



Challenges and framework for Smart Grids deployment

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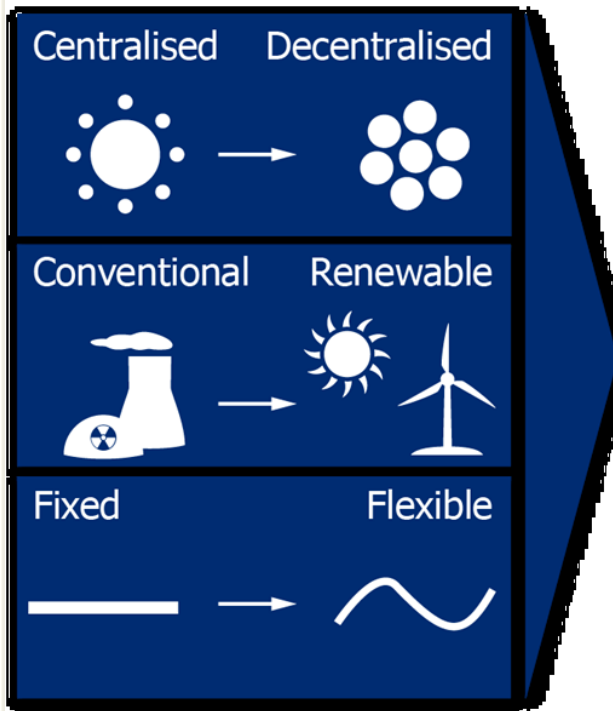




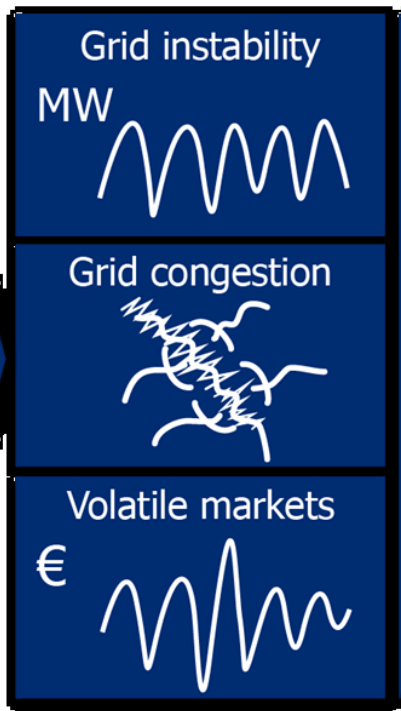
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Low carbon economy requires significant changes of energy systems

TRENDS



OBSTACLES



SOLUTIONS



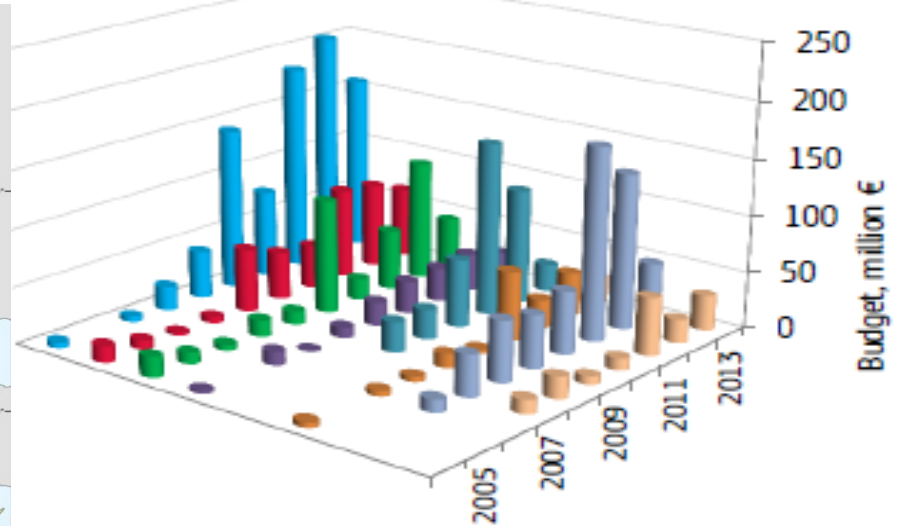
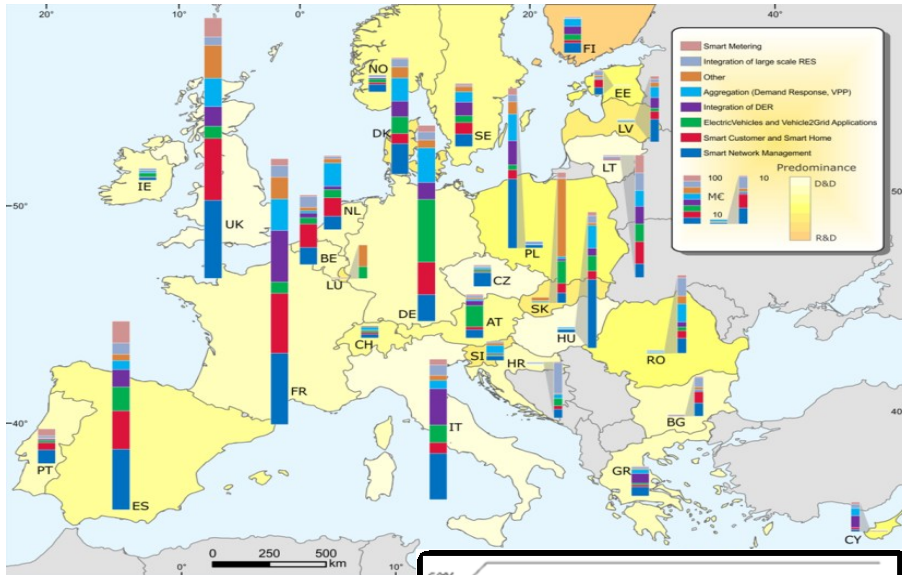
KEY





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Investments in Smart Grids projects (2013, excl. metering)



- Smart Network Management
- Aggregation
- Integration of DER
- Other
- EV and Vehicle2Grid
- Integration of large scale RES
- Smart Customer and Smart Home
- Smart Metering

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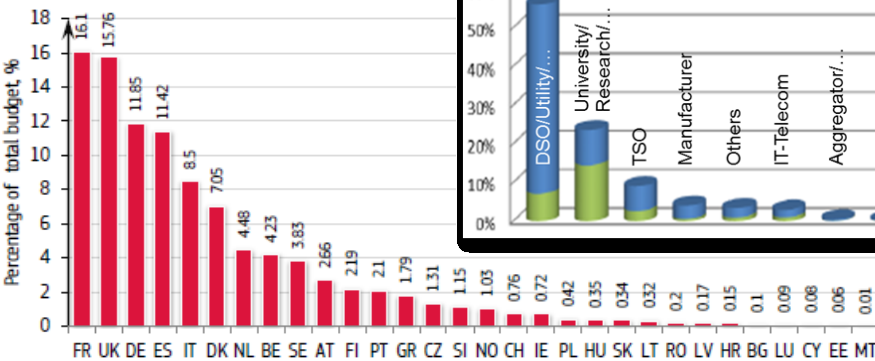
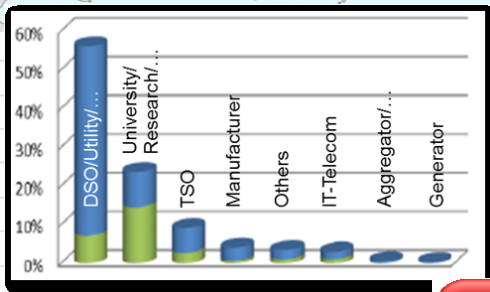
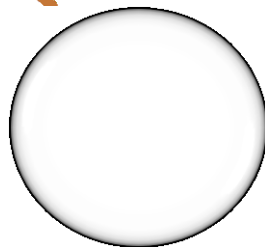


