

Het Europese perspectief van getijdenenergie

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The European Green Deal

• A commitment for the European Union to become world's first climateneutral continent



This "involves taking decisive action now. We will need to invest innovation and research, redesign our economy and industrial policy".

"The European Green Deal provides an action plan to

Boost the efficient use of resources by moving to a clean, circular economy



restore biodiversity and cut pollution



EUROPEAN COMMISSION

The European Green Deal

Brussels, 11.12.2019 COM(2019) 640 final

- Communication published 11 December 2019 ۲
- https://ec.europa.eu/info/publications/communicationeuropean-green-deal en

ANNEX to the

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

The European Green Deal

Annex to the Communication on the European Green Deal

Roadmap - Key actions

Actions	Indicative Timetable
Strategy for smart sector integration	2020
'Renovation wave' initiative for the building sector	2020
Evaluation and review of the Trans-European Network - Energy Regulation	2020
Strategy on offshore wind	2020
Industrial strategy for a clean and circular economy	
EU Industrial strategy	March 2020
Circular Economy Action Plan, including a sustainable products initiative and particular focus on resource intense sectors such as textiles, construction, electronics and plastics	March 2020
	Commission

EUROPEAN COMMISSION	Brussels, 11.12.2019 COM(2019) 640 final				
COMMUNICATION FROM THE COMMISSION					
The European Green Deal					
1. Introduction - turning an urgent challenge into	A UNIQUE OPPORTUNITY				
This Communication sets out a European Green Deal for the European Commission's commitment to tackling climate and environmental-related task. The atmosphere is warming and the climate is changing with each pa species on the planet are at risk of being lost. Forests and oceans are being p	Union (EU) and its citizens. It resets the challenges that is this generation's defining ssing year. One million of the eight million polluted and destroyed ¹ .				

The European Green Deal is a response to these challenges. It is a new growth strategy that aims to transform the EU into a fair and prosperous society, with a modern, resource-efficient and competitive economy where there are no net emissions of greenhouse gases in 2050 and where economic growth is decoupled from resource use.

1.

Commission

Offshore Renewable Energy Strategy Overall objectives



- 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



considered



3 focus areas

Maritime Spatial Planning Grid and Market Framework Industry, Value Chain, Jobs and Research & Innovation



3 focus areas

Private investment, national and EU Funds



Marine Spatial Planning

- MSP Directive 89/2014/EU
- National plans by 2021
- Cross-border cooperation: "Member States bordering marine waters shall cooperate"
- Ecosystem-based approach is compulsory
- Space is identified as the main issue for future developments at sea





Challenges and lead actions

<u>Sustainable management of maritime space and resources</u> Co-existence with other sea space uses / Multi-use approach Respectful of marine biodiversity and environment

Aligning NECPs and national MSP	Reinforce S cross-borde in	ea-basin and r cooperation MSP	Support mul proje	ti-use pilot ects
Guidance on wir legislatio	nd / nature on	Launch a co prac	ommunity of	

ORES - Focusing R&I on supporting offshore projects

Key actions:

- Under the first work programme of Horizon Europe for 2021 and 2022, the Commission proposes to:
 - support cooperation between TSOs, manufacturers and offshore wind developers to start a large-scale HVDC-grid demonstration project in 2022;
 - o develop new wind, ocean energy and solar floating technology designs, for example through Horizon Europe
 - improve industrial efficiency across the value chain of offshore wind energy, involving digital technologies using data-driven approaches and Internet of Things devices
 - o systematically integrate the principle of 'circularity by design' into renewables research & innovation.
- The Commission will review SET Plan targets on ocean energy and offshore wind and the implementation agendas, and launch an additional SET Plan group on HVDC;
- The Commission will study how technology development in offshore energy generation and infrastructure can be embedded sustainably in socioeconomic ecosystems and the marine environment, for example by researching cumulative impacts and social awareness.
- 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.



