

Communicating smart meters to customers – which role for DSOs?

A EURELECTRIC paper



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Communicating smart meters to customers – which role for DSOs?

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Executive Summary

Following EU legislation, smart meters are increasingly being rolled out across Europe. In most Member States, the installation of such smart meters will be the responsibility of distribution system operators (DSOs). As part of the physical grid infrastructure, the meters fall under the grid operator's domain, making DSOs best suited to manage the smart metering infrastructure.

European DSOs already act to facilitate effective and well-functioning retail markets. With the deployment of smart meters they must now be prepared to address very specific customer questions related to the smart meter installation. They will have to explain what a smart meter is, how it works, why smart meters are needed, and where to go for impartial advice on smart meter functionalities and benefits.

The rollout and related education and communication effort towards customers will encompass three different phases:

- Phase 1 – Preparation of the rollout
- Phase 2 – Installation of the smart meters
- Phase 3 – Post-installation: smart meter customer support, complaint handling and fault resolution

Activating consumers will depend on a positive customer experience. In this regard, clear information during all three phases is key. This paper clarifies the important communication role of DSOs towards customers during the installation process. It explains why smart metering by DSOs is so important from a customer point of view. At the same time, it sheds light on how key consumer questions can be addressed and presents best communication practices and strategies of DSOs from around Europe.

1. Introduction

The rise of smart metering systems in Europe today is driven mainly by EU legislation. This includes the Third Energy Package and other legislative instruments such as the Energy Services Directive (ESD), the Energy Performance of Buildings Directive and the Energy Efficiency Directive.

In detailed provisions on intelligent metering systems, they demand that end customers are provided with competitively priced individual meters that accurately reflect consumption and provide information on the actual time of use. Furthermore, they stress the adoption of smart meters as a tool both to enhance competition on retail markets and foster energy efficiency. Smart meters are highlighted as the key to realising the full potential of renewable energy and energy savings, and as essential to the smooth functioning of the European energy market and a secure energy supply.

In addition to this EU legislative push, and as an earlier EURELECTRIC report¹ points out, different national regulatory challenges are directly impacting rollout plans. As a consequence, the smart metering landscape is highly dynamic at the moment, with many Member States adjusting their energy legislation to comply with the EU directives. At the same time, countries are moving towards electronic energy metering as a way of modernising electricity grids and improving the information that is available for grid operators.

Various national and EU structures are currently working on standardisation, regulatory recommendations, technical functionalities, and other issues of importance for the smart meter rollout. While some Member States are awaiting the results of these various working groups and task forces, others are actively moving towards smart metering and are already beginning to deploy smart meters irrespective of remaining barriers.

European countries are at different stages of smart metering deployment for residential electricity customers. Some have already implemented or begun implementing legislative provisions, while others are still catching up. France and Portugal, for example, are now set to join Spain, Finland and the UK in large-scale adoption. Other countries have not waited for changes to the legislative and regulatory framework: in the past years a large number of smart meters have been rolled out in several Member States like Italy or Sweden.

Early adopter countries have usually justified investment in smart meters by pointing to a range of benefits for customers and distribution grid operators (DSOs) alike. Benefits for DSOs include more detailed information on customers' electricity use; reduced DSO operational expenditure, typically due to the elimination of meter reading costs; meeting future expectations from the regulator; reduction of power theft; optimised grid planning and operation; and faster detection of power outages.

Meanwhile, customers will be able to better manage their consumption and, as a result, potentially lower their bill. Accurate and more detailed billing information will improve their knowledge about how much electricity they consume. Smart meters will also help make customer

¹ [EURELECTRIC Report on Regulation for Smart Grids](http://www.eurelectric.org), February 2011, www.eurelectric.org

processes more efficient and reliable, leading to faster supplier switching and higher customer satisfaction.

In most Member States, the installation of smart meters will be the responsibility of DSOs². As part of the physical grid infrastructure, the meters fall under the grid operator's domain, making DSOs best suited to manage the smart metering infrastructure. **The question therefore arises as to how DSOs will communicate with customers when installing the smart meter on their premises.**

European DSOs already act to facilitate effective and well-functioning retail markets. With the deployment of smart meters they must now be prepared to address very specific customer questions related to the smart meter installation. They will have to explain what a smart meter is, how it works, why smart meters are needed, and where to go for impartial advice on smart meter functionalities and benefits.

This paper clarifies the important communication role of DSOs towards customers. It explains why smart metering by DSOs is so important from a customer point of view. At the same time, it sheds light on how key consumer questions need to be addressed and presents best communication practices and strategies of several European DSOs.

Smart Meters: European policy context

A. Energy Services Directive 2006/32/EC (ESD)

Article 13 (1) of the ESD demands that Member States ensure that end customers are provided with competitively priced individual meters that accurately reflect consumption and provide information on the actual time of use. In most cases, this requirement is subject to the conditions that it should be technically possible, financially reasonable, and proportionate in relation to the potential energy savings. The goal of this Directive and thus the objective of introducing individual meters and frequent consumption information is ultimately to save energy.

B. Directive on Internal Markets 2009/72/EC

The Third Directive demands that, in order to promote energy efficiency, Member States shall strongly recommend that electricity undertakings optimise electricity use by, for example, introducing intelligent metering systems or smart grids.

Annex I(1)(i) states that customers must be properly informed about actual electricity consumption and costs frequently enough to enable them to regulate their own electricity consumption.

Moreover Annex I sets up the framework for the rollout of smart metering systems, which states that EU Member States should ensure the implementation of smart metering systems that shall assist in allowing active participation of consumers in the electricity market. Provisions of this Directive foresee that the rollout of smart metering systems in a Member State may be subject to an economic assessment that should include "all the long-term costs and benefits to the market and the individual consumer or which form of intelligent metering is economically reasonable and cost-effective and which timeframe is feasible for their distribution." Where the rollout of smart meters is assessed positively, the Directive demands that at least 80% of customers shall be equipped with intelligent metering systems by 2020.

² In a minority of Member States, DSOs do not own the metering assets; e.g. in the UK suppliers are responsible for the provision of a meter as well as for meter reading and estimation; in Germany customers are free to decide who is responsible for meter reading.

C. Recast of Building Directive EPBD 2010/31/EU

Art. 8(2) of the recast of Directive 2010/31/EU on energy performance of buildings 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.

D. Commission Recommendation on preparation for the rollout of smart metering systems 2012/148/EU

The Commission published a recommendation on the preparation of the rollout of smart metering systems that addresses the following issues:

1. A section that provides guidance to Member States on the design and operation of smart grids and smart metering systems ensuring the fundamental right to protection of personal data. This section also provides guidance on measures to be taken for the deployment of smart metering applications in order to ensure that national legislation implementing Directive 95/46/EC (on the protection of individuals with regard to the processing of personal data and on the free movement of such data) is, where applicable, respected when such technologies are deployed.
2. A section that provides guidance to Member States along with a framework for cost-benefit analysis as a foundation for conducting a consistent, credible and transparent economic assessment of the long-term cost and benefits of the rollout of smart metering.
3. A section that provides guidance on measures to be taken to ensure that Member States make due use appropriate interoperability and standards for smart metering systems currently being developed under Mandates M/441, M/468 and M/490 and of best practice.

