

# Smart Metering and Smart Grids in Europe – Where Do We Stand and What Next?

**Jan PANEK**

**Head of Unit**

**ENER B3 - Retail Markets**

**Bratislava, November 2014**

- 1. Why Smart Grids and Smart Meters Matter**
  - 2. Where Are We in Europe**
  - 3. Key Issues for the Future**



European  
Commission

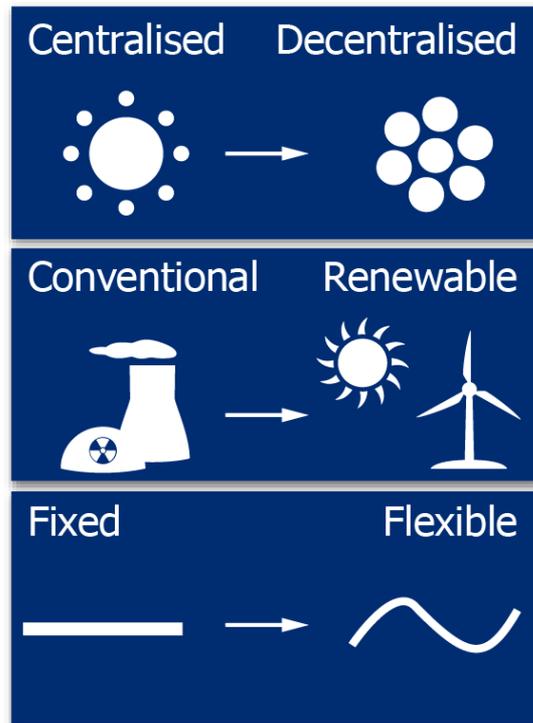
# 1. Why Smart Grids and Smart Meters Matter



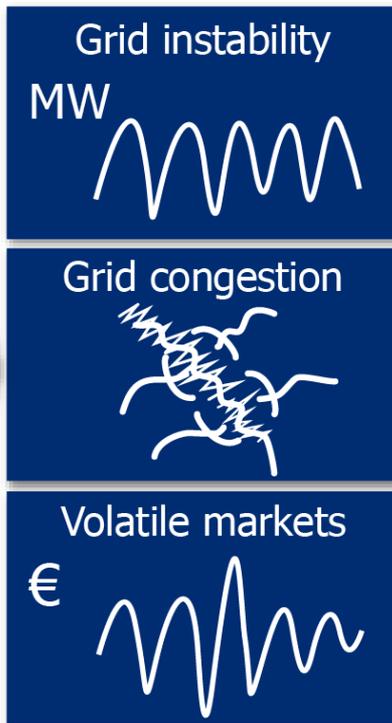
European  
Commission

# Significant systemic change: flexibility through market-based solutions is needed

## TRENDS



## OBSTACLES



## SOLUTIONS



## KEY



# Retail market should evolve towards flexibility



Consumers' empowerment

New business models and dynamics

Transparent and accessible market

Efficient distribution networks

# Consumer Not Only Pays But Also Gets Paid

## Reduced Consumer Bills (demonstrated)

- Individual energy savings/reductions: 2-4% kWh
- Partial consumption shift to cheaper periods: € ca.10%(HH)/20%+(I)
- (Lower system costs)

## System Efficiency

- Reduced peak generation: up to 60 GW (HH controllable load)
- Reduced grid needs

