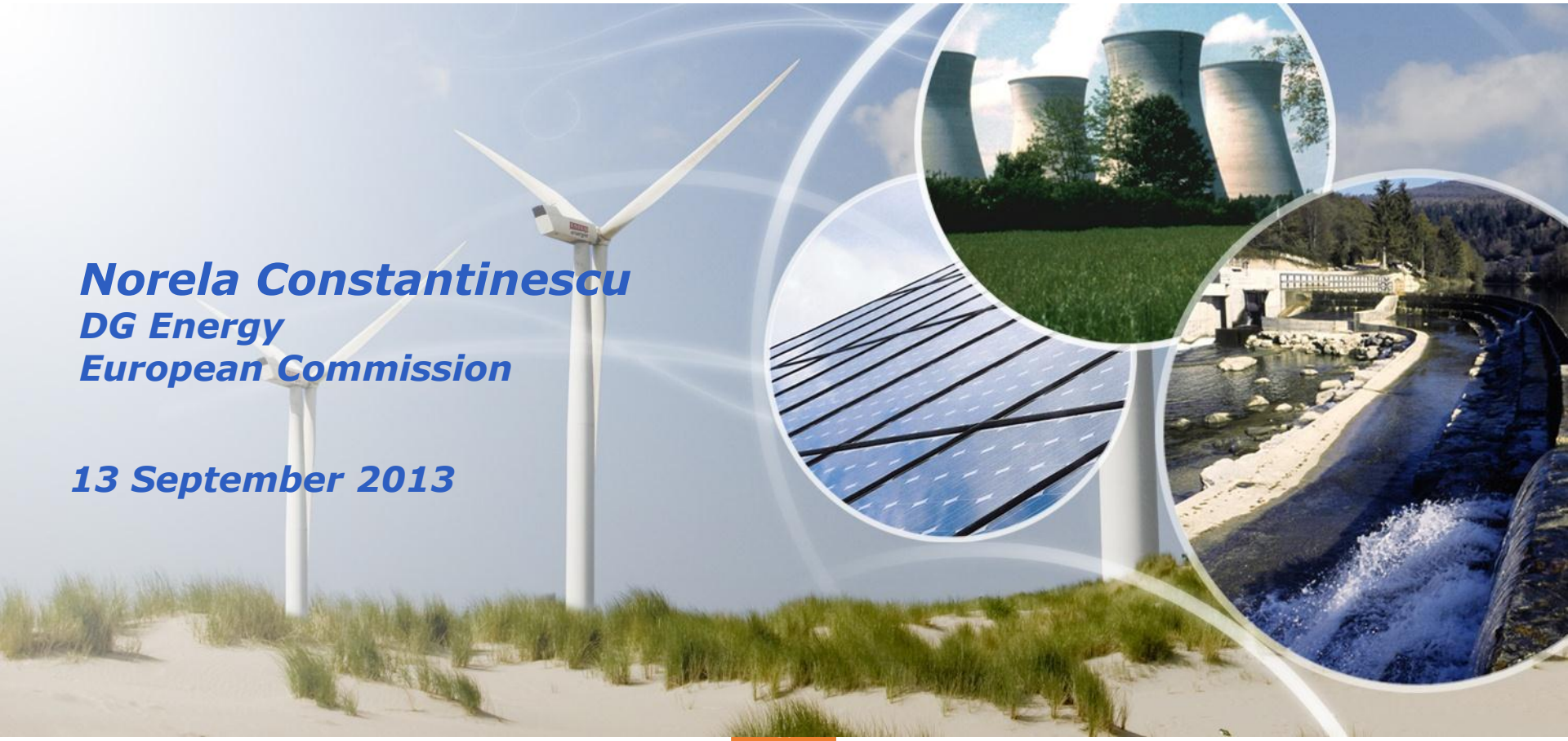
Energy Technologies and Innovation in Europe



