



The Consumer Voice in Europe

PROTECTING AND EMPOWERING CONSUMERS IN FUTURE SMART ENERGY MARKETS

BEUC position paper

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Summary

The retail energy market is often perceived by consumers as being rather complex and future smart energy markets will pose even bigger challenges for them. In a world of fast paced technological innovation and changes, consumers may face yet other new technologies to enter their everyday life. And although these new technologies may offer new services for consumers, the benefits for them are not yet guaranteed. In well-functioning retail energy markets, consumers must be informed and sufficiently protected so that they can benefit from competition, compare information on consumption and costs, and know their rights and means of dispute resolution. Any technological development should ensure user-friendliness and consumer engagement built on consumer protection and empowerment.

In this position paper, BEUC, The European Consumer Organisation, points out to challenges ahead and outlines all necessary elements which need to be addressed to ensure that European consumers are well-protected and empowered in future smart energy markets.

Installation of Smart Meters and Roll-Out Strategies

- Cost-Benefit Analyses must be mandatory and take into account the impact on different consumer groups.
- Cost-Benefit Analyses must be carried out by an independent organisation and regularly reviewed during the smart meter roll-out.
- The European Commission should undertake a continuous assessment of national roll-outs.
- Consumers should freely choose if they want to use smart meters in their homes. This is particularly important where consumers are required to pay for it.
- When consumers do not accept a smart meter, they should not bear any additional costs.
- A coordinated bottom-up approach could facilitate the provision of more targeted information about the potential benefits and new services available to consumers.
- Member States should outline a clear vision of the benefits for consumers and a strategy on how these will be delivered.
- Member States must report annually on the achieved progress and the costs and benefits for consumers.
- Policy makers must provide for a solid legal and regulatory framework that guarantees that the smart meter roll-out is cost efficient and costs and benefits are fairly shared among all stakeholders that benefit from the new technology.
- Targeted information and personalised advice are necessary to raise awareness about how consumers can achieve potential benefits from smart meters and related services.
- Consumers must be provided with on-going advice and support during and after the installation of smart meters.
- During the installation visit, consumers should not be sold any tariffs, goods or services.
- Measures protecting vulnerable consumers must be in place so that the roll-out of smart metering technology does properly address their situation.

Potential benefits for consumers

- Consumers equipped with smart meters should get accurate and regular bills based on actual consumption.
- Functionalities of smart meters must enable access to real time information as well as historical information, advice and easy switch.
- Member States should analyse and present evidence of what frequency of historical consumption data works for consumers.
- If Member States allow the use of the remote disconnection functionality, they must put in place safeguards and legal protection so that this functionality cannot be misused.
- Distributional analysis must be performed on the impact of time-of-use tariffs on different social groups and if/how these groups can access the benefits of new deals.
- Demand response programmes should be available to consumers on opt-in basis.
- As smart meters will enable dynamic pricing tariffs, National Regulatory Authorities must carefully monitor the tariff complexity and ensure new tariffs are easy to compare and do not prevent switching.
- Clear information and protection frameworks about best use, remote control and disconnection of smart appliances must be provided to consumers.
- Those consumers who are also producers should receive information in an appropriate format so that they understand the full potential of micro-generation.

Technological Aspects of Smart Metering Systems

- Interoperability and modularity of the system must be ensured in order to avoid lock-ins and ensure the system is future-proof.
- The technology should meet inclusivity by design standards to ensure consumers find it easy to use.
- Reliability and quality of energy supply need to be monitored.
- Consumers need information to be easily accessible.

Protection of consumers' personal data

- Processing of personal data must be fair, lawful and must comply with the principles of data protection processing, including transparency, data minimisation and purpose limitation.
- Each processing operation must be based on the most appropriate legal ground, while the legitimate interests of the data controller should not be used as a loophole.
- Compliance with the principles of privacy by design and privacy by default must be ensured.
- Introduction of mandatory Data Protection and Privacy Impact Assessment (DPIA/PIA) should be conducted on all aspects of smart metering.
- Retention of personal data should not exceed what is absolutely necessary for specific and lawful purpose.
- Consumers' personal data should be stored at the consumer's side by default.
- Effective enforcement of the Data Protection legislation is key.

Introduction

Smart metering technology has been introduced to and supported in Europe mainly by the Third Energy Package as well as by other legislative instruments such as the Energy End-Use Efficiency and Energy Services Directive¹, the Energy Performance of Buildings Directive² and the Energy Efficiency Directive³. EU Member States are currently in different stages of their smart meter roll-outs; while smart meters have become a reality in some Member States, other countries focus rather on pilots and small scale projects.

This paper provides the consumer view on different aspects of smart meters, outlines the consumer diversity and how consumers should be empowered in future smart energy markets. At the same time, this paper sheds the light on several key aspects such as what is the role of smart meters, who should bear the costs for the roll-out and is this technology really necessary to be implemented in every household? Where the paper refers to smart meters, the focus is on smart electricity meters.

Smart meters are often promoted as a tool to help consumers become more energy efficient, implying energy and therefore cost savings. However, their installation alone will not necessarily deliver any energy or monetary savings and therefore, a key challenge is how to raise awareness, educate and help consumers become more active and bring about a change in behaviour that will increase households' energy and monetary savings. This new technology will enable a range of new energy efficiency services emerging from new business models. Still, the minimum requirements from the consumer perspective should always be present: accurate bills, easier and faster supplier switching, access to up-to-date as well as historical information on energy consumption in an easy to use format and the provision of independent personalised advice on how to benefit from smart meters.

There are still many unresolved issues such as how to ensure fair pricing of smart meter roll-out, deliver benefits different consumer groups may profit from as well as data protection and security issues, different functionalities of smart meters which all need to be addressed before smart meters are rolled out. Any technological development should ensure user-friendliness and consumer engagement, built on a solid basis of consumer protection and empowerment. Nevertheless, real consumer empowerment can only be achieved if consumers are given the choice as to what kind of role they want to play in future smart energy markets.