Implementation of the strategy

- Modelling of future energy system
 - Technology/market readiness
- From demonstration to large scale pilot projects
- Large scale investments
 - Regional/national/EU public/private funding
- Need for reliable data



EU support

- **InvestEU programme** can provide support and guarantees for emerging technologies to accelerate private investment through its different windows.
- The Connecting Europe Facility can be used as a supporting instrument to promote grid infrastructure development but also offshore cross-border renewable energy projects.
- The Renewable Energy Financing Mechanism will allow Member States, as of 2021, to provide financial contributions to renewable energy projects and receive statistical benefits in return.
- The Recovery and Resilience Fund
- The **Innovation Fund** can support the demonstration of innovative clean technologies at commercial scale, such as ocean energy, new floating offshore wind technologies or projects to couple offshore wind parks with battery storage or hydrogen production.
- Horizon Europe supports development and testing of new and innovative solutions.



Tidal energy in the strategy

- The EU industry is also the global leader for developing ocean energy technologies, mainly wave and tidal. EU companies hold 66% of patents in tidal
- The North Sea has a high and widespread natural potential for offshore wind energy thanks to shallow waters and localised potential for wave and tidal energy.
- Tidal technologies can be considered as being at the pre-commercial stage





Specific challenge

The **European Green Deal** expects to transform Europe into a fair and prosperous society with a modern, resource-efficient and competitive economy with no net emissions of greenhouse gases in 2050.

To decarbonise Europe, **land-based and offshore renewables must become the main energy source, while keeping the stability and resilience** of the European Energy System.

Research and Innovation is still needed to be able to achieve a full system transformation and to realize the ambition of other EU policies like the **Clean Planet for all**, the **SET-Plan**, and the **New Circular Economy Strategy** and to contribute to the **Sustainable Development Goals of the United Nations** (in particular SDG 7 Affordable and Clean Energy and SDG 9 Industry, Innovation and Infrastructure.



Specific challenge

- The Commission's long-term strategy, A Clean planet for all, identifies offshore renewable technologies, amongst others, as a key energy system for the Clean Energy Transition. It provides estimates for the offshore wind capacity in Europe of 240-440 GW by 2050, compared to about 22 GW today, while other offshore renewables follow a more modest scenario. This increase would represent a paradigm shift in the European energy system and require a modern infrastructure to seamlessly integrate the power of offshore resources in the energy system via the grid to onshore, or via the option of power-to-X taking into account grid constraints, investments and evolving /new energy market design.
- This buildout needs to ensure cost efficiency and to foster the green economy, while protecting the environment and biodiversity, and assuring a just transition. There is a need for more efficient, cost-effective, affordable and secure technologies using wind, solar, wave and/or tidal resources, considering the potential of the different European sea basins (Baltic Sea, North Sea, Atlantic Ocean, Mediterranean Sea and the Black Sea) and the complementarity of resources to reach the best capacity factor and optimized use of all the power equipment. At the same time, developed solutions should ensure resource efficient use of raw materials, in particular critical raw materials.

Horizon Europe - Our Vision

The EU's key funding programme for research and innovation:

- Tackles climate change
- Helps to achieve the UN's Sustainable Development Goals
- Boosts the EU's competitiveness and growth
- Facilitates collaboration and strengthens the impact of research and innovation in developing, supporting and implementing EU policies while tackling global challenges
- Supports the creation and better diffusion of excellent knowledge and technologies
- Creates jobs, fully engages the EU's talent pool, boosts economic growth, promotes industrial competitiveness and optimises investment impact within a strengthened European Research Area.





While benefiting from world-class research and strong industries... Our knowledge and skills are our main resources



6% of the world's **population**

17% of global R&D

25% of all high-quality scientific publications





EU figure is for 2019 Figures for USA, Japan, China and South Korea are for 2018. Figures represent R&D as % of GDP

> European Commission

...Europe can do better at transforming this into **leadership in innovation** and **entrepreneurship**

HORIZON EUROPE

EURATOM



* The European Institute of Innovation & Technology (EIT) is not part of the Specific Programme



Cluster 5 – Expected impacts

Transition to a climateneutral and resilient society and economy enabled through **advanced climate science**, pathways and responses to climate change (mitigation and adaptation)

