Hearing on CEER advice on demand response with smart meters
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Smart Meters

Key interventions for the rollout

1. Agreement on minimum functionalities
2. Standardization
3. Financial support

Smart meters: Agreement on minimum functionalities

Member states to agree on minimum functional requirements

- avoiding technical barriers,
- ensuring interoperability and enabling the
- introduction of innovative ICT-based applications for managing energy end-use".
- enable Member States to identify common means of achieving cost-efficiencies (and inefficiencies) in their roll-out plans
- serve Member States, the metering industry and utilities as a solid basis for their respective investments, facilitate the roll-out-associated procurement and provide regulators with European reference definitions

Joint action Commission (DGENER, DGINFSO) and ERGEG:

Questionnaire to Member States that have already carried out a Cost Benefit Analysis.
- Question: Has this functionality been included in your CBA?
- Question: What was its impact on the overall cost of the meter?
- Additional free comments

Report on good practices at the Citizen's Energy Forum in London in October 2011

Smart Meters: Standardisation

SMCG (M441) making good progress

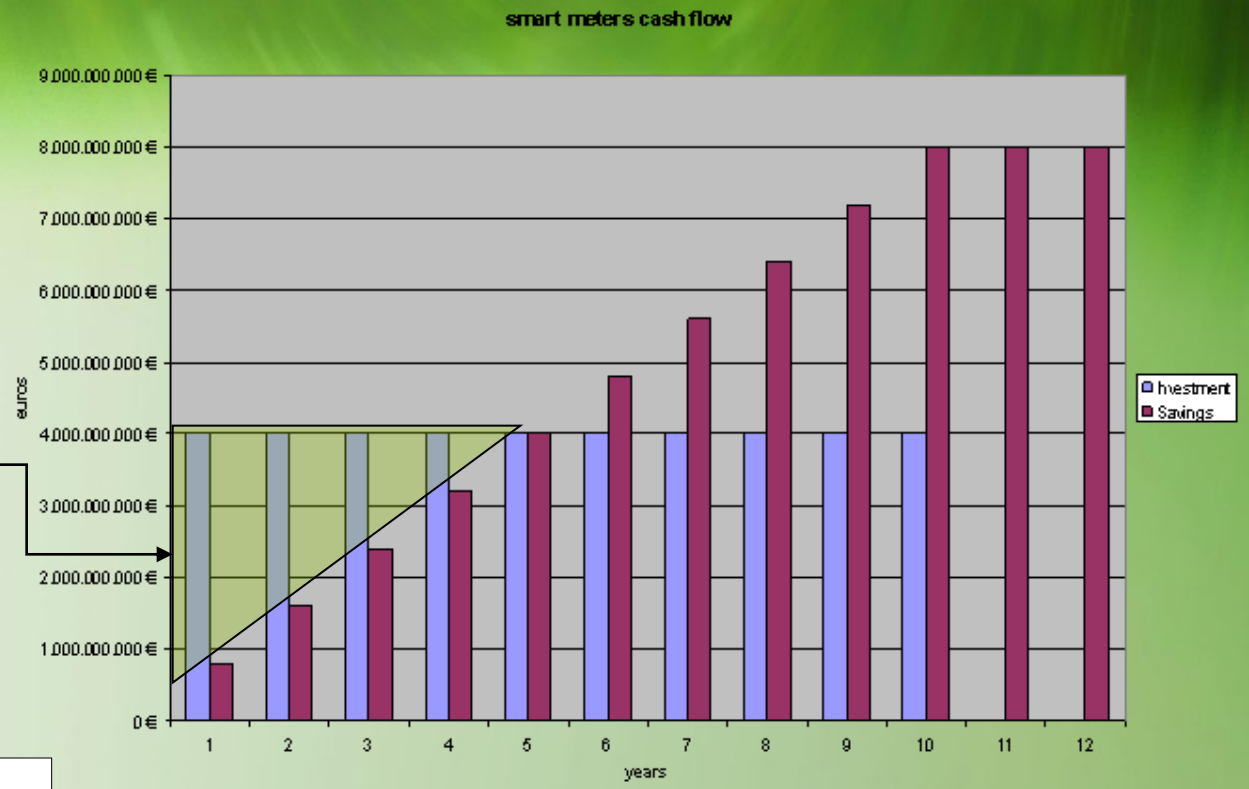
Large amounts of meters at building or district in the same hands
Connectivity standards are medium priority

Many options for display
Coding Language standards (data models) are high priority

Smart Meters: Financial Support

Working hypothesis:
200€ cost per meter
40€ savings in operations/y
200.000 dwellings in EU
10 years rollout

Financial gap
Short term loans



Proposal for a

REGULATION OF THE EUROPEAN PARLIAMENT AND OF THE COUNCIL

On a series of guidelines on broadband networks and digital service infrastructures in the field of telecommunications

A new fund, the **Connecting Europe Facility (CEF)**, aims to boost the pan European value of infrastructure projects. With € 40 billion at its disposal, and another €10 billion from the Cohesion Fund, it includes a preliminary list of transport, energy and ICT projects that bring more interconnectivity across Europe. These growth enhancing connections will provide better access to the internal market and terminate the isolation of certain economic "islands".

