SMART METERING BENEFITS FOR EUROPEAN CONSUMERS AND UTILITIES

THE USMARTCONSUMER Project

ANSWER ALL YOUR QUESTIONS

Year 2017
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THE EUROPEAN DEVELOPMENTS IN SMART METERING

The incorporation of new information and communication technologies in the electricity network is turning the consumers - traditionally passive end-users - into active players.

Member States are required to ensure the implementation of smart metering to consumers under EU energy market legislation in the Third Energy Package.

Only informed consumers will take full advantage of their smart meter, gaining benefit by changing their consumption pattern and making better choices in the market.
THE EU DIMENSION OF SMART METERING

Member States are required to ensure the implementation of smart metering to consumers under EU energy market legislation in the Third Energy Package. This implementation may be subject to a long-term cost-benefit analysis (CBA). In cases where the CBA is positive, there is a roll-out target of at least 80% market penetration for electricity by 2020.

By May 2014, Member States committed to rolling out close to 200 million smart meters for electricity and 45 million for gas by 2020 at a total potential investment of €45 billion. By 2020, it is expected that almost 72% of European consumers will have a smart meter for electricity while 40% will have one for gas. Up to date, 80 million smart meters have been installed in the EU28 and Norway, which constitutes 30% of the overall European electricity metering points.

The goal of USmartConsumer is to promote utilities smart meter rollouts and innovative smart metering services to consumers, that have the potential to achieve energy savings and peak load reduction in Member States. In order to do so the project has promoted the smart metering and innovative services throughout Europe, identifying the current national regulations and the offered smart metering services.
COUNTRIES INVOLVED AND PROJECT PARTNERS

To get more information from our project, you may contact: Francisco Puente, Escan energy consulting (fpuente@escansa.com) or visit us at: www.usmartconsumer.eu

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The EU smart meter roll-out keeps a steady progress forward, but within very different operational environments and speed in each member state. Sweden and Italy are the exceptions with fully rollout since years.

Countries with a clear mandatory regulatory framework and/or positive cost-benefit analysis are reaching their targets according to national plans (Denmark, Finland, France, Ireland, Norway, The Netherlands, Slovenia, Spain or UK). Some other countries which have more neutral cost-benefit or policy support was weaker at some point are progressing slower (Austria, Germany or Poland) but with a clear path.

Countries without mandatory smart meter roll-out (Portugal), negative cost-benefit for massive or specific scenarios (Czech Republic, Belgium), those with conclusions on their cost-benefit analysis indicating possible negative results for the proposed scenario (Belgium, Slovakia) or those with lack of a clear legal framework (Bulgaria, Croatia, Latvia, Lithuania) are facing delays.

The average situation in Europe is now in the "Dynamic Movers" area. This means that both the average legal and regulatory framework and the market conditions for smart metering services are in the 60% considering the overall European Union situation. Compared to 2014, this indicates a 12% positive progress in the EU, and over 25% if compared to 2013.

The primary drivers for rolling out smart meters are EU legislation, energy efficiency and network modernization. Most of the roll-outs are based on a clear regulatory push and implemented by the DSOs (except in UK where the retailer is in charge). Also, some roll-outs are primarily based on business cases such as reducing non-
technical losses, increasing operational efficiency, or gaining competitive advance.

- Smart metering is an enabling technology but needs to be coupled with innovative customer-oriented services to realize all its potential benefits and to create the basis for better demand side energy management and smart grids. In this, consumer engagement is a major driver.

- The wider progress in the European countries’ roll-out shows the need for further and clearer debates among the market actors, involving utilities, consumer representatives, public administrations, regulators and equipment and service providers. At this stage, it is clear that for smart meters to realise their full potential in each EU country, there is need to create a clear roll-out plan, undertake a cost-benefit analysis and establish a common understanding on how the consumers’ information is going to be managed to benefit both the energy companies and the own consumers.

- At the same time, favourable market conditions have to be created for new services, products and entrants, as these are needed to reap the full benefits of smart meters. The market for using smart meter data and functionalities to create added value for consumers should be supported with the right quantity and quality of regulation and by reasonable energy market procedures.

- Three important differences outstand between gas and electricity smart meter rollouts which might make more difficult for a gas smart meter rollout to have a profitable cost-benefit analysis in some EU countries. Firstly, it would need an electricity supply (the electric meter already has it). Secondly, the cost of natural gas is lower reducing the potential economic savings, and lastly there are no natural gas demand “peaks” as identifiable as the ones found for electricity demand.
The Energy Efficiency Directive (EED, 2012) and guidance notes require that final customers for electricity, natural gas, district heating, district cooling and hot water should have a competitively priced individual meter that accurately reflects their energy consumption and provides information on the time of their energy use.

- When introducing smart metering systems for electricity and natural gas, information must be provided on actual time of use, energy efficiency and benefits for final customers must be fully taken into account, data communication must be secure and privacy must be in compliance with EU legislation and appropriate advice and information must be given to final customers with regard to monitoring of energy consumption.

- Member States should develop consumer information and empowering programmes to promote and facilitate an efficient use of energy by small energy customers. These measures shall include one or more of the following elements: (i) fiscal incentives; (ii) access to finance, grants or subsidies; (iii) information provision; (iv) exemplary projects; (v) workplace activities.

- Final customers still with traditional individual meters (not smart metering) should normally be told at least every 6 months how much they will be billed for the energy they used in the last period – every 3 months if they ask for it or are billed electronically.
The Directives on the Internal Market for Electricity and Gas (Directives 2009/72/EC and 2009/73/EC) included in the Third Energy Package, require Member States to ensure the implementation of intelligent metering systems to assist the active participation of consumers in the electricity and gas supply markets.

- As regards electricity, where an economic assessment of the long-term costs and benefits has been made, at least 80% of those consumers who have been assessed positively have to be equipped with intelligent metering systems for electricity by 2020. Where no economic assessment of the long-term costs and benefits is made, at least 80% of all consumers have to be equipped with intelligent metering systems by 2020.

- As regards natural gas, no deadline is given but the preparation of a timetable is required, subject to an assessment of long-term costs and benefits. The Directives also state that final customers must be properly informed of actual electricity/gas consumption and costs frequently enough to enable them to regulate their own consumption.

- The Directive on internal markets (2009/72/EC), demands that, in order to promote energy efficiency, Member States or regulatory authorities shall strongly recommend that electricity undertakings optimise electricity use by, for example, introducing intelligent metering systems or smart grids.

The recast of the Energy Performance of Buildings directive (2010/31/EU, EPBD) includes a provision on the introduction of intelligent metering systems. It specifies that Member States shall encourage the introduction of intelligent metering systems whenever a building is constructed or undergoes major renovation. Additionally, Member States may encourage the installation of active control systems such as automation, control and monitoring systems that aim to save energy.
Market activation

Smart metering landscape

In order to accelerate the development of the market for innovative smart metering services, USmartConsumer published two editions of the "European Smart Metering Landscape" report. This report presents detailed information from proven sources of information and provides both an analysis of the current situation of smart meters in Europe and an overview of the services offered to consumers to change their consumption pattern and move off the peak load. Differential conclusions from all EU Member States and Norway are included.

The first edition was published in 2014 and the second edition was published in November 2016 with a great impact on events and media, being widely presented at the European Utility Week in Barcelona.

The latest edition showed that smart metering has reached an early maturity stage with massive deployments of smart meters in a large part of Europe. "In 2016 the massive deployment of smart metering in Europe has been ratified, with a cumulative number of 80 million smart meters (out of a total of 300 million residential customers), which is a breakthrough in innovation for our society ". They are the main conclusions of the "European Smart Meter Landscape" Report 2016, according to the project coordinator USmartConsumer, PhD. Francisco Puente.

