



## PLOCAN MARINE TEST SITE FOR WAVE AND WIND ENERGY

Japan and Spain Collaboration:  
Opportunities in Offshore Wind Energy  
15 December, 2016  
Madrid, Spain

Ayozé Castro  
Plocan Innovation Manager  
[ayozé.castro@plocan.eu](mailto:ayozé.castro@plocan.eu)

## Outline

1. Definition
2. Main Capacities & Services
3. Wave Energy Converters Tests
4. Offshore Wind Projects
5. PLOCAN & JAPAN cooperation



## Definition



The main objective : design, construction, equipment and exploitation of an offshore platform for Research & Innovation in the marine science and technologies.

### Spanish Network of Unique Scientific and Technical Infrastructures (ICTS):

- Unique research facilities
- Specialized Scientific fields
- Demand high level of investment
- Dedicated to cutting-edge science and technologies
- Foster socio-economical growth and development

## Capacities & Services

Provide ACCESS TO....



MARITIME TECHNOLOGIES FOR SCIENCE & INNOVATION



MONITORED & EXTENSIVE STUDIED MARINE TEST SITE



R & D MARITIME PLATFORM



A COASTAL AND OPEN OCEAN OBSERVATORY



TRANSVERSAL CAPACITIES & TECHNOLOGIES: ICTs



SPECIALIZED TRAINING



OPEN INNOVATION ENVIRONMENT

## Capacities & Services

### MONITORED & EXTENSIVE STUDIED MARINE TEST SITE

El banco de ensayos de PLOCAN en alta mar presenta un área de 23 km<sup>2</sup>, y está situado a 3 millas náuticas de la sede en tierra de PLOCAN y también bastante cerca del puerto principal de la isla de Gran Canaria (Puerto de Las Palmas). La zona ofrece profundidades progresivas desde la costa hasta 600 m (pudiendo trabajar a profundidades mayores bajo petición) y está dedicado a estudiar el comportamiento y la eficiencia de los diferentes tipos de dispositivos y tecnologías marítimas, contribuyendo así a acelerar el proceso de su introducción en el mercado.

El área marina del banco de ensayos de PLOCAN se estudió exhaustivamente el objetivo de ofrecer un espacio idóneo en términos de logística, infraestructuras compatibles y conexión a la red. Además, la zona cuenta con excelentes condiciones ambientales que facilitan al menos 9 meses de ventana operativa y los recursos de energía eólica y undimotriz generada de los días lectivos para las operaciones de ensayo/demonstración, que oscilan entre 300-400 MW para la densidad de energía eólica y de 4 a 8 Mw/m de energía undimotriz.

### PLOCAN Marine Test Site

The PLOCAN offshore test site area is 23 km<sup>2</sup>, located 3 nautical miles from the PLOCAN Land Base and also quite near to the major harbor of Gran Canaria Island (Las Palmas Port). The area offers progressive depths from above sea to 600 m (deeper upon request) dedicated to study the behaviour and efficiency of different types of marine devices and technologies and contributing to speed up the process of their introduction into the market.

The marine area of PLOCAN test site was comprehensively studied with a view of offering an optimal space in terms of logistics, supported infrastructures and grid connection. In addition, the area has excellent environmental conditions facilitating at least 9 months of operational window and optimal wind and wave energy resources for testing/demonstration operations, which range from 300-400 MW for wind power density and from 4 to 8 Mw/m of wave power.

### Plataforma Platform

- Cableado eléctrico (150 MW)
- Óptica marina
- Óptica terrestre
- Red de Alimentación
- Área de Almacenamiento
- Almacenamiento de energía
- Almacenamiento de combustible
- 3 helicópteros