Demand Response

Ongoing works

1. Global Energy Efficiency challenges
2. Energy Efficiency management challenges
3. Demand Response: Drivers and scope
4. Funding Research and Innovation
5. DR Systems Approach

Global Energy Efficiency challenges

Horizon 2020

Reduce energy consumption and footprint through a smart and sustainable usage

Bring to mass market more efficient energy smart devices and appliances

Bring to mass market Energy Efficiency tools for buildings, services and industry.

Unlock the potential of efficient and renewable heating-cooling systems

Foster European Smart cities and Communities

Knowledge and tools for robust decision making and public engagement
Support of the SET-Plan, to develop robust and transparent tools, methods and models to assess the main economic and social issues related to energy; to build databases and scenarios for an enlarged EU and the assessment of the impact of energy and energy-related policies on security of supply, the environment and climate change, society and competitiveness of the energy industry; to carry out socio-economic research, in particular, on public engagement, public acceptance of new technologies, user involvement and economic, social and environmental sustainability.

Alternative fuels and mobile energy sources
Make bio-energy competitive and sustainable
Reducing time-to-market of hydrogen and fuel cells technologies
New alternative fuels

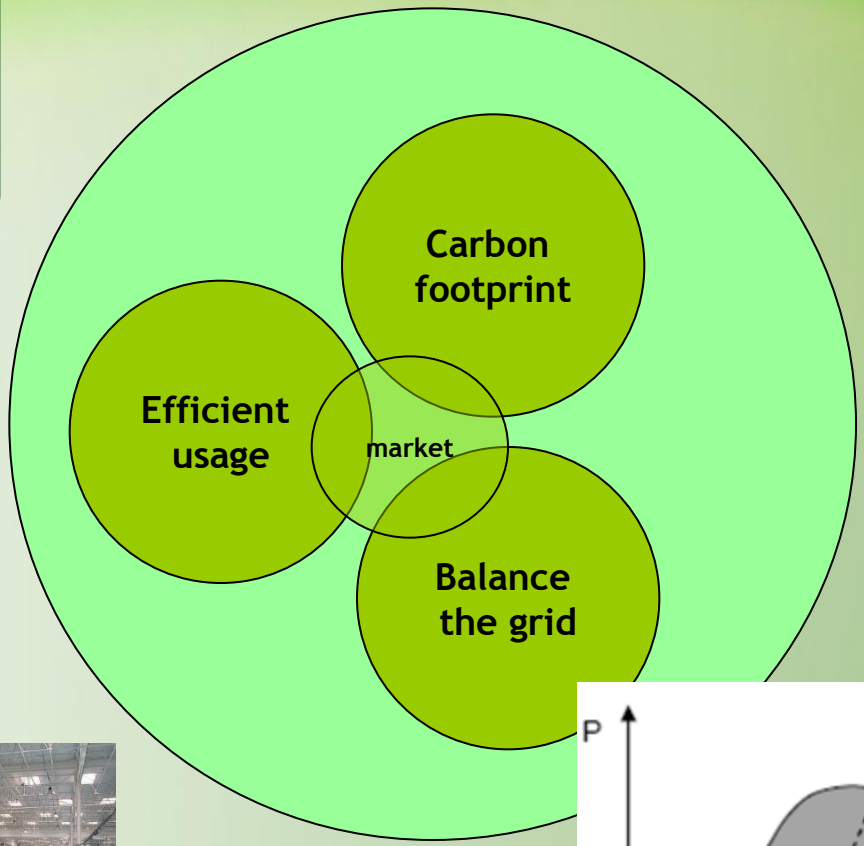
Low cost, low carbon electricity supply
Develop the full potential of wind energy
Develop efficient, reliable and cost-competitive solar energy systems
Develop competitive and environmentally safe technologies for CO2 capture, transport and storage
Develop geothermal, hydro and marine renewable energy options

Enable a single, smart European electricity grid
Transmission, Distribution, Storage
Management of the millions

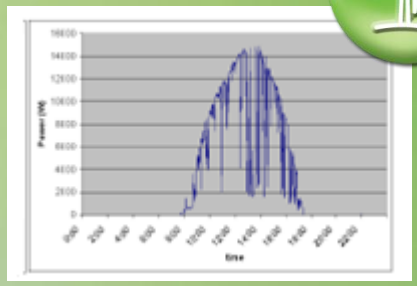
Discover new knowledge and technologies
Key Enabling Technologies (KETs) e.g. nano-science, material science, solid state physics, information and communication technologies, bio-science, computation.

