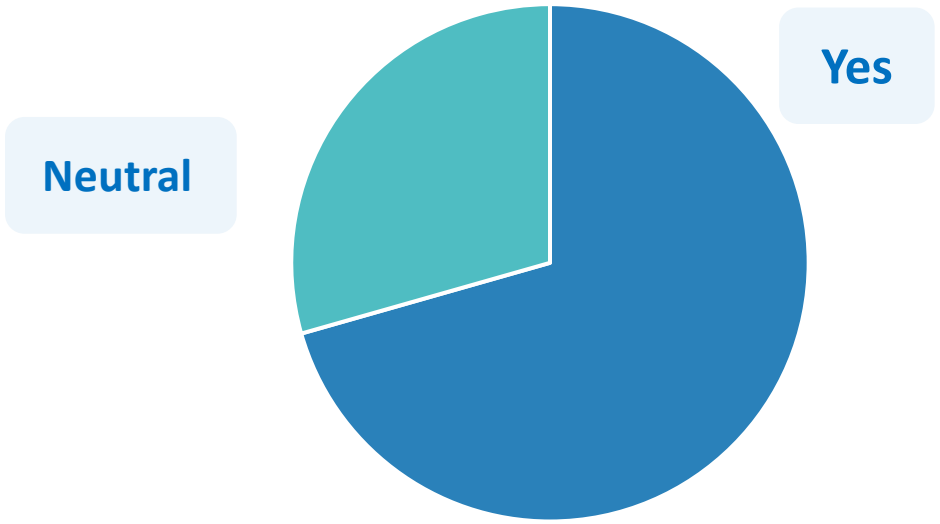
  As a technology developer, are you engaged with the process of creating these specifications?



TIDAL / WAVE

Standards

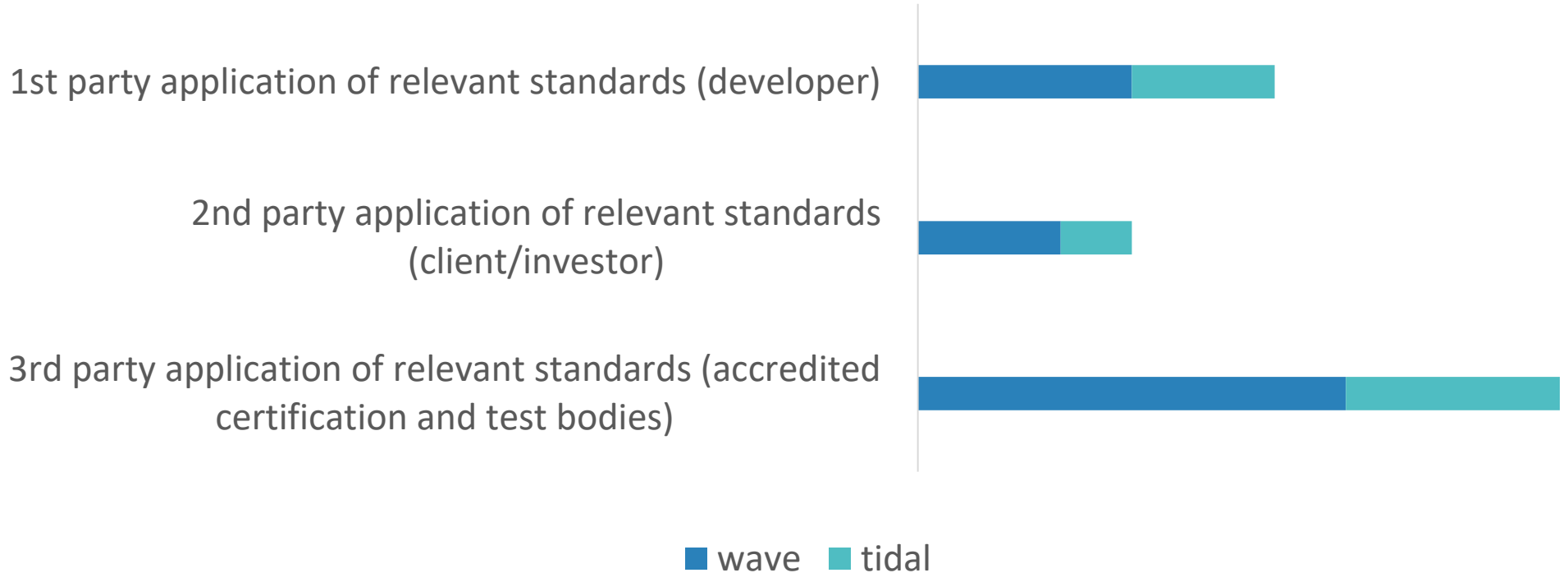
- Do you feel technical specifications benefit the sector in its current state of development?



