The Consumer Voice in Europe

DO'S AND DON'TS FOR SMART, FLEXIBLE ELECTRICITY OFFERS

Policy recommendations

Contact: Angeliki Malizou– energy@beuc.eu

BUREAU EUROPÉEN DES UNIONS DE CONSOMMATEURS AISBL | DER EUROPÄISCHE VERBRAUCHERVERBAND
Rue d'Arlon 80, B-1040 Brussels • Tel. +32 (0)2 743 15 90 • www.twitter.com/beuc • consumers@beuc.eu • www.beuc.eu
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Why it matters to consumers

One of the main financial concerns consumers have is high energy bills. New types of electricity services such as those that would enable consumers to shift their energy consumption to moments where energy is cheaper (so called demand-side flexibility) services could, if well-designed, give consumers the possibility to reduce their bills by cutting electricity consumption when prices are high. Current EU energy proposals are trying to open up the market to these types of service providers but it is essential there are both safeguards for all consumers and financial benefits for consumers who sign up to these types of services.

Summary of consumer needs

Consumers are concerned about increasing energy bills. Consuming electricity in time when it is cheaper can help consumers reduce their bills, provided that offers and services are in line with consumers' needs and expectations.

The EU is trying to lift barriers prohibiting the entry of new service providers and offers to the market.

The EU must ensure that these services correspond to consumer expectations and needs. Only then will it deliver to its commitment to put consumers at the centre of its Energy Union.

This paper focuses on household consumers. In this respect, it is important to bear in mind that households' electricity use is driven by their daily routine and that their ability to take up new services and offers depends on their financial means.

For new services and offers to deliver benefits to consumers, the EU should ensure that:

A) Consumers are well informed:

- ✓ Through clear, independent, transparent and comparable information tools;
- ✓ Through awareness raising campaigns about energy system changes, new services/offers and smart meters.

B) All consumers are protected. This is how:

- ✓ Participation should be voluntary;
- ✓ Tariffs which do not fluctuate according to the time of day, should always be available;
- ✓ Consumers who do not participate should never be penalised;
- ✓ Those who participate should have access to an 'override' function which does not penalise them;
- ✓ Targeted measures for vulnerable consumers should be in place;
- ✓ Regulators should regularly monitor the impact of new offers and services on different consumer groups.

C) Consumers are in control:

- ✓ By having access to a single contact point for troubleshooting;
- ✓ By having access to independent redress mechanisms, including mechanisms for the settlement of disputes involving suppliers from different sectors;
- ✓ Of the collection and use of their data.

D) Consumers benefit:

- ✓ By receiving lower bills;
- ✓ By having access to financial incentives for enabling technologies such as smart devices.

E) Consumers enjoy the benefits of a smart home without trade-offs:

A smart home needs to be a comfortable, energy efficient living space in which consumers can benefit from self-generation of electricity and smart and interoperable appliances which have been designed to last and manage consumption through consumer friendly smart metering systems. Opting for smart home features should not come at the cost of consumer safety or privacy and should not put a burden on them when it comes to liability.

Detailed policy recommendations are presented in sections 3 and 4.

1. The need to rethink the way we consume energy

Historically, electricity has been supplied by a few centralised power plants that were designed to cover society's electricity consumption. This set-up of the energy system is challenged due to increasing decentralised electricity generation by, often variable, renewable energy sources. Integrating cleaner sources of energy and continuing to provide energy in a secure and affordable way could become even more challenging with the effort to decarbonise heating and transport. At the same time, a number of Member States already support or are considering subsidising often dirty power plants with the objective to ensure security of supply. These power plants are in one way or another paid for by consumers.[1]

Shifting peak electricity demand to off-peak times is one of the ways[2] to reduce the need for keeping active old centralised power plants. Increased flexibility in electricity usage could also reduce the need for investing in new power plants that only help out for a few peak hours a year and which push up consumers' energy bills.

Despite a drop in 2011 and 2014, the overall residential electricity consumption has grown by 5.1 % between 2000 and 2014.[3] At a household level, consumers' electricity consumption varies a lot throughout the day. Peak times for energy demand typically occur in the morning and in the evening but not always when the sun is shining and the wind is blowing most or when a lot of electricity from renewable sources is being produced. For electricity demand and supply to match, certain challenges need to be addressed. One way is for new technologies to store energy. Home batteries or improving storage at the distribution level are such solutions. Another way is through demand-side flexibility. Here

[1] This is linked to the so-called capacity mechanisms, which are measures taken by Member States to ensure that electricity supply can match demand in the medium and long term. For more information please check out BEUC's response to the public consultation on the European Commission's interim report of the sector inquiry on capacity mechanisms- July 2016.

