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IDOM | ADA leads the company activity in technologically advanced and challenging projects involving applied mechanics, structural design, electronics control, and as such, in Ocean Energy.

Our portfolio of clients and collaborators include ESO, AURA, IAC, GTC, EHU-UPV, SNS/ORNL, GANIL, ESS-Bilbao, ESS, F4E/ITER, CENER, CEA, VTT ORN, GMT, LTMT Observatory Corporation, Clemson University, NaREC, Fraunhofer Institute and others.

CONTACT DETAILS FOR OCEAN ENERGY PROJECTS

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## IDOM

Idom-Oceantec aims to develop cost-effective marine energy converters to sell commercially viable device arrays worldwide. Following several years of technology landscaping and exhaustive analysis and design, the company deployed its flagship WEC, dubbed MARMOK-A-5, in BIMEP test site, being the first WEC connected to the Spanish national grid.

The extensive R&D and testing process undergone has granted the team with both the skills and experience necessary to accomplish any task in the development of marine energy converters.

## MARMOK-A-5

#### Wave Energy Converter

- Spar-buoy type OWC Wave Energy Converter

- Developed with the support of the Basque Energy Agency (EVE) by Pre-commercial Public Purchase.

- Quasi full scale device: 42m length (full scale), 5m diameter (≈1/3 scale). - Grid connected.
- Rated Power 30kW. Maximum generated power 90kW.
- Currently installed at Biscay Marine Energy Platform (BiMEP) 4,7 km from shore.
   First deployment: October 2016 June 2018. Two Wells turbines. Polyester tethers.
   Second deployment: October 2018 June 2019. Single bi-radial turbine. Elastomeric tethers.
   Survivability demonstrated during two winters in Bay of Biscay's open waters (Hmax=14m).
   Reaching monthly average availability of 90%.





## TEAM SKILLS

### Engineering

Having experienced all device lifecycle phases has provided notable expertise to the technical team.

- Site resource characterization
- Numerical modelling
- Prototyping and tank testing
- Design and calculation of mooring systems
- Structural design and load modelling
- Design and manufacturing of Wells turbines.
- Electrical subsystems design.
- Robust Instrumentation & Control system design.
- Acquisition and analysis of large experimental datasets

### Operation

Real offshore experience has brought in-depth knowledge of key operations for WEC development.

- Device installation, commissioning and deinstallation
- Device Operation and Maintenance





 Device Operability/Maintainability
 Validation and refinement of numerical models with real sea operational data

- Get better approximation of the LCOE

- Certification by DNV-GL

# **OBJETIVES ACHIEVED**

- vice Survivability
- Controlled costs
- Functionality:
- Availability
- Performance

## MARMOK-A-14

All the work done so far allows Idom to reliably face the next step of product development: the MARMOK-A-14 prototype, with economically optimized dimensions, and representing the keystone of future WEC array designs.

#### Main features of the prototype:

- External diameter 14m, internal diameter 7m
  Total weight with ballast 1300tm
- Draft 40m - Cell-type mooring system



### Goals:

The main objectives of the MARMOK-A-14 development are.

- Advance towards a commercially viable product
- Demonstrate energy production estimations
- Improve the efficiency of each subsystem
- Numerical model refinement
- Increase experience in 0 & M
- Obtain third-party technology certification from C.A.

### **COLABORATIVE PROJECTS**

#### These projects have received funding from the European Union.



Will collect, analyze and share open-sea operating data to validate several industrial innovations for wave energy. Grant Agreement No: H2020/654444



Will develop a suite advanced design tools for the selection, development and deployment of ocean energy systems. Grant Agreement No. H2020/785921

Will increase environmental data and reduce uncertainty in modelling on potential impacts of wave energy devices. Grant Agreement No: EASME/EMFF/2017/1.2.1.1/02/S12.787640

WESE