



# Smart Grids: from innovation to deployment

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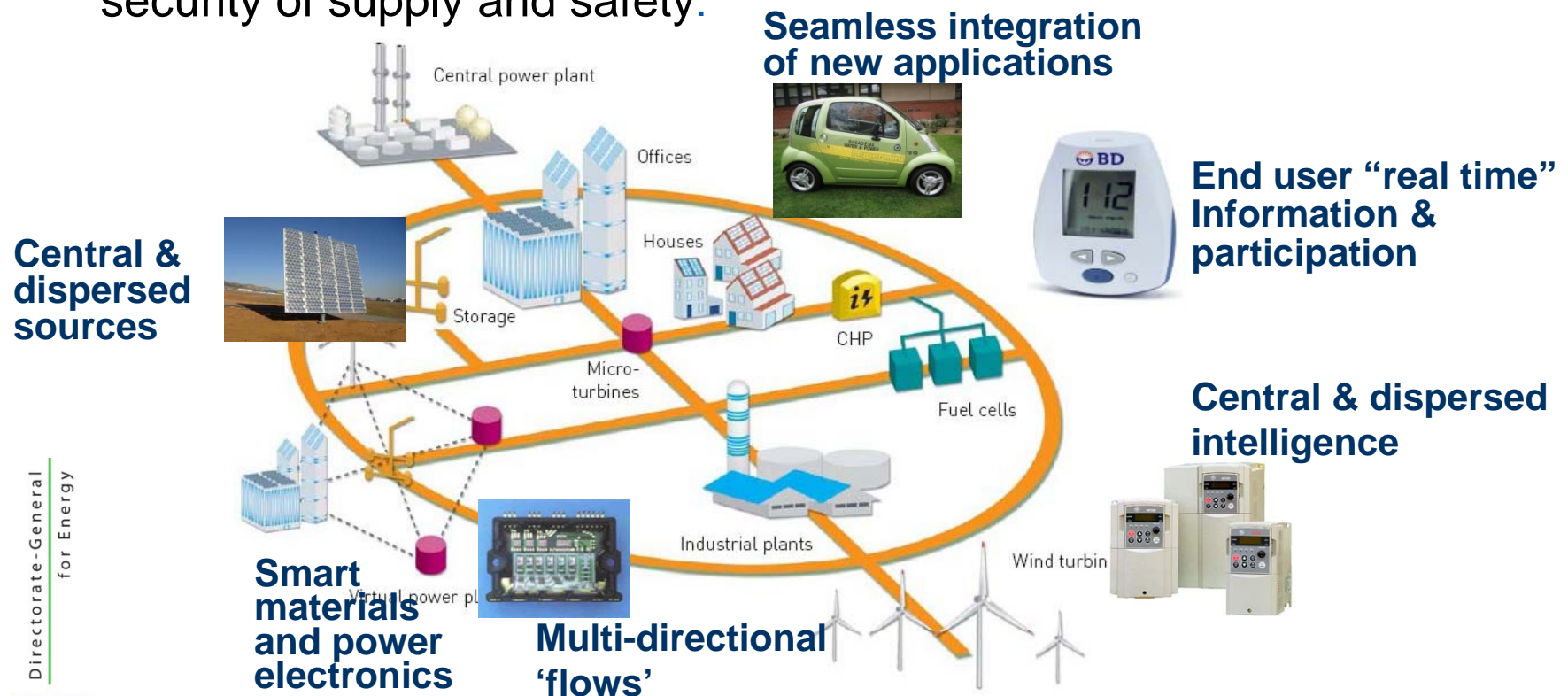
**[http://ec.europa.eu/energy/gas\\_electricity/smartgrids/smartgrids\\_en.htm](http://ec.europa.eu/energy/gas_electricity/smartgrids/smartgrids_en.htm)**

Directorate-General  
for Energy



# Smart Grids

A Smart Grid is an electricity network that can cost efficiently integrate the behaviour and actions of **all users** connected to it - generators, consumers and those that do both – in order to ensure efficient, sustainable power system with low losses and high levels of quality and security of supply and safety.



# Policy drivers

- **Sustainability: 20-20-20 targets**

- Integration of renewables into the grid
- Increase grid and consumption efficiency

- **Energy security of supply**

- Increase grid robustness and resilience
- Integration of large centralised and small distributed generation

- **Competitiveness: market development**

- Empowerment of consumers and those who produce
- Better management of supply (generation, load) and demand
- New market opportunities for consumer services

**These drivers call for the restructuring of the grids, e.g. the structure of generation, market and the use of electricity**

# ● Legal framework

- **Energy Efficiency Directive (2006/32/EC, Annex3)** has identified smart meters as one of the main measures, contributing to the overall energy efficiency improvement.

- **Renewables Directive (2009/28/EC, Art16)** views Smart Grids as an enabler for integration of increasing renewable energy into the grid and obliges the Member States to develop transmission and grid infrastructure towards this aim.