Norela Constantinescu
DG Energy
European Commission

13 September 2013

SET Plan adopted in 2008

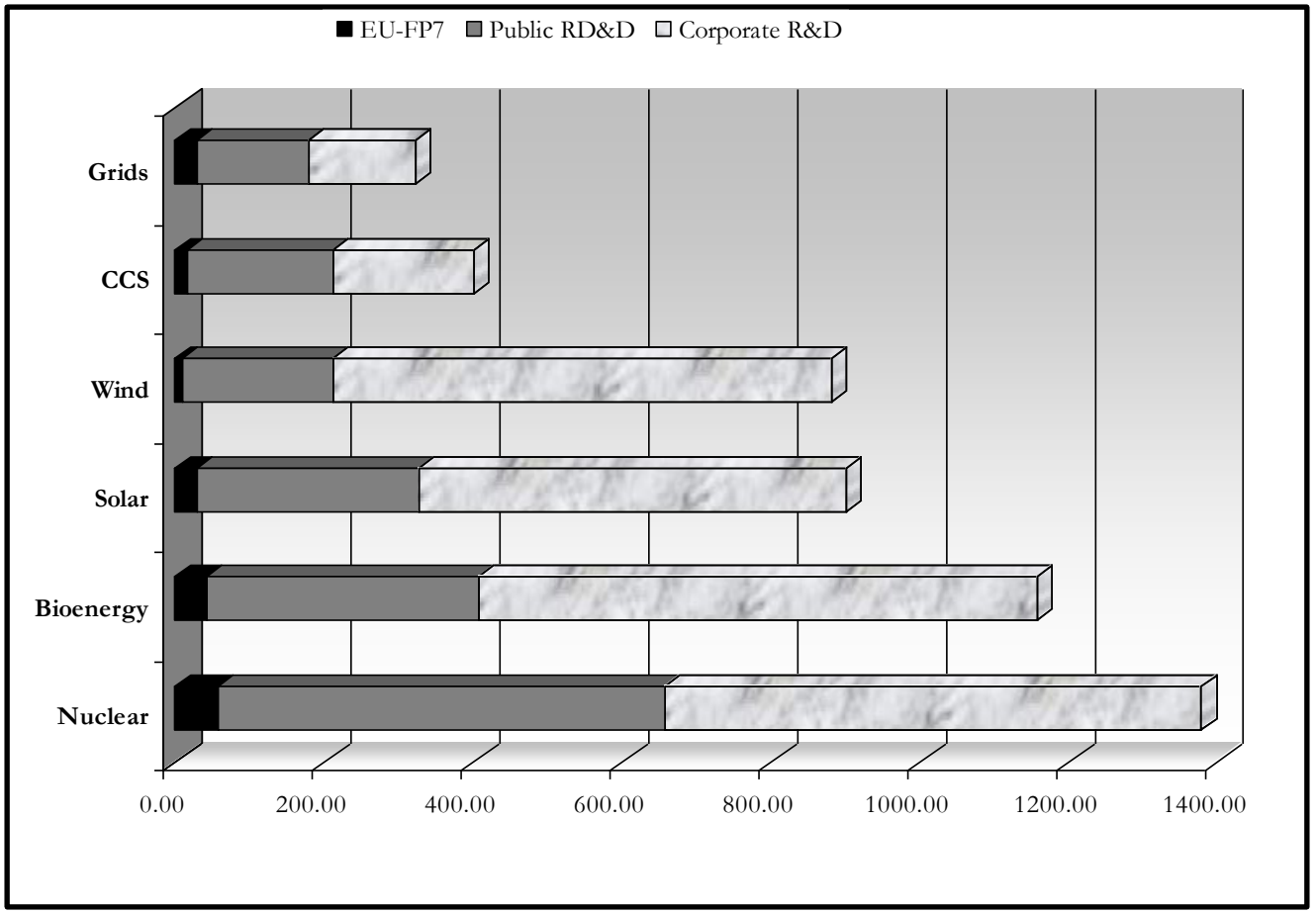
European Commission

- ***Focus on technologies with market impact up to 2020 (set up of EIIs)***
  - Wind
  - Solar
  - Electricity grids
  - CCS
  - Bioenergy
  - Nuclear
  - Smart Cities and Communities
  - Fuel cells and hydrogen
- ***Focus on longer-term research actions beyond 2020 (set up of EERA)***
- ***Financing***