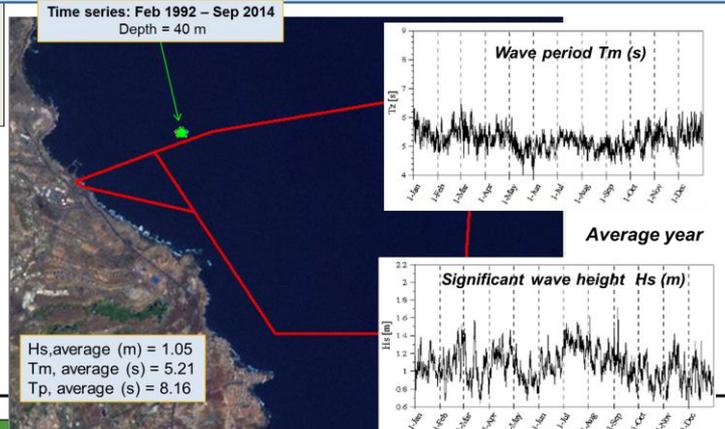
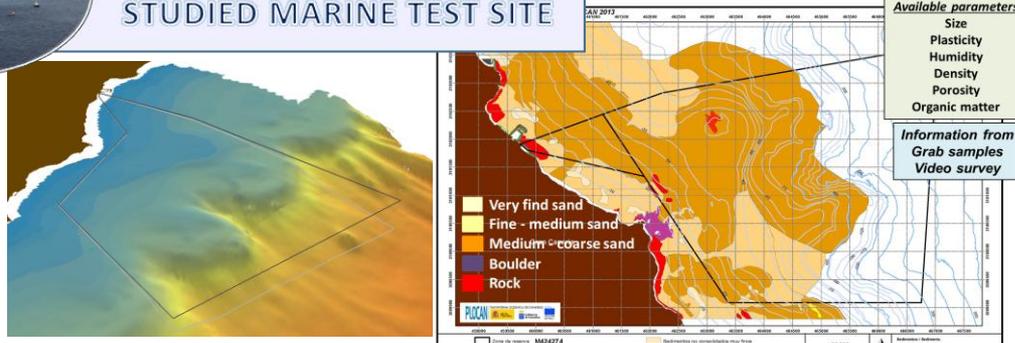
- 23 km<sup>2</sup>
- Cabled: 15MW
- Depth: 0 - 600



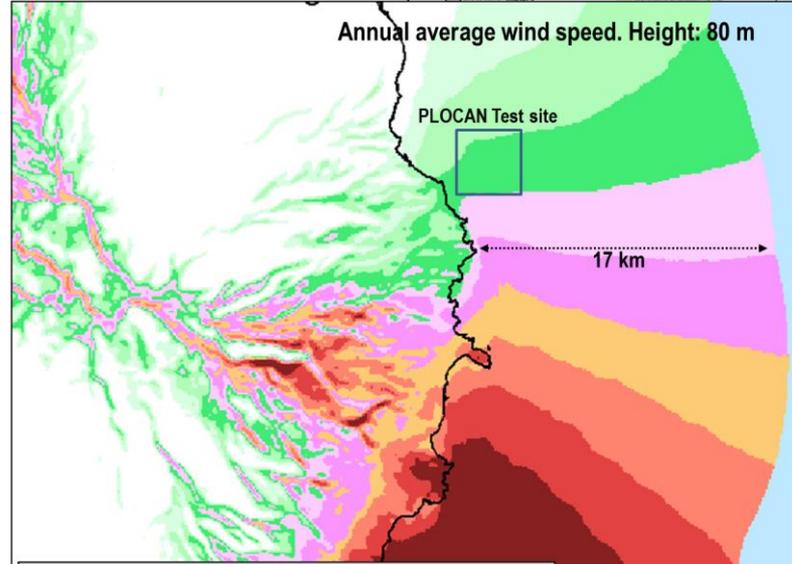
## Capacities & Services



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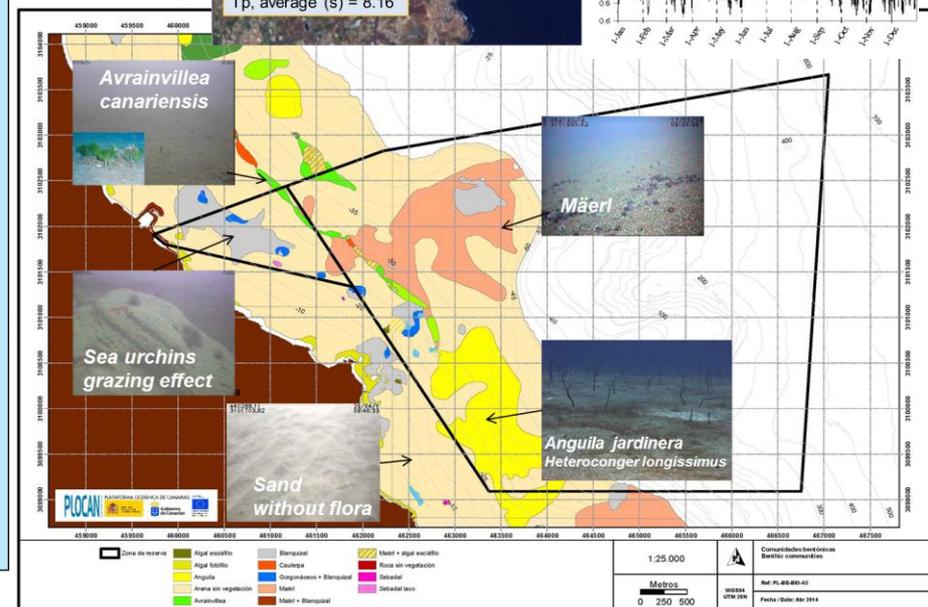


