



Ocean Energy SET PLAN

24th February 2022 IWG Ocean Energy Gianmaria Sannino* (Chair IWG group) * ENEN - 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 lowcarbon technologies in a fast and cost-competitive way.



13 implementation working groups



The European Strategic Energy Technology Plan 13 implementation working groups SET Plan key actions 🔕 🕲 🕲 🥹 🌚 🕲 🕲 · Offshore wind Energy systeme Photovoltaics The European Strategic Energy Deep geothermal Ocean energy (3) te finning es 0 · Concentrated solar power rests of & services **Technology Plan** (SET Plan) is the Solar thermal electricity Resil enco & o insume a security of inlegrated i technology pillar of the EU's energy system - Energy systems - Positive energy districts energy and climate policy since New materials & technologies for hold rus 2008. It is a key stepping-stone to · Energy efficiency in buildings ۲ SET Nuclear 🛞 Energy 徸 - Energy efficiency in industry efficiency PLAN ۲ boost the transition towards a Energy efficiency for industry Batteries climate neutral energy system Renewable fuels and bipenergy 1 CO. through the development of low- Carbon capture and storage. SCLUDE ALLE Carbon capture and utilisation (CCS - CCU)carbon technologies in a fast and 3 \odot ccs.ccu cost-competitive way. + Nuclear safety



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



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.



EU Objectives for the Ocean Energy sector

These common objectives 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.





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)





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

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.



Running project in Europe





- > 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.





million in public funding from member states and regions

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10 member states

have test site facilities





were **funding ocean energy projects** and **9** were funding TRL 7+





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)



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.







Phase 1 (2018 -2020) **COMPLETE** – A feasibility **DISCOVERY** phase to develop:

- a collective monitoring approach by MS and partnering non-EU countries in 2018 and an agree oversight management process for projects and funding which outlines achievable interim commercialisation targets;
- the likely levels of funding required for phase 2 and 3.

Phase 2 (2020-2025) **ONGOING** – Collaborative **DEVELOPMENT** Phase with operational arrays demonstrating the ability to meet the technical and financial metrics.

Phase 3 (2026-2030) – Commercialisation Scale **DEPLOYMENT** Phase to build the sectors supports with large scale deployments that will drive costs to a commercial level. After 2030 the ambition is that the sector **DELIVERY** will be at scale via a commercial market with a functioning supply chain.



The primary focus of the actions over the coming years will be on the following areas:

- Tidal stream: Demonstration projects in operational environments, based on arrays of devices with TRL levels of 7-9, to bring tidal stream technology to the point of industrial roll-out.
- Wave: A systematic and structured focus on support for technology development up to TRL level 6. This should be part of a wider initiative to create stage gate metrics for wave device components and subsystems, which will support the competitive procurement of reliable wave devices up to a TRL level of 8.



Actions to be monitored during the Implementation Plan

	Technical Actions
Design and Validation of Ocean Energy Devices	 1.1 - Demonstration of ocean energy devices to increase experience in real sea conditions
	1.2 - Demonstration of ocean energy pilot farms
	1.3 - Improvement and demonstration of PTO and control systems
	1.4 - Application of innovative materials from other sectors
	1.5 - Development of novel wave energy devices
	1.6 - Improvement of tidal blades and rotor
Foundations, Connections and Mooring	1.7 - Advanced mooring and connection systems for floating ocean energy devices
	 1.8 - Improvement and demonstration of foundations and connection systems for bottom-fixed ocean energy devices
Logistics and Marine Operations	1.9 - Optimisation of maritime logistics and operations
	1.10 - Instrumentation for condition monitoring and predictive maintenance
Integration in the Energy System	 1.11 - Developing and demonstrating near-commercial application of ocean energy in niche markets and hybrid systems.
	1.12 · Quantifying and demonstrating grid-scale benefits of ocean energy
Data Collection & Analysis and Modelling Tools	1.13 - Marine observation and modelling to optimise design and operation of ocean energy device
	1.14 - Open-data repository for ocean energy operation and performance
Cross-Cutting Challenges	1.15 - Standardisation and certification



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Actions to be monitored during the Implementation Plan

Environmental, Policy and Socioeconomic Actions

De-risking of Environmental Consenting through an integrated programme of measures

Promoting Ocean Energy in Marine Spatial Planning

Promoting political support and public backing for ocean energy

Market Uptake and Financial Actions

Dedicated revenue support for the first wave & tidal demonstration farms, to allow developers to attract the necessary private investment to action these deployments.

Create of an Investment Support Fund for ocean energy farms.

Creation of an EU Insurance and Warranty Fund to underwrite various project risks, as envisaged in the OceanSET dedicated report.

Funding from EU, national, regional and private sector to support demonstration and innovation projects under the Technical and Environmental, Policy and Socioeconomic Actions

Support the development of novel mechanisms to close funding gaps (such as a Public Procurement of Innovative Solutions)







Funding required for the Technical and Environmental/Socio-economic phases.

The current estimate is for funding levels totalling **1,00 BN EUR** between 2021 and 2025. The breakdowns are outlined in the Action Fiches in Appendix 7.

- EUR 335 million coming from the industry (private funds - 33% of the total);
- EUR 400 million coming from national/regional programmes - (40% of the total);
- EUR 271 million coming from EU funds (27% of the total – mainly from Horizon Europe and the ETS Innovation Fund)





Position on Horizon Europe 2023-24 Work Programme



Figure 2: Average budgets ringfenced for established and emerging renewable technologies

The 2023-24 Work Programme must prioritise ocean energy and other emerging renewables

However, from an Industry analysis it emerges that the current 2021-2022 Work Programme allocates 4 times more budget to PV and wind, compared to ocean, geothermal and concentrated solar

If this continues, it is not realistic for emerging renewables to become competitive and achieve large-scale rollout.