



GEODE Position Paper on Smart Metering

GEODE Working Group Intelligent Networks

NOVEMBER 2009

Updated April 2010



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Purpose of paper	4
Executive Summary	5
Background	10
Drivers for Smart Metering	12
Benefits of Smart Metering (electricity)	14
Benefits of Smart Metering (gas)	16
Barriers to Smart Metering	16
Responsibility for Metering	19
Cost of Smart Metering	21
Access to meter data and functionalities	24
Functionalities	24
Smart Grids	26
EU target 20-20-20	27
Standardization	28
Overview per country	29
Conclusion	31
Glossary	32
References	34
ANNEX I - Smart Metering in different European countries	36
ANNEX II – Consumer Concerns	54



Purpose of paper

This paper is an updated version of the June 2008 **GEODE** position paper on Smart Metering. Latest developments on Smart Metering, both at a national level in various countries and at European level made it necessary to revise the **GEODE**'s position from June 2008. Particularly the new legislation from Brussels, i.e. the adoption last July 2009 of the European Commission Third Energy Package introducing roll-out of Smart Metering by 2020 and European Union targets for 2020 (20% reducing gas emissions, 20% renewables and improving energy efficiency to 20%) This paper is one of three being published by **GEODE** during 2009 and 2010. The other two deal with Smart Grids and E-Mobility.

The purpose of this paper is twofold:

1. Give the view of **GEODE** on the implementation of Smart Metering for electricity and gas
2. To present the status of Smart Metering for various countries across Europe

The paper primarily concerns electricity, but also gas where applicable. The implementation and regulation regarding electrical Smart Metering has come further than for gas, and therefore experiences on Smart Meters referred to in this paper refers to the electricity sector. However Italy is now moving ahead with the implementation of Smart Meters for gas and some other countries are preparing for a simultaneous roll-out of gas and electricity e.g. UK, Germany and The Netherlands. This gives a possibility of co-ordinating the roll-out where so is technically feasible.

In the last year several countries have moved closer to or adopted new legislation. Italy was the first European country with legislation for electrical Smart Meters already in 2006, Sweden has completed the installation of Smart Meters by 1st July 2009, while Finland, Spain and Greece have established new regulations and are now starting implementation. Norway and the UK have their suggested regulations on public consultation. Italy is the only country with regulation in place for gas.

The advancement of Smart Grid, and the realisation of the importance of Smart Meters and Advanced Metering Infrastructure, has also led to a different view today compared with a year ago on Smart Metering among especially the DSO's.



Executive Summary

Smart Metering is an issue addressed extensively throughout the world.

It is estimated that in the next five to ten years close to 30 million electrical Smart Meters will be implemented in the USA, another 4.3 in Canada, close to a 100 million in Europe and 2.5 million in Australia. If the cost for each implementation is estimated at 250 Euros, the total cost for this will exceed 36 billion Euros.

The new electricity Directive (Directive 2009/72/EC) included in the European Commission Third Energy Package adopted by Council on the 13th. July 2009, envisages the installation of Smart Meters for at least 80% of customers by 2020.

Drivers for Smart Metering

Behind the new EU legislation lays the assumption that better informed customers will use less energy. Thus Smart Meters become an important tool in reaching the 20/20/20 targets on reduction of energy consumption. The goal of increased Energy Efficiency is without a doubt the main driver for the implementation of Smart Meters, especially in Europe.

| A need for improved billing accuracy is another driver for Smart Metering.

In several countries, the need to reduce losses due to fraud has been a strong driver for companies to introduce Smart Metering even before legislation.

The advancement of so called Smart Grids is also becoming a more important part of the roll-out of Smart Metering.

Smart Meters will play a key role to enable incorporation of renewable energies and distributed generation to the grid.

The need to handle peak demand issues is the single most important driver for the implementation of Smart Meters in the USA as well as in Australia, and deemed important for several countries in Europe.



Benefits of Smart Metering (electricity)

There are a number of benefits to the implementation of Smart Metering:

- Increased consumer awareness of how and when energy is spent
- Invoices based on actual consumption
- Increased internal efficiency within energy distributors, distribution system operators and retail energy sales companies.
- Possibility to reduce peaks in power demand
- An opportunity for energy related services, especially within energy saving consultancy
- Increased information on low voltage network
- Better information for Investment Planning
- Increased knowledge of quality of delivery
- Important part in the development of Smart Grids
- Facilitate switching and moving

Benefits of Smart Metering (gas)

Smart Meters for gas will result in many of the same benefits for consumers and suppliers as set out for electricity meters in terms of choice, energy savings, quality of service and increase efficiency.

Barriers to Smart Metering

There are a number of barriers to the implementation of Smart Metering:

- The cost
- New Technology
- Shorter time-period for write offs
- Complex and time-consuming projects
- Need of data protection
- Customer reactions
- Regulatory Issues
- Lack of standardisation
- Lack of minimum requirements on functionality

Responsibility for Metering

There are in Europe today basically three different ways to distribute the responsibility of Metering:



1. The DSO is responsible for Metering.
2. The Supplier manages the Smart Metering Infrastructure.
3. Responsibility for Metering is disconnected both from DSO and Supplier

GEODE believes that the DSO's should be responsible for Smart Metering, should possess the infrastructure and form the basis for an efficient value chain across all participants.

Cost of Smart Metering

GEODE sees five different ways to recuperate the investment necessary for a Smart Metering project:

1. From customers
2. From internal efficiency within DSO/metering provider
3. From suppliers
4. From government or similar
5. From new services

Access to meter data and functionalities

The party responsible for metering plays a key role in energy markets. Its services include meter data services such as meter reading, data provision and additional smart meter functionalities such as remote disconnection and tariff change. Whatever metering model is in place, it is essential to ensure non-discriminatory access to meter data and/or smart meter functionalities to all suppliers authorised by the customer according to the contract.

Functionalities

It is important that one aims for the highest level of Smart Metering functionality and makes sure that the regulations takes full advantage of the existing level of technology in order that the investments do not become obsolete too soon.

Smart Metering Systems should have functional and performance characteristics that offer the same minimum options to all customers within a country.

The following main functionalities should be carefully considered for electrical Smart Meters:



- Remote meter reading
- Load profile data
- On demand metered data access for customers
- On demand meter data access for authorised 3rd party
- Provision of variable time-of-use tariffs (time bands)
- Remote meter management
- Remote demand reduction
- Remote connection/disconnection
- Quality of supply
- Price signal to customer

For gas meters the number of needed functions is smaller than for electricity.

Smart Grids

Smart Grid consists of both the electricity network and its components and communication infrastructure. At the heart of Smart Grids lies the Smart Meters with their communication infrastructure since it supports the market with information necessary for its stakeholders. It is therefore important for the DSO's to carefully consider their investment in Smart Metering, in order that the chosen system can in an optimal way support the Smart Grid of the future.

EU target 20-20-20

Energy efficiency and energy saving constitute main drivers for the implementation of Smart Metering systems in a significant number of Member States.

To reach EU 20-20-20 targets, the energy mix will change on the next future to include much more renewable generation e.g. wind, solar, biomass with increasing amounts of distributed and micro-generation. Smart Meters will help to enable new ways of actively managing energy use across the networks helping the system to deal with the intermittent character of significant new renewable energy generation contributing to 2020 renewable target mentioned above.



Standardization

GEODE welcomes the initiative of European Commission to mandate CENELEC and the work thus initiated to set a common set of standards across the EU.

Conclusion

GEODE stresses that the installation of Smart Metering Systems is a large investment for DSO. It is necessary that the DSO is given financial allowance in order to recover the costs of the investment of a Smart Metering Infrastructure.

GEODE holds that the DSO is the suitable actor to be responsible for and to manage the Smart Metering infrastructure.

A minimum level of functionalities should be defined at national and European level, in order that all customers are given the same basic option of services.

Standardisation at European level is needed and should be made on open communication level. Harmonisation on a national level on technical infrastructure between electricity and gas could decrease the investment cost where it thus becomes possible to use the same infrastructure.

Customers concerns over privacy issues can become a hindrance to the implementation of Smart Metering.



Background

Smart Metering is an issue addressed extensively throughout the world. Several states in the USA, especially California and Texas have come a long way of implementing Smart Metering. In Europe some countries have implemented Smart Metering and many others are moving towards legislation and implementation. Australia is also moving ahead in the advancement of Smart Metering.

There are approximately 253 million electricity meters in the European Union, 109 million gas meters and about 3 million district heating meters. Electricity reaches every household and business in the whole Europe, while gas is most widely used in The Netherlands, UK, Germany, France, Spain and Portugal. District heating is a significant energy source in the Nordic countries and Central Eastern Europe. The residential sector is the second largest final user of energy, accounting for about 30% of the total consumption.

It is estimated that in the next five to ten years close to 30 million electrical Smart Meters will be implemented in the USA, another 4.3 in Canada, close to a 100 million in Europe and 2.5 million in Australia. If the cost for each implementation is estimated at 250 Euros, the total cost for this will exceed 36 billion Euros.

In the EU, the Energy Services Directive (Directive 2006/32/EC) has significantly accelerated the introduction of Smart Metering in Europe by stipulating that private households should be informed about their energy consumption on a more regular basis and in real time and that utility invoicing should provide more detailed and regular information.

The new Electricity Directive (Directive 2009/72/EC), included in the European Commission Third Energy Package adopted by Council on the 13th. July 2009, envisages the installation of Smart Meters for at least 80% of customers by 2020, subject to a cost-benefit assessment on long-term cost 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. The cost-benefit assessment is an option for Member States and can be completed by 3rd. September 2012. Some Member States have already initialised or even finished such assessments, while others have not yet decided whether to do it.