Almost a third of EU electricity customers had a smart meter by the end of 2016, a share that will double in the next five years. Most of these equipment are now in France, Spain, the United Kingdom, Austria and the Netherlands. Sweden, Finland and Denmark have already installed smart meters for all or most customers. If they include deployments in central and eastern Europe, the penetration rate in the EU is expected to be about 60 percent by 2020. Germany will gradually introduce smart meters, starting with target groups that consume more than 6,000 kWh at year. For households using less (approximately 90%), the installation of an intelligent meter will be voluntary.
Market analysis with segmentation

Another tool for market activation was the publication of market analysis with segmentation. This research, carried out in 7 Member States, shows the latest perceptions of customers' needs and expectations, translated into representative consumer segments and related to their behaviour.

Consumer Protection

On the basis of recent experiences in Member States and lessons learned, such as in the Netherlands and Finland, a consumer protection framework document has been developed, providing valuable information for stakeholders in other countries to assist acceptance of smart meters installation. In addition, this document calls for close collaboration between all stakeholders to help other member states in developing their regulatory frameworks thus contributing to consumer satisfaction and increasing energy efficiency.

The framework document for consumer protection can inspire other countries to anticipate and avoid setbacks that could prevent the EU objective of ensuring at least 80% of European consumers are equipped with a Smart meter by 2020.
Monica Štajnarová, representative of the European Consumer Organization BEUC, presents a checklist on the benefits of consumer smart meters.

The importance of rights and consumer protection was also the focus of the European seminar in Warsaw in September 2015. The European Consumer Organization (BEUC) stated that EU consumer associations support smart measurement on the basis of that Europeans are well protected and strengthened in the future smart energy markets.

To ensure these interests, the installation of the smart meter must be free, related to a real and accurate billing, consumption data must be adequate (accurate, understandable, updated, in an easy-to-understand format and include monetary information).

It is also necessary to consider the protection of privacy and compatibility and interoperability, to deal with future technological innovations.
COUNTRY SPECIFIC INFORMATION

Smart metering is an enabling technology that needs to be coupled with innovative customer-oriented services to realize all its potential benefits and to create the basis for better demand side energy management and smart grids. In this, consumer engagement is a major driver.

Each USmartConsumer partner country has delivered specific actions which are presented in this document.
In October 2011 the Energy Regulatory Authority (E-Control (2011)) issued a decree according to the Electricity Act which determines the functional requirements of smart metering systems in Austria. As expected by the stakeholders, the regulator mainly determined in this decree the topics mentioned in a catalogue with minimum function requirements for smart metering systems, which was already published in June 2010 for public consultation. In spring 2012 E-Control published a proposal for the mandatory information of customers equipped with a smart meter. This regulation entered into force in January 2013.

In an amendment of the Electricity Act in August 2013 the possibility for customers to opt-out was set by the legislator. There are 3 categories of meters:

1. Smart Meter “Opt in”: approval by the customer is necessary (metering and storage in 15 minutes interval; 60 days storage of the data, remote interruption and unblocking possible; only the actual meter reading is visible at the display)

2. Smart Meter with its basic functionalities (metering and storage of daily data; apart from that like Opt in”)

3. Smart Meter “Opt out” (no storage of metering reading in the meter; only transmission to the network operator; transmission of data possible, when provider change, change of tariff, move), no remote reduction of performance or switch off; no charts about the consumption data)

On 24 April 2012 the Minister of the Economy issued a decree, which determines the mandatory timetable for the rollout of smart metering services in Austria (BMWFJ (2012)). The new decree will accelerate the rollout of smart meters. The main rollout of smarter can be expected in 2016 and 2017. The electricity network operators have to equip at least 95 per cent of all metering points by the end of 2019.

In September 2014 the Minister of the Economy communicated a legislative proposal to weaken the targets for the mandatory roll-out. The 10% target by 2015 should vanish.

In the meantime it is clear that the 95% goal by the end of 2019 will be failed. The regulator estimates that less than 70% will be reached.

In spring 2013 the Regulatory Authority E-Control carried out the first monitoring of the implementation.

In the actual monitoring report it is stated that in Austria 456,000 smart meters are installed which constitutes 7,4% of the metering points (versus 2014: 4,9%), and 740,000 smart meters are either installed or already ordered which constitutes 12,1% (versus 2014: 6,3%).
National Consumer Campaign

Making use of the market activation tools and with the help of consumers associations, regional or even national information and media campaigns have been designed and initiated to activate consumer interest and engagement in accessing energy information from the smart meter for energy savings, peak load reduction and integration of renewable energy. In order to reach massive numbers of consumers, the campaign concept included training of representatives from consumers associations and instruments such as news articles, press conferences, mailings, social networks (Facebook, Twitter) etc.

In Austria the focus of the consumer campaign was put on the communication of advantages and possible new services going together with smart metering. It has to be mentioned that the development of the Austrian market for smart metering is standing at the beginning, roll-outs are still running and there are hardly any services available for customers. Therefore it was important to inform and convince consumers and consumer organisations about the potentials and benefits of smart meters and related services.

A brochure and posters were produced and disseminated concentrating on the positive aspects of smart metering. Those advantages are also stressed in two youtube-videos spread over the channels of partner organisations. So the message of the Austrian campaign could be transmitted successful through online and offline media channels.

The poster was created as an eye catcher

Two videos were produced for youtube

In the workshop for consumer representatives organised in April 2015 in Vienna participants from the regulator, utilities, network operators and the Austrian chamber of labour came from all over Austria to Vienna to discuss the pros and cons about smart metering and its role for the Austrian
energy market.

In cooperation with the Austrian energy supplier aWATTar – an innovative start-up company offering flexible tariffs for smart meter households – a short survey was conducted. aWATTar clients were asked how satisfied they were with the service offered. In the expo energy fair in Wels, which is Austria’s biggest consumer fair, aWATTar disseminated the USmartConsumer brochure and had two speeches in the official programme also mentioning content of the project.

**Action in the field**

To foster a market driven uptake of smart metering services, USmartConsumer also focused on practical cooperation with energy utilities and energy service providers to develop new and further enhanced services - such as informative billing and feedback, variable tariffs and load control services - that are most potential to bring energy savings, peak load reduction and integration of renewables to consumers. In cooperation with the energy utilities, and considering the feedback on consumer’s needs, national and regional ‘action in the field projects’ were developed, executed and evaluated to be disseminated as examples for developing better consumer-oriented smart metering services in other Member States.

Due to the Austrian situation one focus of the activities in the ‘action of the field’ was to improve the regulatory conditions for the offering of variable tariffs. The development of flexible tariffs as one possible service for customers with smart meter is a crucial element for the optimized system integration of renewable energies. In addition to the regulatory questions the benefits of flexible tariffs were promoted by a cooperation with the start-up energy supplier aWATTar.

Simon Schmitz, CEO of aWATTar, giving his speech on the expo energy in Upper Austria
## Legal and regulatory status

The regulation adopted in 2009 demands smart meters capable of hourly remote metering for at least 80% of all customers by the end of 2013. The DSOs are responsible for the roll-out, reading the meters, and reporting and forwarding the meter data.

From the beginning of 2014, hourly consumption data had to be made available on the next day to the customer, electricity supplier, and also to a 3rd party if authorised by the customer.

The regulator has defined minimum functional requirements for the metering system, including hourly metering, two-way communication, standardized connection for real-time electricity consumption, and load control abilities. According to the regulation, the balance settlement has to be based on hourly consumption values.

The Finnish TSO Fingrid Oyj is developing Datahub for electricity meter data exchange and market processes in the Finnish electricity market, estimated to be operational on 1st August 2019.

## Implementation status

The first DSOs started a widespread roll-out already in the early 2000’s. Electricity smart meter rollouts are now completed and nearly 100% of consumers have smart meters and access to their hourly consumption data through online services and apps offered by DSOs and suppliers.

