

A view on Smart Grid projects in Europe: lessons learned and current developments

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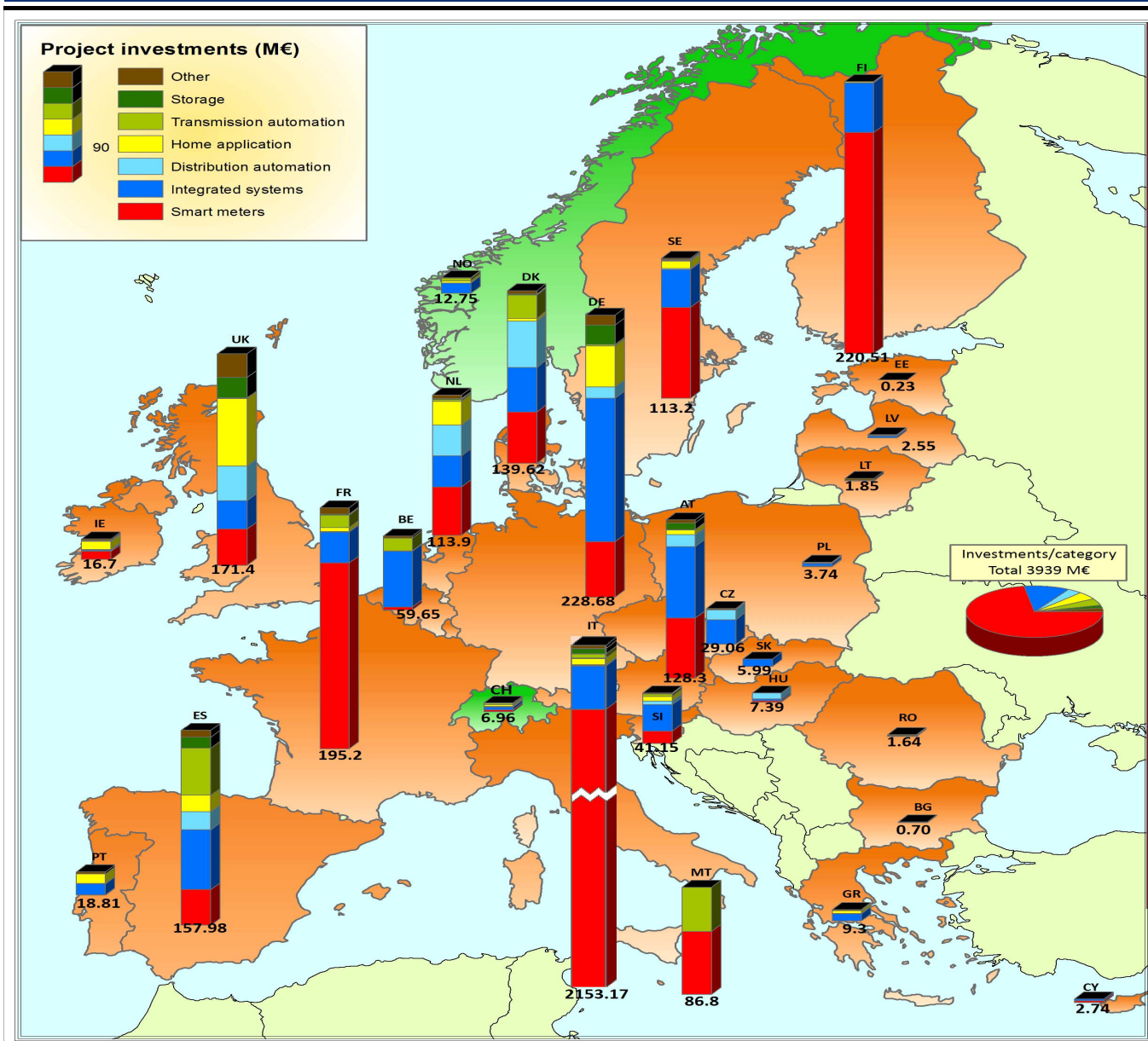
- The catalogue includes projects focusing on grid integration of new energy technologies and resources (e.g. new storage devices, Electric vehicles).
- Includes projects aiming at making the grid smarter (through new technologies and new ICT capabilities).
- does not include projects aiming at making the grid stronger (e.g. through new lines, substations and power plants).

- More than 300 projects were received. Around 80 projects were screened out as they didn't comply with the screening rules or they lacked data.
- The final catalogue includes **220** projects from 26 EU Countries, Switzerland and Norway.