- **3rd package for the internal energy market (Directive 2009/72/EC and Directive 2009/73/EC)**

# ● EU activities for development and deployment of Smart Grids

## ➤ Technology push

- RTD&D projects since 2003, about €400 Million EU support
- European Technology Platform, launched in 2006
- Strategic Energy Technology Plan – European Electricity Grids Initiative, launched in June 2010, and smart cities in June 2011

## ➤ Market push

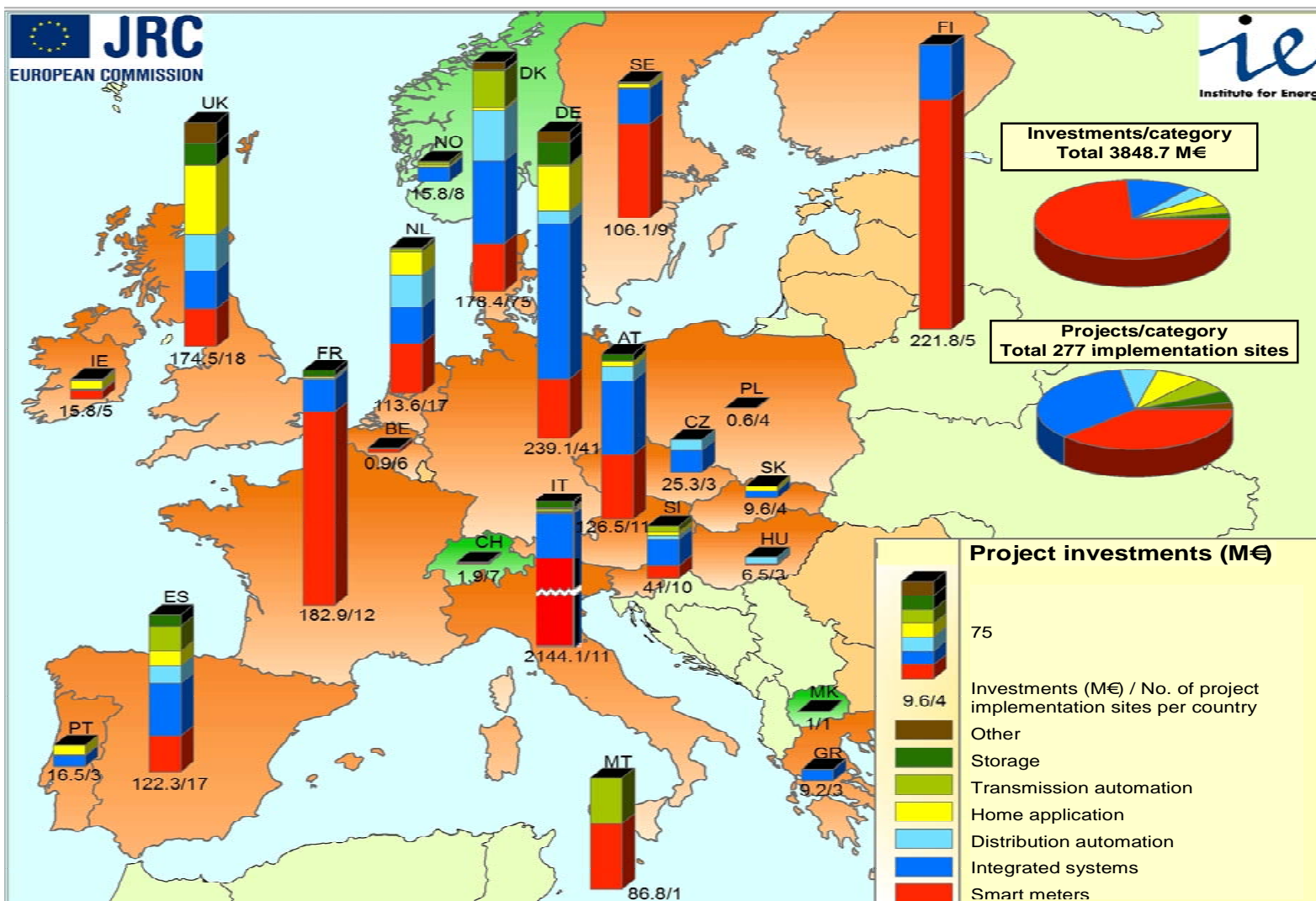
- Market regulation: 3rd energy package, adopted in August 2009
- Task Force for Smart Grids, November 2009 – June 2011
- European Infrastructure Package, November 2010 and October 2011
- Communication on Smart Grids, COM(2011)202 - 12 April 2011
- Energy Efficiency Action Plan and revision of ESD in June 2011

## ➤ International cooperation

- EU-US Energy Council
- International Grid Action Network (ISGAN), under the Clean Energy Ministerial Conference.