The countries that have already done a cost-benefit analysis for the implementation of electrical Smart Meters are the Czech Republic, Finland, France, the Netherlands, Norway, Portugal, Spain and Sweden. Austria, Belgium, Denmark, Germany, UK, Ireland and Poland are in the process.

In France, the results of the cost benefit analysis for the mass market showed that for AMM improving DSO's performance can not justify by itself a roll-out. However, the business model becomes positive when expected benefits not only for DSOs but customers and suppliers are taken into account.

As for gas, Italy, Spain and the Netherlands have conducted a cost-benefit analysis and another countries as Austria, Belgium, France, Germany, UK, Ireland, Poland and Slovenia are in process.

The Italian analysis concluded that for an annual consumption up to 5.000m³, neither AMM or AMR seem justifiable, regardless the size of the DSO. For annual consumption over 5.000m³ there are undoubted financial benefits.¹

Member States shall prepare timetables with the goal of implementing Smart Metering within 10 years. Although there is no specific target date for the implementation of Smart Meters in the Gas Directive, Smart Meters for gas should be implemented within a reasonable period of time.

According to the Directives, Member States shall ensure the interoperability of the metering systems to be implemented and shall have due regard to the use of appropriate standards and best practice and the importance of the development of the internal market in electricity.

However the provisions of the Directives mentioned are quite general, without providing any details of principles or specifying technology, which leaves a lot of work to be done, should it be deemed advantageous with harmonisation of functionalities and standardisation across countries and/or the EU.

For the time being the specifications of minimum requirements is the task of Member States competent authorities. Several countries, e.g. the UK and Norway are looking to set a minimum requirement on functionality.

¹ ERGEG Status Review on Regulatory Aspects of Smart Metering as of May 2009. Ref. E09-RMF-17-03



On 16 March 2009, European Commission mandated European Standardisation Organisation, CENELEC, to settle European interoperability common standards on Smart Metering. The objective is the creation of European standards that will enable interoperability of utility meters (water, gas, electricity, heat) which can then improve the means by which customers' awareness of actual consumption can be raised in order to allow timely adaptation to their demands.

A Smart Meters Co-ordination Group, (SM-CG), a joint advisory group of the European Standards Organisation with participation of various stakeholders is working on focal points concerning Smart Meter standardisation issues. The standard should comprise a software and hardware open architecture for utility meters that supports secure bi-directional communication and allows advanced information as well as management and control systems for consumers and service suppliers. The group is expected to present a combined progress report on the mandated work by the end of October 2010.

European Commission has recently initiated a Task Force for the implementation of Smart Grids in the internal energy market which will develop guidance on regulatory aspects of Smart Grids and Meters at EU level and a roadmap for the implementation of Smart Grids and Smart Meters into European internal market by May 2011.

ERGEG is also pushing for implementation of Smart Metering and the establishment of standardisation and minimal requirements. ERGEG therefore plans to develop Guidelines of Good Practice (GGP) on regulatory aspects of Smart Metering.

Drivers for Smart Metering

Behind the new EU legislation described above lies the assumption that better informed customers will use less energy. Thus Smart Meters become an important tool in reaching the 20/20/20 targets on reduction of energy consumption. The goal of increased Energy Efficiency is without a doubt the main driver for the implementation of Smart Meters, especially in Europe.

Several studies have shown that Smart Meters, or rather the improved information they provide, indeed help to educate the consumer and thus lead to a reduction in their consumption.



A need for improved billing accuracy is another driver for Smart Metering. Bills tend to be a lot easier to understand when they are based on actual consumption rather than on assumed consumption and then reconciled once a year.

In several countries, the need to reduce losses due to fraud has been a strong driver for companies to introduce Smart Metering even before legislation.

The advancement of so called Smart Grids is also becoming a more important part of the roll-out of Smart Metering. This is also influencing the need for involvement of the DSO's in the roll out and in the demand specification on functionalities.

The energy mix is set to change the coming years in order to fulfil EU 20-20-20 targets. Smart Meters will play a key role to enable incorporation of renewable energies and distributed generation to the grid by facilitating local, renewable generation and provide better ability to deal with the intermittency of large-scale renewable generation such as wind, solar, waste etc.

The need to handle peak demand issues is the single most important driver for the implementation of Smart Meters in the USA as well as in Australia. This driver is also important for the countries of Europe where there are growing concerns over shortage of power for peak consumption periods. Smart Meters and their infrastructure play a double role in this. By implementing time-of-usage tariffs it is possible to steer consumption away from peaks. It is also possible to use the metering infrastructure in order to control customer appliances and reduce or turn-off appliances during extreme peaks.

E-mobility is another driver for Smart Metering. With the expected growth of electrical and hybrid vehicles, it becomes crucial that the loading of these can be monitored as well as steered to times of low consumption in the grid. If these vehicles also are used as power storage, then it is necessary to be able to measure two-way flow of power. The balancing of the demand and supply features of these vehicles will be an additional challenge that the network sector will need to meet.



Benefits of Smart Metering (electricity)

- Increased consumer awareness of how and when energy is spent

The shorter the time cycle between readings, the more useful is the information is for the end user. Hourly readings give a very different understanding of usage pattern than monthly or yearly readings. The closer in time to the actual consumption the data is available to the consumer, the better the awareness. A display in the home showing for example current consumption in kWh, cost in monetary terms or CO2 effect of consumption will be much more likely to change consumer behaviour than information on a bill several months later. A web application that can give the customer detailed information on their energy consumption is another way of increasing awareness and drive energy efficiency. The underlying goal of increased customer awareness is of course increased energy efficiency.

- Invoices based on actual consumption

Smart Metering ensures that customers are always billed for their actual energy consumption, regardless of billing frequency. It is assumed that this will also lead to invoices that are easier to understand, an important factor in light of that the most common complaint in the industry is the complicated bills.

- Increased internal efficiency within energy distributors, distribution system operators and retail energy sales companies

The internal efficiency improvements due to less manual tasks, improved processes and a higher degree of automated processes (e.g. customer contacts) as well as less error in meter measurement handling has the potential to improve internal efficiency for the DSO as well as for other companies involved in the value chain. This also leads to improved service for customers for example in contact centres where better information on customer energy usage will facilitate a good customer dialogue.

- Possibility to reduce peaks in power demand

By steering the end consumer behaviour through incentives, e.g. time based tariffs, it is possible to steer energy consumption away from hours or days where there is a risk of peaks in power demand.

If an installed Meter System supports it, disconnections on a rolling scheme can further help in controlling peaks in power demand.



- *An opportunity for energy related services, especially within energy saving consultancy*

The increased knowledge about the end-customers energy related behaviour, gives an opportunity to develop new services aiming at helping the customer become more energy efficient. It is also possible, depending on the installed AMI, to use the infrastructure in order to control the climate in buildings in a more efficient way. This can generate both energy savings as well as a potential for new services.

- *Increased information on low voltage network*

This increased information regarding the low voltage distribution network holds potential savings in operating and managing the electrical grid, thus becoming an important part of a Smart Grid. Problems can easier be pinpointed and speed up corrective maintenance.

The increased knowledge generated by the increased information should lead to more efficient operations and can also be used in finding fraud.

Several Italian DSO's were able to generate a good return on investment largely due to savings from decreased energy fraud.

- *Better information for investment planning*

The improved information that is generated by Smart Metering on the low voltage network creates an opportunity for better investment planning. The information can be used both for new investments in infrastructure as well as for reinvestments in current networks. Load profiles over time, maximum loads and load distribution in the grid are some examples of what can assist better investment planning.

- *Increased knowledge of quality of delivery*

Today's modern meters in combination with the more advanced metering systems have the ability to generate information on the quality of delivery to a much larger degree than before. This includes power failure alarms, statistics on power outages, voltage levels and power consumption.

- *Important part in the development of Smart Grids*

Smart Meters will also be a platform for the major expansion in the use of new and renewable energy sources, home micro-generation and electric



vehicles in the future. Smart Meters will help us to meet the strategic challenge of managing the changing nature of energy generation and use, as we go from only centralised generation to a more distributed model, including micro-generation.

- Facilitate switching and moving

By the use of Smart Meters, the processes related to switching and moving in or out of a home have the potential of being significantly improved. By being able to access meter reads in an easy way at any time, switching can be done easier. The uses of remote connect and disconnect also give the potential for better and faster service when a customer is moving.

Benefits of Smart Metering (gas)

Smart Meters for gas will result in many of the same benefits for consumers and suppliers as set out for electricity meters in terms of choice, energy savings, quality of service and increase efficiency.

The benefits on the technical side are different between electricity and gas. The more advanced AMM functions do not apply to Gas and for example the need for a Smart Grid foundation does not exist.

Barriers to Smart Metering

- The cost

The biggest issue in most countries across Europe today in regards to metering is the question of who will pay for the implementation of Smart Meters.

The cost to install a Smart Metering System is a large investment. The return on such an investment takes a number of years and creates a necessity to actively pursue the cost savings such an investment can generate.

But the cost of a Smart Metering system goes beyond the investment in itself. There are also the write-offs of current meters (stranded costs), the operation of the Smart Metering System, unexpected quality costs and all this paired with an expected life-cycle that is substantially shorter than what today is normal in the industry.



Presenting Smart Metering data to the customer is another new cost that might potentially be large, depending on the frequency of updating information and the quality of the presentation.

The network companies will never reap enough benefits to cover costs of implementing a Smart Metering system. As benefits are shared along the value chain, including the end customer, the cost have to be distributed as well. The understanding of the cost involved is not always present among the legislators, and there is a danger that the regulations do not let the responsible parties recover their costs.

As for Gas, it is even harder than for electricity to get a positive return on investment. As many of the technical benefits do not occur in a gas implementation, the return obviously becomes smaller.

- New Technology

Most, and certainly all the more advanced, modern Smart Metering systems today have been developed quite recently and are still evolving very rapidly. The various forms of communication being used in the Smart Metering Infrastructure are also to a large degree being developed, for example the use of WAN, LAN, ZigBee, IP over PLC etc.