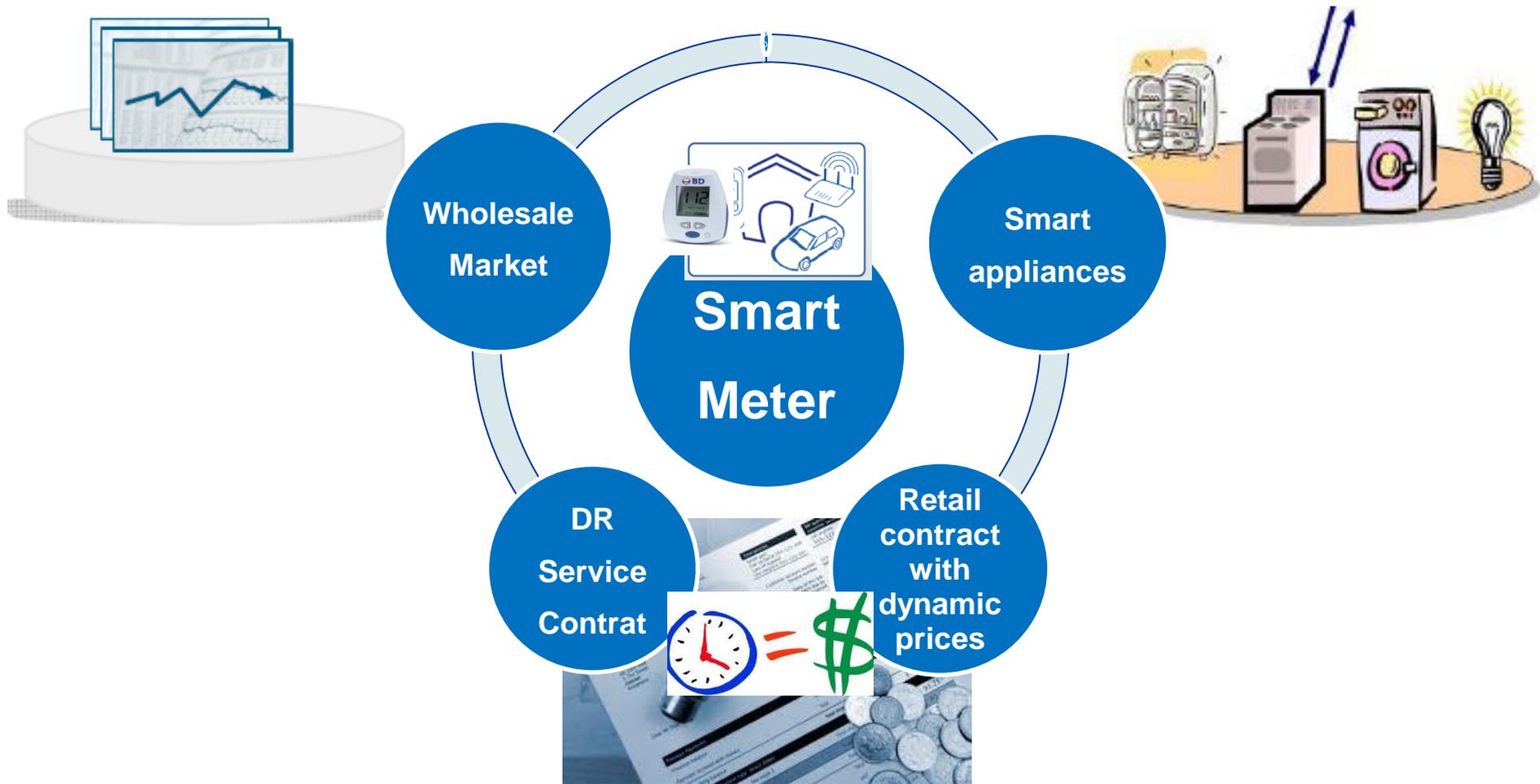
## Vicarious benefits

- More RES possible on the grid
- Environment/CO<sub>2</sub>↓
- Consumer engagement/empowerment



European  
Commission

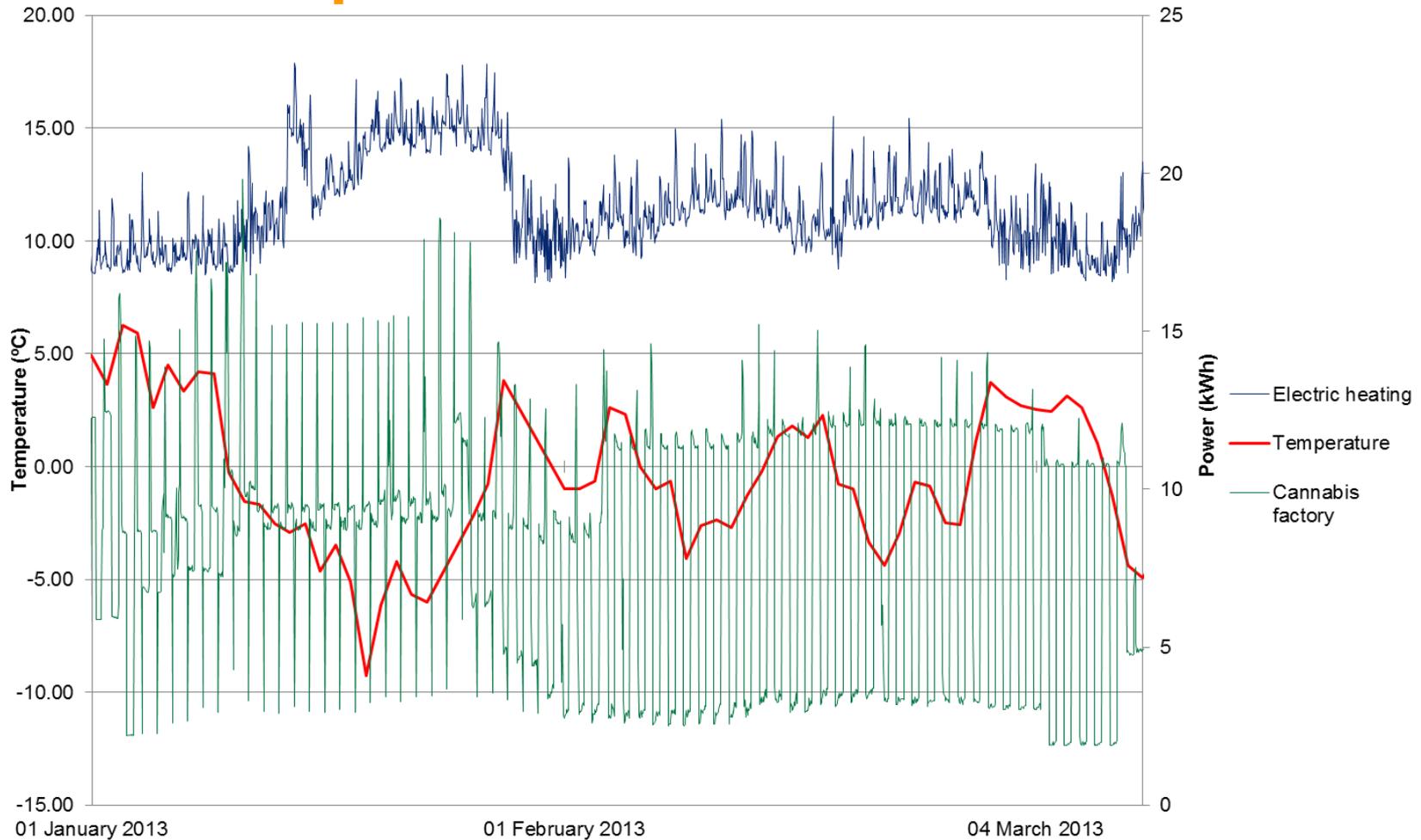
# Demand Response as Part of Smart Grids



