

A key element for a massive deployment of RES: sustainability

ICREPQ´2013

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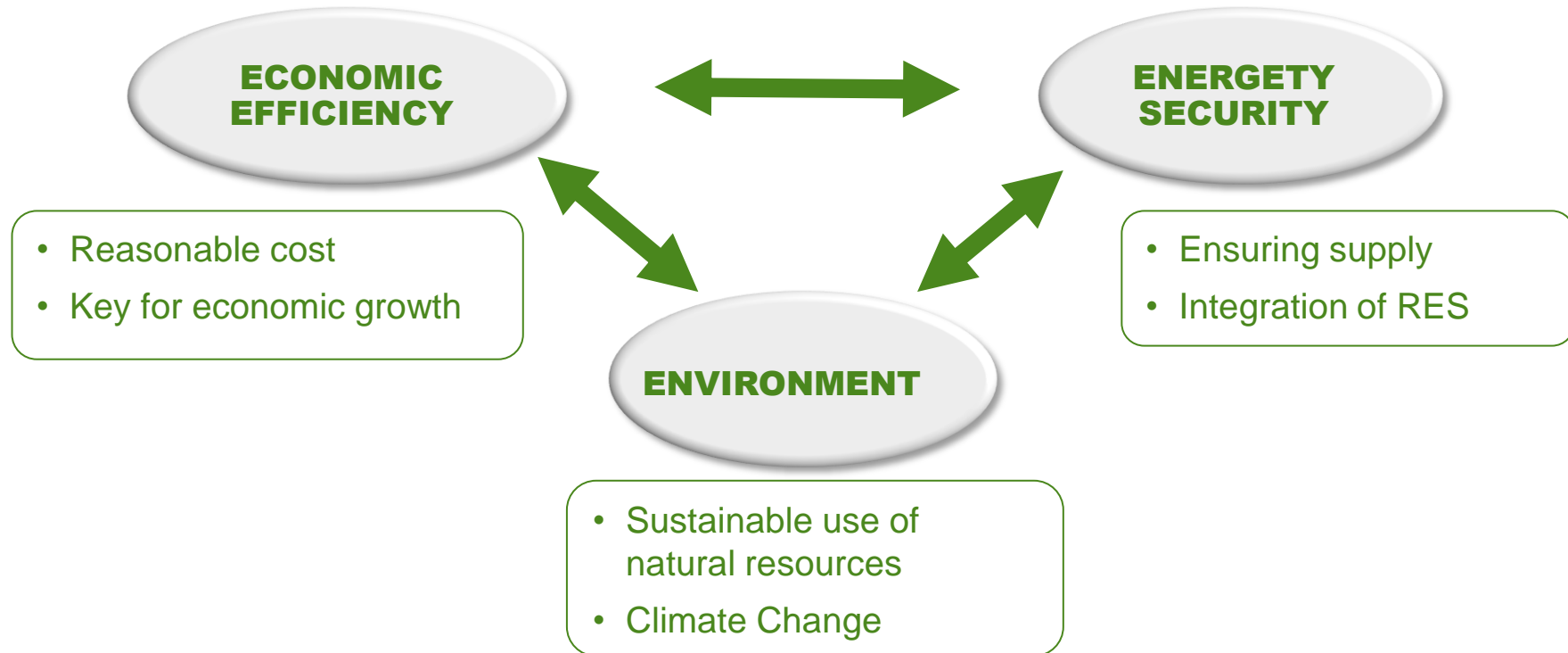
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I. EU energy policy: commitment to RES

II. Success and failure of RES development

III. The challenge of competitiveness

True sustainability: a balance between environment, security and economic drivers



Clear environmental credentials but competitiveness will be key

Robust and consistent EU policies have driven the growth

1997

White paper

- **12% indicative target** of gross inland energy consumption from renewables for the EU-15 by 2010

2001

Directive
2001/77/EC

- **21% indicative target** of electricity produced from RES for the EU-25 by 2010

