

LifeDemo
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LIFE14 CCM/ES/001209

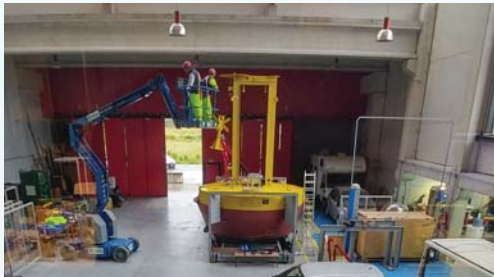
**Demonstration of the
efficiency &
environmental impact of
wave energy converters
(WEC) in high energy
coasts.**

**After Life
communication plan**

With the contribution of the LIFE Programme of the European Union

Description and objectives

The main objective of the LifeDemoWave project is the demonstration of the feasibility of the use of wave power for electric generation in order to reduce greenhouse gases' emissions. Thus, according to the LIFE regulation 2014-2020 Regulation (EC) No 1293/2013, it contributes to achieve the specific objective (d) set in article 14, by developing and demonstrating new technologies aimed at mitigation of climate change, such as this is the case of the energy got from the waves, with easily replicable equipment; and it helps to raise awareness in society that it is a way to achieve clean energy, which is currently one of the biggest barriers nowadays.



Additionally, this goal is in accordance with the policies set by the EU, which established guides for a European strategy for sustainable, competitive and safe energy through the Green Paper (8th of March of 2006). Furthermore, the Directive 2009/28/CE established that in 2020, 20% of the EU energy consumption has to come from renewable sources,

although this value was only up to 14% in the EU. On the 20th January 2014 it was presented an action plan named «The blue energy», highlighting the support to wave power and tidal power as one of the priority areas in the EU in order to mitigate climate change. This way, wave power solution provided by LifeDemoWave matches with one of the priority areas in the strategies set by the EU for climate change mitigation. This project will help to the implementation of these policies and support the adaptation of the applicable legislation in order to adopt these technologies, achieving what was set in section (a), article 14.



For demonstration purposes, two prototypes of wave power generation, 25kW each, were installed in the Galician coast (Galicia stands out for having up to 75kW per each meter of wave front) that will be replicable and scalable at high level.

During the project, it was monitored the reduction of the carbon footprint and the emission of pollutants (NOx, NMVOC, SO₂, NH₃, PM₂₅...), aimed to reach the set values in the performance indicators, allowing to adjust to the EU environmental policies such as Directive 2008/50/EC, 2001/81/EC and 94/63/EC, among others.

The LifeDemoWave project analyses as well in its design and implementation the environmental impact in the installation areas and its effect on biodiversity, trying to minimize as much as possible any of these effects and to quantify them explicitly.



Demonstration devices

For the development of the project, two different devices called PTO (Power Take Off) were built, with different systems for obtaining energy: one hydraulic and the other one mechanical, both results of patents developed by the University of Vigo. For their installation and tests, they were installed on a buoy made up by two bodies: a floating one and an inertial reacting one. The movement between them is used as a principle of operation in the generation of energy.



The two PTO systems can be mounted interchangeably, as was done, on the buoy, which in turn houses the power generation, control and telemetry equipment. For the installation of this buoy, it was developed, manufactured and deployed a mooring system that, at the same time, keeps the position of the prototype, ensures its survival, and allows the buoy to move in coherence with the waves, so that the mooring system does not interfere with and deteriorate

the uptake of wave energy. Demonstrative equipment are developments on a non-commercial scale, intended to validate the operating principles of patented systems. Therefore, the project also includes scalability and replicability reports aimed to guaranteeing future commercial exploitation of the systems.

Environmental impact and carbon footprint analysis

In order to analyze the environmental impact of the project, during its development physical and chemical parameters were monitored in the demonstration area before installation, during installation and after prototype removal. The recorded data allowed to study the impact that prototypes installation and operation of the equipment caused on the environment.