[2] For example, according to *Frauenhofer IWES et. Al. (2015): Interaktion EE-Strom, Wärme, Verkehr* for Germany, flexible use of heat pumps and electro mobility ranks third in the list of cost-efficient ways to increase the flexibility of the electricity system. Grid expansion and flexible power plants are more cost-efficient ways.

[3] "Energy Consumption and Energy Efficiency Trends in the EU-28 2000-2014." 2016. Accessed November 28, 2016. http://publications.jrc.ec.europa.eu/repository/bitstream/JRC101177/report_energy_trends_2000-2014_19.05.2016_final-pdf.pdf.

consumers are nudged to shift their electricity consumption to times of the day when there is more electricity available, or are encouraged to reduce their electricity consumption temporarily when demand is high.

The EU is in the process of redesigning the rules that govern the electricity market. If well-designed, demand-side flexibility could be one of the tools to deliver a cleaner, affordable and secure energy system. While there are high expectations about the residential sector providing much of this flexibility, policy makers and regulators should not overlook the large potential identified in the industrial and the commercial sector.

The estimations about the potential of the residential sector for increasing the efficiency of the electricity system are theoretical and it remains to be seen what this would mean in practice.[4]

Looking into the future, it is very likely that the number of electric vehicles will increase and as a result electricity consumption will also increase. According to BEUC's recent analysis[5], Europe will need at least 15% of its vehicles to be electric by 2025 in order to reach the 2030 emissions reduction target. There are concerns that the potential take-up of more electric vehicles could increase demand for electricity during peak hours[6], for example in the evening when people return home. On the other hand, electric vehicle charging is viewed as an area with major potential for demand-side flexibility. This is because of the flexibility in charging times but also because the battery can be used to store excess energy which can be fed into the grid at times of increased demand.

Decisions that policy makers take today are going to define what the market will look like in the next ten to fifteen years. In their effort to make the energy system more efficient policy makers should ensure that consumers get better services and that the right infrastructure and technological solutions are in place.

2. Flexible electricity consumption not yet a reality for most consumers

A limited number of new services and business models which provide incentives to consumers to adjust their electricity consumption have appeared in certain Member States. For example, in the UK, under a pilot project, a 'sunshine tariff'[7] nudged consumers to use cheap solar power when the sun is out. In Finland consumers can, with the help of automation and apps, heat their homes when electricity prices are low. In France a service provider adjusts the heating load of a number of households for a few minutes in order to reduce the strain on the energy system. Such service providers, called aggregators, manage the electricity consumption of several households and offer consumers either information on consumption or reduction of energy use, or both.

Demand-side flexibility schemes for households are far from common across Europe. A recent report of energy regulators looked into the underlying barriers to dynamic pricing in electricity supply and network tariffs to household consumers in several EU Member States. Figure 1 demonstrates that lack of awareness and the perception that there are

[4] According to Commission's Impact Assessment *the theoretical demand-side flexibility potential could add up to approximately 120 GW in 2020 and 160 GW in 2030, which will lay mainly with residential consumers. These estimations do not take into account commercial viability and technology restrictions and for 2030 greatly depend on the uptake of flexible loads such as electric vehicles and heat pumps in the residential sector. (More information available at* Part 3 of European Commission's impact assessment.)

[5] Low carbon cars in the 2020s- Consumer impacts and EU policy implications- BEUC 2016.

[6] ICF Consulting Services. "Overview of the Electric Vehicle Market and the Potential of Charge Points for Demand Response." March 10, 2016. Accessed November 28, 2016. https://www.nve.no/Media/4053/icf_-uk_overview-of-the-electric-vehicle-market_160316.pdf.