2009

EU Directive
28/2009

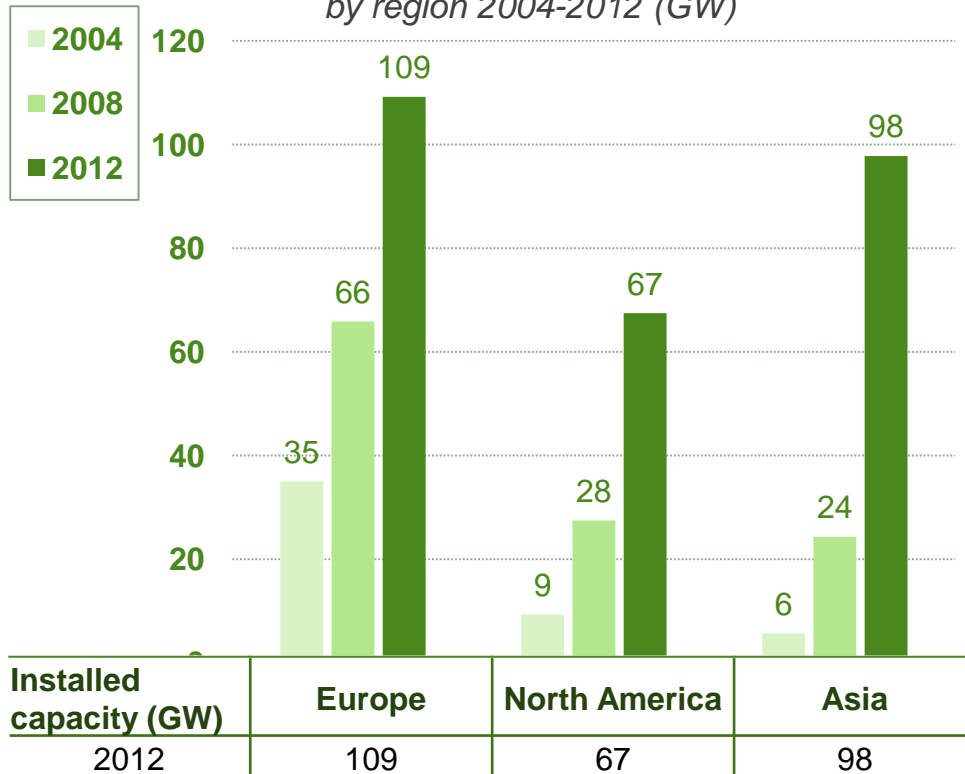
EU Directive 28/2009 on the Promotion of the Use of Energy from Renewable Sources (20-20-20)

- **European overall binding target of 20% renewable energy in final energy consumption by 2020**
- Burden sharing: 6% for every MS; the rest according to GDP per capita.
- Priority access to the grid
- Cooperation mechanisms

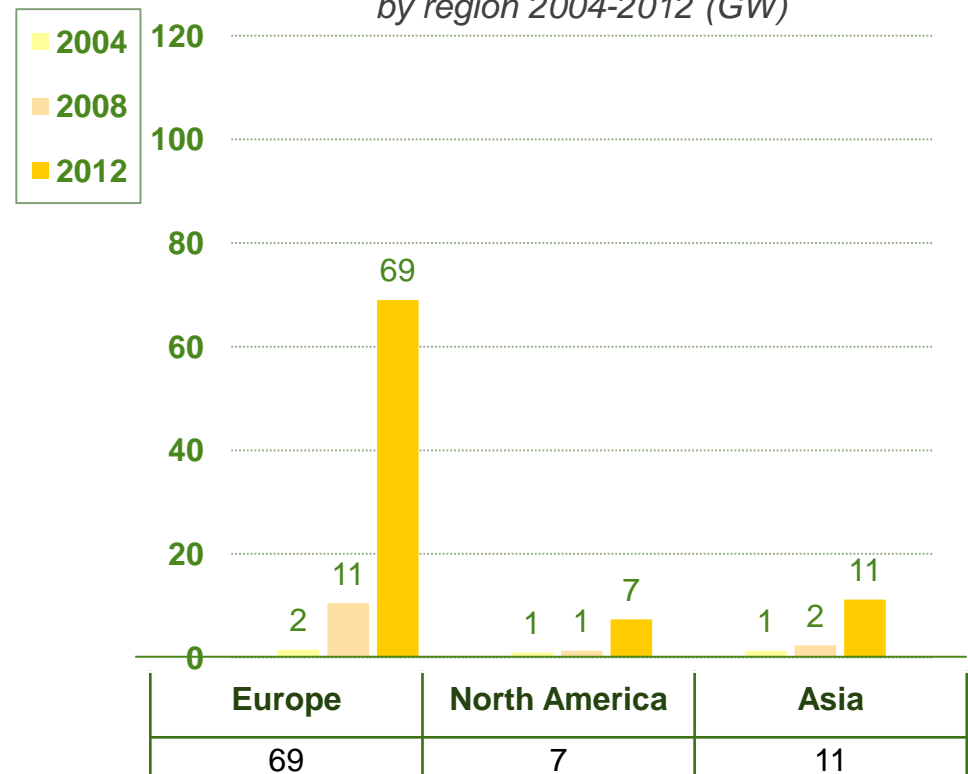
Europe has been at the forefront of renewable development