E. Energy Efficiency Directive 2012/27/EU (EED)

The provisions of the EED on metering and billing information take over some of the provisions of the earlier ESD. The EED repeals the ESD, but in general its provisions have been taken over and additional clarification has been provided so as to explain specific conditions, e.g. with accounting and billing for individual consumption of heating, cooling and domestic hot water in multi-apartment and multi-purpose buildings or when smart electricity meters are installed.

The EED does not require the rollout of smart meters as such, as this is already covered by the Third Directive. However, in the view of the on-going or planned rollout of smart meters, the EED brings clarification mainly as regards ensuring that relevant information from metering and billing will be provided to the final customers using smart metering.

In order to strengthen the empowerment of final customers as regards access to information from the metering and billing of their individual energy consumption, bearing in mind the opportunities associated with the process of the rollout of smart metering in the Member States, the EED plays an important role in clarifying the requirements of EU legislation in this area. This should help with the rollout of smart metering systems equipped with functions enhancing energy saving and support the development of markets for energy services and demand management.

EURELECTRIC considers that the requirements established under the EED concerning information to the final customers are necessary and fundamental to foster energy-efficient customer behaviour.

However, clarification is still needed through national and complementary European regulation, including:

- Within the context of the EED, “time-of-use” should be interpreted as information of energy consumption according to a number of established time-of-use periods.

It should be clearly stated that, for privacy, security and economic efficiency reasons, the complementary information should only be provided to those final customers who have requested it.

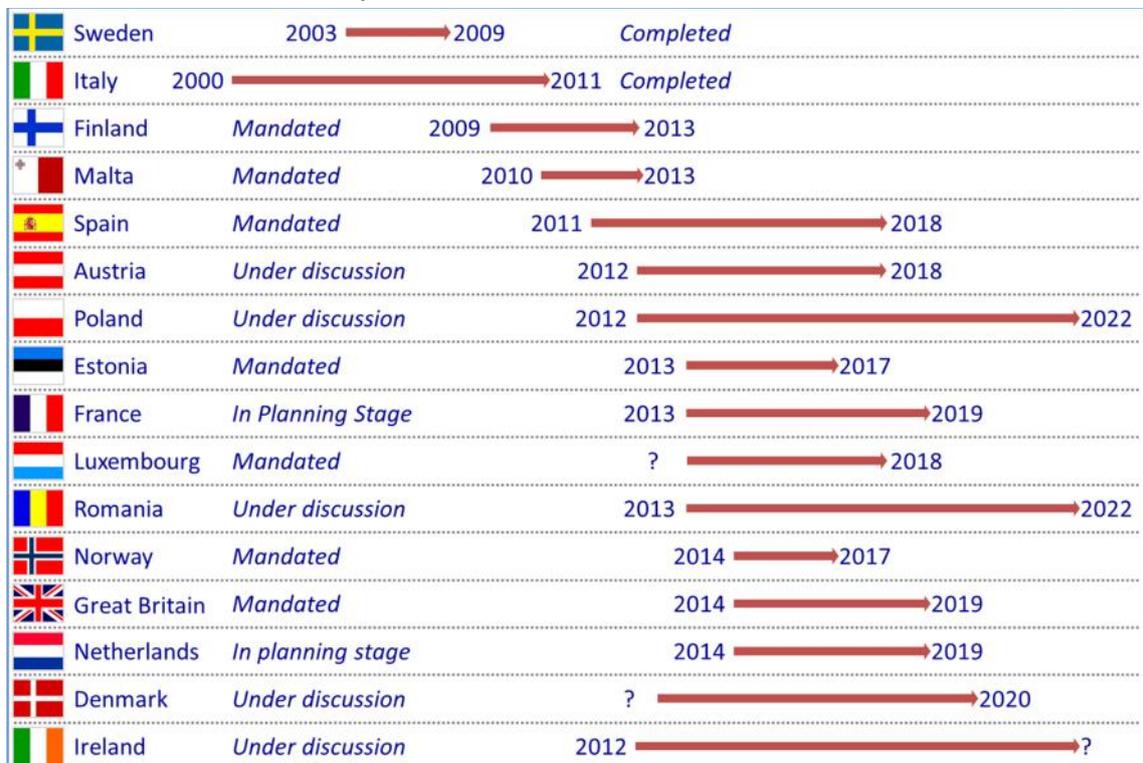
F. European Commission Task Force on Smart Grids Expert Group 2 (EG2)

An additional push can be expected from the Smart Grids Task Force which has been established by the Commission to give advice on smart grids issues. One of the subgroups of the Task Force, Expert Group 2, focuses on security and data protection aspects.

A significant part of the earlier mentioned Commission Recommendation (2012/148/EU) is dedicated to data protection. The Recommendations calls for the preparation of a template for a data protection impact assessment. This template has been developed in EG2 in 2012 and constitutes an evaluation and decision-making tool for entities planning or executing investments in the smart grid sector, including smart meters.

Thus the Commission pursues a ‘soft law’ approach combining a Commission Recommendation covering data protection among other issues and further guidance to Member States in the form of a template for a data protection impact assessment, which is to be applied voluntarily by industry participants. The Commission has also not excluded the need for further legislative action and national and/or at the European level regarding data protection in the smart grids context.

Smart Meter rollout status in Europe:



Source: European Commission, DG Energy, EURELECTRIC Innovation Action Plan Task Force analysis

2. Present DSO Activities and Responsibilities related to the Electricity Meter

The organisation of the customer interface is an essential element for a well-functioning retail market. EURELECTRIC advocates a customer-centric model in which the customer has just one counterpart for all (major) matters: the supplier.³ As a rule, suppliers should handle most customer issues, including, but not limited to, communication regarding supplier switching, moving, billing, offers and contracts covering supply, demand response, and micro-generation.

However, this model does not imply that all customer issues should be handled by suppliers. Strictly network-related issues will remain the responsibility of DSOs, defined by Directive 2009/72/EC as the “natural or legal persons responsible for operating, ensuring the maintenance of and, if necessary, developing the distribution system in a given area” (Article 2.6). Such issues include interruptions, technical aspects of metering and metering devices, quality of supply, physical connections to the grid, and compensation for failing to meet specified standards of supply. In these cases DSOs are responsible for providing a customer service point that the customer can contact.

The installation of smart meters will therefore touch upon the DSO responsibilities. Moreover, as the ones installing the smart meters, DSOs will be the first entity directly faced with customer questions and concerns regarding smart meters. Such questions could be related to the reasons for installation, the benefits and technical aspects of the smart meter or the possible implications regarding the quality of supply. For any other questions, DSOs should refer customers to their supplier.

Fostering understanding is key to making the most of smart meters. Consumers need to understand the features and potential benefits of smart meters before, during and after the meters are rolled out. DSOs should therefore be able to inform customers about how to best engage with smart meters. At the same time, DSOs will need to approach consumers differently, according to their profiles and needs.