This makes taking decisions on best solution difficult and there is also the inherent risk of being an early adopter of new technology. The older and more tried and tested systems and communication methods are often not able to live up to the high expectations of tomorrow's Smart Metering systems.

- Shorter time-period for write offs

As the Smart Metering systems become more and more “high-tech”, the life expectancy of such systems becomes more like other high-tech products and less like the typical investments within the utility business. Where meters used to have write-off periods of 18-20 years and a life expectancy of even longer, today's investment might not even reach half of that. These quite short write-off periods are bound to make the investments in Smart Metering an even harder strain on the bottom line of the DSO or other responsible part.

- Complex and time-consuming projects

Regulations should consider the time needed for planning, procurement, installation and implementation of a Smart Metering system. This time



requirement should not be underestimated. Enough time should be given to the responsible party to implement the system. It is the responsibility of each Member State to set suitable timeframe for implementation.

- *Need of data protection*

Data access and data protection is central to consider in the roll out of Smart Meters. The right level of data access within the industry will be important for the full benefits of Smart Metering for consumers and for Smart Grid management to be realised. Equally the right safeguards must be in place to protect consumers from improper access and misuse of data. Data protection legislation in each country should serve as guidelines for this.

- *Customer reactions*

Consumer concerns regarding privacy issues in relation to meter data management has become an issue in Holland. The proposed legislation has been postponed as small end users refused the installation of Smart Meters on their premises in relation to confidentiality of metering data with respect to the privacy issues. They considered consumer behaviour might be traced by the usage of their electrical equipment.

In Sweden the issues have mainly been two. The scare of increased Electro Magnetic Fields (EMF) in the homes has been an issue for many utilities in Sweden in the rollout of Smart Metering. This has in many cases led to increased costs, and in some areas to delayed installation. The choice of communication method and technical platform will influence the amount of EMF that is generated. This must be considered both in the work on standardisation, as well as in the final choices made by responsible parties when choosing their systems.

The largest issue in Sweden has been the questioning of the accuracy of the meter data. This is both in the sense that the public suspects the new meters to read too much in general, but also that their meter is malfunctioning and thus gives a abnormal read. Much time and effort must be allowed for in the education of the consumer in conjunction with the rollout of meters. The responsible party for implementation will also have to have efficient processes to quickly handle any faulty equipment and to reimburse the customer for any erroneous billing.

Customers concerns over privacy issues, both in regards to what can be conveyed by the metering data, as well as concern about who has access to the information, can become a hindrance to the implementation of Smart Metering. These concerns must be handled both by the Regulators as well as by the party responsible for metering.



- *Regulatory Issues*

National legislations are sometimes too weak or even inexistent as regards the implementation of Smart Metering Systems, creating uncertainty for the market actors and making the process much more difficult than it should be. To avoid this, it is important that timeframe, roles and responsibilities as regards Smart Metering systems are clearly defined by national regulations, as well as some minimum functional requirements of the systems should be settled. The way how costs are going to be covered is an issue that should also be included specifically in the legislation.

- *Lack of standardisation*

The lack of standardisation is seen as a barrier to the roll-out of Smart Metering and work has been started by the EU to look at standardization on communication protocols as well as for the functionalities needed. The risk then becomes that the various countries that had initiated regulation in regards to implementing Smart Metering are now in some instances awaiting the work done in EU, in order not to create regulations or standards that does not concur with the coming EU standards which is not expected to be ready before 2012.

- *Lack of minimum requirements on functionality*

It is vital that each country and, if possible, also at EU level it is specified a minimum set of functionalities. If this is not done, it might create different levels of benefits for customer or other market participants depending on which solution has been implemented in that area. Sweden did not do this in their regulation, and that has led to a significant difference in what services can be offered to the customers depending on which DSO they belong to.

Responsibility for Metering

In principle, there are two metering market models established in the EU Member States. First there is the regulated metering market model, where the grid operator or a regulated meter service provider has the monopoly of providing meter services. This is the case according ERGEG Status Review on regulatory aspects of Smart Meters 2009 in 23 of 25 MS.



There is also the liberalised metering market model, where either the customer or supplier can mandate an independent (from grid operations) meter service provider, who is responsible for meter services. In this case, meter service is open to competition.

Given the above there are in Europe today basically three different ways to distribute the responsibility of Metering.

1 – The DSO is responsible for Metering.

This is the solution for all countries in the EU except the UK and Germany.

This is the solution that **GEODE** recommends as it promotes stability in the Metering Process, as the meter is a logical end point of the electrical grid and as managing a Smart Metering Infrastructure has a lot in common with managing the electrical grid. The net operator is the only market participant that will always be connected to the customers.

In order to reap many of the benefits of Smart Metering, especially increased knowledge of quality of delivery, increased information on low voltage network, reduce peaks in power demand and better information for investment planning, the DSOs need to be responsible for metering.

The benefits mentioned above will come when the existing SCADA systems are integrated with the Smart Metering Systems creating part of the Smart Grids of the future. This is greatly facilitated if the DSOs are able to operate and develop these two important systems in parallel.

2 – The Supplier manages the Smart Metering Infrastructure.

A huge problem here is of course the switching / churn and the difficult task for all suppliers in a country to agree on a standard in order that each churn will not have to result in a change of meters.

The only European country that is moving towards this solution today is the UK, based on historical reasons. There are three different models that have been suggested in order to handle metering values in a effective way. (See section on the UK in Annex I)

The energy authorities in the UK, as well as the suppliers and DSO's, are well aware of the complications of this model and are looking for a solution that could work while still holding the supplier responsible for metering.



The DSO's in the UK have realised the importance of Smart Metering in Smart Grid and the need to be involved in some shape or form of the roll-out of Smart Metering in order that Smart Grid can be implemented.

3 – Responsibility for Metering is disconnected both from DSO and Supplier.

In this model metering is managed by third party companies specialising in metering.

The end customer is here free to choose Metering supplier. This creates just as big of a problem in the market structure as in option 2, if not more, when it comes to customer churn. In this case you have a possible double amount of churn - both in terms of churn of Electricity Supplier and churn of Metering Supplier.

This is in the view of **GEODE** the least desirable situation as it is the scenario most likely to create inefficiencies in the value chain instead of reducing them. An industry solution where customers are free to choose third party metering companies will very likely create increased bureaucracy, increased inefficiencies and problems with churn.

Based on the above mentioned reasons, GEODE believes that the DSO's should be responsible for Smart Metering, should possess the infrastructure and form the basis for an efficient value chain across all participants.

As a Smart Metering infrastructure is an excellent extension in operating and managing the low voltage grid and creates the backbone of Smart Grids, it is important that if the DSO is not operating the Smart Metering Infrastructure, the status of the low voltage net is provided on-line to the DSO at reasonable costs. This is then especially important in the case of Germany and the UK, which are the two countries that are moving away from holding the DSO responsible for metering.

Cost of Smart Metering

Below are described five various ways to recoup some of the costs associated with Smart Metering. A mix of these five options, if not all, should be utilised in order to create a positive return on a Smart Metering investment.



There are various market participants who can profit from the implementation of Smart Meters. Not only can the grid operator streamline his processes, but suppliers, energy service companies and customers will benefit from the availability of data and the possibility to manage consumption. As the benefits of Smart Meters are spread between all market stakeholders, but costs are only incurred by the grid operator or meter service provider, these have in general only limited incentives to invest in metering systems. Society as a whole and the environment also stands to gain from expected increase in energy efficiency.

In general, those companies responsible for metering will consider whether it is profitable for the company to invest in Smart Meters. Regulators on the other hand, have a responsibility to review the socio-economics of Smart Metering to see if the investment is beneficial for society as a whole. Thus, in order to get the metering operator to make the investments that realise the full socio-economic benefits of Smart Metering, some form of financial incentives is necessary.

GEODE sees five different ways to recuperate the investment necessary for a Smart Metering project.

1. From customers
2. From internal efficiency within DSO/metering provider
3. From suppliers
4. From government or similar
5. From new services

From customers – This usually means increased tariffs for end consumer. As the countries of Europe have different ways and levels of regulating tariffs, the way of transferring part of the cost to customers will have to differ between Member States. In a regulated meter market, metering tariffs are set by the regulator or they are part of the grid tariffs. By allowing for higher meter tariffs for Smart Meters, incentives can be given for the installation of these meters.

The customer stands to gain significantly by Smart Metering and should therefore be able to share at least part of the cost of implementing such a system.

The customer will have invoices that are based on actual consumption instead of calculated prognosis which will lead to easier understanding of bills.

The processes involved when moving in or out or when switching supplier will be easier and faster to the benefit of the customer.



Manual metering will no longer be at the inconvenience of the customer and, as is the case in some countries, the customer will no longer have to read the meters themselves.

The increased knowledge on their own consumption patterns gives the customer a better chance of using energy efficiently and thus saving money.

Time-of-use tariffs will give the customer another possibility to change their spending patterns in order to save money. And as energy prices continue to rise, this increased awareness will be even more valuable in the future. Simultaneously, as the energy cost will make up a larger part of the customers living cost than today, efficient use of energy becomes ever more important for the end consumer.

From internal efficiency – Parts of the investment should come from greater efficiency within the DSO and possibly in the whole value chain. Smart Metering can provide a range of costs savings such as eliminating manual meter reading costs, theft detection, reduced customer transaction costs and bad debt.

It is of utmost importance that, depending on the industry structure, implementation of Smart Metering does not create inefficiencies in the value chain instead of reducing them.