SET Plan R&D investments in 2010

European Commission

Almost a doubling compared to 2007

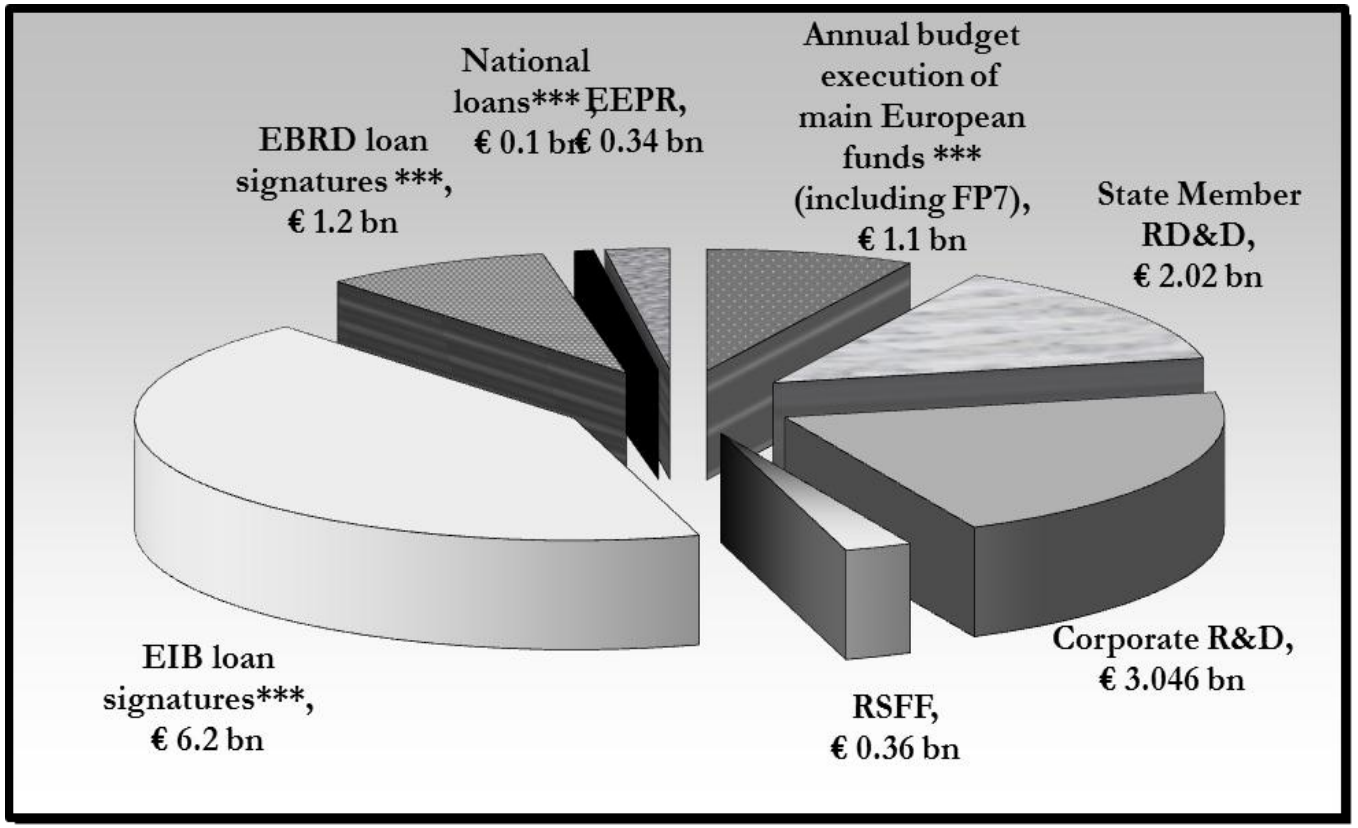


Public and corporate R&D by SET Plan technologies and source (2010) - EEPR funding is not included – Source: JRC/SETIS (COM(2013) 253 final)