...and remains the world largest wind and solar energy market

Wind cumulative installed capacity by region 2004-2012 (GW)



Solar PV cumulative installed capacity by region 2004-2012 (GW)



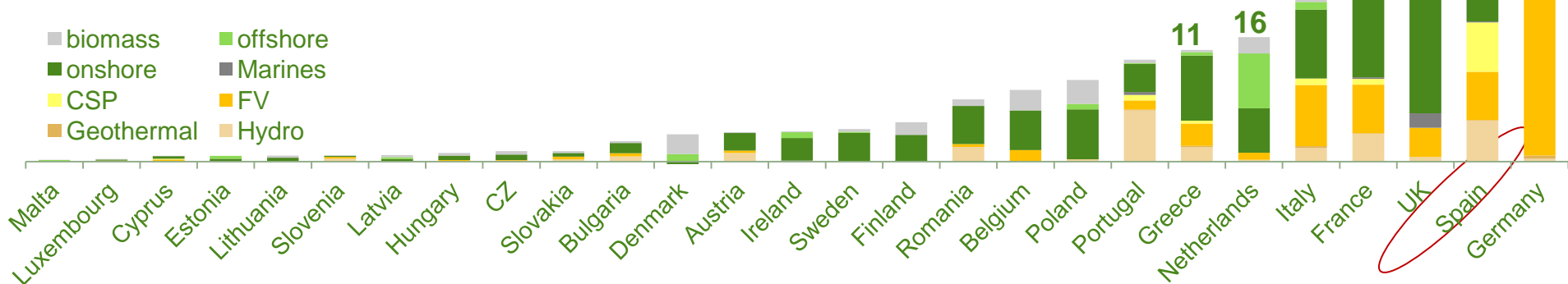
Today 1/3 of the UE generating power capacity is renewable