From suppliers – Suppliers also stand to gain from an increased efficiency in the flow of metering data, better information on customer usage and reduced workload when it is no longer necessary to invoice based on estimated meter values. If hourly usage data can also be supplied, the supplier can introduce time-of use tariffs which will make it possible to reduce trading risk. It will also be possible to create other forms of new tariffs that can benefit the suppliers. The suppliers should therefore assume responsibility for some of the cost involved in Smart Metering investments.

Government or similar – It would be feasible to think that part of the cost of implementing a Smart Metering System is covered by government or similar due to the fact that some of the benefits of Smart Metering falls upon the general public, for instance the expected environmental benefits. How this can be structured depends on the regulation of the various countries. Investment in meter technologies should in principle be treated like any other investment made by the DSO or the regulated meter operator. However, the issue of split incentives could be an argument for some additional financial measures to the ordinary regulation.



New Services – This can either be new services to existing customers or new services to new customers based on the new infrastructure. There are definitely opportunities for Network operators to create new business with a Smart Metering system, but it must be allowed for in the legislation under which the Network Operator works.

These services can entail such services as statistics on usage, particularly hourly usage statistics, home displays connected to meter infrastructure and alarm functions to give customer information on power failures. For more advanced systems, it is also possible to let the customer turn on and off power in their homes. This is particularly interesting for second homes.

Given the above discussion regarding recovery of cost, additional regulation on a national level should be allowed for in order that the metering system owner can recoup at least part of their cost from other actors in the value chain. This then would include the right to offer additional services to their present and future customers based on the functionality and data of the metering system.

Access to meter data and functionalities

The party responsible for metering plays a key role in energy markets. Its services include meter data services such as meter reading, data provision and additional smart meter functionalities such as remote disconnection and tariff change. Some or all of the meter services can be provided by one or several meter service providers. Whatever metering model is in place, it is essential to ensure non-discriminatory access to meter data and/or smart meter functionalities to all suppliers authorised by the customer according to contract.

Metering data and functions should be shared along the value chain at a reasonable cost and in an efficient manner, so all participants in the market can reap the benefits of the Smart Metering Systems.

Functionalities

It is important that one aims for the highest level of Smart Metering functionality and makes sure that the regulations takes full advantage of the existing level of technology in order that the investments do not become obsolete too soon. The development of Smart Metering Infrastructures and communication methods are evolving fast and will result in that investment will have a much shorter lifespan than what is normal for large investments in the industry. Communication will become



cheaper in the future, and the functionalities of the systems should not be limited unnecessarily.

Smart Metering Systems should have functional and performance characteristics that offer the same minimum options to all customers within a country. It would of course be desirable if these minimum functions could be set across the EU.

It is important to define certain minimum Smart Meter functionality. In order to allow for economic optimal solution and technical innovation, the individual meter service provider should be left to decide on the technical solution to fulfil the required functionality.

The following main functionalities should be carefully considered for electrical Smart Meters:

- Remote meter reading
- Load profile data
- On demand metered data access for customers
- On demand meter data access for authorised 3rd party
- Provision of variable time-of-use tariffs (time bands)
- Remote meter management
- Remote demand reduction
- Remote connection/disconnection
- Quality of supply
- Price signal to customer

GEODE strongly believes that the most important function of the Smart Metering system is the ability to handle at least hourly meter data from all meters with an acceptable service level agreement. This frequency is necessary in order to provide a good understanding of customer behaviour in order to encourage reduction in usage. Hourly readings are of course also necessary in order to offer time of use tariffs.

Independent of the market organisation the regulator could and should set minimum functional requirements, including the ability to handle at least hourly readings for all customers, for meters installed in order to ensure a certain standard of data quality and functionality within a certain area or country.

Demand response needs time-of-use pricing (not only Smart Meters). It is therefore important that retailers offer these pricing arrangements in competitive environments. The case for Smart Metering and time-of-use



pricing might be lessened if some retailers do not give customers this option. If not all chosen Smart Metering Systems in a given country can supply at least hourly metering values, it becomes unduly difficult for suppliers to supply demand-response services to their customers.

Other functions, such as power failure alarms should also be considered as an essential part of a Smart Metering System. The use of power failure alarms from Smart Meters in real time, and the capability to verify service delivery and restoration through the Smart Meter communications Infrastructure can significantly reduce the time for outage detection and service restoration.

With the advancement of micro generation in Europe, the chosen system should if possible be able to handle metering of a two way flow of power. This should be considered both in the selection of meters as well as the supporting system software.

With the onset of hybrid cars that use electricity to a larger extent, there will be a need for “gas-stations” for electricity and of course Smart Metering of these stations. This is not something that is relevant quite yet, but will most probably expand the need for Smart Metering in conjunction with time-of-use tariffs in the future.

For gas meters the number of needed functions is smaller than for electricity. The functionality for gas meters will result in many of the same benefits for consumers and suppliers as set out for electricity network businesses.

Smart Grids

Many utilities today have initiated strategic plans for modernization of their power delivery and distribution capabilities and the term Smart Grid is heard more and more. Smart Grid consists of both the electricity network and its components and communication infrastructure. At the heart of Smart Grids lies the Smart Meters with their communication infrastructure since it supports the market with information necessary for its stakeholders. It is therefore important for the DSO's to carefully consider their investment in Smart Metering, in order that the chosen system can in an optimal way support the Smart Grid of the future.

The integration of today's SCADA systems with the Smart Metering systems might be one of the logical step towards Smart Grids. If the DSO



is not responsible for metering, as it is the case in UK and Germany, this integration becomes difficult, if not impossible, to achieve. For the DSO, installation and access to information is crucial for an efficient Smart Grid. The Smart Grid will increase the value for the customers and make it possible to interact with the grid based in the information available.

The DSO's in the UK have realised the importance of Smart Meters as an essential part of the Smart Grids of the future. The DSO are therefore there now taking a more active role in the coming legislation on the implementation of Smart Metering.

In Germany it is of course of outmost importance that the metering solutions are standardized and open so that the DSO's can take advantage of the implemented metering system for their Smart Grid endeavours.

EU target 20-20-20

The EU aiming to achieve its core objectives of sustainability, competitiveness and security of supply agreed on the following targets: reducing greenhouse gas emissions by 20%, increasing the share of renewables in the energy consumption to 20% and improving energy efficiency by 20%, all of it by 2020. These EU's targets for 2020 are essential steps in the transition to a high-efficiency, low-carbon energy system. Energy efficiency and energy saving constitute main drivers for the implementation of Smart Metering systems in a significant number of Member States.

Smart Metering provide households with accurate information on how much energy was consumed, when it was consumed and at what tariff. Detailed consumption data will help consumers to better understand how they use energy and will empower them to reduce and adjust their consumption and to make informed decisions on energy-efficiency measures, such as heating, lighting and appliance upgrades, in particular when metering is accompanied by informative billing. At the end this will lead to a more efficient consumption patterns.

Studies in Sweden have showed that a reduction in usage of 2-5% is possible when actual usage per month is presented. If real-time usage or hourly usage can be presented, studies indicate a much larger savings potential. When these potential savings are translated into reductions of CO₂, the business case for Smart Metering projects looks a lot more positive on the whole.



The energy mix will change in the near future and will include much more renewable generation e.g. wind, solar, biomass with increasing amounts of distributed and micro-generation in order to reach EU targets for 2020. Smart Meters will contribute to enable new ways of actively managing energy use across the networks helping the system to deal with the intermittent character of significant new renewable energy generation. Smart Meters will also allow exported energy to be measured, and therefore support the development of micro-generation in homes.

Smart Meters are then an important mean to maximise energy savings particularly in buildings and for efficient energy supply and distribution and for integrating renewable energy sources.

Standardization

GEODE welcomes the initiative of European Commission to mandate CENELEC and the work thus initiated. **GEODE** is pleased to be part of this important work in creating a set of standards for Smart Metering in the EU.

In order to give the parties responsible for Smart Metering sufficient time to implement systems that adheres to the coming standards, the work of the SM-WG must be prioritised and deliver according to plan. Should their work be delayed, it will affect the timely roll-out of Smart Metering across Europe and make it difficult to reach the targets set out by the EU-regulations.



Overview per country

I.- ELECTRICITY SMART METERS IMPLEMENTATION PER COUNTRY

Country	Timeframe / Legal framework	Responsibility	Minimal requirements	Costs
AUSTRIA	Not by Law. Legislation under discussion	DSO	Under discussion	Under discussion
DENMARK	Not by Law. Done by companies on a voluntary basis.	DSO	NO	DSO
FINLAND	Roll-out obligation by Law by 1.1.2014	DSO	YES by Law	DSO
FRANCE	Not by Law. Legislation under discussion	DSO	NO	
GERMANY	Under discussion	DSO Third parties	NO	By tariffs passed through consumers
HOLLAND	Not by Law. Done by companies on a voluntary basis. Legislation under discussion	Mainly DSO	YES by technical rule	By regulated metering tariffs
HUNGARY	Not by Law. Legislation under discussion	DSO	NO	By network tariffs
ITALY	Roll-out obligation by Law. Regulatory Order December 2006	DSO	YES	
MALTA	Not by Law. Done by IBM+Enemalta on a voluntary basis	DSO	just one model as just one company	
NORWAY	Legislation under public consultation	DSO	YES	By tariffs passed through consumers
SLOVENIA	Not by Law. Done by companies on a voluntary basis	DSO	YES	DSO
SPAIN	Roll-out obligation by Law. Gradual installation until 2018	DSO	YES by Law	Under discussion
SWEDEN	Roll-out obligation by Law. 100% customers 1 st July 2009	DSO	NO	DSO
UK	Roll-out obligation 100% domestic customers by 2020 Public Consultation 11 th May 2009 – 3 rd . August 2009	Suppliers	YES	By tariffs passed through consumers



II.- GAS SMART METERS IMPLEMENTATION PER COUNTRY

Country	Timeframe / Legal framework	Responsibility	Minimal requirements	Costs
AUSTRIA	Not by Law. Legislation under discussion	DSO	Under discussion	Under discussion
DENMARK	No regulation in place			
FINLAND	No regulation in place			
FRANCE	Not by Law. Legislation under discussion	DSO	NO	
GERMANY	Under discussion	DSO Third parties	NO	By network tariffs
HOLLAND	Not by Law. Done by companies on a voluntary basis. Legislation under discussion	Mainly DSO	YES by technical rule	By regulated metering tariffs
HUNGARY	By Law. Act XL of 2008 in natural gas (GET), for customers with the larger consumption capacity (more than 100 m ³ /h) by 1.07.09	DSO	NO	By distribution tariffs
ITALY	Roll-out obligation by Law. Regulatory Order ARG/gas 155/08, October 2008	DSO	YES	By metering tariffs
MALTA	No regulation in place			
NORWAY				
SLOVENIA	No regulation in place			
SPAIN	No regulation in place			
SWEDEN	No regulation in place			
UK	Roll-out obligation 100% domestic customers by 2020. Public Consultation 11 th May 2009 – 3 rd . August 2009	Suppliers	YES	By tariffs passed through consumers



Conclusion

GEODE agrees with the European Commission on the importance of implementation of Smart Metering for a number of reasons.

