



EU R&I Support to Marine Renewables

Directorate General for Research & Innovation
New and Renewable Energy Sources

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Policy Context

- **Energy challenges:** Competitiveness, Sustainability, Supply
- **2007 – Energy for a Changing World**
“Energy and Climate Change Package”
(roadmaps, policy guidance documents, market initiatives, ...)
- **Key targets:** 3 x 20% by 2020 (EE, RE, GHG).
- **Key actors:** Power Sector, Industry and Manufacturing Sector, Building Sector, Mobility Sector.



The Strategic Energy Technology (SET) Plan

“Technology Pillar of the Energy and Climate Change Package”

**Technology Pillar
of EU energy &
climate policy
(20/20/20 targets)**

Accelerate development of key low-carbon technologies

- to make them affordable and competitive faster
- to reach EU 2020 targets at lower cost

Competitiveness of EU industry

- engine for growth and jobs

**Europe
2020
Strategy**

**Comprehensive
public-private
coordinated
strategy**

Involves all stakeholders (EC/Member States, industry, research)

- A new way of working (to avoid fragmentation of efforts)
- Coordination at both strategic planning and implementation

Implementation via innovative instruments:

- Industrial initiatives: public-private partnerships with industry
- Research Alliance: coordination of capacities of major EU labs

FP trends Ocean

FP5 – 4.5 M€

Single devices design

FP6 – 29 M€

Single devices lab tests

FP7 - 89 M€

Some results – device arrays –
MS coordination



FP7 Waveport: EC contribution 4.6 M€

FP trends Wind

FP5 – 44 M€

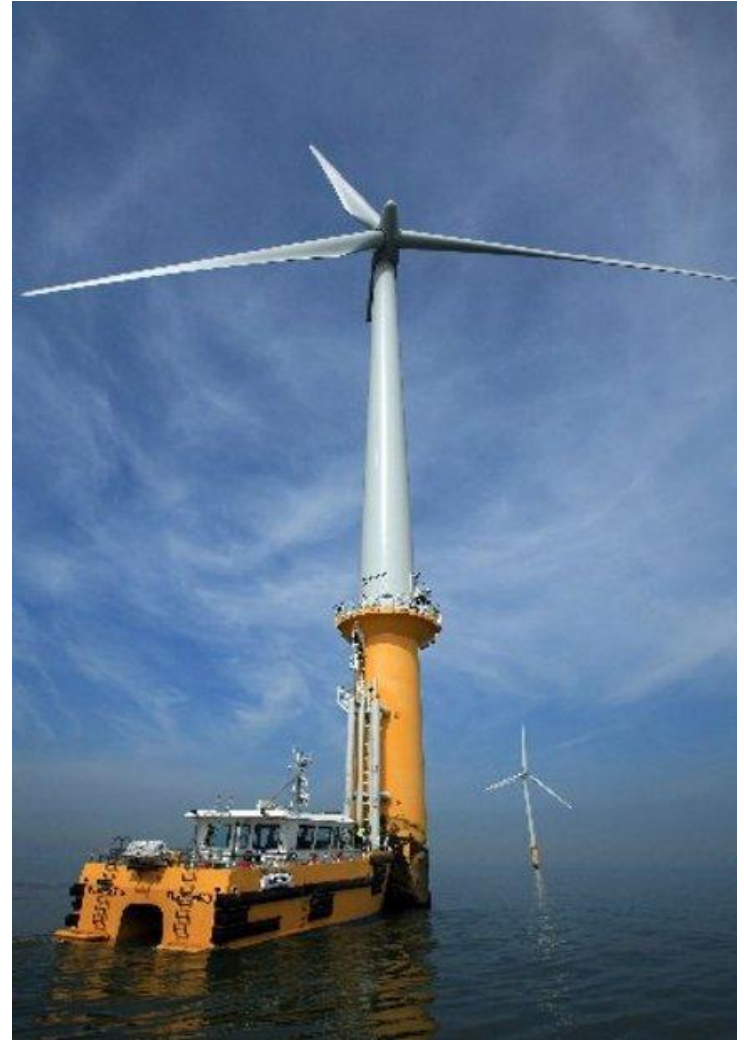
On-shore technologies –
megawatt turbines