Special attention needs to be paid to vulnerable consumers, so that the roll-out of smart metering technology does appropriately address the situation for those who already struggle to pay their energy bills. Consumer protection rules must be up to speed and ready to cope with challenges that future smart energy markets will bring about.

¹ Directive 2006/32/EC.

² Directive 2010/31/EU.

³ Directive 2012/27/EU.

1

Installation and Roll-Out Strategies

This chapter aims to describe a number of issues which, in our view, need to be considered prior to the installation of smart meters and before implementing a roll-out strategy. It lists the consumer aspects that need to be taken into account when doing Cost-Benefit Analyses and underlines the importance of consumer choice. Moreover, this section highlights the need for transparency of costs and financial implications on consumers.

1.1. Cost-Benefit Analysis

1.1.1. Mandatory Cost-Benefit Analyses

The Third Energy Package⁴ foresees that the implementation of intelligent metering systems ‘may be subject to an economic assessment’. However, in order to thoroughly evaluate all possible socioeconomic implications of smart meters for consumers, detailed Cost-Benefit Analyses (CBA) need to be mandatory and become the fundamental pillar of any further deployment of smart metering systems. These CBAs should not only carefully examine the overall economic, social and environmental aspects, but also take necessary investments in smart meter security into account. They should also include an overview of the costs related to different roll-out strategies, as the costs can vary depending on the different roles and responsibilities that will be assigned in the market. Furthermore, different scenarios that take into account different smart meter functionalities should be carefully assessed as costs and benefits will differ for very basic meters and smart meters with more advanced functionalities. As smart meters have a rather limited life expectancy compared to current mechanical meters, CBAs should take into account the replacement of both current and future meters as well as any additional costs that may occur at the later stage translating into higher expenses for consumers. Without proper analyses, BEUC is highly concerned about the costs that consumers will have to pay without benefiting from the new technology.

1.1.2. Focus on consumer diversity – need for a distributional impact assessment

The energy consumption of residential households varies largely in nature and size, and households have their specific consumption patterns depending on consumers’ needs, skills, motivations, interests, lifestyle, and equipment and so on. It is expected that not all consumers can benefit from smart meters in the same way or at all. The CBA should therefore provide an in-depth analysis of the potential benefits for different groups of consumers, including all costs that may be passed onto them during or after the smart meter roll-out.⁵ Special attention should be paid to vulnerable consumers who cannot easily shift their energy consumption from peak to off-peak time for instance, and to households which are not able to further reduce their energy consumption. BEUC is concerned that this aspect of consumer diversity has not been taken sufficiently into account by the non-exhaustive list of costs and benefits of the European Commission’s Recommendation.⁶ It is therefore of utmost importance that when Member States undertake CBAs, they include a detailed analysis of the impact that smart meters will have on all socioeconomic groups, in order to understand if and how these groups can benefit from smart meters. As stated above, this is particularly important for low income households and vulnerable consumers. If the analysis does not take account of consumer diversity, Member States must review their existing CBAs and adjust their roll-out strategies.

⁴ Directive 2009/72 concerning common rules for the internal market in electricity and Directive 2009/73 concerning common rules for the internal market in natural gas.

⁵ For instance in France, the Cost-Benefit Analysis focused mainly on the benefits for the Distribution System Operator. However, in order to understand the overall impact (direct and indirect) on consumers, it is necessary to evaluate all implications on industry (from producers to distribution system operators) as well as on individual consumer (consumer diversity).

⁶ Commission’s Recommendation of 9 March 2012 on preparations for the roll-out of smart metering systems.

1.1.3. Transparency

Cost-Benefit Analyses should be carried out by an independent organisation⁷ in a transparent way, taking into account different possible scenarios. The design process of the CBA and its tender should be discussed with all concerned stakeholders beforehand and in particular with consumer groups. Results should then be open for discussion in order to ensure that the most effective scenario for the roll-out is being chosen. The Cost-Benefit Analysis should be regularly reviewed during the smart meter roll-out to ensure its accuracy, taking into account parameters such as consumer experience, quality of service and financial impact on consumers, and the overall strategy should be modified where appropriate. We therefore ask the European Commission to undertake a continuous assessment of national roll-outs in order to guarantee that consumer interests are well-reflected and met at all times.

1.1.4. CBAs must be positive and allow for consumer choice

Cost-Benefit Analyses may have different results depending on a variety of factors. From a consumer perspective, it is possible that the analysis will be positive for at least some segments of the population. However, the assumption that the entire population will always benefit from having a smart meter is highly questionable and therefore consumers should have the last word as to whether or not they want the meter installed. For instance, the report of CWaPE, the energy regulator in Belgium's region of Wallonia, suggests that while the CBA for a full smart meter roll-out as envisaged by the Directive 2009/72 is negative, a consumer friendly scenario that does not require a smart meter in every household may be positive.⁸ The emphasis of the roll-outs should therefore be put on consumers' engagement rather than on forcing them to accept a smart meter they do not necessarily want. Hence, consumers should be able to freely choose whether to use or refuse a smart meter. This is of particular importance where consumers are required to pay for it. It must also be ensured that when consumers do not accept a meter, they will not face additional charges to compensate for the roll-out that does not concern them.⁹

1.2. Smart meter roll-out

According to the Third Energy Package, at least 80% of consumers should be equipped with intelligent metering systems by 2020 if the roll-out of smart meters is assessed positively. At the same time, the legislation sets that the potential economical assessment should include "all the long-term costs and benefits to the market and the individual consumer or which form of intelligent metering is economically reasonable and cost-effective and which timeframe is feasible for their distribution".¹⁰ However, so far these assessments have either not been carried out or are – in most Member States – not conclusive enough. The overall benefits of this new technology for different consumers have therefore not been sufficiently understood. Preferably, European legislators should have had a clearer picture on these aspects before setting a target. Moreover, EU Member States are currently in different stages of the smart meter roll-out with more or less clear plans which often result in little room for manoeuvre to have things changed to the benefit of consumers.