[7] BBC News. "Smart Meters Enable Cornwall's Sunshine Tariff Trial." April 1, 2016. Accessed November 28, 2016. http://www.bbc.com/news/business-35942034.

insufficient savings to be made are the top two barriers for demand-side flexibility to take off.[8]

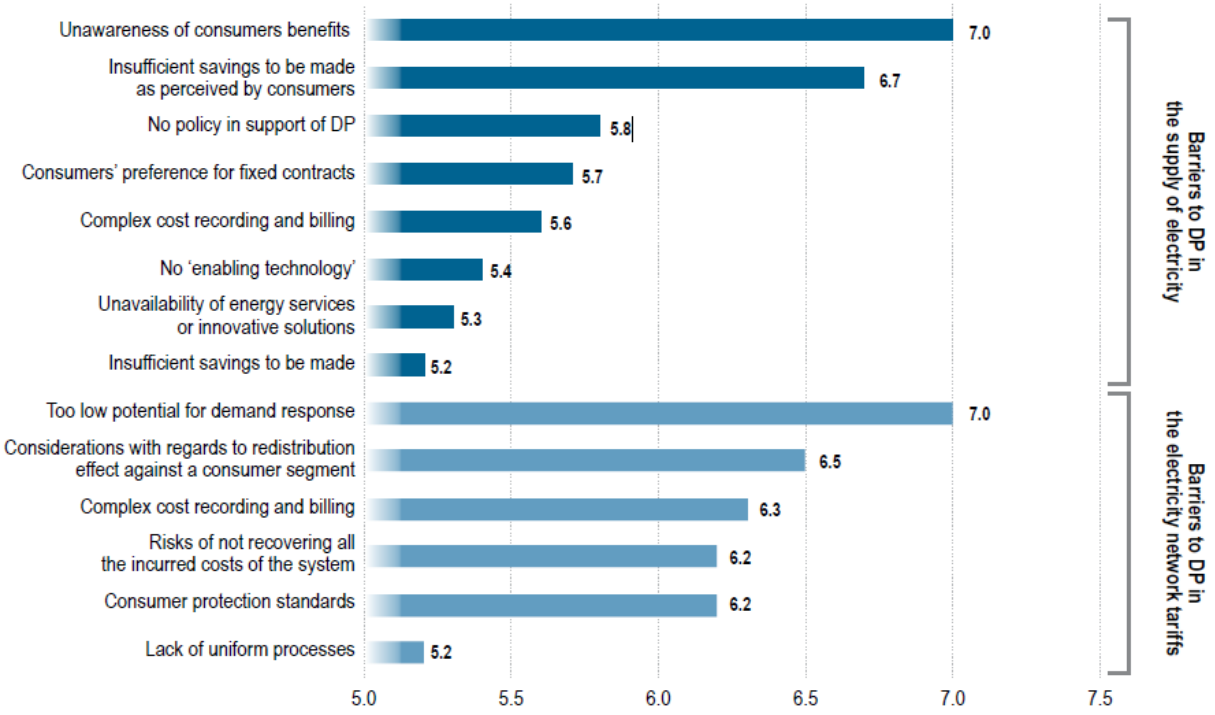


Figure 1. Underlying barriers to dynamic pricing in electricity supply and network tariffs to household consumers in a selection of EU MSs, ranked by average of all respondents – 2015 (1 = not at all important, 10 = very important) (1 = not at all important, 10 = very important).

But beyond the consumer perception, there are several factors that are inhibiting the take-off of new services of this kind. For example, the level of liberalisation of the energy market around Europe varies considerably. In addition, the approach that Member States have taken on the diffusion of smart grid enabling technologies such as smart meters differs[9] and in most Member States which have decided to roll out smart meters the process is under way.[10] Another factor is whether new market players can access the market without impediments[11] and whether they can have a viable business. Consequently, it is not possible today to make a broad estimation of the consumer savings and whether these will be considerable.

[8] "ACER/CEER Annual Report on the Results of Monitoring the Internal Electricity and Gas Markets in 2015 Retail Markets NovembeR." November 2016. Accessed November 28, 2016. http://www.ceer.eu/portal/page/portal/EER_HOME/EER_PUBLICATIONS/NATIONAL_REPORTS/National_Reporting_2016/MMR 2015 - RETAIL_final.pdf.

[9] For example, Germany has opted for a selective roll-out of smart meters and requires only households with an annual consumption above 6,000 kWh to install a smart meter. The cost of smart meters is a deterrent for households adopting the new technology. According to our German member organization vzbv-Verbraucherzentrale Bundesverband only households with annual consumption of more than 6,000 kWh would gain net benefits from Time of Use tariffs due to the high cost of smart meters.

