

European research experience and needs on smart metering

John Parsons
Project Coordinator
European Smart Metering Alliance

Contents

- European Smart Metering Alliance
- ESMA definition of smart metering
- Developments across Europe
- Research experience
- Field Trials
- Needs
- Conclusions

Project Objective



- To maximise the energy efficiency benefits of Article 13 of the ESD
- To reach consensus on the energy efficiency benefits of smart metering
- To develop and disseminate best practice
- To provide a forum for stakeholders to come together, resolve issues and speak for all stakeholders

Intelligent Energy  Europe

Project Participants



ESMA Principles

- Aim is to link smart metering with energy savings
- It is not a trade association
- It will represent the views of all stakeholders
- It is technology neutral
- It is evidence based
- Linked to other groups
 - Demand response
 - Renewables and distributed generation
 - Smart homes

ESMA Progress

- Alliance web site: “www.esma-home.eu”
- Alliance > 60 members
- Draft reports
 - Drivers and regulation
 - Impacts
 - Definition of smart metering
- Working on (amongst other things)
 - Barriers
 - Energy savings from previous trials
 - New energy products
 - Generic Cost Benefit Model
 - Smart Metering Application Guide

ESMA Definition of Smart Metering

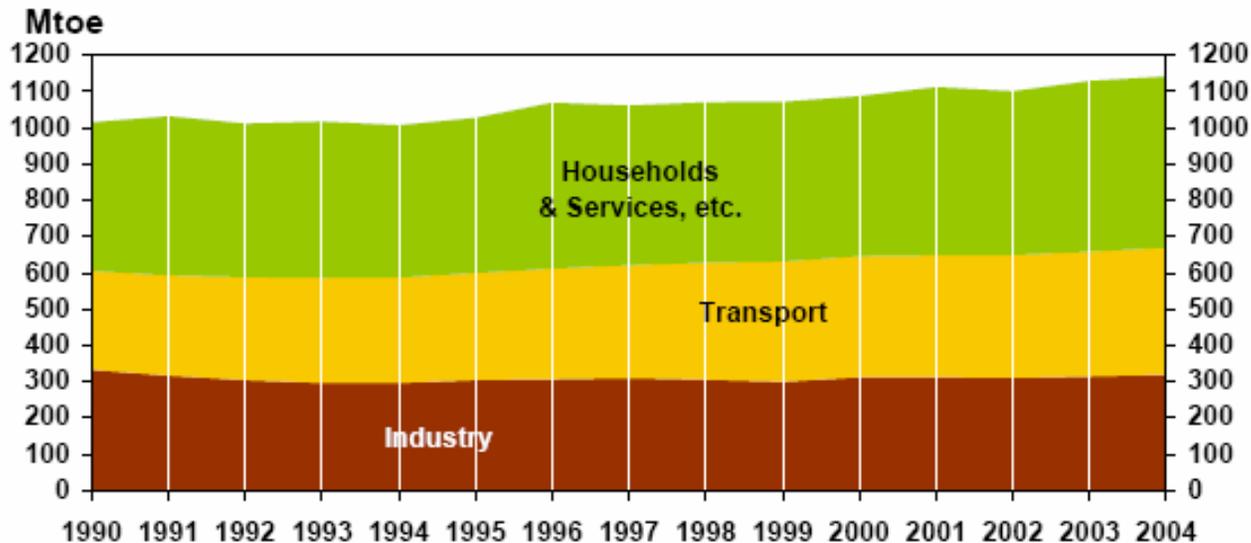
- Smart metering has the following features:
 - Automatic processing, transfer, management and utilisation of metering data
 - Automatic management of meters
 - 2 way data communication with meters
 - **Provides meaningful and timely consumption information to the relevant actors and their systems, including the energy consumer**
 - **Supports services that improve the energy efficiency of the energy consumption and the energy system (generation, transmission, distribution and especially end use)**

Smart Metering Drivers

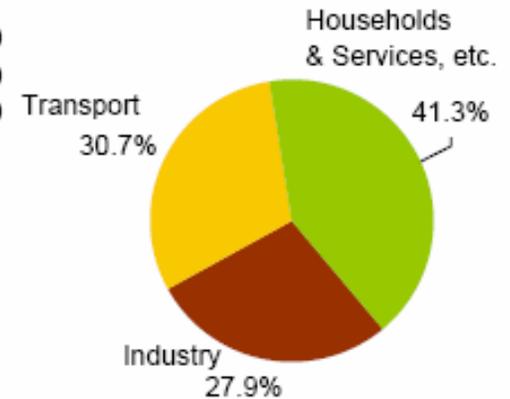
- ESD, Energy Efficiency and market liberalisation
- Demand Management and Response
 - Where electric heating and cooling is significant
- Customer Service
 - In UK 100,000 customers switching every week
- Service Offerings
 - Expectation that RESCS will move to Energy Service products
- Fraud

