

Norwegian-Spanish Seminar on Marine Renewable Energies and Technologies

Las Palmas de Gran Canaria, 14th November 2011



Renewable Energy Framework in Spain. Marine Technologies

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GOBIERNO
DE ESPAÑA

MINISTERIO
DE INDUSTRIA, TURISMO
Y COMERCIO



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What is IDAE?

- ✓ A Public Business Entity
- ✓ Reporting to the Ministry of Industry, Tourism and Trade, through the State Secretariat for Energy

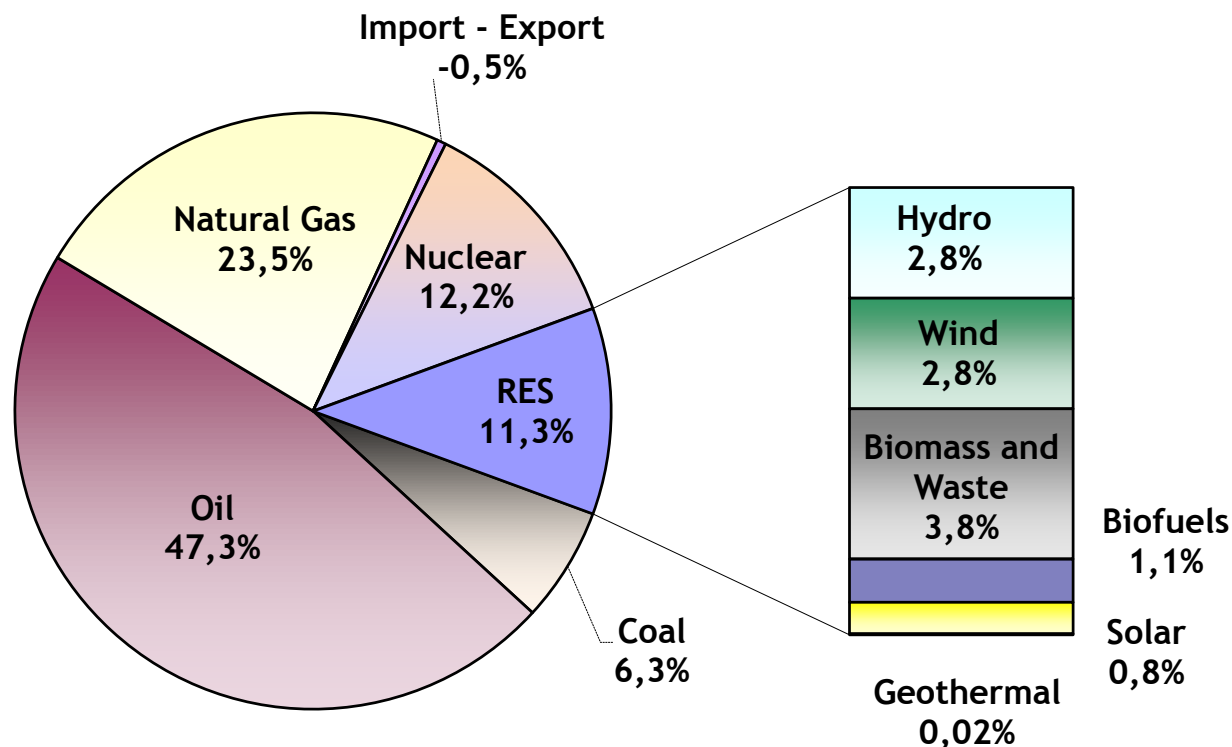
Mission

- ✓ Promote **energy efficiency** and the rational use of energy in Spain
- ✓ Promote the diversification of energy sources and the increasing use of **renewable energies**
- ✓ Foster these activities through **technical consultancy** and implementation of innovative projects

IDAE Activities

- ✓ Development, implementation and monitoring RES and EE plans approved by the Government.
- ✓ Technical consultancy to the public administration.
- ✓ Technical and financial support for RES and RUE projects.
- ✓ Actions to introduce new, more efficient technologies and incorporate mature technologies into the Spanish market.
- ✓ Participation in the management and promotion of EU programmes and participation in international networks.
- ✓ Dissemination of Spanish technologies abroad and capture of international information of interest to Spanish firms.
- ✓ Dissemination activities of RES and EE programmes and measures.