This is even more important when consumers are going to pay for the roll-out via their energy bills. A voluntary and consumer-centred roll-out of smart meters may increase consumer participation and public support as it facilitates ownership, data protection, security and cost allocation issues. In cases where meters have to be exchanged, consumers must be consulted and

⁷ For instance in Austria, the Cost-Benefit Analysis was carried out by PriceWaterhouseCoopers (PWC) which acts as a consultant company for smart meter producers as well. In our view, this is not acceptable as consulting companies should not be considered an independent party.

⁸ Rapport CD-12f19-CWaPE concernant «l'évaluation économique du déploiement des compteurs intelligents», 19 June 2012.

⁹ As consumers should always be given the choice whether or not they want the smart meter in their homes, a dual system covering consumers with and without smart meters may be considered in the future. It must be ensured that if there is such a dual system in place, it does not create unfair situations where consumers without a meter end up subsidizing those that do have one.

¹⁰ Directive 72/2009 concerning common rules for the internal market in electricity, Annex I(2).

modular concepts should be discussed. Moreover, where consumers move into a home that already has a smart meter, they should be given the option to have the meter operate in dumb mode.

Furthermore, some countries in Europe such as Germany favour a market-driven (i.e.: not widespread mandatory) smart meter roll-out as they believe this may decrease the overall costs and increase consumer acceptance.¹¹ In the United Kingdom, on the other hand, a supplier-led roll-out has been heavily criticised for creating additional costs when compared to a roll-out led by the Distribution System Operator.¹²

Last but not least, according to a report published by the University of Tilburg¹³ which had a significant influence on the legal basis for the smart meter roll-out in the Netherlands, the mandatory introduction of smart meters, where data is collected on a granular level, constitutes a violation of the right to respect for private and family life and would thus be in breach of the European Convention of Human Rights (Article 8). Following this report, the Dutch law changed from a mandatory approach to a voluntary one, and the frequency and granularity of the collected data has also been adapted.

1.3. Information for consumers

Consumers' knowledge about smart meters is currently very limited. For instance, according to a study commissioned in 2012 by the UK Government's Department of Energy and Climate Change (DECC),¹⁴ over half of the population was not aware of the existence of smart meters in the UK. Only one in four knew at least a fair amount about the meters, more than 20% had heard of them but knew nothing about them, while just 2% claimed to know "a great deal". Consumers need to understand the features and potential benefits of smart meters and the services that this technology may offer and facilitate before, during and after the meters are rolled-out. Only if consumers are motivated to change their consumption behaviour and if they are given real choice and offered the right tools and incentives to become active players, it will be possible for them to achieve energy and monetary savings.

In our view, a coordinated bottom-up approach can create a better understanding among consumers and promote behavioural change. Therefore, prior to the smart meter roll-out, consumers should be informed about how to best engage with smart meters and the different interfaces of their choice, as well as how the information they receive through the smart meter or any additional interface may be used to be more energy efficient. As all consumers are not the same, they need to be approached differently. Therefore, actions focused on a regional or local level can facilitate the provision of more targeted information about the potential benefits and services consumers may use to be more energy efficient. Member States should monitor the process, including the smart meter roll-out and the experiences that consumers get, and report on how/if smart meters deliver the benefits and potentials identified in the government's assessment.

¹¹ J. Schächtele, J. Uhlenbrock, *How to regulate a market-driven rollout of smart meters? A multi-sided market perspective*, 2011.

¹² For example in the UK, around a third of consumers take their gas and electricity from separate suppliers which will require at least two home visits, rather than one. As a result of the supplier-led roll-out, the costs may increase and consumer engagement strategies will be harder to roll-out. From the technical point of view, the roll-out in blocks of flats could also result in duplication of communications equipment. The need for the Data Communications Company has added significant cost but is needed to ensure interoperability because of the supplier-led roll-out.

¹³ C. Cuijpers and B.-J. Koops, *Het wetsvoorstel 'slimme meters': een privacytoets op basis van art. 8 EVRM*, University of Tilburg, October 2008.

¹⁴ Quantitative Research into Public Awareness, Attitudes, and Experience of Smart Meters, research conducted by Ipsos MORI for DECC, August 2012.

1.4. Installation of Smart Meters

During and after the installation of smart meters, consumers need to be provided with all relevant information mentioned above. During, as well as after the installation, consumers should be offered on-going advice and support on how to use the smart meter and apply the information it provides in practice.

During the installation visit, consumers should not be sold any tariffs, goods or services. Aggressive and misleading practices related to doorstep selling have been reported in many Member States and these unacceptable practices should under no circumstance occur during the visit to install a smart meter.¹⁵ In order to avoid these cases, companies should not incentivise staff with commissions on their sales when they are installing smart meters.

1.5. Transparency of costs

When talking about the costs of the smart meter roll-out, it has to be borne in mind that smart meters are a component of the wider smart grids. In Europe alone, the deployment of smart meters represents a €40 billion market¹⁶ and expectations in terms of benefits for different stakeholders are sky-high. If Member States decide to roll-out smart meters, they may follow different scenarios. In any scenario, a certain share of the investment costs is surely going to be passed on to consumers, yet there is often little acknowledgement of what should be considered as fair cost sharing among those who benefit from the smart meter roll-out. Transparent mechanisms are needed to ensure a proper scrutiny of all costs and enhance cost efficiency. Consumers must receive clear information about all costs passed on to them, including all charges for the installation and maintenance of all devices. Therefore, BEUC asks policymakers to construct a solid legal and regulatory framework that guarantees that the smart meter roll-out is cost efficient and that costs and benefits are fairly shared among all stakeholders who benefit from the new technology.

