



**European Ocean Energy**  
ASSOCIATION

# **Ocean Energy: A European Perspective**

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# European Ocean Energy Association

- Formed in 2005
- Registered in Belgium as an International Non-Profit association
- Established our office in the Renewable Energy House under the umbrella of the European Energy Council in January 2007
- Membership at present 50 companies



# What are our main objectives

- Provide constant and active policy observation at European level.
- Provide immediate policy feedback to European and National documents
- Lobbying at European level, gathering under a single voice the pressures for favorable policies and schemes for OE
- Coordinate the effort of the actors on OE at European level



# European policy

The European Strategic Energy Technology Plan (SET Plan) provides guidance to the Member States on how to address the challenge faced by Europe to meet its energy and climate change targets: to reduce greenhouse gas emissions by 20%, ensure 20% of renewable energy sources in the EU energy mix, and to reduce EU primary energy use by 20% by 2020.

The so-called 20/20/20 by 2020.



# European policy

The European Commission is strongly promoting offshore wind energy development as part of its Second Strategic Energy Review (An EU energy Security and Solidarity Action Plan {SEC(2008) 2794} {SEC(2008) 2795}, released in Brussels on November 13th 2008.

The document promotes offshore wind both in its general strategy, and in the specific call for a North Sea Offshore Grid.

This pairs with the new action plan of the Commission to promote offshore wind energy "Offshore Wind Energy: Action needed to deliver on the Energy Policy Objectives for 2020 and beyond"

Although the SET plan adopted by the commission in early 2008 calls for the diversification of RES for reaching the 2020 targets, Ocean Energy risks to be considered secondary compared to other RES.



# EU Funding and support

- A number of tools such as ERA Nets, Technology platforms, Joint Technology Initiatives, ...
- Funding for R&D projects since FP5 (1998)
- FP5 : 7 project with a total EC contribution of 6.85 M€
- FP6 : 7 projects with a total EC contribution of 14.03 M€



# WAVEPLAM : Wave energy planning and marketing

- The overall objective is to assess and tackle the non-technological barriers that may arise when these technologies are available for large-scale development, by supporting the creation of a market for ocean energy.
- Main outcome will be guidelines for wave energy promoters
- Coordinator : Ente Vasco de la Energia
- More information on the project website : [www.waveplam.eu](http://www.waveplam.eu)



# EquiMar : Equitable testing and Evaluation of Marine Energy Extraction Devices in terms of Performance, Cost and Environmental Impact

- The overall objective of the EquiMar project is to deliver protocols for the equitable evaluation of marine energy promoters.
- Results from the EquiMar project will establish a sound base for future standards (e.g. IEC TC 114).
- Project coordinator : University of Edinburgh
- Online consultation to key stakeholders ongoing on EU-OEA website - info please contact [pricci@robotiker.es](mailto:pricci@robotiker.es)