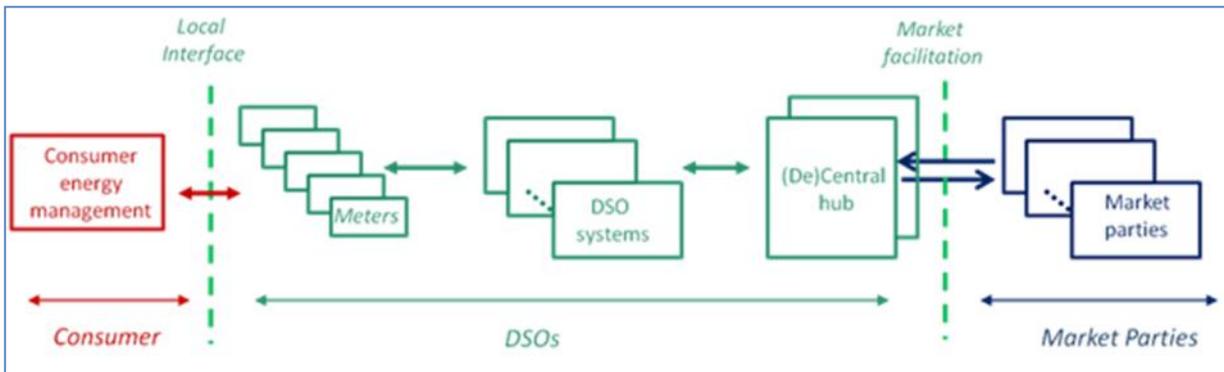
To better understand how DSOs should communicate during the rollout and installation of smart meters, the rest of this chapter will clarify their present responsibilities related to electricity meters that require a direct contact to end customers.

1. Metering and Meter Value Reporting

Metering is a crucial behind-the-scenes process for establishing consumption data for billing purposes. The meter reader must provide consumption information to the relevant market players in a timely, efficient and non-discriminatory manner, whilst safeguarding consumers’ privacy and data confidentiality. In most EU member states, the DSO both owns the metering assets and is responsible for ensuring physical access to the meter, be it to read the meter, estimate consumption or validate metering data.

The process of delivering metering data is shown in the figure below:

³ EURELECTRIC Report Customer-Centric Retail Markets, September 2011, <http://www.eurelectric.org>



Source: European Commission Smart Grids Task Force, Expert Group 3

Behind this DSO service lies a complex range of processes:

- Installing the meter;
- Registering the meter location and giving it a unique identifier number;
- Ensuring safety and accuracy of the installation;
- Establishing and continuously ensuring good communications infrastructure;
- Initial set-up and continuous management of meter configuration (time-of-use tariff parameters, contracted power limits, etc.);
- Collecting metering data;
- Maintaining the meter and communications; managing breakdowns and incidents;
- Data capture, validation and storage in DSO systems (for network operations and for market delivery).

The established consumption data is communicated to the supplier, who is then able to correctly bill the customer. The supplier should therefore be the primary contact for queries about meter values. Although this model is the most common across the EU, the frequency of meter reading varies among countries. For low voltage (LV) customers it is often yearly, but in other cases it depends on thresholds related to annual consumption, ampere or other criteria.

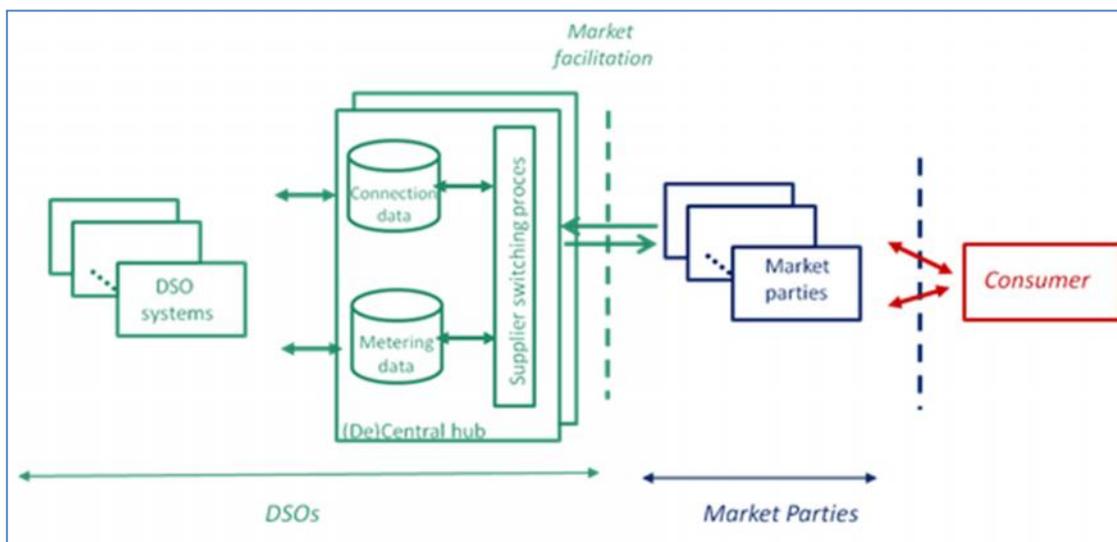
2. Facilitating Market Scenarios

Properly functioning electricity retail markets benefit customers in terms of prices, quality of services, choice of commercial offers and product innovation. DSOs' role is to facilitate such markets. In doing so, DSO transparency and neutrality are essential. This is especially true when managing metering and providing information to market participants.

Most of the known market processes imply a direct meter operation. Since DSOs are the key players in metering the electricity flow to customers, they are also responsible for the exchange of large amounts of data between different market players.

Example: Supplier switch: the DSO facilitates this market process behind the scenes

1. The customer contacts the new supplier. A variety of means to agree a contract are available: in person, by e-mail, via internet or a written contract.
2. The new supplier informs the DSO of the customer's desire to switch supplier.
3. The DSO checks the (technical) consistency of the switch inquiry and sends a (possible) confirmation message to the new and old supplier.
4. The DSO effectuates the meter reading and the programming of the new contract parameters.
5. After the acceptance or the estimation of the metering data, the DSO sends the meter value and/or energy consumption values to the old and new supplier.



Source: European Commission Smart Grids Task Force, Expert Group 3

By providing the connection and metering data in this process, the DSO allows old and new suppliers to exchange information efficiently. The DSO also makes sure to synchronise the supplier switching process with the allocation and reconciliation process between those market parties.

To initiate a market process, customers must inform their (chosen) supplier. The supplier then notifies the DSO to take the suitable action. For new physical connections customers can either contact the DSO directly or contact the (new) supplier, who will make sure that the DSO contacts the customer.

The DSO is responsible for handling and informing customers on the status of any inquiry they have submitted to the DSO related to the physical connection. Although the DSO has the responsibility to turn on the connection in a new place of consumption, customers should always contact a supplier to agree on a new supply contract for starting the supply. The DSO should inform customers about this procedure when they make the connection contract.