TIDAL / WAVE

Standards

- How do you carry out the performance certification of your device?



Suggestions for EC action

- Additional support from funding providers?
- Topics to upcoming R&I funding calls?
- Other actions from the European Commission?

Suggestions for EC action

WAVE

- **Insurance, warranties and guarantees** for future projects

- Financial support for **market pull mechanisms**
  - Introductions to energy and utilities companies
  - Support on entering the market (*i.e.* reducing the risk for the customer)
  - Support for Feed in Tariffs for wave energy

- **Shortened consenting** lead times

  (easier administrative procedures; understanding among countries on starting offshore energy projects)

- Electricity production regulations **promoting renewables with the capacity to balance supply-demand** (instead of just looking after the amount of capacity installed and energy produced)

- Region directed actions (*e.g.* Mediterranean).

Suggestions for EC action

WAVE

- R&D support on specific areas to reduce LCOE (reduce unit cost and increase efficiency)
- **Market push mechanisms**:
  - When funding 'demonstration Projects' its is key to **map 'side Projects'**, to be leveraged and validated
  - Support applications for smaller scale wave energy, in order to build up a learning curve that can make wave energy really cost effective in the future
  - **Commitment to longer term support** and to continue development at higher TRL levels
  - Further support for **small wave arrays** (*e.g.* 3 wave devices)
  - Support for common projects: wave & wind/floating wind; wave & power-to-X (*e.g.* **requiring new energy sources like wave to be integrated in large offshore energy farms**)

Suggestions for EC action

WAVE

- R&D support on specific areas to reduce LCOE (reduce unit cost and increase efficiency)

  - ✓ Optimising specific components
  - ✓ Incentivising device simplicity and targets achievement such as in Kg/kW and capacity factor
  - ✓ Sustainable materials related to key aspects of the device
  - ✓ O&M planning of ocean energy arrays (simulations of installation, decommissioning activities)
  - ✓ Tools for system value modelling
    (evaluating the role of wave energy in the renewable energy system compared to wind and solar)

Suggestions for EC action

TIDAL STREAM

- **Continued European funding**
  - Continuing initiatives like the "Innovation Fund“
  - High priority for diversification of the renewable energy systems in the upcoming “Research and Innovation” (for generating economic growth and increasing energy security)

- **Simplifying** the approval process for **short term trials** of devices

- Network/contacts of future customers

Suggestions for EC action

TIDAL STREAM

- **Ongoing funding** to support multiple technical challenges of unit scaling
  (onshore testing of drivetrain/blades, load control optimisation, mooring/anchoring, launch and recovery)
  - **More devices in the water**
    - namely a tidal energy blades project involving multiple partners
  - **Novel methods** for reducing CAPEX and OPEX
    - namely innovative technologies and solutions to **widen the deployment potential** of tidal technologies (a large deployment potential is important to reach scale that will drive cost reductions)
  - Funding for **environmental monitoring for first arrays** – developing a robust, low-cost environmental monitoring system
  - Support for common projects: floating wind and tidal

Thank you for your attention!

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

Bridging the gap to commercialisation of wave energy technology using pre-commercial procurement

EUROPEWAVE

This project has received funding from the European Union's Horizon 2020 research and Innovation programme under grant agreement 883751.

www.europewave.eu @Europewave_EU info@europewave.eu

EUROPEWAVE

Bridging the gap to commercialisation of wave energy technology using pre-commercial procurement

