



Raising standards for consumers



The Consumer Voice in Europe

ANEC/ BEUC comments on the European Commission SET Plan

Action 3 'Smart solutions for energy consumers', Issues paper No. 3

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General remarks

The incumbent hierarchical model of a top-down oriented energy supply with a limited number of dominant suppliers is likely to evolve towards a decentralised system with more bottom-up energy supply. With new technologies and smart solutions for our homes, electric cars, energy storage technologies as well as new actors slowly entering the market, Research & Innovation (R&I) plays an important role in putting all these puzzle pieces together.

We consider a **“smart home” to be a comfortable energy efficient living space in which consumers can benefit from self-generation, smart and interoperable appliances which have been designed to last long as well as to control consumption through consumer friendly smart metering systems.** All this provided that consumers opt in for this solution/system and this brings clear benefits to them. Also, smart homes urgently need to be linked to intelligent urban planning schemes which allow consumers to have short and convenient ways of sustainable transport.

We welcome that the development of smart solution for energy consumers is among the key actions of the European Commission’s SET Plan.¹ While we support the key objective,² we believe further clarification is needed what regards proposed associated high level performance indicators.³ In particular, we invite the European Commission to provide an explanation of what is the basis for setting these indicators, especially *50% European households having implemented smart homes solutions by 2025* and how will this target be reflected in legislative proposals expected in 2016. At the same time, targets should be regularly reviewed and the information showing whether the targets are being met should be made publicly available together with appropriate corrective actions where necessary.

While the involvement of stakeholders from different sectors is necessary to implement activities described in the Issues Paper No. 3, independent consumer organisations as trustworthy intermediaries are in an outstanding position to be “agents of change”. They can play a major role in providing tailor made advice to consumers to successfully change their behaviour. At the same time, being experienced in and having a good overview over a number of markets, consumer organisations are very well placed to help out policy makers to protect and strengthen consumer interests in the energy market.

¹ SET Plan Communication C(2015)6317, 15 September 2015

² The key objective of this action (described in Issues Paper No. 3) is to enable the development of smart solutions and services for energy consumers, to give them the possibility to activate their assets to provide services to the grid against economic benefits (e.g. additional income or lower energy bill) and engage at their level in the energy transition.

³ As described in the Issues Paper No. 3 circulated to stakeholders in December 2015, the proposed associated high level performance indicators to be followed over the years are:

- The quantity of energy that is handled through demand response mechanisms (compared to no demand response mechanisms) at EU-level and the associated cost savings with a target of xx % the annual amount of electricity by 2020 / 2030, and xx EUR savings for consumers.
- By 2025, smart homes solutions including e.g. demand response, intelligent energy management and controls, RES integration are implemented in half of European households thanks to relevant progress in smart technologies and services adapted to consumers' needs.

Key challenges for development of smart homes and new services

What follows is more detailed feedback on activities within Action 3 '*Creating technologies and services for smart homes that provide smart solutions to energy consumers*':

1. Nudging consumers to become more active

While increased consumer engagement is considered to be important to the future of the energy sector, better understanding is needed, especially on how to nudge consumers into more sustainable lifestyles and what is the ability of different consumers to engage with the market. Behavioural economics can be useful in this respect.

The energy consumption of residential households varies largely in nature and size and depends on consumers' needs, skills, motivations, interests, lifestyle, and equipment and so on. We therefore believe more research is needed on how to engage different groups of consumers with different behaviour patterns in a way that not only encourages them to engage in energy markets, but also enables different consumer groups to benefit from smart appliances and self-generation.⁴

Moreover, it is also important to assess the degree to which consumers will likely rely on home automation to deliver the expected benefits, and therefore what 'smart' services would be expected from appliances in the future. It should be born in mind that home automation, the key component of future smart homes, should accommodate consumers' lifestyles, thereby require less actions by consumers.

2. Accessibility

Consumers need access to smart home appliances and components which are user-friendly and smart metering systems fit for purpose to be able to better manage their energy consumption and better budget their expenses. The discussion on smart appliances and the impact on people's lives is at its beginning and it is necessary to look at the impact on people's lifestyles.

All consumers in the household should be able to use smart appliances, irrespective of age or ability. Standards for smart appliances should ensure the accessibility of devices. For example, speech/audio function, and compatibility with screen reader software, is necessary for visually-impaired persons and persons who are blind.