- Km/h**
- < 19.8
  - 19.8 - 21.6
  - 21.6 - 23.3
  - 23.3 - 25.3
  - 25.3 - 27.0
  - 27.0 - 28.8
  - 28.8 - 30.6
  - 30.6 - 32.3
  - 32.3 - 34.3
  - > 34.3
- m/s**
- < 5.5
  - 5.5 - 6.0
  - 6.0 - 6.5
  - 6.5 - 7.0
  - 7.0 - 7.5
  - 7.5 - 8.0
  - 8.0 - 8.5
  - 8.5 - 9.0
  - 9.0 - 9.5
  - > 9.5



Source: Technological Institute of the Canary Islands (ITC)

<http://hipocrates.itccanarias.org/recursooecologico/>



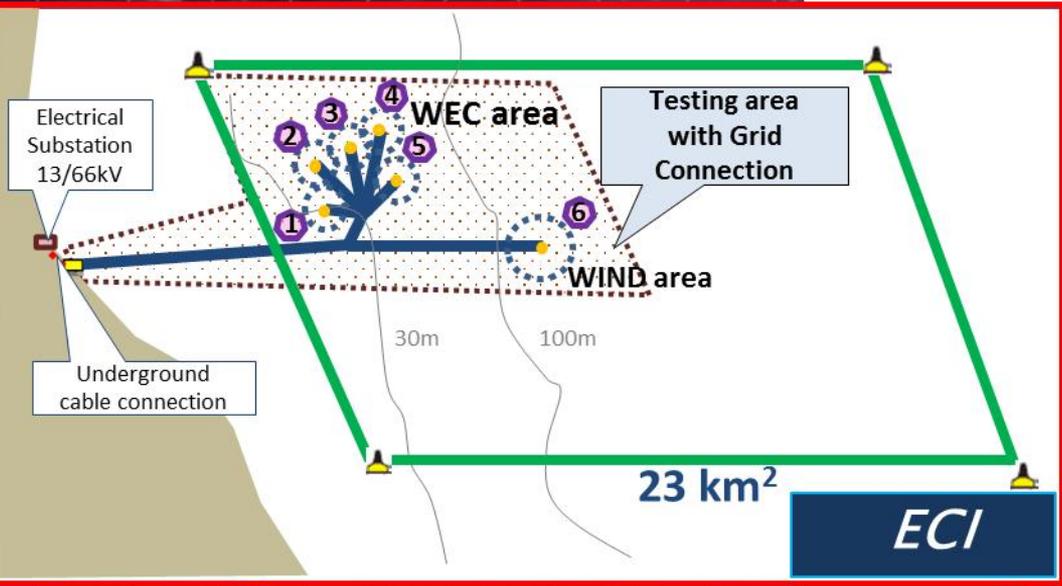
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## Capacities & Services



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### Selection Criteria

- |                    |                           |
|--------------------|---------------------------|
| Energy Resources   | Grid Connection           |
| Accessibility      | Infrastructures/Logistics |
| Operational window | Uses                      |
| Excellent weather  | Optimal Bathimetry        |