FP6 – 43 M€

Off-shore – multi-mW wind
turbines (UPWIND project)

FP7 – 93 M€

Deep water – very large wind
turbines – floating structures
– wind farm clusters



FP7 Project example - HiPRWind

High Power, high Reliability offshore wind technology

- Project start date: November 1, 2010.
End date: October 31, 2015
- Total budget 20 million €, total EC-funding 11 M€
- 1130 person months over 5 years

Industry

Acciona Energia (Spain)
Acciona Wind Power (Spain)
ABB (Switzerland)
Bureau Veritas (France)
IDESA (Spain)
Mammoet (Netherlands)
Technip (France)
Vicinity Cadenas (Spain)

R&D SMEs

Micromega (Belgium)
Olav Olsen (Norway)
Wölfel berat. Ing. (Germany)
1-Tech (Belgium)

Universities

NTNU (Norway)
University Siegen (Germany)

Research org.

Fraunhofer IWES and IZFP
Narec (UK)
SINTEF (Norway)
Tecnalia-Robotiker (Spain)
The Welding Institute (UK)



Main research topics:

- Floater and mooring systems
- Controls, power and grid
- Condition and structural health monitoring
- Advanced rotor concepts

FP7 Project example – ORECCA

Synergies, Hybrids and Combined Platforms Wind/Wave/Tidal....

- Spatial synergies: Sharing the area (Co-location)
- Installation and infrastructure commonalities
 - grid connection
 - Installation equipment (vessels, jackups, ...)
 - port infrastructure
 - O&M synergies
- Process engineering synergies: hydrogen, desalination, other non-electrical applications
- Offshore Renewable Hybrids
- Multipurpose Platform Concepts, “Energy Islands“



FP7 Project examples - Combining different energy technologies

Offshore Renewable Hybrids



Multipurpose Platform Concepts (“Energy Islands”)

TROPOS, H2Ocean, MERMAID

What is Horizon 2020?

- **Commission proposal for a 80 billion euro research and innovation funding programme (2014-2020)**
- **A core part of Europe 2020, Innovation Union & European Research Area:**
 - **Responding to the economic crisis** to invest in future jobs and growth
 - **Addressing people's concerns** about their livelihoods, safety and environment
 - **Strengthening the EU's global position** in research, innovation and technology

What's new ?

- **A single programme** bringing together three separate programmes/initiatives*
- **Coupling research to innovation** – from research to retail, all forms of innovation
- **Focus on societal challenges** facing EU society, e.g. health, clean energy and transport
- **Simplified access**, for all companies, universities, institutes in all EU countries and beyond.

*The 7th Research Framework Programme (FP7), innovation aspects of Competitiveness and Innovation Framework Programme (CIP), EU contribution to the European Institute of Innovation and Technology (EIT)

Horizon 2020

Three priorities:

- 1. Excellent science**
- 2. Industrial leadership**
- 3. Societal challenges**

Proposed funding 2014-2020

<i>Health, demographic change and wellbeing</i>	<i>8 033</i>
<i>Food security, sustainable agriculture, marine and maritime research & the bioeconomy</i>	<i>4 152</i>
<i>Secure, clean and efficient energy*</i>	<i>5 782</i>
<i>Smart, green and integrated transport</i>	<i>6 802</i>
<i>Climate action, resource efficiency and raw materials</i>	<i>3 160</i>
<i>Inclusive, innovative and secure societies</i>	<i>3 819</i>

Million euro

Access to risk finance (3.5 bn Euro)

- *Remedy market deficiencies in **accessing risk finance** for research and innovation*
- **Debt facility:** *loans, guarantees, counter-guarantees,...*
 - demand-driven component: first come, first served
 - policy-driven component: focusing on key sectoral policies of the Union
- **Equity facility:** *equity finance*
 - start-up window: focus on early stage
 - growth window: expansion and growth stage investments in conjunction with Equity Facility for Growth of COSME
 - primarily demand-driven, possibility of earmarking for particular policy goals
- *Further **implementation details** in Specific Programme*