[10] Smart Metering deployment in the European Union- JRC- Last visited 14-December 2016, http://ses.jrc.ec.europa.eu/smart-metering-deployment-european-union

[11] In Germany access to independent aggregators is very difficult due to cumbersome procedures requiring them to get permission from several actors before engaging with consumers. In France, retailers need to be compensated for lost revenue due to demand response. Since 2014, 80 to 87 percent of all demand response has gone to compensation payments. An analysis of this issue is provided through the publication "Benefiting Customers While Compensating Suppliers: Getting Supplier Compensation Right," October 2016, accessed November 3, 2016, http://www.raponline.org/wp-content/uploads/2016/10/baker-benefiting-customers-compensating-suppliers-2016-oct.pdf

3. Key policy enablers and safeguards for consumer engagement

3.1. Reward consumers for their flexibility

The on-going update of the energy market rules provides the opportunity to lift the barriers that prohibit new service providers from entering the market so that consumers can access new, innovative services. But giving consumers the possibility to opt for new service providers and offers providing demand-side flexibility is not enough.

As flexibility can generate value in the electricity market, consumers should receive a fair part of that value as a reward for their participation. The lack of financial incentives would mean that consumers are only subsidising the modernisation of the system. Studies on the acceptability of different kinds of demand-side flexibility by consumers conclude that the savings which would trigger consumer action and lead to lasting changes in behaviour may need to be high.[12] This is in line with the findings of BEUC's German member organisation vzbv-Verbraucherzentrale Bundesverband. When asked about time of use tariffs, two-thirds of German consumers want to save money and fear having to pay too much. Ease of use, convenience and privacy were essential for consumers.[13]

A recent study illustrates the impacts of demand response on the French, German-Austrian, and Nordic spot markets[14]. It estimates savings up to 1.6 billion euro as a result of reduced wholesale market clearing prices during the period that demand-side flexibility is applied. This translates to a decrease in the cost of electricity for all suppliers. The question is how this value generated in the wholesale market will be passed on to the consumer.

In a well- functioning energy market, lower wholesale prices should create lower retail prices for consumers. While in some Member States (such as Norway, Sweden and Finland) there is direct correlation between wholesale prices and the energy component of retail prices, in countries such as the UK and France retail prices do not follow wholesale prices[15].

How can the EU ensure consumers benefit from new services?

- The EU should set clear rules ensuring that service providers **reward consumers financially for their flexibility** in the form of a reduction in their bill.
- **National regulatory authorities and competition authorities** should **carefully monitor the price developments and intervene** if wholesale and retail energy components do not follow the same patterns.

[12] Annala, S., Viljainen, S., Tuunanen, J., Honkapuro, S., Does Knowledge Contribute to the Acceptance of Demand Response?, J. sustain. dev. energy water environ. syst., 2(1), pp 51-60, 2014, DOI: http://dx.doi.org/10.13044/j.sdewes.2014.02.0005.

[13] Variable Stromtarife Aus Verbrauchersicht." VZBV. November 25, 2015. Accessed November 02, 2016. http://www.vzbv.de/termin/variable-stromtarife-aus-verbrauchersich

[14] The analysis covers the years 2013/14, 2014/15, and 2015/16. It shows that the total annual savings of 4 GW of demand-side flexibility as a resource for 400 hours in each of the three markets could be higher than €1.6 billion euro. More information is available through "Benefiting Customers While Compensating Suppliers: Getting Supplier Compensation Right," October 2016, accessed November 3, 2016, http://www.raponline.org/wp-content/uploads/2016/10/baker-benefiting-customers-compensating-suppliers-2016-oct.pdf

[15] ACER/CEER Annual Report on the Results of Monitoring the Internal Electricity and Gas Markets in 2015 Retail Markets, November 2016

3.2. Let consumers choose

The residential sector should not be treated as a uniform source of flexibility. The way consumers use electricity reflects their daily routines and lifestyle. These are defined by numerous conditions such as personal taste, working time, housing conditions, financial and family status. The personal situation and these circumstances are subject to change. Participation in demand-side flexibility schemes should be voluntary. Tariffs, which do not fluctuate according to the time of day, should always be available to consumers.

Consumers should never be locked into products and services which do not reflect their personal circumstances. At the same time, they should be able to offer their flexibility freely and to whomever they want.