Distribution of project investments across Countries and project categories

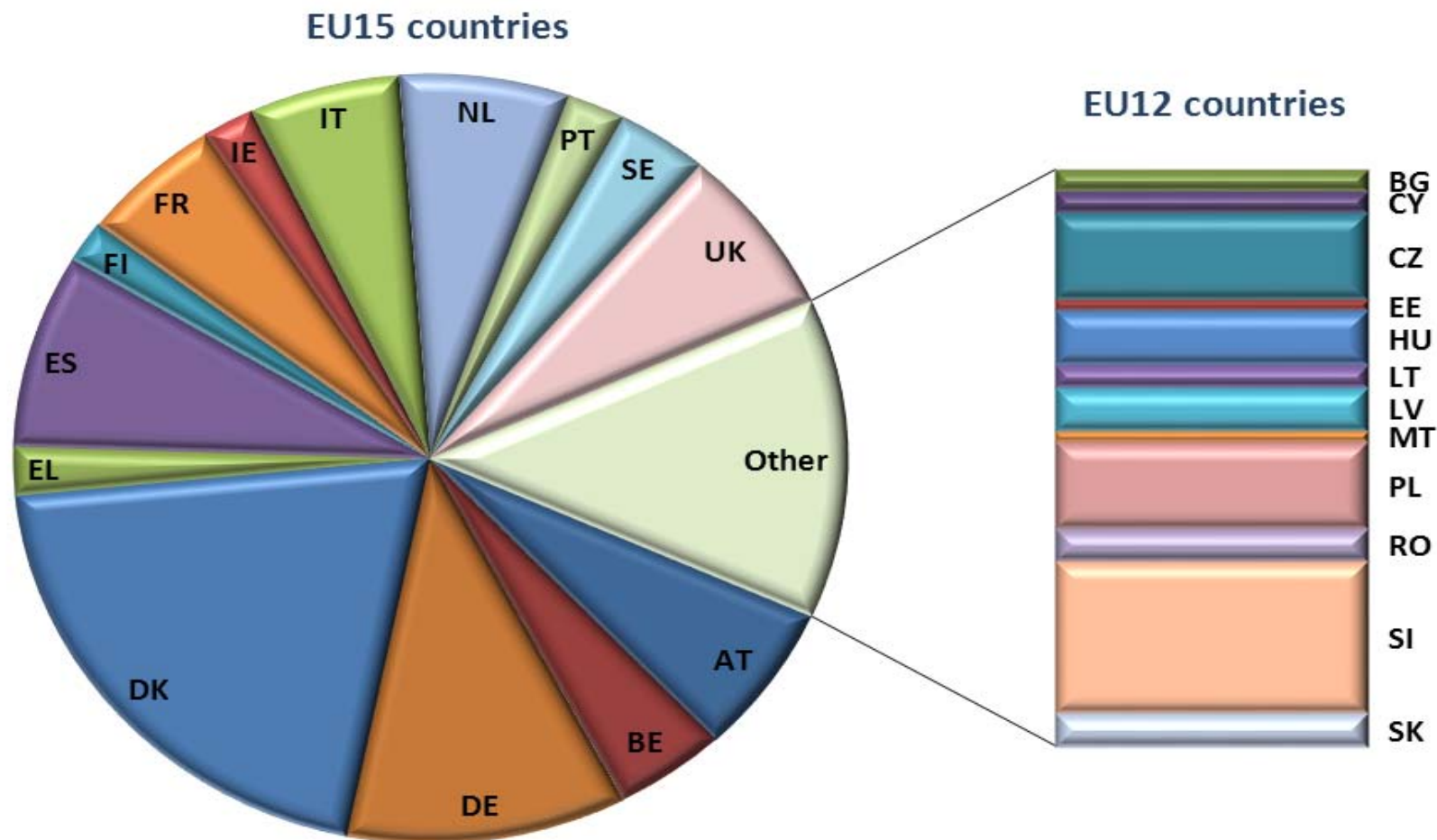
Brussels 15th June 2011 – EC Smart Grid Task Force

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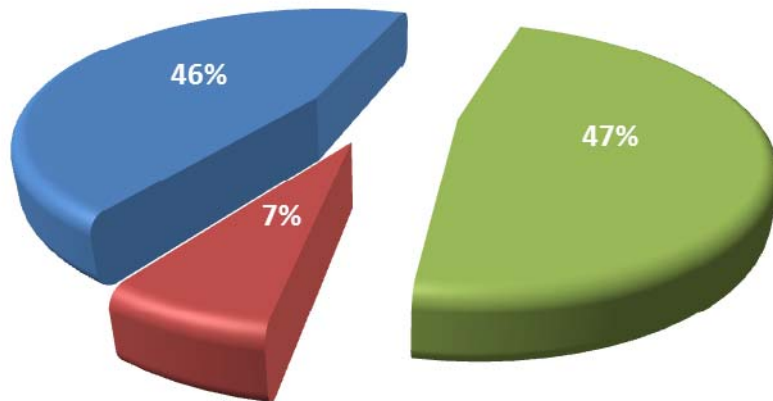


- ✓ Over 5 billions of investments, but still at the beginning of the Smart Grid transition
- ✓ Uneven distribution of projects across Europe. Most of investments in EU-15 Countries

Projects can span over more than country and can include more than one category. The picture does not include the Smart Meter Roll-out in Sweden, spanning approx. 150 projects and amounting to approx. 1500 M€, as a detailed description of the projects was not received.

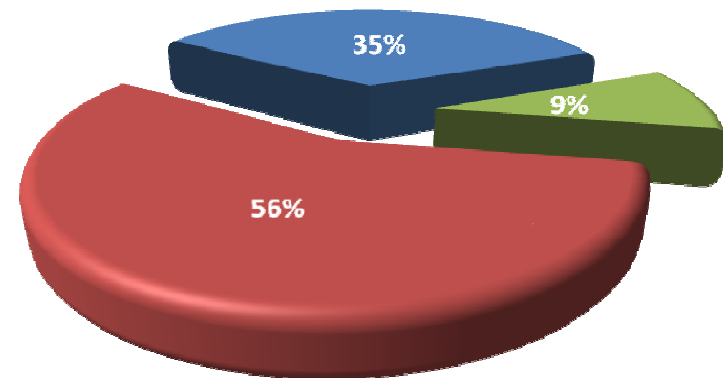


✓ Uneven distribution of projects across Europe. Most projects in EU-15 Countries