Horizon 2020 and partnering

Public private partnerships:

- Through Joint Technology Initiatives or other formal structures (Art. 187)
- Through contractual agreements, which provide inputs for work programmes
- Only when criteria are met, e.g, clear commitments from private partners

Public public partnerships:

- Through "ERA-Nets" for topping up individual calls/actions (replacing current ERA-Net, ERA-NET Plus, Inco-Net, Inno-Net)
- Through participation in joint programmes between Member States (Art. 185)
- Supporting agendas of Joint Programming Initiatives when in line with Horizon 2020
- Only when criteria met, e.g, financial commitments of participating countries

European Innovation partnerships:

- Not funding instruments, but for coordination with broader policies and programmes

Next steps

- Ongoing:** Parliament and Council negotiations on the basis of the Commission proposals
- Ongoing:** Parliament and Council negotiations on EU budget 2014-2020 (including overall budget for Horizon 2020)
- Mid 2012:** Final calls under 7th Framework Programme for research to bridge gap towards Horizon 2020
- Mid 2013:** Adoption of legislative acts by Parliament and Council on Horizon 2020
- 1/1/2014:** **Horizon 2020 starts, launch of first calls**

More information ?

Energy Research and Innovation

http://ec.europa.eu/research/energy/eu/index_en.cfm

Intelligent Energy Europe

<http://ec.europa.eu/intelligentenergy>

Maritime policy

http://ec.europa.eu/maritimeaffairs/policy/index_en.htm

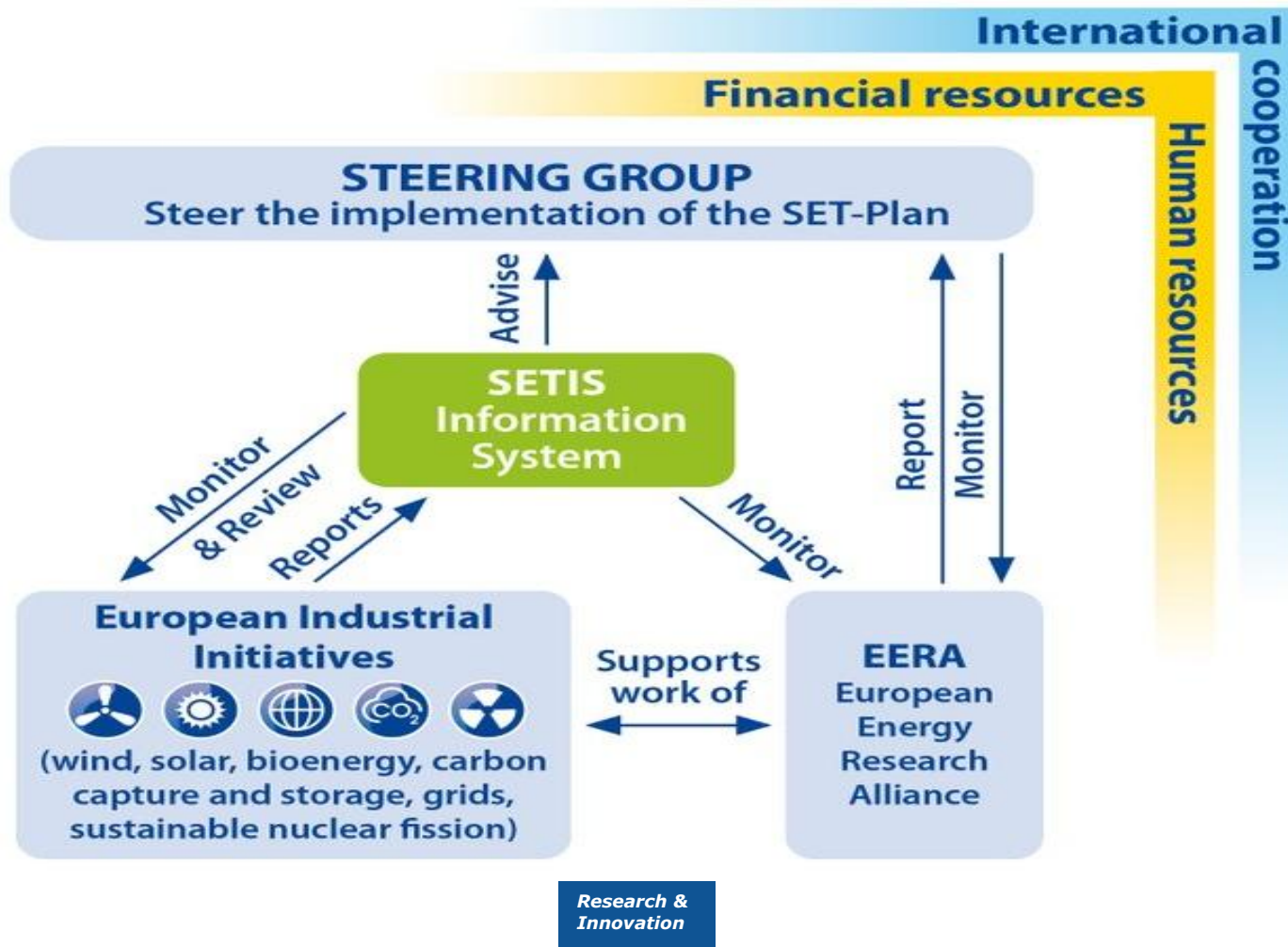
Climate Action NER300

http://ec.europa.eu/clima/funding/ner300/index_en.htm

Thank you for your attention

Back-up slides

SET-Plan Architecture



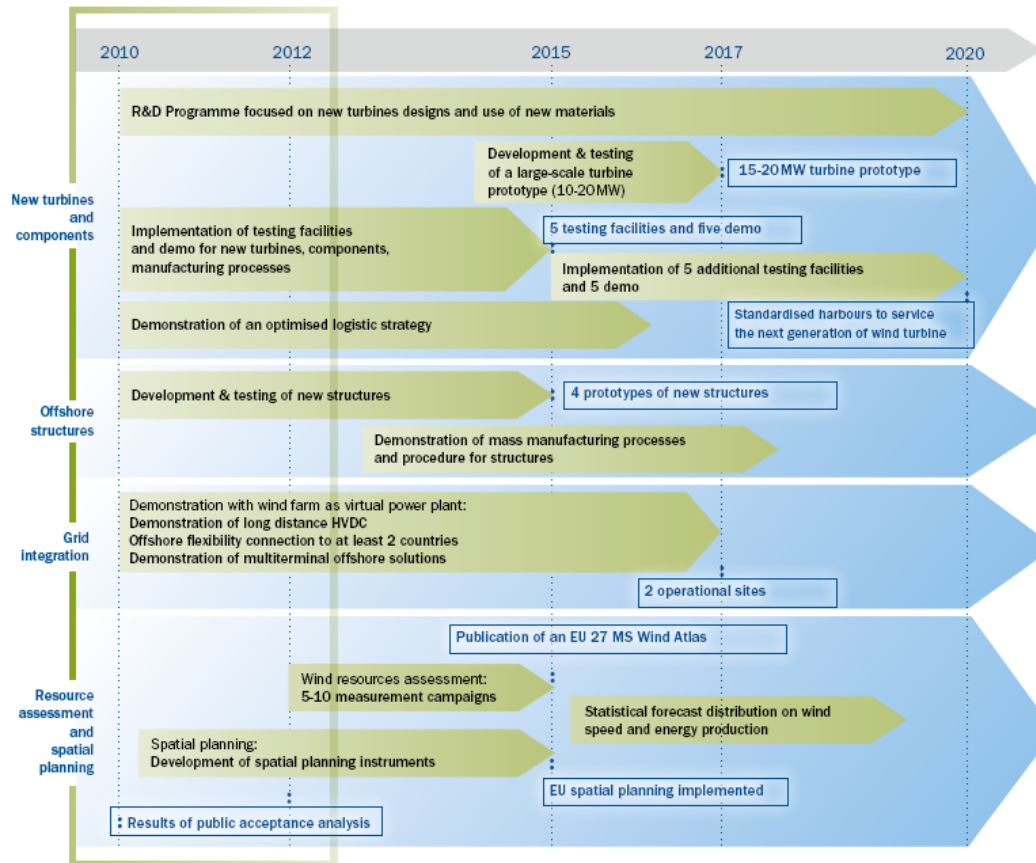
European Industrial Initiatives in brief