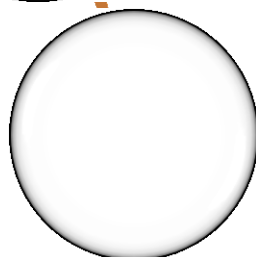
Figure 8 Percentage from total budget per country

459 smart grid projects - €3.15 billion
26% R&D and 74% Demo & Deployment

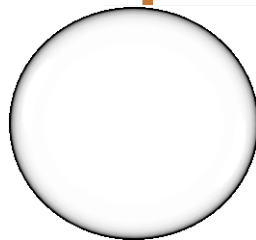
European Smart Grids Task Force is working on key challenges



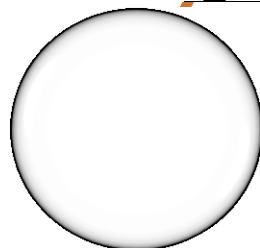
Standards and interoperability



**Data privacy, security and
cyber-security**



Regulatory issues



**Industrial policy and
infrastructure**

SG related EU legislation & policy documents

- ✓ **Electricity and Gas Directives 2009/72/EC and 2009/73/EC**
- ✓ **Energy Efficiency Directive 2012/27/EC**
- ✓ Energy Infrastructure Regulation (EU) 347/2013
- ✓ Electro-mobility Alternative Fuels Directive AFID, 2013/0012(COD)
- ✓ **Recommendation 2012/148/EU on smart metering roll-out**
- ✓ **Recommendation 2014/724/EU Data Protection Impact Assessment Template**
- ✓ COM(2011)202 on Smart Grids
- ✓ COM(2012)663 on the Internal Energy Market
- ✓ COM (2013)7243 on IEM and public intervention
- ✓ SWD(2013)442 on Demand Side Flexibility
- ✓ **COM(2014) 356 Benchmarking Report on Smart Metering & accompanying SWDs**



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Commission Recommendation 2012/148/EU of 9 March 2012 on preparations for the roll-out of smart metering systems

13.3.2012 **LEU** Official Journal of the European Union L 73/9

RECOMMENDATIONS

COMMISSION RECOMMENDATION

of 9 March 2012

on preparations for the roll-out of smart metering systems
(2012/148/EU)

THE EUROPEAN COMMISSION,

the Member States' plans for implementation of smart metering systems, along with cost-benefit analyses.

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 292 thereof,

Whereas:

(1) Smart grids mark a new development on the path towards greater consumer empowerment, greater integration of renewable energy sources into the grid and higher energy efficiency and make a considerable contribution to reducing greenhouse gas emissions and to job creation and technological development in the Union.

(2) In accordance with Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC⁽¹⁾ and Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC⁽²⁾, Member States are required to ensure the implementation of smart metering systems that assist the active participation of consumers in the electricity supply and gas supply markets and implementation of those metering systems may be subject to an economic assessment of all the long-term costs and benefits to the market and the individual consumer or which form of smart metering is economically reasonable and cost-effective and which timeframe is feasible for their deployment.

(3) The Communication from the Commission to the European Parliament, the Council, the European Economic and Social Committee and the Committee of the Regions of 12 April 2011 on 'Smart grids: from innovation to deployment' (3) announces a number of measures, including monitoring Member States' progress, establishing guidelines on key performance indicators and guidelines to define a methodology for

(4) The Digital Agenda for Europe lists a set of appropriate measures, in particular on data protection in the Union, on network and information security, on cyber attacks and on functionalities for smart grids and metering. Member States, in collaboration with industry, the Commission and other stakeholders, should take appropriate measures to ensure a coherent approach.

(5) One of the key tasks and preconditions for using smart metering systems is to find appropriate technical and legal solutions which safeguard protection of personal data as a fundamental right under Article 8 of the Charter of Fundamental Rights of the European Union and Article 16 of the Treaty on the Functioning of the European Union. Member States and stakeholders should ensure, especially in the initial phase of the roll-out of smart meters, that smart metering system applications are monitored and that fundamental rights and freedoms of individuals are respected.

(6) Smart metering systems allow processing of data, including predominantly personal data. Moreover, the deployment of smart grids and smart metering systems should allow suppliers and network operators to evolve from a broad view of energy behaviour to detailed information on the energy behaviour of individual end-consumers.

(7) The rights and obligations provided for by Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data⁽⁴⁾ and by Directive 2002/58/EC of the European Parliament and of the Council of 12 July 2002 concerning the processing of personal data and the protection of privacy in the electronic communications sector (Directive on privacy and electronic communications)⁽⁵⁾ are fully applicable to smart metering which processes personal data, in particular in the use of publicly available electronic communications services for contractual and commercial relations with customers.

⁽¹⁾ OJ L 211, 14.8.2009, p. 55.
⁽²⁾ OJ L 211, 14.8.2009, p. 64.
⁽³⁾ COM(2011) 202 final.

⁽⁴⁾ OJ L 281, 23.11.1995, p. 31.
⁽⁵⁾ OJ L 201, 31.7.2002, p. 37.

I. Data protection and security considerations

- Data protection impact assessment
- Data protection by design and data protection by default settings
- Data protection measures
- Data security
- Information and transparency on smart metering

II. Methodology for the economic assessment of the long-term cost and benefits for the roll-out of smart metering systems

III. Common minimum functional requirements for smart metering systems for electricity

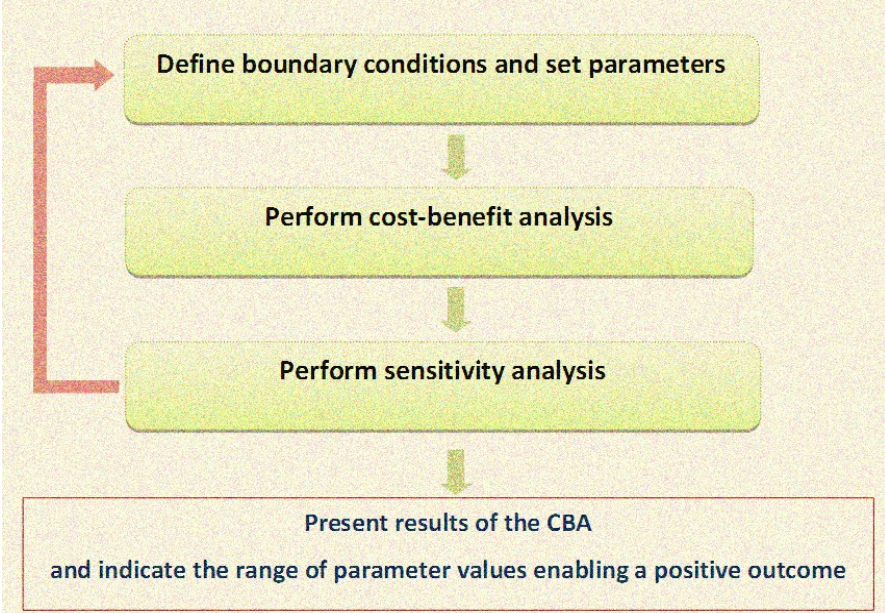
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CBA for the roll-out of Smart Metering Systems