■ Deployment ■ Demonstration ■ R&D

Number of projects



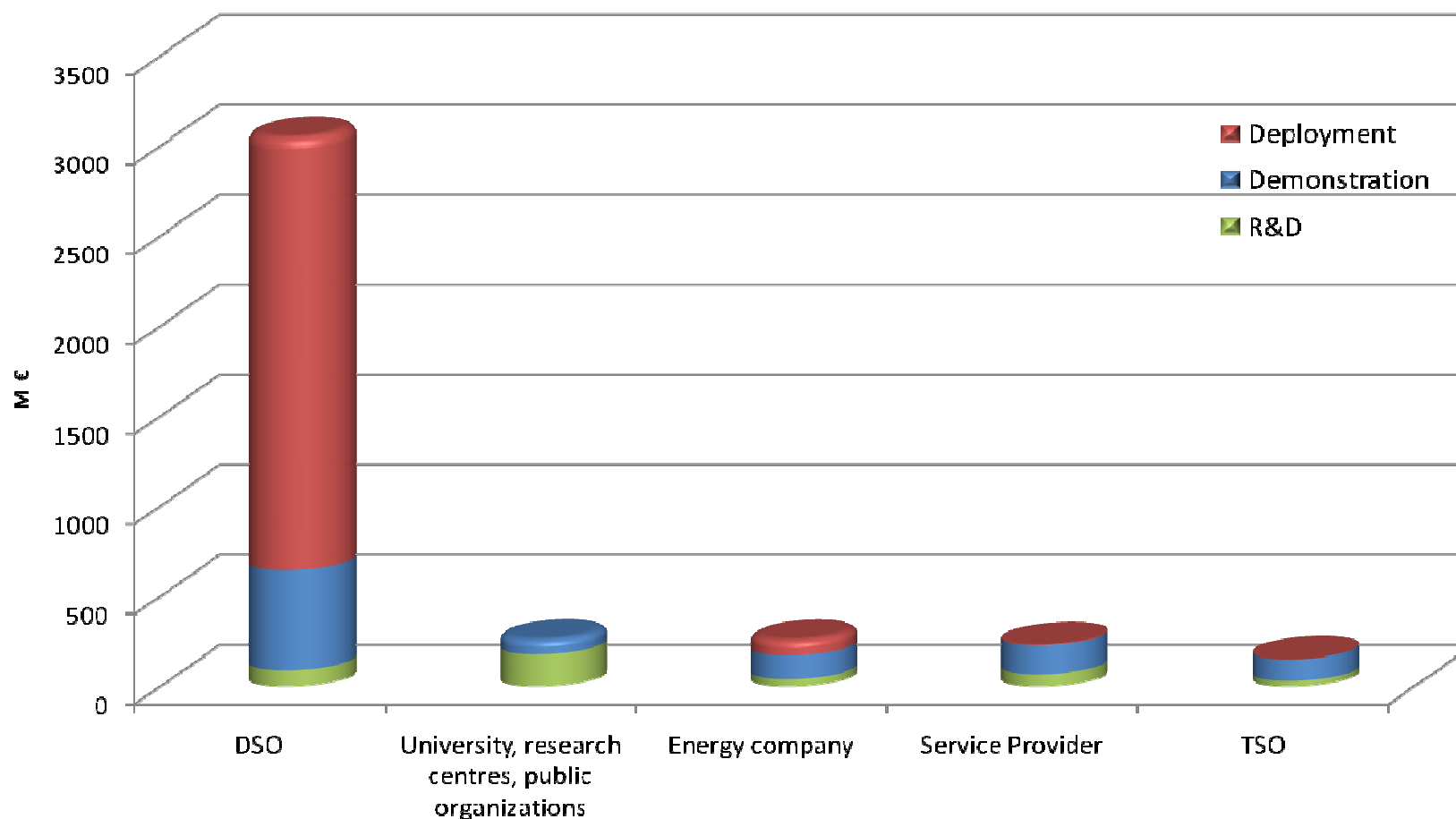
■ Deployment ■ Demonstration ■ R&D

Budget (M€)

Deployment projects: largest part of investment, main focus: **Smart Meters** roll-outs

R&D and Demonstration projects: mostly small-medium scale (4 and €12 million of average budget respectively), wider portfolio of technologies and applications