Where we are. Primary Energy Consumption, 2010 - Spain

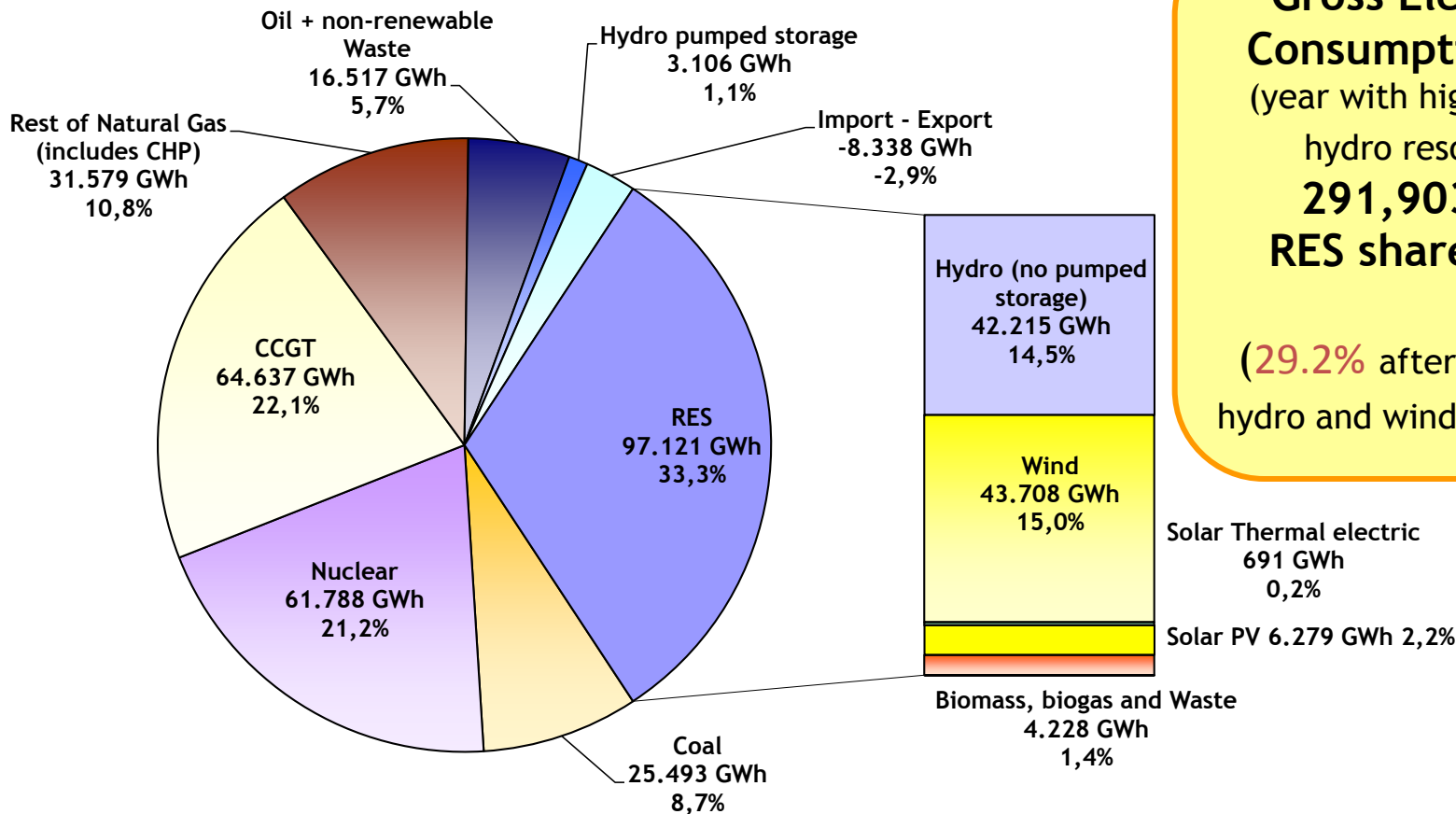


Total Primary Energy Supply in 2010: 132 Mtoe

RES share: 11.3% (year with high wind and hydro resources)

[13,2% on FE using methodology Directive 2009/28]

Where we are. Electricity Production, 2010 - Spain



Gross Electricity Consumption 2010
(year with high wind and hydro resources):
291,903 GWh
RES share: 33,3%

(29.2% after normalising hydro and wind productions)