Economic appraisal

Non-monetary appraisal



Merit deployment of the roll-out (contribution to policy goals)

CBA Externalities (e.g. employment, safety, environmental impacts)

→ *KPI analysis*

→ *Qualitative descriptions /physical units*

10 Common Minimum Functionalities



CONSUMER

- Provide readings directly to the consumer and/or any 3rd party
- Update the readings frequently enough to use energy saving schemes

METERING OPERATOR

- Allow remote reading by the operator
- Provide 2-way communication for maintenance and control
- Allow frequent enough readings to be used for networking planning

COMMERCIAL ASPECTS OF SUPPLY

- Support advanced tariff system
- Allow remote ON/OFF control supply and/or flow or power limitation

SECURITY AND DATA PROTECTION

- Provide secure data communications
- Fraud prevention and detection

DISTRIBUTED GENERATION

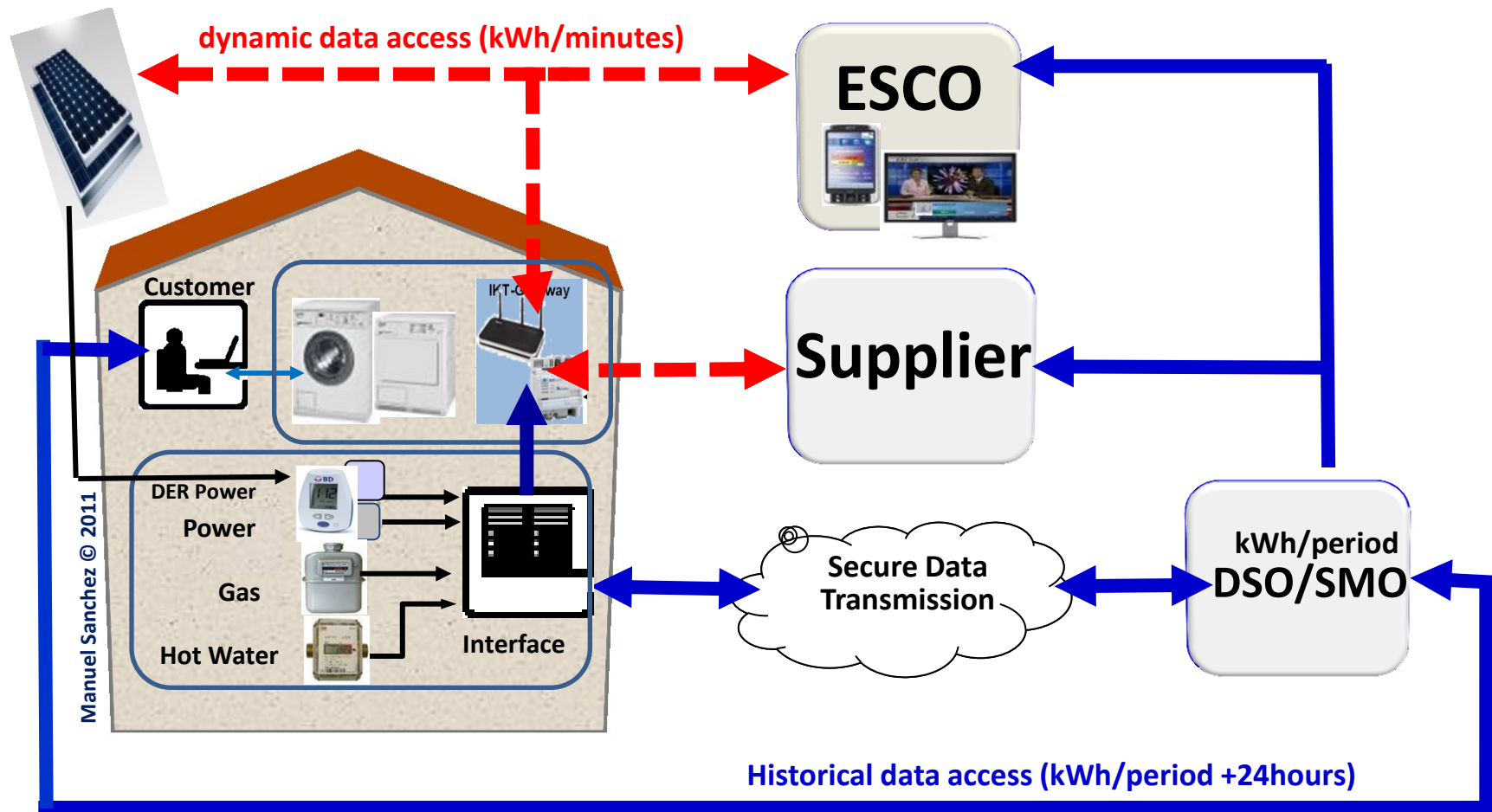
- Provide import/export and reactive metering

MS are encouraged to go beyond these common minimum functionalities in their CBA scenarios.



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Key 1: Open model for consumption data flow