Consumers should only take part in demand-side flexibility programmes on an opt-in basis. The way technology such as smart meters in the Netherlands has been deployed shows how crucial this aspect is.[16]

Convenience is an important factor too. Considerations about noise occurring when shifting electricity use to night time, for example to do the laundry, or temperature variation due to modifications in space heating and cooling will play a major role in consumer acceptance. In case consumers will not be able to accommodate a modification in their electricity use at a certain moment, they should be able to override the feature of providing demand-side flexibility without being penalised.

How to ensure that consumers are not locked into services that don't reflect their needs:

- The EU should legislate that **participation** in demand-side flexibility schemes **is voluntary**.
- **Tariffs, the price of which does not fluctuate during the day, should always be available to consumers**.
- An **override function that does not penalise consumers should be part of demand-side flexibility schemes** for cases when they are not able to provide their flexibility.

3.3. Make demand-side flexibility an easy choice

3.3.1. Raise awareness

Demand-side flexibility takes advantage of the possibilities offered by faster communication technologies and a more efficient management of information. But consumers have different levels of motivation and capabilities.[17] So that consumers can benefit widely, it is important to address different consumer segments.

[16] A law proposed in the Netherlands in 2008 would have required a mandatory roll out of smart meters for all Dutch homes. A privacy assessment from the Tilburg Institute for Law and Technology (TILT) deemed that the legislative proposal constituted a violation of Article 8 of the European Convention on Human Rights which establishes the right to respect one's private and family life, his home and his correspondence. Following the publication of the report and the opposition of the public opinion to the proposal, the government withdrew it and put forward a proposal for voluntary roll-out of smart meters. Cuijpers, Colette; Koops, Bert-Jaap. "Smart Metering and Privacy in Europe." 2012. Accessed November 28, 2016. https://pure.uvt.nl/ws/files/1477311/CPDP_final_Cuijper_Koops_springer_1_.pdf.

[17] BEUC. "EMPOWERING CONSUMERS THROUGH SMART METERING." December 2011. http://www.beuc.eu/publications/2012-00369-01-e.pdf.

Member states and national regulatory authorities should raise awareness about on-going energy market developments, new offers and services as well as the use and functionalities of smart meters. For instance, Ofgem, the UK regulator for the electricity and natural gas markets has developed a factsheet[18] which provides useful background information about demand-side flexibility and what is in it for consumers.

How to increase consumer awareness?

- Member States together with national regulatory authorities, and – subject to funding - consumer organisations should coordinate **an information campaign on the link between smart meters, new services and the changes in the energy system, tailor-made to different consumer segments**.

3.3.2. Address the risk of a two-gear energy society

The limited experience with new services and their impact on different households gives rise to concerns 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. To prevent consumers from finding themselves in a two-gear energy society, BEUC calls on policy makers to address a number of challenges.

First, policy makers have to ensure that more efficient use of generated energy goes hand-in hand with efforts to reduce the amount of energy used. Neither from a consumer perspective nor from an environmental perspective would it make sense for a poorly insulated household to focus only on providing flexibility. That is why financial incentives for consumers should address both energy efficiency and the take-up of demand-side flexibility. This is particularly relevant when it comes to highly inefficient building stock.

Secondly, the limited examples of residential demand-side flexibility schemes around Europe are supported by different types of enabling technologies such as smart devices. It is therefore impossible to define with precision what the cost of participating in such schemes will be for consumers and how they will cover it – either through upfront investments or through their contract. Consumers who cannot afford investment in enabling technologies should be provided with incentives to access them.

Finally, national regulatory authorities should systematically map and analyse the impact of new tariffs and services on different social groups, if/how these groups can access the benefits of new deals and whether there are risks for these groups. Apart from the level of income, this analysis should take into consideration vulnerability of the consumer, heating type, dwelling and location among other factors. All of these issues will influence the degree of flexibility the household has to shift their load and to help assess benefits and risks.

[18] Ofgem (2013), How managing your energy use could help you

How to address the risk of participation asymmetries amongst consumer groups:

- Member States and national regulatory authorities, in coordination with the European Commission, should carry out an analysis of **the impact on new offers and services on different consumer groups,** and not just on the average consumer. The study should also look into the cost of enabling technologies that consumers might need to bear to participate in such schemes.
- Member States should put in place targeted measures for vulnerable consumers.
- Financial incentives to access enabling technologies such as smart devices should be available for consumers.
- The EU should ensure that **demand-side flexibility policy and energy efficiency policy reinforce one another**

3.3. Build consumer confidence with clarity and transparency

Clarity and transparency should be the guiding principles of the energy market. However, consumers still struggle to understand their energy contracts.