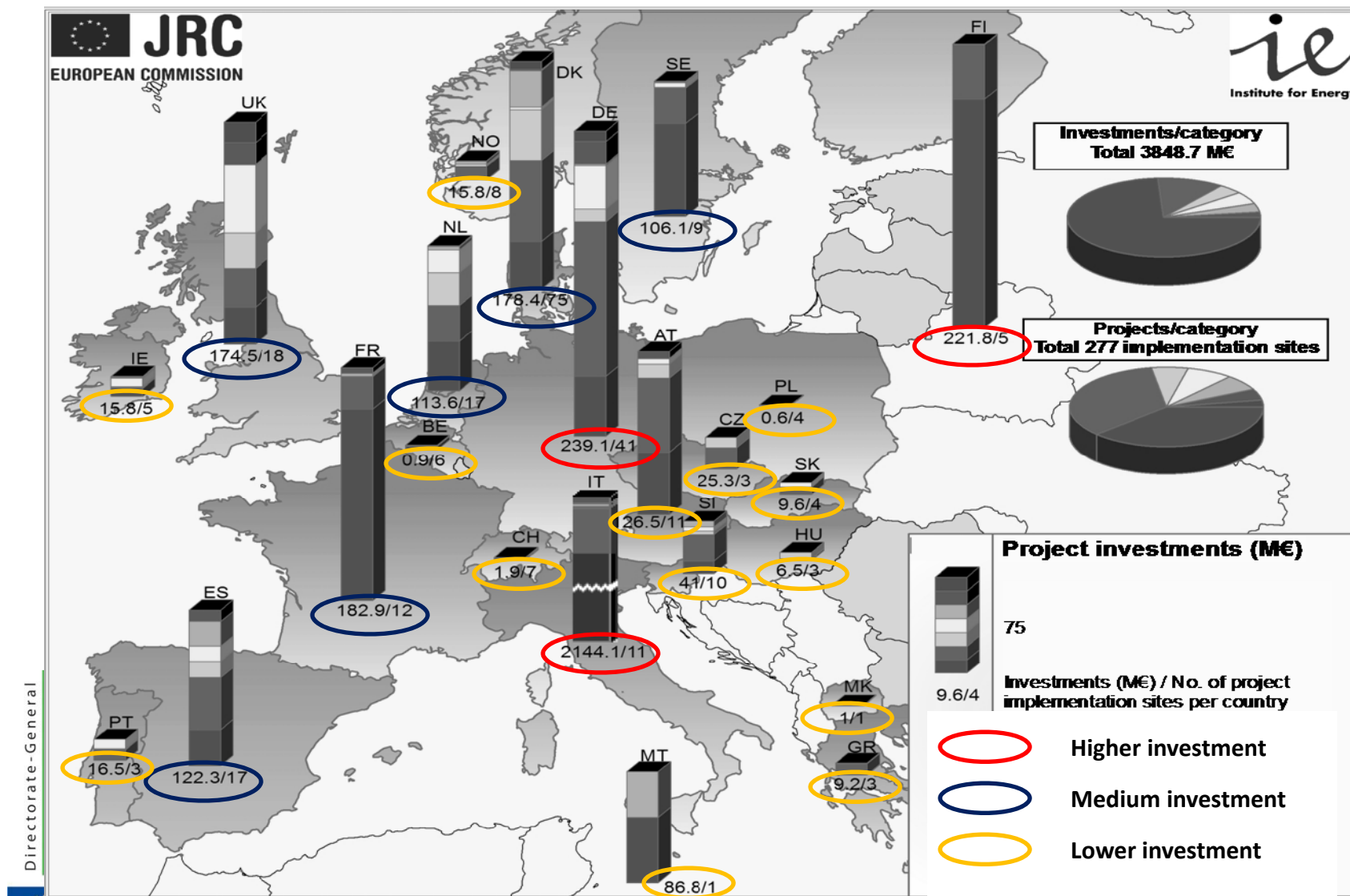


# Smart grid investment in Europe



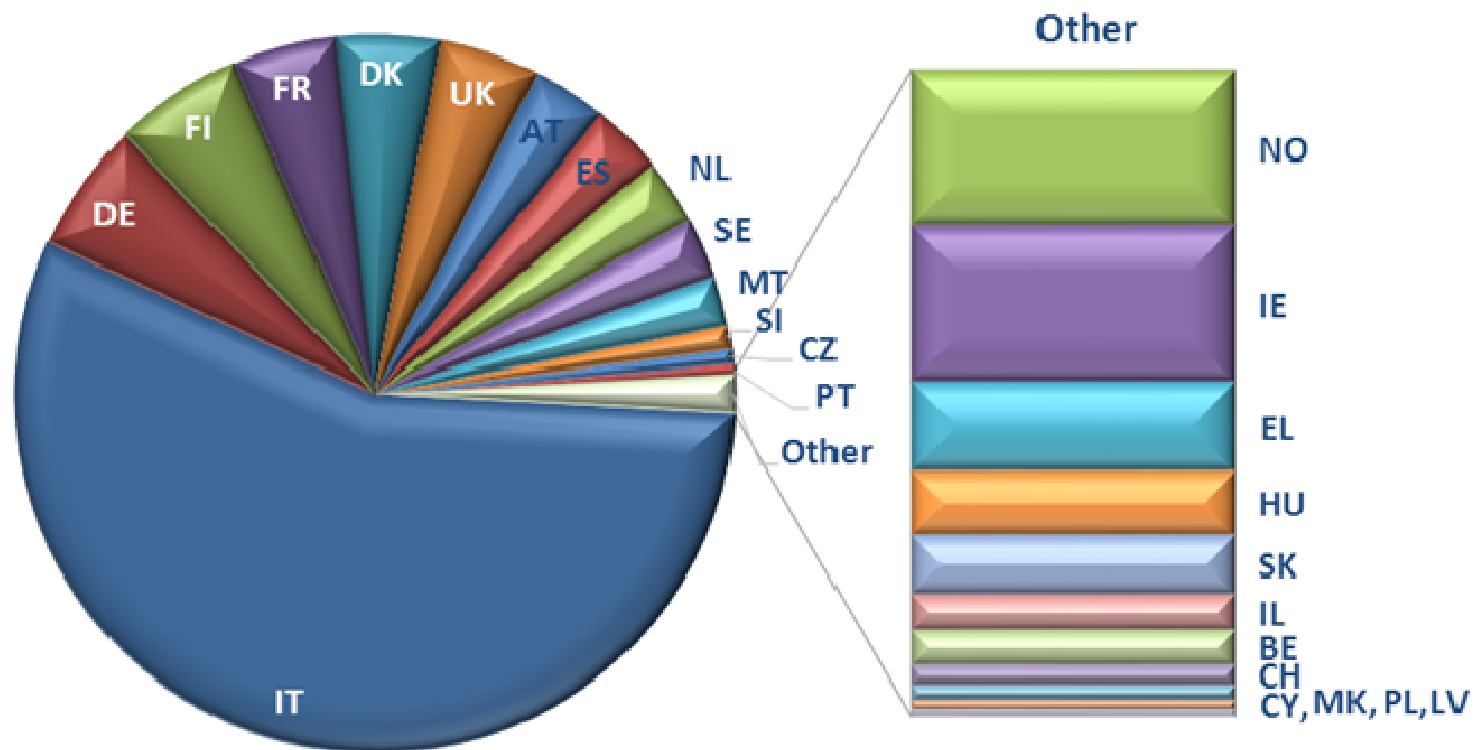
Projects represented can span over more than one country and can include more than one category. Three projects are not represented in this Picture: Kriegers Flak project, a Super Grid between Germany and Denmark, total investment of 507 M€; Smart Meter Roll-out and AMI in UK, estimated investment of 11897 M€; and Smart Meter Roll-out in Sweden, spanning in approx. 150 projects and amounting a total investment of approx. 1500 M€.