# 6 Ways Smart Metering benefits consumers

|                                       |   |
|---------------------------------------|---|
| <b>Energy Savings</b>                 | more accurate and frequent consumption data demonstrably help consumers reduce their consumption and save money |
| <b>Energy Efficiency</b>              | more detailed consumption measurements help consumers identify opportunities for energy efficiency improvements |
| <b>Innovative Services</b>            | smart meters are indispensable for smart home solutions/home automation, reducing energy costs                  |
| <b>Consumer Empowerment</b>           | switching suppliers, modifying contractual terms, etc. becomes easier, faster and cheaper                       |
| <b>Sustainability</b>                 | use of local renewable sources and storage potential (micro-grids), electromobility become easier               |
| <b>Distribution System Efficiency</b> | management of the distribution systems becomes cheaper and more effective, leading to lower distribution costs  |

# Unexpected Benefits of Smart Meters



Courtesy of Göteborg Energi



European  
Commission

## 2. Where Are We in Europe

# Commission Benchmarking Report Issued 17 June



## "Benchmarking Smart Metering Deployment in the EU-27 with a focus on electricity"

- **Commission Report (COM(2014) 356)**
- **Country fiches (SWD(2014) 188)**
- **Cost-benefit data analysis (SWD(2014) 189)**

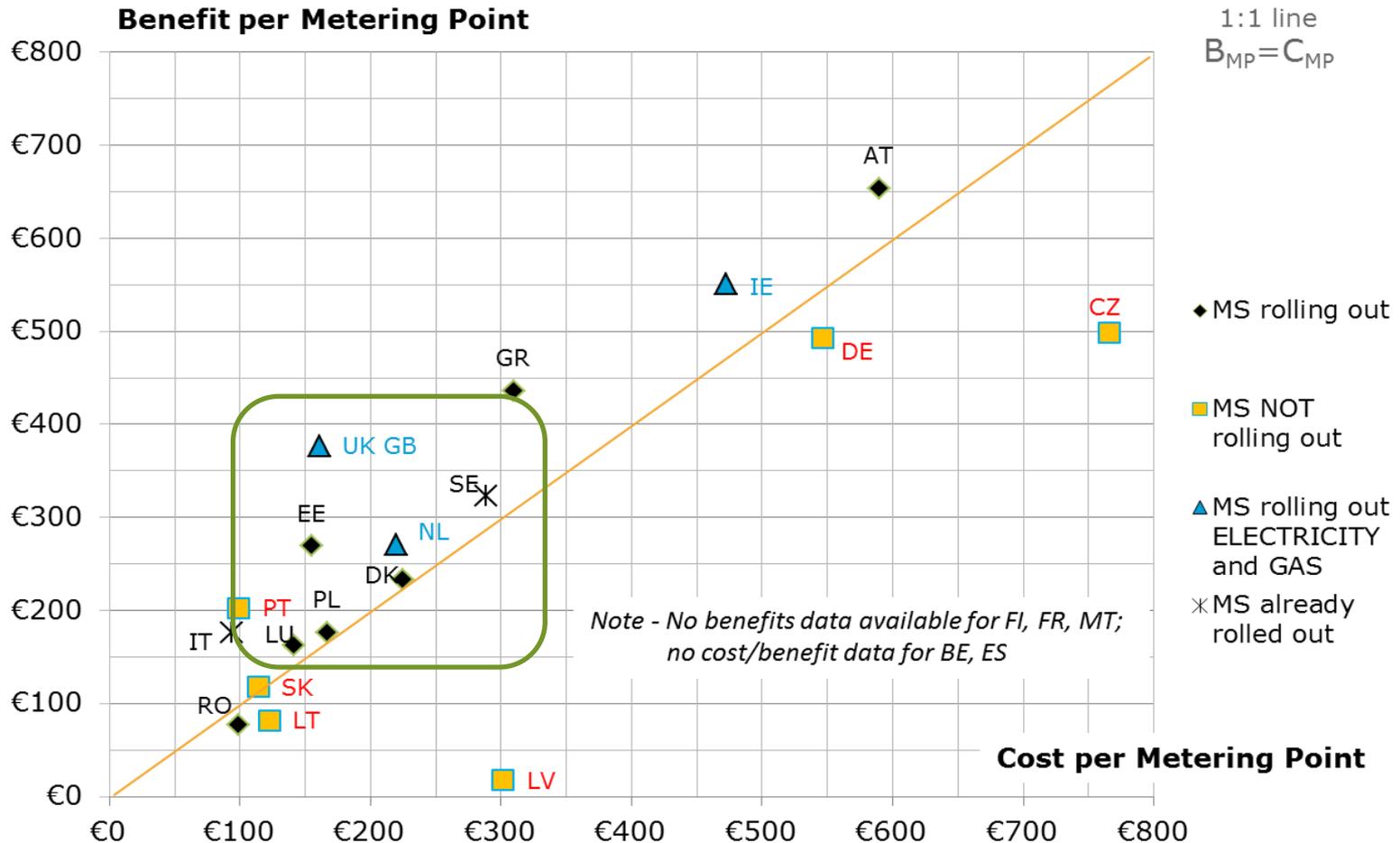
[http://ec.europa.eu/energy/gas\\_electricity/smartgrids/smartgrids\\_en.htm](http://ec.europa.eu/energy/gas_electricity/smartgrids/smartgrids_en.htm)