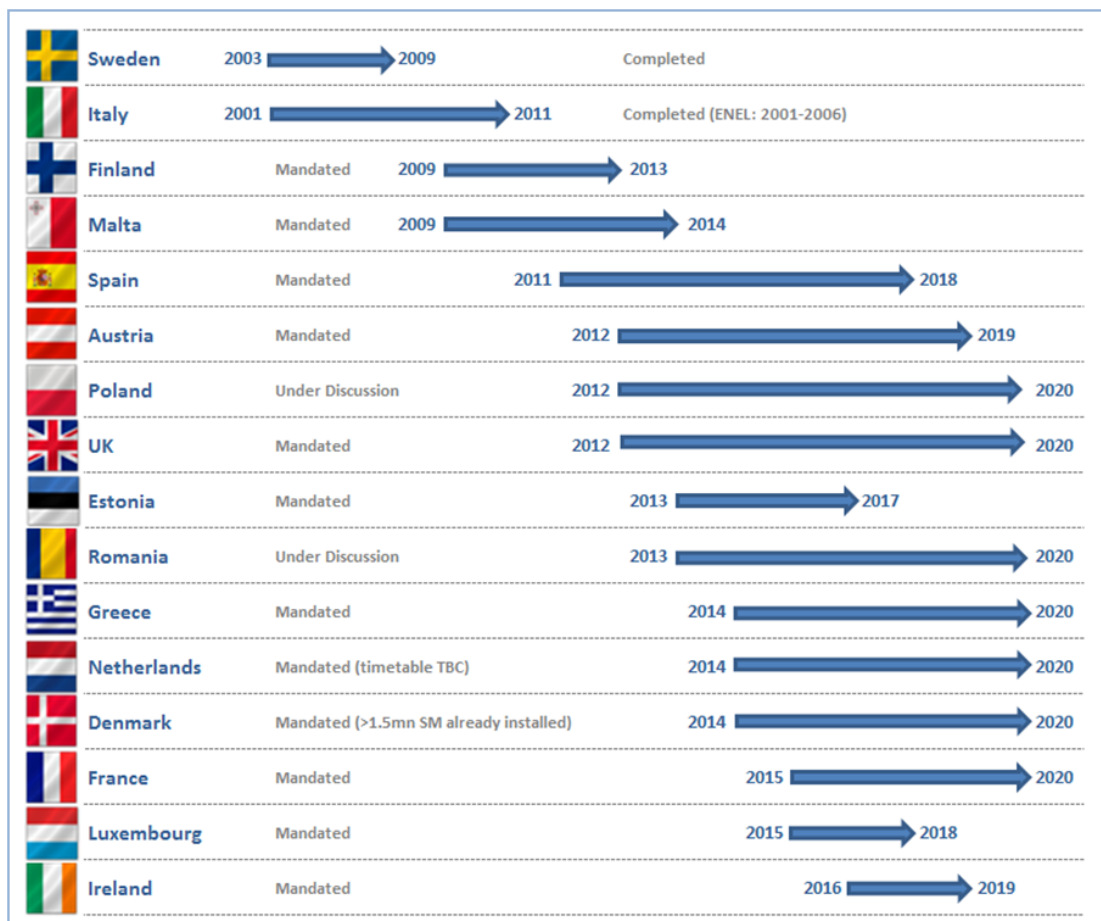
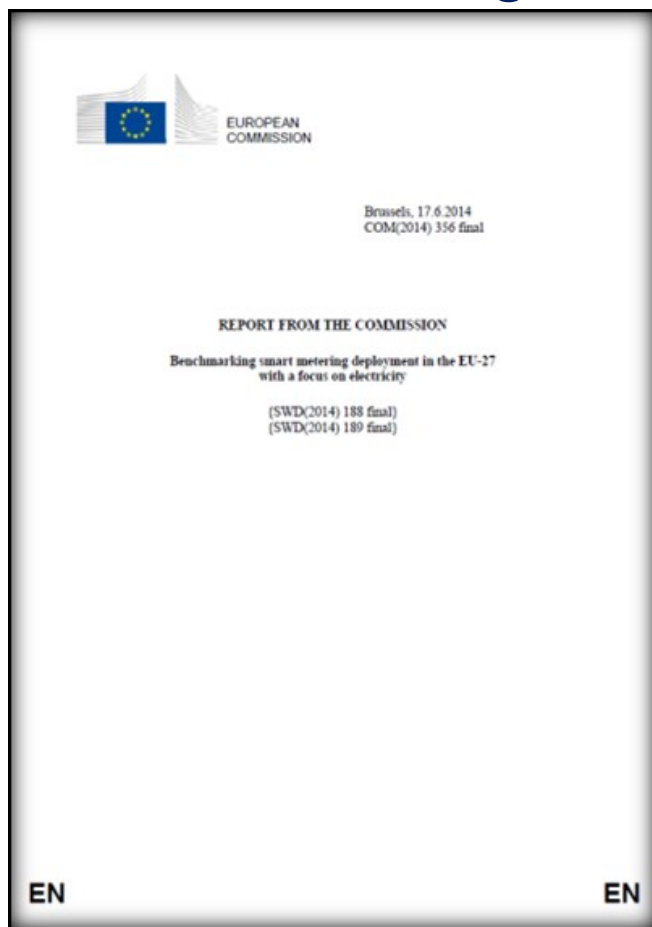


Manuel Sanchez © 2011



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Commission report of 10 October 2014 Benchmarking smart metering deployment in the EU-27