National Renewable Action Plans 2020 sent by MS in July 2010

~ 34% renewable electricity by 2020

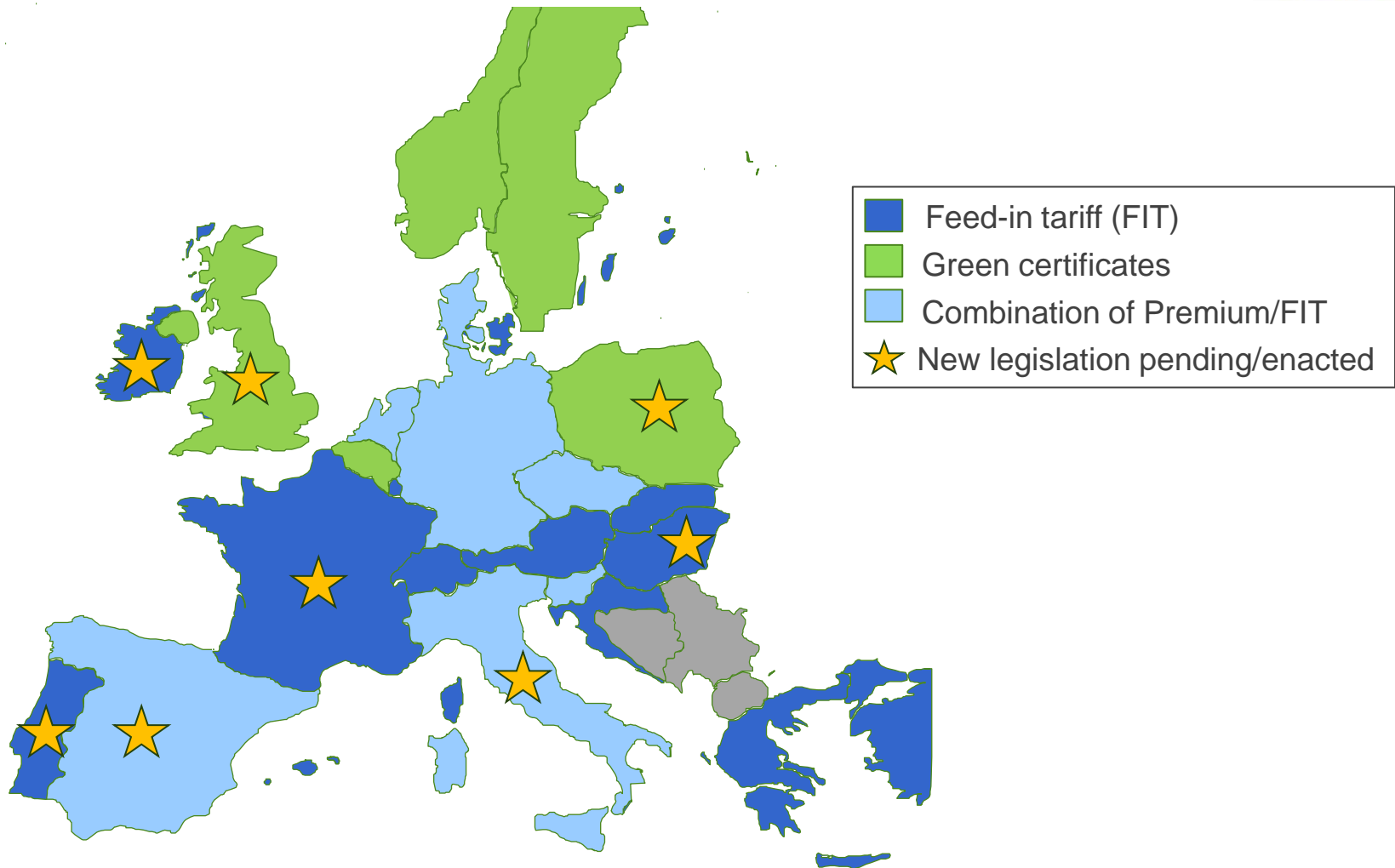
	RES cumulative capacity 2020	Additions 2013-2020
On-shore wind	172 GW	+71 GW
Off-shore wind	41 GW	+36 GW
Solar PV	84 GW	+15 GW
CSP	7 GW	+5 GW

Additional RES capacity (GW) in each Member State 2010-2020 cfr. NREAPs



Source: MS NREAPs

Support mechanisms for RES differ among MS



No single formula to efficiently support renewables, as long as the design is appropriate.