Likewise, this activity includes an analysis of carbon footprint generated by the activity, and its assessment against the energy savings that can be obtained. Since the prototypes that are part of the project are non-commercial scale equipment, these calculations were made based on the scalability and replicability studies developed.



Results

LifeDemoWave has shown promising results, with high survival behaviour in extreme wave conditions, a compact and non-aggressive anchoring system; low costs in both CAPEX and OPEX (thanks to its ease of access for maintenance and minimal submerged mass); and competitive returns at generation level compared to similar technologies for a TRL 5.

This project has been another step towards obtaining alternative clean energy, future versions that can be optimised thanks to hydrodynamic behaviour correlated with sea simulations and trials.

The goal is to increase the scale of production and create wave energy parks to obtain in future iterations the desired TRL 9 with a competitive LCOE compared to other energy sources.



Communication plan:

Events:

Opening event LifeDemoWave
2016/03/15 – Vigo (ES)



Oceanology International 2016
2016/03/15-17 – London (UK)

Navalia – International Shipbuilding
Exhibition 2016
2016/05/24-26 – Vigo (ES)

IV Jornadas de Engenharia
Hidrográfica
2016/06/21-23 – Lisbon (PT)

Martech 2016
2016/10/26-28 – Barcelone (ES)

XXV Congreso Latinoamericano de
Puertos AAPA
2016/11/29-12/02 – Mérida (MX)

III Marine Energy Week
2017/03/27-31 – Bilbao (ES)

Ocean Business 2017
2017/04/04-06 – Southampton (UK)

EU Green Week 2017
2017/05/29-06/02 – Brussels (BE)

III Congreso transfronterizo sobre
Cambio Climático y Litoral
2018/03/06-07 – Irún (ES)

Oceanology International 2018
2018/03/13-15 – London (UK)



Ocean Energy Europe 2018
2018/10/30-31 – Edimburgh (UK)

Martech 2018
2018/12/11-12 – Porto (PT)

Enermar 2019
2019/06/19-20 – Ferrol (ES)

Evento final del proyecto
LifeDemoWave
2019/06/28 – Vigo (ES)



Articles and publications

UPCommons – Portal de acceso
abierto al conocimiento de la UPC

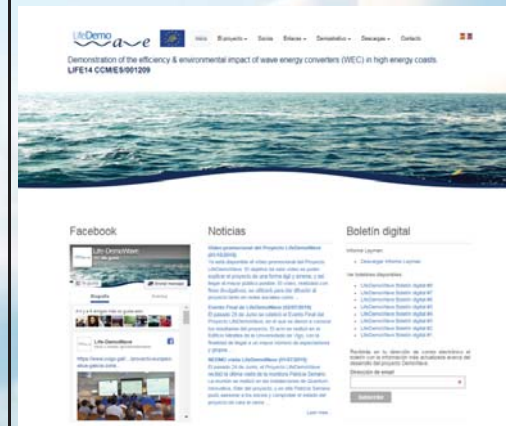
OEPM – Vigilancia tecnológica de
energías marinas

ASIME – Asociación de Industriales
y Metalúrgicos de Galicia

OES – Annual Report of Ocean
Energy Activities

Dissemination materials

- Website
- Leaflets, folders and pens
- Layman report
- Newsletters
- Informative panels



After LIFE

The After Life Communication Plan developed for the project is launched before its end, and will be kept by the coordinating partner, Quantum Innovative, and supported by the rest of the partners, who have shown their commitment from the beginning for this task at least for the next five years. The actions included within this After Life plan are:

- Activity of digital communication channels. Website www.life-demowave.eu will remain active and operating since dissemination material includes this reference. Through this website it is possible to access all the information related to the project in Spanish and English. Likewise, the email, Facebook and Twitter accounts will be kept active, as well as the YouTube channel of the project. All these communication channels will be maintained by the staff of the consortium members, who are familiar with the project and will be able to attend the queries that may arise, as well as update the channels with news related to the project appearing after its completion.