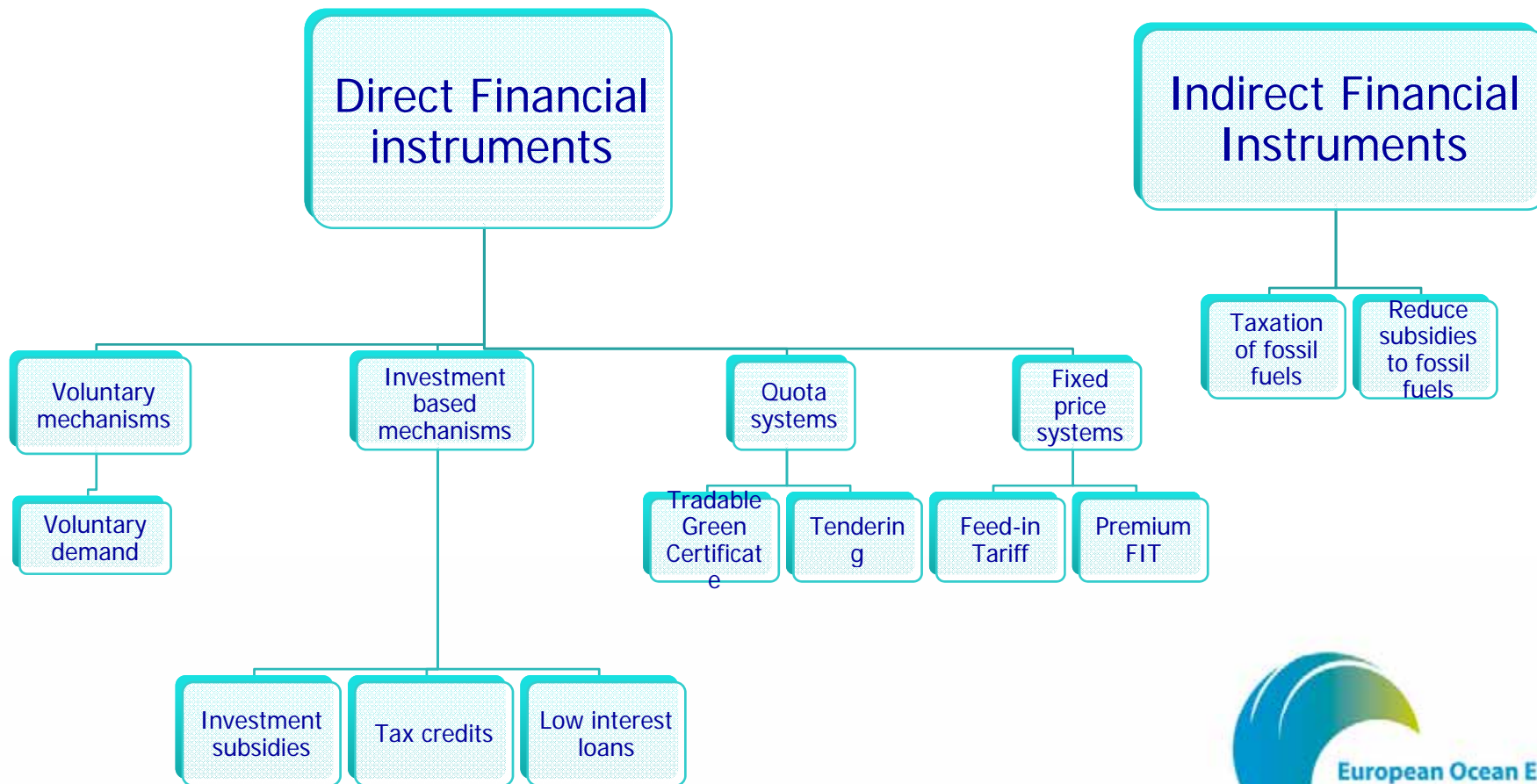


# Relevant open calls

- DG Research (energy call) : combined deep offshore multi-purpose renewable energy platforms / first joint call for wind and ocean
- DG Research (environmental call) : innovative coastal protection systems / cross cutting issues

# Policy strategies for the promotion of electricity from RES

There are several instruments that can be used to promote the use of RE:



# What are the available mechanisms?

- Which support instruments for renewable electricity are currently being implemented in the individual Member States of the EU?
  1. Investment Based Mechanisms (subsidies, credits, loans)
  2. Quota systems (Tradable Green Certificates, tendering)
  3. Fixed price systems (Feed-in Tariff)

# Feed-in tariffs (FITs)

FITs put a legal obligation on utility companies to buy electricity from renewable energy producers at a premium rate.

- **Fixed feed-in tariffs:** Currently, this is the dominant policy scheme for promoting electricity generation with RES in Europe. This system allows independent electricity generators to feed renewable electricity in the public grid at a fixed tariff for a determined period of time.
- **Premium feed-in tariffs:** Like for the fixed feed-in tariffs, premium guarantee a fixed price for every kWh fed to the grid. However, in the case of the premium one, the tariff consist of two distinct payments: first, electricity is sold at regular market prices, then, as market price varies, shortfalls are paid to the investor as a premium tariff.