- Public – private partnerships (PPPs) in sectors where barriers can best be tackled collectively
- Risk sharing, pooling resources, co-ordinated work
- Generate the critical mass to accelerate technology development and deployment
- Demonstration activities + support actions.
- Variable geometry and different instruments

*7 EIIs launched to date, including a
European Industrial Wind Energy Initiative (EWI)
with a strong offshore content*

European Wind Initiative - EWI

WER implementation plan for 2010-2020



European Energy Research Alliance

- *EERA is an alliance of leading organizations in the field of energy research.*
- *EERA aims to strengthen, expand and optimize EU energy research capabilities through:*
 - **the sharing of world-class national facilities in Europe**
 - **the joint realization of pan-European research programmes (EERA Joint Programmes).**

Currently, both EERA-Wind (2010) and EERA-Ocean (2012) have been created

EERA - Ocean

JP Coordinator: SuperGen Marine, Institute for Energy Systems,
The University of Edinburgh (UK)

Participants/Associates: The University of Edinburgh (UK),
Technalia (ES), Wavec (PT), IFREMER (FR), ENEA (IT), HMRC (IE),
SINTEF/MARNTEK (NO), Fraunhofer (DE)

Research Themes are:

- **Resource**
- **Devices and Technology**
- **Deployment and Operations**
- **Environmental Impact**
- **Socio-economic Impact**
- **Research Infrastructure, Education and Training**

EERA - Wind

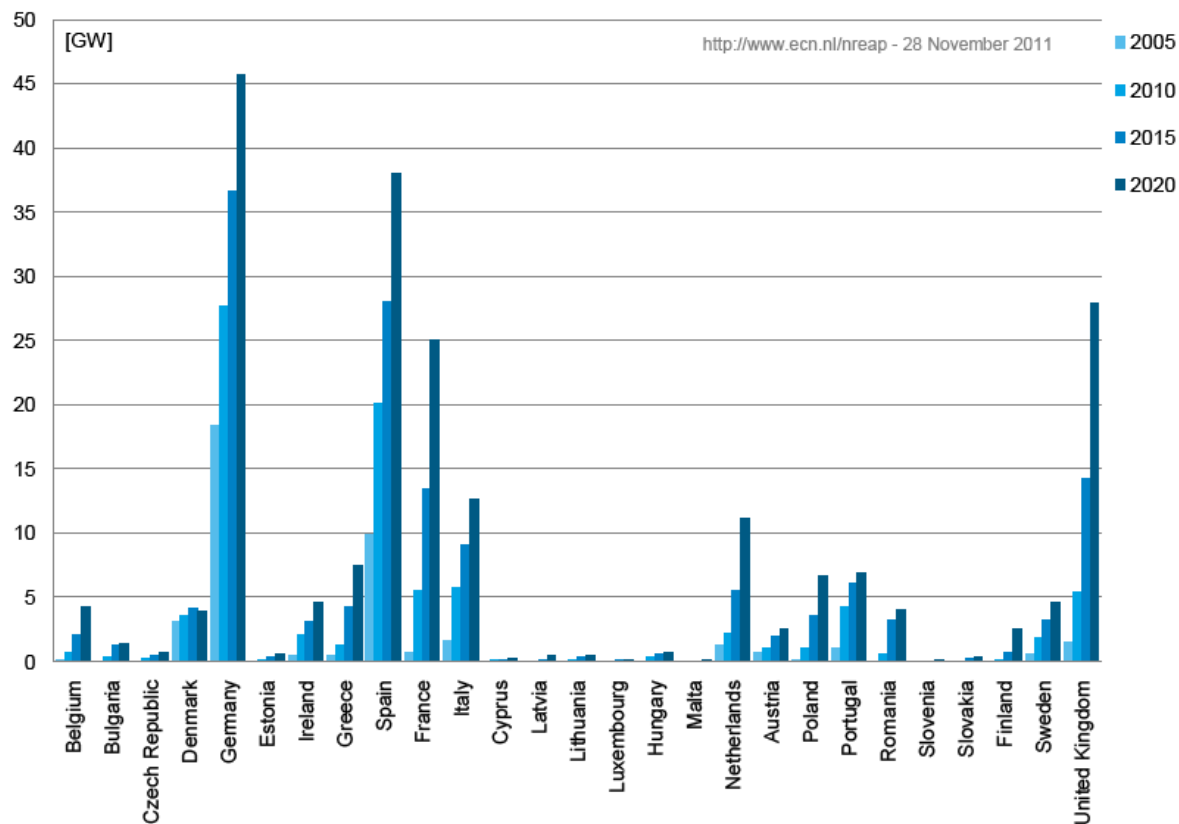
JP coordinator: DTU Wind Energy (DK)