- Dissemination of the results and experiences of the project in conferences, seminars and fairs. All members of the consortium, partners and associates may make use of the communication materials developed throughout the project, for dissemination on those occasions in which communication actions are carried out within the framework of future projects related to the theme of the LifeDemoWave project.

- Availability and use of materials in physical support. The dissemination materials developed within the framework of the project will remain available to partners and those entities and individuals that show interest in the project. Thus, the information panels will be kept for at least five years in the locations where they were installed at the beginning of the project, and the printed Layman brochures and reports will continue available for dissemination when appropriate.

- Contact with relevant institutions and interest groups, and participation in new projects and initiatives related to wave energy. Within the communication and collaboration strategy developed within the framework of the project, links were developed with entities and institutions that may be of great interest when it comes to keeping the dissemination of the project alive once ended. Likewise, the relevance of some of these institutions, such as EMEC, INEGA and Puertos del Estado (that manages the ports of Vigo and Coruña), allow LifeDemoWave to keep open the possibility of developing new initiatives and projects related to wave energy and to study its environmental impact of. This would complement the project and will help to maintain its dissemination. Within this activity is an initiative already underway that will try to develop a new device based on DemoWave and scaled for commercial use, with a TRL 8, and that would be tested at the EMEC experimental site, in the Orkney Islands (Scotland).

- Search for new financing channels, some of which have already been developed during the project (DYNAMARE - EAPA 960/2018, within the INTERREG ATLANTIC AREA PROGRAM); while others are ongoing, such as the future OATWave project application in the Fast Track to Innovation call of the H2020 program. The latter has already been funded by the Ministry of Economy, Industry and Competitiveness within the framework of the State Plan for Scientific and Technical Research and Innovation 2013-2016 with Reference EUIN2017-88555, aimed to develop the final proposal. The first one (DYNAMARE - EAPA 960/2018) sought to continue testing the prototypes of LifeDemoWave project in the experimentation area of Punta Langosteira, with the objective of both improving the performance of the prototypes, and increasing the available information about the environmental impact. Although the request was not admitted, this way remains open for the future, with the support of the whole consortium.

On the other hand, the second one (OATWave - EUIN2017-88555), is aimed to develop a device with a higher TRL, focused on commercial use, and that will allow the use of the produced electrical energy in the public electricity supply system.

Partners



Quantum Innovative is a spin-off of the Universidade de Vigo that was created by the CIMA research group. The company has positioned itself in the market offering advanced solutions in mechanical engineering.

Universidade de Vigo

The Universidade de Vigo is one of the main Spanish public universities. In its three campuses, R&D projects are carried out in the fields of science, humanities, social-legal sciences and technology.

The following research groups are participating in LifeDemoWave:

- Grupo CIMA: mechanical engineering.
- Grupo en.e: electrical engineering.
- GPI-RV: image processing and virtual reality.



CETMAR, is an initiative of the Consellería do Mar (Regional Ministry of the Sea), the General Management of R&D&i of the Xunta de Galicia and the Ministry of Science and Innovation. Its goals are to encourage cooperation between institutions, research centres and the maritime-fishing sector and promote joint R&D&i activities and effective technology transfer.



Hercules Control is a spin-off of the Universidade de Vigo, originating from the GPI-RV research group, with extensive experience in environmental consulting and R&D sea-related projects.



ACSM (Advanced Crew and Ship Management) is a company specialising in global maritime services, including comprehensive submersible ROV services for offshore projects, with clients all over the world.



Grupo Josmar develops innovative projects in broad areas of the marine and fishing industry. It offers all the necessary know-how for the construction and maint

Contact

Life Programme
www.life-demowave.eu

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Facebook:
<https://www.facebook.com/lifedemowave.eu/>

YouTube:
<https://www.youtube.com/channel/UCWCRZibIVyFmkmHwkvK6PJw>

Twitter:
<https://twitter.com/LifeDemowave>

Blog:
<http://life-demowave.blogspot.com/>

Linkedin:
<https://www.linkedin.com/company/life-demowave>



With the contribution of the LIFE Programme of the European Union