

Coexistence between Offshore wind and Biodiversity

November 2022

SOLARFX 8/7

Based on our belief that offshore wind energy is an essential part of the global energy transition, we develop, finance, build and operate offshore wind farm projects all around the world.

Ocean Winds (OW) is the result of a Joint Venture between two of the biggest worldwide players in energy:



ENGIE, French multinational energy and services company and global leader of the zero-carbon transition.

- **Key Figures of ENGIE**

- 101,504 employees
- €57.9 billion revenue
- 100.3 GW installed power generation capacity
- 34.4 of renewables total installed capacity

EDPR (Energías de Portugal Renováveis), subsidiary of EDP and global leader in the renewable energy sector and the world's fourth-largest wind energy producer.

- **Key Figures of EDPR**

- 2,150 employees
- €1,758 million total revenue
- 13.6 GW installed power generation capacity (100% renewables)

2020 - WindFloat Atlantic, the 1st European floating offshore wind farm

LOCATION

18 km of the coast of Viana do Castelo, Portugal, in 100m water depth, in a area of sand and sediments, suitable for mooring

TECHNOLOGY

3 wind turbines V164 - 8.4 MW each
3 WindFloat floating platforms
Dynamic cables for the collecting system

INTERCONNECTION

Constructed by PT TSO (REN) allowing a direct connection to 60kV to an existing onshore substation operated by PT DSO (E-REDES)

FINANCING

EIB: Project Finance 60 M€
EU FUNDING - NER300
PT ENVIRONMENTAL FUND (FA)
WINDPLUS



- 25 MW CAPACITY
- DESIGNED FOR 25 YEARS OF OPERATION
- EQUIPMENT FABRICATION STARTED IN Q1 2018
- OFFSHORE INSTALLATION IN SUMMER 2019 / WINTER 2020
- OPERATION & MAINTENANCE BASE IN THE NORTH OF PORTUGAL, USING LOCAL TEAMS & LOGISTICS

STATUS

In Operation





WFA – Environmental Obligations & Status

November 2022



PRE-INSTALLATION:

- Approved Environmental Monitoring Plan
- Archaeological Assets Identification – 1 year (campaigns every 2 months)
- Cetaceans and Anthropogenic Noise – 1 year
- Geological Substrate Monitoring Programme – Before Export Cable installation
- Water quality monitoring programme – 2 collections

INSTALLATION:

- Archaeologist present during anchor and mooring lines installation
- Export Cable - Electromagnetic fields Propagation impact on Fish and Eels.
- Geological Substrate Monitoring Programme – After Export Cable installation
- Socioeconomics Monitoring – Complaints Book and Pamphlet
- Water quality monitoring programme – 2 collections

OPERATION:

- Birdlife – 3 year (campaigns every 2 months + Radar imaging)
- Platform Marine Growth Colonization – 4 collections, in the first 5 years
- Cetaceans – first 3 years; and Anthropogenic Noise – first year
- Chiropters (bats) – first 3 years
- Socioeconomics Monitoring – Complaints Book for project life (25 years)
- Water quality monitoring programme – 2 collections per year, for the first 2 years.