# Advantages of Feed-in tariffs

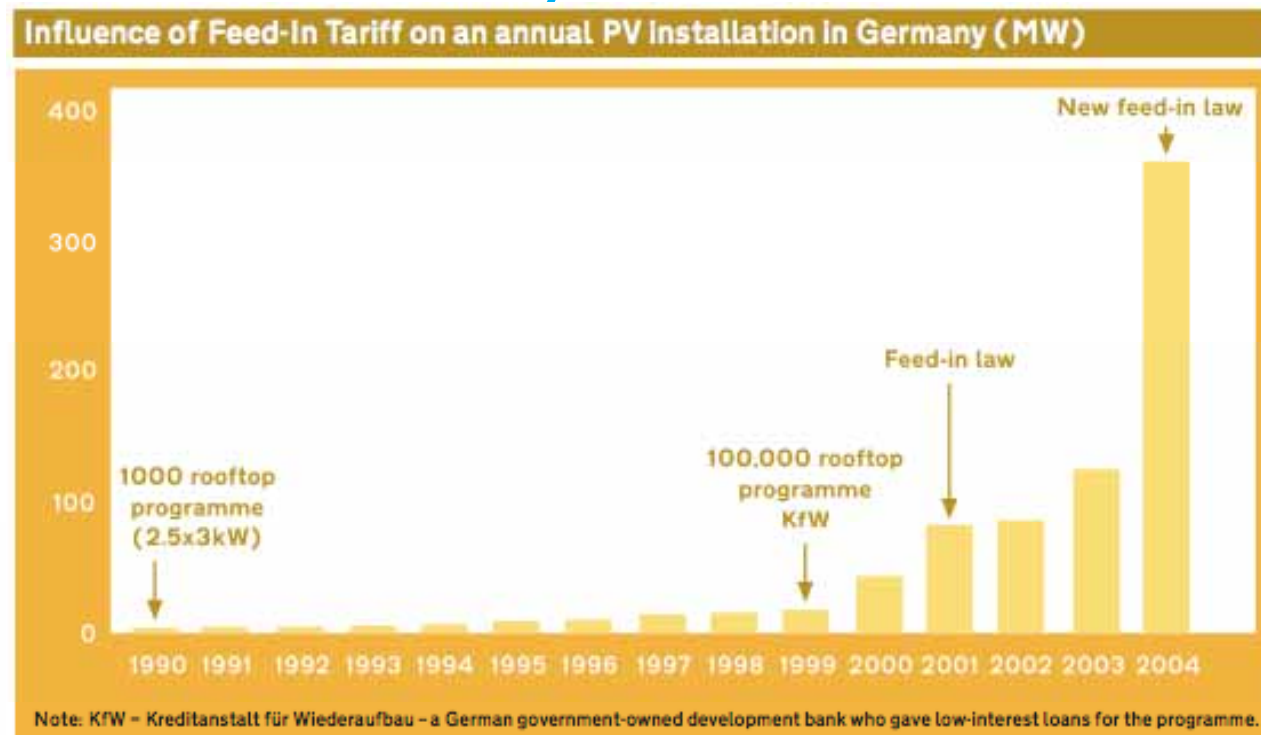
FITs can kick-start the domestic RE market without requiring large government subsidies.

They are effective at overcoming RES penetration barriers such as

- costs and pricing
- legal and regulatory: lack of legal framework for independent power producers; planning restrictions; grid access; liability insurance requirements
- market performance (lack of access to credit; perceived technology performance uncertainty and risk; lack of technical or commercial skills and information)

# Impact of FITs

## Example of the impact of FIT on the PV market in Germany



# Countries that adopted FITs

Year	Cumulative number	Countries/states/provinces added that year
1978	1	United States
1990	2	Germany
1991	3	Switzerland
1992	4	Italy
1993	6	Denmark, India
1994	8	Spain, Greece
1997	9	Sri Lanka
1998	10	Sweden
1999	13	Portugal, Norway, Slovenia
2000	14	Thailand
2001	16	France, Latvia
2002	20	Austria, Brazil, Czech Republic, Indonesia, Lithuania
2003	27	Cyprus, Estonia, Hungary, Korea, Slovak Republic, Maharashtra (India)
2004	33	Italy, Israel, Nicaragua, Prince Edward Island (Canada) Andhra Pradesh and Madhya Pradesh (India)
2005	40	Turkey, Washington (US), Ireland, China, India (Karnataka, Uttaranchal, Uttar Pradesh)
2006	41	Ontario (Canada)