European  
Commission

# Smart metering for electricity – costs & benefits

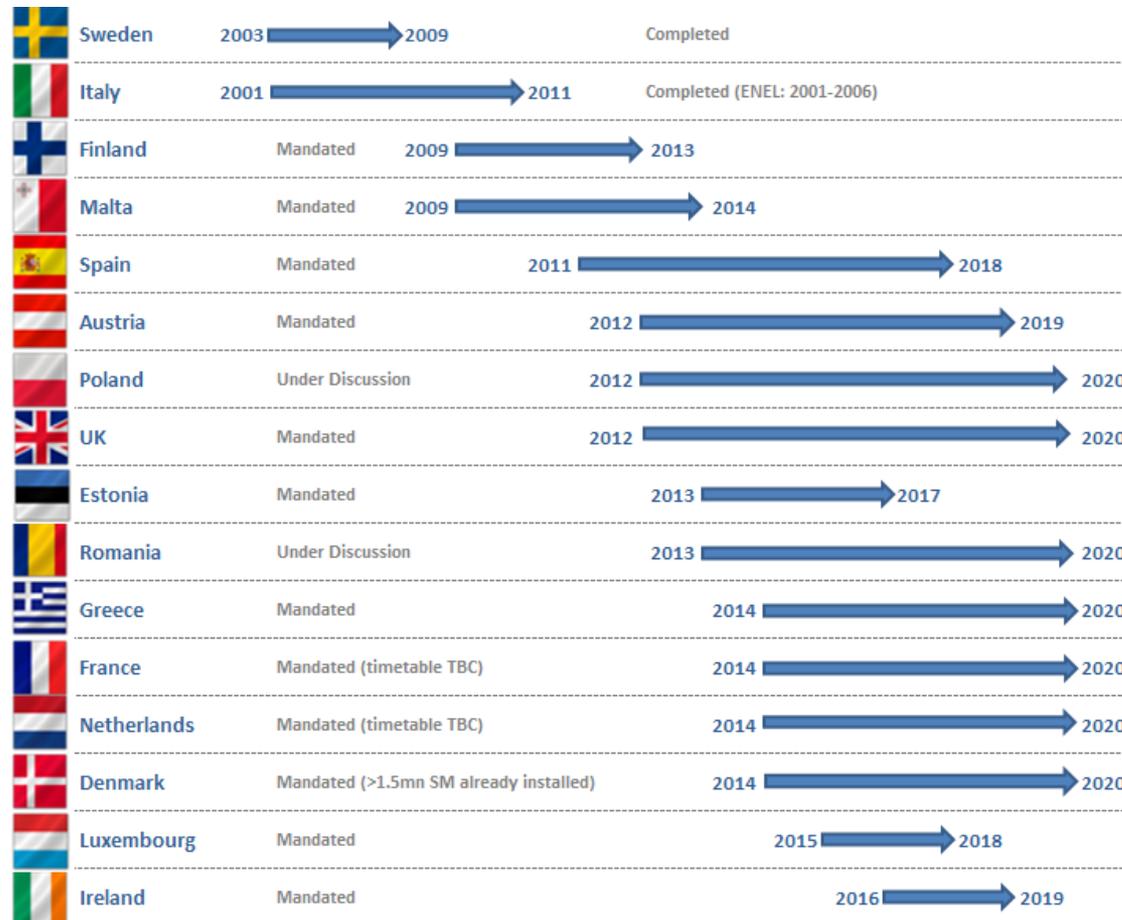
## Costs & Benefits (normalised by number of metering points)



## Striking Diversity in CBAs (Here Electricity)

|  | Range of values | Average<br>(based on data from<br>positively assessed cases) |
|--|-----------------|--|
| Discount rate                              | 3.1 to 10 %     | 5.7% $\pm$ 1.8% (70%)  |
| Lifetime                                   | 8 to 20 years   | 15 $\pm$ 4 years (56%)                                       |
| Energy saving                              | 0 to 5 %        | 3% $\pm$ 1.3% (67%)  |
| Peak load shifting                         | 0.8 to 9.9%     | n.a.   |
| Cost per metering point                    | €77 to €766     | €223 $\pm$ €143 (80%)  |
| Benefit per metering point                 | €18 to €654     | €309 $\pm$ €170 (75%)  |
| Consumer benefits (as % of total benefits) | 0.6 to 81%      | n.a.   |