From research to deployment

European Commission

Example of renewables

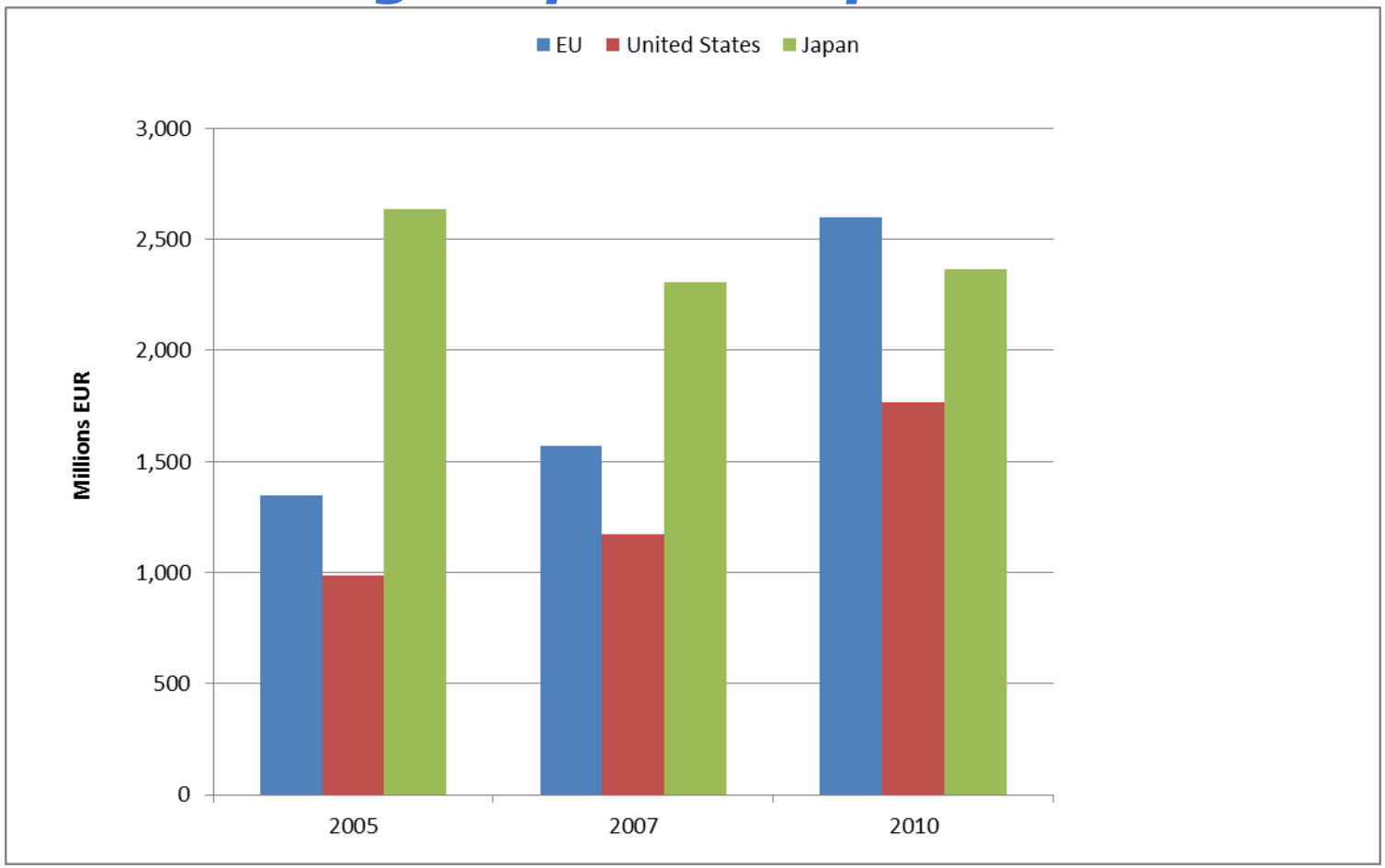


Indicative distribution of the financial support of the main bodies involved in financing energy efficiency projects, RES RD&D and deployment programs for the year 2010 – Source: JRC/SETIS (SWD(2013) 157 final)

EU public R&D spending for energy

European Commission

Increased over 2007- 2010 and caught up with Japan and USA



Source: JRC/SETIS

Subsidies

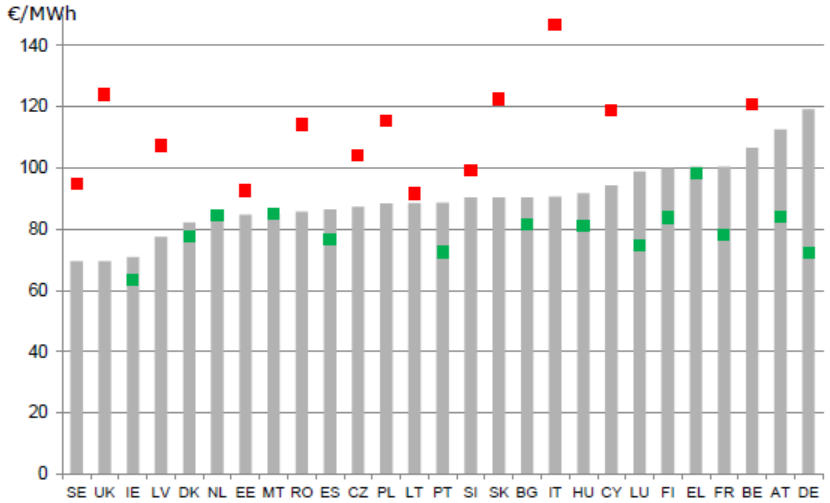
European Commission

Production costs versus subsidies for renewables

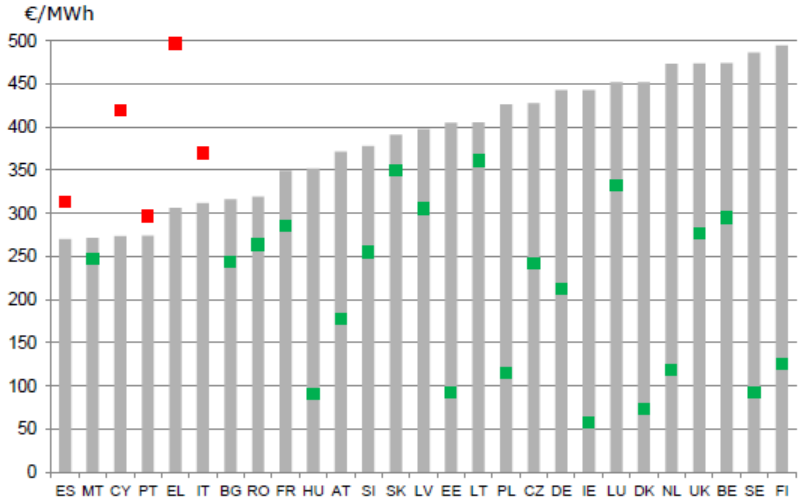
(averages, in €/MWh, latest year available)

Production costs | Subsidies over production costs | Subsidies below production costs

Wind energy on-shore



Solar energy (photovoltaics)



Average employment over the life of a facility (jobs/MW)

	Construction, manufacturing, installation	Operation & maintenance and fuel processing	Total employment
Solar PV	5.76–6.21	1.20–4.80	7.41–10.56
Wind	0.43–2.51	0.27	0.71–2.79
Biomass	0.40	0.38-2.44	0.78-2.84
Coal	0.27	1.01	0.74
Gas	0.25	0.70	0.95

Sources: Kammen et al. (2006) cited in Fankhauser, 2008.