1.6. Strategy for vulnerable consumer groups

A key indicator of an advanced society is how it treats its most vulnerable consumers. Conditions that lead to vulnerability in the energy sector need to be better understood. It should be analysed if these consumer groups are sufficiently protected as well as how they will be affected and if they can benefit from the implementation of smart technologies. Consequently, measures ensuring that the roll-out of smart metering technology does properly address the situation for those who already struggle to pay their energy bills must be put into place. In addition, strong protections are needed for vulnerable consumers in terms of remote disconnection, time of use tariffs and the potential misuse of load limiting as a debt management tool by suppliers.

¹⁵ In June 2011, WHICH?, the BEUC member, found adverts for smart meter installers offering commissions if they could sell products to homeowners. In April 2012, the UK government announced a set of rules for energy companies installing smart meters, including provision that prevents companies from selling to customers during the installation.

¹⁶ Klopfer & Wallenborn (2012), Université Libre de Bruxelles, Empowering consumers through smart metering.

BEUC demands

- Cost-Benefit Analyses must be mandatory and take into account the impact on different consumer groups.
- Cost-Benefit Analyses must be carried out by an independent organisation and regularly reviewed during the smart meter roll-out.
- The European Commission should undertake a continuous assessment of national roll-outs.
- Consumers should freely choose if they want to use smart meters in their homes. This is particularly important where consumers are required to pay for it.
- When consumers do not accept a smart meter, there should not bear any additional costs.
- A coordinated bottom-up approach could facilitate the provision of more targeted information about the potential benefits and new services available to consumers.
- Member States should outline a clear vision of the benefits for consumers and a strategy on how these will be delivered.
- Member States must report annually on the achieved progress and the costs and benefits for consumers.
- Policy makers must provide for a solid legal and regulatory framework that guarantees that the smart meter roll-out is cost efficient and costs and benefits are fairly shared among all stakeholders that benefit from the new technology.
- Targeted information and personalised advice are necessary to raise awareness about how consumers can achieve potential benefits from smart meters and related services.
- Consumers must be provided with on-going advice and support during and after the installation of smart meters.
- During the installation visit, consumers should not be sold any tariffs, goods or services.
- Measures protecting vulnerable consumers must be in place so that the roll-out of smart metering technology properly addresses their situation.

2 Benefits, challenges and expectations

Consumer confidence, satisfaction and engagement with the new technology, cost-effectiveness, and ease of use by all are key prerequisites for the successful deployment of smart meters.¹⁷ This chapter will deal with the basic requirements smart metering and smart grid technologies should have to deliver to consumers.

2.1. Who benefits from smart meters

The main drivers for the need to invest in new networks are firstly the peak loads caused by renewable generation and secondly the peak loads of industry and large scale companies' demand. For example, distribution system operators (DSOs) can often achieve significant financial savings thanks to the possibility offered by remote reading of meter data or by using them to detect frauds. They will also be able to purchase energy more efficiently and better handle decentralised, inconstant electricity generation.

Suppliers can get more frequent information about households' energy consumption and therefore will be able to offer new and more flexible tariffs to their clients. Suppliers, as well as third parties, will also be interested in getting first-hand information about the consumption patterns of their customers which will help them to analyse the savings potential and facilitate Demand Side Management. New technologies can also enable new business actors to enter the market. But what is in all this for consumers?

A number of benefits have been promised to consumers such as the end of estimated bills, easier and faster supplier switching, access to real-time information on their consumption, and increased choice of new services which should help them to become more energy efficient. However, it remains questionable whether these benefits will be delivered in practice and whether they justify the additional costs of this technology for consumers.

2.2. Smart Meters and Energy Efficiency

Smart meters are often promoted as a tool to help consumers become more energy efficient. However, in our view, smart meters alone are not sufficient to achieve energy savings or a better use of energy from the consumer side. This technology may help those who consume large amounts of electricity or for example households equipped with heat pumps to better profit from sophisticated services or tariffs that will be provided in future 'smarter' energy scenarios. But the installation of smart meters alone will not bring the desired benefits and should not be considered as the way to help consumers become more energy efficient.

A key challenge is how to raise awareness about consumption patterns and bring about a change in behaviour that will increase households' energy savings. Only if consumers understand the information they are given, and are aware of how to optimise their energy consumption, they can become more energy efficient. In order to do so, consumers need to know the price of energy as stipulated in their contract, if there are peak and off-peak tariffs in place, and be aware of tips for economising their appliance consumptions and/or the benefit of buying better energy performing appliances.

At the same time, currently complex energy markets make it often difficult for consumers to navigate which results in many consumers being discouraged to get actively involved. It cannot be expected that consumers will spend hours in front of the screen (of an in-home display or any

¹⁷ Trans Atlantic Consumer Dialogue, Resolution on Smart Grids, June 2011.

other interface) and observe how much energy each of their appliances is using. Therefore, consumers need friendly technology to be able to change their consumption habits and different tools and applications should be offered to them to make it as easy as possible.

Furthermore, from the economic perspective, the potential of smart meters to save energy has proven to be limited. According to research conducted by the Université Libre de Bruxelles (ULB)¹⁸, a best-case scenario of a reduction of 2-4% is achievable in the short term. This amounts to a saving of €15 to €30 per year for an average European household. According to other sources, the savings for consumers can be even lower – for instance in Germany, consumers may save between €4.5 and €34 depending on the willingness and the ability of consumers to adapt their behaviour.¹⁹ The level of savings depends on various factors, such as what kind of feedback and service is provided, what are the communication channels, if the solution is user-friendly and what are the characteristics of each particular household.