JRC Report on European Energy Use

Final Energy Consumption - EU25
by sector (Mtoe)



Year 2004



The Smart Meter Cost Benefit Analysis

- A range of costs and benefits each accruing to different participants
- Local conditions affect the balance of the costs and benefits
- The more privatisation, the more complex the balance
- Funding and support linked to environmental benefits is becoming increasingly important

Countries Committed to Smart Metering

- Italy
- Sweden
- Spain
- Netherlands
- UK
- France
- Finland
- Germany
- Norway
- Denmark
- Ireland

National Energy Efficiency Action Plans (NEEAP)

- Member States must:
 - Develop a plan to reduce national energy consumption by 9% over 9 years (2018)
 - Identify strategic plan and bottom up measures to achieve these savings
 - Web site lists responses
 - (http://ec.europa.eu/energy/demand/legislation/end_use_en.htm#efficiency)

NEEAP

- Finland
 - Residential Sector – 10% saving targeted
- Netherlands
 - Smart meters and feedback – 2% savings expected
- Lithuania
 - some mention, nothing firm
- Norway
 - Not a Member State so not on list, has committed to smart metering

Denmark

- “Already had a plan and has recently increased its targets In a typical household, **appliances on standby consume 10% of the total amount of electricity consumed**. This is equivalent to 400-500 kWh or between DKK 600-800 annually”
- **Heat key target**
- “Promote transparency of energy consumption. It must be easy to monitor individual consumption and to compare it with the consumption of others, for instance by using advanced meters”
- “Promote transparency, including by means of self-checking functions, meters with continuously show energy consumption for current and previous periods, etc”
- “Support research, development and demonstration projects in energy-efficient appliances and technologies that can help to **promote price-sensitive electricity consumption**, including the promotion of advanced meters and intelligent appliances”
- “The National Agency for Enterprise and Construction is responsible for a number of official, energy-related tasks in the construction sector. These duties include the energy provisions of the Building Regulations, regulations on individual metering of electricity, gas, water and heat, and regulations on efficiency in heat-producing systems”
- “In general, the energy efficiency activities **must be market-oriented**, and there must be **focus on realising the energy savings identified**. There must be focus on development of well-functioning markets for energy-efficient products and solutions. It must be easy for consumers to implement the savings identified, and the players must help with this implementation. At the same time, efforts **must be organised so that they promote market-based solutions, including the sale of energy services**”

Germany

Goal: Brisk spreading of new technologies in the liberalized current measurement for real-time consumption measurement as a condition for current savings.

Measures: The Federal Government will create the conditions for the fact that these technologies are increased used in particular in the trade:

- Complete opening of this range for the competition by an addition of the power industry law (power industry law and statutory order) as fast as possible. (At present the reading is still bound to the network user.)
- Creation of the necessary bases in the power industry law for the fact that intelligent electronic counters can be introduced also in favour of a variety of read-variable tariffs, first at trade and industrial customers, temporally transferred also at household customers, as far as they are economically meaningfully applicable. For the conversion a transition period is planned of six years, which is accompanied by a monitoring process over the results of the liberalisation.

United Kingdom

- “...implement a package of measures to improve metering and billing and get smart meters or visual display units into the domestic sector within the next decade.”
- Ofgem is working on an energy saving assumption of 1%

Clip-On Displays

- Electrisave & CurrentCost
- Pro's
 - Cheap
 - Simple to install
 - Doesn't depend on anyone else
- Cons
 - Less accurate than utility meter
 - Not simple to install
 - Less information
 - Less functionality
 - Single utility