Suppliers and other market players have brought new smart metering-based services and products to the market, such as in-home displays and other real-time feedback solutions, demand response and smart home products. For example, customers with electric or oil heating can have automated demand response services adjusting their heating to the cheapest hours in the electricity spot-market. All consumers can now have hourly tariffs based on the Nordpool Spot market price, from over 50 different suppliers.

In district heat, over 80% of meters are remotely readable, with a major part delivering hourly data and the rest monthly data. Most of the suppliers have on-line district heat consumption reporting available, while some deliver hourly district heat data and others monthly. Utilities also provide monthly district heat consumption reporting to their customers via informative bills.
National Consumer Campaign

Making use of the market activation tools and in cooperation with the national and regional consumer associations, information and media campaigns have been designed and initiated to activate consumer interest and engagement in accessing energy information and services from the smart meters. In order to reach massive numbers of consumers, the campaign concept included training of representatives from consumers associations and instruments such as news articles, press conferences, mailings, social networks (Facebook, Twitter) etc.

In Finland, the consumer engagement campaign was designed and carried out in cooperation with several associations and organisations, including the Consumers’ Union of Finland (CUF), the main consumer organisation covering tens of regional and national associations related to consumers. In cooperation with CUF, a national press conference and event on smart metering and consumers was organised in October 2015, covering several aspects including consumer needs and expectations, regulation, currently available services and their benefits, as well as possibilities now and in the future for consumers.

Consumer event organised in cooperation with CUF in Helsinki in October 2015

The campaign included producing consumer material on smart metering and related services and benefits and communication through several press releases articles and blog texts and active Facebook account and Finnish webpage.

Sähkölasku hallintaan
Hyödynnä etälueettavan sähkömittarisi mahdollisuudet
Campaign material on smart metering for Finnish consumers

Several regional consumer events and trainings were held, as well as trainings for regional energy agencies and energy advisors. Extensive dissemination of campaign materials was carried out to consumer organisations, energy industry, energy companies, Motiva and regional energy agencies and advisors.

**Action in the field**

To foster a market driven uptake of smart metering services, USmartConsumer also focused on practical cooperation with energy utilities to develop new and further enhanced state-of-art smart metering based services to consumers. These included informative billing, indirect and direct feedback (websites, mobile apps and displays), energy efficiency tools and incentives, variable tariffs and home energy management systems. The activities were carried out in seven European countries: Austria, Finland, Germany, Italy, Poland, Spain and UK.

In Finland, the project worked with energy utilities to develop their information and feedback services to consumers and with Kangas area development project to develop new smart metering and energy management solutions for the residents of the area.

The main action included developing smart metering based energy efficiency services of Elenia, the second largest electricity distribution system operator (DSO) in Finland, to better match the needs of their consumer customers and according to experiences and best practises in the field. The cooperation focused on their Elenia Aina on-line and mobile services offered for their 420 000 consumer customers. The cooperation included benchmarking Elenia’s current services to other Finnish utilities and best practises, implementing a customer study on their customers’ needs and expectations and making a development plan for their services. Also energy savings resulting from the services were evaluated.
indicating positive effect for consumer customers' energy efficiency.

After the action, conclusions were made on how consumers accept and react to the available information and feedback service services, and how the services and customer interaction should be improved to achieve better consumer engagement and energy savings.

New Elenia Aina online and mobile services for energy information and feedback. Introduced already in 2010, Elenia is constantly developing their services to better engage and motivate consumers.

In the Kangas area, USmartConsumer project developed concepts, implementation plan and guidelines for smart metering and smart home solutions and cooperated with the main actors (city, developers, energy utility and solution and service providers) in developing new services for the residential buildings in the area. As a result, definitions of Smart Kangas solutions were created, aiming for as real-time as possible energy and water metering and making consumption visible and energy use controllable through energy management solutions for the residents, enabling also demand response.

Kangas is the main urban development project of the City of Jyväskylä for the next several decades, with the aim to be a city of the future with low carbon and resource wise solutions. The area is expected to have 5000 residents and 2100 workplaces when completed.
On 8th of July 2016 the law on the digitization of the energy transition ("GesetzzurDigitalisierungderEnergiewende") was passed. The beginning of the rollout is planned for January 2017.

The legislation and the rollout are a result of a cost-benefit analysis commissioned in summer 2013 by the Ministry of Economy. This CBA came to the conclusion that the widespread rollout of smart metering systems in Germany is not economically feasible until 2020.

Therefore, the law provides equipment required for a conditional rollout. In the first step, only large customers with a consumption of over 10,000 kWh and renewable energy generators distributed generation above 7 kW of installed capacity have to install a smart meter ("intelligenteMesssysteme") to measure their electricity consumption.

From 2020 the rollout scheme includes consumer with annual electricity consumption higher than 2,000 kWh. Furthermore as modern measuring ("moderneMesseinrichtungen") devices are seen as obligatory basic equipment, the EnWG provides the mandatory installation in new buildings, at major renovations and at the regular exchange of old meters ("Ferraris").

These measuring devices are digital electric meter with a better illustration of consumption which can be integrated via an interface to an intelligent measurement system, if necessary.

With the adopted government bill on the digitization of the energy transition, the legal and regulatory basis for the installation of smart meters is specified. Currently delays in the widespread adoption of smart meters may occur.

This is especially due to the fact that there is currently a lack of clear definitions of the technical and organizational requirements to ensure data protection and data security. The Federal Office for Information Security (BSI) was not yet far enough with its certification work for a timely introduction of smart meter devices.

The Federal Network Agency ("Bundesnetzagentur") is currently working on a transition model for the data communication. However it is seen quite critical to start with the distribution of the meter in the beginning of 2017 as laid out in the law on the digitization of the energy transition.

The altered access to meter data is in the current debate about the digitization law one of the main points of contention between distribution network operators (DSO) on the one side and the transmission system operators (TSO) on the other side. By now a compromise has been found which enables both DSO and TSO to access the data.

In recent years, a number of German utilities have begun testing smart meters in pilot projects. Most studies currently give only information about the savings with reference to the installation of smart meters. The studies show that consumer interest on own energy consumption after the initial euphoria decreases greatly and thus remain the energy savings far below expectations.
National Consumer Campaign

Making use of the market activation tools and with the help of consumers associations, regional or even national information and media campaigns have been designed and initiated. Their aim was to activate consumer interest in smart metering and in energy efficiency. In order to reach massive numbers of consumers, the campaign concept included training of representatives from consumer associations and instruments such as news, articles, press conferences, mailings, social networks (Facebook, Twitter) etc.

In Germany, the project partners designed an information campaign. Throughout the campaign, they held close contact with DIN Consumer Council, an organization representing consumer interests in national, European and international standardization, and with Energiesparzentrale, a regional institution which helps consumers and gives advice for all efficiency-related questions.

Seminars, workshops and conferences were an integral part of the campaign in Germany.

The first regional conference was solutions.hamburg in September 2015. 300 industry and university representatives attended this conference, in which USmartConsumer was represented in a panel discussion bringing together experts from Silicon Valley, Shenzen and Hamburg.

The second conference took place in October 2015 in Berlin. Called “European Forum on Smart Metering and Data Management for Utilities and Industry”, the conference brought together 30 European DSOs, utilities and market regulators.

![Workshop with the WEMAG customer council in November 2015](image)

The workshop “smart meter – smart what?” was a training workshop for private consumers, which was held at the WEMAG customer council in November 2015.

Moreover, a seminar with key market actors was held at VKU (Verein kommunaler Unternehmen) in November and December 2015. The VKU is the German association of local utilities of municipally determined infrastructure...
undertakings and economic enterprises.

As part of the campaign, press articles were published. One article in TAM News, a well known and highly regarded German news feed for the energy industry, dealt with the USmartConsumer project and revealed the actions WEMAG and REE! had done at that point. It reached about 1,200 readers.