In summary, here are some of the basic market scenarios and the related activity regarding the electricity meter:

- Move in, move out, customer switch: **meter reading, remote action (if existing) on the breaker**
- New connection: **remote action (if existing) on the breaker**
- End of contract, drop of customer: **meter reading and remote action (if existing) on the breaker**
- Supplier switch: **meter reading and meter programming**
- Upgrade and tariff modification: **meter reading, meter programming**

3. Quality of supply, unplanned outages and technical meter problems

DSOs are responsible for taking care of customers with quality issues. To enable DSOs to operate the network and maintain security of supply, certain meter data should be made available to DSOs as a matter of course. For instance, DSOs need to be informed as quickly as possible about outages or power quality issues. DSOs should also be able to collect logs, events and alarms that will allow them to manage electricity meters, including their quality of service and performance.

For these issues, the DSO should be the primary contact point for customers. This is the best way to ensure that customers reach the party that is responsible for the quality of supply. It will also make it easier for DSOs to assess customers' needs and decide which steps to take. This includes the obligation to respond to customer enquiries with feedback and solutions.

3. Why is (Smart) Metering by DSOs Important for Consumers?

DSOs are responsible for ensuring that the system (grid) is able to meet reasonable demands for the distribution of electricity in the long term. They are also responsible for economically operating and maintaining a secure, reliable, and efficient electricity distribution system with due regard to energy efficiency. This could be seen as a codification of DSOs' general contractual duty to ensure a high level of grid quality as well as grid stability and security.

The meter is the customer-facing end point of the natural electricity network monopoly granted to the DSO. Even in countries where another actor owns the meter, the DSO requires certain data from the meter in order to operate the grid effectively. In order to operate an effective and efficient grid in the future, the (smart) meter is a vital part of a chain of functions delivering electricity and data to and from the customer. With European energy demand on the rise, DSOs could require accurate metering data in very short time intervals to better react to energy supply shortages.

A number of parties will need to interact and access information from the customer's meter. Standardised operational procedures must be developed that consider actors' different timeframes and requirements when it comes to obtaining such information. All actors should use agreed messages to the meter operator for actions to be executed in order to achieve maximum efficiency and assure data security.

In general, meters can be considered as the grid 'sensors' that will support DSOs in managing an electric distribution network facing the new challenges of integrating renewables and electric vehicles. The DSO must have adequate tools, including an easy access to the meters in the LV network, in order to monitor the grid and take action whenever necessary to better integrate such distributed energy resources.

Any scenario where metering information collection and management are not carried out by the DSO risks introducing additional costs and/or forgoing important benefits, for example:

3.1. Costs due to duplication of metering information systems and processes

To handle highly granular metering information DSOs will always need dedicated systems and processes that can support both network planning and operation processes and market support processes. A scenario where a separate entity has to implement similar systems and processes, dedicated exclusively to market support, implies significant redundancy.

3.2. Loss of synergies in local metering operations

The DSO can gain large synergies from performing local meter management activities with the same resources that deliver other network management services, such as LV network operation and maintenance. Placing meter management activities outside the DSO prevents such synergies, leading to increased costs.

3.3. Costs due to the increased number of entities and process fragmentation

Separating processes that are currently integrated and managed by a single entity into multiple sub-processes that are managed by separate entities introduces costs and complexity (beyond the obvious dilution of responsibility). Incremental IT costs arise because the total number of systems increases and they have to be integrated using interfaces, implying the definition and maintenance of protocols and, in general, an increased coordination effort in IT system development and maintenance.

3.4. A series of consumer benefits

- Metering is a crucial behind-the-scenes process that is necessary for the smooth operation of all other market processes, which all depend on metering data. Allowing the DSO to act as the unique agent responsible for all sub-processes significantly reduces complexity and guarantees a smooth and efficient operation.
- Decoupling the metering data collection and treatment by the DSO from metering processes carried out by market parties (e.g. billing) creates a controlled level playing field, since DSOs are regulated.
- The aggregated data for consumers is stored by one entity; this enables effective verification and validation of privacy and security around customer data in a regulated environment. The DSOs can effectively safeguard that only data approved by the customer is delivered to market parties (DSO in a “privacy assurance” role).
- Differentiated metering data delivered by the DSO (e.g. usage and production metering data) can create new business models in the market (e.g. for aggregators) from which consumers can benefit.
- Above all, having the DSO – a regulated entity – as the central market facilitator reinforces accountability and makes it easy for the regulator to supervise outcomes and determine corrective actions if necessary. In particular, it avoids the dilution of responsibility and decreased control that would result from having core market facilitation processes dispersed among different entities.

4. The Smart Meter Roll-Out: How do DSOs Inform Customers?

Enabled by smarter metering and in-home technologies, consumers will gain new tools and programmes to help them use energy more efficiently. However, beyond the implementation of the necessary technology lies a new and ultimately decisive challenge: engaging this 'new' energy consumer. Simply installing smart metering devices (and in-home displays) will not drive lasting consumer adoption.

Energy suppliers will develop a more comprehensive competence in consumer energy support – including the ability to address the nuances of consumers' energy efficiency needs and to tailor products and service channels accordingly. The consumer energy support competence will probably include advanced insight and segmentation, new service channels and advanced products. It will also provide a new value proposition that convinces consumers the extra effort is worthwhile.

DSOs should enable suppliers to offer such new services by providing the right information from the start. Consumers need to fully understand the features and potential benefits of smart meters. During, as well as after the installation, consumers should be offered on-going advice on how to benefit from the smart meter and apply the information it provides in practice. Consumers should thus be guided in the direction of sources from which they may obtain impartial information and assistance on how to use smart meter functionalities to their advantage.

The provisions of Article 9 of the EED adopted on 25 October 2012 also set out obligations related to informing customers:

- *“The metering systems must provide final customers with information on actual time of use;*
- *The smart meters and data communication must be secure and the privacy of final customers must be in compliance with relevant Union data protection and privacy legislation*
- *metering data available in an easily understandable format customers can use to compare deals on a like-for-like basis;*
- *At the time of installation of smart meters, appropriate advice and information is to be given to the final customers in particular about their full potential with regard to meter reading management and the monitoring of energy consumption”*

DSOs will therefore have a key role to play before, during and after the installation of smart meters. The rollout and related education and communication effort towards customers will encompass three different phases:

- Phase 1 – Preparation of the rollout
- Phase 2 – Installation of the smart meters
- Phase 3 – Post-installation: smart meter customer support, complaint handling and fault resolution

For each phase we will describe good practices that should be understood as references for future implementation.

In this preparatory phase, DSOs should aim to:

- Inform customers about the deployment of the new metering system and the advantages smart meters bring with respect to overall energy efficiency;
- Inform public officials, the media, and other energy market players (ESCOs, suppliers, aggregators, etc.) who are likely to interact with customers during the deployment process;
- Provide a timeline of smart meter installations;
- Explain the process associated with the installation of smart meter;
- Clarify at a general level why the DSO is installing smart meters.