Elderly people, and those with disabilities, are vulnerable consumers with specific needs. The use of smart appliances must bring about real benefits. Of course, compatibility between mainstream appliances and assistive technology, even legacy ones, should be ensured. We are also concerned that increased complexity in programming the appliances will exclude some consumers from benefitting from the new features.

The principle of 'universal design' or 'design for all' is key if we want everyone to be able to use smart appliances. Although parts of ISO/IEC 40500:2012 (WCAG 2.0) on Web Content Accessibility Guidelines may apply, we recommend new standards are developed, based on the principle of universal design. In addition to the ISO standard on eAccessibility, we would like to note EN 301 549 "Accessibility requirements suitable for public procurement of ICT products and services in Europe".

⁴ For more details, please, see BEUC position paper *Building a consumer-centric Energy Union*, available at: http://www.beuc.eu/publications/beuc-x-2015-068_mst_building_a_consumer-centric_energy_union.pdf

3. Safety

The Ecodesign preparatory study on smart appliances notes that smart appliances can bring new safety risks not addressed by the requirements of EN 60335, the standards series for household appliances covering safety aspects. The standards for smart appliances should identify and offset the safety risks relevant to the type of device.

In addition, and noting societal concerns regarding rising levels of electromagnetic radiation (EMF), consideration must be given to the development of particular spectrum usage regulations and specifications (power level limitations, acceptable interference levels, coexistence, interference mitigation) that will respond to the concerns expressed. A key issue for debate concerns development of methodologies for measuring the cumulative level of electromagnetic radiation resulting from the large-scale presence of objects enabled with radio communication capabilities.

4. Interoperability

We believe that interoperability of the smart appliance with other smart appliances in the household – from the same manufacturer or other manufacturers - must be a basic requirement. Interoperability should allow consumers to mix appliances from different manufacturers, so optimising consumer choice and facilitating competition among manufacturers. Moreover, it would prevent consumers from being locked-in and tied to products of one and the same company. 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.

Lack of interoperability among end devices connected to the smart grid interface increases the risk of loss of functionalities to consumers. Failure to address this issue could result in increased inconveniences, pointless costs to consumers and more barriers to competition. A clear programme of end-to-end testing would help to ensure interoperability of both the system and end devices. We further believe that support needs to be provided to consumers to resolve interoperability issues without incurring additional costs.

5. Product durability

The lifetime of consumer products needs to be prolonged through a design for durability, possibility to repair, upgrade, disassemble and recycle products in an effort to reduce resources depletion, prevent waste and mitigate the associated societal impacts.

Current consumption patterns are marked by two trends⁵: Consumers own more products than in the past and partly they are only used shortly. The decision should be left to the consumers when and why to replace products. Shorter use times and quicker replacement rates lead to increasing pressure on resources. In our view, longer product lifetimes are an opportunity to reconsider business and innovate.

6. Upgradability

First of all, taking into account considerable upfront costs of household appliances and consumer purchase decisions, we would be interested in further analysis of options to make existing appliances smarter so that instead of buying a smart fridge, consumers could just add a functionality to their old fridges. At the same time, we believe that the whole move should not be from non-smart to smart, but there could be different levels of smartness consumers might engage in. Probably not all consumers will need/want for instance a fridge that interacts with them and does the grocery shopping.

Moreover, if consumers chooses a smart appliance which then cannot be upgraded when its firmware or software becomes outdated, life-expectancy decreases. A product may be

⁵ For more details, please, see BEUC position paper on durable goods available at: http://www.beuc.eu/publications/beuc-x-2015-069_sma_upa_beuc_position_paper_durable_goods_and_better_legal_guarantees.pdf

discarded simply because its software does not support new functionalities, even though it remains capable of performing its main functions. We see this problem already with smartphones.

As highlighted in the ULB research,⁶ modularity is essential for instance for the ICT components of smart metering systems to allow new energy services as well as a progressive deployment of smart meters. The technology must be future-proof and able to react to changing consumer needs. It is essential to avoid future inefficient costs and to pave the way for economies of scale.

7. Costs & benefits of new technologies

Costs of technologies are considered as one of the key barriers to the adoption of smart homes. While financial benefits from using a smart appliance should outweigh the costs of purchase, installation and (if needed) upgrade of the appliance, the upfront costs of these appliances are still rather high. Therefore, proactive involvement of financial institutions providing creative financial solutions to help consumers finance investments in energy-efficient products and services should be further considered.