Spanish leadership in Renewable Energy



2nd largest wind energy capacity in Europe and 4th largest worldwide

1st CSP producer in Europe and in the world

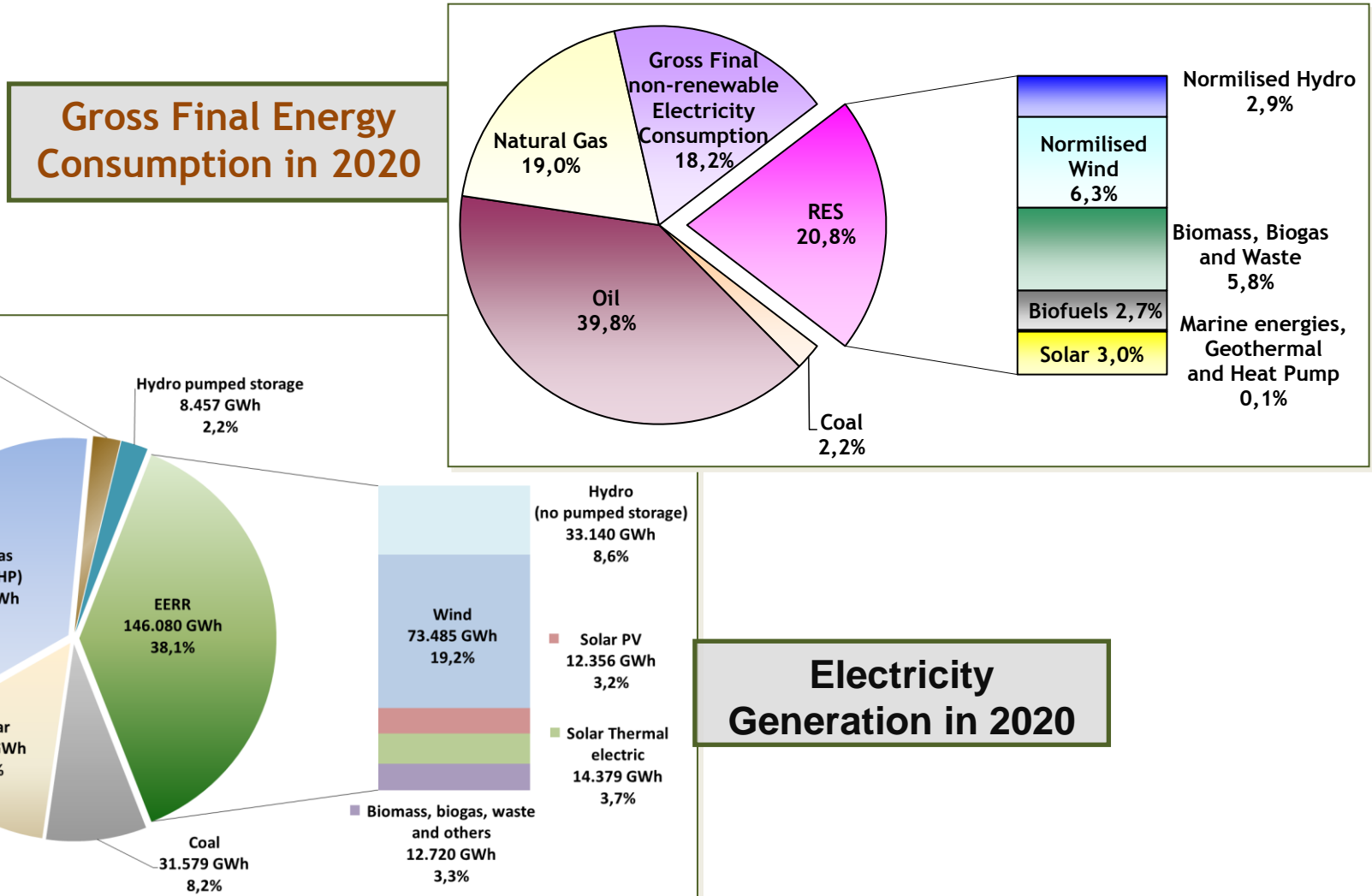


2nd largest photovoltaic capacity in Europe and in the world

3rd producer in Europe in mini-hydro



Where we intend to be. Renewable Energies 2020



REP 2011-2020: Analysis and Studies (two examples)

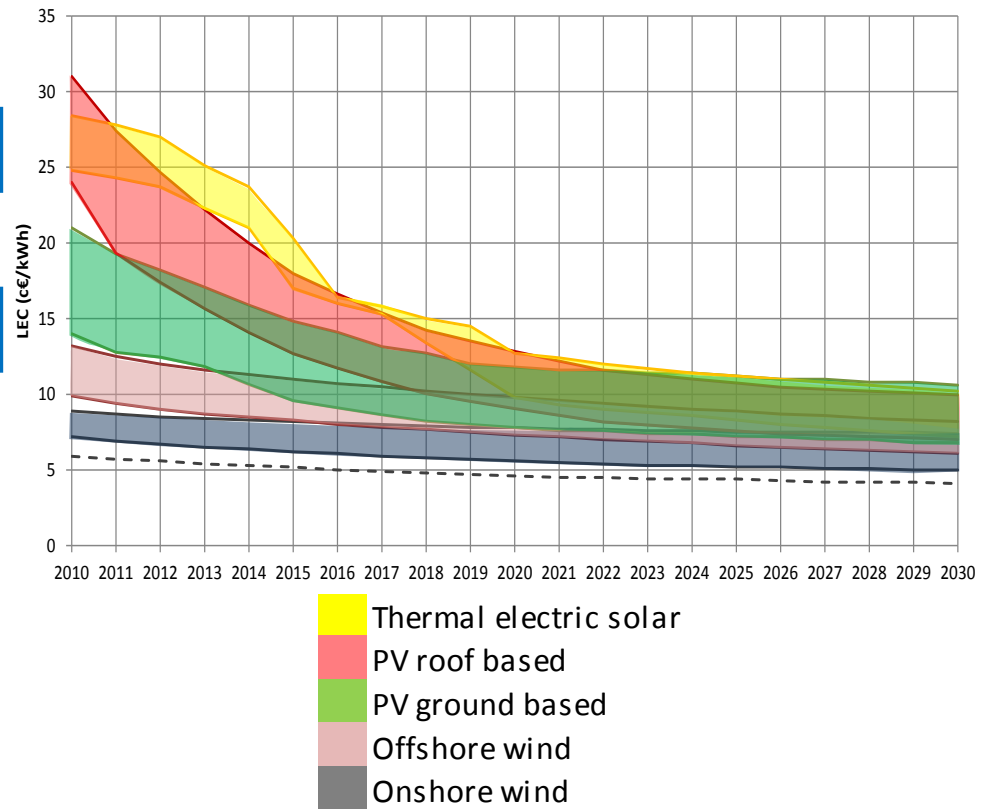
AVAILABLE RESOURCE

Technologies	Resource (GW)
Solar	> 1.000
Onshore / Offshore Wind	332 / 8,5
Geothermal (1)	2,5
Geothermal (2)	20
Wave	20
Hydro	13
Pumping capacity	13
Electrical biomass	8
Municipal Solid Waste	1,8
Biogas	1,2