I. EU energy policy: commitment to RES

II. Successes and failures of RES development

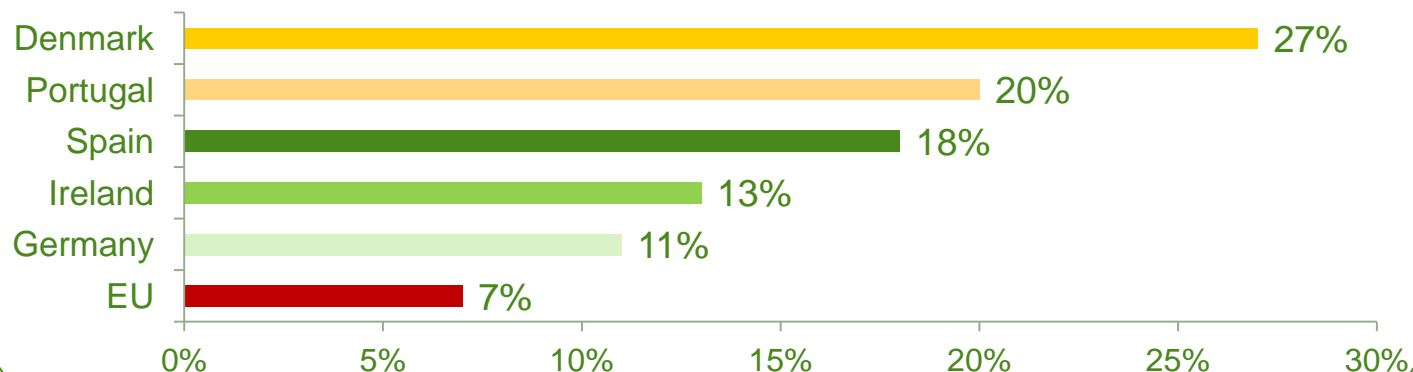
III. The challenge of competitiveness

Massive deployment of renewables in the EU

More than 175 b\$ invested in RES in Europe in the last 5 years

- 315 renewable GW in the EU in 2012 (109 GW of wind, 69 GW of solar PV)
- Since 2000, 28% of new capacity installed has been wind power, 51% renewables (compared to 40% of CCGT)
- High added value for the local economy.
- European companies are leading the growth in the most significant markets
- High penetration levels of renewable energy in many MS

Wind power share of electricity consumption



1st wind market

1st solar market

*Source BNEF. Data for 2007-2011 period
Source: EWEA

Strong support to expensive technologies: PV bubble due to regulatory failures

Unsustainable growth of solar PV, at very expensive prices...



	PV GW 2012	Economic support* 2012 (M€)	Economic support Average 2012 (€/MWh)
Spain	4.5 GW ⁽¹⁾	2,600 M€	~ 320 €/MWh
Germany	32 GW	8,000 M€	~ 300 €/MWh
Italy	16.6 GW ⁽¹⁾	6,500 M€	~ 215 €/MWh

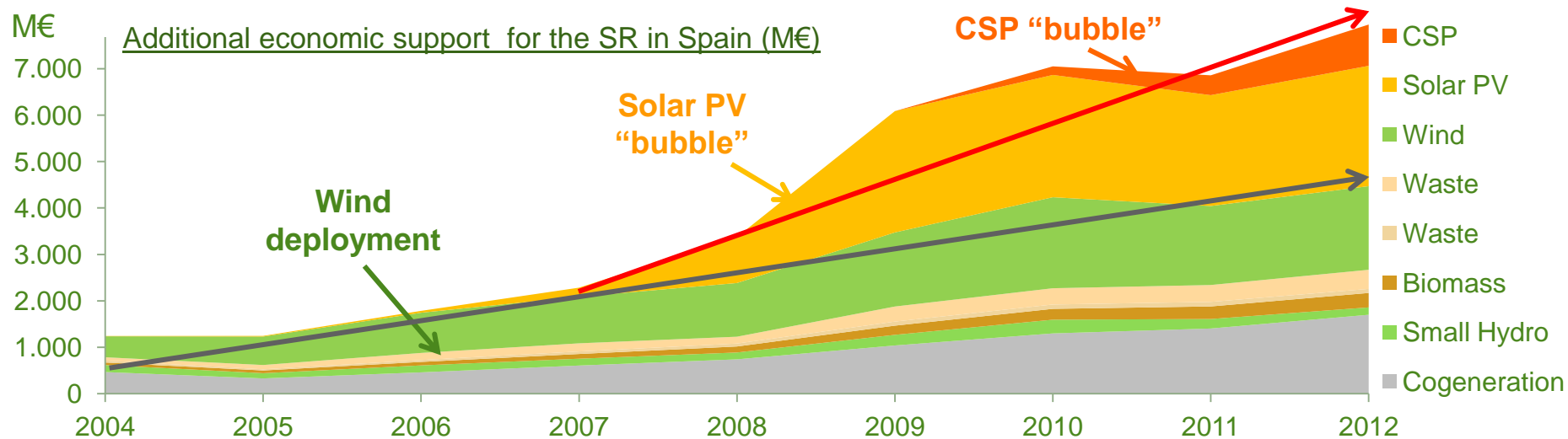
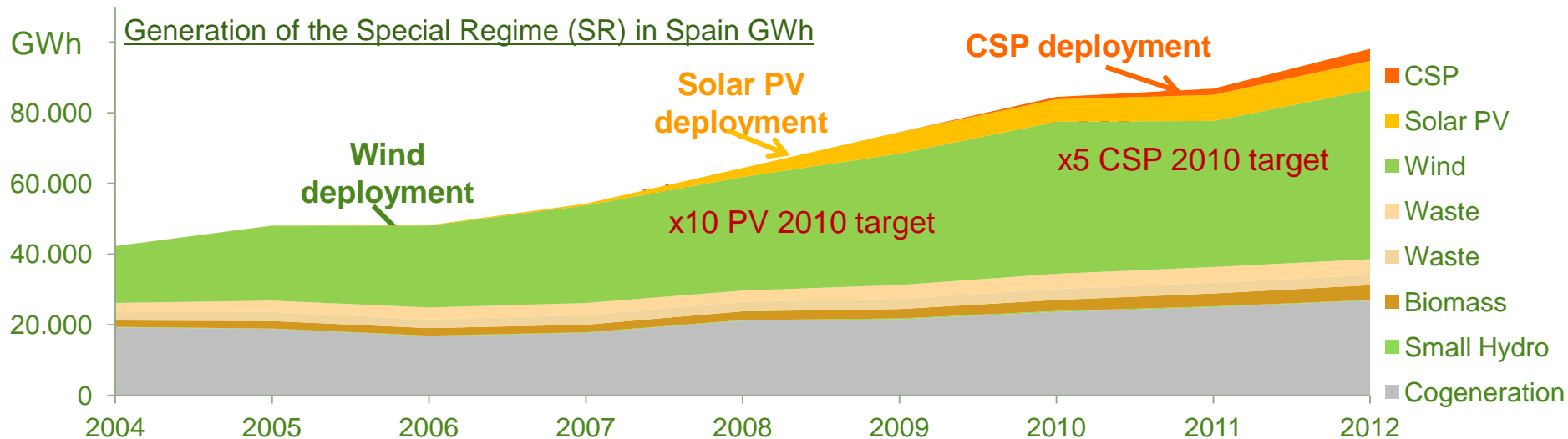
...is putting under stress supporting mechanisms for RES all over Europe, and affecting economics of the power system