MONITORED & EXTENSIVE STUDIED MARINE TEST SITE

## Wave Energy Converters



### INNPACTO WAVE ENERGY

#### Marine Renewables

**Coordinator:**  
Pipo Systems S.L. (ES)

**Partners:**  
Pipo Systems S.L. (ES) - FICOSA (ES) - CEIB-UPC (ES) - CIRCE (ES) - PLOCAN (ES)



## Wave Energy Converters



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# UNDIGEN+

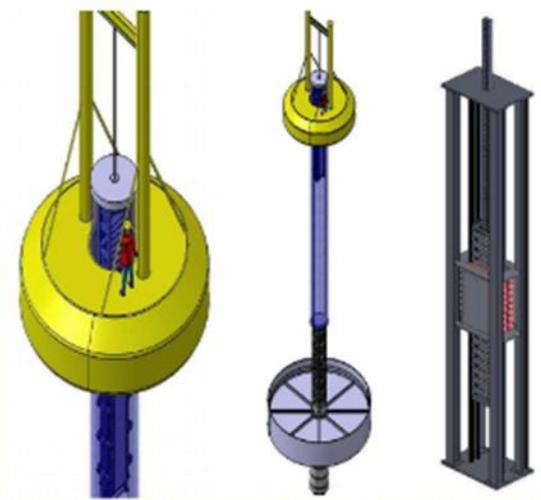
Marine Renewables

**Coordinator:**  
Wedge Global S.L. (ES)

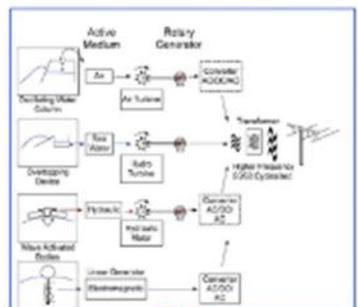
**Partners:**  
Wedge Global S.L. (ES) - FCC (ES) - CIEMAT (ES) - PLOCAN (ES)



Generador Lineal de Reluctancia Conmutada



REALISMO- SIMPLICIDAD- ESCALABILIDAD- EXPERIENCIA

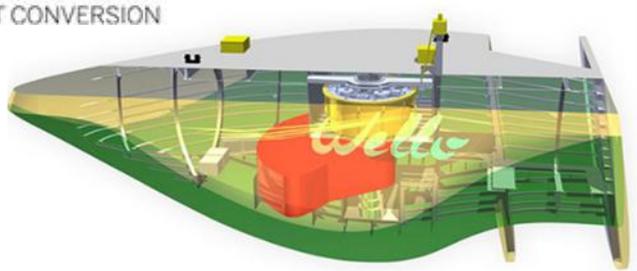




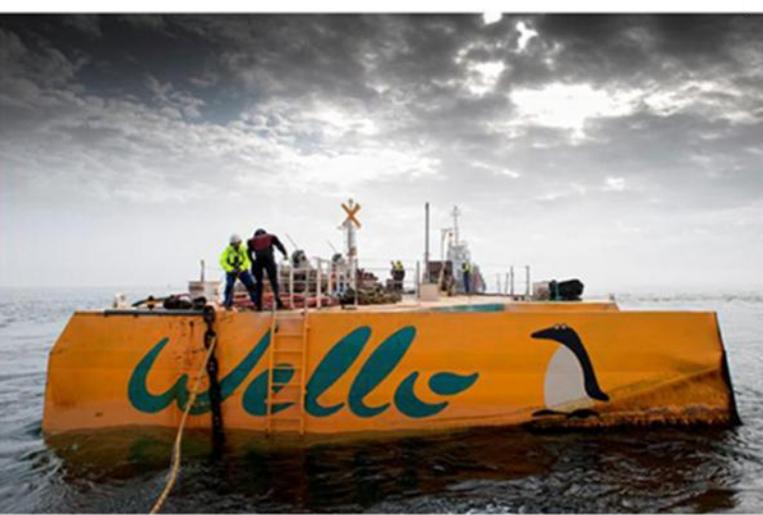
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## Wave Energy Converters

**Wello**  
DIRECT CONVERSION



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement No 655594



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## Wave Energy Converters



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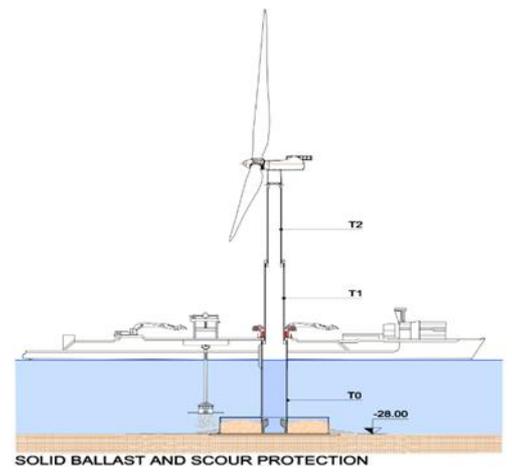
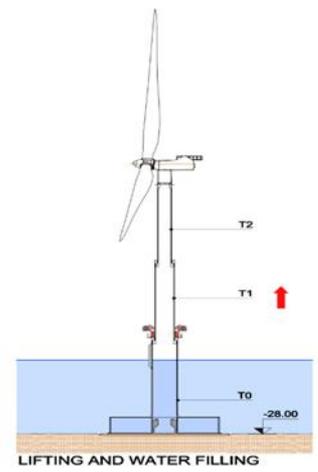
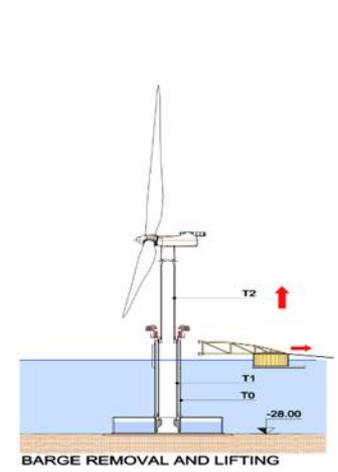