# Smart grid investment in Europe



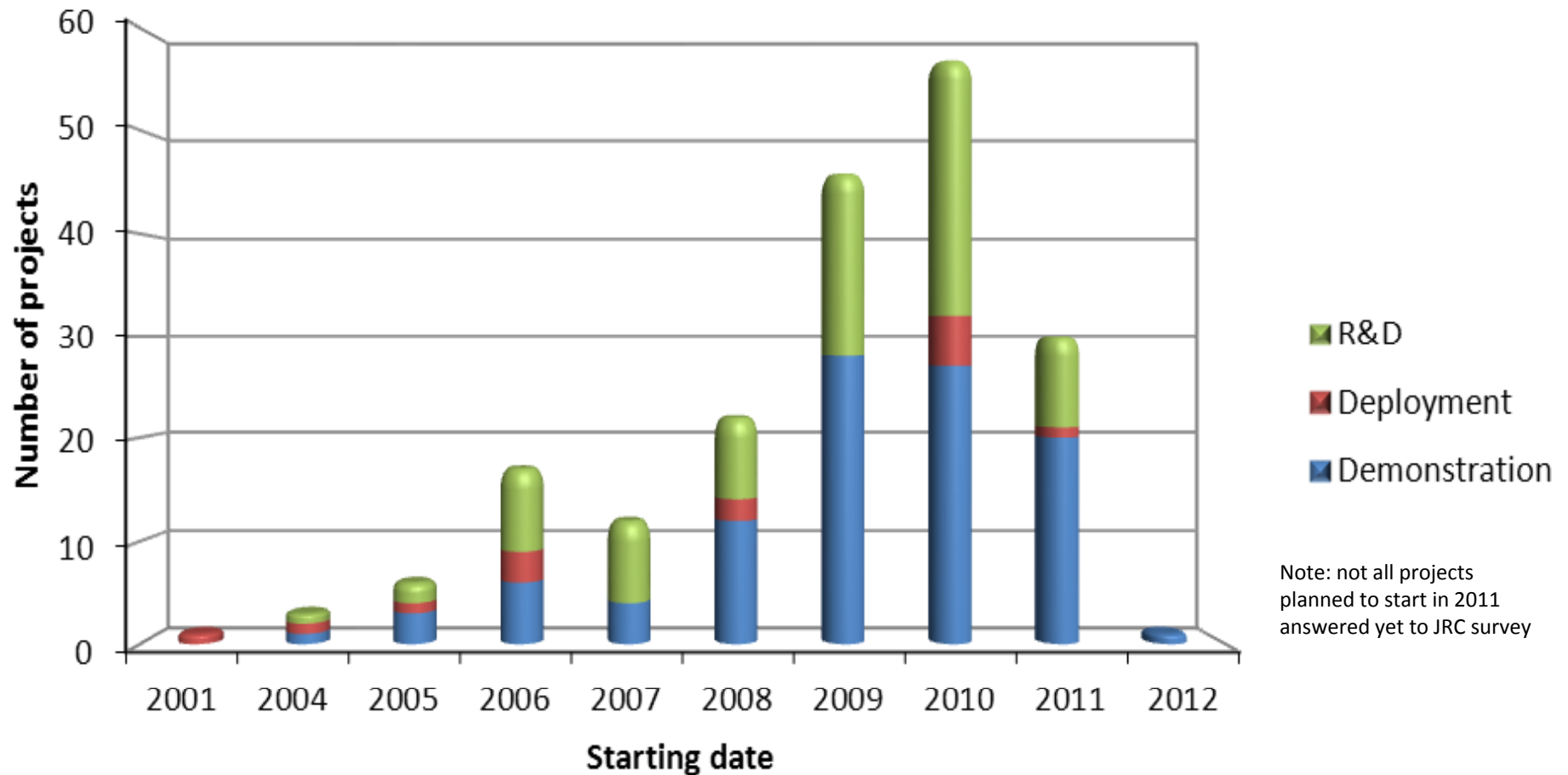
# ● Smart grid investment across MS

Bulk of investment in a few countries





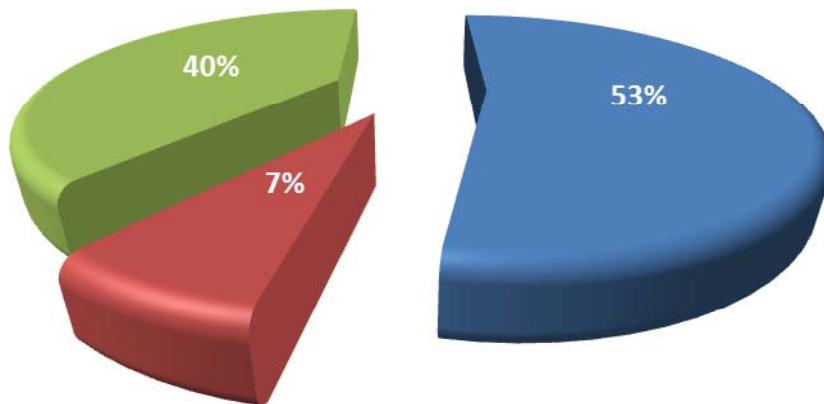
# Investment vs. development stage



Waiting for answers from new projects after February 2011

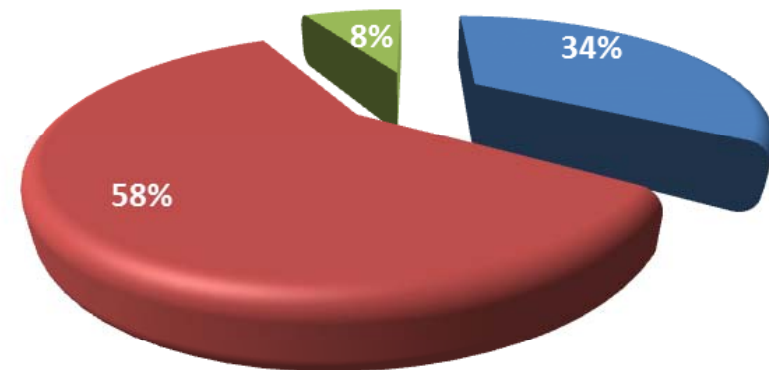
**The data collection and analysis continue – contact us!**