Another article in the WEMAG customer magazine reached about 375,000 readers. The article reported from the seminar “smart meter – smart what?”, which was held at the WEMAG customer council.

Besides these articles, the local radio station in Hamburg, TIDE 96.0, broadcasted the first radio—based story about smart metering in its session “TIDE aktuell”. The interview focused on pros and cons of smart metering and the legislative background. It reached up to 30,000 listeners.

To support all measures, 100 A2 posters and 2,500 A5 brochures were displayed at workshops, seminars, conferences, at the Energiesparzentrale and at DIN Verbraucherrat. They promoted the projects and aimed at a large group of experts and public consumers.

Poster “Become a smart energy consumer”

Due to the changed approach in Germany, the development of specific products or services lag behind that in other countries. As
there will not be a roll out for residential consumers using less than 6,000 kWh, the project partners focused on energy efficiency information. Nevertheless, many meetings with key market actors were fruitful and led to co-operations.

Action in the field

To foster a market-driven uptake of smart metering services, USmartConsumer also focused on practical cooperation with energy utilities to develop new and further enhanced services such as informative billing and feedback, variable tariffs and load control services that are most potential to bring energy savings, peak load reduction and integration of renewables to consumers. In cooperation with energy utilities, and considering the feedback on consumer’s needs, national and regional ‘action in the field projects’ were developed, executed and evaluated to be disseminated as examples for developing better consumer-oriented smart metering services in other member states.

In Germany, the project partners tried to find partners and close cooperations for the possible future rollout. In addition to these cooperations, the project partners took a multi-sided approach on promoting both smart meter related and other energy efficiency measures. Thus, the meetings with key market actors from different areas were very important in order to prepare for future services and products which might result from the rollout plan fixed within the “Law on digitalisation of Energiewende”.

Meeting with key market actors

WEMAG AG /e.dat GmbH: Due to the fact that WEMAG was both a member of the German project team and at the same time directly affected by the upcoming rollout plan, a very close cooperation developed between the USmartConsumer project team and e.dat, the responsible subsidiary for metering services within the WEMAG group. As a result, good progress was made in order to implement structures and processes for the upcoming rollout.
thüga AG: Being shareholder of WEMAG AG, a cooperation was initialized in order to participate in a possible pilot project. Furthermore the cooperation with thüga AG was very helpful to find out about rights and duties resulting from the upcoming rollout and moreover get to know the necessary hard- and software, for example the smart metering gateway administrator.

Rockethome: The company combines the topics smart meter and smart home and offers interesting solutions and services to customers, focussing on visualisation of data, controlling appliances and comfort. The project partners got in contact with Rockethome in order to evaluate the possibility to develop an appliance together with or without smart meter components.

Verbraucherschutzzentrale: The project partners consider the VZBV - the umbrella organisation of 41 consumer organisations - as a key actor. Consumers are very sceptical towards smart metering due to fears of data security and data safety. Due to the experiences made in other European countries this was obvious to the German project team with the start of the USmartConsumer project and it gained even more importance after the result of the market survey done within the project was published. To work against those fears, a representative of VZBV took part in a project meeting in Warsaw and will keep contact with the project.

Reviewing the project and considering the legal framework, it was an optimal approach to not concentrate on smart meter products and services but to broaden the portfolio to other energy efficiency measures. With the legal framework for the rollout becoming more and more concrete, further actions were taken especially with reference to the internal cooperation between WEMAG and e.dat GmbH.
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<th>Legal and regulatory status</th>
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<td>The installation of remotely readable electronic meters is mandatory. The largest Italian distributor e-distribuzione carried out an internal CBA with a positive outcome before proceeding with the large scale smart metering roll-out. The solution adopted by e-distribuzione brought forward the minimum provisions required by the EU recommendation 148/2012. The main functionalities implemented are: Acquisition of certified metering data, Historical and current consumption data, Setup of frequency for reading rate, Remote disconnection and power limitation, Alphanumeric Display, Multi tariff-registers, Load curves acquisition, Bidirectional active/reactive energy measurements, Acquisition of QoS and network status data, Tampering alarms, Fraud alarms, Energy Balance monitoring, Full integration with DSO legacy systems, Security Mechanisms for data protection and privacy, Remote management of contractual parameters, Remote update of meter and data concentrator firmware. The metering data registered by the smart meter are owned by the final customer (decree 102/2014, art. 9, comma 3b) according to the customer data ownership principle. The DSO is the actor responsible for the metering process. Regulation about metering data exchange between the DSO and traders/third parties is under discussion, some guidelines have been published by the Italian authority for electricity, gas and water (AEEGSI) within the scope of resolution 87/2016. These guidelines also covers the provision of data to the final customer within the home area network (HAN).</td>
<td>Rollout of the first generation of smart meters started in 2001 and by the end of 2011 95% of 36 million customers had received electronic meters. By the end of 2016 a new generation of smart meters will be rolled out by e-distribuzione. The technical features of these meters and the related remote metering management infrastructure will cover the requirements on data management and data exchanged specified in resolution 87/2016 published by the Italian authority for electricity, gas and water (AEEGSI). A PLC band C communication channel from the meter to the HAN will be established. Data - stored within the smart meter - will be sent to in home local visualization devices using an open protocol whose specifications will be delivered by CEI (Italian Electrical Standardization Committee) through the publication of a new technical standard.</td>
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National Consumer Campaign

Making use of the market activation tools and with the help of consumers associations, regional or even national information and media campaigns have been designed and initiated to activate consumer interest and engagement in accessing energy information from the smart meter for energy savings, peak load reduction and integration of renewable energy. In order to reach massive numbers of consumers, the campaign concept included training of representatives from consumers associations and instruments such as news articles, press conferences, mailings, social networks (Facebook, Twitter) etc.

In Italy, the consumer engagement campaign was designed in close cooperation with Unione Nazionale Consumatori (UNC) and other consumer associations as well as the main stakeholders of the energy sector - the list of all the stakeholders involved in defining and carrying out the campaign in Italy is reported in the USMARTCONSUMER Communication Concept.

AISFOR has closely worked together with the various stakeholders in all the phases of the project and this proved to be a winning strategy as it enabled to organise and implement plenty of activities targeting every time a specific target so that it was possible to reach with targeted messages all the various targets.

“Consumers are interested in being informed on energy issues, especially on their energy consumption. We can state this on the basis of the statistics on the articles read” comments Agnese Cecchin the Director of Canale Energia. “The statistics of the site clearly show how the issue of energy efficiency is of high interest. Articles with simple how-to-do instructions on energy domestic consumption are more appreciated than articles on complex technological aspects. To communicate to the citizens, it is important that the message is clear and concise, in response to a concrete need. Once captured the interest it is possible to deepen the issue. Another useful aspect to engage consumers on the energy themes is to associate the consumption of energy in the daily routine activities, preferably if in a relaxing and amusing context, such as the choice of a tourist resort.”

Screenshot showing the good collaboration with CANALE ENERGIA

Training seminars were organised addressing all consumer associations. They represented also
an opportunity to discuss the actual and future role of Italian consumer within the national energy market and on the important role of consumers’ associations in supporting consumers in gaining an active role in the energy market and in promoting the development of innovative services related to the energy market.

Another important actor of the Italian USmartConsumer campaign was the media. Thanks to the Italian context – where all Italian consumers have already a smart meter installed and where the discussion during the project lifetime was on the services and the installation of second generation smart meters – a very strong collaboration was installed with CANALE ENERGIA to promote the objectives of USmartConsumer and to share with them the organisation of numerous initiatives.

The importance of the topic of the project and the impact of the campaign in Italy enabled to have several interviews also on important national radio RADIO24.