(1) Regarding areas already studied and recognised by IGME

(2) Regarding favourable geological areas (non analysed)

COSTS FORECAST



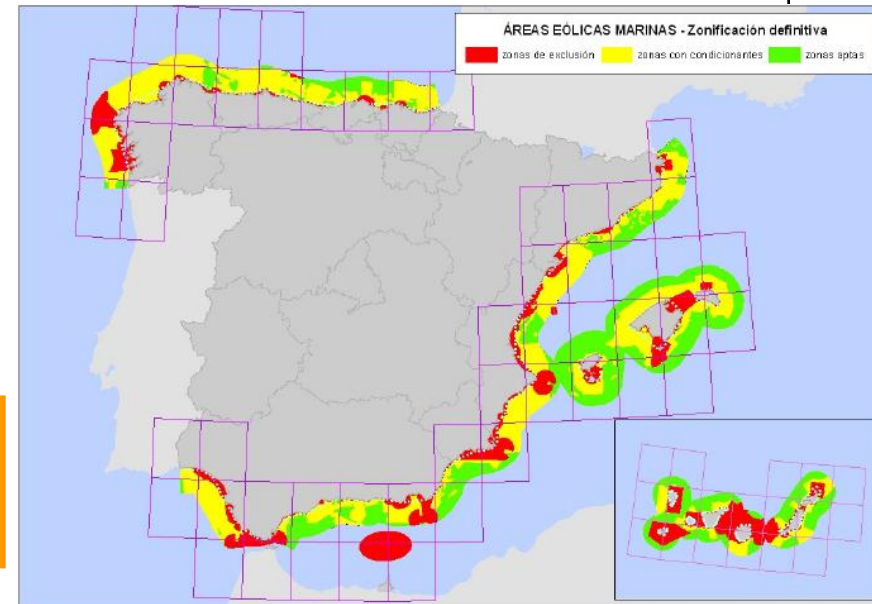
Strategic Environmental Study for Spanish Coasts - Wind offshore

“Zoning” (Final)

- ✓ Scope of Study: **24 nautical miles** from coastline, including internal waters.
- ✓ **73 Wind Offshore Areas** (1° separation between parallels and meridians),
- ✓ Zoning has been established taking into account **compatibility among wind farms and the different legitimate uses and environmental figures** identified in each area, regarding **strategic planning**:

- **Exclusion zones (red)**: Incompatibility with other uses or figures.
- **Suitable Areas with identified limitations (yellow)**.
- **Suitable areas (green)**: No detected incompatibility at planning scale.

Definitive environmental suitability will be established for each specific project, after necessary detail studies.



Wind offshore Potential Assessment. Tool: 'Wind Atlas of Spain'

Double target:

- ✓ Support for the **totality of public administrations** for the wind area related planning studies.
In particular: **Evaluation of the Spanish wind potential (REP 2011-2020).**
- ✓ **Providing stakeholders a tool** that allows to identify and to realize an **initial evaluation** of the existing wind resource in any area.

Geographical Information System (GIS), Freely available -via Internet-.
(Grid resolution: 100 m).

Complementary information
(cartographic, topographic, electrical grids, environmental figures,...)

Supplier: Meteosim Truewind

<http://www.idae.es>
<http://atlaseolico.idae.es>

- Wind Offshore Potential by 2020 \approx **8.5 GW**.
(excluding depth waters)
- In terms of energy, potential above 22.5 TWh.