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## Offshore Wind Projects



### MELICAN PROJECT



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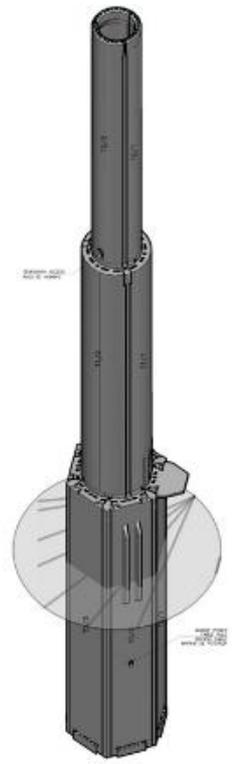
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## Offshore Wind Projects



### ELICAN PROJECT

THE ELICAN PROJECT HAS A TOTAL BUDGET OF 17,107,301.25 € AND WAS SELECTED FOR THE H2020-LCE-2015-2 CALL IN SEPTEMBER 2015. THE ACTION STARTED IN JANUARY, 2016 AND WILL LAST UNTIL DECEMBER, 2018.





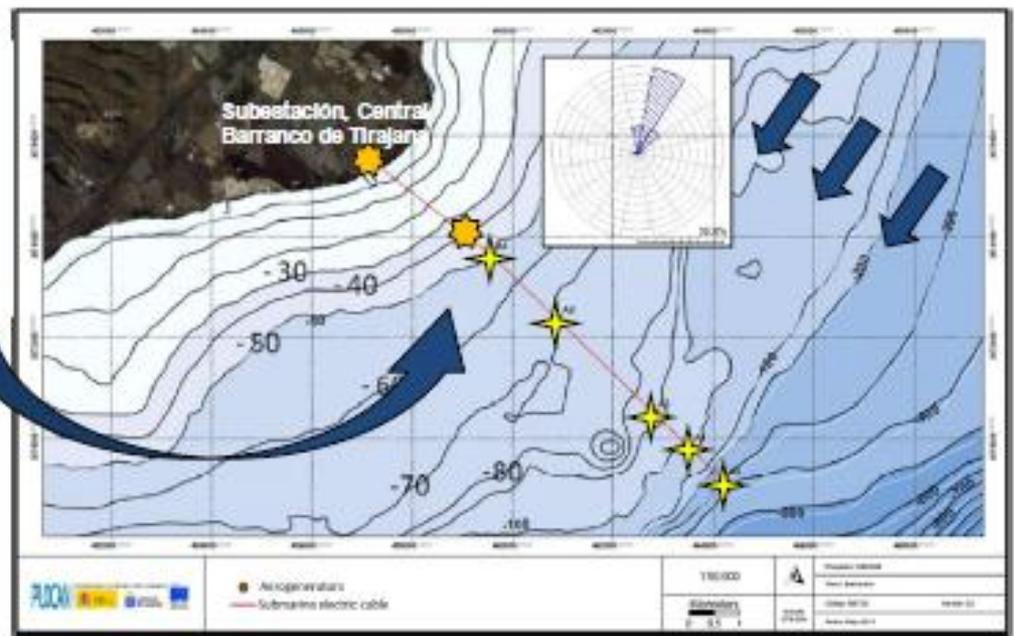
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## Offshore Wind Projects