DSOs will consider the following three aspects:

1. Customer awareness and understanding of smart meter deployment

- ✓ The communication materials should be clear, concise and drafted in a way that customers can reasonably be expected to understand them. Examples of communication materials include:
 - **A welcome letter:** Before the first smart meter installation, all customers receive a letter introducing smart meters and informing them of the phased installation. The letter provides background information on smart meters, introduces the installation process, and informs customers that they may be contacted to set up an installation appointment.
 - **Website:** The DSO's website could provide a section on smart meters, giving customers and stakeholders a robust online resource for information and education about smart meters and related features.
 - **Frequently Asked Questions:** DSO customer call centre employees should be able to handle smart meter questions, concerns, and disputes/complaints. They should receive detailed FAQs on the key features of smart meters, timing and functionality, and possible consumer concerns on privacy, security, health risks and accuracy. DSOs should be prepared to answer the following questions:
 - Why are you installing smart meters?
 - What are smart meters?
 - When will I get my smart meter?
 - Will I receive any notice before the meter is exchanged?
 - Will I lose power during the meter exchange?
 - Can I opt out? Can I refuse to have a smart meter installed?
 - What happens to the old meter?
 - How do smart meters work?
 - What are the benefits of smart meters?

- ✓ The customer awareness materials point the customer to sources (suppliers, service providers, consumer organisations, government organisations) from which they may obtain additional and impartial information or assistance to improve their energy efficiency.
- ✓ The customer awareness materials are updated regularly and in a timely way.
- ✓ Local media (e.g. radio or newspapers) can also be used for information purposes.

2. Training and accreditation of the installers

- ✓ Rules for safety in low voltage to observe during installation work
- ✓ The installation instructions and process information should be well documented and taught to the installers
- ✓ The training material should recognise local specificities (e.g. metering solutions, wiring, tariff based load controls)
- ✓ It is important to train the meter installers thoroughly on:
 - work safety
 - customer service issues
 - the big picture of the whole process
 - special issues concerning DSO area
- ✓ The quality of installations must be followed throughout the process and learned from.
- ✓ The staff of the contractor is trained beforehand in a training organised jointly by the DSO, the metering instrument provider and the contractor. Main points of the training should include:
 - Technical aspects of meter switch
 - The installation process
 - Going through previously learned experiences from similar projects
 - How the installer shall behave in customer premises
 - How the installers get to the meters (keys, door opening codes, etc.)

3. Scheduling visits

When scheduling the smart meter installation time:

- ✓ The DSO agrees with the chosen contractor to carry out the installations at the installation time of a certain area.
- ✓ Some weeks before the planned installation the DSO sends a letter to those customers who will receive a new meter.
- ✓ The letter gives general information about the meter exchange and the changes it implies (e.g. after the meter exchange billing could be based on actual consumption).
- ✓ A few weeks before the planned installation the contractor sends letters to those customers who need to be at home (onsite) during installation.

- These customers are identified based on existing information from meter reading experience etc.
 - The letter tells customers how to agree on the meter exchange time via a chosen channel (telephone, e-mail, SMS).
 - The DSO and/or contractor ensures that there is enough communication capacity (e.g. people answering the phone) for customers to agree on the installation time.
- ✓ Several days before the planned installation the contractor sends an information letter to those customers who do not need to be home (onsite) during meter exchange.
- The letter informs customers about the electricity supply interruption and its duration, and tells customers that they do not need to take any particular action.
- ✓ It is recommended that soon after the installation process, customers are asked to respond to a customer satisfaction inquiry (via email, app, SMS, web-tool, etc.), and that this information is used to improve the advance information and the installation process.

Article 9 of the EED requires Member States to make sure that, at the time of installation of smart meters, appropriate advice and information is given to final customers in particular about smart meters' full potential with regard to meter reading management and the monitoring of energy consumption.

For customers, the electricians are the face of the network company. They should be trained so they can represent the DSO and its values. In this respect, it must be made clear to the electricians which questions they can answer and how and on which issues they should instruct the customer to contact the DSO and/or supplier.

This is important because customers could have a multitude of questions with respect to the installation phase of the smart meter, including

- When will the meter change take place?
- When will the installers come? What if I'm not home – will they still go inside my house?
- What happens to the old meter? Will it be stored and if so for how long?

Customers should receive answers to such questions as well as other clear and simple information about the installation process.

DSOs will install the meter and carry out appropriate tests:

1. Installation

- A site inspection could be undertaken before commencing any work at the installation visit and the customer is advised that the inspection will take place.
- Where appropriate, the installer gives the customer verbal guidance on safety and makes them aware of the risks of storing objects too close to or obstructing the meter.
- The customer is made aware of whom to contact after the installation visit for further information in relation to the smart meter installation for support, query resolution, or to provide feedback (verbally or in writing). Non-premium rate helpline numbers are provided.
- The customer is made aware of any additional sources of help and information, including help-lines, websites and other appropriate organisations able to offer assistance.
- The DSO should be responsible for defining the standards against which meter installers working for contractors are certified as competent for the task.

Process: Installing the smart meter – what will happen when the smart meter is installed?

1. The DSO or the contractor will contact customers and let them know about a fixed period during which a qualified meter installer will come to remove the old meter and fit the new smart meter.
2. The installers will present and identify themselves. They will let the customer know when the work is about to begin and when it is finished. The customer will not be required to pay anything to the installer.
3. The power will be switched off for a certain time (usually 20 to 60 minutes) while the smart meter is installed.
4. Meter reading of the old and new meter: attention should be paid to explaining to the customer that a final meter reading of the old meter will be noted (and maybe signed for). In addition, a picture can be taken from the last reading of the old meter. The same will be done with the first meter reading of the new meter (which may not be zero because of pretesting). It is possible that in, case there have been used estimates in the past or registered meter readings were wrong, customers could be faced with high reconciliation bills. The old meter should therefore be stored for a certain time in case of challenged meter readings or meter functioning.
5. The installer will leave the customer with instructions on how to read the new smart meter (including a safety manual) and details about whom to contact if case of problems.
6. In cases where the power control functionality of the smart meter is being implemented, instructions must be left so that the customer understands the new operation of power control and how to react when the demanded power exceeds the contracted one.
7. Suppliers will get in touch with consumers to offer innovative customer services (e.g. introduction of new type of contracts or products).

Possible customer questions

- Who owns the meter?
- Will the new meter be long-lasting? What is the average life of the new meter? Some customers might have concerns about the durability of the meter. They might not trust new electronic appliances as much as older, more conventional devices.
- Do I have to take the new smart meter or can I keep the old one if I want to? Can I refuse to take the meter?
- How often will the meters be read?
- Is there a local interface (HAN) available? How can I access it?
- Does the meter itself use electricity? If it does, do I have to pay for it? (Customers may be informed that the old meter also consumed a small amount of electricity. The old meter's consumption may have been higher than the consumption of the new electronic meter.)
- Will I have to pay to have a smart meter installed?
- What happens if my meters stop working?
- What technology do you use to send the readings back to your office?
- Can I still take a reading from my smart meter?
- Is the smart meter compatible with all energy suppliers?

DSO response

The DSO should provide the customer with sufficiently detailed information about the new meter and its functionalities. If the old meter has not metered correctly and has given a lower reading than the actual consumption, customers' bills will be higher after the change. Customers might then blame the new smart meter for metering too much. The DSO should be prepared to check the functioning of the new meter and also, if necessary, the old meter. (However, the DSO should assess the costs of setting up a system to manage old retired meter data).