# Electricity: Wide-Scale Roll-out by 2020 in 16 MS

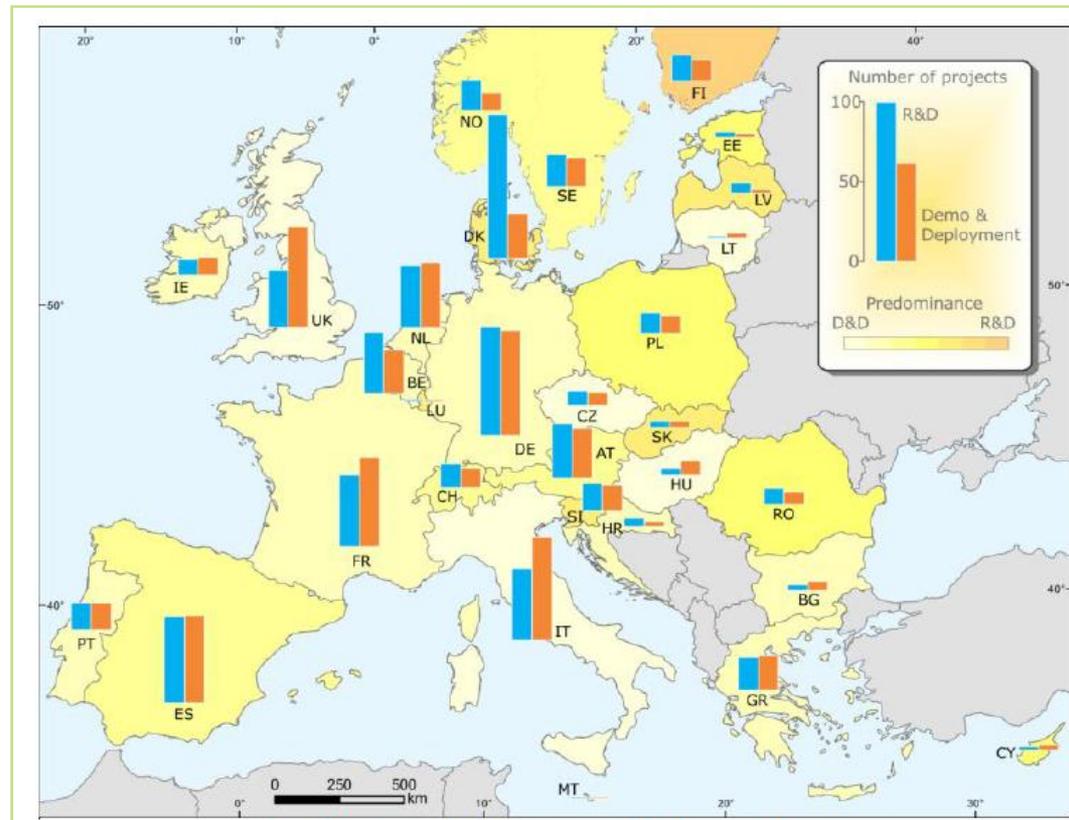


**Altogether: roll-outs in 19 MS => 72% EU electricity consumers with a smart meter by 2020**

## Smart Grids Overall – Still in Early Stages

2013 update (excl. metering):