AISFOR, as the Italian partner of the USmartConsumer project was invited as speaker in many events throughout Italy - such as Catania, Naples, Rome, Verona, Milan - which facilitated the spreading and disseminating of the project objectives throughout the National territory.

Further the USmartConsumer project poster was presented with the poster session at the SET Plan.

Conference in collaboration with consumer associations and media partner

Interview on Radio24

USMARTCONSUMER Italian Poster
Conference held in Rome in December 2014.

**Action in the field**

To foster a market driven uptake of smart metering services, USmartConsumer also focused on practical cooperation with energy utilities to develop new and further enhanced services—such as informative billing and feedback, variable tariffs and load control services—that are most potential to bring energy savings, peak load reduction and integration of renewables to consumers. In cooperation with the energy utilities, and considering the feedback on consumer’s needs, national and regional ‘action in the field projects’ were developed, executed and evaluated to be disseminated as examples for developing better consumer-oriented smart metering services in other Member States.

The “Action in the field” in Italy, as for the consumer campaign was implemented building on collaboration and synergies with main energy stakeholders. During the project lifetime, in Italy several pilot actions were ongoing on to test the impact of providing consumers with energy consumption data through new services such as: In-Home Displays with meter reading data, web portals showing energy consumption information and graphs, home energy management systems, etc.

To support the pilots, engaging campaigns were carried out to verify also the best communication means, messages and modalities to engage consumers on energy efficient pilots as indications to identify the best ways of engaging consumers as active players in the energy market.

Collaboration also on the data monitoring, analysis and communication with consumers to inform him/her on the real use of its energy consumption have been carried out.

"Increase consumers’ awareness on their energy consumption is the first step to enable them to make more informed decisions in the short and long term on their energy use. This way they become active players within the system, managing their energy use in a more flexible and tailored in order to achieve the dual objective of combining energy savings and reducing environmental impact by reducing their energy costs" commented Simone Maggiore, Project manager of “Energia su Misura” at R.S.E. (Ricerca Sistema Energetico).
## The Netherlands

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<th>Legal and regulatory status</th>
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<td>In April 2014 the Dutch parliament approved additional implementing regulation for the large scale rollout of smart meters from 2015. The basis for this regulation, the revised Dutch Electricity Act and the Gas Act (lawful since 2012) mandates network operators to offer a smart meter to all small customers (households and small businesses). Customers have a legal choice to refuse or accept the smart meter. When accepting a smart meter, the customer has to authorise the network operator to collect and use the meter data for specific purposes such as annual billing, switching supplier and moving home. The energy suppliers are mandated to provide the customers with bimonthly consumption and cost statements based on minimum information requirements. Providing customers with more real-time consumption and cost information is considered to be a market responsibility. The customer will choose and authorise a commercial service provider to use (real-time) data beyond the minimum regulated level for the specific purposes for which the customer has given their consent.</td>
<td>The first phase of the rollout of smart meters in the Netherlands took place from 2012 until 2014 as a small-scale rollout for experience purposes. During the trial period the Authority for Consumers &amp; Markets (ACM) and Netherlands Enterprise Agency (RVO.nl) conducted research into the rollout, customer satisfaction and energy savings. From these evaluations, the Minister of Economic Affairs decided to accelerate the rollout, aiming to have a smart meter fitted in at least 80% of households and small businesses in 2020. The large scale roll-out of the smart meters in The Netherlands started in 2015, with 3.0 million Dutch households having one by now. The number of smart gas and electricity meters is predicted to exceed eight million households by 2020. Both the grid operators as well as the government have high hopes for this technology, because it promises more accurate insights into the energy use for the consumer, as well as flexible energy tariffs. However, reluctant market developments since the start of the rollout are mounting over how well the smart meters rollout will lead to quick high level market penetrations of associated smart energy management services to meet the energy saving expectations.</td>
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National Consumer Campaign

Making use of the market activation tools and with the help of consumers associations, regional or even national information and media campaigns have been designed and initiated to activate consumer interest and engagement in accessing energy information from the smart meter for energy savings, peak load reduction and integration of renewable energy. In order to reach massive numbers of consumers, the campaign concept included training of representatives from consumers associations and instruments such as news articles, press conferences, mailings, social networks (Facebook, Twitter) etc.

In the Netherlands, the consumer engagement campaign was designed in close cooperation with the national Consumers Association Consumentenbond (approx. 500.000 members), the national Home-owners Association Vereniging Eigen Huis (approx. 730.000 members) and the national Tennant’s Association Woonbond (approx. 1.000.000 members). After training the contact center employees of the consumers associations and by means of a series of articles, participation in conferences and social media via their own networks, in 2016 different consumer groups were efficiently informed and promoted to take advantage of the smart meter.

A memorable momentum during the Dutch campaign in 2016 was the interest of the national news media in the outcome of the USmartConsumer expert meeting, indicating that the smart meter rollout might not result in the expected energy savings without the use of dedicated smart metering services, especially in-home displays.

The Dutch national TV -news broadcasting organisation NOS and most national print newspapers all reported on the rather disappointing energy savings from installed smart meters so far. Key to this deficit was the absence of in-home displays, making the smart meter ‘a computer without a
keyboard and screen’. An in-home display makes residents immediately aware of how their behaviour affects their energy consumption. And that makes it possible to prevent wasting energy.

As an example of how digital tools can help save energy in homes, the in-home display TOON by Eneco was demonstrated on national TV by a resident who explained the convenience of the display to NOS: ‘You can monitor your gas and electricity consumption extremely well.’ For the resident, saving energy has become a kind of sport. ‘Are there any unnecessary lights switched on? All those computers, do they happen to be charging? Or what about all those useless adapters that consume electricity?’

**Action in the field**

To foster a market driven uptake of smart metering services, USmartConsumer also focused on practical cooperation with energy utilities to develop new and further enhanced services -such as informative billing and feedback, variable tariffs and load control services- that are most potential to bring energy savings, peak load reduction and integration of renewables to consumers. In cooperation with the energy utilities, and considering the feedback on consumer’s needs, national and regional ‘action in the field projects’ were developed, executed and evaluated to be disseminated as examples for developing better consumer-oriented smart metering services in other Member States.

Energy service company Qurrent introduced the Q-box for household energy customers. Q-box is “plug and play” en works independent from the Dutch energy retailer.

Due to already existing consumer behaviour research and monitoring programmes in the Netherlands during the small-scale rollout to deliver evidence for energy savings from smart metering services, no additional ‘action in the field’ projects were scheduled under the USmartConsumer project.
POLAND

### Legal and regulatory status

Poland’s Energy Law as amended in 2013 made the installation of smart meters eligible but not mandatory. The amendment introduced into Poland’s law all the relevant provisions on smart metering of the 2009/72/EU directive. The amendment opened way for DSOs to start pilot projects but did not force them to make more ambitious plans of massive roll-out.

The President of the Energy Regulatory Office (ERO), the energy regulator, initiated the process of smart meter installation in 2009 – the first platform of main stakeholders, including customer associations was established. Then, some other platforms embracing DSOs, financing institutions, industry, research and academic institutions were founded. At present the platforms conduct their activities but not very intensively.

In years 2010-2014 the efforts of the ERO concentrated mainly on setting requirements for minimal smart meter technical standards. Interoperability was the issue of special concern. Afterwards ERO activities faded and his role as a leader in invigorating the market by providing incentives for DSOs to get more involved were rather weak.

Substantial step in legislation governing development of smart meters is expected with the long awaited new act, so called Meter Act. Preparation of the act started as early as in 2010 but then in 2014 the project was dropped. New proposal is due by the end of 2016. The act will regulate the procedures of gathering and processing data from smart metering in a way securing privacy and data safety. To facilitate the duties a new body will be established, namely the Operator of Measuring Information, as a daughter-company of the TSO.

It is expected that the act will make installation of smart meters in at least 80% of end users a legally binding target for all DSOs.