According to the research⁷ analysing smart home market development in three European countries, costs of smart home technologies together with reliability and data privacy are key challenges for smart home market development. Indeed, some surveyed participants expressed concerns about affordability of smart home technologies. For instance, in Germany, some smart home goods and services are considered mostly 'luxury items' or mainly for technology-savvy people. In addition, the research also revealed concerns about implementing smart home technologies in a rented places or if the property is an existing building. Last but not least, this research concludes that smart homes technologies need to be well-integrated into the design, lifestyle and general sense of home and services need to go far beyond household's energy consumption. New services should improve comfort and convenience and could be linked to other services such as health, indoor air quality monitoring or security.

At the same time, consumers need clear commitments that the investments into smart technologies will deliver benefits in terms of savings. Adding new features and functionalities to appliances may increase their overall consumption and may cause a rebound effect on the environment. Therefore, we believe the impact of additional functionalities of smart technologies on the overall savings should be further assessed together with the impact on environment.

8. Privacy concerns

Concerns about privacy and data security are likely to be major obstacles to consumer engagement in demand response programmes and smart energy technologies. Consumers need to retain control over the use of their data and always be able to override any programme for the device to operate "as normal". Smart appliances can represent a de facto invasion of privacy and also compromise consumer decision-making if the consumer is not in control. Not only are there many questions about data collected through smart appliances but also there is a risk that interconnected objects get controlled and accessed remotely by others than people living in the house.

The collection, storage, use and exchange of personal data must be subject to agreement from consumers and to strict regulation in order to ensure data protection, as the transmitted data can reveal sensitive information of the consumer. It should therefore be explored whether the security and privacy standards in place sufficiently protect the connection between the internet (cloud) and smart devices. For example, are the standards

⁶ Klopfert & Wallenborn (2012), Université Libre de Bruxelles, Empowering consumers through smart metering.

⁷ Balta-Ozkan, Boteler, Amerighi (2014), European smart home market development: Public view on technical and economic aspects across the United Kingdom, Germany and Italy

ensuring that the communication or transfer of data is secure along all of the communication channel?

In 2015, ANEC published several guides⁸ to assist consumer representatives in addressing privacy issues related to personal data analysis and the following principles are reflected in the standardisation work on smart appliances:

1. *Remote control over device power* - The privacy implications of any remote ability to cause any digital device used by consumers to power up or power down should be evaluated.
2. *Eavesdropping digital radio emissions from devices* - The privacy implications of eavesdropping radio emissions when a device is powered up and in operation should be evaluated.
3. *Data transmission to and from the connected device (security)* - The privacy implications of the device and network security, and any mismatch of security configuration between device and network, should be evaluated.
4. *User control of data types passed over networks and remote processing of that data* - The default when data types are unknown should be evaluation of the most sensitive of the personal information being processed & transmitted in each direction.
5. *User personal data sensitivity* - The privacy implications of the sensitivity of the data types processed and collected should be evaluated.
6. *User control over personal privacy preferences* - The privacy implications for the degree of control over privacy preferences available to the user should be evaluated.
7. *User behaviours* - The privacy implications of user behaviour and their use of digital devices should be evaluated to identify privacy risks brought about by how the device is used in domestic life.
8. *User privacy exposure arising from organisational security breaches* - The risk to privacy should be evaluated for personal data lost or stolen from an organisation leading to the linking of that data to an individual either through the data itself or linking to the device used by the individual.

Smart appliances form part of the Internet of Things (IoT) as its concept refers to a global network of uniquely-addressable, interconnected objects, based on standard communication protocols. The IoT can be defined as the infrastructure (hardware, software and services) that provides for the networking of physical objects and the exchange of information, such as their identities, their physical properties, and the information these objects 'sense' from their environments.

Hence it is necessary that policies and standards supporting the development of the IoT are conceived to address issues such as privacy and personal data protection, health and environment protection, interoperability across a range of networks and devices, as well as the optimal and efficient use of spectrum resources.