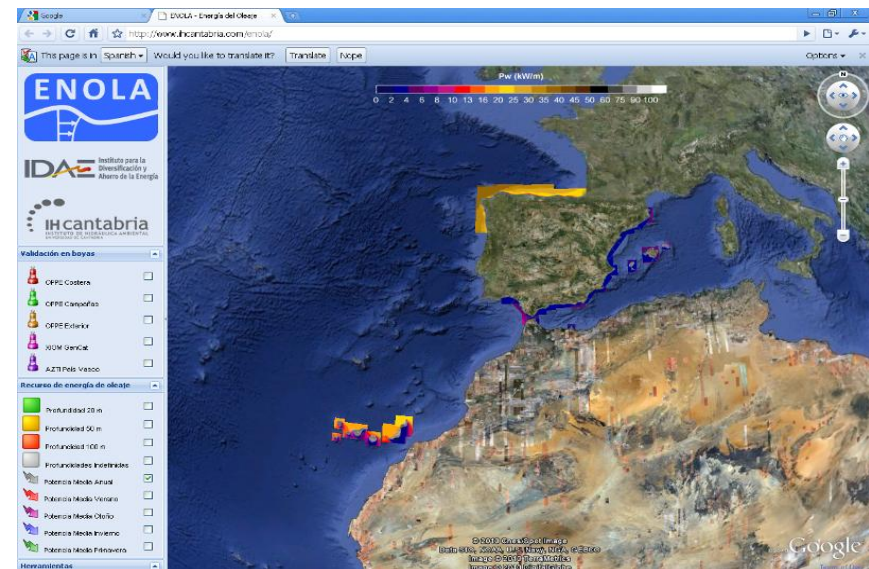


Ocean Energy in Spain



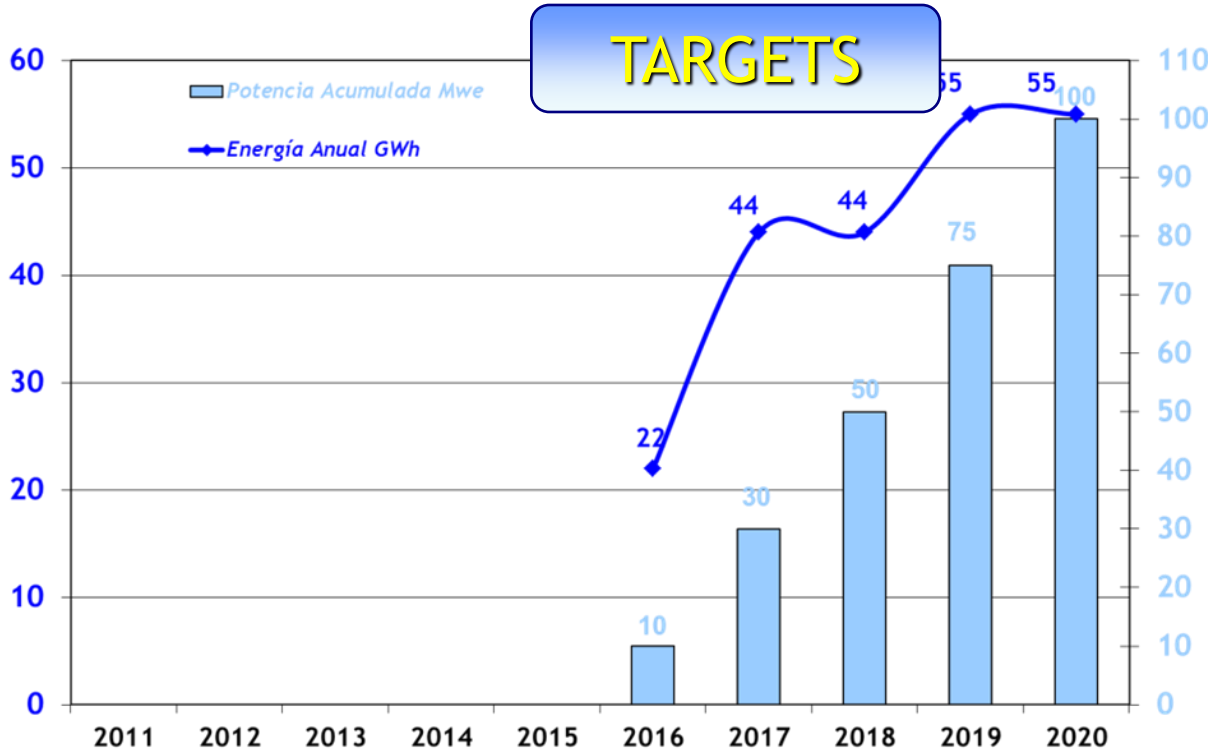
- ✓ R&D&I Sector
- ✓ Outstanding projects: Santoña project with a 40kW prototype buoy (Cantabria); Mutriku 300 kW with 16 OWS turbines (Basque Country); Wavegen (Canary Islands)
- ✓ Development of Tester Technological Centres: Santoña (Cantabria), BIMEP (Basque Country) & PLOCAN (Canary Islands)

- ✓ For the first time, ocean energies are included in the new PER. Target of 100 MW by 2020. Wave energy is the most promising.
- ✓ “Study on wave power potential in Spain” finished. Accessible application in IDAE’s website:



Spanish Renewable Energy Plan: Target by 2020

New PER 2011-2020 will deepen the development of mature or more consolidated areas and will incorporate new others, as OCEAN ENERGY, with a concrete targets for 2020.