2.3. Communication channels

Apart of the type and frequency of the information provided to consumers via smart meters and through the interfaces, the right communication channel of such information is essential. Some consumers may react to frequent accurate bills and tips on how to save energy, others may profit best from the information sent to them via interfaces, mobile apps or from the advice provided by third parties. However, we are concerned that national roll-outs focus more on the smart meter roll-out as such and not enough on how the information is communicated to the individual consumer. For instance, consumers in the UK will receive an in-home display (IHD) together with the smart meter while consumers in France will have to pay for a remote display if they want to have one.²⁰

2.4. Potential benefits for consumers

Consumer benefits and protections should be taken into account when deciding on the minimum functionalities of smart meters. Receiving an accurate bill is one of the fundamental benefits promised to consumers and should be guaranteed from the moment a smart meter is installed. Moreover, we welcome the inclusion of information on historical consumption within the minimum functionalities as recommended by the European Commission.²¹ However, we strongly believe that consumers should be able to decide when the functionalities to remotely disconnect, switch to and from prepayment or limit the amount of energy received, are used. Moreover, it still remains to be clarified what will be the conditions for remote control and disconnection of smart appliances. Consumers must receive clear information about these processes and it should always be up to them to decide if appliances within their home can be managed remotely.

2.4.1. Accurate bills

When smart meters are in place, it should be the right of the consumer to receive accurate and correct bills which reflect their actual consumption, allowing consumers to better manage their energy usage and to better budget their expenses. We deeply regret that European legislation has failed to secure this basic advantage for consumers.

¹⁸ Klopfert & Wallenborn (2012), Université Libre de Bruxelles, Empowering consumers through smart metering.

¹⁹ J. Schächtele, J. Uhlenbrock, *How to regulate a market-driven rollout of smart meters? A multi-sided market perspective*, 2011.

²⁰ Although the inclusion of remote displays as a part of the basic information funded by the public service was envisaged in the draft decree defining minimum service requirements in France, it has not been reflected in the final decree.

²¹ Commission's Recommendation of 9 March 2012 on preparations for the roll-out of smart metering systems.

2.4.2. Access to consumption data

The introduction of smart meters should help to provide the rights stipulated in Directive 2009/72/EC (Article 3 and Annex I) on the access to consumption data. In this regard, consumers are entitled to be informed about their actual electricity consumption and related costs. This information should be provided in a clear and understandable manner so that consumers can make more efficient consumption choices. However, we would like to emphasise that only if smart meters are rightly designed and provide information in a user-friendly way, can they contribute to making these rights work in real life.

2.4.3. Real time information

As set in the European Commission's Recommendation,²² the meter readings should be updated frequently enough so that consumers can save energy.²³ In our view, consumers should be given the possibility to be provided with real time information on their actual energy consumption to ensure that the information is useful for them. Such information should be visually attractive and interactive to enable consumers to engage with smart meters and interfaces of their choice, as well as in a format that consumers can use to compare deals on a like for like basis. The most important element is that consumers need to be provided with an accurate up-to-date account balance which should be expressed in kilowatt hours as well as in monetary terms so that consumers get a full understanding of the cost of their energy usage. These figures must be accurate, avoiding for example illustrative figures which do not include fixed costs. One of the possibilities could be setting a unit price for energy in order to allow consumers to compare offers from different suppliers. It should be made clear that any 'common currency' developed for the purpose of comparing energy tariffs should be simple and relevant to the vast majority of consumers using the same metric.

2.4.4. Historical consumption data and complementary information

Furthermore, the Commission recommends that the data on consumer consumption is stored for a reasonable amount of time²⁴ in the smart metering system. We support the general direction of this recommendation but believe that more detailed guidance is needed. In our view, the information should be stored at the consumer premises by default (i.e.: in the meter itself or accompanying system in the household) so that consumers have control over their data and can analyse their long-term consumption data.

Complementary information on historical consumption should also be available either through an interface, web-based programmes or smart phones at no additional costs. However, as many Europeans still do not have an Internet access, this data should also be available in hard copy at no extra costs. Moreover, Member States should analyse and present evidence of what frequency actually works best for consumers.

2.4.5. Advice

In order to meet all expectations that smart technologies may bring to the environment and to society in general in terms of increased efficiency, energy savings and lower carbon emissions, consumers need advice and support as well as the right tools and incentives to contribute to the achievement of these goals. According to studies and projects analysed in the ULB research,²⁵ apart from accurate bills, consumers need to get also energy efficiency advice in order to achieve some energy savings. Therefore, consumers must have access to their consumption data and the information provided must be in a format that consumers, as well as third parties, can understand and use to provide personalised advice. The transparency of any additional costs related to these services is also of key importance.

²² Commission Recommendation of 9 March 2012 on preparations for the roll-out of smart metering systems (2012/148/EU).

²³ According to the Commission's Recommendation, an update rate of 15 minutes is recommended while it has been acknowledged that even more frequent update may come with new services.

²⁴ For example in the UK, the data will be stored in the meter for 13 months.

²⁵ Klopfert & Wallenborn (2012), Université Libre de Bruxelles, Empowering consumers through smart metering.

2.4.6. Easier and faster switching

The three-week switching period as envisaged in the Third Energy Package is too long when smart meters have been installed and therefore the switch should be possible as soon as the technology allows. In order to encourage people to switch to a better deal and improve their experience, switching should be smooth and become possible within 24 hours, helping consumers and improving competition. Whilst from a technical perspective switching has become easier, non-interoperable smart meters make switching more challenging.²⁶ Action is needed to avoid these cases which result in higher costs for consumers and hinder switching by lock-ins.

2.4.7. Remote functionalities

Remote functionalities of smart meters are of key importance to consumers as they offer the potential for great advantages but also pose significant risks and challenges. They can for example facilitate processes when consumers move into a new house, or allow energy consumers to access the necessary data to offer innovative services. Yet it is crucial that strong consumer protection is in place so that consumers are confident that these functionalities will not be used inappropriately.

In particular, the use of the remote disconnection functionality by energy suppliers cannot be left to be used arbitrarily at their own discretion with no protection mechanisms in place. Moreover, there is a risk that this functionality can be hacked into by unauthorised parties. This could result in widespread blackouts and leave many households without an energy supplier for significant periods of time. The remote disconnection functionality therefore represents an important factor when thinking of consumer vulnerability.