Demand-side flexibility schemes could lead to more complex energy offers and contracts. The more complex these get, the higher the probability of disputes emerging due to non-transparent terms and conditions or new forms of misleading marketing practices.

To respond to the challenges in communicating new energy services to consumers, E-Control, the Austrian energy regulatory authority, is piloting new features in its web portal providing new ways for comparison. For example, consumers with smart meters could choose from a number of user-group profiles e.g. 'single-household', 'fulltime working', 'family'. A more advanced use of the tool allows them to create their own profile while the most advanced feature allows consumers to upload a complete consumption-profile from a smart-meter web-portal in standard file formats.

Ensuring that consumers receive independent, impartial, up to date and accurate information without cost is a challenge that EU policy makers must address before new and dynamic energy offers appear.

Energy services are increasingly sold as part of a package. The same is likely to be the case with demand side flexibility services. Clear responsibility schemes and redress mechanisms capable of acting across industry sectors are needed to ensure the efficient treatment and settlement of disputes involving service providers from different sectors.

Demand-side flexibility will rely on enabling technology such as smart appliances and smart meters. It should always be clear to the consumer who they need to contact if a problem arises. Consumers should also be able to get answers to their questions from a single contact point and he should not have the responsibility of identifying where the fault comes from i.e. from the equipment, the aggregator or the energy supplier.

How to build consumer confidence in new tariffs and offers?

- National regulatory authorities should **analyse good and bad practices** and **coordinate a survey about how consumers understand** these new services and offers, in light of the on-going update of the energy market rules.
- Consumers should be offered **independent, clear and transparent information**.
- The EU should make appropriate and **independent redress mechanisms** available to address consumer complaints in the energy market, including the settlement of **disputes involving suppliers from different sectors**.
- There should be a clearly defined, **single contact point for troubleshooting and customer support** regardless of whether the problem concerns the equipment or the service.

3.4. Ensure consumer privacy and data portability

New technologies, such as smart meters, make it technically possible to store and process much more detailed and revealing data and metadata than what is currently processed in the retail energy market sector. They can provide a unique insight into the private sphere of households. If compliance with the data protection framework and effective enforcement is not ensured, this information may be used for purposes that are different from the original one.

For instance, insurance providers could have commercial interest in analysing data generated by consumer's participation in demand-side flexibility services. Such an analysis could have an impact on the home insurance premium of the consumer. Insurers are increasingly using connected/smart devices for a more granular risk assessment and personalised premiums. This trend challenges the traditional philosophy of insurance - from risk pooling to personalisation of risks and could lead to discrimination against certain consumer groups.

It will be important to clearly define what type of data is necessary to deliver the energy service to consumers and if and under what conditions a market player can gain access to consumer data.

In addition, there need to be adequate mechanisms to ensure the security of electronic communication and data storage and consumers should always be in control of their data. As owners of the data consumers should have the possibility to use the data when looking for better offers and take the data with them in case they switch service provider.

Due to the digitalisation of the energy sector, the EU must provide stronger regulatory supervision to keep up with the new challenges. Cross-sector collaboration will be essential too. BEUC welcomes the PEER initiative (Partnership for the Enforcement of Energy Rights). The initiative was launched in July 2016 by CEER, the Council of European Energy Regulators to "*promote a cross-sectoral, cross-authority form of cooperation at EU level on energy consumer issues, to help protect consumer interests*."

How to ensure consumer privacy and data portability:

- **Compliance with the data protection framework and effective enforcement** must be ensured and the customer must have the right to access and control all the data generated by the smart meter and other smart devices at home. Each party requesting the data has to provide justification why the data is needed and should access data only after the explicit consent of the consumer.

- **As owners of the data, consumers should be able to get hold of a copy of all their data** that have been collected from service providers. This should be provided to them in a format which is transparent and consumer-friendly and which they can use and share with other service providers, in order to be able to switch or subscribe to third party services.

- **Cross sectoral cooperation** of regulators and enforcement authorities is essential.