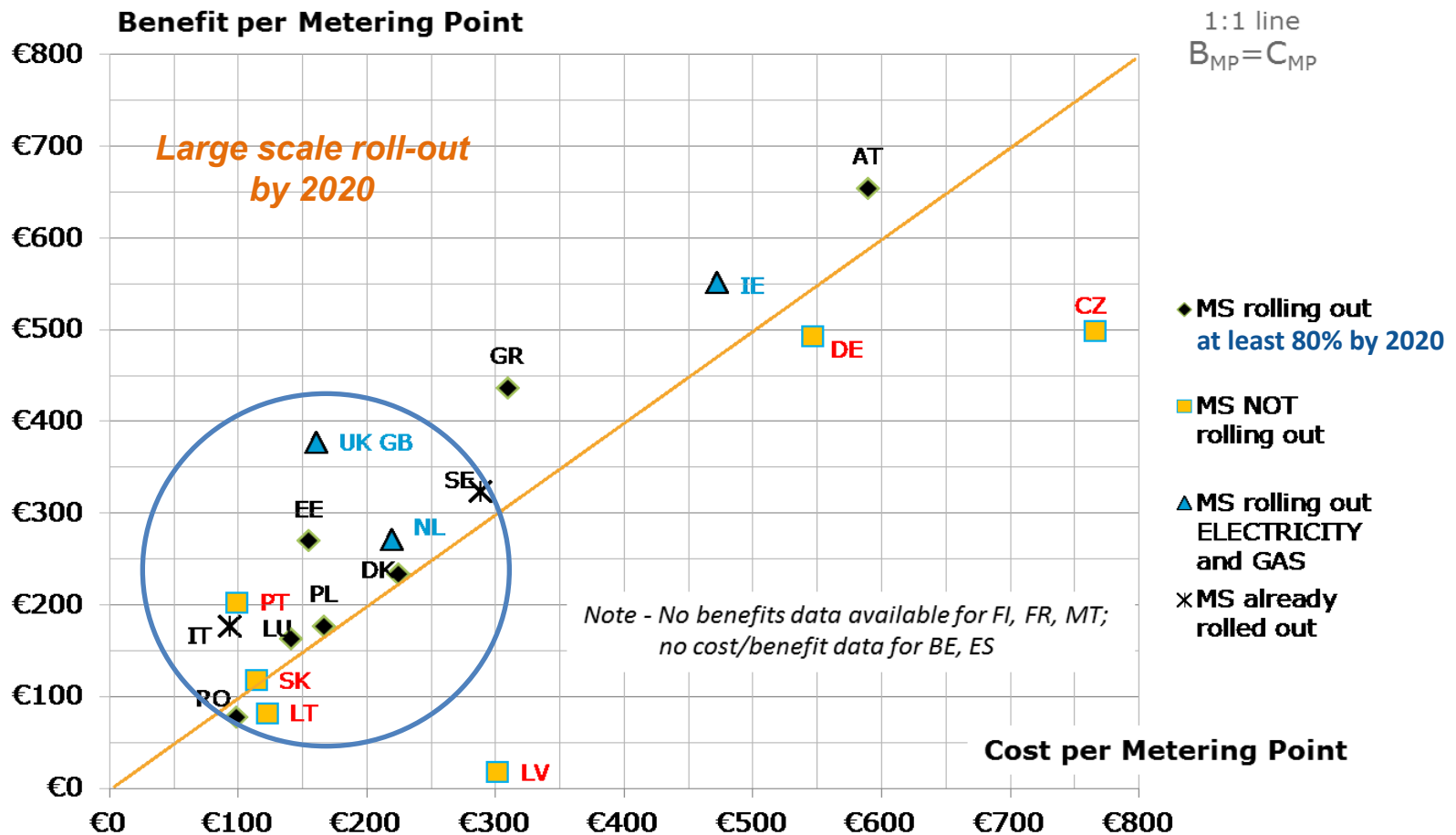




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Smart metering for electricity – costs & benefits

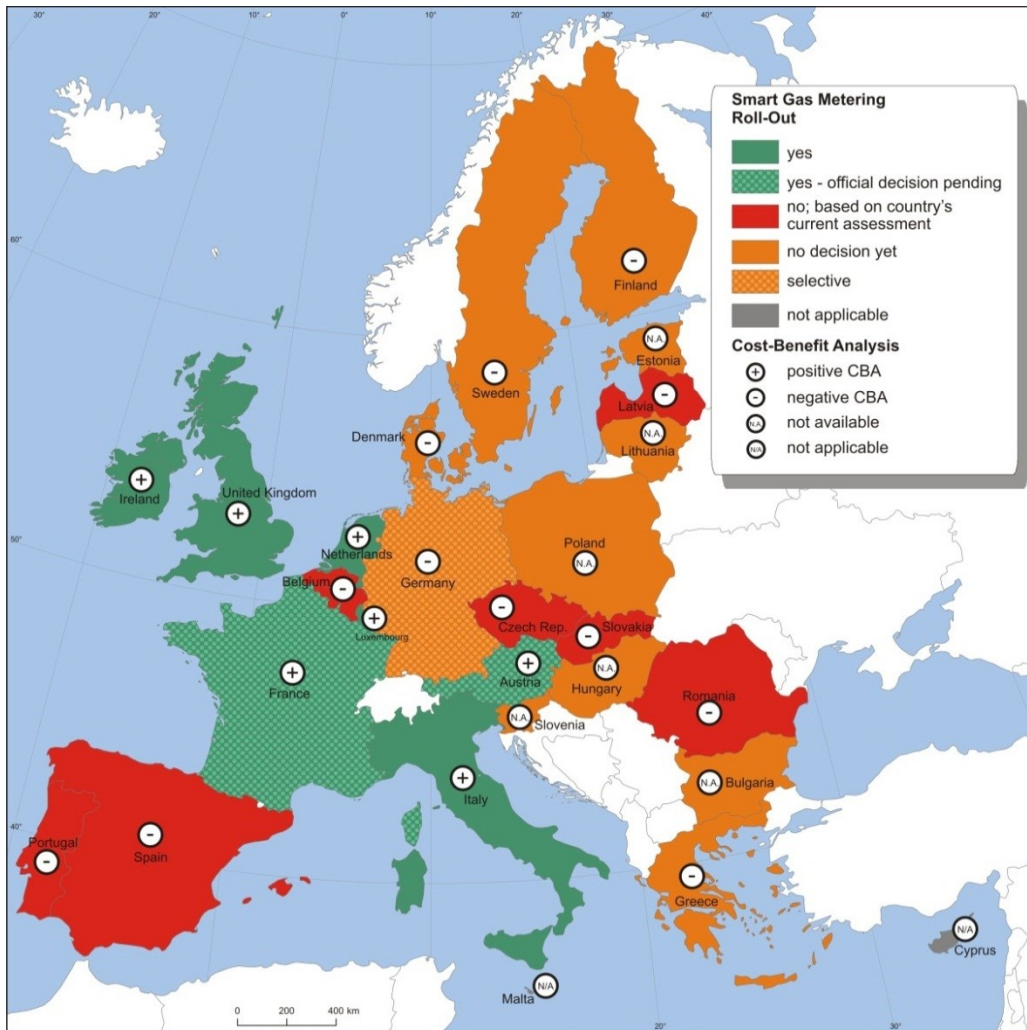
Costs & Benefits (normalised by number of metering points)





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Smart Meters CBAs: Encouraging Gas Results by 2020



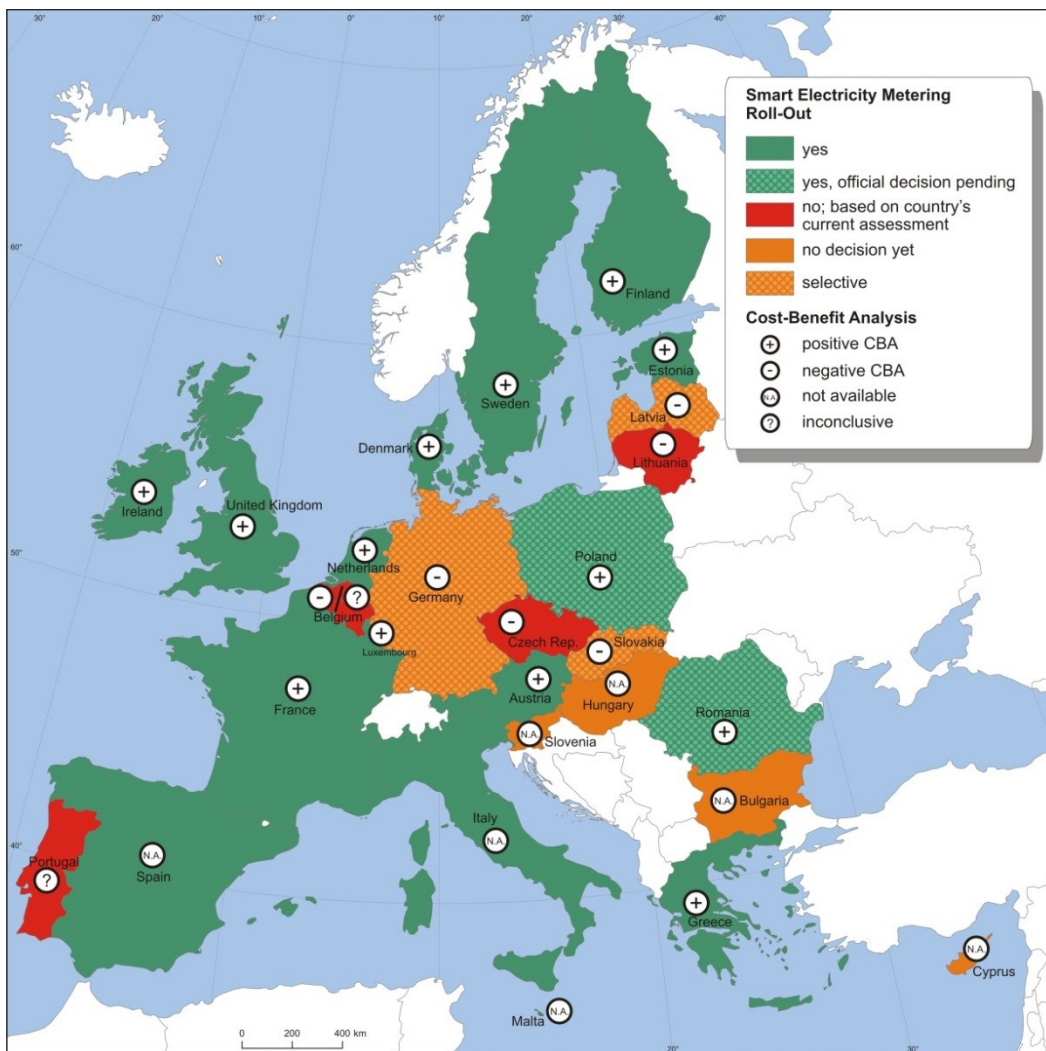
- ❖ 19 CBA, 7 MS: wide roll-out
- ❖ ~ 40 % EU consumers
- ❖ 45 million meters
- ❖ €10 billion