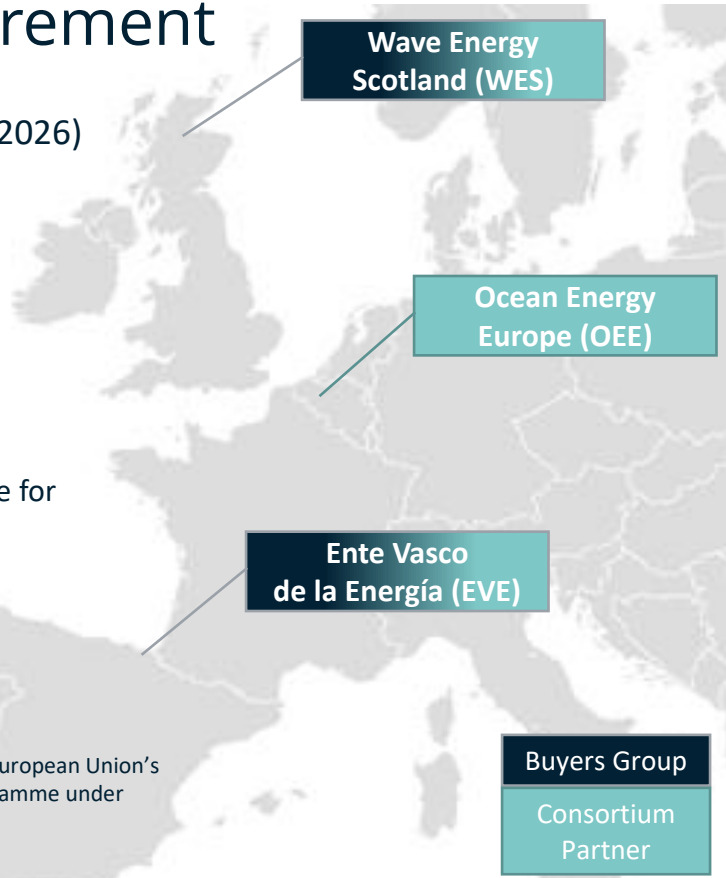
Duration: 65 months (01/01/2021 to 31/05/2026)

PCP Budget: €19,600,000

Total Budget: €22,702,112

Programme: H2020-EU.3.3.2.
[Low-cost, low-carbon energy supply]

Topic: LC-SC3-JA-3-2019
[European Pre-Commercial Procurement Programme for Wave Energy Research & Development]



wave energy SCOTLAND

ENERGIAREN EUSKAL ERAKUNDEA
ENTE VASCO DE LA ENERGÍA

Ocean Energy Europe

This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 883751.

EuropeWave Consortium

wave energy SCOTLAND

A Scottish Government funded initiative to develop wave energy technology

ENERGIAREN EUSKAL ERAKUNDEA
ENTE VASCO DE LA ENERGÍA

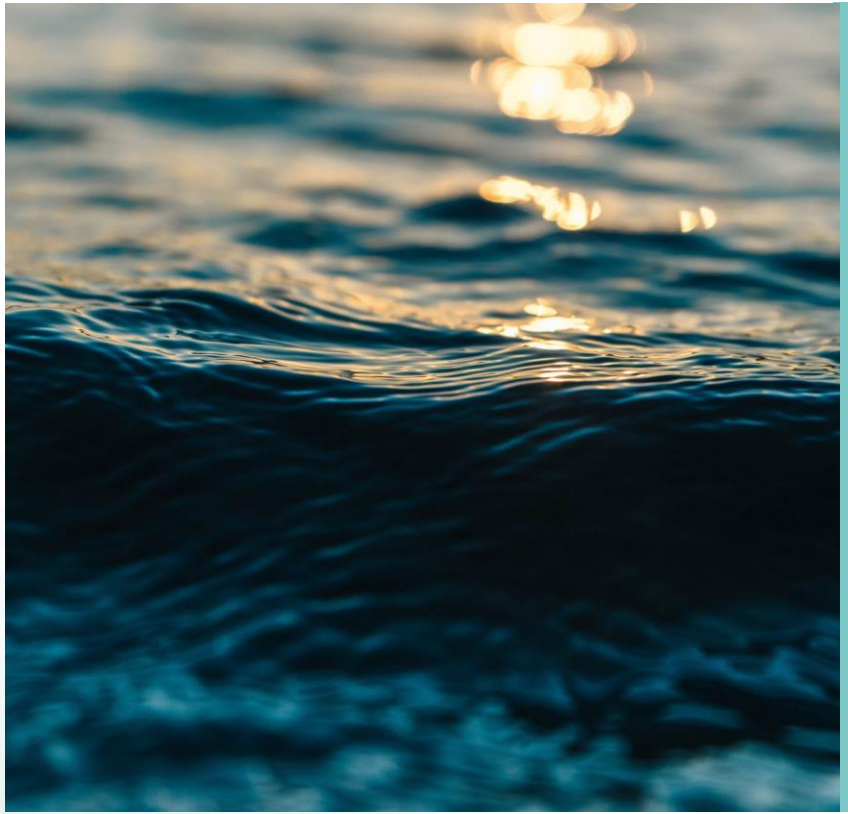
The Basque Government's Energy Agency, responsible for delivering energy policy

Ocean Energy Europe

The voice of the ocean energy sector – the sector's industry association in Europe

Overarching Challenge

The design, development,
and demonstration of cost-effective wave energy converter systems for electrical power production that can survive in the harsh and unpredictable ocean environment



EuropeWave PCP Challenge

To 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.