✓ Need to invest in large scale demonstration projects



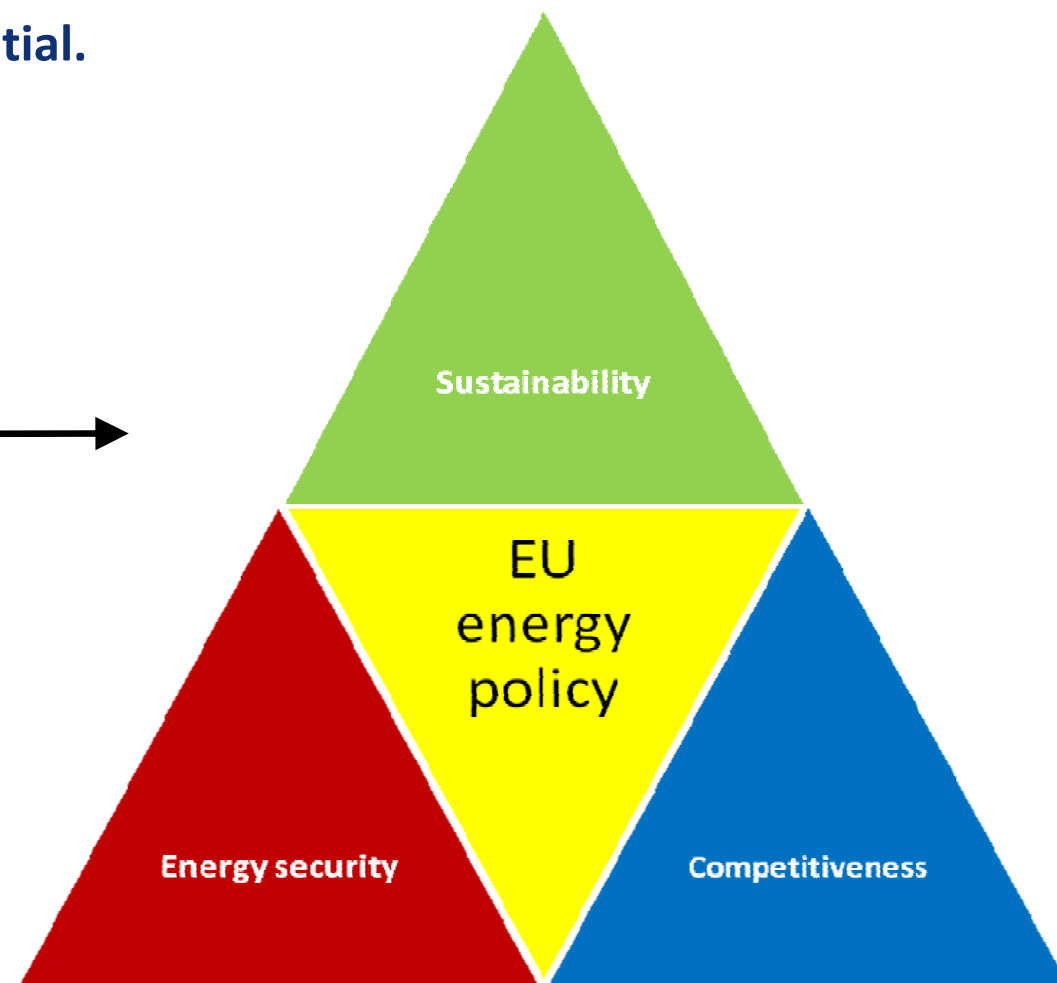
- ✓ Multidisciplinary consortia to share competencies and reduce risks.
- ✓ Leading role of DSOs.

Smart Grids as a means to contribute to EU energy policy objectives.

Need to unlock market investment potential.

Storage
Renewables
Aggregators
Demand Response
Smart Meters
Prosumers
Distributed Generation
EV

Market



Sustainability: by facilitating the reduction of CO₂ emissions, enabling the integration of large-scale renewables and increasing energy efficiency

Competitiveness: by increasing market participation through aggregation of distributed prosumers and through strengthening of inter-regional markets.

Security and quality of supply: by integrating technologies/mechanisms to balance flexible generation and by increasing the observability and controllability of the grid to reduce outage times

✓ Project results illustrate the potential of Smart Grids to contribute to EU energy policy goals through different means

- Importance of system integration illustrated through project examples.
 - Set-up of platforms for the transaction of services (e.g. demand response) is a central theme across collected projects. Systemic benefits for several players.
 - Network owners/operators are expected to sustain the majority of up-front investments. Need for fair sharing of short-term costs and long-term benefits.
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- ✓System integration is crucial to reap the full benefits of Smart Grids.
 - ✓Regulation should support the investment potential of network owners/operators and encourage them to move to a more service-based business model.

- Project results show that potential benefits for consumers are numerous.
 - The whole system needs to be in place to provide full Smart Grid benefits to consumers.
 - On the other hand consumer's participation and awareness are crucial to have the whole system in place.
 - Consumer segmentation - Targeted messages and applications, early adopters, protection of vulnerable consumers, data privacy and security
- ✓Trust, understanding and clear benefits to engage consumers**

- Set-up of open and secure ICT platforms to interconnect grid users is a central theme of several scanned projects.
 - Convergence towards proven standards and industry best practices used for IT systems.
 - Few projects focus specifically on data protection and security.
 - Responses to the data protection and security section of our survey have been poor.
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- ✓ Further coordinated efforts are needed to fully tap the European potential in addressing data protection and security.
 - ✓ Importance of knowledge sharing and cross-fertilization between ICT and energy sector
 - ✓ New projects focusing on data handling would be useful to assess how data handling principles from other industries (e.g. banking industry) can be applied to Smart Grids.

- Mapping activity and data gathering of Smart Grid projects proved challenging.
- Fragmentation in data collection, assessment and dissemination across Europe is a barrier to Smart Grid implementation

- ✓ Strengthening project data repository and sharing at national and European level
- ✓ Common framework for data collection, assessment and dissemination

- PROJECT INVENTORY

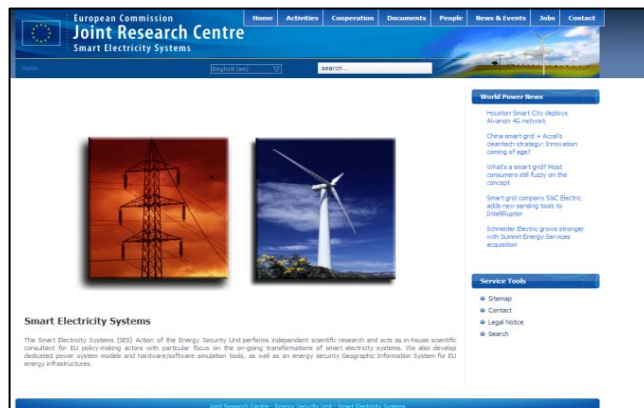
- Periodic review of the catalogue and of the report, with new projects and new available data
- Coordination with other initiatives on Smart Grids, in particular with the EEGI and ISGAN
- Mapping of “Strong Grid” projects (e.g. grid reinforcements, interconnections)