2. Testing and demonstration

To ensure the accuracy of its smart meters, the DSO has multiple test phases in place prior to, during and after installation. This thorough testing process can include, for example, testing at the back-office, random palette tests from the company's shipment, and digital captures of the old meter before it is removed.

- It is the DSO's responsibility to take appropriate steps to ensure the full smart metering system is operating correctly.
- The use of the smart metering system is demonstrated to the customer, including what information is available from the smart metering system and how this can be accessed.
- Instructions, in a written or other suitable format, on how to use the smart metering system are left with or sent to the customer.
- The demonstration of the smart metering system is responsive to the needs of vulnerable customers or others with specific needs.
- Essential information should be provided in a format suitable for vulnerable customers and those with specific needs.
- When the meter installers have changed the meter they can give the customer a hand-out (or leave a note in the customer's mailbox) with additional information. It is important to notify customers where they can get additional information if needed.

Customers do not necessarily need to receive all of the information mentioned in the previous section automatically (e.g. all benefits of smart metering, all new qualities of the meter, the distribution of installation costs). Instead, some information can be made available on the DSO or the supplier web page. Alternatively, customers could contact a customer service centre if they would like to receive more specific information.

1. Customer feedback

It is the DSO's responsibility to ensure that:

- ✓ The customer has a means of providing feedback on their experience of the installation visit. This could be in the form of feedback card, via a website, email or verbally.
- ✓ A follow-up call or visit can be made to a demonstrably valid sample of customers from a variety of customer groups to learn from their experience of the installation visit. This information provides input for future installation visits and, where appropriate, for member policies and processes.
- ✓ The customer should possibly also receive written information about the reading of the replaced meter and the fact that a smart meter has been installed. It is also recommended that additional information on the meter itself is provided (information available on the display, etc.).

What about Data Privacy?

The implementation of smart metering is highly dependent on the collection, processing, and transfer of personal data. Therefore, data protection issues play a very important and even decisive role in the successful implementation of smart metering. Such issues should be addressed at the very beginning of implementing smart metering at the DSO level.

From a technical point of view, privacy issues can be reduced by adopting a privacy-by-design approach. This means already integrating privacy-friendly solutions into technology and business.

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

In this respect, one of the main obligations of Article 9 of the EED states that the smart meters and data communications must be secure and the privacy of final customers must be in compliance with relevant Union data protection and privacy legislation.

Customers want free, easy and frequent access to their consumption data in an appropriate format. Customers can be very sensitive about their information and want to be able to decide to whom, when and for what purpose they should allow access to their metering data.

Possible customer questions

- Who has access to my consumption information? What is my information used for?
- Can someone steal my energy use data off your wireless network?

DSO response

- The customer should be informed about data privacy issues in adequate detail. Customers should know who has access to their data, what the data will be used for and how the data will be stored. Granting access to any additional metering data, apart from the billing information, should require the customer's explicit authorisation/request. However, other information – like system voltage, reactive energy, meter events, etc. – provides useful indicators of both supply quality and operational status, and should therefore be easily available to the DSO if required.

What about Safety and Protection?

Smart meters must be reliable and safe, reducing the risk of negative impacts on consumers. The design and manufacturing of smart meters should respect safety standards and stringent criteria, thereby guaranteeing the highest possible consumer protection.

Customers may have concerns about the safety of the smart meter and may be afraid that it might affect/break other electrical equipment or even present fire safety risks.

Possible customer questions

- Will the remote reading interfere with other devices (phones, TV or radio)?
- Will people who are sensitive to electricity experience symptoms from the new meter and remote reading?
- Will there be any radiation effect (when radio-based meters are installed)?

DSO response

- The customer should be informed how the DSO has made sure there is no safety risk (fire safety risk, etc.).
- The DSO should place the utmost importance on the security and protection of all aspects of its electric system and associated subsystems. The DSO's smart grid systems and components will guard against cyber and physical attacks. For example, firewalls, encryption, and other methods as defined in technology standards should be used to defend, deter, detect and minimise security threats.

2. Resolving complaints

Customers should have clarity on whom to contact if they have queries or problems and where they can get redress. DSOs should ensure that:

- ✓ Different communication channels (customer care centre, web, offices, etc.) are put in place and trained to give an adequate level of support.
- ✓ Dedicated complaint handling and redress systems with appropriately trained staff are put in place ahead of rollout.
- ✓ The DSO makes every reasonable endeavor to take responsibility for the fault and the resolution.
- ✓ Suitable operational arrangements are in place with service providers and network operators so that complaints are addressed in a timely manner.
- ✓ If DSOs use a contractor for installations, the processing and responsibilities concerning customer complaints must be clearly agreed between DSO and contractors.

3. Fault resolution

DSOs should ensure that:

- ✓ Information is provided as to whom customers can contact if they identify a fault with the smart metering system.
- ✓ The customer is provided with contact details for additional information related to the smart metering system fault, for example should they wish to check progress.
- ✓ If a fault is identified with the smart metering system after the installation visit, the customer is made aware what the resolution is likely to be, who will be resolving the fault, and the approximate timescales of the resolution.

5. Examples of Best Communication Practices and Strategies

Best Practice 1: Customer Support Infoline in Kalisz (Poland)

In order to answer all possible questions related to the smart meter installation in three locations (Kalisz, Drawsko Pomorskie, Władysławowo) Energa-Operator, one of the energy distribution companies in Poland, decided to launch a dedicated customer support info-line in the second half of December 2011. The main aim of the info-line was to facilitate the work of installers, i.e. providing a chance to arrange an installation visit when it was most suitable for a customer and reassuring the customers as they knew when to expect the installation.

The information about the info-line was announced on the company's webpage just before the installations of smart meters. It was also placed on posters in buildings and leaflets left on the door by installers.

The info-line consultants were able to answer customers' questions concerning issues such as why the meters were being replaced and how smart meters should be read. The consultants were trained by public relations specialists and were equipped with a list of possible Q&As. The majority of questions asked by customers might be divided into key topics: what are new smart meters; how to read a smart meter and how to do it during the replacement period; safety and data protection issues; arranging a visit for meter replacement and the replacement itself; legal basis for replacement of meters.

During the whole project questions were updated with answers on the company's website.

In effect Energa-Operator received more than 20,000 telephone calls in the period of 6 months. This covered about 20% of households in the installation area (a total of 100,000 households in 3 locations).

Best Practice 2: Liander Brochure 'The Smart Meter – Ready for the Future' (The Netherlands)

Customers of Liander received a brochure with the following information:

"Liander is making its energy grids ready for the future. Like the automobile, the telephone and the banking sector, energy networks are becoming digitised. The smart meter is an important link in this respect. This digital energy meter transfers the meter data remotely.

The smart meter is necessary to support social, technical and ecological developments and to keep the grid affordable and manageable. New products and services for the smart meter lead to more convenience and energy savings. In January 2012 Liander will start the installation of smart meters. [...]. In 2020, 80% of Dutch households will have been offered a smart meter."