Energy Efficiency management challenges: "managing the interactions of the millions"

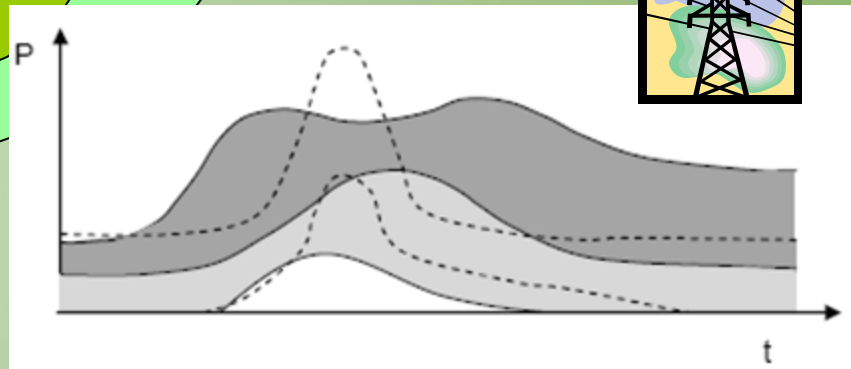
Users achieve same <u>comfort</u> or <u>productivity</u> with less consumption



Moving towards <u>renewable</u> production

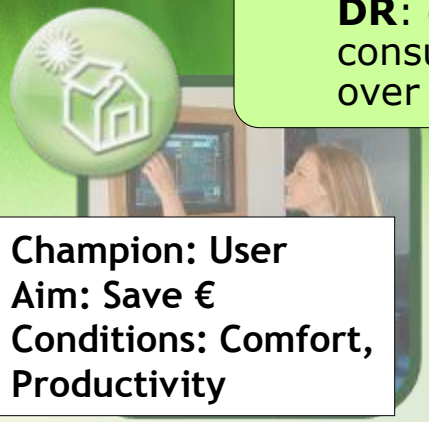


<u>Matching</u> the production with the consumption



Demand Response: Drivers and scope

DR: changes in electric usage by end-use customers from their normal consumption patterns in response to changes in the **price** of electricity over time



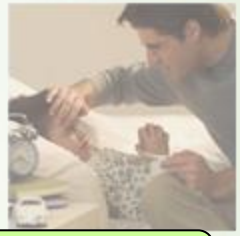
Champion: User
Aim: Save €
Conditions: Comfort, Productivity

Champion: Producers
Aim: Make €
Conditions: Not commit

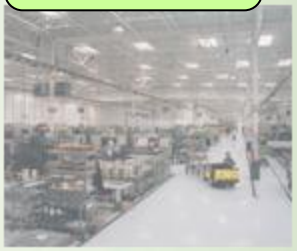
Moving towards renewable production

Champion: Government
Aim: Save CO2 and dependency
Conditions: Keep public costs, deliver

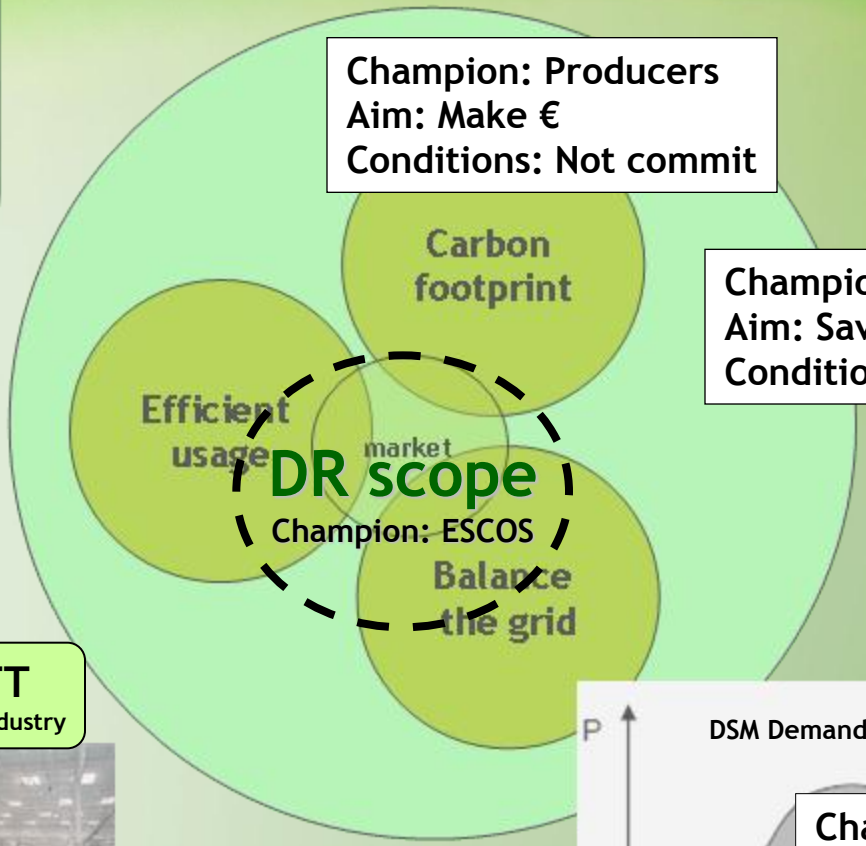
Users achieve same comfort or productivity with less consumption