- **459** SG projects @ **€3.15bn**
- 26% R&D and **72%** Demo & Deployment



No. of projects per stage of development & country

## Investments in SG projects so far concentrated mainly in a few Member States

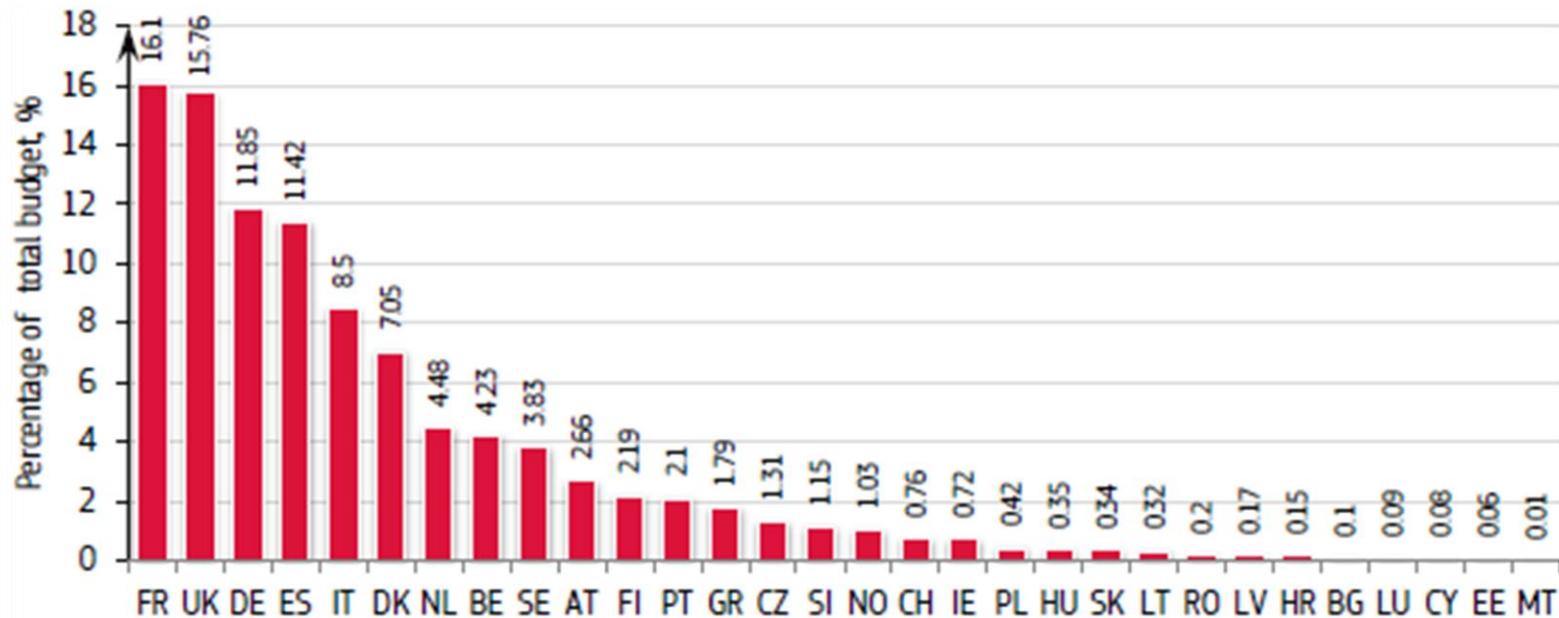


Figure 8 Percentage from total budget per country



European  
Commission

## 3. Key Issues for the Future



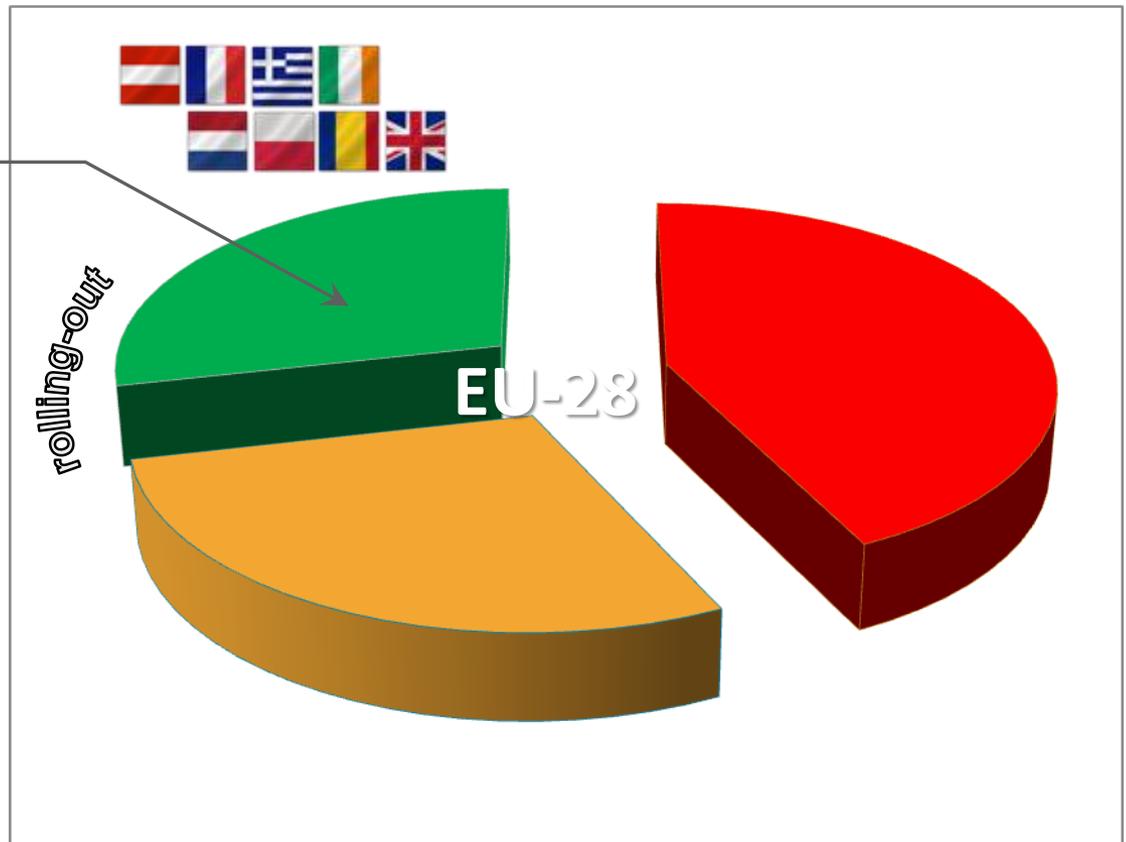
European Commission

# 50% 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

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



# Set-up of smart metering deployment - electricity

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

| Member States   | Metering Market | Responsible party -<br>Implementation & ownership | Responsible party -<br>Access to metering data |
|---|-----------------|---|--|
|     | Regulated       | DSO   | DSO  |
|    |                 |   | Central Hub                                    |
|  | Competitive     | Supplier  |  |

*FR – meters ownership is retained by local municipalities while DSO will operate them under a multi-annual concession*

## Many open questions on DSO roles

How to create open and competitive environment for new services and actors?

Which roles to assign to DSOs in a transparent and non-discriminatory competitive market?

What new roles and tasks? Where and when is it necessary to facilitate market development?

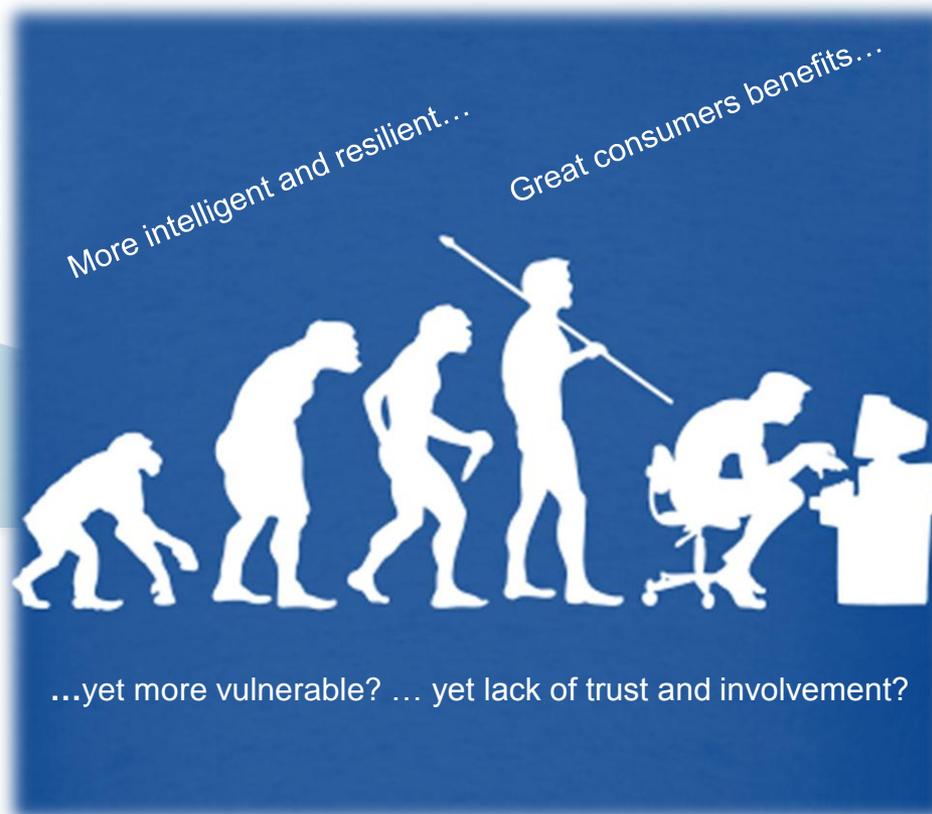
- ... have a role in EVs infrastructure in initial stages
- ... assume the handling of smart metering data