The brochure addresses the following questions:



- What is a smart meter?
- Why do you get a smart meter?
- How will the installation process be run?
- What about your privacy?
- What happens with your data?
- Is the smart meter mandatory?
- What does the smart meter cost?
- What potential does the smart meter offer in the future?

Best Practice 3: Enel Distribuzione - The Telegestore Project (Italy)

The Telegestore (remote management system) is the innovative solution that Enel has been deploying since 2001 in Italy to remotely manage the new electronic meters. By 2011 all 36 million electricity customers were equipped with a smart meter.

A whole set of communication means has been used, for example:

A. Communication to the customer – The billboard



A few days before the meter replacement, the customer is informed with a billboard.

The content:

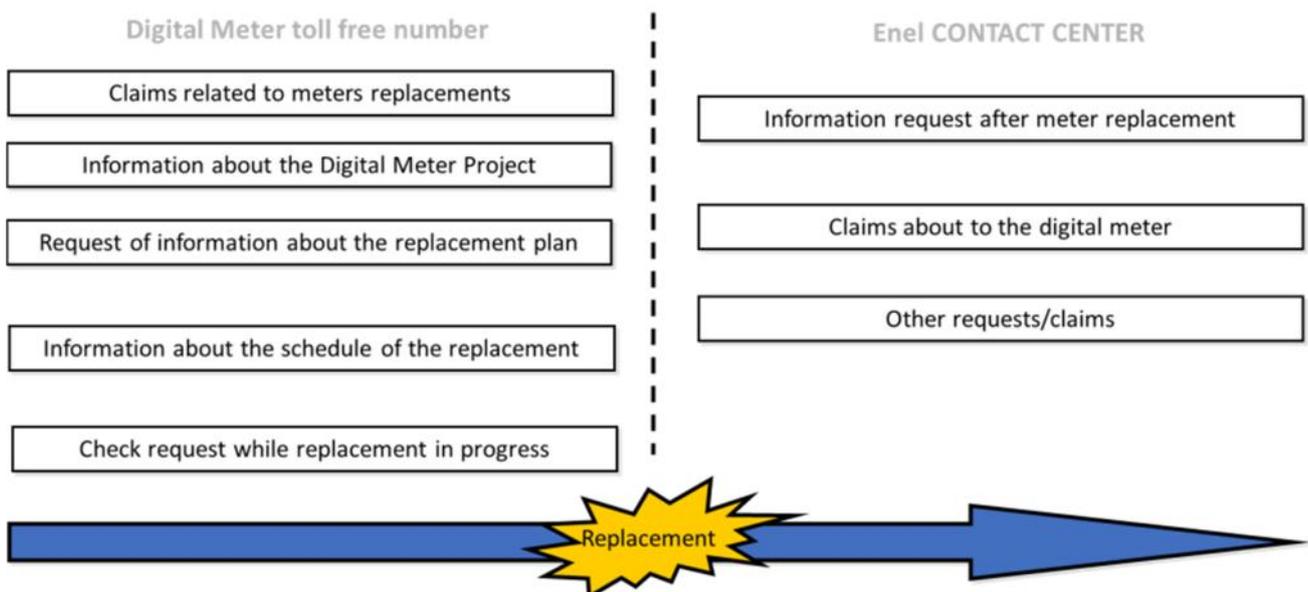
- The replacement is free
- The replacement will not last more than 30 minutes
- The toll-free number for Digital Meter Project information
- The day and time for the replacement

B. Communication to the customer – The notice of a missed replacement



C. Contact Centre for Digital Meter Project Activity

- The Contact Centre for Digital Meter Project provides information about the project and manages customers' requests for customised appointments
- The Enel Contact Centre manages customers' requests after the meters' installations



Enel Distribuzione operates 85% of the Italian electricity distribution network. It is at the forefront of the development and roll-out of smart grid technologies and business, starting with smart meters and AMI infrastructure deployment back in 2001.

Best Practice 4: ERDF – Linky Project ‘Dossier de Presse’ (France)

ERDF is implementing a plan to modernise its 35 million electricity meters nationwide. The main challenges of this Linky project are to improve the functioning of the electricity market and help control energy demand and reduce CO2 emissions. 7 million Linky meters will be deployed in France from 2013 to 2014 and an additional 28 million from 2015 to 2018.

- ERDF has developed a ‘Dossier de Presse’ including the experiences of the Linky project (http://www.erdfdistribution.fr/medias/dossiers_presse/DP_ERDF_010711_1.pdf). The document presents, amongst other things, an overview of the technology, how it works and what benefits the smart meter brings for customers.
- A dedicated web page with frequently asked questions has recently also been introduced: http://www.erdfdistribution.fr/ERDF_Questions_Frequentes_Linky

Best Practice 5: Endesa – “Smart Metering is More” (Spain)

Endesa’s smart metering roll-out plan involves the installation of 13 million meters with contracted power capacity of up to 15 kW and 140,000 concentrators at the secondary substations until the end of 2018.

The roll-out of Endesa’s smart metering system started in 2010. By the end of 2012, more than three million smart meters based on the open ‘Meters and More’ technology had already been installed. Endesa has launched a special communication and dissemination plan in order to inform its customers about the meter replacement and the benefits of the new smart metering system.



Retailers and clients are informed about the replacement of the meter three months in advance. Specifically, Endesa sends customers a letter notifying them about the substitution and informing them about benefits and advantages of the smart metering system. The letter is complemented by a leaflet designed especially for this campaign.

In addition to this individual notification, customers are informed by posters indicating the exact time and date of the replacement and the contact phone number of the contractor performing the meter replacement. These posters are typically placed at a visible location in the entrance hall of the customer’s building. In particular, both the letter and the poster inform the customer that the replacement is free.

After the meter replacement a second letter is sent to customers with information about the replacement (information like the day of substitution, the consumption up until the replacement, etc.). Within this letter another leaflet, the Smart Meter Manual, explains in a simple way how the new meter works. The letter also includes a special sticker to be put below the ground fault interrupter, so that customers know what to do if they need to restore the power in case of cut-off due to power control.

If, for any reason (installation with faults, zone with defects, etc.), the meter replacement was not possible, another letter is sent in order to inform customers that they are legally obliged to have the replacement, so the DSO will carry out the substitution.

Generally, the communication and dissemination plan involved a series of complementary actions, including for example, the training of internal staff; informative sessions for contractors, with a special focus on work safety; local authorities; associations of installers, dissemination activities at specific magazines of the electricity sector; educational institutions, etc.

Special showrooms have been installed in all major offices of the company to frequently perform guided tours and explain smart metering. In addition, special campaigns have been carried out involving radio and newspaper articles, informing people about the replacement if needed.

All of Endesa's customer care channels are involved in the process in order to provide customers with the best support, be it in our offices (showrooms, etc.), on the phone (contact centre), on the website (video) or via written information (letter, brochures, etc.).



Best Practice 6: Vattenfall – “Soon we will install the New Age of Electricity Meters” (Sweden)

Vattenfall Distribution Nordic has deployed 830,000 AMR meters in Sweden. The business case for this investment mainly arose from lower meter reading and customer service costs, but also from extra readings linked to move in/move out processes and change of supplier.

The installations were carried out in three major phases, starting in 2003. They were finalised in 2008.