*Income above the market price

(1) Spain: PV Target 2010 0.4GW; Italy: PV Target 2020 8GW

Source: CNE, GSE, BMU

Steady growth of RES in Spain ...with unsustainable growth of premiums due to solar “bubbles”



In 2012, Solar technologies received 3.500M€ (4% of electricity demand) vs. 2.000 M€ received by Wind (18%)

The effect of the economic crisis

In a context of economic difficulties...

- Need to alleviate budget deficits
- Weak electricity demand leading to low electricity prices
- Reductions in bank lending and increased financing costs for projects



...pressure is building up to reduce costs

✓ **Governments are reconsidering their priorities**

✓ **Some countries have announced or already carried out reviews of their renewable support**



...leading to regulatory instability

High pressure to limit support for renewables

Reviews of RES support schemes have been carried out in many markets



- Spain:** Regulatory moratorium. Elimination of market+premium option and 7% tax to all power generation.
- Italy:** Switch to tender scheme starting on 2013 and adjustments to solar PV incentives. Unexpected introduction of balancing costs.
- Greece:** Introduction of new tax on incomes
- Bulgaria:** Introduction of grid access fees for all installed capacity since 2010. FIT reductions
- Germany:** Government proposed measures that would reduce incomes both for existing and future installations
- Poland:** Government proposed measures that would reduce income of existing installations

...challenging renewables growth / whole system stability

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A turning point..