# The role of DSOs in a Smart Grid environment

- The current energy market will change through smartening the grid
- Introducing new actors to the energy system
- New tasks and responsibilities will emerge from existing and new actors
- As a consequence DSOs are facing new challenges
  
- Ecorys/ECN study focused on the role of DSOs in 5 key services
  - Flexibility services
  - Infrastructure provision for electric vehicles
  - Energy efficiency services
  - Ownership and management of smart meters
  - Data handling

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

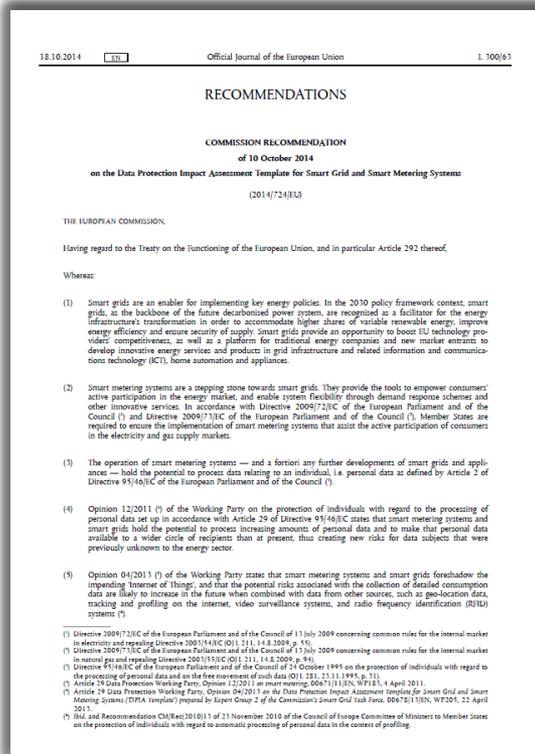
# Recap: Smart Grid Security and Privacy



- + Technological progress
- + Great consumer benefits

- Critical infrastructure
- Personal data

# Commission Recommendation on DPIA template



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

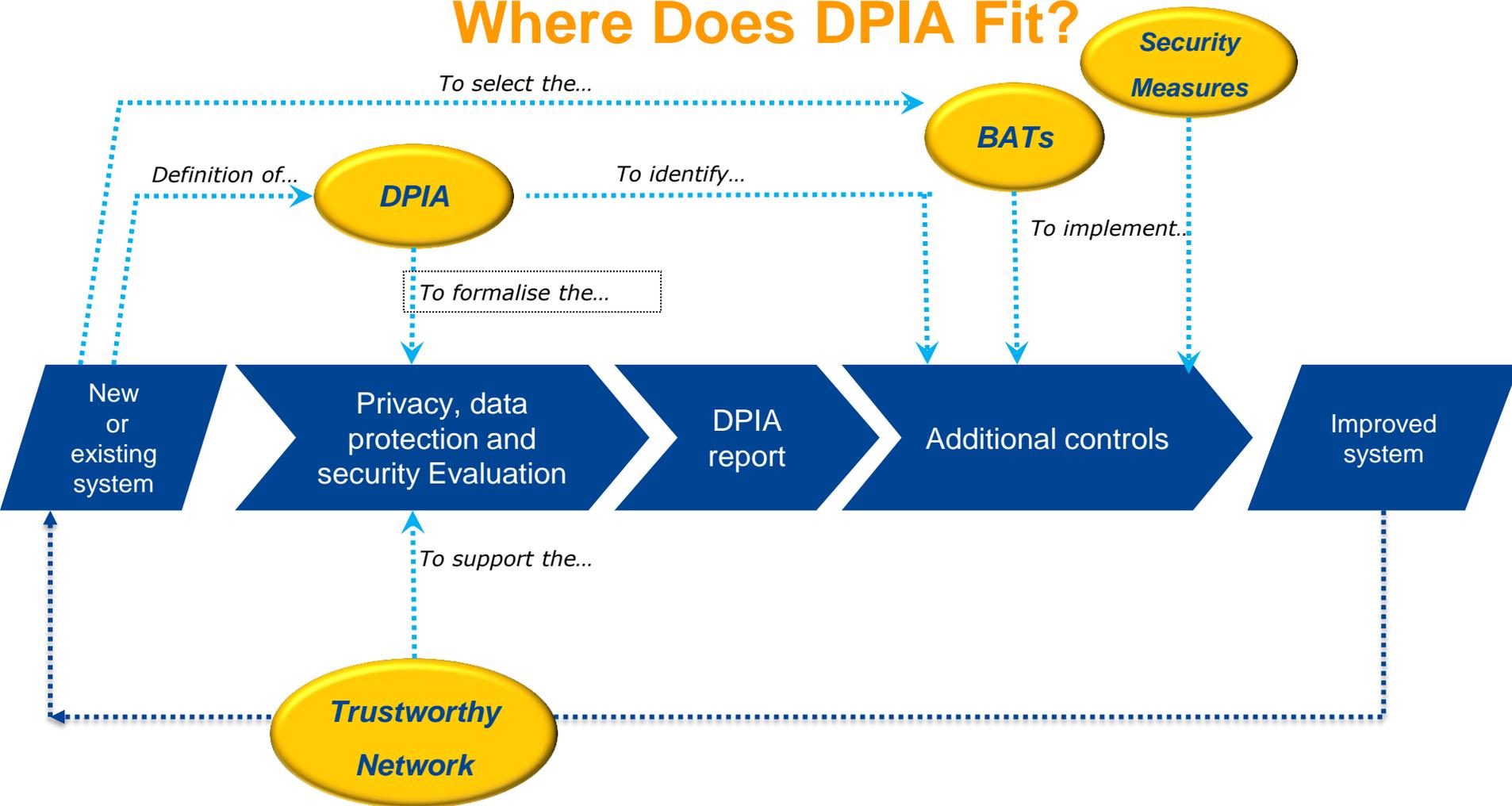
2014/724/EU

[http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:JOL\\_2014\\_300\\_R\\_0013&qid=1413790118102&from=EN](http://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=OJ:JOL_2014_300_R_0013&qid=1413790118102&from=EN)