Metering Trials

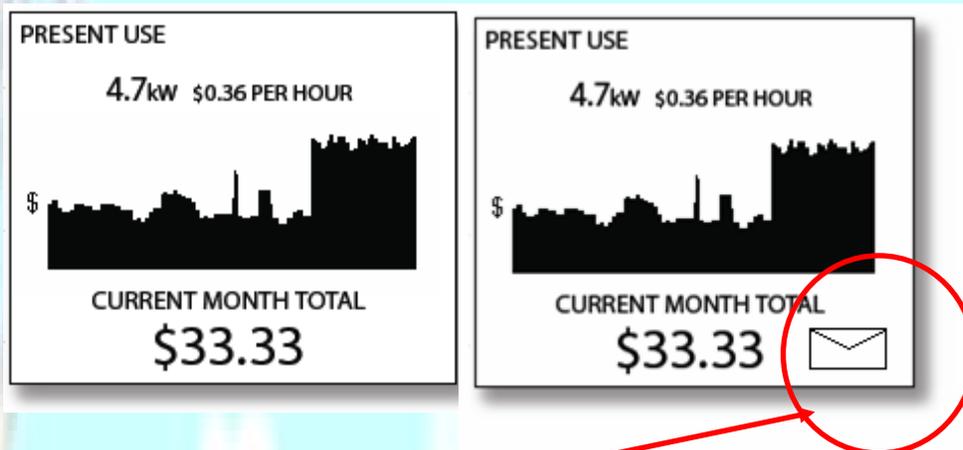
- Previous or on-going trials identified
 - Denmark
 - Finland
 - Norway
 - Latvia
 - Netherlands
 - Poland
 - Northern Ireland
 - UK
 - Italy
 - Portugal

Smart Metering Trials

- Italy
 - Customer display, expecting 10% saving
 - 1000 house trial starting late 2007
- Portugal
 - 2300 house trial starting soon
- UK
 - 41,000 house trial (when announced and including clip on displays)
 - Starting late 2007
 - Focus is only on energy savings – how much, how long, best methods
- France
 - 300,000 meters to be installed in 2 years

In Home Unit Displays

Default Display



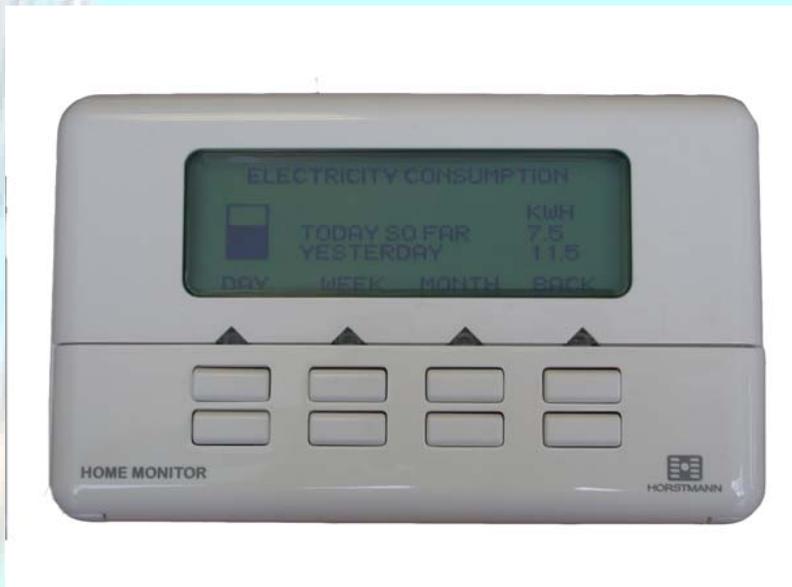
Messaging from Agents or Suppliers



Calibrated Load Indication by Coloured Lights

Smart Homes

Based on well established heating controls designs



The home monitor can show electricity, gas, water and Heat information

Current European Experience

- Some trials believed to have happened but not published
- Savings highly dependent on individual scheme and hard to compare – few major trials
- Different feedback mechanisms, different customer propositions
- Figures vary from 14% with high support down to 1.5%
- Reported that customers show little interest after initial enthusiasm

Needs

- High quality data from smart metering trials
 - Need good data about the trial set up
 - Need access to detailed data
 - ESMA producing guidelines for setting up smart metering trials
- Need research into obtaining customer reaction
 - What channel?
 - What works / what doesn't work?
- Need to engage with energy agencies and others to explore potential for energy reduction based on smart metering
 - Using feedback as a means of increasing the effect of other measures
- Links to demand response groups
 - what do you need? How many registers, what products??

Conclusions

- Smart metering is happening
- Energy efficiency is important for sharing costs at the moment
- Demand response is a key driver
- Important to meet the needs of demand response in smart metering implementations
- Need research into making the most of the energy potential for smart metering