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Smart Meters CBAs: electricity targets by 2020



- ❖ 20 (21) CBAs, 16 MS: large-scale roll-out
- ❖ ~ 72% EU consumers
- ❖ 195 million meters
- ❖ € 35 billion



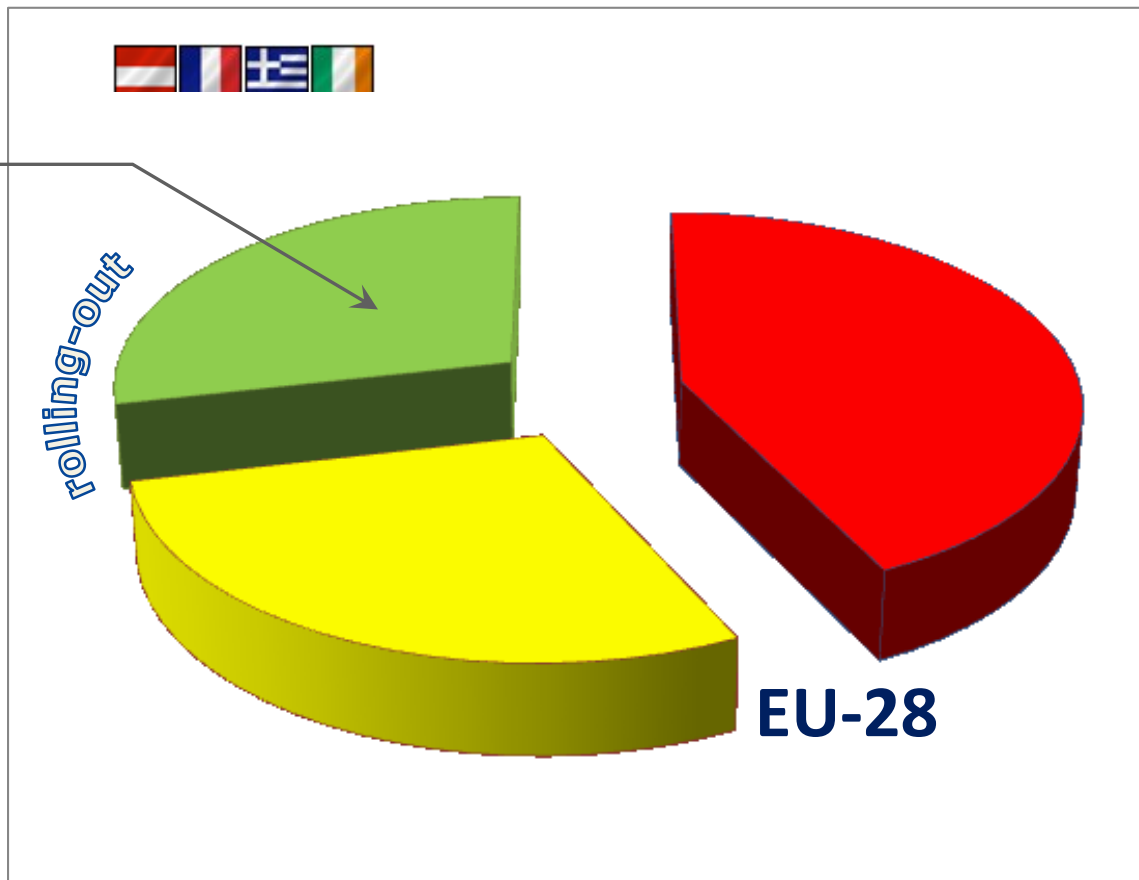


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50% of roll-out plans follow recommended functionalities

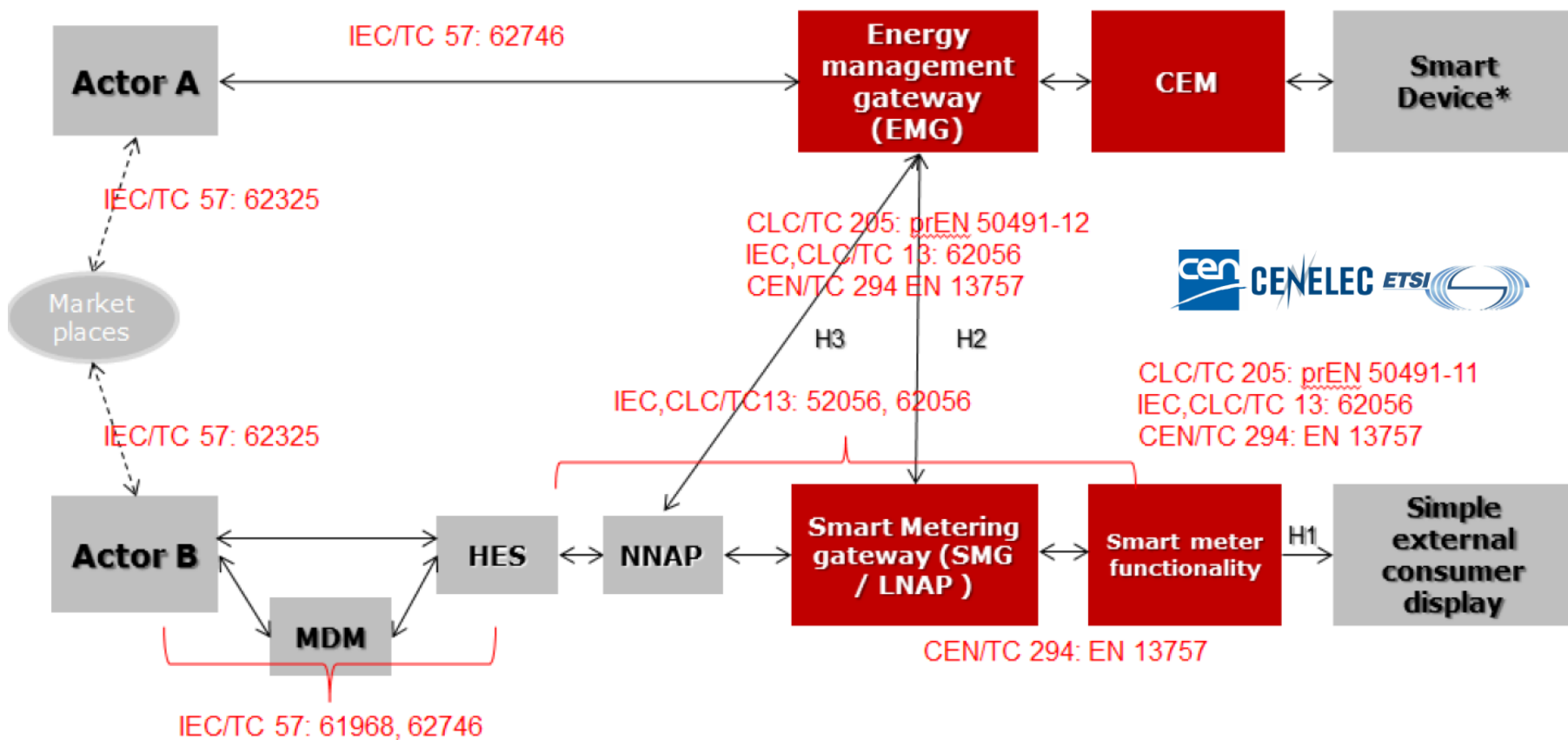
in the 16 Member States proceeding with large-scale smart metering roll-out by 2020