European  
Commission

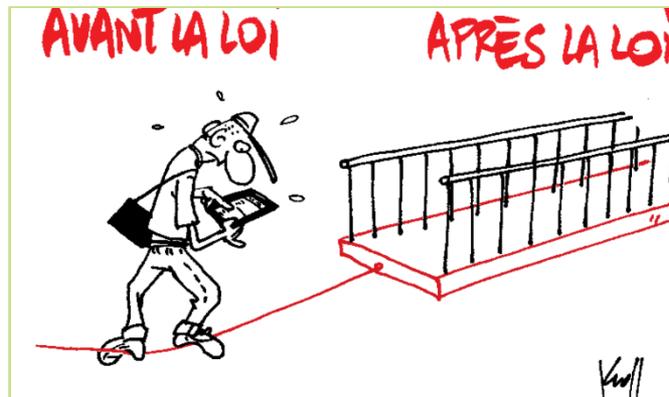
# Where Does DPIA Fit?



# Securing Consumer Acceptance: Ensuring data protection, privacy, security

## Data Protection

- Data Protection Impact Assessment (DPIA) template
- Data Protection Reform of Directive 95/46



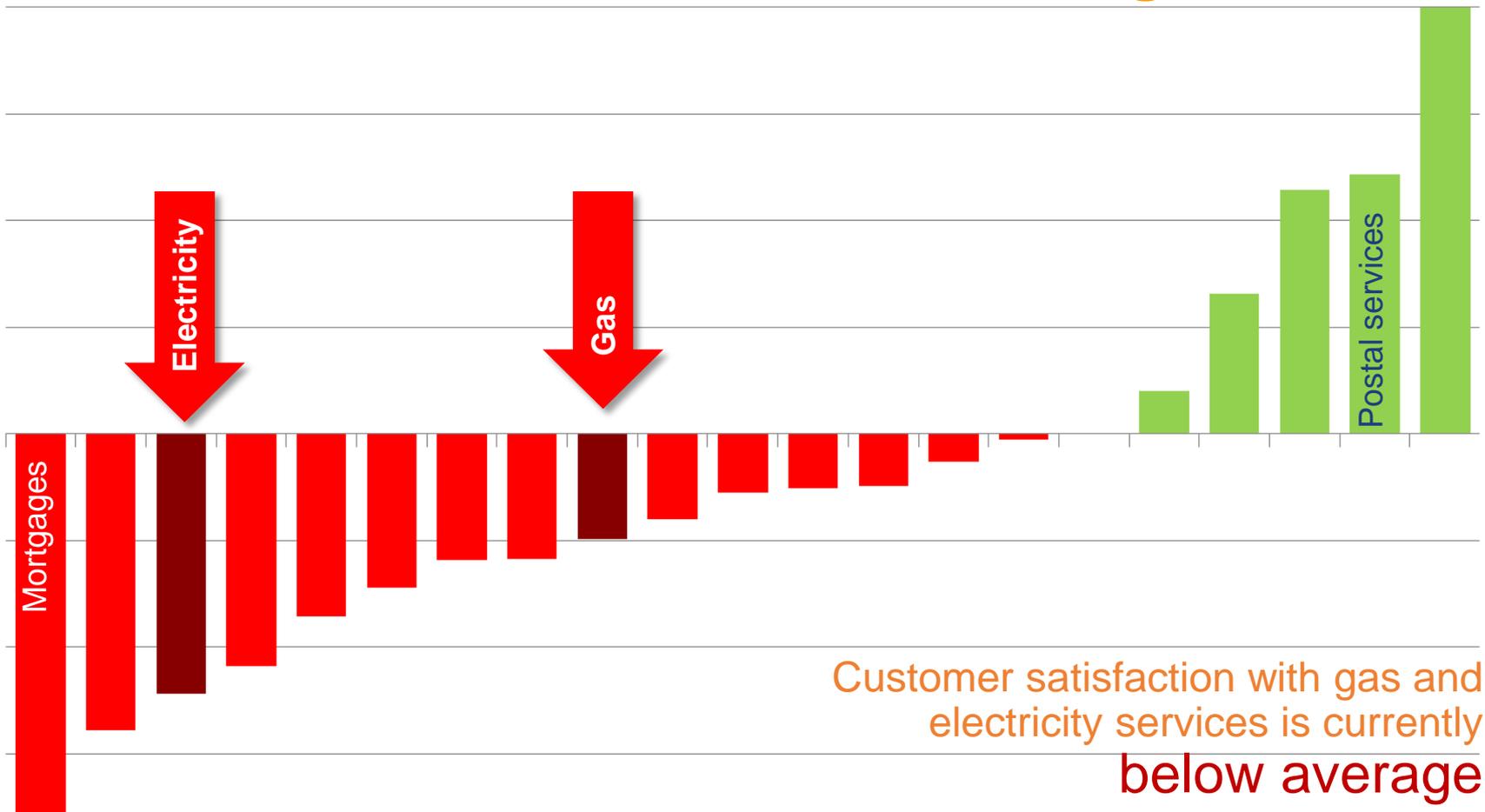
## Cyber-Security

- Identification of BATS for smart metering systems
- Trustworthy network
- Minimum Security Measures



European  
Commission

# Consumers Will be the Judge



**Thank You for Your Attention!**

**[http://ec.europa.eu/energy/index\\_en.htm](http://ec.europa.eu/energy/index_en.htm)**