### Implementation status

The cost benefits analysis carried out by the DSOs revealed that replacement of traditional meters by smart meters is economically viable for a vast majority of end users. This conclusion enabled to undertaking smart meters deployment by DSOs as the expenditures are eligible costs of their operation and may be included into energy tariffs.

It can be estimated that the total number of smart meters installed by all DSOs up to mid-2016 amounts to 500 000. It is approximately 3% of all end users.

Government’s analyse made in 2014 predicted rather modest impact of smart meters on energy savings in households since reduction of only 1% of electric energy consumption in 2021 as compared to 2015 use is projected in governmental energy forecasts. This estimation takes into account two opposite trends: increase in consumption caused by higher living standard and consumption reduction due to energy saving measures, including smart meters.

Ongoing pilot projects do not entail development of energy services that at least theoretically should follow smart meter deployment. Information on the energy savings attained in the pilot projects due to smart meters is rather scarcely and not well promoted among the end users participated in the projects.

In 2014 the government drafted the schedule of smart meter deployment – at least 5% in 2015, with final target set for 80% in 2020.

It is envisaged that the new Meter Act will also introduce new schedule of meeting the targets of the smart meter deployment. Since the current plans of reaching 80% of end-users equipped with smart meters in 2020 are rather unrealistic it is expected that the target year will be shifted to 2024.
**National Consumer Campaign**

Making use of the market activation tools and with the help of consumers associations, regional or even national information and media campaigns have been designed and initiated to activate consumer interest and engagement in accessing energy information from the smart meter for energy savings, peak load reduction and integration of renewable energy. In order to reach massive numbers of consumers, the campaign concept included training of representatives from consumers associations and instruments such as news articles, press conferences, mailings, social networks (Facebook, Twitter) etc.

The educational campaign conducted as part of the USmartConsumer project aimed at informing the consumers about the features and benefits of the smart metering system. The users were educated on the possibilities related to the installation of smart meters by their local distribution network operators (DNO) and the mechanisms assuring the security of measurement data and personal information. What is more, the benefits of using smart meters, namely the opportunity of using the personal measurement data available online for increasing the household energy efficiency and reducing energy bills was outlined.

The consumer engagement campaign in Poland was designed in close cooperation with numerous energy companies, the national Consumers Federation, local authorities and media.

In order to assure the sustainability of the projects’ initiative through raising the consumers’ awareness and engagement an advisory platform as well as a dedicated email (porady@federacja-konsumentow.org.pl) were created.

The platform was then advertised in all departments of the Consumers Association, which participated in the AMI (Advanced Metering Infrastructure) pilot projects. What is more, the departments of the Consumer Federation based in the pilot project areas received informational leaflets which they were required to distribute among their employees during planned meetings.

Additionally the meetings served as a platform for clarification as trained consumer advisors were present to answer questions concerning the process of meter exchange, measurement data security and the new possibilities connected to the smart metering technology. Information about the smart metering systems was also disseminated during initiatives such as KAPE’s “Energy Bus”. Informational leaflets and posters
were distributed to apprise consumers of the USmartConsumer project. Numerous exhibits of alternative technological solutions including the smart metering infrastructure were also presented during the “Energy Bus” project. Therefore, not only were the project participants able to attain informational materials concerning the USmartConsumer initiative but also actively learn about the elements of the smart metering infrastructure that it promotes.

Meetings with consumers, stakeholders and local authorities were an additional element of the consumer engagement campaign. They concerned the AMI smart metering systems and included similar dissemination methods as those used in the departments of the Consumer Federation. Two of such meetings were held in Lodz and Augustow in August 2016. More than 80 people interested in the topic participated.

Information concerning the USmartConsumer project and the advanced metering infrastructure was also disseminated through the media. Numerous broadcasts related to the topic were held on regional radio stations of the pilot areas – Lodz and Augustow. The broadcasts consisted of topic related interview fragments. One such interview lasted 30 minutes and was held with KamilPluskwa-

Dąbrowski from the Consumer Federation interview was made for PGE Dystrybucja and concerned the future benefits of smart metering systems and related consumer services. The questions and content of the broadcasts was prepared by KAPE and the Consumer Federation. The interview was broadcasted 24 times in total, in the form of 10 smaller modules each lasting 3-3.5 minutes.

**Action in the field**

To foster a market driven uptake of smart metering services, USmartConsumer also focused on practical cooperation with energy utilities to develop new and further enhanced services -such as informative billing and feedback, variable tariffs and load control services- that are most potential to bring energy savings, peak load reduction and integration of renewables to consumers. In cooperation with the energy utilities, and considering the feedback on consumer’s needs, national and regional ‘action in the field projects’ were developed, executed and evaluated to be disseminated as examples for developing better consumer-oriented smart metering services in other Member States.
The distribution network operator Energa-Operator introduced the “My meter” specialized website and application. The clients who possess smart meters in their households are now able to use both the website and application to gain information about their energy consumption.

Both the website and the application allow consumers to:

- Monitor their energy consumption regularly - hourly data from the previous day is available
- Make daily, weekly and monthly comparisons of their energy consumption
- Compare their energy consumption with their “twin” households

The AMI clients are provided with their measurement data through a dedicated website and application. They are able to use these sources to monitor their regular energy consumption, compare their own energy consumption average over different periods of time and contrast it with the average consumption of other consumers using the same tariff.

Throughout the duration of the USmartConsumer project 53,652 households were reached by the initiatives of “Actions in the field”. Some of the tools and communication recommendations created during the USmartConsumer will however be used by the network operators only in the subsequent phases of their implementation projects, that may happen after the projects’ termination.
Legal and regulatory status

In February 2012 the national roll-out plan was reviewed, and established the requirement of having 35% smart meters installed by the end of 2014, 70% by end of 2016 and 100% by 2018. DSOs are responsible for the substitution of traditional meters by new smart meters. A set of functional requirements is available for the smart meters.

A public cost-benefit-analysis for electric smart meters has not been performed yet, even when the 5 main utilities, serving over 4/5 of the total consumers in the country, have provided detailed data to the national regulator to estimate the cost of the smart meter installation, based on the requested characteristics. Then, a national CBA based on the impact on the 5 main utilities data, but not public, was carried out.

In 2014 the new regulation Royal Decree 216/2014 has been published, establishing a mandatory requirement for distributors to provide hourly energy consumption data.

Where a smart meter with full tele-management has been installed consumers can choose an energy cost based on their real hourly consumption data. In those homes where there is not a smart meter installed, the invoice will be based on the average national hourly curve cost, with variable prices.

An alternative offer is mandatory to be available in both situations (with or without smart meter) from the suppliers, for homes with <30kW power contracted. This will be a fixed price for one year for the energy consumption (like the traditional situation).

A recent document published by the national regulator (CNMC) indicates the need of a new regulation to establish how the data should be exchanged among the different agents (distributor, supplier, consumer...), protecting the information of consumers with a smart meter.

A cost-benefit analysis has been developed for gas meters in 2013 with negative results for a rollout and which proposes that there is a for further analysis.

Implementation status

The five main companies in Spain (ENDESA, IBERDROLA, GAS NATURAL FENOSA, EDP-HIDROCANTABRICO and VIESGO) are leading the installation of the new smart meters with AMI capacities. There are two main protocols in development, the PRIME/DLMS, leaded by IBERDROLA and involving a number of other utilities as GAS NATURAL FENOSA and EDP-HIDROCANTABRICO, and the Meters and More, leaded by ENEL-ENDESA and with participation of EON Spain.

The massive installation is currently in progress with hundreds of thousands of units per month. Communications and data bases are also in progress to allow full AMI.

The national regulatory body (CNMC) has published in 2016 their report on smart meter rollout follow up as to end of 2015. According to it, 14,5m smart meters were already installed in Spain from the 28m existing, which constituted over 50%.