**FLOCAN-5**



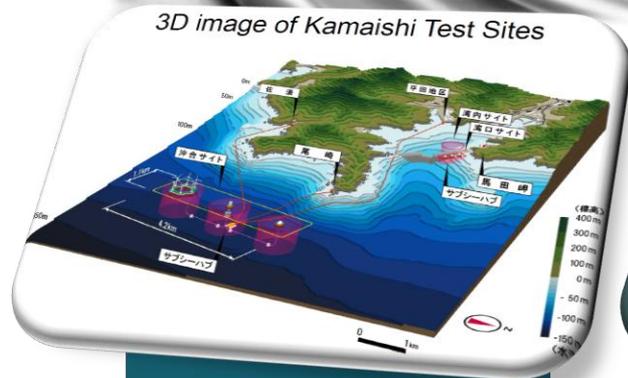
**NER300**



**25 MW**



## PLOCAN & JAPAN Cooperation



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## PLOCAN & JAPAN Cooperation

1st Visit



16 - 19 de June, 2014



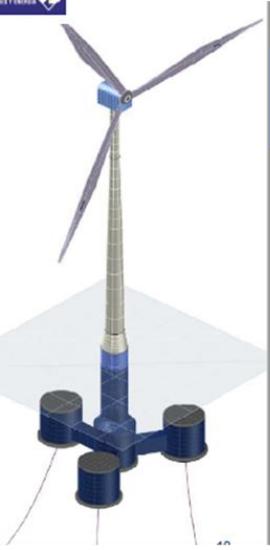
ECONOMIC AND COMMERCIAL OFFICE  
 TOKYO

**Marine Energy Japan Seminar**  
 Marine Energy/ Wave Power

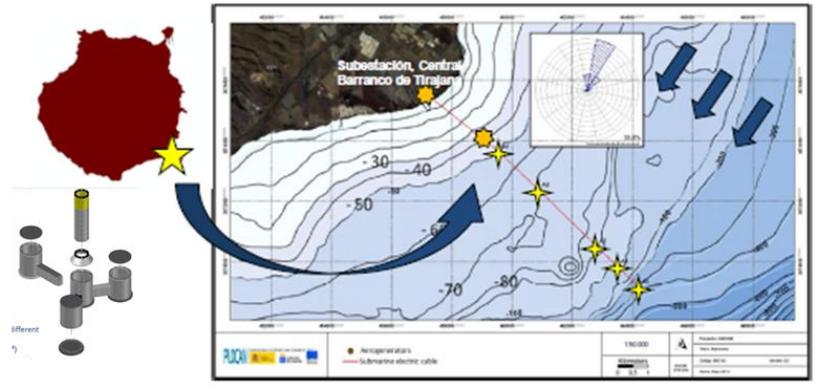


Date: June 16<sup>th</sup> 2014 (14:00-17:00)  
 Venue: Embassy of Spain in Japan; 3F, 1-3-29, Roppongi, Minato-ku, Tokyo, 106-0032  
 Organization: Economic and Commercial Office of the Embassy of Spain in Japan  
 Co-Organization: NEDO, OEAI, JWEA

### UNDIGEN



### FLOCAN-5



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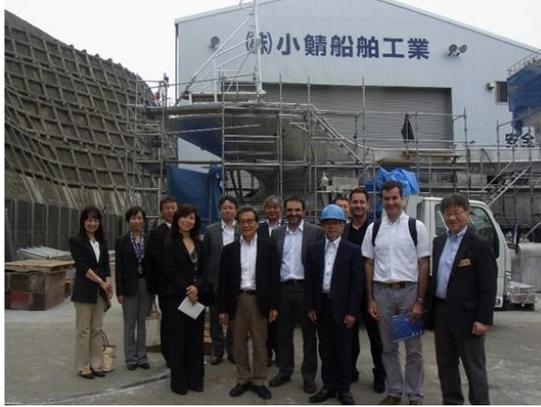