EuropeWave PCP

PCP budget: **€19,600,000 (inc VAT†)**
Duration: 53 months

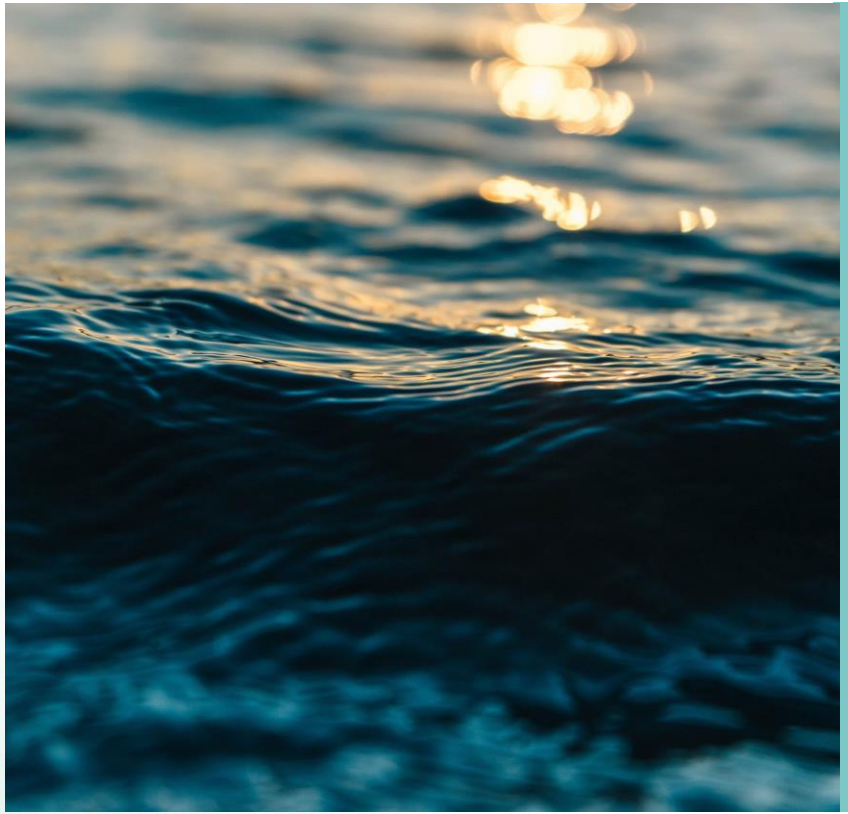
Phase 1 Concept Development	Phase 2 Design / modelling	Phase 3 Open-sea deployment & testing programme
Phase budget: €2,450,000 (inc VAT†)	Phase budget: €3,650,000 (inc VAT†)	Phase budget: €13,500,000 (inc VAT†)
Call-off contracts: 7	Call-off contracts: 5	Call-off contracts: 3
Contract budget: up to €350,000 (inc VAT†)	Contract budget: up to €730,000 (inc VAT†)	Contract budget: up to €4,500,000 (inc VAT†)
Duration: 7 months	Duration: 9 months	Duration: 33 months

† the applicable VAT rate is that in the country of the Lead Procurer

EuropeWave PCP

Procurement

Contract notice published	02 July 2021	
Tender period	02 July – 01 Oct 2021 (13 weeks)	
Query deadline	15 Sept 2021	
Tender submission deadline	**01 Oct 2021 12:00 BST [13:00 CEST]**	
Tender evaluation period	01 Oct – 26 Nov 2021 (8 weeks)	Estimated
Notification	26 Nov 2021	Estimated
Framework Agreement & Phase 1 contract signed	22 Dec 2022	Estimated
Phase 1 contract start	**03 Jan 2022**	Estimated



EuropeWave Phase 1 Projects

- Waveram Ltd: The Waveram
- Mocean Energy Ltd: Blue Horizon 250
- IDOM Consulting, Engineering, Architecture SAU: MARMOK Atlantic
- CETO Wave Energy Ireland Ltd: ACHIEVE
- Bombora Wave Power Europe Ltd: emWave
- Arrecife Energy Systems SL: Trimaran
- AMOG Consulting Limited: Sea-Saw WEC

Questions ?

EUROPEWAVE

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