Participants/Associates: DTU Wind Energy (DK), ECN (NL), CRES (GR), CENER/CIEMAT (ES), FhG IWES (DE), LNEG/INETI (PT), SINTEF (NO), VTT (FIN), Univ. of Strathclyde (UK), Forwind/Univ. of Oldenburg (DE), NTNU (NO) IFE (NO), Forwind/Univ. of Bremen (DE), Forwind/Univ. of Hannover (DE), DHI (DK), Univ. of Aalborg (DK), Tubitak (TU), IEn (PL), University of Porto (PT), Technical University of Delft (NL), WMC (NL), University College of Dublin (IR), CNR (IT), CTC (ES), IREC (ES)

Joint Programme and Sub-programmes

- **Wind Conditions**
- **Aerodynamics**
- **Offshore Wind Energy**
- **Grid Integration**
- **Research Facilities**
- **Structural design and materials**

2020 targets in NREAPs – Wind energy



2020 targets in NREAPs – Ocean energy

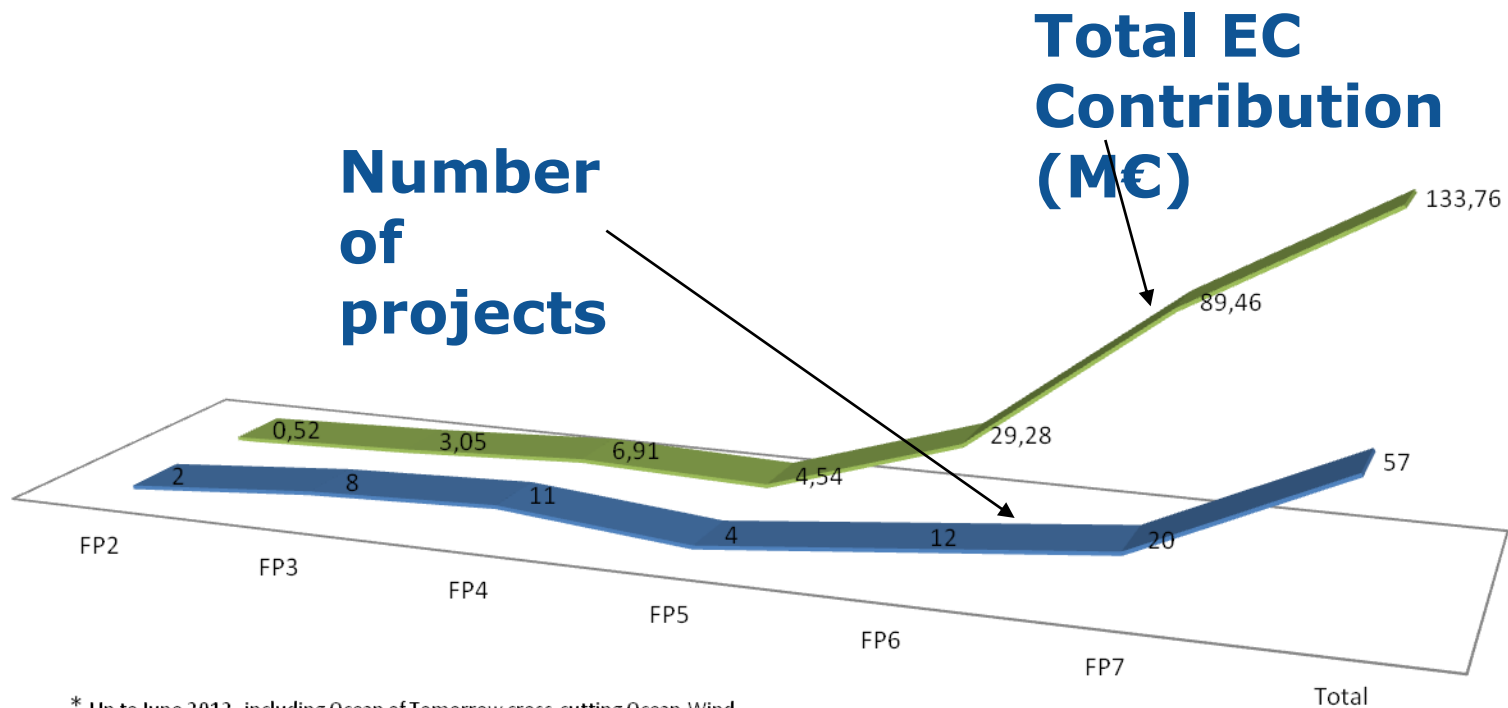
	Tide, wave, ocean	
	MW	GWh
France	380	1 150
Ireland	75	230
Italy	3	5
Portugal	250	437
Spain	100	220
UK	1 300	3950
Finland	10	na
TOTAL	2 118	5 992