# ● Share of R&D, demo and deployment



■ Demonstration ■ Deployment ■ R&D

**Number of projects**



■ Demonstration ■ Deployment ■ R&D

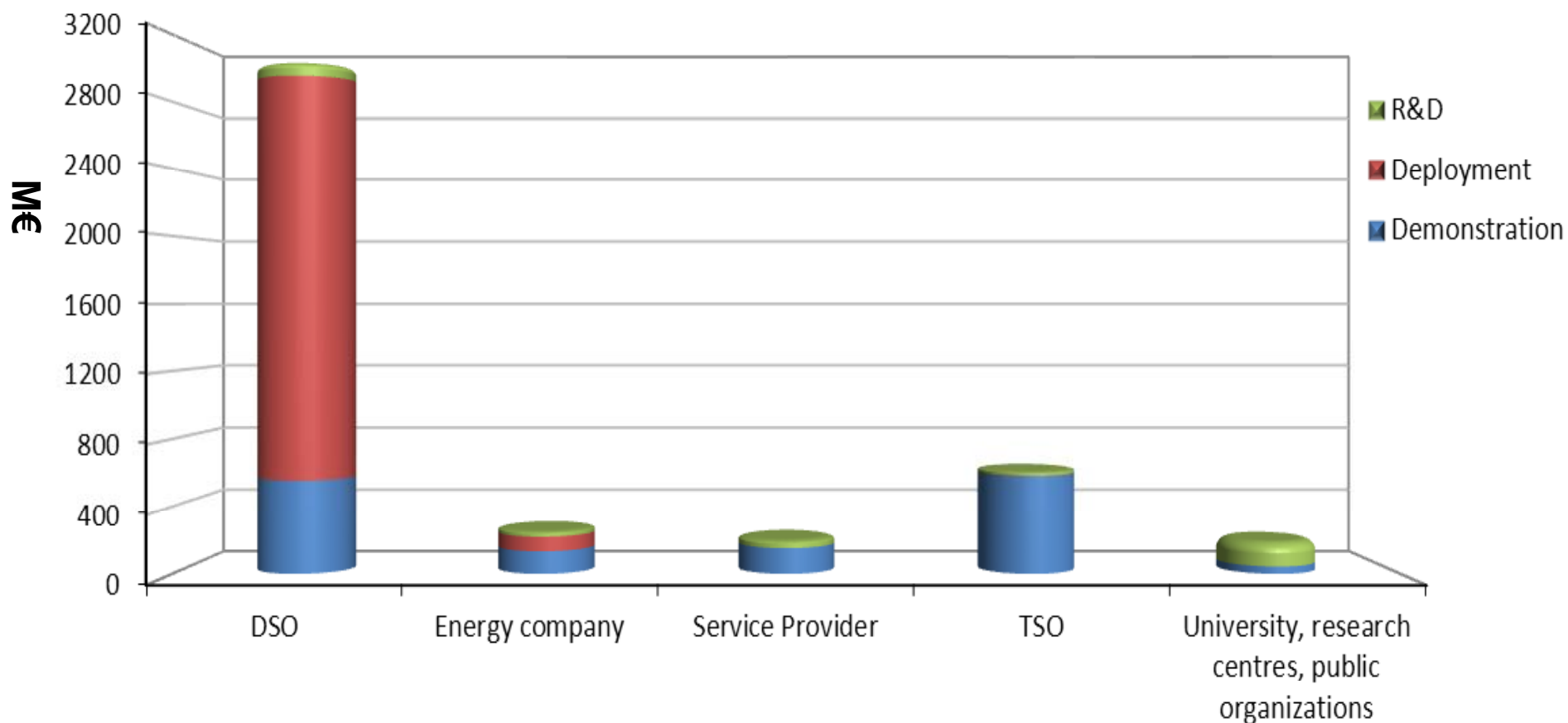
**Budget (M€)**

Deployment projects: greatest part of investment, main focus: **Smart Meters** roll-out

R&D and Demo projects: mostly small-medium scale (< 10M €), wider portfolio of technologies and applications