Early technology
deployment of RES

Government support
driving RES investments

Constant evolution of
technology

RES technologies maturing
fast. Wind most mature
renewable technology

RES generation costs going
down

High penetration levels in
many markets

Massive RES deployment

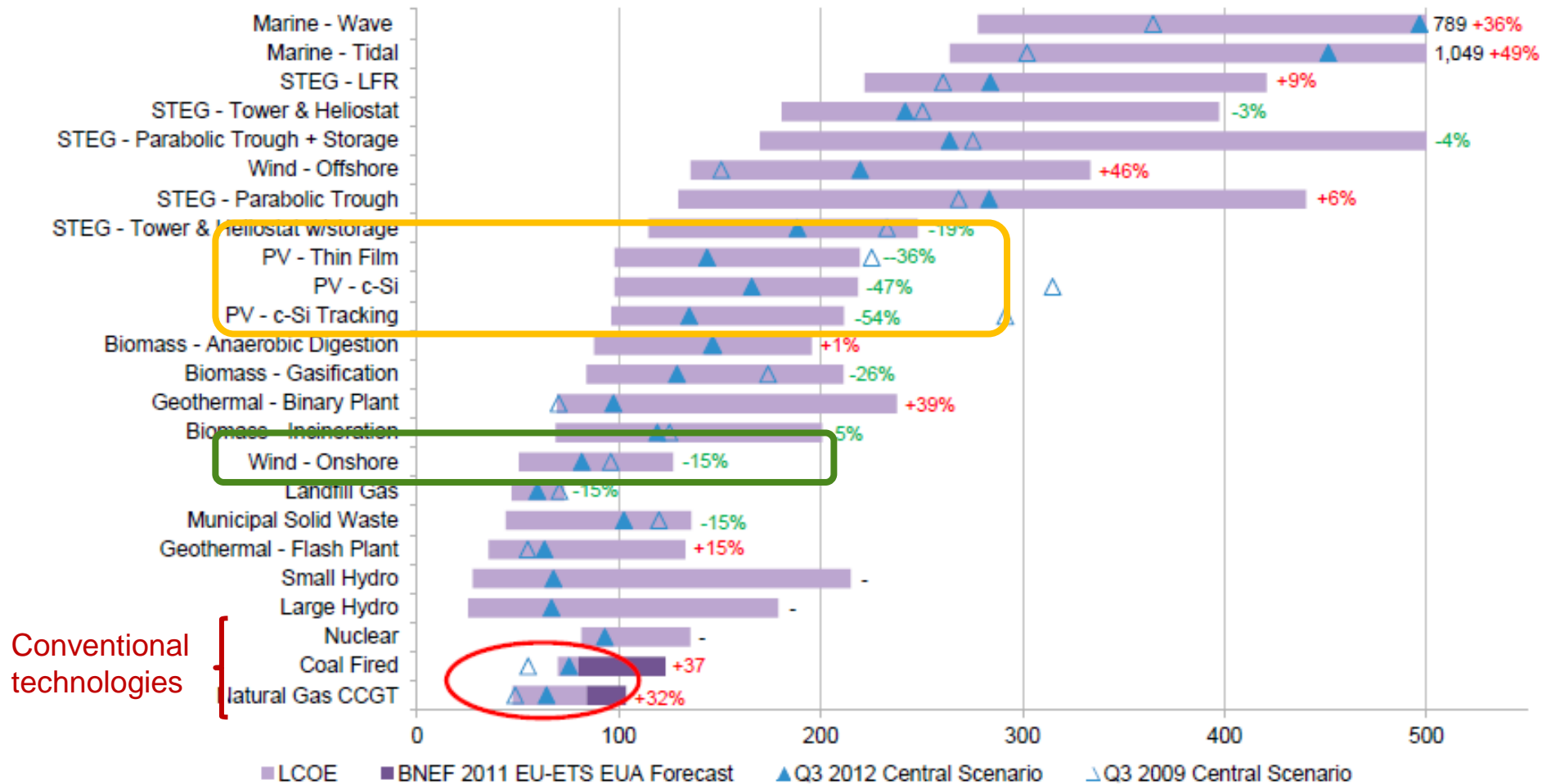
Economic crisis . Pressure to
limit support for RES.

High costs from solar bubble

**Will support
mechanisms
still be there
in the future?**

Economic sustainability → cost effectiveness

Levelised cost of electricity, Q3 2012 (\$/MWh)