More efficient, clean, sustainable, secure and competitive **energy supply** through new solutions for smart grids and energy systems based on more performant renewable energy solutions Clean and sustainable transition of the energy and transport sectors towards climate neutrality facilitated by innovative **cross-cutting solutions** Efficient and sustainable **use of energy**, accessible for all is ensured through a clean energy system and a just transition

Restoring Europe's ecosystems and biodiversity, and managing sustainably natural resources

Strategic Plan

Making Europe the first digitally enabled circular, climate-neutral and sustainable economy

Open strategic autonomy by

leading the development of key

digital, enabling and

emerging technologies,

sectors and value chains

Creating a more resilient, inclusive and democratic European society Towards climateneutral and environmental friendly mobility through clean solutions across all transport modes while increasing global competitiveness of the EU transport sector

Safe, seamless, smart, inclusive, resilient, climate neutral and sustainable **mobility systems** for people and goods



Fostering the European global leadership in affordable, secure and sustainable renewable energy technologies

A strong global European leadership in renewable energy technologies, coupled with circularity and sustainability, will pave the way to increase energy security and reliability.

It is imperative to enhance affordability, security, sustainability and efficiency for more established renewable energy technologies (such as wind energy, photovoltaics or bioenergy), and to further diversify the technology portfolio.

In line with the "do not harm" principle for the environment, actions for all renewable energy technologies aim to also improve the environmental sustainability of the technologies, delivering products with reduced greenhouse gas emissions and improved environmental performance regarding water use, circularity, pollution and ecosystems.



Mission "Healthy oceans, seas, coastal and inland waters" proposal





Figure 6. Mission Starfish 2030 ©European Union, 2020

Horizon Europe legislation defines three types of impact tracked through **Key Impact Pathways**





Where to find information?



Funding and Tenders portal

https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/home

Workprogramme <u>https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-8-climate-energy-and-mobility_horizon-2021-2022_en.pdf</u>

General annexes <u>https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/wp-call/2021-2022/wp-13-general-annexes_horizon-2021-2022_en.pdf</u>

Proposal template <u>https://ec.europa.eu/info/funding-tenders/opportunities/docs/2021-2027/horizon/temp-form/af/af_he-ria-ia_en.pdf</u>



Examples of ocean energy projects

https://cinea.ec.europa.eu/publications/ocean-energy-cordis-result-pack-brochure_en





Commission

International cooperation via IEA OES TCP

MISSION

Using our unique position as an intergovernmental organisation, the OES role within the contex tof this vision is to:

Connect organisations and individuals working in the ocean energy sector to acceleratedevelopment and enhance economic and environmental outcomes

ES CCEAN ENERGY SYSTEMS Search Q Ocean Energy ▼ News & Events ▼ OES Projects Publications About Us ▼ Extranet



Inspire governments, agencies, corporate and individuals to become involved with thedevelopment and deployment of ocean energy systems

Facilitate education, research, development and deployment of ocean energy systems ina manner that is beneficial for the environment and provides an economic return for thoseinvolved.



IFA-OFS is a Technical co-

https://www.ocean-energy-systems.org/

Clean energy transition and system integration

- Added value of ocean energy for the clean energy transition
 - Utilities

. . .

- Desalination, aquaculture, decarbonisation islands
- System integration aspects are becoming more important
 - Grid integration
 - Storage (batteries, hydrogen)
- BLUE ECONOMY AND ITS PROMISING MARKETS FOR OCEAN ENERGY

Technology Collaboration Programme



A TIDAL TURBINE BUILT IN SCOTLAND HAS STARTED GENERATING ELECTRICITY IN JAPAN

SIMEC Atlantis Energy

AN ARRAY OF FOUR TIDAL TURBINES IN SHETLAND ISLANDS ACCUMULATED OVER 35,000 HOURS OF ENERGY GENERATION TO THE GRID

Nova Innovation

Nova Innovation is currently doubling the capacity of

TIDAL CURRENT ENERGY DEVELOPMENTS HIGHLIGHTS

AN ARRAY OF THREE TIDAL TURBINES AT ROOSEVELT ISLAND IN NEW YORK'S EAST RIVER HAS REACHED RELEVANT OPERATIONAL MILESTONES OVER THE LAST YEARS

Thank you