We therefore propose **additional indicators** to the Action 3 'Smart solutions for energy consumers':

- Proportion of consumers that are provided with personalised consumption information including comparisons with similar users (to stimulate energy-saving behaviour)
- Number of complaints about privacy issues
- Privacy by design and default of the entire smart home system including smart appliances and the information provision via in-home display and/or web portals

⁸ For completeness, please find all ANEC Guides on privacy at the following links:

- [ANEC Pocket Guide "Using Consumer Data: Consumer Representatives Guide on Privacy"](#)
- [ANEC Pocket Guide "Overview of Privacy Guidance for members of standards technical committees who are Consumer Representatives: Key Principles for Digital Device Privacy Impact Assessment"](#)
- [ANEC Pocket Guide "Overview of Privacy Guidance for Consumer Representatives in standards technical committees. Key Principles"](#)
- [ANEC Pocket Guide "Using Consumer Data. Data transfer, trading and privacy"](#)
- [ANEC Consumer Representatives Guidance "Domestic privacy and the privacy of digitally connected devices"](#)

- Proportion of consumers that are satisfied with:
 - Information provided on consumer rights; contact details for problem resolution; how to manage consumption and how to use and benefit from demand response
 - Ongoing personalised support
 - Clarity of billing and improved complaint resolution
 - Usability/connectivity of end devices (interoperability)
 - Information and independent advice on new tariffs
 - Switching supplier (process and timescales)
 - Savings achieved
 - The upgradability of smart home technology
 - Accessibility of smart home technologies
- Proportion of consumers changing consumption pattern or reducing peak time usage
- Number of connections by consumer by year to access consumption data (website/app)
- Principle of 'universal design' or 'design for all' of smart home technologies to ensure all consumers in the household are able to use them, irrespective of age or ability
- Number of complaints on safety aspects of smart home technologies

9. Demand response policies need to focus on consumers' needs

Demand-side response together with the implementation of new technologies such as smart meters is being considered as an important tool to balance the future electricity grid. However, without simplicity, benefits, consumer confidence and appropriate protections in place, consumers may a) be unwilling to adopt the dynamic tariffs that would maximize the use of Smart Grids and b) be unable or unwilling to change their behaviour. Getting it right may make demand side response a valuable resource and a helpful tool for consumers to optimise their electricity costs, but getting it wrong could result in chronic confusion, poor service and unfair costs for consumers. In any case, participation in dynamic tariffs and demand side response should be voluntary for household consumers.

In addition, 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. If we want to develop a market with high consumer confidence, the market must be transparent and policies covering smart grid, ecodesign and renewable technologies need to ensure that the promised consumer outcomes are delivered.

Moreover, consumers should not be locked into demand-side response schemes by bundled appliance offers and stronger protections must be in place for vulnerable consumers. It should always be kept in mind that energy is a commodity which should be at the service for the households and should not bring about a full-time management task for private consumers.

We believe households' flexibility in energy consumption should be further analysed and costs and benefits for different consumer groups assessed as there is a lack of thorough, comparable analysis on this topic. In our view, such a research is essential in order to design proper incentives and nudges as well as appropriate protections for consumers. This analysis should focus on the impact of time-of-use tariffs on different consumer groups and take into consideration heating type, dwelling, price signals parameters and use of household automation among other factors. This analysis should also provide a forecast considering future energy market developments after 2020.

Transparency and comparability are key

Future energy market should be fair, inclusive and provide consumers with tools and necessary protections allowing them to engage in the market if they wish so. Transparency and simplicity are the key requirements for the implementation of dynamic tariffs otherwise households will be overwhelmed by information without being able to find out the option best designed for their consumption behaviour. We thus consider clear information and adequate reward for consumer participation as prerequisites for consumer engagement. It is critical that new tariffs are explained to consumers in a simple and clear way using a set

of common terms, so that they can weigh up the costs and benefits and compare offers. Precision is critical, given the outcomes for consumers can vary hugely.⁹

Ensure consumers' flexibility is properly rewarded

A level-playing field needs to be ensured while treating demand and supply side equally and enabling consumers to opt for the supplier or service provider of their choice. Consumers' flexibility should be properly rewarded. Consumers may participate in and provide demand-side flexibility (DSF) if they see clear benefits. In order to be able to understand the implications for their energy consumption, they should be provided for instance with concrete projections on the impact of changing their behaviour and energy use as well as with the value of these changes.

