

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

Sharing data to attract investors

Gianmaria Sannino Video Conference 15 April 2021





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





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

Sharing data to attract investors ... and to drive European Policies for the Ocean Energy sector

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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 Nuclear (#10) safety boost the transition towards a climate neutral energy system through the development of lowcarbon technologies in a fast and cost-competitive way.



The European Strategic Energy Technology Plan

13 implementation working groups





13 implementation working groups



SET Plan Ocean Energy





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





Development of cost competitive Ocean Energy technologies with high market potential for Europe

Reduce the LCOE for tidal stream energy to

0.15 €/kWh in 2025
0.1 €/kWh in 2030

Reduce the LCOE for wave energy technology to

- 0.2 €/kWh in 2025
- o 0.15 €/kWh in 2030
- 0.1 €/kWh in 2035



SET Plan IP 11 Actions for Ocean Energy



6 Technical Actions - To ensure support for all TRL to ensure development of tidal arrays and to drive convergence in wave technologies.

- Action 1.1 Tidal Energy technology device development and knowledge building up to TRL6
- Action 1.2 Tidal energy system demonstration in operational environment (TRL 7-9)
- Action 1.3. Wave energy technology development and demonstration up to TRL 6
- Action 1.4. Wave energy system demonstration and deployment TRL 7-9
- Action 1.5. Installation, logistics and testing infrastructure [and] supply chain development.
- Action 1.6. Standards and guidelines for evaluation of wave energy technologies.

3 Financial Actions - To ensure investment and insurance support funds are available to support the development of the sectors.

- Action 2.1. Creation of an investment fund for Ocean Energy farms.
- Action 2.2. Creation of an EU insurance and guarantee fund to underwrite project risks.
- Action 2.3. Pre-Commercial Procurement (PCP) action for development of wave energy technology.

2 Environmental Actions - To share knowledge on safety and environmental matters.

- Action 3.1. Development of certification and safety standards to support offshore renewable technology development.
- Action 3.2. De-risking environmental consenting through an integrated programme of measures.









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)



The Implementation Working Group will deliver actions

For the execution of the Implementation Plan, the temporary working group evolved to assume the role of an Implementation Working Group (IWG).





Implementation Working Group – Ocean Energy





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





Directorate-General for Research and Innovation (DG RTD)



14 Member States (SE, NO, FI, DK, UK, IR, DE, BE, ND, FR, ES, PT, CY, IT)











From 2019 the H2020 OceanSET project assists the IWG to deliver on the

targets and actions set in the Implementation Plan.







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.





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	WP4	WES	
Programme Development			
Monitoring & Review	WP5	DGEG	
Communication & Dissemination	WP6	FEM	
Management	WP7	SEAI	
Seal SUSTAINABLE ENERGY AUTHORITY OF IRELAND	ergy	FRANCE ENERGIES MARINES	
C Direção-Geral de Energia e Geologia		European Ocean Energy	
THE UNIVERSITY of EDINBURGH	1	PLOCAN	



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-ofthe-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









Mapping using a survey: what information?



4 types of information

aligned with the requirements of the Implementation Plan





Definition of appropriate metrics for 2019



Policy and funding



Supply chain, capacity, jobs



- Amount spent on OE: total, percentage of budgeted amount spent
- **Funding** by Government, EC, private sector, grants, debt
- **OE policy**, revenue support, licensing/consenting

- Supply chain development level
- Installed capacity : newly installed
- Supply chain: Status
- Infrastructure Status

Concepts and technologies



- TRL 1-6 projects: number of projects financed in each MS (wave, tidal, other)
- TRL 7-9 projects : number of projects financed in each MS, technology, installation, capacity factor, availability, CAPEX, OPEX, lifetime, LCOE





No.	Member State	Was a response for Survey received?	Has the Member State funded projects over TRL7 or above?
1	UK	Yes	Yes
2	Germany	Yes	Yes
3	Italy	Yes	No
4	Spain	Yes	Yes
5	Portugal	Yes	Yes
6	Sweden	Yes	Yes
7	Ireland	Yes	Yes
8	Netherlands	Yes	Yes
9	France	Yes	Yes
10	Denmark	Yes	Yes
11	Cyprus	No activity to report	n/a
12	Finland	No activity to report	n/a
13	Norway	No activity to report	n/a
14	Belgium	No activity to report	n/a





Ocean Energy Policy in Member States



Country	Responding organisation	Is there an Ocean Energy Policy?	Is there an assigned Ministry/ Department owner?	
UK	Offshore Renewable Energy Catapult (Cornwall); Welsh European Funding Office; and Wave Energy Scotland	Yes	Yes	
Germany	Fraunhofer IEE	Yes	Yes	
Italy	ENEA (Agenzia nazionale per le nuove tecnologie, l'energia e lo sviluppo economico sostenibile)	Yes	Yes	
Spain	AEI (Agencia Estatal de Investigación) and CDTI (Centro par el Desarrollo Tecnológico Industrial).	Yes	Yes	
Portugal	DGEG (Directorate General for Energy and Geology)	Yes	Yes	
Sweden	Swedish Energy Agency	Yes	Yes	4
Ireland	SEAI (The Sustainable Energy Authority of Ireland)	Yes	Yes	
Netherlands	Ministry of Economic Affairs and Climate, with input from RVO and DMEC	No	No	
France	ADEME (Ecological transition Agency)	Yes	Yes	
Denmark	Danish Energy Agency/Ramboll	Yes	Yes	





Annual report key findings – Ref year 2019



member

states have an

ocean energy

budget





had test site facilities

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.

> 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



1 tidal 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







- Overall funding of technology development was well supported in 2019
- Overall public funding from MSs and Regions of around €42.7M. Aligns well with the estimated requirements of the Ocean Energy IP
- In tidal a significant number of concepts are being developed and 5 at or above TRL7. First array scale demo is underway and progressing ahead of the expectations of the IP
- Wave also showed a significant number of sub-TRL7 technologies in development. Demonstration of full-scale wave energy technology was progressing broadly in line with the expectations of the IP





- There is difficulty in accessing accurate funding information and performance of technology
- Industry partners are reluctant to provide accurate information





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

	Technical Actions	Progress		
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			



Pre-Commercial Procurement





https://europewave.eu



Key dates:

19 April: Deadline for queries prior to consultation (via the PCS portal indicated above)

26 April: Open consultation via a public webinar3 May: Deadline for queries following consultationJune 2021: Call for tender opensSeptember 2021: Call for tender closes

EuropeWave is an innovative R&D programme for wave energy technology. It will combine over €22.5m of national, regional and EU funding to drive a competitive Pre-Commercial Procurement (PCP) programme for wave energy.

The programme will focus on the highest priority technology areas for the advancement of wave energy systems: scale prototypes, off-grid applications and mooring systems.

This collaboration is closely aligned with the decarbonisation, industrial and competitiveness objectives of the European Green Deal, and will help meet the European Commission's newly-announced targets of 100MW of ocean energy by 2025 and at least 1GW by 2030.







Brussels, 19.11.2020 COM(2020) 741 final

COMMUNICATION FROM THE COMMISSION TO THE EUROPEAN PARLIAMENT, THE COUNCIL, THE EUROPEAN ECONOMIC AND SOCIAL COMMITTEE AND THE COMMITTEE OF THE REGIONS

An EU Strategy to harness the potential of offshore renewable energy for a climate neutral future

The Commission will work with Member States and regions, including islands, to make use of available funds in a coordinated manner for ocean energy technologies in order to achieve a total capacity of 100MW across the EU by 2025 and around 1 GW by 2030.





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Thank you for your attention!

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