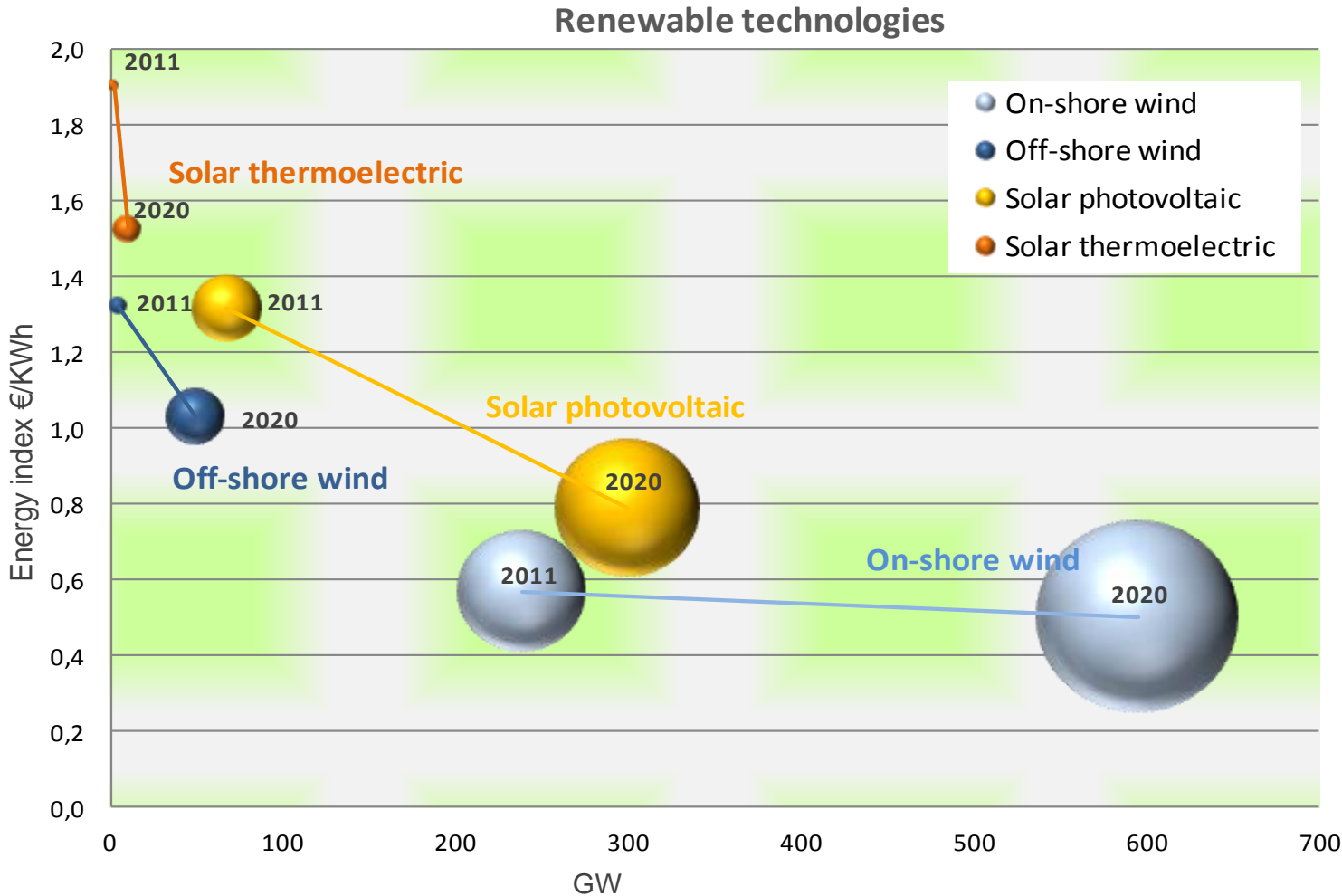


Conventional technologies

Wind is close to competitiveness

Future of RES: meeting the challenge of competitiveness

Diverse technology solutions...



- Different in terms of..
- Natural resource availability and growth potential
 - Efficiency and level of technological maturity
 - Cost-effectiveness
 - Integration into the grid and into the system

Future of RES

RES will play a key role the European Energy future

“Energy roadmap 2050”: Target on GHG emissions reduction

- 80-95% by 2050 (compared to 1990), which means 96-99% of electricity production is to be carbon free

No way to fulfill this goal without a massive deployment of RES

But... RES will need to move away from support mechanisms

- We can no longer think of support mechanisms for RES, the way we are used to
- Cost competitiveness with conventional generation → maturing and cheap technologies
- Adequate CO2 targets and prices will be crucial



RES will compete...

- ✓ In this market? In another market?
- ✓ Will current market design need to be changed taking into account large shares of renewables?

Thank you for your attention



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