**For waves / tides
only 7 country plans
have targets for 2020**

http://ec.europa.eu/energy/renewables/transparency_platform/transparency_platform_en.htm

R&D EU funded projects in Ocean Energy

EU Ocean Energy R&D*



* Up to June 2012, including Ocean of Tomorrow cross-cutting Ocean-Wind projects, not including DG ENER WP2012 projects under negotiations

Illustrative examples - FP7 EQUIMAR

EQUIMAR – FP7 – Finished 2011

3 years duration

total budget of 5.4 M€

23 participants

11 different Member States

Has established protocols for ocean energy devices testing and evaluation



FP7 WP2013 – Topics Ocean Energy*

ENERGY.2013.2.6.1: Design tools, enabling technologies and underpinning research to facilitate ocean energy converter arrays

ENERGY.2013.10.1.3: ERA-NET - Supporting the coordination of national research activities of Member States and Associated States in the field of ocean energy

(WP2012 – Call for Tender to be published: effects of noise, vibrations and EMI from MRE devices on the environment)

* Submission deadlines: 28/11/2012 for 2.6.1, 28/02/2013 for ERA-NET

FP7 WP2013 – Topics Wind Energy*

ENERGY.2013.2.3.1: Advanced aerodynamic modelling, design and testing for large rotor blades

ENERGY.2013.2.3.2: Small to medium size wind turbines

ENERGY.2013.10.1.2: ERA-NET Plus – European wind resources assessment

OCEAN.2013.4: Innovative transport and deployment systems for the offshore wind energy sector

* Submission deadlines: 28/11/2012 for ENERGY, 28/02/2012 for ERA-NETPlus, 07/02/2013 for OCEAN



"Proven, innovative, competitive solutions !"

- ***Creating favourable market conditions***
- ***Shaping policy development and implementation***
- ***Preparing the ground for investments***
- ***Building capacity and skills***
- ***Informing stakeholders and fostering commitment***

IEE - €730 million from 2007-13

IEE projects ...