- PROJECT ASSESSMENT

- In the framework of the EU-US council, adaptation of EPRI cost-benefit methodology to a European case study
- Joint work with US-Department of Energy, common assessment framework for sharing project data, best practices and analysis

**Thank you for your
attention**

Smart Electricity Systems
<http://ses.jrc.ec.europa.eu/>

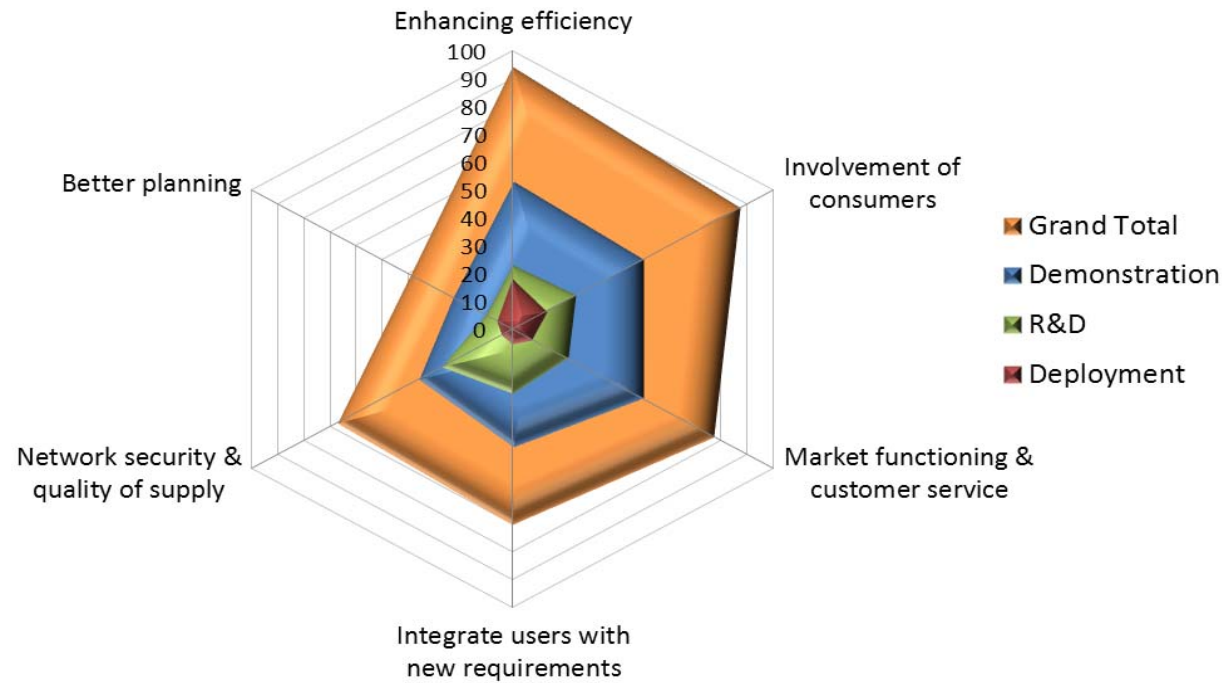


Institute for Energy
<http://ie.jrc.ec.europa.eu/>

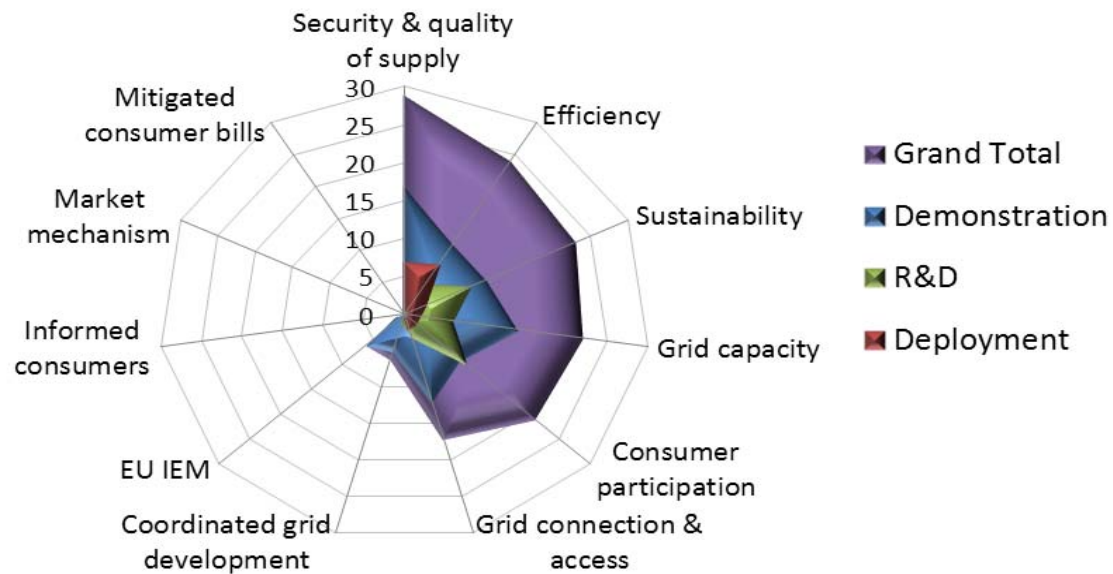


BACKUP

Activated services



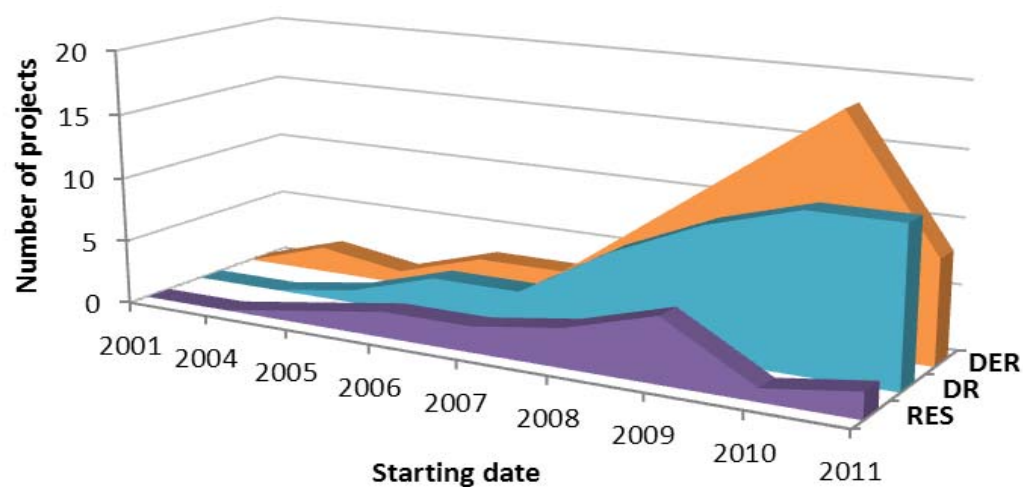
Activated benefits



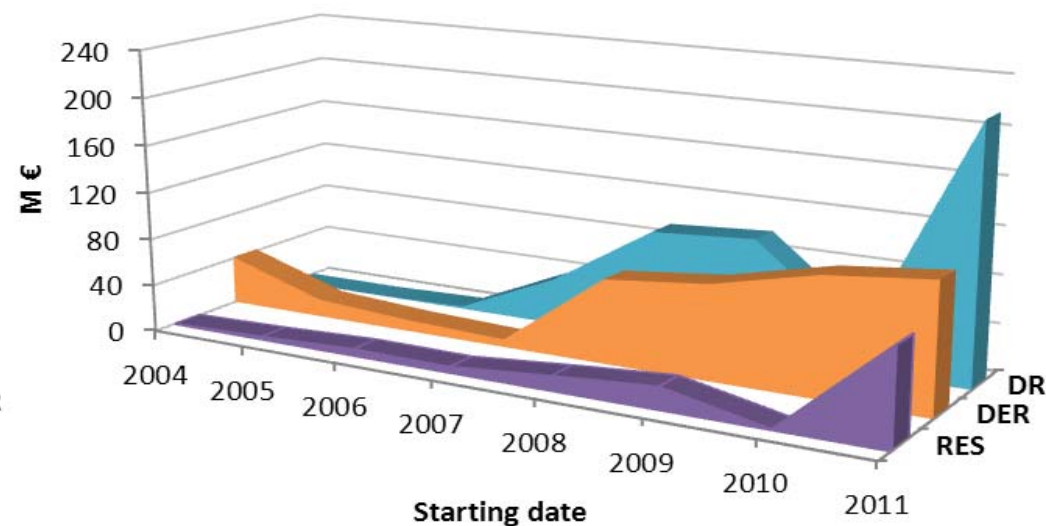
BACKUP

BACKUP

Projects contributing to aggregation of DER, demand response, integration of large scale RES