3.5. Enable consumers to generate their own electricity

Consumers who generate their own electricity can reduce electricity demand from the grid or supply electricity to the grid at specific times. This way, the consumer becomes a more active energy market participant (or 'prosumer') whose role and rights should be clearly defined. There needs to be a reliable remuneration scheme for excess electricity sold to the grid by small scale self-generators. Self-generation of electricity should not be something limited to detached house-owners. Tenants living in multi-storey dwellings should also be able to access electricity from solar energy.

When the electricity grid is congested, Distribution System Operators (DSOs) might consider curtailment of small-scale self-generators as a cheap and simple option. Ensuring priority grid access and dispatch for small-scale self-generators can prevent misusing demand-side flexibility schemes for curtailing these self-generators.

How to create a welcome culture for consumers that want to produce their own electricity:

- Both house owners and **tenants should be able to self-generate electricity.**

- The EU should ensure that grid operators **grant priority grid access and dispatch** to small-scale renewable self-generators without setting any caps.

- The EU must put in place **stable and adequate safeguards** for small-scale renewable self-generation projects.

4. Flexibility as part of the smart home - improving consumer lives without trade-offs for them or the environment

From a consumer perspective, a smart home needs 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 manage consumption through consumer friendly smart metering systems if they choose so. Opting for smart home features should not come at the cost of consumer safety or privacy and should not put a burden on them when it comes to liability.

The participation of consumers in demand-side flexibility schemes can affect them in areas beyond energy such as:

4.1. Safety and health

The assessment about whether an appliance is safe is currently based on an average predictable, common pattern of use. Current safety testing protocols would need to be updated in order to assess the safety of connected products.

Demand-side flexibility schemes could significantly alter usage patterns. For example, appliances could be switched on and off many more times a day than they are at the moment. Shifting energy use to different times of the day could mean that appliances operate unattended for longer times and at unpredictable moments of the day. Aside from the impact on the product itself, the new use patterns might also increase concerns about safety such as the risk of overheating due to using appliances in an interrupted manner.

If an electricity failure occurs at a household that participates in a demand-side flexibility scheme, new and unanswered questions related to product liability may arise. The EU Product Liability Directive from 1985 is completely outdated as it does not cover questions related to new technologies such as interconnectivity and software[19]. In particular it remains currently unclear who is liable in case something goes wrong in a "smart" home: the electricity provider, the communication provider or the device manufacturer. The EU Commission therefore urgently needs to review the Product Liability Directive to make sure consumers can participate in demand-response schemes with confidence[20].

In the absence of clear legal rules about safety and liability of smart devices some manufacturers and retailers may try to fill the gap through a whole new series of insurances. However, such a development would not necessarily be in the interest of consumers as appliances which can participate in demand-side flexibility schemes should be safe by design and fit to be integrated in such modern networks.

In addition, participation in demand-side flexibility schemes would mean that a number of appliances are constantly connected. It would be important to assess whether exposure to radiation could have detrimental health impacts on some consumers.

[19] Piotr Machnikowski (2016): European Product Liability. An Analysis of the State of the Art in the Era of New Technologies, p. 11.
[20] In early 2017, the EU Commission launched a public consultation to assess the need to review the Product Liability Directive.

How to ensure flexibility-enabling products are safe?

- Consumer **safety** should be guaranteed **by product design**. The EU should analyse **whether the existing safety legislation can sufficiently address potential safety risks** arising from flexibility-enabling products.

- The EU in coordination with regulators and Member States should carry out a comprehensive **analysis** on how new services **impact liability assessment and insurances and take adequate measures** where negative impacts for consumers are identified.

- **Health and safety considerations** should be a parameter **included in future assessments** of residential demand-side flexibility schemes.

4.2. Product design and energy consumption

Appliances making it possible to participate to demand-side flexibility have more electronic components. The fact that appliances might need to operate in an interrupted manner can have an impact on safety but also on the durability of the product. In addition, appliance software will be subject to updates which could affect their lifetime, upgradability and interoperability. Another concern is the longevity of demand-side flexibility enabling technologies and the consumer detriment in case they are no longer supported by their manufacturer.

Also, readiness to respond to price signals can mean that appliances are in standby mode for longer periods or consume more energy to perform an operation in an interrupted manner. This could increase their energy consumption and result in trade-offs. For example, a consumer who has opted for a highly efficient product expects certain savings in electricity. Keeping the appliance in a 'ready to respond' mode or running it in response to price signals could increase the electricity consumption of the appliance compared to running it as usual. On the other hand responding to price signals would lead to lower running costs. Consumers cannot be expected to figure out what the result of such a trade-off would be.