Source: REN 21, 2006



# Supporting schemes by EU country

## EU Support schemes

Country	Main System	Duration
Austria	FIT	10+ years
Belgium	Quota/TGC and feed-in-tariffs (minimum tariffs)	
Bulgaria	FIT	
Cyprus	FIT	15
Czech Republic	FIT + Premium	15
Denmark	FIT for all RES but Wind (for which premium and tenders)	
Estonia	All RES bought at fix price (74,2 fixed - 54,2 premium)	
Finland	Tax Exemption 4- 7,3 €/MWh	
France	FIT	15-20
Germany	FIT	5 years- 12 years
Greece	FIT	12
Hungary	FIT	Lifetime of plant
Ireland	Tender (until end of 2005) / Feed-in Tariffs starting in 2006	15
Italy	Quota/TGC 130€/MWh in 2007 option FIT for small plants < 1MW	15
Latvia	FIT (2007)	10
Lithuania	FIT (2002-present)	10
Luxembourg		10
Malta	Under construction (Grants and or fixed purchase price)	
Netherlands	FIT Since august 2006 the premium tariffs were put at 0	10
Poland	Quota obligation	
Portugal	FIT	15
Romania	Quota/TGC mandatory quota for electricity suppliers	
Slovak Republic	Tax relief, FIT	
Slovenia	FIT (Fixed and premium)	
Spain	FIT or premium price	No limit but decreasing
Sweden	Quota / TGC: Currently certificates are trading for around 29-31 €/MWh	
United Kingdom	Quota / TGC	

# OE supporting schemes in EU

Countries including OE in the RES-E in their supporting schemes, currently conducting experimentation with OE technologies, and where OE can contribute to the energy mix

- Denmark
- France
- Ireland
- Italy
- Portugal
- Spain
- United Kingdom



# Denmark

- The share of RES in the gross final energy consumption was **17% in 2005 (mainly from wind)**
- **RES targets:** 30% share of RES on the final consumption of energy in 2020.
- **Support schemes:**
  - FIT (Fixed and Premium) + special tariff of 80 €/MWh for the first 10 years + 50 €/MWh for the following 10.
  - Incentives (Fiscal and Investment)
  - Tenders

# France

- France aims at 23% share of RES on the final consumption of energy in 2020 (was 10,3% in 2006)
- **RES Policy Instruments**
  - FIT: Introduced in 2001 and modified in 2005 (20 year FIT 150 €/MWh for Ocean Energy). Tender system for large renewable projects
  - Incentives (Fiscal and investments)
  - Indirect schemes (Tax on polluting activities)

# Ireland

- The share of RES in the gross electricity consumption was 8.6% in 2006 (compared with 4.9% in 1990)
- RES targets: 16% share of RES on the final consumption of energy in 2020
- Support Schemes:
  - Tender scheme
  - Since 2006 FIT has become the main scheme for RES support, including Ocean Energy. Feed-in tariffs will be guaranteed for up to 15 years in order to ensure investor confidence. Feed in tariff Wave (from 2008) 15 years (fixed) 2006-present 220 €/MWh
  - On January 15th, 2008, the Irish Government announced a feed in tariff of 220 €/MWh for Ocean Energy
- In 2008, the National Ocean Energy Development initiative will include:
  - €1 million towards a state-of-the-art National Ocean Energy facility in University College Cork;
  - €2 million to develop a grid-connected wave energy test site in County Mayo;
  - €2 million in grants under the Ocean Energy Prototype Fund to help developers commercialise their devices;
  - the introduction of a new feed-in-tariff for wave energy of €220 per MWh electricity generated; and
  - €500,000 to establish an Ocean Energy Development Unit as part of Sustainable Energy Ireland to oversee the implementation of the initiative.