Vattenfall sent out letters some weeks before the installation as well as handing out folders with the necessary smart metering information at the time of the installation.

Letter example:

Snart installerar vi den nya tidens elmätare

Nu påbörjar vi ett arbete så att vi ska kunna ta betalt för den el du förbrukat och inte som hitills, en beräknad förbrukning. Detta blir möjligt genom att vi installerar elmätare som vi kan läsa av på distans.

Bättre kontroll på elförbrukningen

Den nya mätaren rapporterar mätresultat någon gång månad. Det betyder att fakturor baseras på en verklig elförbrukning och ger bättre kontroll på din förbrukning.

Vi hör av oss

Senast en vecka innan det är dags att byta mätaren skickar installatören ett brev med all information som rör bytet. I detta brev följer vi Allmänna avtalsvillkor (Nät 2004K), och ger oss tillräde till elanläggningen eller mätarordningen hos dig.

Har du frågor – se Frågor och svar

En utvald vanligaste frågorna och svarar angående mätarbytet i den bifogade fjäddern. För de flesta frågor är du välkommen att kontakta vår Kundservice för mätarbytet på telefon 03 336 36 76.

Ved vänlig hälsning

Vattenfall Distribution AB
Värmland



Erik Nordgren
Chef i/inställningscenter

PS På grund av installationsarbetet kan det crejairan din nästa faktura komma. LIS

HET TRIKREVIK

VATTENFALL DISTRIBUTION AB

Brochure example:

**FRÅGOR OCH SVAR OM
DIN NYA ELMÄTARE**

Snart installerar vi en ny elmätare hos dig!

Med den nya fjärravlästa elmätaren kan vi läsa av din elförbrukning på distans. Du slipper uppskattade elräkningar och överraskande sluträkningar. Med den nya mätaren kan du med lätthet följa din elförbrukning – enbart genom att titta på din elräkning. Du ser exakt hur mycket el du har använt under den senaste perioden. På så sätt blir det enklare att få kontroll på elkostnaderna.

Vilka kommer att få nya fjärravlästa elmätare?

Alla villa- och lägenhetskunder och småföretag inom Vattenfalls nätområden får den nya mätaren. Totalt kommer vi att installera cirka 900 000 fjärravlästa mätare.

Hur går mätarbytet till?

Senast en vecka innan din mätare ska bytas ut får du ett brev med information om mätarbytet från vår installatör. Arbetet tar ungefär en halvtimme, med ett elavbrott på cirka 15 minuter.

Måste jag vara hemma?

Sitter mätaren utomhus och är åtkomlig för installatören så kan bytet ske utan att du är hemma.
Sitter mätaren inomhus eller inte är åtkomlig för installatören och du inte är hemma när vi är i området, så kommer vi att kontakta dig för att boka en lämplig tid.

Best Practice 7: Union Fenosa Distribución (Gas Natural Fenosa) - Sample Letter (Spain)

Union Fenosa Distribución, S.A. has adapted its communication process to the supply point users, according to the IET Order 290/2012, using the following mechanisms:

NOTICE TO FINAL CONSUMERS.

- Communication by personalised letter to the final consumer. This communication will be sent at least **three months prior** to the replacement of the measuring equipment.
- Communication of the date and the approximate time of the on-site work, with reminders to be delivered in the **week prior** to the meter replacement by poster in the case of farms and mailbox communication in the case of houses. Model is attached (Annex III).

c) In addition, the telephone customer service, whose phone number is indicated in the communication, provides customers with access to additional information about the plan.

Submissions indicated in the above will be explained:

1. Applicable regulations regarding the new meters (remote management capability and time discrimination).
2. Union Fenosa Distribución has the responsibility to replace current measurement equipment by others that permit remote management and time discrimination, according to the Substitution Plan under this document.
3. The available options to the user of the supply:
 - a. Installation of rented equipment.
 - b. Installation of bought equipment. Union Fenosa Distribución made available to the owner of the supply of the required specifications duly approved measuring equipment that may be acquired in property by him (RD 1110/2007 of 24 August, Article 9.8).

SAMPLE LETTER TO CUSTOMER PROPERTY METERS

Supply User Name
COMPLETE ADDRESS SUPPLY POINT
Zip, City

Date Month Day, Year

ES002200000NNNNNNNXXYY

Subject: Measure Equipment Replacement Plan

Dear customer,

We contact you to inform you that, according to the Order IET/290/2012 of 16 February, amending the Order ITC 3860/2007 of December 28, Union Fenosa Distribución, S.A., will proceed to replace your measuring equipment within three months. Such renewal meets the requirement to install metering equipment with remote management capability in all supplies before December 31, 2018, contained in such orders.

As you own the measuring equipment, we offer you the opportunity to choose your meter renewal by renting or you will own another one that meets the certification requirements established by the current regulations.

If you choose to renew by renting, we inform you that no rent will be charged for the new meter if the current one is under 15 years old, and will remain so until it will have reached that age, from that date it would be applied the current rates for equipment rental according the legislation of the time.

If you choose renewal in ownership, the acquisition of the meter is within your competence, after the acquisition, you must contact us at the number provided at the end of this letter to schedule the installation.

A few days before we will inform you about details of date and time slot in which our technicians will execute the necessary works. If the meter is inside your house it will be necessary to make us easy the access.

The new meter will have the ability of remote management and time discrimination according to current regulation.

For more information concerning this communication or if you choose to continue be owner of the new measuring equipment, we offer you the service telephone XXX XX XX XX.

Thank you for your confidence, yours sincerely

Union Fenosa Distribución.

6. Conclusions

1. Smart metering by DSOs is in the interest of customers.

- ✓ Metering is a crucial behind-the-scenes process, which is necessary for the smooth operation of all other market processes. Giving the DSO the sole responsibility for all metering sub-processes, including meter reading and validation, significantly reduces complexity and guarantees a smooth and efficient operation.
- ✓ Smart meter data collection and management by DSOs enables effective privacy and security of customer data in a regulated environment.
- ✓ Smart meters enable DSOs to measure power quality and interruptions. This is useful to solve problems in the network and to improve the quality of supply for customers.

2. DSOs have a central role in communicating the smart meter rollout to customers.

- ✓ DSOs will have to inform customers about the benefits of smart meters. In particular, they will have to respond to customer concerns regarding health and privacy issues.
- ✓ DSOs must point customers in the direction of sources from which they may obtain impartial information and assistance on how to use smart meters to their advantage.
- ✓ DSOs should understand and correctly address customers' key concerns.
- ✓ DSOs must set up efficient cooperation with their smart meter contractors to guarantee a positive installation experience for customers.

3. Activating consumers will depend on a positive customer experience. In this regard, clear information is key.

- ✓ Empowering consumers is crucial for the development of a smart energy system. This requires providing customers with both the right tools and the right information to ensure they understand the possibilities and benefits of smart meters.
- ✓ Customer information should be uniform, regardless of who provides it (DSOs, contractors, suppliers, media, regulators, etc.).
- ✓ National rollout strategies should include DSO-supported national and local communication campaigns to explain the usage and opportunities of smart meters.



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