New challenges

European Commission

New realities in the global energy market

Competitiveness
➔ Energy cost

Trends in energy price indexes 2005-2012

	EU	US
Gas price index Industry	35%	-66%
Gas price index Households	45%	3%
Electricity price index Industry	38%	-4%
Electricity price index Households	22%	8%

1980 1990 2000 2010 2020 2030 2035

Source: IEA

Impact of the financial crisis

Fall in private investment, tight financing conditions

ETS Price

Fukushima

Some countries phase out nuclear power production

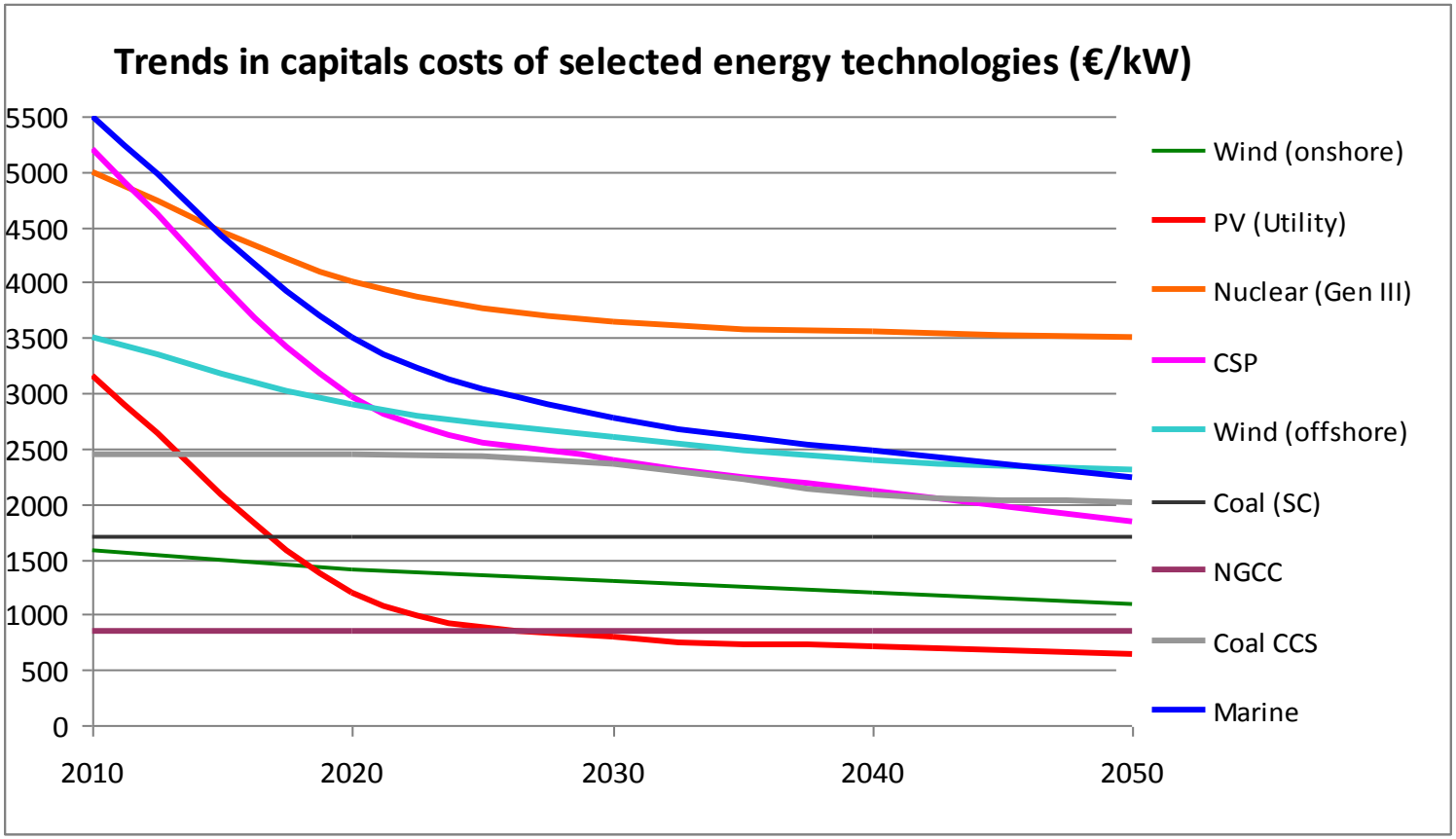
Rising demand ➡ rising prices

By 2030, world economy set to double and energy demand to rise by 1/3

Innovation potential

European Commission

Remains a significant potential for innovation to be captured



Capital cost reductions for selected energy technologies in absolute values - Source: JRC-SETIS SWD(2013)158 final

Key principles

European Commission

For new challenges post 2020

- *Adding value at the EU level*
- *Looking at the whole energy system*
- *Bridging research and innovation with energy policy*
- *Making better use of existing and increased financial resources*
- *Keep options open*
- *Harness endogenous resources*

Key developement needed (1)

European Commission

(a) Unlocking the full potential of energy efficiency, focusing on end use consumption

- ***Buildings and industry*** *to save money, be less dependent on energy prices and more competitive*
- *More optimal use of the grid, with increased demand side participation, including* ***demand response****, brings savings to consumers and benefits to operators*
- *Market uptake measures crucial to build the capacity of market actors and support innovative financing solutions*