# Budget vs. actors and development

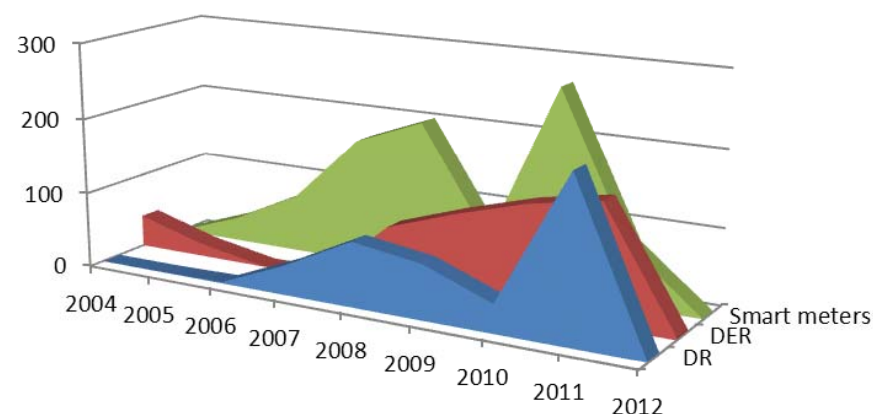
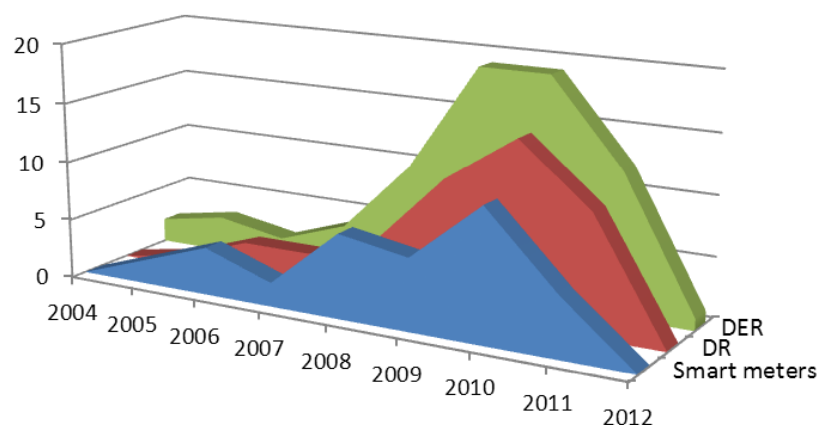
Distribution system operators execute the main investment



# ● Number of projects starting each year in key Smart Grid areas

Integration of **Distributed Energy Resources (DER)** steadily growing

**Demand Response (DR)** projects, testing dynamic pricing and consumer participation, are growing in numbers (**smart meters** as key enabler)



Directorate

Number of projects per year

Budget allocated per year



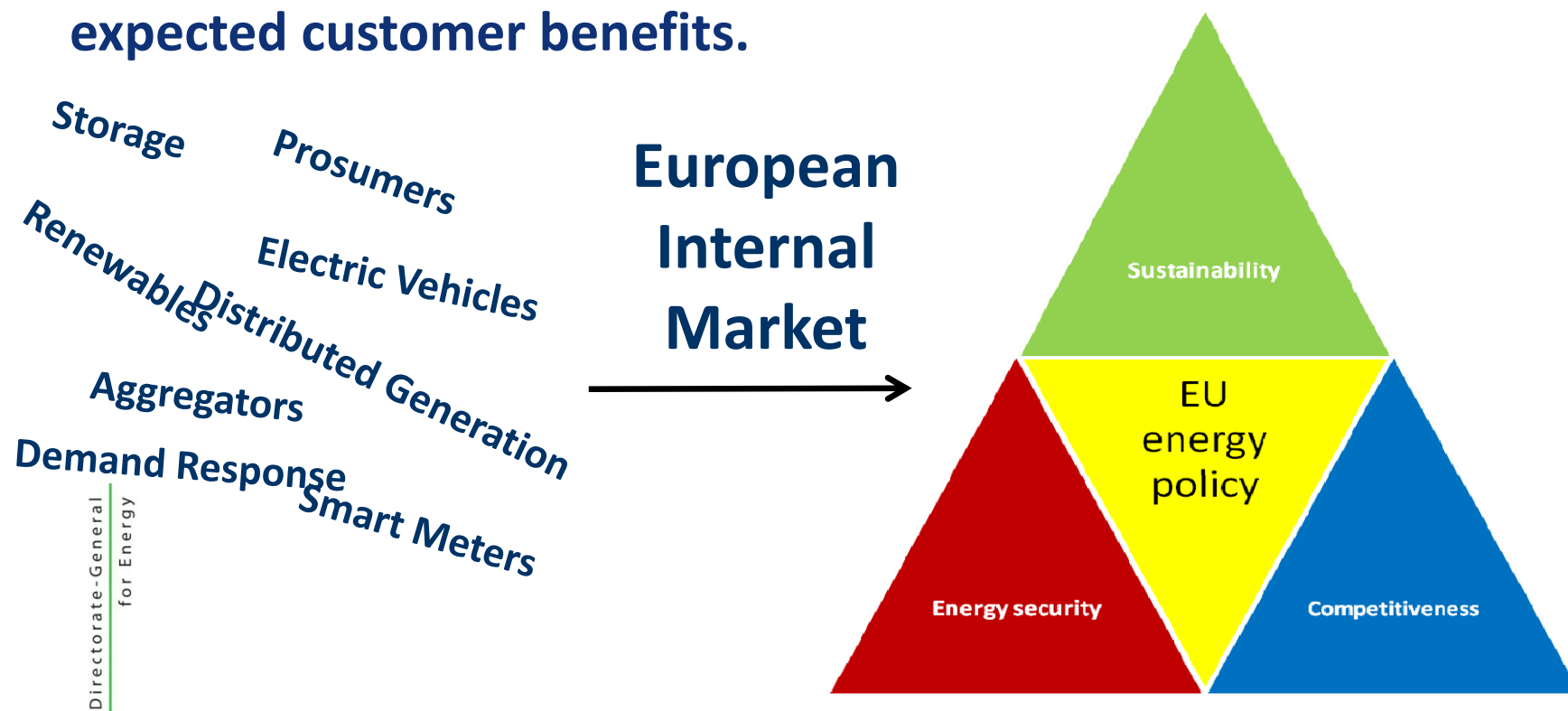
Dr. Manuel Sánchez Jiménez. European Commission. DG ENER