## PLOCAN & JAPAN Cooperation

1st Visit



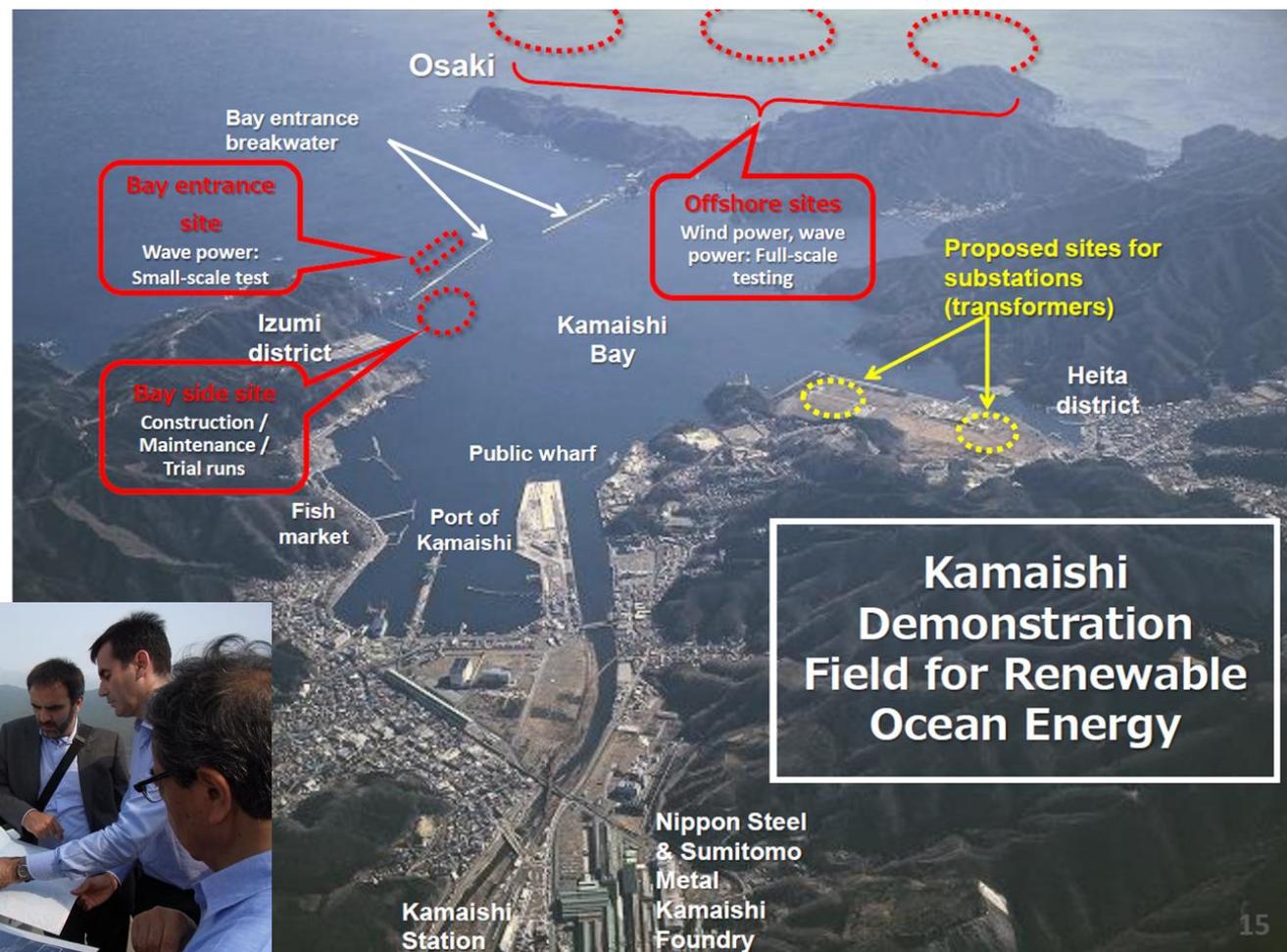
16 - 19 de June de 2014



### 1 - ① Iwate's history with ocean energy

Year	Month	Iwate Prefectural Government	National Government
2007			Establishment of Basic Act on Ocean Policy in April
2008	Jun	Starting an association to develop ocean resources in Iwate	
2009	Dec	<u>Iwate Prefectural Government Long Term Plan</u> (Policies for developing ocean industry was decided in the plan)	
	Mar	<u>Guidelines for Promoting Local Innovation</u> (Environment and Energy Field were added to the guidelines)	
2011	Mar	The Earthquake and Tsunami	
	Aug	<u>Iwate Prefecture Great Earthquake East Japan Earthquake and Tsunami Reconstruction Plan</u> (Ocean Renewable Energy as a part of Sanriku Creation Project)	
2012		Survey for introducing ocean renewable energy in coastal area in Iwate	Policies for promoting utilize ocean renewable energy in Japan was decided in May
2013		Discussions with local organizations and fishing industry on Test Site Starting a feasibility study for wind farm in Hirono	
2014	Feb	Applying National Government for Kamaishi Test Site	First Announcement of the selection in July
	Dec	Adoption of the NEDO Project	
2015	Mar	<u>Cooperative Agreement with the University of Tokyo</u>	Second Announcement of the selection in April
	Apr	<u>Selection of the Kamaishi Test Site</u>	
	Dec	Starting an association to develop the ocean energy industry	