BEUC is concerned about the potential misuse of remote functionalities and calls on Member States to put in place strong consumer protections in all cases, and, in particular, to carefully consider whether or not and how they should include remote disconnection among the minimum functionalities of the smart meters that will be deployed in their territory. Where this functionality is allowed for, specific safeguards and legal protections must be ensured to protect consumers from the illegal or inappropriate misuse of remote disconnection.

2.5. Demand response

Demand response is being considered as an important tool to balance the future electricity grid and smart meters may indeed play a role if systems with variable tariffs and different prices per kilowatt hours based on the time when electricity is being used are put in place. Consequently, energy providers may offer new innovative tariffs which better reflect households' varying consumption patterns. The process may get even more sophisticated with smart appliances that turn on or off according to the best moment in terms of energy availability and prices.

Although some consumers may profit from moving their energy consumption from peak to off-peak time, it must be borne in mind that not all consumers will be able or willing to shift their energy consumption to off-peak hours. Special attention should be paid to vulnerable consumers as many of them are less likely to have room to modify their consumption patterns, need more heating or are dependent on electrical appliances. Therefore, we believe that it is important that suppliers always offer at least one standard tariff with a constant and affordable price at all times.

Even when consumers are able to shift their consumption, they may not understand how to do so. Research conducted by BEUC's member Consumer Focus in the UK found that almost 40% of customers on basic time of use tariffs would be better off on a standard offering. Many customers did not understand how to benefit from the time of use tariff they were on.²⁷ Moreover, for instance in France there is no possibility for many households using electric heating (30% of

²⁶ Consumers were sometimes not able to switch their supplier as the technology was not compatible and therefore, they would have had to replace the entire meter.

²⁷ <http://www.consumerfocus.org.uk/files/2012/09/From-devotees-to-the-disengaged.pdf>

households) to shift their consumption during the winter peak time. This will have a negative impact especially on those living in homes with a low level of thermal insulation.

As there is not enough experience with flexible tariffs and their impact on different consumer groups, BEUC strongly recommends performing a distributional analysis on the impact of time-of-use tariffs on different social groups and if/how these groups can access the benefits of new deals.²⁸ We are concerned that consumers who might not be able to shift their load or reduce consumption at peak times might end up paying more with the introduction of these tariffs.²⁹

If smart grid technologies are to be successful, it is essential that consumers can choose among the different offers to be able to opt for the most suitable programme for them – even if this means being completely inflexible. Therefore, it should be left up to consumers to choose whether or not they would like to have a smart meter installed and if they want to opt-in and participate in demand response programs. In addition, consumers should be provided with support to be able to understand the impact of demand response (for instance, with projected bills based on actual energy use over a number of seasons). Furthermore, the aggregator company managing loads of several houses under the demand response programme may play an important role in this process since many consumers will not be able to play the game alone.

2.6. Prevent over complexity of the consumer market

We are concerned that variable tariffs coming with smart meters will be adding further complexity to a market that customers already find hard to navigate. For instance, with the French smart meter Linky, the operator will be able to offer 40 different prices to consumers. This situation could easily lead to suppliers building offers that are too complex for consumers, as it is the case for the mobile phones tariffs.³⁰ Research looking into the psychological effects of choice has shown that an excess of choice could prevent consumers from making a truly well-informed decision.³¹

Therefore, BEUC asks national regulators to carefully monitor the situation on the market and its complexity together with the number of flexible tariffs and take action to simplify tariffs if they become too complex. At the same time, BEUC is concerned that the provision of new, innovative tariffs, products and services may increase the number of long-term contracts that lock-in consumers. Therefore, national authorities should closely monitor the compliance of all types of contracts with the relevant consumer legislation.

2.7. Micro-generation

The number of consumers installing micro-generation units in their homes is steadily increasing and the same trend can also be expected in the future. Nevertheless, barriers hindering the implementation of decentralised generation (especially high upfront costs, lack of knowledge of the most suitable technology or support schemes) persist in some countries.

²⁸ Evidence can be found also in the report on the *"Effect of smart metering on electricity prices"* commissioned by the European Parliament (ITRE Committee). This report provides a list of policy recommendations which should be addressed at the EU or national level. According to this report, extensive research has been carried out in the US, while there is a great need for further analysis in Europe. *"In some Member States, low-income households may have absolutely no potential to save energy due to already extremely low consumption levels. Therefore, it will be important to carry out analyses on Member State level, clearly showing the impact of smart meters on electricity expenditures of low-income households. In case these analyses show that some categories of vulnerable households may be worse off after the introduction of flexible tariffs and smart meters, Member States should also foresee measures to protect these households from energy poverty or increasing indebtedness."*

²⁹ For example, in Victoria, Australia, concerns that time of use tariffs would be a 'tax on the poor' led to a halting of rollout and protections being put in place. The State government recognised that not all customers would benefit from new time of use tariffs or be able to afford smart appliances to enable them to take advantage of cheaper direct load control offers.

³⁰ For instance, although the UK mobile market is considered as highly competitive, consumers are facing tariff complexity, lengthy contracts and problems related to barriers to switching. As reported by our UK member, only 20% of mobile users found it easy to navigate through the range of tariffs available, with close to 70% feeling that there are too many mobile tariffs in the market.

³¹ Barry Schwartz, *"The Paradox of Choice: Why More Is Less"*, Ecco, 288 p.

Those consumers who produce energy need to access the information on their consumption and production frequently enough and in a format they can understand. We also believe consumers should be able to promptly get a clear picture of the value of both incoming and exported energy.