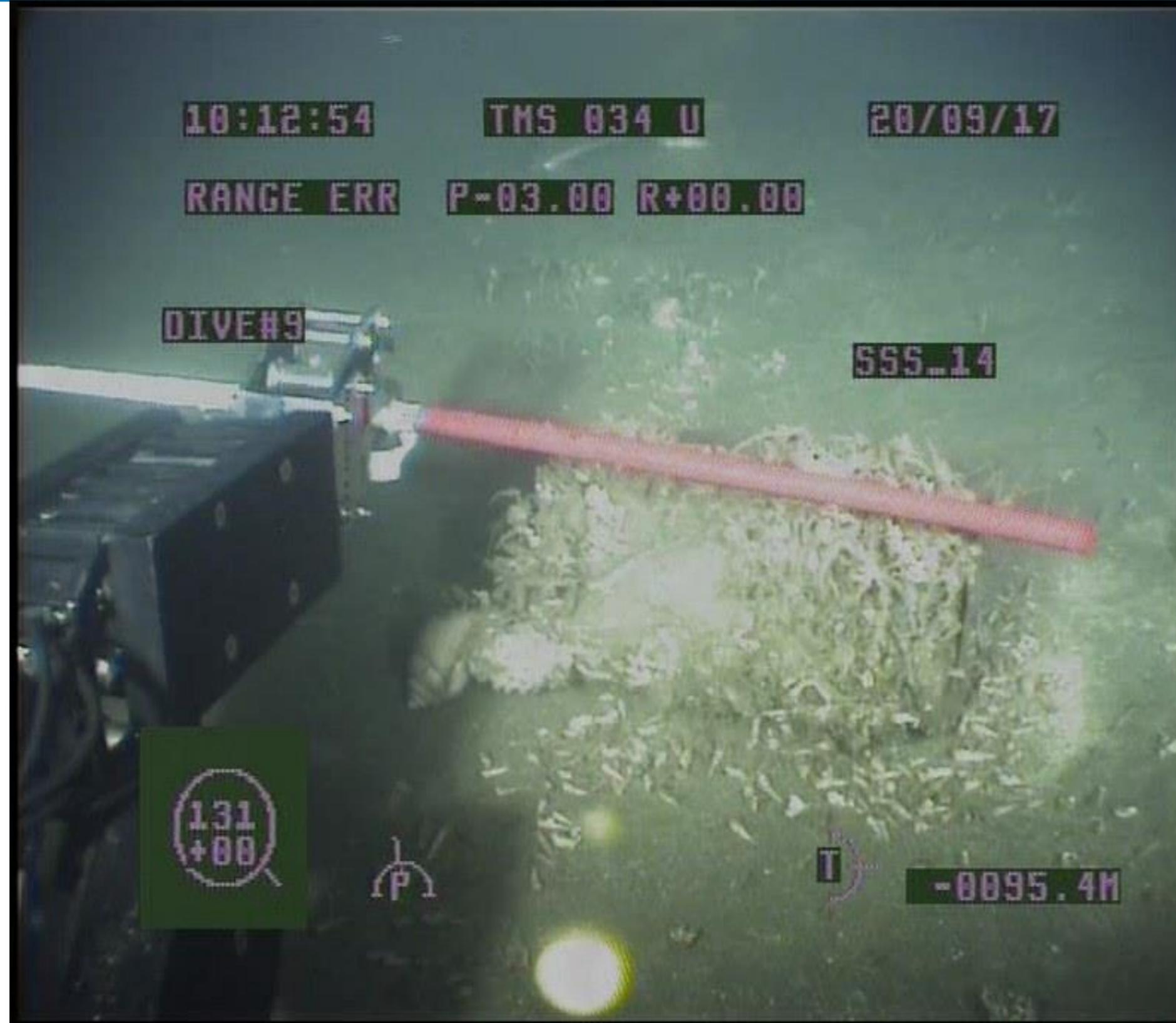
DECOMMISSIONING:

- Specific Environmental Management Plan – with Waste Management Plan
- Socioeconomics Monitoring – Complaints Book

Archaeological

Possible Assets Identified in our area were not in anchors or mooring lines route.

No archaeology findings found during ROV layout operations.

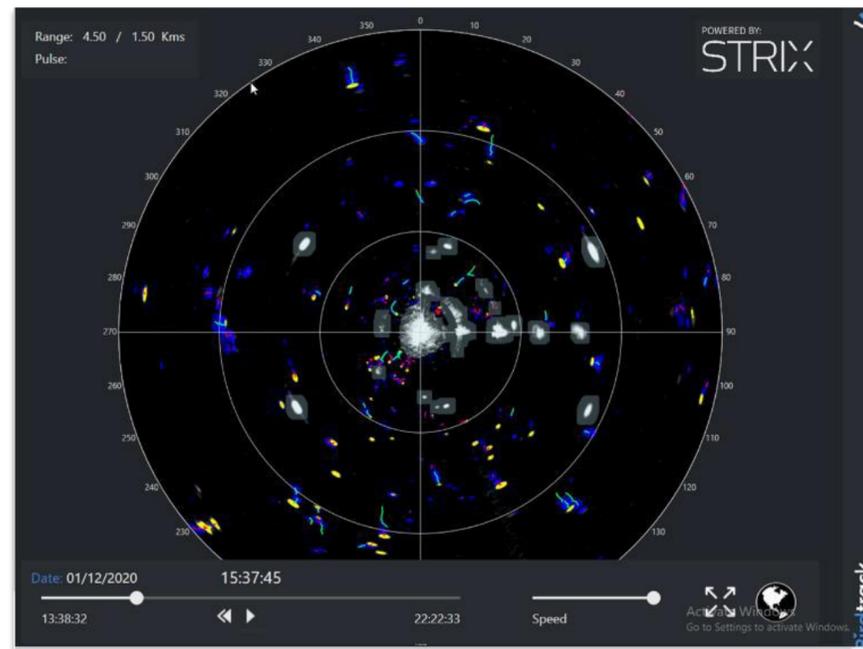


Birdlife (year 0 and 1st)

21 species detected – one endangered (*Puffinus mauretanicus*).

Only 3 species in collision risk with turbine: 2 of sea gulls (*Larus fuscus*, *Larus michahellis*) and the Northern gannet (*Morus bassanus*).

Radar image, installed in 1 platform.



Cetaceans and Anthropogenic Noise (year 0)

Detections by visual census every 2 months, and c-pods. Anthropogenic Noise by hydrophone.