## PLOCAN & JAPAN Cooperation



## PLOCAN & JAPAN Cooperation

1st Visit

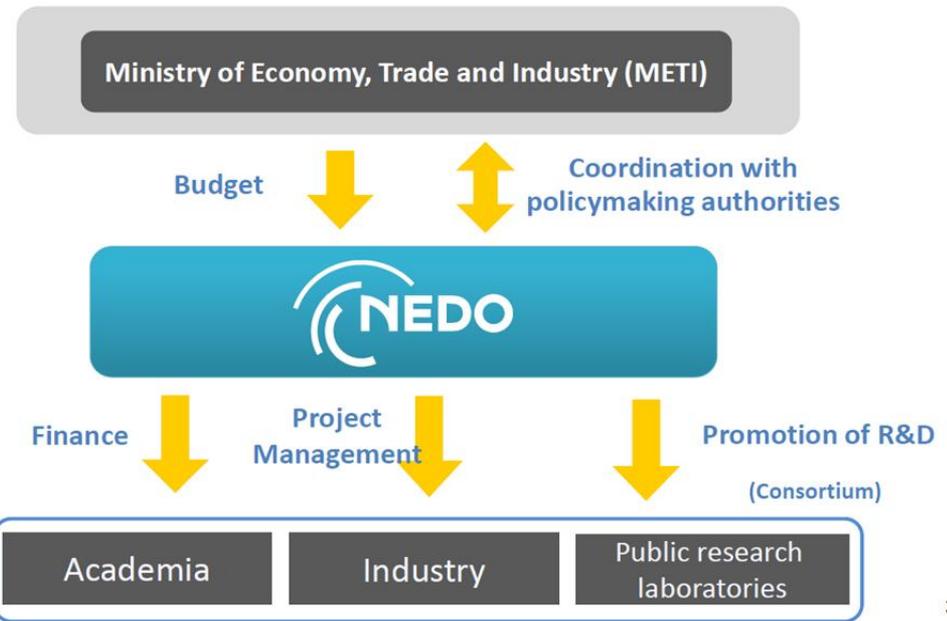


東京大学  
 THE UNIVERSITY OF TOKYO



R&D Japanese Project

### Role of NEDO



## PLOCAN & JAPAN Cooperation

2nd Visit



18 – 20 March de 2015



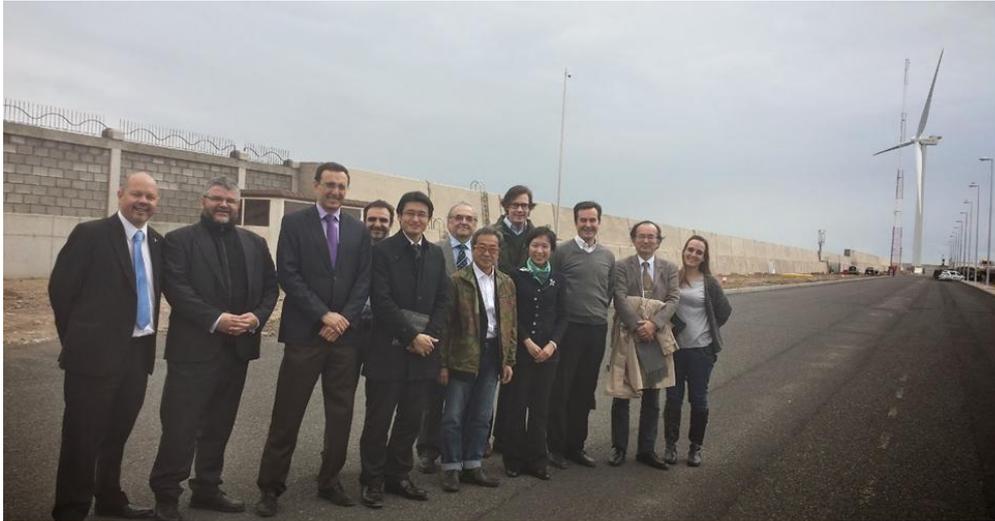
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## PLOCAN & JAPAN Cooperation



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## PLOCAN & JAPAN Cooperation

3rd Visit



20 - 22 de March 2016



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## PLOCAN & JAPAN Cooperation

The Japanese ambassador to Spain, his deputy, and the new Japanese consul in the Canary Islands visit PLOCAN

Published: 29 June 2018



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**THANK YOU**  
for your  
**ATTENTION!**