



Response to consultation

Artificial intelligence and digitalisation for energy



November 2025

Why it matters to consumers

Energy systems are increasingly connected with digital tools and automation becoming more common in consumers' homes. This digitalisation can be beneficial to consumers. It can help make their energy system more efficient and as consequence lower their energy bills. However, the digitalisation of the energy sector also comes with important question marks around data privacy and protection, the cybersecurity of products and services, as well as the trustworthiness of AI.

Published | 5 November 2025

Contact | energy@beuc.eu

Reference | BEUC-X-2025-103

Document coordinator | Frederico Oliveira da Silva

Credit | Photo by photoschmidt from iStockPhoto

BEUC, The European Consumer Organisation

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.beuc.eu
EC register for interest representatives: identification number 9505781573-45



Co-funded by the European Union.

Views and opinions expressed are however those of the author(s) only and do not necessarily reflect those of the European Union or EISMEA. Neither the European Union nor the granting authority can be held responsible for them.

TABLE OF CONTENT

1. Artificial intelligence	4
2. Cybersecurity	5
3. Data protection and privacy.....	6
4. Data spaces.....	7
5. Interoperability	7
6. Unfair price personalisation	8
7. Risk of digital exclusion	9
8. Product information	10
9. Comparison tools	10

Energy systems are increasingly connected with digital tools and automation becoming more common in consumers' homes. This digitalisation can be beneficial to consumers. It can help make their energy system more efficient and as consequence lower their energy bills. For example, in order to be able to fully benefit from the advantages of a flexible system¹, consumers need to have access to digital tools and services that provide real time data. Also, the proliferation of online comparison tools and switching services can help consumers finding an offer that better suits their needs and to switch provider quickly.

Digitalisation can also contribute to the green transition by making it easier for consumers to use and share renewable energy. Consumers with solar panels will benefit from digitalisation as it will help them to optimise the use of electricity generated and, for instance, share the surplus with neighbours.

However, the spreading of digitalisation and AI in the energy sector also comes with important shortcomings that consumers need to be protected from. The misuse of digital tools can undermine consumers' fundamental rights to privacy and data protection. Poorly cybersecure smart meters could have an impact on peoples' finances and even health. The use of AI by energy providers could also result in discriminatory practices. Therefore, while BEUC is supportive of the digitalisation of the energy sector, this can only happen if certain conditions are fulfilled and with a high level of consumer protection.

Below we provide a list of recommendations that EU and national policymakers as well as regulators need to bear in mind when considering the further digitalisation of the energy sector.

1. Artificial intelligence

Artificial intelligence is revolutionising the way our society functions. But AI systems can lead to price discrimination or exploit people's biases and vulnerabilities. For example, 'price optimisation techniques' can lead to consumer harm if energy providers use an AI system to target price increases to those perceived as less likely to switch provider and/or are more likely to pay.²

Another challenge AI can pose to consumers relates to misinformation. Generative AI is well known for producing inaccurate outputs³ and "hallucinating".⁴ This can be detrimental for consumers (e.g. wrong advice on energy usage, wrong information about

¹ 'Flexibility' refers to when consumers adapt their use of electricity to moments when prices are lower, for instance when solar power is abundant.

² We also address this point in section 5 below on price personalisation.

³ BBC, *Largest study of its kind shows AI assistants misrepresent news content 45% of the time – regardless of language or territory*, 22 October 2025

⁴ New York Times, *A.I. Is Getting More Powerful, but Its Hallucinations Are Getting Worse*, 6 May 2025

energy bills) but also for energy providers (e.g. inaccurate data can lead to errors in maintenance schedules).

The EU's recently adopted AI Act applies to AI systems used by energy providers. An AI system used by a supplier of gas, heating or electricity falls under the list of high-risk AI systems of the regulation (Annex III of the AI Act). If certain conditions apply, these systems will then be classified as high-risk, and the energy provider will therefore need to ensure that they comply with the AI Act's requirements before the deployment of the AI system.