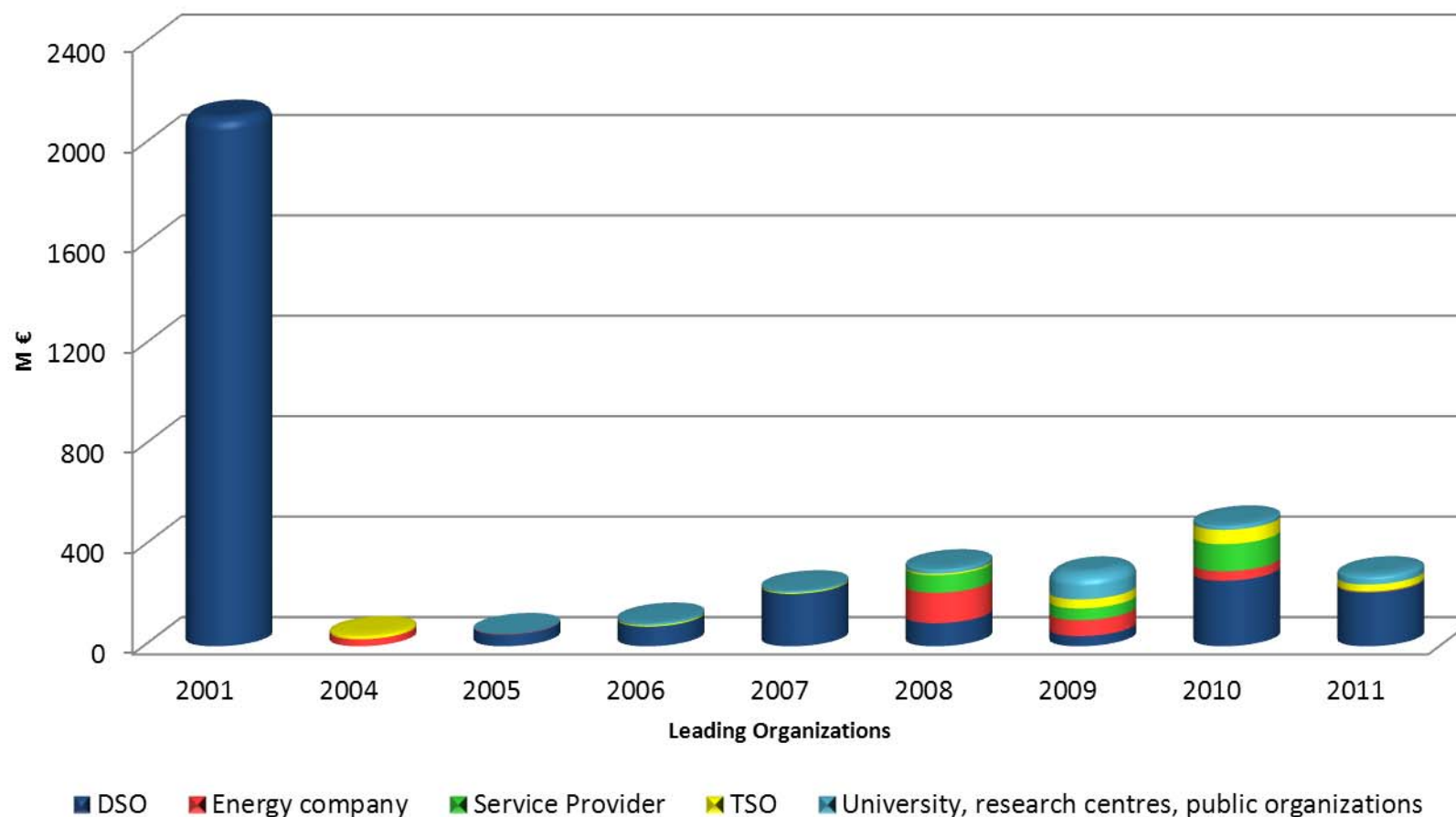


Number of projects



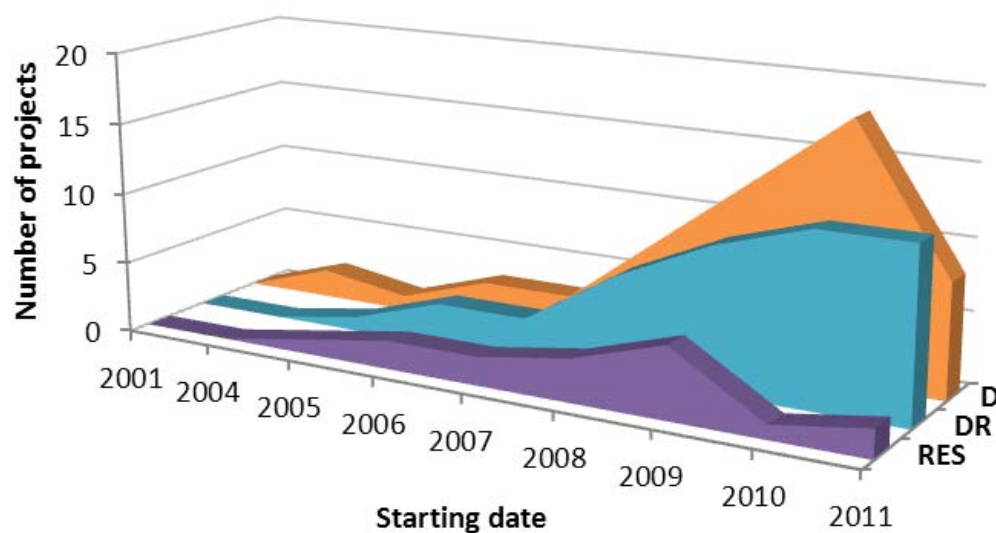
Project budgets

1. Significant budget – over 5 billions. But still at the beginning of the Smart Grid transition.
2. Smart Grid projects are not uniformly distributed across Europe. Most of investments in EU-15 Countries. Need for uniform development pace in Europe to reap the full benefits of Smart Grids.
3. Most R&D and demonstration projects are small to medium size (4 and €12 million of budget respectively on average). Need to invest in larger scale demonstration projects.
4. The increased complexity of the electricity system requires multidisciplinary consortia to share competencies and reduce risks
5. Leading role of DSOs in performing investments. Need to ensure fair sharing of costs and benefits
6. System integration is crucial to reap the full benefits of Smart Grids. Set-up of service platforms
7. Consumers' awareness and participation is crucial: trust, understanding and clear benefits
8. Smart Grid is an enabler of EU energy policy goals through different means
9. An open and secure ICT infrastructure is at the core of a successful Smart Grid implementation. Addressing interoperability, data privacy and security crucial to reduce transaction costs
10. Sharing lessons learned and best practices. Streamlining project data repository and sharing.