According to the latest information collected as to September 2016, IBERDROLA communicated the installation of over 8m smart meters (accumulated), over 76% of their total electric meters.

ENDESA also informed on the installation of over 8m smart meters, and expect to have 9,2m by the end 2016.

GAS NATURAL FENOSA installed over 2,7m smart meters (>72%) of their 3,7m.

VIESGO installed overall 670,000 smart meters, over 97% of their total customers.

EDP-HIDROCANTABRICO installed over 450,000 units.
"Smart meters are devices that will facilitate the process of transformation of the network and the exploitation of new functionalities by all the agents involved, in a scenario in which the consumer has a special role. Supervision of the aspects related to the information available from the smart meters, such as the analysis of the information that should be available to the consumer to be able to manage their demand based on the signal of market price, the need for standardization of the information to be exchanged between the agents, or the proposals of actions to be carried out in relation to the access and protection of the information that is capable of registering the measurement equipment are among the functions of the CNMC. Contributions have been made with USmartConsumer to disseminate information regarding the implementation of the smart meter systems in Spain, as well as the benefits they entail for consumers, with special emphasis on the experiences exchange and results dissemination, and we wish to continue collaborating in activities that have these common objectives"  

Miriam Salguero, smart metering expert, CNMC (Spanish Regulator)

**National Consumer Campaign**

Information and awareness campaigns have been designed and developed through regional or even national means to activate the interest of consumers and participation in access to energy information from the smart meter, with the aim of publicizing the way Energy consumption, energy savings, reduction of consumption peaks and the use of market activation tools. The concept of the campaign included the formation of representatives of consumer associations and instruments such as news, press conferences, mailings, social networks (Facebook, Twitter), etc.

In Spain, the campaign was supported by the Spanish Confederation of Consumers and Users (CECU), which offered its advice and support in training activities to consumer associations, such as the workshop held in June 2015 in Valencia with 30 representatives of associations and municipal offices in the region.
Training workshop in Valencia organized in collaboration with CECU-AVACU and with speakers, among others, the regulatory body (CNMC), the ITE and Escan consultants.

CECU-AVACU has a reach in the Valencia Community of 5 million people (almost 30 million in Spain if all its associations are integrated), reason why the dissemination of information supposes a great impact in the Region and throughout the national territory.

The collaboration has included designing and disseminating campaign materials such as posters and leaflets, issuing press releases, publishing articles, collaborating on Facebook and participating in radio programs.

Due to this campaign, the project has been able to inform many citizens, directly or through the associations technicians and municipal offices staff, about the smart metering rollout in the specific areas, their main characteristics and how to use the information for their own benefit.

The focus on a specific region allows to better explain the specific situation of smart metering and services to the consumers.
Action in the field

The massive smart metering rollout will be finalized by end 2018 in Spain.

USmartConsumer also carried out actions to collaborate with energy companies in the promotion of new services offered to consumers, mainly those aimed at their reaction and benefit. The aim of the "action in the field" is to develop the market for services to final customers based on information from the smart meter, in order to improve energy efficiency and achieve consumer reaction.

These services include state-of-the-art technology developments such as: billing information, direct and indirect response (through websites, mobile applications and devices), energy efficiency tools and incentives, variable tariffs and home energy management system.

The services performed were based on the meter information provided to consumers through the regional distribution company's website (IBD), which provided a platform with frequent information for consumer reaction.

"The correct adequate management of the massive smart meters information exchanged daily is a challenge, and our company works hardly to make it available to the final consumer supply holder, through a simple, practical and interactive web, all the information that consumers need. Initiatives such as USmartConsumer promote the use of smart meter and services to consumers, with special emphasis on smart meters projects dissemination happening throughout Europe. We want to continue collaborating in activities that involve these common targets."

Iñigo Larumbe, Iñigo Larumbe, Head of Global Metering Technical Office, Iberdrola Distribución

The action was developed in the province of Castellón, in the Eastern part of Spain, with the cooperation of the public University from that region (UJI).
UK

Legal and regulatory status

In March 2011, the Government set out the rollout strategy and policy design for smart meters. The Smart Metering Implementation Programme has been revised significantly since its inception in 2011. The updated delivery plan expects the roll out to start in late 2016 and be completed by 2020. The roll out is lead by the Department for Energy and Industrial Strategy (DBEIS). (It was formerly facilitated by the Department of Energy and Climate Change until July 2016).

Key players in the roll out include: a) Energy suppliers – supplying and installing smart meters and In Home Displays (IHDs). b) Smart Data Communications Company (DCC) – communications infrastructure for smart meter data. c) Ofgem – the national energy regulator to ensure consumer protection, adherence to codes of practice for meter installation and data sharing, and regulation of the DCC. d) DNOs – respond to network-related issues during the smart meter roll out. e) Smart Energy GB – not for profit national marketing and engagement campaign.

The DCC communications system will ensure consistent operation of meters irrespective of supplier, and the potential for consumers to allow third parties to access their smart meter data to provide them with additional services. The Smart Energy Code sets out the rules, rights and obligations for this new metering system, and is a multiparty contract that determines the DCC service provision. It is self-regulated by a panel of its members, and regulated by Ofgem.

The Smart Meter Installation Code of Practice regulates the training of meter installers, and the meter installation process and provision of energy efficiency guidance by energy suppliers. It includes but does not specify the need for additional support for vulnerable customers in use of their smart meter.

For domestic consumers, smart meters are free and optional, and all households must be offered an IHD for energy efficiency. The British Cost Benefit Analysis attributed a significant £5.69 billion of consumer benefit to this. Many suppliers will/are also offering free online and phone app options for energy management. Trials are currently underway to assess whether these options provide an equivalent ability for consumers to achieve energy reductions in the home as the IHD and whether they could be given as an alternative, rather than in addition to a display.

Smart Energy GB has been successful at increasing consumer awareness of smart metering. 30% of British households know about smart meters and 21% want to upgrade or already have a smart meter. Smart Energy GB is also facilitating community-led smart meter awareness raising and provision of IHD-related and other energy efficiency advice by small local organisations and networks for specific vulnerable consumers groups.

Implementation status

In the early foundation phase, the UK’s largest smart metering trial Energy Demand Research Project (EDRP), with around 58,000 households, was finalised in 2011 with four suppliers (EDF, SSE, Scottish Power and E.ON) installing smart meters, in-home displays and trialled feedback mechanisms, financial incentives and ToU tariffs. A variety of small scale trials testing specific incentives have followed.

Nearly 6% of British households now have a smart meter (2.75 million meters installed by June 2016).

Technical specifications for smart meters were changed in 2014, with full functionality of smart meters dependent on the DCC communications system. There have been significant delays to the DCC Go Live date, and as a result many suppliers have not commenced roll out. It could prove more costly to them to have to install a second smart meter which meets the new technical specifications in the near future.

Consumers can register their interest for a smart meter already with many suppliers.

Once the DCC is live, 70% of households can be fitted with smart meters. However technical challenges still exist for installation in blocks of flats (about 27% of homes, to be facilitated later in the roll out using dual band communications that utilise two radio wave frequencies). Another solution is still sought for the 3.5% of properties (rural, some flats) where dual band won’t work.

Some suppliers, particularly those that focus on smart prepay, have successfully installed smart meters with the original specification. Multiple advantages for consumers exist with smart prepay – such as ease of topping up – so these meters are appealing as they meet a need. One smart prepay supplier also offers a smart Economy 7 meter, something the majority of suppliers are leaving for later in the roll out.

One supplier trialled smart PAYG in 2015, offering a reduced tariff on evenings and weekends. Another supplier currently offers a Time of Use tariff, with free off peak electricity for one day of the weekend.