8 Member States (50% of those rolling-out) consider all recommended functionalities



CONSUMER	<ul style="list-style-type: none">• a) Provide readings directly to the consumer and/or any 3rd party• b) Update readings frequently enough to use energy saving schemes
METERING OPERATOR	<ul style="list-style-type: none">• c) Allow remote reading by the operator• d) Provide 2-way communication for maintenance and control• e) Allow frequent enough readings for networking planning
COMMERCIAL ASPECTS OF SUPPLY	<ul style="list-style-type: none">• f) Support advanced tariff system• g) Remote ON/OFF control supply and/or flow or power limitation
SECURITY - DATA PROTECTION	<ul style="list-style-type: none">• h) Provide secure data communications• i) Fraud prevention and detection
DISTRIBUTED GENERATION	<ul style="list-style-type: none">• j) Provide import/export and reactive metering

Key 2: Interoperability and open standards



Ref.: SWD(2014)189 accompanying the **Smart Metering Benchmarking Report** (COM(2014)356)



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Commission Recommendation of 10 October 2014 on Data Protection Impact Assessment Template for Smart Grid and Smart Metering Systems

18.10.2014 Official Journal of the European Union L 300/63

RECOMMENDATIONS

COMMISSION RECOMMENDATION

of 10 October 2014

on the Data Protection Impact Assessment Template for Smart Grid and Smart Metering Systems

(2014/724/EU)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union, and in particular Article 292 thereof,

Whereas:

- (1) Smart grids are an enabler for implementing key energy policies. In the 2010 policy framework context, smart grids, as the backbone of the future decarbonized power system, are recognised as a facilitator for the energy infrastructure's transformation in order to accommodate higher shares of variable renewable energy, improve energy efficiency and ensure security of supply. Smart grids provide an opportunity to boost EU technology providers' competitiveness, as well as a platform for traditional energy companies and new market entrants to develop innovative energy services and products in grid infrastructure and related information and communications technology (ICT), home automation and appliances.
- (2) Smart metering systems are a stepping stone towards smart grids. They provide the tools to empower consumers' active participation in the energy market, and enable system flexibility through demand response schemes and other innovative services. In accordance with Directive 2009/72/EC of the European Parliament and of the Council (1) and Directive 2009/73/EC of the European Parliament and of the Council (2), Member States are required to ensure the implementation of smart metering systems that assist the active participation of consumers in the electricity and gas supply markets.
- (3) The operation of smart metering systems — and a fortiori any further developments of smart grids and applications — hold the potential to process data relating to an individual, i.e. personal data as defined by Article 2 of Directive 95/46/EC of the European Parliament and of the Council (3).
- (4) Opinion 12/2011 (4) of the Working Party on the protection of individuals with regard to the processing of personal data set up in accordance with Article 29 of Directive 95/46/EC states that smart metering systems and smart grids hold the potential to process increasing amounts of personal data and to make that personal data available to a wider circle of recipients than at present, thus creating new risks for data subjects that were previously unknown to the energy sector.
- (5) Opinion 04/2013 (5) of the Working Party states that smart metering systems and smart grids foreshadow the impending 'Internet of Things', and that the potential risks associated with the collection of detailed consumption data are likely to increase in the future when combined with data from other sources, such as geo-location data, tracking and profiling on the internet, video surveillance systems, and radio frequency identification (RFID) systems (6).

(1) Directive 2009/72/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in electricity and repealing Directive 2003/54/EC (OJ L 211, 14.8.2009, p. 55).
(2) Directive 2009/73/EC of the European Parliament and of the Council of 13 July 2009 concerning common rules for the internal market in natural gas and repealing Directive 2003/55/EC (OJ L 211, 14.8.2009, p. 64).
(3) Directive 95/46/EC of the European Parliament and of the Council of 24 October 1995 on the protection of individuals with regard to the processing of personal data and on the free movement of such data (OJ L 281, 24.11.1995, p. 13).
(4) Article 29 Data Protection Working Party, Opinion 12/2011 on smart metering, 09/71131EN, WP 123, 4 April 2011.
(5) Article 29 Data Protection Working Party, Opinion 04/2013 on the Data Protection Impact Assessment Template for Smart Grid and Smart Metering Systems (DPIA Template) prepared by Expert Group 2 of the Commission's Smart Grid Task Force, 00678131EN, WP 205, 22 April 2013.
(6) Risk and Recommendation CM(Rel)2010(0)13 of 23 November 2010 of the Council of Europe Committee of Ministers to Member States on the protection of individuals with regard to automatic processing of personal data in the context of profiling.