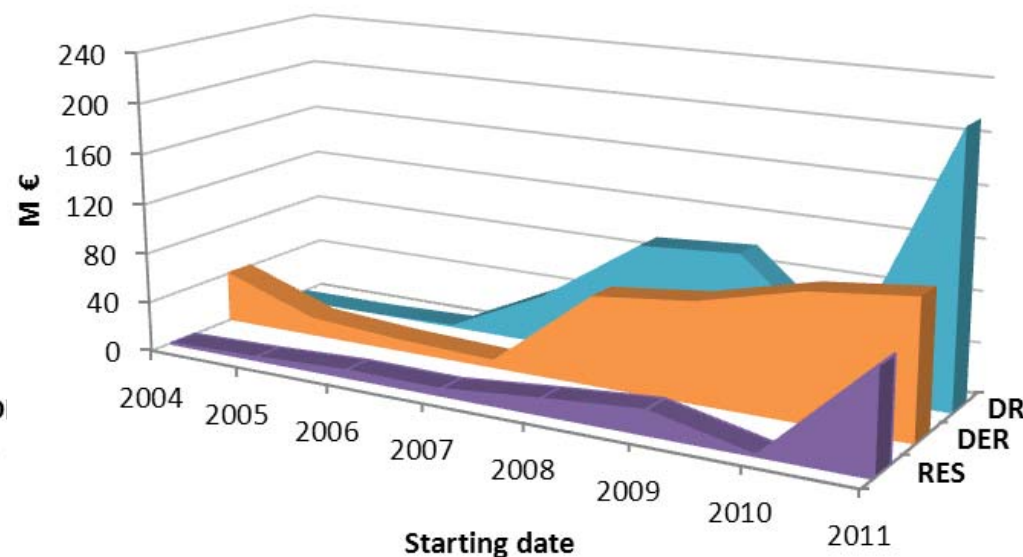


Crescente numero di progetti per integrazione di:

- **DER** - Distributed Energy Resources
- Large scale **RES** - Renewable Energy Sources
- **DR** - Demand Response (tramite **smart meters**)

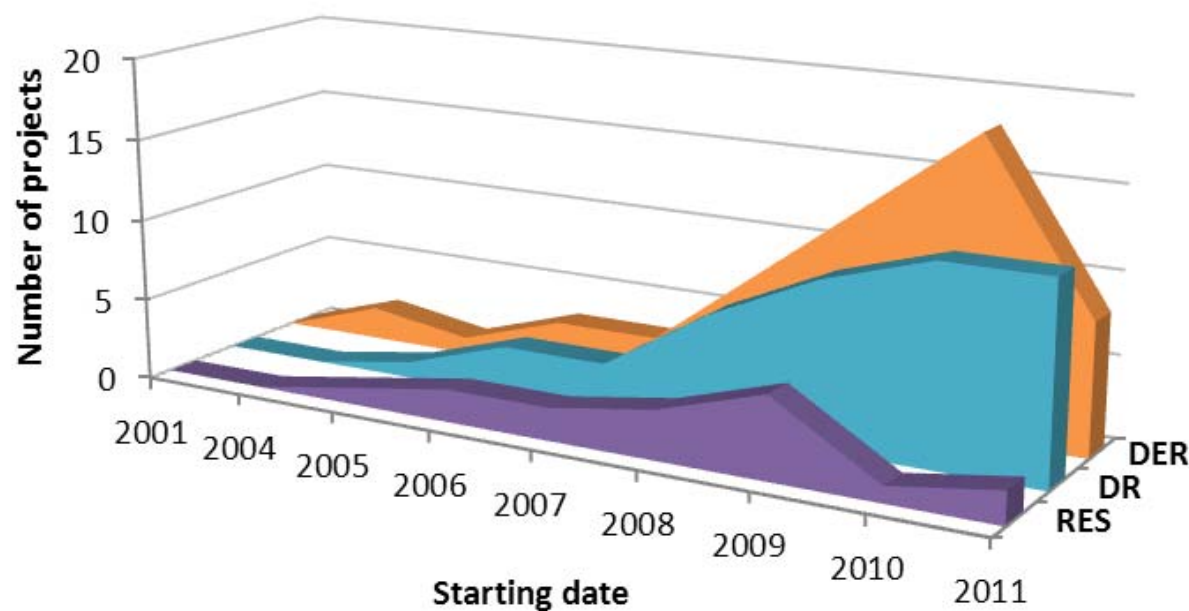


Numero di progetti per anno

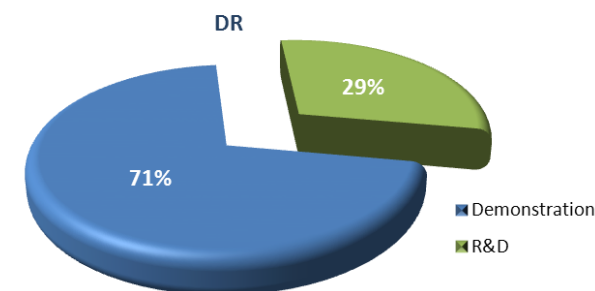
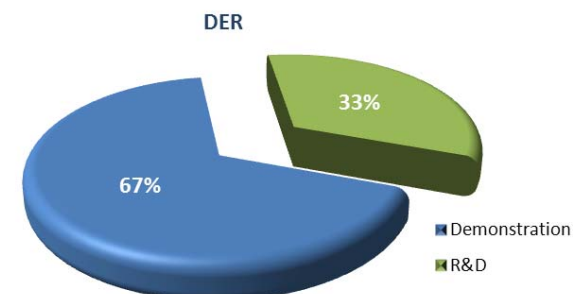
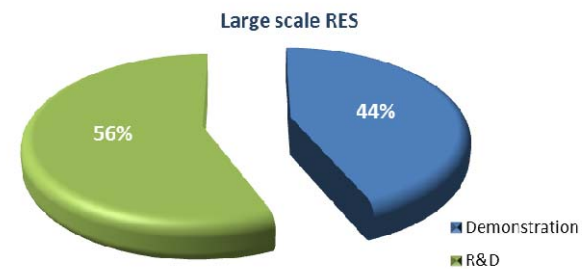


Budget allocato per anno

Nota: non tutti i progetti pianificati per/nel 2011 hanno ancora risposto all'indagine JRC



Numero di progetti per anno



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