How to make sure that enabling appliances are energy efficient, durable and interoperable:

When setting product design requirements for energy using products through the **Ecodesign Directive**, the EU should ensure that **smart features of appliances are limited in terms of energy consumption and that these features do not negatively affect the durability, reparability and upgradeability of the product**.

4.3. Open questions related to guarantees

In the context of the smart home, consumers will increasingly rely on appliances that use software to connect and interact within the smart home. Those products, as any other consumer product can appear to be defective. The legislation on legal guarantees establishes rights for consumers in case of failure of the physical components of a product. However, it remains unclear in EU law whether consumers can enjoy the same rights in

case of failure originating from the software of the product. The sales of so-called smart appliances will keep on growing over the coming years. It is important that the legislation offers the same or equivalent legal protection to consumers, regardless of whether the origin of a failure is on the hardware or the software the product comes with.

In this regard, the European Commission's proposal on digital content contracts[21] offers an opportunity to address these questions.

However, this proposal is not clear enough as what rules would apply to physical products that include a digital content element e.g. software. In case of a lack of conformity: will the rules for tangible goods apply or those of the proposal?

In recital 11 the proposal states that *"digital content which is embedded in goods in such a way that it operates as an integral part of the goods and its functions are subordinate to the main functionalities of the goods"* are not covered by this Directive and consequently the rules for tangible goods shall apply.

In the future it will become more difficult to differentiate what would be the predominant element of the product between the digital content and the tangible good. Therefore, it should to be clarified in the text of the directive (and no by means of a recital) what are the criteria to follow for the application of the rules of the directive to connected devices and the Internet of Things.

Therefore, BEUC considers that irrespective of the legal regime applicable, consumers should be able to reach an equivalent result no matter whether the rules of tangible goods or digital content apply.

How to ensure that the legislation on legal guarantees is fit for purpose:

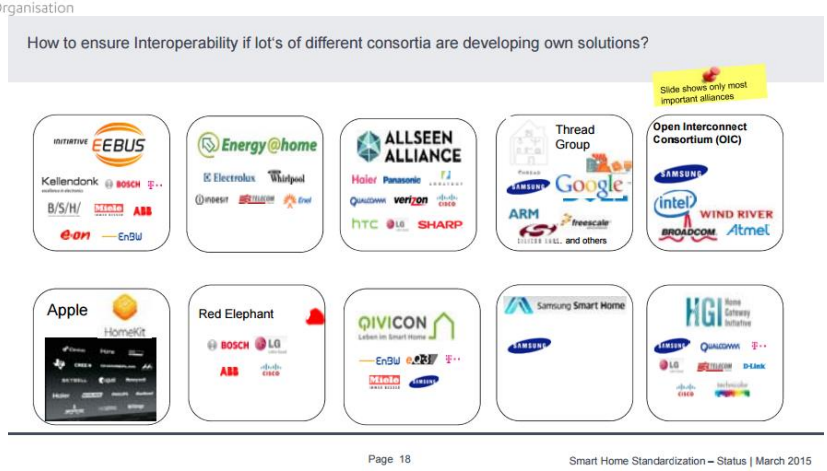
Consumers should always be able to rely on equivalent guarantee remedies no matter whether the defect lies on the tangible or intangible components of the product.

4.4. Connectivity and competition across the system

The interaction of appliances with the electricity distribution system requires a connectivity element that allows an exchange of the necessary data. It is unclear how this will function in practice and whether consumers will be able to freely choose the provider of this connectivity element. New lock-ins and barriers to switching can emerge because of how automation models are designed.

In addition, new platforms will be deployed for consumers to pick and choose the connection of their electrical appliances with the electricity distribution system in a way that best suits their interests. These platforms will have software and hardware elements provided by different suppliers, which raises questions regarding their interoperability and whether there will be sufficient competition or alternative platforms to choose from. Consumers should be free to choose service and app providers as well as electrical appliance brands without the fear of being locked-in.

[21] COM(2015)634 final



Preparatory study on Smart Appliances- 10 March 2015- Josef Baumeister- BSH

How to ensure that consumer interests are not locked in services and products

- The EU should ensure that **anticompetitive practices and product design limiting consumer choice,** when it comes to service providers, **are prohibited**.

- The EU should ensure that common standards are available to ensure compatibility between different software and hardware elements and avoid lock-in effect.

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