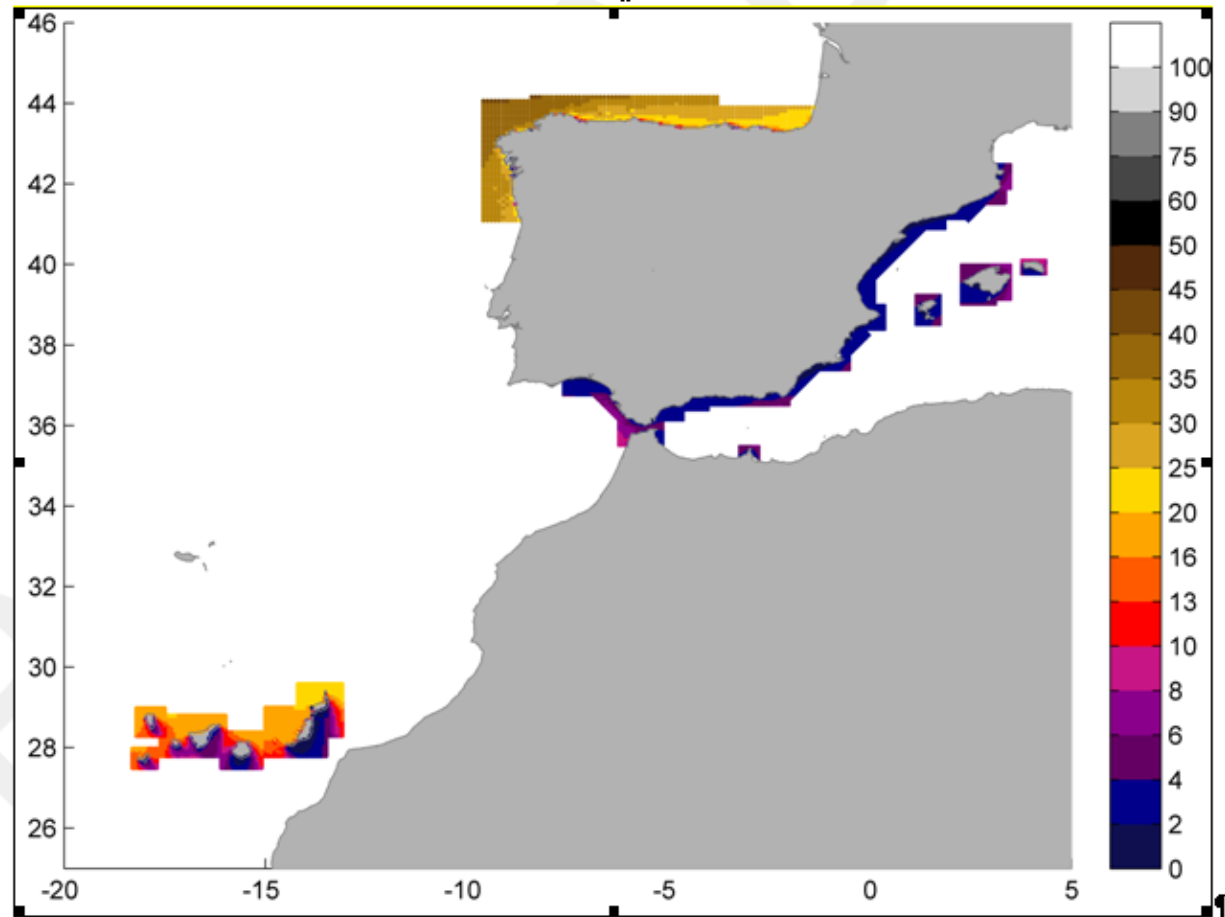


- Increase of **100 MW** in period 2011-2020

- Increase of the contribution of the Sea Energies (waves) up to 220 GWh/year in 2020.

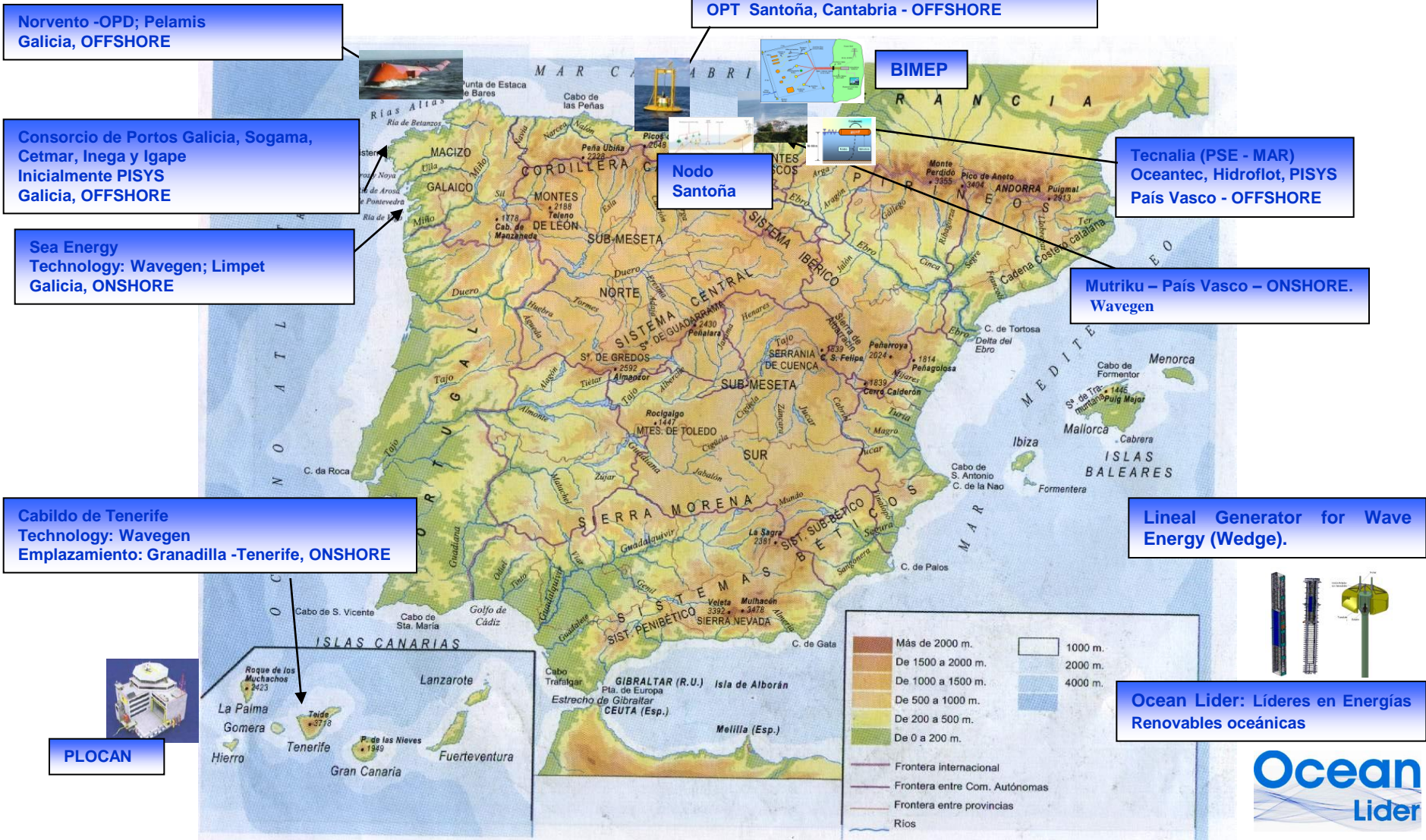
Wave Energy Potential Assessment in Spain