Key developement needed (2)

European Commission

(b) Delivering solutions for a competitive & sustainable energy system

- ***Flexibility and security*** *of the European energy system* (i.e. electricity grids to take more RES, energy storage)
- ***Continuity*** *of electricity supply and rationalise demand for infrastructure (*e.g. demand response, local flexibility*)*
- ***Active*** *consumer* ***participation***
- *Open and flexible approach to further development of a portfolio of* ***cost effective*** *and sustainable* ***energy solutions***
- ***Interfaces*** *with other sectors (e.g. new material, KET such as ICT, advanced manufacturing processes)*

Key developement needed (3)

(c) Fostering innovation in real environments

Market uptake measures supporting policy implementation for grids, renewable energy and energy efficiency and

- Building the capacity of market actors
- Supporting the development of innovative financing solutions

Particular focus on cities through Smart Cities and Communities

- Innovation at the intersection of energy, transport and ICT
- Demonstrate commercial scale urban solutions

ETI strategy – Implementation (1)

European Commission

Making better using of existing financial resources

Coordination of R&D energy programmes through

- Alignment, joint actions between MSs and / or with the EU
- Structural and Investment Funds of regional policy
- Connecting Europe Facility
- ETS financing mechanisms

Financing mechanisms according to development stage

- Access to Risk Financing Facility
- European Investment Bank instruments

ETI strategy – Implementation (2)

European Commission

Strengthening the link with energy policy

- *Tackling regulatory barriers*
- *Reinforce the role of technology and innovation within energy policy:*
  - Triggering new business models

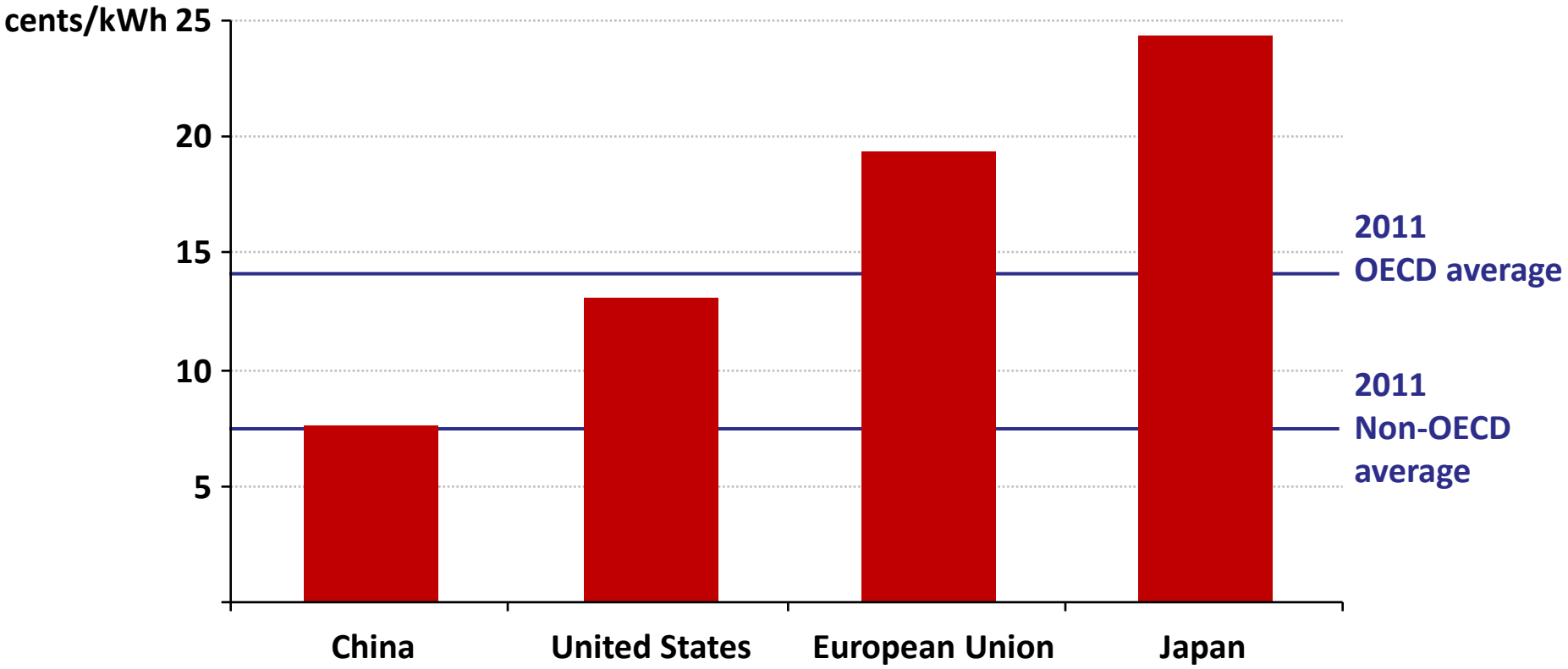
Key Conclusions

European Commission

Implementing Actions

- *Integrated Roadmap*
- *Action Plan*
- *Robust reporting system*
- *a new coordination structure under the SET plan SG on energy efficiency*
- *New competences: e.g. non-technological barriers*
- *External Dimension*

