

(English version)

**Question for written answer E-003406/25  
to the Commission  
Siegbert Frank Droese (ESN)  
(3 September 2025)**

*Subject:* European Digital Twin Ocean project

Since 2021, the Commission has provided the European Digital Twin Ocean project with funding of approximately EUR 15 million per year. The project promises to develop a ‘highly accurate living replica of the ocean’ based on data from sensors placed in the world’s oceans and satellite data. One of the stated objectives is to help stakeholders make better decisions so that we can mitigate and adapt to climate change.

1. How much energy has been consumed per year by the European Digital Twin Ocean infrastructure, including high-performance computing, cloud and graphics processing unit resources, data lake and storage solutions, modeling and simulation tools and any other machinery or software that contribute to the project, since its inception in 2021?
2. What is the year-by-year breakdown of this energy consumption between renewable and non-renewable sources?
3. Which experts and scientific bodies were involved in the conception of the project?

Submitted: 3.9.2025

**Answer given by Ms Zaharieva on behalf of the European Commission  
(27 October 2025)**

The Commission is developing the EU Digital Twin of the Ocean (DTO) <sup>(1)</sup>. It is a key element of the EU Mission ‘Restore our Oceans and Waters’ <sup>(2)</sup> and aims to provide decision support tools and transform ocean knowledge into actionable solutions for sustainability and resilience.

Currently, the DTO’s annual energy consumption is about 60 megawatt-hours (MWh), equivalent to the heating energy of approximately 10 houses.

Of this, 20 MWh is sourced entirely from green energy, while the remaining 40 MWh draws from the French grid, which relies minimally on fossil fuels <sup>(3)</sup>. Additionally, waste heat from computing is repurposed for heating, resulting in negligible CO<sub>2</sub> emissions from the DTO.

Although energy use is expected to rise as the initiative expands, the DTO adheres to an open science principle that enhances energy efficiency by centralising resources and sharing computing results, preventing redundant data storage and calculations.

The DTO holds immense potential for significant energy savings across various sectors. The World Meteorological Organisation estimated that improved ocean observations and weather forecasts save the maritime industry EUR 1.5 billion annually in fuel costs, avoiding circa 8 million tons of CO<sub>2</sub> emissions.

This is achieved by optimising shipping routes according to ocean currents, wind patterns and wave heights. With the enhanced forecasting capabilities of the DTO, such savings are expected to grow.

To develop the DTO’s core infrastructure EDITO <sup>(4)</sup> the Commission partnered with Mercator Ocean International and the Flanders Marine Institute, who manage the Copernicus Marine Service <sup>(5)</sup> and European Marine Observation and Data Network programmes <sup>(6)</sup>.

They employ a fully open and co-design approach, engaging with about 100 EU collaborative projects and interested stakeholders through Digital Ocean Fora.

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<sup>(1)</sup> [https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters/european-digital-twin-ocean-european-dto\\_en](https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters/european-digital-twin-ocean-european-dto_en).

<sup>(2)</sup> [https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters\\_en](https://research-and-innovation.ec.europa.eu/funding/funding-opportunities/funding-programmes-and-open-calls/horizon-europe/eu-missions-horizon-europe/restore-our-ocean-and-waters_en).

<sup>(3)</sup> (6-7% in 2023).

<sup>(4)</sup> European Digital Twin Ocean phase 2 <https://cordis.europa.eu/project/id/101227771>.

<sup>(5)</sup> <https://marine.copernicus.eu>.

<sup>(6)</sup> <https://emodnet.ec.europa.eu>.