EE-MFT
Champion: Industry



BEMS
Champion: Construction



Matching the production with the consumption

Champion: DSOs
Aim: Deliver
Conditions: Save € or Make €

Funding Research and Innovation

FP7 Objective ICT-2011.6.1 Smart Energy Grids

The integration of local renewable energy sources represents a key technical challenge. The successful combination of smart processes (e.g. demand side/response management, real-time consumption management) and smart technologies (e.g. smart meters, intelligent home energy management devices) will enable energy efficiency and savings to be achieved.

Indicative budget distribution:

- STREP: EUR 29 million
- CSA: EUR 1 million

Call: FP7-ICT-2011-8

OJ Reference: OJ C213 20 July 2011

Deadline: 17 January 2012

ftp://ftp.cordis.europa.eu/pub/fp7/ict/docs/ict-wp-2011-12_en.pdf

Objective ICT-2011.6.1 Smart Energy Grids

- **<u>Targeted Outcome</u>: Intelligent systems and integrated communication infrastructure that can assist in the management of the electricity distribution grids in an optimized, controlled and secure manner.**

- **<u>Key research challenges to be addressed</u>:**

- Strengthening the **distribution grid** by providing control systems, management and decision support tools that enable the integration of renewable energy sources, both large scale production (e.g. wind and solar farms) and massively distributed production (e.g. residential and tertiary buildings).
- Advancing **security and reliability**, as well as protection of equipment, fault detection and alert, and self-healing through development of the necessary high power electronics.
- **Data management infrastructures** to allow electricity production and consumption to be measured, reported and controlled (and eventually credited or billed).
- Home energy controlling hubs that will collect real-time or near real time data on energy consumption data from smart household appliances and **enable intelligent automation**.
- Building consensus on industry-driven **open standards** to ensure the interoperability of smart grids control and management systems.

Objective ICT-2011.6.1 Smart Electricity Grids

➢ **Expected Impacts:**

- Connection and operation of distributed and intermittent generators of diverse technologies enabled by ICT.
- Demand side and demand response management enabled by innovative decision support systems.
- Producers and consumers allowed to play a novel role in the management of their energy consumption.
- Quantifiable and significant reductions of energy consumption in the electricity distribution grid, leading to reduction of the overall environmental impact of electricity grids.
- Enhanced levels of reliability and security of electricity supply.
- For open standards, reinforced collaboration between the European electricity suppliers and distributors, energy equipment manufacturers of all sizes, and the ICT sector.

Demand Response IT systems approach

- **No END to END integrated systems.** Tools with clear business case and owner, DSOs, ESCOS, Building Managers, Habitants, cause interests are (partly) diverging and systems too complex.
- **Each actor to keep its independency**. Basic **competition principles** (who sets the price should not set the consumption).
- Soft approach. Systems that **encourage** behaviour.
- DR IT systems to support mostly **open energy market trade** and delivery mechanisms (trading languages and commercial data standards).
- Tools needed (examples):
  - Market forecast and simulation tools
  - Modelling user behaviour at large scale
  - Trading interfaces and languages between actors, eCommerce interfaces
  - eCommerce services ("energy shops")
  - Flexible distribution network managing tools to adapt to variable generation sources
  - Energy consumption analysis and assessment
  - Etc.
- Avoid "energy" proprietary IT approaches. Don't reinvent the wheel.
  - Semantic Web (for user Web Services and interfaces)
  - Internet of things (for connecting appliances)
  - Social networks (for education, social activities)
  - Broadband networks (for transmission)
  - Cloud computing