Average household electricity prices, 2035



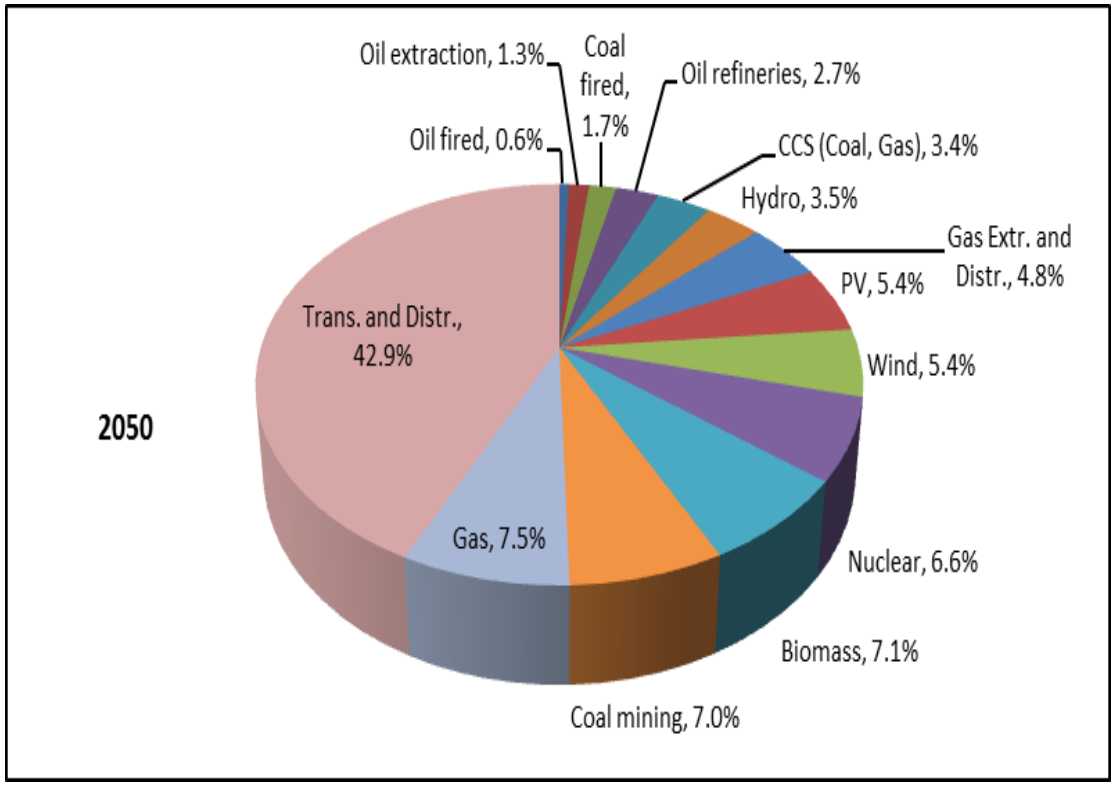
IEA: Electricity prices are set to increase with the highest prices persisting in the European Union & Japan, well above those in China & the United States