Common dolphin (*Delphinus delphis*), was the one most found, and harbour porpoises (*Phocoena phocoena*) All of the specimens are more frequently detected by audio closer to shore, outside the control and windfarm areas.



Chiropters (bats) – first year ongoing

Batlogger installed in the nacelle closest to shore, requirement came from WF prototype experience, where bats were detected at 5 Km from shore.

Preliminary data indicate that we already have 11 recordings in WFA of at least 2 species *Nyctalus leisleri* and *Tadarida teniotis* (18.5 km from shore).





Electromagnetic fields Propagation impact on Fish and Eels. & Geological Substrate Monitoring Programme – (Export Cable installation)

Both of these are of TSO responsibility, OW/WindPlus has little information.



Socioeconomics Monitoring – Complaints Book

No complaints were made in the local parishes' complaints book, not by email, nor letter or phone. Therefore no actions, nor mitigations needed so far



Water quality monitoring programme (year 0 and 1st)

In all samples (in both summer and winter), only oils were detected in both control (north) and windfarm (south) area, even before construction. Being higher in the control area. Origin is unknown, however possible due to vessels activity. Besides this, all parameters were as predicted and no unforeseen substance present.



Not a license obligation



Analyse all environmental programs results so far



1 year - 4 campaigns of 2 months for each season to study:

Ichthyofauna

– fish species, density, diversity, spatio-temporal dynamics, and economic and ecological value in the windfarm location vs outside

Plankton

- three sampling stations (1 in the windfarm, 2 outside for control, N and S)
- temperature, salinity, pH and chlorophyll
- zooplankton morphology
- total biomass, and taxonomic identification



2022- EFGL, building the first environment oriented pre-commercial project

LOCATION

Over 16 kilometers off the coast of the Leucate-Le Barcarès area in the Mediterranean Sea in water depths of 65 to 80 meters

TECHNOLOGY

3 wind turbines V164 - 10 MW each
3 WindFloat floating platforms

LOCAL PARTNER

Banques des Territoires

ENVIRONMENT FOCUSED

- **Enhance marine biodiversity** with artificial habitats
- **Improvement of bird behavior knowledge**
- **Implementation of ICCP** to avoid any release of metals

STATUS

In Construction

- **30 MW CAPACITY**
- **HOUSEHOLDS POWERED: 50,000**
- **DESIGNED FOR 20 YEARS OF OPERATION**
- **FID JANUARY 2022**
- **IN WATERS BY THE END OF 2023**

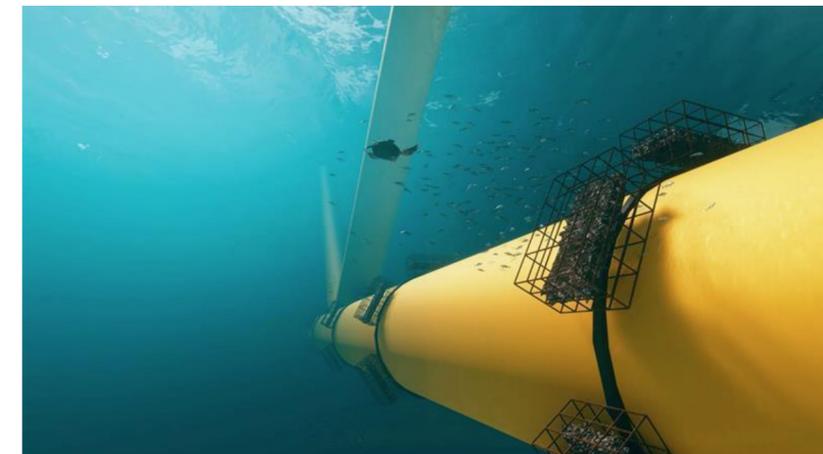
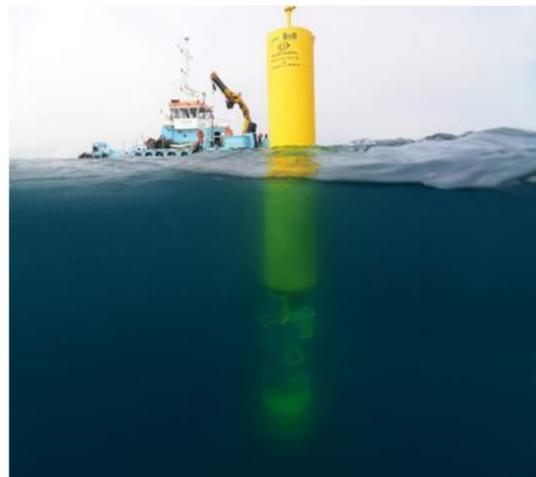




In view of improving its reliability for EFGL use, coming test in WFA of a design tailored deterrent system to protect the handrails of the WindFloat from bird perching.



Ecodesign approach whose finality is to install artificial habitats on one EFGL floater to develop marine biodiversity.





Thank you!

OW
OCEAN WINDS