**Over 500 IEE-supported projects across Europe,
more than 3,000 participants from 30 countries...**

**Energy
efficiency**



**Renewable
energy
sources**



**Integrated
initiatives**

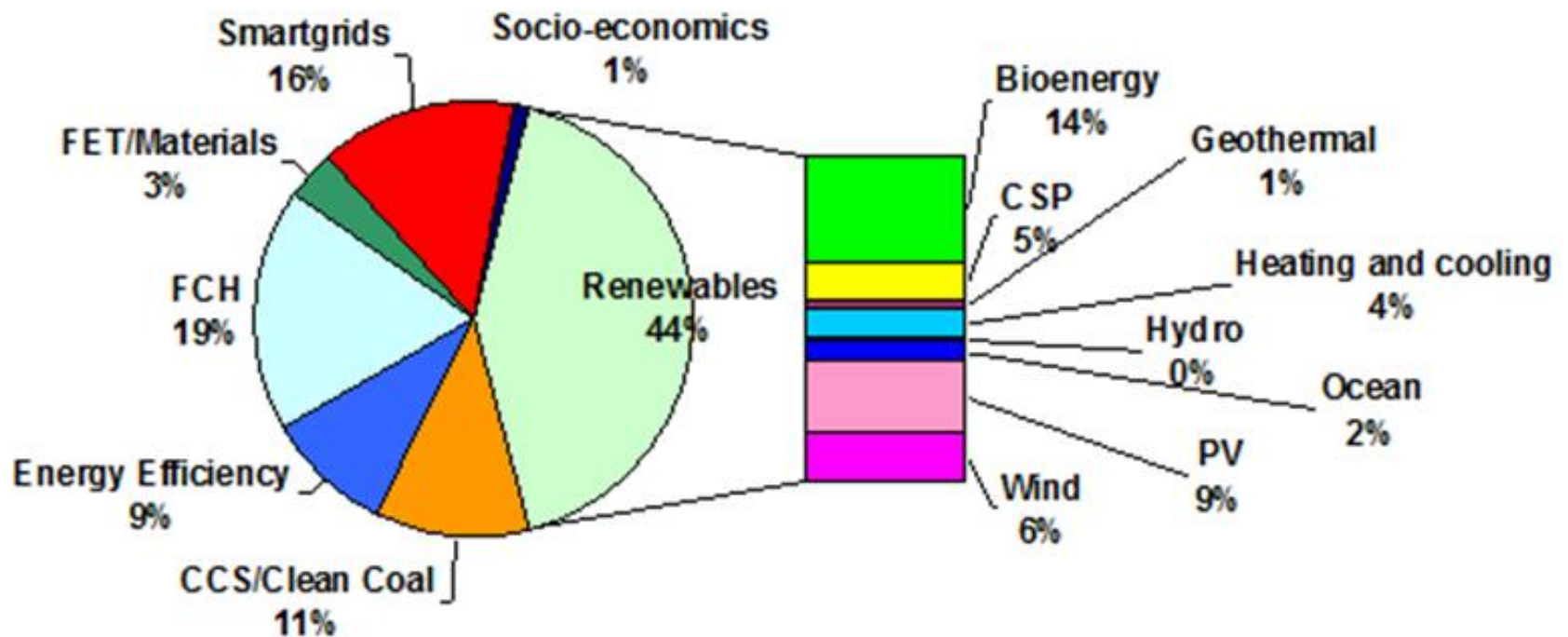


**Energy-
efficient
transport**



→ Important impacts at EU level

FP7 Energy - investment per sector 2007-2011



Priority 3: Societal challenges

Why:

- Concerns of citizens and society/EU policy objectives (climate, environment, energy, transport etc) cannot be achieved without innovation
- Breakthrough solutions come from multidisciplinary collaborations, including social sciences & humanities
- Promising solutions need to be tested, demonstrated and scaled up

Horizon 2020 and MRE

- **European Wind Energy Initiative well established**
- **EERA-Wind has already prepared joint programming activities**
- **EERA-Ocean is up and running**
- **ERA-NET Plus (Wind Atlas) in WP2013**
- **ERA-NET "Ocean" proposal is being actively prepared**
- **Strong links with other initiatives (EU Maritime policy, MMRS, Ocean of Tomorrow,)**

Many elements for a bright future of MRE in H2020!

● **New instruments (under discussion)**

- **Horizon 2020**
 - Significant budget increase expected for Energy R&I
 - Access to risk finance (both as equity & loans)
 - Strengthened coordination with Structural Funds
- **EU Emissions Trading Scheme (ETS) → Significant budgets available for MS (to be invested inter alia in renewable energy)**
- **Recently created: Working Group on financing**