Energy sector

2010

1.5% of total EU employees

2050 *–1.7% of EU employees in*



European Commission

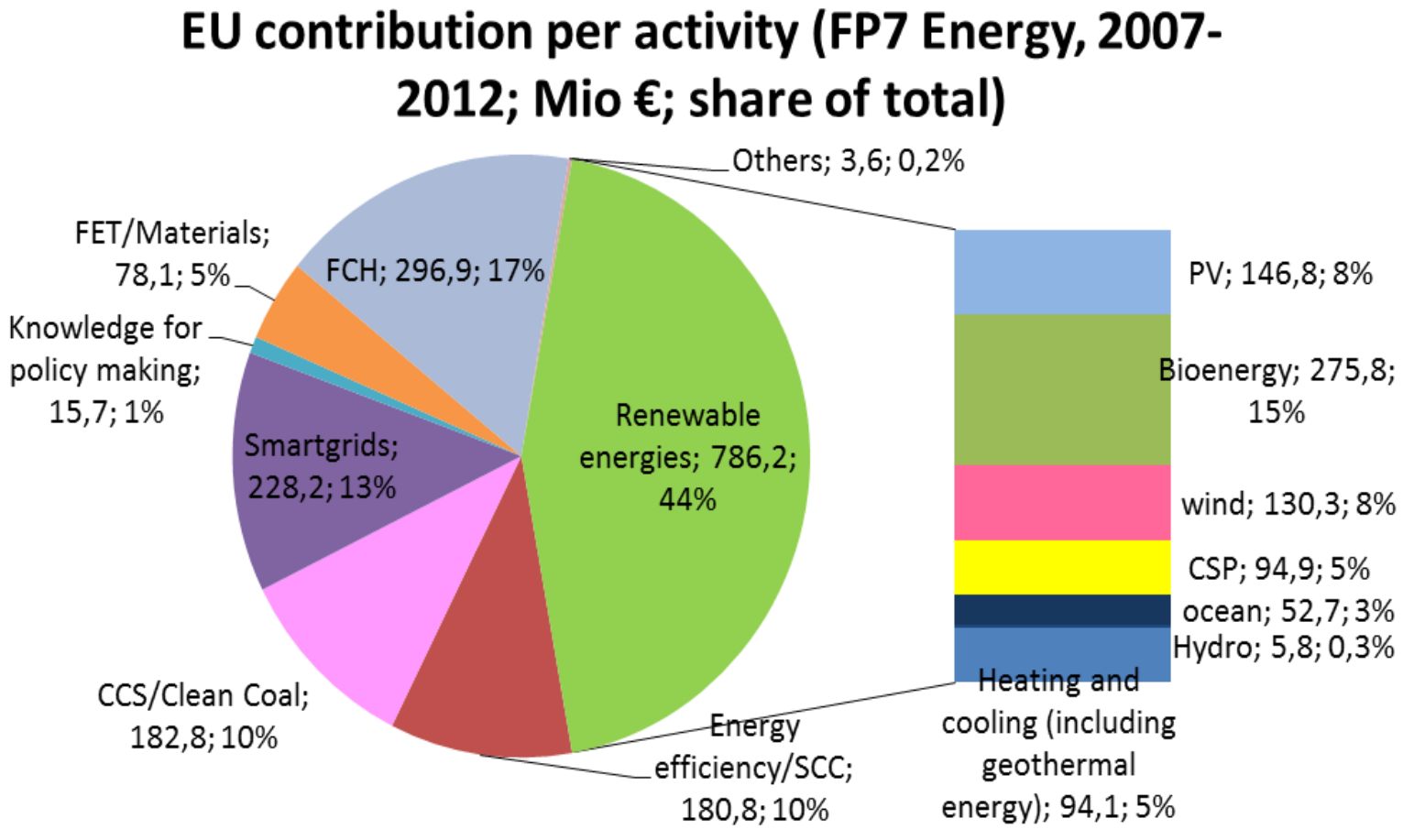
Getting all the pieces together

Thank you for your attention

EU support to SET Plan (1)

European Commission

7th FP - Funding for sustainable energy (calls 2007-2012)



EU support to tackling non-technological barriers (IEE II)

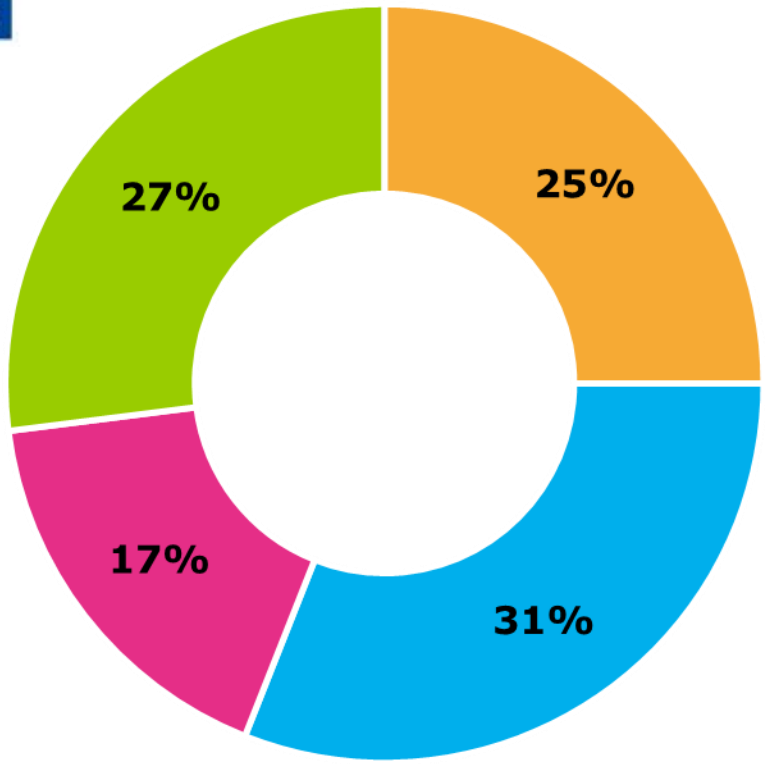
European Commission

INTELLIGENT ENERGY EUROPE

The EU funding programme for the market uptake of sustainable energy solutions

EU contribution: 732 million € from 2007 to 2013

300+ EU projects (2007-2011) with more than 2,500 market actors



Budget distribution
(excl. ELENA & tenders)

- **SAVE - Energy efficiency in buildings, products and industry**
- **ALTENER - Renewable energy sources**
- **STEER - Energy use in transport**
- **INTEGRATED - Projects addressing both energy efficiency and renewables**