# Italy

- **RES policy:** At the end of 2007 the Italian government has introduced some new provisions for renewable power generators. Small generators (up to 1 MW) will have the choice between selling their green certificates on the market and receiving a feed-in tariff. The renewable energy obligation for Italian suppliers will increase annually by 0.75% to 2012 (instead of the former 0.35%), starting from the 2007 share of about 4%. After 2012, a new annual increase percentage will be established by the Italian government.
- **Schemes:**
  - **Quota obligation**
  - **TGC**
  - **FIT for PV**
  - **New FIT** (LEGGE 24 December 2007, n. 244.) introducing a 340 €/MWh from wave and tidal energy
  - Incentives and subsidies (fiscal and investments)

# Portugal

- The average (hydropower depends on precipitations) **share of RES in the gross electricity production was 30.6% in 2006 (an almost average year).**
- **RES Target:** 31% share of RES on the final consumption of energy in 2020. Portugal's roadmap to the RES targets includes an increase installed capacity of Wave energy plants by 200 MW through the creation of a Pilot Area with a total exploitation potential of up to 250 MW for new emerging industrial and pre-commercial waves technological development prototypes.
- **Supporting schemes**
  - **FIT ( a 15-years 260-76 €/MWh for Wave).** In particular, the Decree-law 225/2007 introduced new tariffs for emerging technologies, such as wave energy and Concentrated Solar Power providing the legal basis for government use of public maritime areas for producing electricity from sea-wave power.
  - direct subsidy payments and tax incentives
  - Fiscal and financial incentives
  - Beginning in 2005, a tendering/concession process has also been established.



# Spain

- The Spanish Renewable Energy Plan expects a contribution from RES of 12.1% of primary energy consumption in 2010, electricity generation from RES of 30.3% of gross electricity consumption, biofuels consumption of 5.83% of gasoline and diesel use for transport in 2010, and RES contribution of 4445 ktoe for heating and cooling.
- In 2006, 18,8% Spanish electricity production came from RES
- Policy Instruments:
  - Feed in Tariff for electricity generation (ordinary regime and special regime)
  - Special obligation for Solar Thermal
  - Investment subsidies for heating and cooling
  - Fiscal incentives and quota obligation for biofuels
  - FIT (fixed and premium) explicitly set for Ocean and Tide (65-69, 30-38 premium)

# U.K.

- The **share of RES in the electricity production** was 4.6% in 2006 up from 4.2% in 2005. Res target has been set to 15% share of RES on the final consumption of energy and a 20% of RES-E in 2020.
- **Support schemes**
  - Renewable obligation (RO). The RO places an obligation on electricity suppliers to source an increasing share of their power sales from renewable sources. In case they should not meet this obligation, they have to pay a penalty. For each megawatt hour of renewable energy generated, irrespective of the technology used, a tradable certificate called a Renewables Obligation Certificate (ROC) is issued.
  - A £50 million (EUR 72.5 million) fund is available for the development of wave and tidal power, the Marine Renewables Deployment Fund.

# Support schemes in selected countries: Synopsis

	<b>Denmark</b>	<b>France</b>	<b>Ireland</b>	<b>Italy</b>	<b>Portugal</b>	<b>Spain</b>	<b>U.K.</b>
<b>Support scheme</b>	FIT for all RES (Wind premium and tenders)	FIT	Tender until end of 2005) / Feed-in Tariffs starting in 2006	Quota/TGC 130€/MWh in 2007 option FIT for small plants < 1MW	FIT	FIT or premium price	Quota TGC
<b>Hydro (+small)</b>		25-60,7	72	220	75-77	70-78	
<b>Solar</b>	200-250	300-400 ++		Separate FIT 36-49/ 20 years	PV 310-470 Therm 267-273	PV 184-440,4 Therm 215-269	
<b>Wind</b>		82-130	57-59/140	220	74-75	61-73	
<b>Geothermal</b>		120+	200			65-69	
<b>Biomasses</b>		49 +	70-72	220-300	102-109	81-159	
<b>Wave/Tide</b>		150	220	340	76-260		
<b>Biogas</b>	80	75-90 ++		180	115-117	65-80	
<b>Sewage and landfill gas</b>		45-57,2					
<b>MSW</b>		45-50 +			53-54	23 (premium)	
<b>RDF</b>					74-76		



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