BEUC demands:

- Consumers equipped with smart meters should get accurate and regular bills based on actual consumption.
- Functionalities of smart meters must enable access to real time information as well as historical information, advice and easy switch.
- Member States should analyse and present evidence of what frequency of historical consumption data works for consumers.
- If Member States allow the use of the remote disconnection functionality, they must put in place safeguards and legal protection so that this functionality cannot be misused.
- Distributional analysis must be performed on the impact of time-of-use tariffs on different social groups and if/how these groups can access the benefits of new deals.
- Demand response programmes should be available to consumers on opt-in basis.
- As smart meters will enable dynamic pricing tariffs, National Regulatory Authorities must carefully monitor the tariff complexity and ensure new tariffs are easy to compare and do not prevent switching.
- Clear information and protection frameworks about best use, remote control and disconnection of smart appliances must be provided for consumers.
- Those consumers who are also producers should receive information in an appropriate format so that they understand the full potential of micro-generation.

3 Technological Aspects

This chapter provides an overview of the key technological aspects of smart meters. It describes how the technology should be designed in order to enable easy supplier switching and avoid future unnecessary reinstallations and costs. It also explains what needs to be done so that consumers are confident while having smart meters at home.

3.1. Interoperability and compatibility

Both the hardware and the software of smart meters are being developed around the world. We are highly concerned about poor interoperability which could result in technology lock-ins causing significant problems when consumers move home or want to change their supplier. Smart meters, displays and white goods (smart appliances) and all features of smart homes which may be used in the future must be able to communicate with each other so that consumers can switch the supplier easily and move homes without having to change appliances or communication systems. Moreover, smart meters should be installed on a standardised socket so that the meter can easily be replaced. Although this has been already a reality in some countries, this principle should be obligatory across the EU. Failure to address this issue could result in increased inconveniences, pointless costs to consumers and more barriers to competition.

3.2. Modularity by design

Modularity by design, a principle that aims at avoiding lock-ins and reducing future costs, is of key importance. Modularity is the principle that enables the progressive development of the functions and the uses of the meters by ensuring that all modules are easily replaceable. This approach is essential to avoid future inefficient costs and to pave the way for economies of scale. The metering system must be flexible enough to be future-proof and able to cope with future changes and innovations. The technology must be able to react to changing consumer needs and where implemented, smart meters should open the door to innovative services, particularly those enabling more energy efficiency.

As highlighted in the ULB research³², modularity is also essential for the ICT components of smart metering systems³³ to allow new energy services as well as a progressive deployment of smart meters. While the lifetime of current analogue meters is around 30 years, it is expected that smart meters will need to be replaced or upgraded after 8 to 15 years. In order to avoid premature replacements of these meters and ensure they function properly until a possible second deployment wave, modularity of the meters and all the components of systems need to be flexible.

3.3. Safety

There are also concerns about health risks such as electromagnetic sensitivity smart meters may bring. There is a large volume of information, most of which is unlikely to reassure consumers, for instance emotive claims of harmful effects on health (e.g. comparisons of the electromagnetic fields of smart meters with existing fears regarding telephone masts). As this is a complex scientific issue, it is very difficult for the majority of consumers to separate fact from fiction.

The design and manufacturing of smart meters should respect safety standards and stringent criteria guaranteeing the highest consumer protection possible. Smart meter manufacturers must provide consumers with relevant information for a safe use and ensure that smart meters are safe.

³² Klopfert & Wallenborn (2012), Université Libre de Bruxelles, Empowering consumers through smart metering.

³³ Such as Smart Meter Gateway, the in-house communication module and the remote communication modules.

3.4. Reliability and quality of supply

A whole range of benefits is promised to be delivered by future smart grids and smart meters: from reducing our carbon footprint, integration of renewable energy sources to better consumer information and improved system reliability and quality of energy supply. In practice, this should mean that consumers will face less power outages and in case of any incident, the notification about the outage should be sent immediately, ensuring a shorter response time than it is the case at present. It is also expected that these technologies will allow for better monitoring and control of the energy flow to households. However, meters are very often located outside the house where they are rarely protected and research³⁴ suggests that this technology can fail in low temperatures. This can result in inaccurate meter readings or even in situations where households do not get energy during the winter, in the period when this service is most needed.³⁵ Therefore, all promised benefits should be carefully monitored for compliance.

3.5. Accessibility

It is frequently claimed that smart meters will be installed in the same location as the traditional mechanical meters which can be situated outside the house or in the basement and the accessibility may therefore be limited.³⁶ Also, as people do not pay much attention to their current non-smart meters, we can expect a similar trend with smart meters situated in the basement or under the stairs. However, consumers need information to be easily accessible and different ways how to visualize this information should be offered to them, e.g. on a screen in their kitchen, on their laptop or their TV set. This is equally important also for those consumers who produce energy so that they can fully understand the potential of micro-generation.

BEUC demands

- Interoperability and modularity of the system must be ensured in order to avoid lock-ins and ensure the system is future-proof.
- The technology should meet inclusivity by design standards to ensure consumers find it easy to use.
- Reliability and quality of energy supply need to be monitored.
- Consumers need information to be easily accessible.

³⁴ Dr. I. Jamieson, Smart Meters and Weather Extremes – *Set to Fail?, What happens when weather is colder than smart meters can operate?*, 2012.

³⁵ For instance, in Canada where smart meters are designed to work till -40 °C but the temperature can fall to -63 °C.

³⁶ As reported by BEUC French member, UFC-Que Choisir, the smart meter experiment in France has until now focused on the roll-out itself (cost, operation, etc). However, for many households, the smart meter once rolled out is not easily accessible (setting outside the housing or in closed locker). Moreover, according to the French Energy Ombudsman, electricity meters are generally sited in hard-to-access locations and even outside the home in more than 50% of cases in France. (Activity Report, 2011).

4 Protection of consumers' personal data

This chapter will focus on how to address significant risks and challenges smart meters pose in terms of protection of consumers' personal data. Smart metering technology makes it technically possible to process much more granular data than is currently processed in the retail energy market sector, which could give a unique insight into the activities of households. If compliance with the data protection framework and effective enforcement is not ensured, this information may be used not only for analysing the consumption patterns of particular households but also for other purposes that are not compatible with the one for which the data has been collected. Smart metering technology is based on the principle of generating and communicating data, therefore it can easily pose significant risks and challenges in terms of data protection. In order to address all concerns and prevent the misuse of consumers' personal data, the EU legal framework³⁷ has established a number of fundamental principles every data processing operation must comply with.