GEODE holds that the extended use of Smart Metering would enhance policy goals of the European Union such as energy efficiency and security of supply whilst encouraging innovation in the provision of energy services. **GEODE** also agrees in the importance of giving the end-consumer a better understanding of their energy use, time of usage and through increased awareness become more efficient in their energy consumption.

Smart Meters are an important part in the development of Smart Grids as well as for the major expansion of renewable energy sources, home micro-generation and electric vehicles in the future.

GEODE stresses that the installation of Smart Metering Systems is a large investment for DSO. It is necessary that the DSO is given financial allowance in order to recover the costs of the investment of a Smart Metering Infrastructure. How this is allowed for depends on the regulatory possibilities and restraints of the country in question.

GEODE holds that the DSO is the suitable actor to be responsible for and to manage the Smart Metering infrastructure.

It is important that whoever is responsible for Metering that the various actors in the value chain are given access to meter values and functionalities in a timely and efficient manner at a reasonable cost.

A minimum level of functionalities should be defined at national and European level, in order that all customers are given the same basic option of services.

Standardisation at European level is needed and should be made on open communication level. Harmonisation on a national level on technical infrastructure between electricity and gas could decrease the investment cost where it thus becomes possible to use the same infrastructure.

Customers concerns over privacy issues can become a hindrance to the implementation of Smart Metering.



Glossary

DSO – Distribution System Operator, same as Distributor.

ERGEG - ERGEG stands for the "European Regulators' Group for Electricity and Gas". ERGEG is a body of independent national energy regulatory authorities, which was set up by the European Commission as an Advisory Group to the Commission on energy issues.

GEODE – “Groupement Européen des entreprises et Organismes de Distribution d’ Energie”. Founded in 1991 it is made up of European independent distribution companies of gas and electricity. The association represents more than 600 companies in 11 countries, both privately & publicly owned. These companies supply more than 100 million people.

IP – Internet Protocol

LAN - A local-area network is a computer network covering a small geographic area, like a home, office, or group of buildings e.g. a school. The defining characteristics of LANs, in contrast to wide-area networks (WANs), include their much higher data-transfer rates, smaller geographic range, and lack of a need for leased telecommunication lines.

PLC – Power line communication (or carrier). Systems for using power distribution wires for data transmission. It can include broadband over power lines with data rates sometimes above 1 Mbps and narrowband over power lines with much lower data rates. Traditionally electrical utilities use low-speed power-line carrier circuits for metered data transmission, control of substations, protection of high-voltage transmission lines and domotic purposes.

QUALITY COSTS – Cost resulting from imperfection in products, services, systems, or processes

SCADA – Is the abbreviation for Supervisory Control And Data Acquisition. It generally refers to an industrial control system which is meant to function across a wide area with an autonomous Remote Terminal Unit (RTU). A SCADA system is expected to have open loop controls (meaning that a human operator watches near real time data and issues commands). The process can be industrial, infrastructure or facility based as described below:



Industrial processes include those of manufacturing, production, power generation, fabrication, and refining, and may run in continuous, batch, repetitive, or discrete modes.

Infrastructure processes may be public or private, and include water treatment and distribution, wastewater collection and treatment, oil and gas pipelines, electrical power transmission and distribution, and large communication systems.

SMART GRID - Smart Grid is a transformed electricity transmission and distribution network or "grid" that uses robust two-way communications, advanced sensors, and distributed computers to improve the efficiency, reliability and safety of power delivery and use.

SMART METER – This is a general definition for an electronic device that can measure the consumption of energy (electricity or gas) adding more information than a conventional meter (price schemes, interval data, quality of supply, etc...), and that can transmit data using a form of electronic communication. Similar meters, usually referred to as 'time-of-use' or 'interval' meters, have existed for years, but smart meters usually involve a different technology mix such as automated meter reading, automated meter management and a different application mix such as domotics, value-added services, etc...

SWEDENERGY - Swedenergy is a non-profit industry organisation representing companies involved in the production, distribution and trading of electricity in Sweden.

WAN – Wide Area Network is a computer network that covers a broad area (i.e., any network whose communications links cross metropolitan, regional, or national boundaries).

ZigBee - ZigBee is a low-cost, low-power, wireless mesh networking standard. The low cost allows the technology to be widely deployed in wireless control and monitoring applications, the low power-usage allows longer life with smaller batteries, and the mesh networking provides high reliability and larger range.



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M/441 European Commission Mandate to CEN, CENELEC and ETSI, 12th of March 2009.

Energy Networks Association (UK) – Response to the consultation on the Smart Metering for Electricity and gas, 28th July, 2009.

Information from Italian Regulator (Autorità per l'Energia Elettrica e il Gas), Dutch Regulator (Netherlands competition authority, NMa, Office of Energy Regulation), UK Regulator (Ofgem) and UK Government (Department of Energy & Climate Change).

Companies and associations:

Wienenergie Stromnetz GmbH (Austria)

Energiemidt I/S (Denmark)

Naturgas Midt-nord I/S (Denmark)



Finnish Energy Industries (Finland)
FNSICAE (France)
BBH (Germany)
HUNGAS (Hungary)
Elektro Ljubljana, D.D. (Slovenia)
Estabanell i Pahisa Energia, S.A. (Spain)
Gas Natural, S.A. (Spain)
ENA (UK)



ANNEX I - Smart Metering in different European countries

- **AUSTRIA**
- **DENMARK**
- **FINLAND**
- **FRANCE**
- **GERMANY**
- **HOLLAND**
- **HUNGARY**
- **ITALY**
- **MALTA**
- **NORWAY**
- **SLOVENIA**
- **SPAIN**
- **SWEDEN**
- **UK**



AUSTRIA

In Austria the roll-out of smart meters is under discussion. Questions as the timeframe, costs and minimal functional requirements are in discussion between Regulator and electricity and gas industry. At the moment five working groups are established: communication technology, costs, legal framework, customer's point of view, data and meter management. The objective is to find a consensus on these issues, which should be the basement for the roll-out of smart meters in Austria. DSO is responsible for metering.

DENMARK

Electricity sector: In Denmark there are approximately 3.3 million metering points. Around 350,000 metering points are currently remotely read. Approximately 1.100.000 metering points are under construction. This means that there are still around 1.850.000 metering points, which have not yet reached agreement on the establishment of AMR. However, it is the perception that these metering points are also moving in the direction of AMR. It is predicted that within a timeframe of five years, a given number of projects will be launched to establish AMR for virtually all the metering points.

As there is no Law obligation, it is mainly the big companies that have established or are in the process of establishing AMR on a voluntary basis. Since 2005 there is mandatory hourly electricity metering for customers with more than 100 MWh/year consumption.

There are no minimum functional requirements and technology used for AMR is different. The most frequently used technology is communication via PLC. In addition, the GPRS technology is used and to a lesser extent also radio.

The trend moves in the direction that the AMR-projects include more than just the reading of electricity meters. It is increasingly more common that the infrastructure built for the reading of electric meters is also used to read water, heat and gas meters. In these cases the electric meter is operating as a gateway to the reading of other kinds of utility.

DSO are responsible for meters and own meters. Investment costs are not being recovered and DSO's are paying for it.



As benefits DSO's consider that smart meter provide better and more reliable data, less net losses and provide better service to the customer as for example energy controlling.

Gas sector: Smart Meters or intelligent network in the natural gas system is not yet an issue in Denmark. Only manual read meters by the consumer or remotely read meters by the distribution companies are in operation. In the Danish natural gas sector there are approximately 410.000 metering points. Of these around 1.500 are remotely read by the distributor. Meters at the consumers have to be remotely read on hourly basis if the consumption at the consumer exceeds 300.000 m³ of natural gas a year (approx. 3.600 MWh).

FINLAND

A new regulation came into effect on the 1st of March 2009 in Finland, requiring the DSO's to, without any extra cost, supply their customers and the electricity suppliers with hourly meter readings. These hourly readings shall be made available no later than the following day, or if the customer so desires, be given in real-time. The goal is that at least 80% of the 3,2 million customers that are considered small users will have Smart Meters by the year 2014.

The Government sees several advantages with the implementation:

- Invoices based on actual consumption
- Hourly values gives the possibility of shifting the consumption from periods with higher prices to periods with lower prices. This will reduce the cost for the end customer.
- All involved parties – customers, DSO's and suppliers will have reduced costs in the future.
- There is a direct link to employment opportunities in the installation business as well as for companies working with meters, software and communication solutions.

The new legislation states:

- New metering points above 3x63 A have to be hourly metered from now.
- All DSOs will have to bring their plan on implementation of hourly metering by 1.1.2010 to the regulator.
- Old metering points > 3x 63 A have to be hourly metered by 1.1.2011. Settlement shall be made for all these based on hourly values.