- **Galicia** presents the major potential of energy with values in indefinite depths between 40 - 45 kW/m.
- The **Cantabric sea** is the following zone of the littoral as for resource (30 kW/m diminishing of Or to E).
- Thirdly, the north front of **Canary Islands** (20 kW/m).
- Proved in indefinite depths they diminish with the fret.
- Strong seasonal variation in the average power.



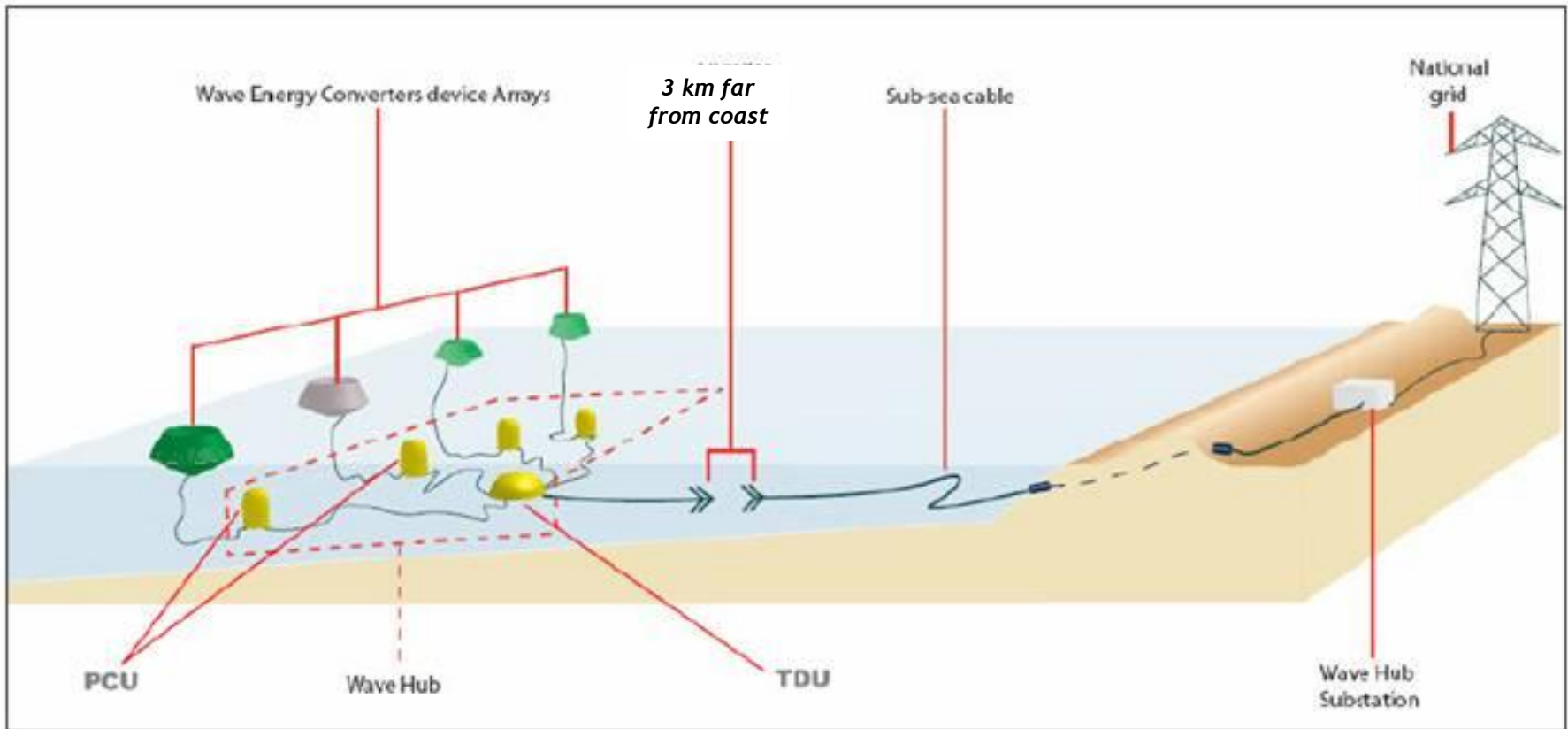
Yearly average potential (kW/m) in Spanish Coasts