4.1. Fundamental principles of data protection

Transparency

The consumer should be informed about the purposes for which their data is processed, i.e. who, when and in what circumstances collects, processes and retains personal data, what data, where it is stored and for how long, whether data has been shared with third parties and whether data has been transferred to third countries.

Data minimisation

The data collected should be relevant and limited to the minimum necessary in relation to the purpose for which they are processed.

Purpose limitation

The data must only be collected for specific, explicit and legitimate purposes and not further processed in a way incompatible with those purposes.

4.2. Legal grounds for data processing

Article 7 of Directive 95/46/EC sets out the following legal grounds that allow for data processing: consent, performance of a contract, legal obligation, protection of vital interest of the data subject, public or legitimate interest. In order to ensure legal certainty for both data subjects and data controllers, certain grounds for data processing need to be clarified.

Consent

When consumer consent is needed to access personal data it should be ensured that for the consent to be valid it must be informed, free and specific. However, consent is only one of the legal grounds for processing and not necessarily the most appropriate one in all circumstances. The condition of validity is not met when the requirements of transparency and information have not been respected; similarly the condition of specificity is not met when the data collected is processed for different purposes than the ones initially collected for. Consent must not lead to further processing of data which is otherwise unnecessary.

³⁷ Directive 95/46/EC on the protection of individuals with regard to the processing of personal data and on the free movement of such data.

Contract

Processing of personal data may also be necessary for the performance of a contract to which the data subject is a part, or in order to take steps at the request of the data subject prior to entering into a contract. This may serve as the basis for legitimate personal data processing for the purpose of billing. However, as also highlighted by the Article 29 Data Protection Working Party in its opinion on smart metering,³⁸ it is important to bear in mind the element of necessity in this respect. For instance, if the supplier is obliged to provide its customers with a quarterly bill, he does not need to collect readings more frequently to fulfil the contract.

Legal obligation

The current legal basis for deployment of smart metering systems (Directive 2009/72) is not specific enough to be considered as a 'legal obligation' in the meaning of Article 7(c)³⁹ of Directive 95/46/EC.⁴⁰ Therefore, the energy company should base the processing of personal data on different legal grounds.

Legitimate interests

We are concerned with the use of legitimate interests as the legal basis for the processing of personal data. Unless it is defined and a balancing test with the rights of the data subjects is undertaken, this legal basis may be used as a loophole to legitimise processing when there is no other legal basis. Moreover, as concluded by the Article 29 Data Protection Working Party, "simply because this particular use of personal data seems legitimate does not mean that it can be applied to legitimise every element of processing. In other words, the imperative to reduce energy consumption, although it might be a sensible public policy objective, does not override data subjects' rights and interests in every case."⁴¹

4.3. Rights of the data subject

Consumers need easy access to their data and displays need to be adapted to consumer needs. In addition to the right to access the data, they must be also able to exercise their rights to correct, erase and delete information held about them. This should always remain free of charge so that consumers can fully exercise their fundamental rights in accordance with the principle that they have the ownership and the control over their data. Moreover, when consumers wish to switch their energy supplier they need to be able to carry their data with them.

4.4. Obligations of data controllers

Since the protection of personal data is a fundamental right, its processing also entails responsibilities. The EU legal framework provides for a set of obligations, which are further clarified in the draft proposal for a Data Protection Regulation. BEUC considers the following obligations as particularly important:

Privacy by design & by default

In order to significantly minimise the risks and to secure users' willingness to rely on smart meters, it is crucial to integrate data protection and privacy from the very inception of the smart metering project and at all stages of its development. Privacy by design should require that privacy and security protection mechanisms be embedded in ICT technologies during the whole life cycle, from the design of specifications of systems and technologies. Moreover, BEUC strongly believes

³⁸ Opinion 12/2011 on smart metering, April 2011.

³⁹ According to Article 7(c), processing is necessary for compliance with a legal obligation to which the controller is subject.

⁴⁰ Opinion of the European Data Protection Supervisor on the Commission Recommendation on preparations for the roll-out of smart metering systems, June 2012.

⁴¹ Opinion 12/2011 on smart metering, April 2011.

that the privacy settings on smart meters should by default comply with the general principles of data protection, such as data minimisation and purpose limitation.

Privacy Impact Assessment

Considering significant privacy threats, mandatory Data Protection and Privacy Impact Assessment (DPIA/ PIA) needs to be conducted on all aspects of smart metering, allowing for the identification of risks to consumers' fundamental rights at an early stage. The assessment shall contain at least a general description of the related risks, the measures envisaged to address the risks, safeguards, and security measures.

Data retention & storage

Retention of personal data should not exceed what is absolutely necessary for specific and lawful purposes such as billing, or network management. We strongly believe that consumers should hold maximum of their data directly on the meter or gateway device by default as the highest protection of personal data can only be ensured when stored at the consumer's side. Such a solution would enable consumers to decide to whom, when and for what purpose they decide to give access to their own metering data. In our view, transparency, efficiency as well as a high level of security and data protection is of utmost importance.

BEUC demands:

- Processing of personal data must be fair, lawful and must comply with the principles of data protection processing, including transparency, data minimisation and purpose limitation.
- Each processing operation must be based on the most appropriate legal ground, while the legitimate interests of the data controller should not be used as a loophole.
- Compliance with the principles of privacy by design and privacy by default must be ensured.
- Introduction of Mandatory Data Protection and Privacy Impact Assessment (DPIA/ PIA) should be conducted on all aspects of smart metering.
- Retention of personal data should not exceed what is absolutely necessary for specific and lawful purpose.
- Consumers' personal data should be stored at the consumer's side by default.
- Effective enforcement of the Data Protection legislation is key.

END