- Settlement on all metering points (all size), that are equipped with a meter capable of hourly measurement, shall be made based on hourly values by 1.1.2012.
- Each DSO shall have implemented hourly metering for 80 % of all her metering points by 1.1.2014. (This means, as many DSOs intend to do it 100 % or close, that the national percentage will be more than 80.)
- Each DSO will have to arrange all their hourly measured customers access to their hourly values latest the day after (extranet) by 1.1.2014.
- The remaining non-hourly meters will be read at least 3 times a year from 1.1.2014 (now: 1/year).
- The remotely read hourly meters must be able to manage DSM (e.g. switching off electric heating by suppliers request on a peak hour). They also have to be able to register any longer outages.

The Law establishes minimum functional requirements for Smart Metering systems:

- hourly energy registering
- remote reading ability (first monthly, from 2012 daily readings)
- ability to manage DSM requests (e.g. switching off electric heating by supplier's request for a peak hour)
- register any longer outages (>3 min)
- store consumption data 6 years and outage data 2 years
- data security requirements

Additional requirement, based on customer request and payment only:

- meter shall be equipped with a standardised connection for real-time consumption follow-up

Regarding costs, DSO's are allowed, according to the Finnish regulatory system, to have a recovery on the capital invested in their pricing (cost of capital). However, additional operative costs will not be recovered in prices.

FRANCE

Electricity sector: There is a pilot project being carried out by ERDF (EDF DSO) that advances correctly for the installation of 300.000 meters. The installation of first meter will be in March 2010 ending all installations in December 2010.



If the experience is conclusive, regulator will decide the roll-out by 2016 for customers of DSO with more of 100.000 connections, that is mainly ERDF (representing 96% customers in France) and for 100% customers by 2020.

To replace the 35 million meters installed in France, ERDF has estimated the investment will cost between 4 and 5 billion euros, with deployment taking around 5 years. However new Smart Meters will contribute to significant savings, for instance by eliminating most on-site visits for readings, start-up, power or offer modification and would significantly improve quality of service for consumers (less bother, shorter maintenance delays, detailed and frequent consumption information, bills no longer based on estimated consumption, new supply and service offers, etc)

Gas sector: It is under discussion. Decision is expected by end 2010 and then starting roll-out by beginning of 2012. GdF is going to start a pilot project during the next year.

GERMANY

A distinction is made between measuring and meter operation in Germany. Meter operation refers to the installation, the operation and the maintenance of measuring devices, whereas the scope of measuring is the meter reading and the transmission of the metered values. The meter operation has been liberalized for about 3 ½ years. At first the grid connection owner (owner of an apartment/a house) had the possibility to entrust a third party, the meter operator, with the installation, the operation and the maintenance of the measuring devices. If no third party was entrusted with this task, the local distribution system operator was at the same time the meter operator.

In September 2008 the measuring was also opened to competition. At the same time the title owner changed. Now it is the grid connection user (supplied customer/tenant) who decides about who is going to operate the metering point and/or carry out the measuring. Only if the measuring devices are connected electronically, the responsibility for the metering point operation and the measuring will coincide; otherwise the grid connection user can request a metering point operator and a measuring service provider.

The Metering Access Ordinance (Messzugangsverordnung), in force since October 2008, defines in more details the rights and obligations of the



parties. The law requires from the metering point operators to install from 1 January 2010 meters that reflect the actual energy consumption and the actual time of use for the consumers or to offer the change thereof according to the connection user's choice (for new buildings obligatory). This provision however, is subject to the technical feasibility and the economical reasonability. In respect of the legislative change, the Federal Government has expressed its expectation to start within a period of six years the nationwide introduction of the so-called smart meters.

Despite the changes, there will still be a conflict of goals between liberalisation and introduction of Smart Meters. The liberalisation does not create incentives for the introduction of Smart Meters. On the contrary: investment insecurity for network operators and unclear legal provisions, as to what extent Smart Metering may be required as binding standard by the local distribution system operator, as well as the lack of minimum requirements towards Smart Metering systems lead to a clear scepticism towards Smart Metering.

HOLLAND

Due to several distortions in the functioning of the energy market the Ministry of Economic Affairs, the Energy Regulator, the network companies, the metering companies and the retailers have discussed the issues of a new energy market model from end 2005 until early beginning 2008.

The aim is a better functioning energy market for small domestic and non domestic end users (connection capacity for electricity up to 3x80 Ampere and gas up to 40 m³/h) and a simplification of all relevant administrative processes such as switching and moving for small end users.

The building blocks of the new energy market model are:

- Introduction of capacity rates for network costs. All network costs are now paid as a fixed amount in € per day or per year.
- Switch in metering responsibilities in the segment of small domestic and non domestic end users. In this market segment retailers will be responsible for the collection, validation and settlement of metering data for all small end users instead of the network companies.
- Introduction of smart meters and a large-scale roll-out of smart meters under direction of network companies.
- Introduction of a mandatory supplier model (supplier single (billing) point for small end users).



- Introduction of an Information Code for all data exchange between suppliers, network companies, metering in all market segments (small domestic and non domestic end users as well as industrial end users), including the introduction of one open and uniform standard for all electronic message traffic.

The result is a proposal by the Minister of Economic Affairs for amending the Electricity Act 1998 and Gas Act in order to improve the functioning of the electricity and gas markets. This proposal is in procedure in Parliament since March 3, 2008.

The proposal for amending the Electricity Act 1998 and Gas Act as discussed in the Senate holds the following issues for introduction of Smart Meters:

- Network companies are responsible for installing and replacing meters (smart and non smart meters), they own the meters and carry out maintenance. This means a mandatory large-scale roll-out of Smart Meters by network companies.
- All small end users and third parties are allowed to ask priority installation of Smart Meters.
- Others such as retailers, house-building corporations, real estate companies and local authorities are allowed to install Smart Meters by themselves, but are obliged to transfer these installed Smart Meters at reasonable price to the network companies.
- The roll out of Smart Meters shall take place in two phases, first a trial period of about two years and after the evaluation of this period by Minister and discussion in Parliament a large scale roll out of approximately six years.
- Only Smart Meters shall be installed which fully comply with the specific – functional - metering requirements stipulated in secondary legislation. Up to now the NTA 8130:2007, gives a minimum set of functions for metering of electricity, gas and thermal energy for domestic customers.
- All small end users have to cooperate with the installation of Smart Meters on their premises under penalty of a fine or sanction.
- Network companies are responsible for making Smart Metering data accessible to third parties.
- Retailers are responsible for collection, validation and settlement of metering data for all small end users.

The proposal for amending the Electricity Act 1998 and Gas Act is adjourned in Senate on April 7, 2009. Bottleneck in Senate was the



penalty fine for small end users who refuse the installation of Smart Meters on their premises in relation to confidentiality of metering data with respect to the privacy issues (consumer behaviour might be traced by the usage of their electrical equipment).

Main concerns argued by consumers:

- hourly and 15 minutes readings give away information about consumer's habits, as when they leave house or return to house. Such information could be used for bad purposes.
- Smart Meters provides insights into family's living patterns and relationships that could affect people's freedom to do as they please at home and would constitute a violation of the consumers' right to privacy and consequently would be in breach of the European Convention of Human Rights.
- Risk that information on a person's energy use will fall into the hands of third parties.

In accordance with debate in Senate, small end users will get the right to refuse the Smart Meter, or once the Smart Meter is installed the right to stop the AMR.

Minister of Economic Affairs is now preparing a legislative change (novella). Adaptation of this novella should be through the Council of State, Second Chamber and Senate and is expected during 2010 and then large-scale roll-out of meters is postponed until 2011.

Most of the issues regarding the introduction of Smart Meters shall remain unchanged. Also network companies probably hold their responsibility to install Smart Meters, but the installation itself is no longer required because small end users may refuse the Smart Meter, or once the Smart Meter is installed may require stopping the automatic meter reading.

Smart Meters costs are expected to be covered through regulated metering tariffs.

HUNGARY

The Government is working on Decrees on Smart Metering for both electricity and gas subjected to a study made by an expert company. Some pilot projects have been carried out by one of the largest electricity company.



Regarding the gas sector the Act XL of 2008 on natural gas calls for obligation of installing Smart Meters for largest consumers of more than 100 m³/h. The Act establishes that the installation, operation, maintenance and periodical authentication of gas meters are the duty of the natural gas distributor.

Costs are covered by the distribution fees.

ITALY

The requirement to reduce losses due to fraud was of prime importance in Italy where the scale of the losses, and costs associated with their detection, were significant. In particular Enel, the dominant distribution (and retail) company in the domestic sector in Italy has invested in Smart Metering for a number of business driven reasons including limiting the large number of visits per year and reducing bad debt.

Electricity sector: The Regulatory Authority published in December 2006 (292/06) a Regulatory Order calling for the roll-out of Smart Meters. It will be mandatory by 2011 for all low voltage customers (36 million customers, representing 95% of customers) and setting some minimum functional requirements. Experience in Italy shows that “extra-charge” for each household customer due to Smart Meters in the period 2003-2007 has been less than 2 €/year. Metering tariff is separated from distribution tariff. The metering tariff will be adjusted every year and the X factor will be for the next 5 years 5% for metering activities compare to 2% for distribution activities.

The DSO is the owner of the meter and is responsible for installation, maintenance, data reading and data validation.

Through a Regulatory Order published in September 2007 (235/07) the Regulatory Authority has also introduced some performance indicators of AMM systems.

Italy is thinking on a second generation of Smart Meters, taking particular care of functional requirements, demand response issues, synergies within Smart Metering systems, standardization and interoperability and smart grids development.