Without substantial benefits available for them, consumers will not be incentivised to participate in demand response programmes. In residential buildings, the energy consumption peaks in the morning hours when people are preparing for the day, and in the evening when they are returning from work. Nevertheless, the possibilities to shift consumption outside peak hours is limited. DECC found savings from demand-side response between 2025 and 2030 are likely to amount to roughly £10 per household per year if evenly shared¹⁰. The University of Umeå also found that economic incentives for individual households to reschedule their electricity consumption over the course of the day are small. They also found that the compensation an average household would need in order to systematically reschedule its electricity use is considerably higher than today's incentives.¹¹

Improve transparency of energy contract terms and conditions

Consumers often encounter difficulties to understand the contract terms and conditions. Therefore, contracts with new intermediaries and demand side flexibility service providers must be fair and with necessary protections against discriminating consumers. For instance, in the design of contracts, profiles (or preferences) are assumed to be stable throughout the time. This is however not always the case (as individual situations can change quickly due to illness or family situation and consumers must be able to change their contract accordingly) and consumers will move between customer segments so they need to be able to change to more suitable demand response products without barriers or penalties.

Need for greater co-ordination of demand response and energy efficiency policies

We see the need to refocus demand response policies to give consumers greater control and choice according to their specific needs and interests. It is very likely that greater co-ordination between demand response and energy efficiency policies could open new opportunities for consumer to manage and reduce their consumption if this is supported by a greater understanding of the potential of the respective consumer groups to engage.

10. Electrification of transport

An increased market penetration of more energy-efficient cars and the development of new powertrain technologies such as electric vehicles will play a fundamental role in the transition towards a low carbon future. Developing ultra-low carbon vehicles, coupled with a decarbonisation of the electricity mix, will help achieve the EU target of significantly

⁹ For instance, in Norway where consumers can opt for spot price products (ie. price following the fluctuations in the wholesale market), BEUC member reported that due to the confusing price structures and directly misleading marketing practices, it is very difficult for the majority of households to verify their electricity invoices. While most consumers think they pay the so-called spot price, our member discovered that most contracts are in fact only partly based on the spot price. Even the most informed consumers, who enter into the most favourable contracts, experience that their prices and conditions are being changed without being properly informed.

¹⁰ Redpoint/Baringa/Element (2012), 'Electricity System Analysis – future system benefits from selected DSR scenarios' in Citizens Advice (2014), 'Take a walk on the demand-side'

¹¹ Broberg et al. (2015) 'An electricity market in transition-Is consumer flexibility for sale, or even for real?', Umeå School of Business and Economics, Umeå University Centre for Environmental and Resource Economics

reducing CO₂ emissions from transport by 2050 and simultaneously help to reduce the dependence on foreign oil imports. Furthermore, electric vehicles might also be beneficial in the long term as electrical energy storage in order to stabilise electricity production capacity.

Charging systems for electric vehicles should be fully standardised across Europe (e.g. in terms of paying systems, charging plugs, charging points etc.) which in turn would allow consumers to charge their vehicles easily if they are driving across borders or when travelling within their own Member State. In turn, this approach would improve interoperability and ensure against fragmented market developments across Europe.

11. Consumers becoming self-generators

The EU's research and innovation strategy should focus on paving the way for a more efficient and decentralised energy supply system and adequate policy framework should be in place allowing consumers to produce electricity on their premises. Self-generation opportunities for tenants need to be further explored as well.

According to BEUC members' experiences in several Member States, the quality of offers could be improved in many solar PV markets, especially those recently emerged. This refers, for instance, to quality standards for planning and building installations as well as to the comparability of offers and devices. In this context, several BEUC members have together launched the CLEAR project¹² that advises consumers on renewable self-generation technologies. A number of consumer organisations provide exhaustive online information tools, raising awareness of the potential of self-generation as well as guiding consumers who are interested in investing in renewable self-generation.

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ANEC in Brief

ANEC is the European consumer voice in standardisation, representing and defending consumer interests in the development of technical standards, in conformity assessment to standards, and in the creation or revision of legislation on products and services. Its members represent national consumer associations in 33 European countries. ANEC receives financial support from the European Commission and the EFTA Secretariat. ANEC has signed the EU Transparency Register (507800799-30).

BEUC in Brief

BEUC, The European Consumer organisation, defends the interests of all Europe's consumers and represents 41 independent national consumer organisations from 31 European countries. BEUC acts as the umbrella group in Brussels for these organisations. BEUC acts on EU decisions and developments affecting consumers' daily lives, with a special focus on Energy, Financial Services, Food, Digital Rights, Consumer Rights & Enforcement and Sustainability. BEUC has signed the EU Transparency Register (9505781573-45)

¹² The CLEAR project (Consumers Learn about, Engage with and Adopt Renewable energy technologies) covers the most important devices for self-generation of electricity and heat, such as solar PV modules, solar thermal collectors, heat pumps and wood pellet stoves; see <http://www.clear-project.eu>.