A significant body of research is available on consumer attitudes to smart meters and what works in terms of IHD use, energy monitoring and behaviour change.
National Consumer Campaign

Making use of the market activation tools and with the help of consumers associations, regional or even national information and media campaigns have been designed and initiated to activate consumer interest and engagement in accessing energy information from a smart meter to cut energy waste, explore peak load reduction and integration of renewable energy. To reach large numbers of consumers the campaign included training representatives from consumer associations as well as news articles, press conferences, mailings, and social networks (Facebook, Twitter) etc.

In Britain the smart meter roll out was mainly in a transition over the life of the UsmartConsumer project, which bridged an initial foundation stage of behavioural smart meter trials to the beginnings if the installation stage in December 2016. The roll out was delayed due to a change in meter specification in 2014. This required the setting up of centralised infrastructure - the Smart Data Communications Company - as an intermediary for all smart meter data, to achieve all smart meter services as anticipated in the original cost benefit analysis for the roll out (e.g. fast switching times). The Smart Data Communications Company went live in November 2016.

Previous to that, most energy suppliers had held back in initiating their smart meter roll out, possibly to avoid additional cost in having to change meters again at a later date. (Unlike most Member States in Britain smart meter installation is being implemented by energy suppliers, not network operators). One large supplier and two smaller suppliers that specialise in smart prepay were proactive in meter installation in 2014-2016. By October 2016 4 million domestic smart meters were installed across Britain, representing 8% of households. (DBEIS Smart Meters Quarterly Report to end of September 2016).

Since 2014 a national smart meter marketing campaign spearheaded by the independent organisation Smart Energy GB (www.smartenergygb.org) has been promoting smart meters mainly to domestic consumers. Smart Energy GB research has shown that the general public are responding favourably to smart meters.

Nearly 80% of the 10,000 smart meter users surveyed said they’d recommend a smart meter to others, and the same percentage had made at least one change in their household activities to reduce fuel use. (Smart Energy Outlook August 2016).

The British UsmartConsumer engagement campaign focused predominantly on smart prepayment meters, given these were the meters being installed at that time. It included training sessions for housing associations and other support workers entitled ‘Are smart meters right for your clients?’ framed within current and awaited benefits system changes.
Some of the participants ‘vote with their feet’ at a UK smart meter training ‘Is smart Pay-As-You-Go right for your clients?’, June 2015.

Three fact sheets were produced on smart meters, smart prepay, and smart meter displays which were shared widely in paper and electronic format and on the Centre for Sustainable Energy website. The British marketing campaign also included weekly social media, press releases, newspaper articles, and radio.

**Action in the field**

USmartConsumer focused on practical cooperation with energy suppliers to develop new or enhance existing smart meter-related services. National and regional ‘action in the field projects’ were developed, executed and evaluated which considered consumers’ experiences of smart metering for fuel bill reduction and energy management. Findings were disseminated to develop better consumer-oriented smart metering services in other Member States.

In Britain CSE worked in partnership with two smart prepay energy suppliers – Utilita and Ovo – on qualitative research into customers’ experiences of smart prepay. Prepayment meter customers were identified as potentially needing additional support to fully engage with their smart meter and IHD (Smart Energy GB, Smart Energy for All, 2015). The research explored:

- the installation process
- the perceived benefits and drawbacks of the smart meter and in-home display
- if and how customers utilise the display to manage their fuel use and for budgeting.

CSE also investigated whether the current Smart Meter Installation Code of Practice (SMICoP) was being adhered to in terms of consumers being offered appropriate advice on use of the smart meter and display at install, and whether they were offered energy efficiency guidance. Both are required as part of the installation process. The research also touched on the use of the IHD and smartphone apps for reducing fuel bills.

**Smart meter display**

The research found that customers were generally happy with their smart prepay meter; the flexible topping up options and automatic crediting of payment to the meter
was really useful, especially for busy families and the disabled.

Exploring use of the IHD

However it also raised concerns about how smart meters and IHDs are currently being introduced to consumers - especially around energy management and reduction. The quality of advice given to customers on use of the smart meter and IHD during installation on the whole was poor, often limited to instructions on how to top up and check the credit balance.

Little or no indication was reported to have been given by installers on how to use the IHD to reduce and manage fuel use, and none on household energy efficiency. Also, online smart meter tariffs limited the financial information available on the IHD, which made monitoring energy use less comprehensible (the IHD only had this information in kWh and CO2 emissions). The smartphone app gave energy use in financial terms but wasn't in real time.

Lack of consumer understanding and use of their IHD would significantly hamper the energy reductions anticipated for the smart meter roll out, and attributed in the British cost benefit analysis.

The research made practical suggestions and policy recommendations for how to improve the installation process to promote more effective use of the IHD for energy monitoring and budgeting. For example some customers wanted to top up by phone but had to register online to do so, which wasn’t a possible for them. It would be straightforward to check whether phone topping up was required during meter installation and initiate that through an energy supplier follow up call.

Two research reports are available here:
https://www.cse.org.uk/news/view/2095

Following the research CSE explored with one smart prepay energy supplier the potential to create a video for consumers to watch during installation that gives the basics on smart meters and explains how to use the IHD. It also developed an annual programme of IHD messages which could be sent to IHDs to encourage ongoing consumer monitoring of energy use in the home, and support consumers to make energy-reducing changes to home activities.

Research results were disseminated at two international conferences, national events, government seminars and funder publications.
The key results of the project have been actively disseminated throughout the European Union through the website of USmartConsumer, social media and a series of brochures, newsletters, press releases and international events.

The project website is the central dissemination tool, containing the main conclusions, reports, brochures and data sheets with the services offered from the smart meter in each European country.

The main platform for disseminating the USmartConsumer project was the European Utility Week (EUW), the annual reference event with conferences, exhibitions and networking that brings together industry leaders, Energy professionals and industry experts from all over Europe. The USmartConsumer project was successfully received by the European energy community at the EUW’14 workshop in Amsterdam. The professionals of the sector were able to share experiences of the services enabled by smart metering successfully, or the need for favourable market conditions for these services.

The final conference of the project was held in the framework of the EUW’16 in Barcelona, with the participation of more than 300 professionals around the world and the participation of first-level speakers from the CNMC, EDP, ENEL-ENDESA, IBERDROLA, GAS NATURAL FENOSA and experts from EU countries.
“The massive smart meters rollout in the distribution network allows us to offer added value services to consumers such as the pioneering tool launched by Unión Fenosa Distribución, an electricity distribution subsidiary of Gas Natural Fenosa that allows real-time consultation of random incidents and programmed maintenance works in the electrical grid. This is part of a series of innovative initiatives developed by Unión Fenosa Distribución that have a common denominator: placing the customer at the centre of the company's activity. The USmartConsumer project analyzes and promotes the identification of best practices present in the field of distribution and consumption, so it is in our interest to know the results obtained”

Mariano Gaudó, Head of Digital Grid Infrastructure, Gas Natural Fenosa

The latest edition of the European Smart Metering Landscape Report 2016 was presented, smart metering services and the need for well-designed guidelines to achieve the joint benefit of electricity companies and consumers.

The following link provides access to the ENGERATI interview to Francisco Puente on the project final conclusions, at the European Utility Week 2016:

https://www.youtube.com/watch?v=74KIINm-a0hA
USmartConsumer goes on!

The consumer information campaigns have generated very effective results that can be replicated in other European regions. If you are a consumer association, utility, regulator or service provider, feel free to ask for the project materials in pdf format.

Find out more about the consumer associations cooperating, which have the information resulting from the project and will continue to promote smart metering energy saving services.

Check the conclusions from our actions in the field, that allowed to evaluate the quantitative and qualitative results of services based on smart metering based services for consumers, generating conclusions of great value.

www.usmartconsumer.eu

Anything else you would like to comment, please contact:

Francisco Puente, fpuente@escansa.com

USmartConsumer project coordinator, and smart metering enthusiast