Minimum requirements are requested as follows:

- •TOU price scheme (weekly profile): up to four bands, up to five intervals per day
- •Interval metering
- •Security of data (inside meters, during the transmission to the control centre, status word with prompt transmission to the control centre in case of meter failure)
- •Remote transactions (activation/deactivation, change of the subscribed power, change of the price scheme, power reduction)
- •Freezing of withdrawal data (billing, contractual changes, switching)
- •Breaker on board of meters + demand control algorithm (alternative: registration of the peak power per band)
- •Meter display
- •Slow voltage variations (according to EN50160)
- •Upgrade of the program software

AMM performance indicators:

- 1) Annual percentage of successful remote transactions (activation/deactivation, change of the subscribed power, change of the price scheme, power reduction) within 24 hours and within 48 hours
- 2) Annual number of meters that at least once registered a failure reported to the control centre (through the status word)

Concerning costs, a metering tariff was introduced by Law, separate from distribution tariff and retail tariff.

Gas sector: The Regulatory Authority introduced the implementation of Smart Metering in the gas sector in October 2008, by Regulatory Order ARG/gas 155/08, after a long consultation process, for all customers of the natural gas distribution networks:

- July 2006: announced Smart Metering implementation in the gas sector.
- May/October 2007: made a cost-benefit analysis, a technical benchmark, a survey on the use of AMR/AMM systems in Europe.
- July 2007: published the first consultation document (first thoughts).
- November 2007: established a WG (still alive) on “What minimum functional requirements for Smart Meters” (participants: the Autorità, DNOs, retailers, meters manufacturers, the Italian Gas Committee).
- February/April 2008: sent a request of information on installed meters to major DNOs.
- June 2008: published the second consultation document (final thoughts).
- October 2008: published the Regulatory Order ARG/gas 155/08.



Meter reading activities have been assigned only to DSO's that before was also done by retailers.

Smart Meters will fulfil minimum functional requirements set out by the Regulator. They must guarantee same functions for all customers, regardless of the DSO and they must guarantee interoperability and standardisation.

Minimum functional requirement	>G10	< G10
Metering units' clock/calendar capable of managing seconds; synchronised with the same reading frequency; maximum monthly drift shall not exceed:	3 min	5 min
Temperature adjustment. Measure of the gas withdrawn at standard temperature conditions (15°C).	Yes	Yes
Pressure adjustment. Measure of the gas withdrawn at standard pressure conditions (1,01325 bar).	Yes	No
Withdrawal totaliser register. One single incremental totaliser register.	Yes	Yes
Time-of-use withdrawal totaliser registers. Three separate totaliser registers, three types of day, up to five intervals a day. Schedule updatable twice a year.	Yes	Yes
Interval metering. 70-day capacity, minimum interval:	1 hour	1 day
Saves and backups of withdrawal totaliser register. Min. six-monthly, max monthly; whenever a new TOU schedule comes into operation. Withdrawal registers must be kept after the battery has been replaced or has run out.	Yes	Yes
Withdrawal data security. Mechanisms to protect and monitor withdrawal registers.	Yes	Yes
Diagnostics. Self-diagnosis checks, including one on the maximum monthly drift. Result recorded in a status word for transmission to the remote management centre.	Yes	Yes
Display. At the customer's request: date and time, current and last save withdrawal registers, the register active at the time of display, any alarm showing that the metering unit has recorded an anomaly.	Yes	Yes
Electrovalve. Available on meters, cannot be opened remotely. During any power-supply failures it retains its state.	No	Yes
Up-dating of the metering until software programme.	Yes	Yes
Information on real time withdrawal. At customer's request only.	Pulse emitter	Additional physical or



	output	logical communication gate (regulatory framework still to be defined)
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Source "Regulation of gas smart-metering in Italy" by Ferruccio Villa

MALTA

The company IBM is going to bring electric and water Smart Meters to Malta, as announced last February 2009 through a partnership with Enemalta for the electricity meters and WSC in case of water. The project should be completed by 2012. Malta has a population of 403.000 inhabitants and the project will be replacing 250.000 conventional electricity meters with smart meters and upgrading the water system where it can be monitored and managed remotely. Customers will be able to use the internet to track their utility usage in real time.

NORWAY

The regulator in Norway, NVE, has suggested implementation of Smart Metering for all customers in Norway. The regulation has been out for consultation on two occasions, and the deadline has been adjusted from originally 1st of January 2014 to 1st of January 2016.

NVE holds that the benefits of Smart Metering includes new possibilities for the actors in the electricity market and a larger degree of flexibility for the end-user which should result in delayed new investments in the network as well as in power generation.

NVE will require a minimum set of functionalities, including the possibility of reading the meters every 15 minutes.

The Norwegian regulation also allows for an increase in the network tariffs in order to offset at least part of the cost of the roll-out.



SLOVENIA

There is not a Law on Smart Metering installation and it has been done by companies on a voluntary basis. There are minimum functional requirements. DSO is responsible for metering activity.

Costs on Smart Meters are calculated to be recovered after 12 years. Network companies are paying for it and they own meters.

There are technical requirements as data code system OBIS (IEC 62056-61) DLMS/COSEM protocol (IEC 62056), MID EN 50470-3

Benefits of smart meters for distribution companies are lower maintenance costs in data readings, more efficient metering service, new data services.

To establish a multi-utility metering, is a challenge for a electrical distribution company providing data services to other distribution companies in the area (gas, water)

SPAIN

Electricity sector: Royal Decree 1.110/2007 of 24th August establishes in article 9.8 that measurement equipments bellow 15 kW shall be integrated into smart metering systems to be implemented by the DSO as the one responsible of metering (Art. 4). For equipments above 15 kW Smart Meters are not requested. The Law requires Smart Meters to be installed by 2018 according an implementation plan and annual percentages established by the Government as follows:

- 30% 31.12.2010
- 20% 31.12.2012
- 20% 31.12.2015
- 30% 31.12.2018

The Law sets some minimum functionality requirements as:

- -remote reading of the records of active and reactive power
- -remote reading of the records of quality parameters
- -remote parametrization of measuring equipments
- -activation of the control mode of power demand
- -periodic synchronisation with remote concentrators
- -remote control power: disablement and enablement
- -load management capability to deliver demand side management



Last 24th. April 2009 the Government adopted a Smart Metering system. From now until December 2010, 30% of equipments have to be replaced, then 20% more by December 2012 increasing on a 20% more by December 2015 and total installation by 31.12.2018.

IBERDROLA together with the rest of the power industry with the exception of ENDESA has developed its own model. Actaris, Landis and ZIV are the major manufacturers actively working on developing the devices.

ENDESA announced in July 2009 that they are going to replace their meters with Smart Meters to 13 million customers over the next six years (2010-2015).

Gas sector: There is no legislation in process not under discussion either. Meter stock is less than 10 years old which may difficult any roll-out of smart gas meters

SWEDEN

A need for improved billing accuracy was the main driver for Smart Metering in Sweden. Shortly after deregulation of the electricity market, energy prices soared while consumer groups heavily criticised electricity bills for being both unclear and inaccurate. In addition, environmental concerns were a strong drive for power conservation in Sweden.

In May 2002, the Energy Markets Inspectorate (at that time called Swedish Energy Agency) presented a report outlining the benefits of more frequent readings of electricity meters. As a result, a new bill was proposed in March 2003 and passed, that required monthly readings of all electricity users (5 millions) by 1 July 2009. The regulation does not include any requirements on functionality or specifications on standards for the meters or communication protocols. It only states that customer should be billed for actual usage and that the consumption should be presented per month. The regulation does not stipulate the installation of Smart Meters, but as the reading is required at midnight at the turn of each month, Smart Metering becomes necessary. The most cost effective way distribution companies could meet this requirement was to invest in remote reading technology.

These projects in Sweden have shown to be complex and time-consuming with a wide array of issues along the way. Findings show problems with



inexperienced suppliers, on-time delivery of meters and systems that are still under development.

Due to the fact that the regulator has not set minimum functional requirements, the ability of the chosen Smart Metering systems varies a lot between different DSO's. This is true for the number of functions, but even more so for the service levels of the installed functions. A spontaneous meter reading that in some systems can be delivered within seconds, takes 24 hours in another system.

The problem with service level is particularly true for PLC based solutions and Swedenergy has formed a task group that is looking at the issues facing PLC solutions. Some utilities are already replacing systems that are not able to live up to the business and customer requirements of tomorrow.

In the fall of 2009, virtually all meters for customers up to 63 Ampere have been installed, and are used for billing based on actual consumption. Most utilities are still working with processes that need to be updated due to the new technology as well as finding ways to reap the benefits of more streamlined processes.

UK

In the existing metering market model, metering has been a competitive activity for the last 5/6 years. Electricity and gas suppliers are free to determine their own deployment strategy, choose metering services they require, and have the ability to contract the management of such services. Suppliers would remain responsible for all metering services including communications to and from meters.

In UK around 100.000 customers are changing supplier every week, which constitutes the highest rate in Europe.

UK Government announced in May 2009 the roll-out of smart electricity and gas meters for households by 2020 in Great Britain, which means 26 millions homes for electricity and 20 millions for gas and millions of businesses, at a cost of 7bn£.

Government launched on 11th. May 2009 a three months public consultation on how to install and manage the meters. Consultation finished on the 3rd August 2009 and decisions are expected for Autumn 2009.



As regards certain larger consumption categories a requirement for advanced metering entered into force on 6th April 2009.

