

# WELCOME PROJECT: TOWARDS A NEW WAVE ENERGY CONVERTER TECHNOLOGY CONCEPT

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The Spanish Ministry for Science and Innovation (MICINN), through its 2008-2011 R&D&I Plan and the Subprogramme for Strategic Projects in Energy, (following protocols included in the E-Plan), has granted 2.1ME for the development of an innovative wave-power generator, based on the multiple uptake of potential and kinetic energies from sea waves, under the name of WELCOME Project (Wave Energy Lift Converter Multiple España). Led by PIPO SYSTEMS ([www.piposystems.com](http://www.piposystems.com)), the project is also developed by a Spanish consortium composed of the company ANORTEC ([www.anortec.com](http://www.anortec.com)) and two public research institutions: Plataforma Oceanica de Canarias (PLOCAN) ([www.plocan.eu](http://www.plocan.eu)) and Consorcio Escuela Industrial Barcelona (CEIB) [www.ceib.upc.edu](http://www.ceib.upc.edu).

The proposed system is based on the APC-PISYS technology (first state-of-the-art device designed with multiple collectors and complementary converters, able to transform off-shore wave-power into useful energy), providing clear technical and economic advantages over its single-use competitors. Singularities of this device hinder a direct comparison. However, based on previous studies and validations performed, it is expected that under similar swell conditions, a multiple system as the one proposed, will double-up both the power and energy generation of the best single-use technologies. The 1:5 scale prototype, operated in typical Canary Island's mean-swell conditions, is expected to generate powers between 100 and 120 Kw/h.

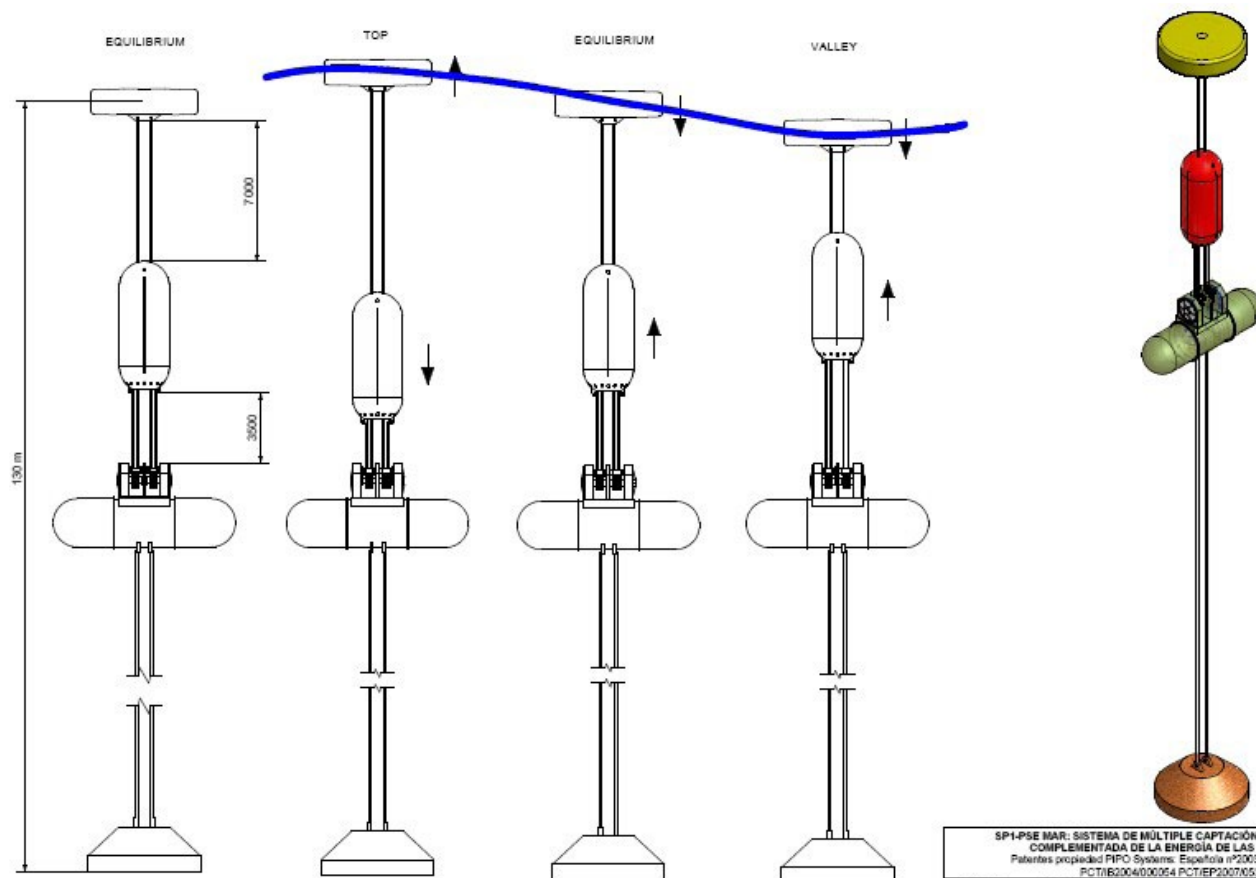
APC-PISYS is a wave energy converter, designed by PIPO Systems divided into the following main parts: Surface buoys, Buoy of variable volume, Positioning

buoy, Mechanical transmission system and Anchorage and mooring systems. Two sections are operated (Surface buoy - Yellow / Submerged buoy of variable volume - Red). Both buoys are joined by hawsers that are tautened by buoyancy forces from a windlass. Using this windlass the linear movements are converted into rotational movements, which finally are converted in one direction only.

The buoys always move in opposite directions, simultaneously increasing their strength and the distance travelled. The third buoy (green) keeps a constant depth by means of its mooring on the seabed. In this positioning buoy the systems for control, generation and measurement of the power are enclosed. The oceanographic measurement systems are situated a chamber in the interior of the superficial buoy and have specific external supports.

WELCOME's main aim is to develop and demonstrate usefulness, as well to apply the APC-PISYS technology capacities to the well-know and widespread existing energy shortage in marine monitoring autonomous devices for both coastal and off-shore applications.

Prototype's design and construction have been carried out in Barcelona and Gran Canaria (Canary Islands), expected to be ready for mooring and put into operation in summer 2011 on the NE coast of Gran Canaria, giving support to a complex oceanographic buoy as application-example for remote and "power-hungry" autonomous devices at sea.



SP1-PSE MAR: SISTEMA DE MÚLTIPLE CAPTACIÓN Y TRANSFORMACIÓN COMPLEMENTADA DE LA ENERGÍA DE LAS OLAS DEL MAR			
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Analisis			
Comentarios			
ESCALA	1:100	Conjunto sistema PISYS	Referencia