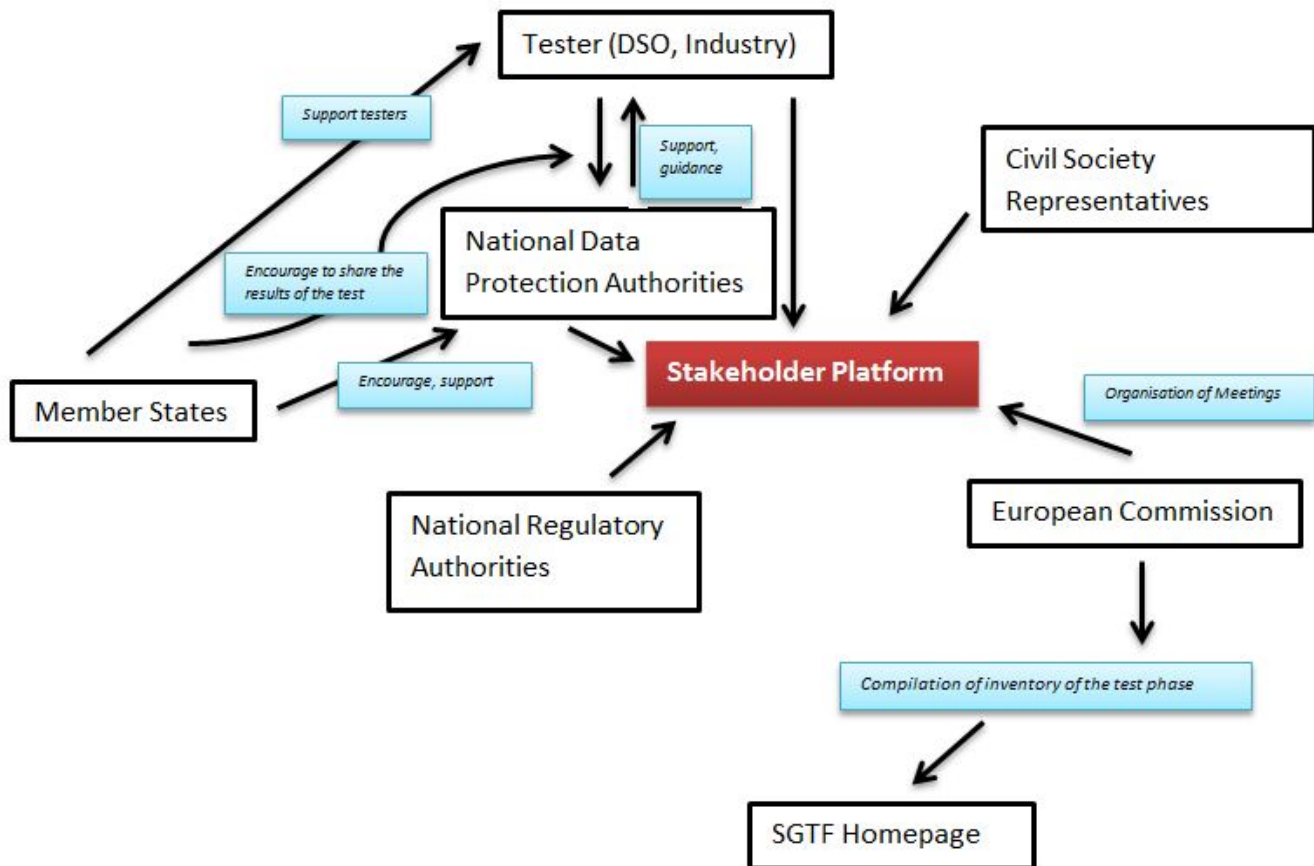
- The DPIA Template is an **evaluation and decision-making tool** which helps entities planning or executing investments in smart grids **to identify and anticipate risks to data protection, privacy and security.**
- The DPIA provides **guidance to help ensure the fundamental rights to protection of personal data and to privacy** in the deployment of smart grid applications and systems and smart metering roll-out.



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Interactions between national authorities and stakeholders

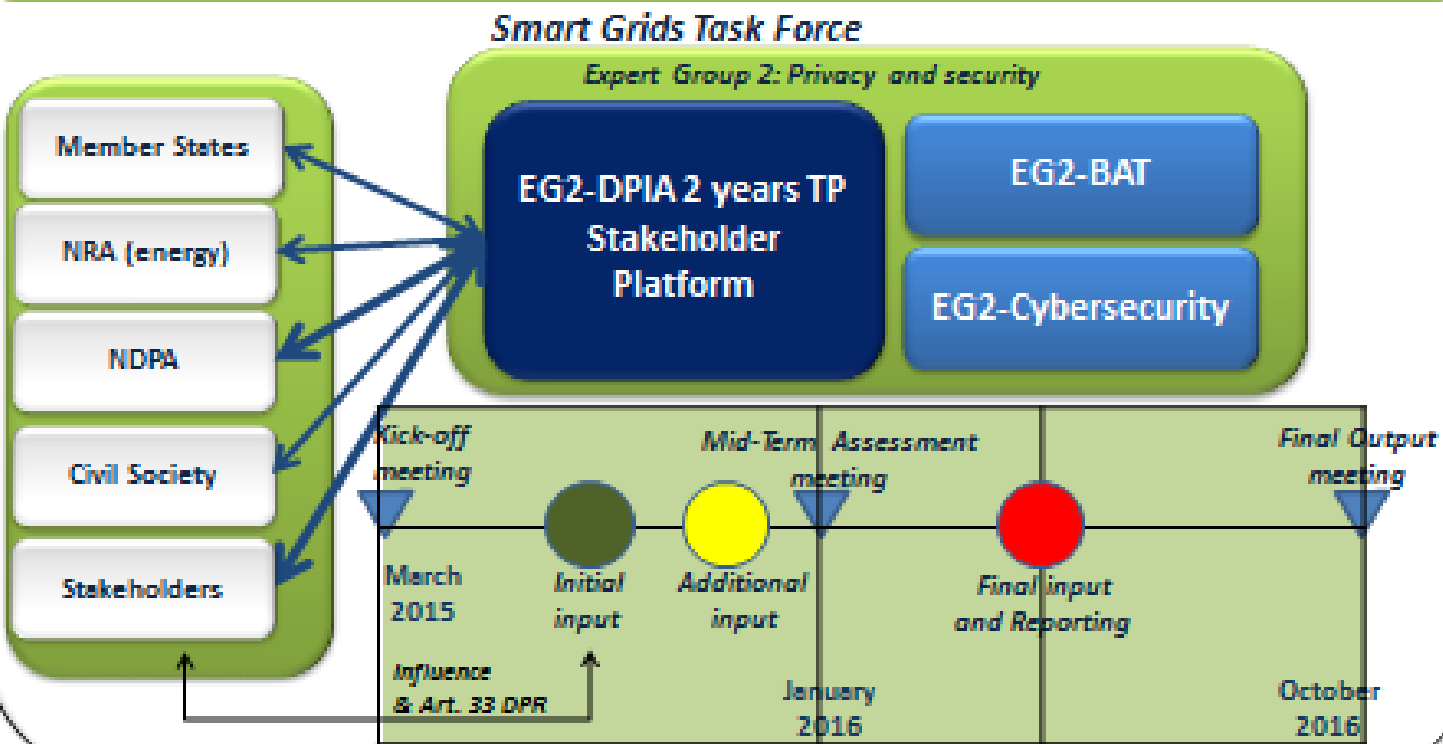
TESTPHASE:





DPIA - Two Years Test Phase Concept

- 2 Years Test Phase: Collection of experiences of DPIA implementation.
- Output: Publication of experiences and possible Recommendation of improvements



ENER/EG/MSU/20.02.2015



<http://ec.europa.eu/energy/en>

<http://ec.europa.eu/energy/en/topics/markets-and-consumers/smart-grids-and-meters>



For further information on the JASPERS Networking Platform
and questions on this presentation, please contact:

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