Note: not all projects planned to start in 2011 answered yet to JRC survey

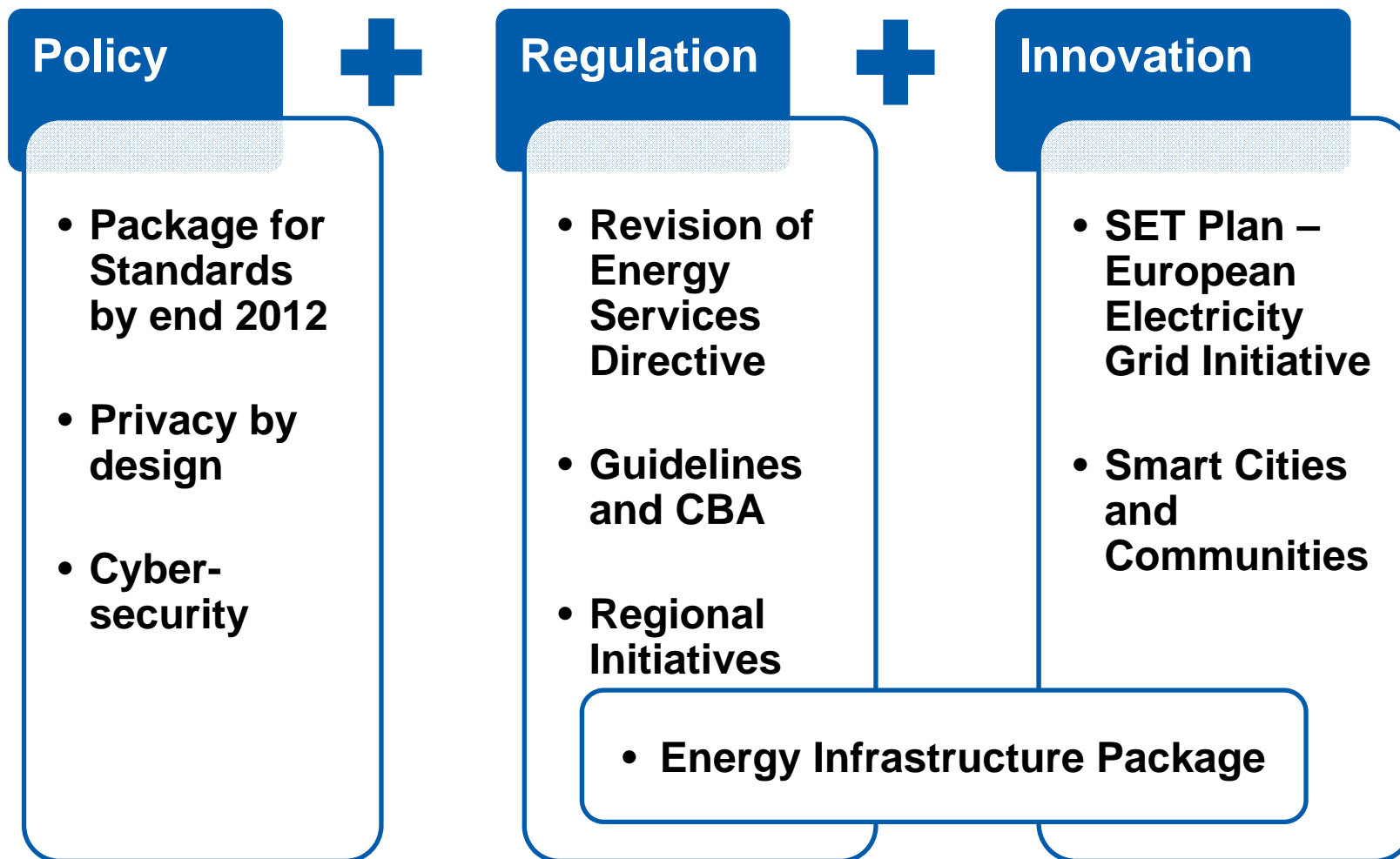
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# ● COM (2011)202 – the way forward

- Rising political attention on Smart Grids as a means to achieve EU energy policy objectives.
- Need to unlock market investment potential and provide expected customer benefits.



# COM (2011)202 – the way forward







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