Decisions on the proposals contained in the consultation will provide a framework for the preparation programme for the roll out, and a platform for more detailed design and implementation work. Three options were evaluated:

- **Competitive model:** this option is based on the existing metering market model where electricity and gas suppliers are free to determine their own deployment strategy, choose metering services they require, and have the ability to contract the management of such services. Suppliers would remain responsible for all metering services including communications to and from meters.
- **Central Communications model:** this option would introduce a new market function to implement and manage communication infrastructure and data carriage, whilst maintaining metering competition. The communication provider would be organised on a national basis. All suppliers would be obliged to use the central communication function via licence conditions. Suppliers would remain responsible for all other metering services.
- **Fully Centralised model:** this option would introduce regional franchises to manage meter asset selection, ownership, deployment and maintenance, via a time-based competitive franchise or licence awarded under competition. Communications services would be managed centrally as under the previous option.

Subject to responses to this consultation, the Government's planned approach is for one in which:

- Gas and electricity supply companies would have responsibility for provision, installation and ongoing management of smart meters.
- A single national communications provider would be appointed centrally to provide communications services for all smart meters across Great Britain. The Government supports this second approach.

The Government also intended to do further work during the consultation to review whether the electricity and gas distribution network businesses



should have greater role in relation to Smart Meters, assuming responsibilities in relation to Smart Metering roll out.

Industry estimates cost amounts around 15 £ per household per year between 2010 and 2020. From that 10 £ will be accounted for in cost savings by the suppliers, so that leaves just 5 £ for customer. At the same time energy savings are estimated around 2% of energy consumption so reductions in energy bills will take place.

It is estimated that the roll out could create costs associated with early meter removal of around 750 m£. Various stakeholders have argued that Government should introduce a compensation fund to provide full or partial compensation to the party bearing the cost of early meter removal. However, the Government is not in favour for establishing a scheme to compensate for these costs rather than allow them to lie where they fall.

The Government included on its public consultation a proposal for the high-level functional requirements for the domestic Smart Metering system, to be used as a basis for the detailed work which will need to be done to set common minimum technical specifications. It should be a starting point to achieve meter interoperability.

The Government recently put in place new rules for metering at larger non-domestic gas and electricity sites. New licence modifications taking effect from 6 April 2009 will require the installation of advanced metering at such sites by April 2014. In industry terms, these measures apply to sites in electricity profile classes 5-8 (around 160,000 meters) and sites with gas consumption of between 732 MWh and 58,600 MWh per annum (around 40,000 meters). Advanced metering is also being quite widely installed in the small and medium business and public sector (around 2.2 million electricity meters and 1.5 million gas meters). The Public Consultation sets out proposals for introducing new metering requirements for small and medium non-domestic sites, consisting of extending to these sectors the minimum functionality requirements proposed for the domestic sector.

Functionality requirements for electricity meters:

- Remote provision of accurate reads/information for defined time periods
- Two way communications to the meter system
- Home area network based on open standards and protocols
- Support for a range of time of use tariffs



- Load management capability to deliver demand side management
- Remote disablement and enablement of supply
- Exported electricity measurement
- Capacity to communicate with a measurement device within a microgenerator

Functionality requirements for gas meters:

- Remote provision of accurate reads/information for defined time periods
- Two way communications to the meter system
- Home area network based on open standards and protocols
- Support for a range of time of use tariffs
- Remote disablement and enablement of supply



ANNEX II – Consumer Concerns



This Annex 2 to **GEODE** Position Paper on Smart Metering gives an overview of the main concerns raised primarily by consumer groups in relation to Smart Metering.

Consumer benefits from Smart Meters are considerable. However Smart Meters roll-out will raise concerns from the consumer perspective. Consumers will therefore want information about Smart Meters installation and understand the reasons for the change to Smart Meters.

GEODE believes that it is essential that the consumers are involved in the new opportunities that arise and have a clear view of the benefits of Smart Meters. Any and all concerns that the consumers might have must be discussed and as far as possible mitigated.

“Smart Meters roll out must be done with consumers, not to consumers.”²

² BEUC Report “Less consumption and a better working energy market: realising the benefits of smart metering for consumers”, 2009.



Meeting Consumer Concerns

- ***Consumers are concerned that they are forced /obliged to install Smart Metering***

Consumers may be concerned that they will be obliged to have a Smart Meter installed. This concern is most likely due to some underlying concern such as having to pay for installation, privacy concern or other. These concerns are addressed below.

- ***Concern that cost for Smart Metering is transferred to consumer***

For consumers, a major issue is the potential cost of a Smart Meter roll-out, and how they would be asked to meet the costs. There are consumers concerns that, at the end of the day, the deployment of Smart Meters implies that consumers will have to pay higher network tariffs as utilities/DSOs costs for Smart Metering could be transferred to consumer.

If the costs are passed on to consumers they want transparent mechanisms to be put in place to ensure that:

- Costs are fairly and proportionately borne
- Consumers are paying for efficient costs – that smart meters are value for money

Implementing Smart Metering has indeed a substantial cost. However, the benefits of Smart Metering are distributed along the value chain, and it is only fair that each party in the value chain bear part of the cost relative to the benefits that are accrued. There are many potential benefits to the small consumer from Smart Metering, and it is reasonable that some of the costs are passed on to the end consumer. The main benefits include:

- Improve retail market competition which can lead to lower cost for consumers
- Increased consumer awareness of how and when energy is spent, hopefully resulting in a more efficient use of energy and thus lower cost for consumers.
- Invoices based on actual consumption



- An opportunity for energy related services, especially from an energy saving consultancy
- Improved knowledge of the quality of service delivery
- Facilitating customer switching
- Introduction of time of use tariffs that can help customers use energy at lower cost
- Facilitate micro-generation development, creating opportunities for consumers to become producers

In the majority of Member States a regulated DSO will be responsible for installing Smart Metering and it will be up to the regulator to set appropriate tariffs, including the cost of metering whether the metering is done manually or remotely/"smart". It is of course in the interests of the party responsible for implementing Smart Metering to do so in an efficient manner and to maximize the value of the investment.

- ***Concern over data handling***

Smart Meters raise some potential data handling concerns from consumer perspective. These include: What data is controlled, used and shared and by who? Who owns the data? There might be concerns that metering data collected by Smart Metering are being sold for marketing purposes to third parties, without consumer consent.

Whatever metering model is in place, **GEODE** strongly believes that it is essential to ensure non-discriminatory access to meter data and/or smart meter functionalities as **authorised by the customer** according to contract or by law. Data must of course be handled in accordance with Member States laws and regulations.

As with all customer and billing data stored by the DSO or other responsible party, data handling must be carried out in a safe and non-discriminatory fashion.

- ***Concerns over privacy issues and integrity***

This is one of the main concerns in Europe and it has, for example, delayed the roll-out of Smart Metering in The Netherlands. Consumers fear that Smart Meters are "spying" on them. Using the detailed data obtained from Smart Meters, DSO or suppliers could ascertain how people live. Smart Meters therefore risk infringing Article 8 of European Convention on Human Rights which advocates "the respect of private and



family life, home and correspondence”. So privacy is a potential concern in respect to Smart Meters.

Data access and data protection is central to consider in the roll out of Smart Meters. The right level of data access within the industry will be important if the full benefits of Smart Metering for consumers and for Smart Grid management are to be realised. Equally the right safeguards must be in place to protect consumers from improper access and misuse of data. Data protection legislation in each country should serve as guidance for this, and Smart Metering management have to comply with data protection laws. A review of European legislation on data protection issues arising from Smart Meter roll-out is recommended.

- ***Concern over security issues***

There are also concerns about illegal hacking into Smart Metering infrastructure and illegal access to meter data or possibly the illegal use of remote disconnect. This concern also includes worries about viruses.

It is of course the responsibility of the operator of the Smart Metering system to ensure that the possibility of hacking is reduced to an absolute minimum. Many of today's systems have the same security as internet banks, and a great deal of effort is made to ensure safe system.

- ***Concern over accuracy of meter reads***

Customers need to know expressed that meters are reliable and will provide correct information. There are two types of concerns: the individual meter is malfunctioning and gives an incorrect value or transmits an incorrect value. Or that the Smart Meters all show a higher consumption compared with the old mechanical meters.

Technical problems, for example faulty installation-quality or meter malfunction, are inevitable in a large scale roll-out of Smart Meters. But with the focus on quality during the selection of vendors and during the roll-out process, these issues can be kept to a minimum. The responsible party for implementation will also have to ensure efficient processes to quickly handle any faulty equipment and to deal with customer queries and complaints arising from the installation of Smart Meters, reimbursing the customer for any possible erroneous billing.

Smart Meters installed will have been MID certified and gone through extensive tests in order to be approved. Smart Meter accuracy means they



meet the same standards as the old mechanical meters, and are no more likely to show faulty readings.

- ***Concern over Time of use tariffs***

Consumers consider that an increase in more complex and “sophisticated” tariffs e.g. time of use tariffs, seasonal tariffs & energy services packages has the potential to create greater customer confusion and complexity, hindering effective beneficial switching decisions.

Installing Smart Meters does not necessarily mean that time-of-use tariffs will be introduced. Smart Meters only provide the possibility of new tariffs. Should these tariffs be introduced, they can also give customers an opportunity and incentive to reduce their energy costs by using the energy when the price is at its lowest.

Comparative information about tariff-offers on utility switching sites will be very important to help consumers choose between offers and avoid confusion. Efforts must be made to properly inform customers about the various tariff options and how to take advantage of new pricing schemes. New tariffs must not be used as an excuse to increase prices across the board.

Time-of-use tariffs will give the consumer a chance to decrease their electricity costs, since they will have the option of steering their consumption to cheaper time periods. The consumer will thus be better positioned to take advantage of the market and the changes in prices over time.

In this way the cost savings due to reduced network and production constraints can be made accessible to the consumer. The high cost of spot prices for electricity during peak demand can be avoided by the active customer. Today those high price peaks are spread between all consumers.

In a self regulated market, the suppliers with the most beneficial prices and the easiest cost structures stand to gain the loyalty of the consumers. Very complex price structures or cost savings not passed on to the consumer should therefore be detrimental to suppliers in the long run.



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