

LifeDemo Wave

LIFE14 CCM/ES/001209

Demonstration of the efficiency & environmental impact of wave energy converters (WEC) in high energy coasts

Presentation of the LifeDemoWave project



Universidade de Vigo



GRUPO
JOSMAR

LifeDemoWave:

Demonstration of the efficiency & environmental impact of wave energy converters (WEC) in high-energy coasts

Life 2014 call within the **Climate Action** sub-program, priority area **Climate Change Mitigation**.

3 years technology transfer project with a total budget of 1,836,778 Euros.

PROJECT'S IMPLEMENTORS:

Associated beneficiaries: UNIVERSIDADE DE VIGO, CETMAR, HERCULES CONTROL, TALLERES JOSMAR y ACSM.

Coordinating beneficiary: QUANTUM INNOVATIVE S.L.

DURATION:

Start date: **01/10/2015**

End date: **30/09/2018**

BUDGET:

Total project budget: **1,836,778 Euro**

Total eligible project budget: **1,723,538 Euro**

EU financial contribution budget: **1,034,119 Euro**

(= 60.00% of total eligible budget)



PROJECT LOCATION: Galicia (Spain)

LifeDemoWave. Partners:



Quantum
INNOVATIVE

Quantum Innovative is a Spin-off company born from CIMA research group of the University of Vigo. Quantum Innovative offers know how in advanced mechanical engineering solutions.



Hércules Control is a Spin-off company born from GPI-RV research group of the University of Vigo. HCTech offers wide experience in environmental consulting and R&D projects related to marine environment.

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Universidade de Vigo is one of the main Spanish public universities and the project involves:

- CIMA, Mechanical Engineering.
- en.e, Electrical Engineering.
- GPI-RV, Image Processing and Virtual Reality.



ACSM (Advanced Crew and Ship Management) provides global maritime services such as nautical management of vessels as well as complete services of submersible ROV vehicles for offshore projects with clients worldwide.



CETMAR is a joint initiative from Xunta de Galicia and the Government of Spain. Its aim is to promote cooperation between institutions, research centers and maritime and fishery firms.



Grupo Josmar develops innovative projects in wide areas of the fishery and maritime industries. Josmar offers the necessary knowledge for construction and maintenance of sea-related systems.

LifeDemoWave. Main objective:

The main objective of LIFE DEMOWAVE is to **demonstrate the viability of two wave energy converter (WEC) devices**, which have already been researched and patented, for electricity generation.

The **two prototypes**, each one scaled at 25 kW, will be manufactured, **installed and tested** to demonstrate their technical and socio-economic viability, as well as the transferability potential.

The project also aims to highlight the environmental benefits of the system, by quantifying the reduction of carbon footprint and other pollutants along the entire cycle, in comparison with other technologies.

LifeDemoWave. Expected results:

- Demonstration of the **technical viability and survival capacity** of two WEC prototypes (25 kW each) on the Galician coast **under extreme conditions**.
- Demonstration of the **energy efficiency**, power quality and high generation ratio of the systems.
- Demonstration of the **electricity generation potential** of these systems in comparison with other solutions.
- Extrapolation of the results so that models and designs could be applied and scaled-up in any location to ensure the **technology's transferability**.
- Measurement of **the carbon footprint** throughout the life cycle of the WECs and establishment of a calculation method to quantify their impact.
- Qualitative and quantitative determination of the parameters to characterize the **environmental impact** on marine biodiversity and environment, including an analysis of pollutants and damage to the seafloor.
- **Energy and environmental comparative report** for all marine energy generation technologies.

LifeDemoWave: Expected results:

ENVIRONMENTAL IMPACT:

Greenhouse gas emissions reduction for prototypes

CO2 :49 Tn/year

CH4: 9,14 Kg/year

N2O: 0,54Kg/year

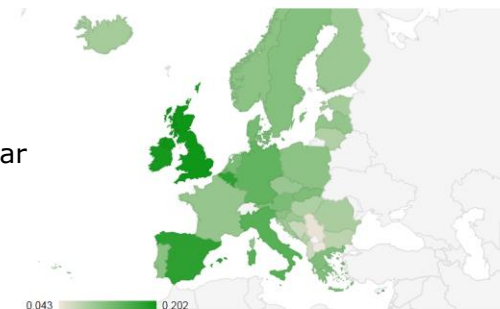
NOx:14,78 Kg/year

COVM: 0,62 Kg/year

Sox: 11,74 Kg/year

NH3:0,007Kg/year

CO: 2,91 Kg/year



SOCIOECONOMIC FEASIBILITY:

Renewable energy

Production: 200000KWh

Minimal days/year Operative: 300

Costs for prototypes: 7,65 c€/kWh(LCOE)

Costs for industrial models 5,05 c€/kWh(LCOE)

SUSTAINABILITY OF THE ENVIRONMENTAL STATUS OF THE MARINE AND COASTAL WATER

Actions and indicators to trace the results of the demonstration phase for water pollutants, underwater noise levels, wave attenuation, ... to help to keep the ecological status quo.

MONITORING

We use **indicators of actions** (layman reports, number of events, web page, panel members, media appearances, networking, etc.) and **impact indicators** to address the stakeholders identified in the project (Local Authorities, NGO, Marine and Energy Companies reached, several already supporting LifeDemoWave).

LifeDemoWave: Expected results:

POLICY IMPLICATION:

- Accordance with national plans of CCM (**Spanish Renewable Energies Plan 2011-2020**). LifeDemoWave will contribute to this plan providing with a technical demonstration as well as a socioeconomic and environmentally feasible solution for WEC, commercially required in the plan by 2026.
- Alignment with **Directive 2009/28/EC** of the European Parliament, establishing a common framework for the promotion of energy from **renewable sources** by 2020 (20%). In the long term the "**2050 Energy strategy**" requires a 30% (2030). LifeDemoWave will offer a sound solution for member countries to meet those requirements and policies.
- Contribution to the plan of action "**Blue Energy: Action needed to deliver on the potential of ocean energy in European seas and oceans by 2020 and beyond**" by the European Commission. LifeDemoWave will provide with technical support to unlock the wave energy potential.
- Compliance with the **Water Framework Directives (2000/60/EC)** and **Directive 2008/56/EC** for the installation, operation and monitoring of the environmental impact of LifeDemoWave, in order to the preserve the environmental water status and facilitate the international replicability.
- **Support** for the preparation and development of legislation in terms of renewable energies and CCM policies. LifeDemoWave will provide with documentation, knowhow and experienced members to the competent authorities.

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