Wave Energy Projects in Spain



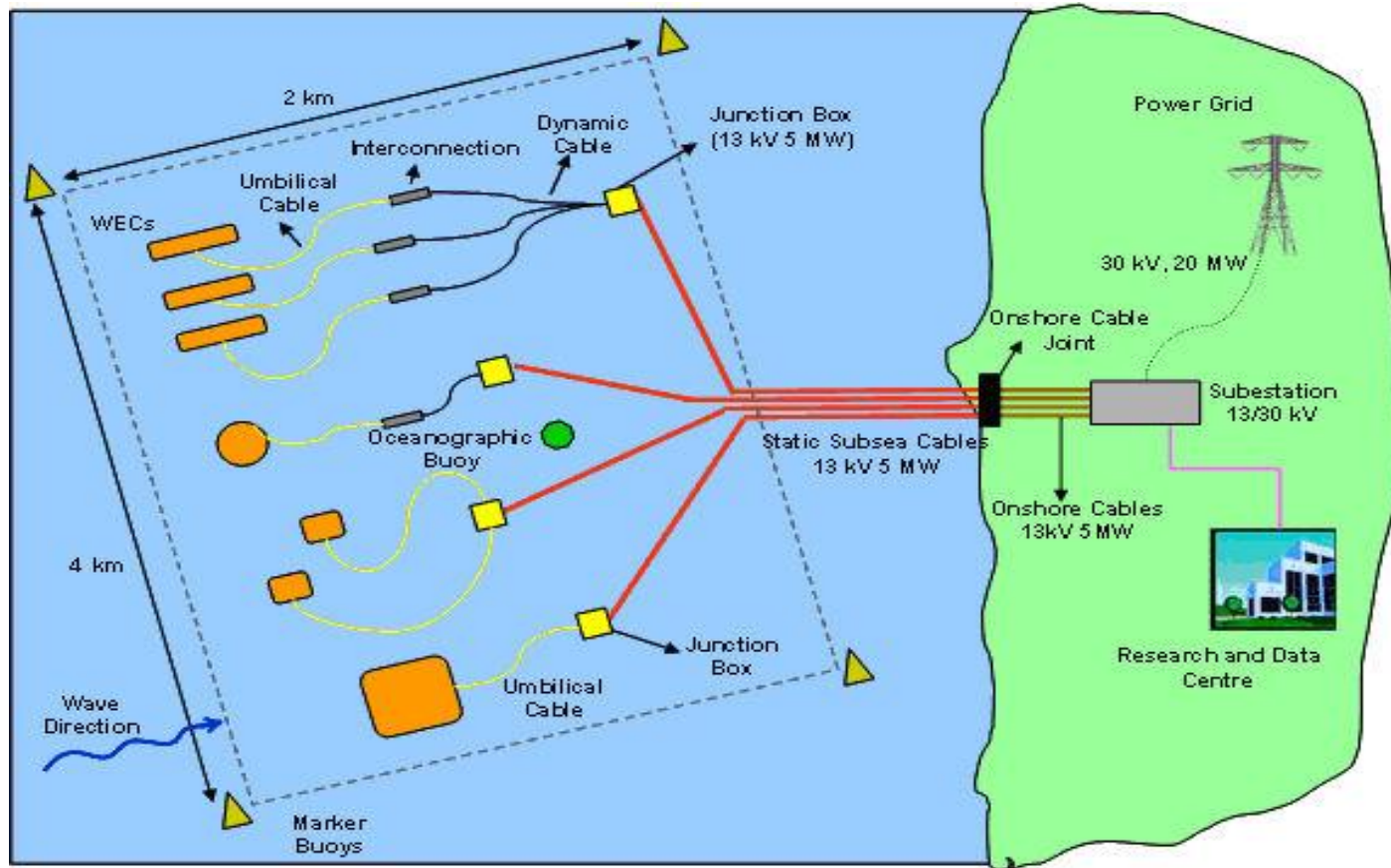
Spanish Sea energy Technological Platforms (1/3)

Nodo Santoña, Santander



Spanish Sea energy Technological Platforms (2/3)

BIMEP: Biscay Marine Energy Platform



Spanish Sea energy Technological Platforms (3/3)

PLOCAN (“Plataforma Oceánica de Canarias”)

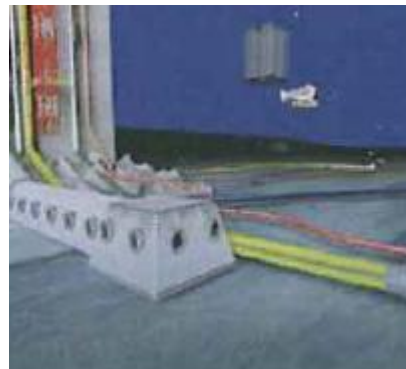
Platform for Marine Technologies in Canary Islands



- ↳ Scientific and Technological infrastructure of Singular character (ICTS)
- ↳ Located continental platform to the east of Gran Canaria

Activities:

- ↳ Socioeconomic innovation Platform.
- ↳ Technological test zone (off-shore wind, waves, currents,...)
- ↳ Base for vehicles and marine instruments
- ↳ Observatory



Plataforma Oceánica de Canarias



Thanks for your attention!



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