BEUC recommendations:

- Once the AI Act becomes fully applicable, member states and national regulators should ensure that AI systems used by energy providers comply with it. Compliance with the General Data Protection Regulation (GDPR) and consumer protection legislation such as the Unfair Commercial Practices Directive (UCPD) also needs to be taken into account regarding the use of AI.
- Policymakers should investigate the effect of possible AI 'hallucinations' on consumers but also on the working of the grid – an essential infrastructure.

2. Cybersecurity

A cyberattack on companies can greatly impact the functioning of our daily lives. This also applies if consumer products or applications were to fail in terms of their cybersecurity. It is therefore crucial to raise the bar on cybersecurity.

In recent years, our members have discovered that too many connected devices available in the EU (including smart meters) are designed and manufactured without the most basic security features embedded in their software. For example, our Belgian member Testachats tested the security of a smart home: they installed 19 popular smart devices in one household and gave ethical hackers a deadline to exploit potential vulnerabilities. In just 5 days, more than half of the products were found to be vulnerable to hacking.

The lack of security of connected products represents risks to consumers' privacy, safety and security of their property. Importantly, critical infrastructure such as the grid using insecure products could also be open to cyberattacks, leaving entire regions without lights.

BEUC recommendations:

- Member states and national regulators must enforce EU rules on the cybersecurity of essential services (the Network Information Systems 2 Directive) and connected devices (the Cyber Resilience Act).
- Any incident pertaining to the essential infrastructure or connected devices is reported to various regulators (e.g. data, energy, consumer) as well as EU cybersecurity agency ENISA.

3. Data protection and privacy

The digitalisation of the energy sector requires the collection and processing of a significant amount of data. Much of this data can be considered as personal data⁵ and should therefore be treated with particular caution and in respect of the law, in particular the General Data Protection Regulation. This means that suppliers, producers, and system operators should embed privacy protections in the way they design their products and service data policies, following the principles of privacy by design and by default. It also means that they should strictly apply the principles of data minimisation and purpose limitation.

As pointed out by the European Data Protection Supervisor, the collection of energy consumption data allows those who have access to it to draw conclusions about the behaviour of energy consumers. This behavioural data could then be used to enhance someone's online profile for marketing or advertisement purposes. Insurance companies could also be interested in accessing personal energy consumption data.

BEUC recommendation:

Data protection authorities, in cooperation with energy authorities, should ensure that energy providers comply with data protection rules, namely the GDPR, when collecting and processing personal data.

⁵ For example, data gathered from smart meters can be considered as personal data.

4. Data spaces

Smart meters, smart appliances, electric cars charging points and other household products produce vast quantities of data that can tell us a lot about consumers habits and preferences. Smart grids also produce a great deal of data. With the digitalisation of energy systems, it is increasingly important that energy providers find ways of cooperating and sharing their data. For example, if a consumer wants to switch energy provider, both old and future energy providers should find a secure way to transfer the customer data.

This is where data spaces come in. They are a shared digital room where different organisations can safely and fairly exchange data. Without them, the energy transition will be slower, less efficient and less inclusive. They also benefit competition as they allow for smaller energy players to access data from previously “monopolistic” data holders.

A healthy digital ecosystem requires an approach to data governance that avoids concentration of data in a few hands, limiting the benefits of a well-functioning market: consumer choice and innovation. It goes without saying that it is the consumer who should decide who has access to their data, and under which circumstances and conditions it can be used.

BEUC recommendation:

Access to and use of data spaces should be facilitated. The European Commission and competent authorities should cooperate with data protection authorities under the GDPR to improve consistency in guidelines and strengthen enforcement actions in case of obstructive practices and non-compliance. The experience of Art. 20 GDPR on data portability may provide useful insights on how to increase data exchange, reduce market barriers and introduce technical standards.

5. Interoperability

BEUC’s Norwegian member Forbrukerrådet published a consumer policy review of its country’s grid tariff model in 2024. They came across a new consumer issue linked to digitalisation: the linking of the sale of real-time meters (HAN adapters, used in Norway for the consumer to be able to read electricity and power consumption in real time) to a subscription. This can create a lock-in effect and barrier to switching. In practice, if consumers were to change energy supplier, they would have to purchase a new real-time meter.

BEUC recommendation:

Smart meters and other digital devices should be interoperable and designed to work seamlessly with multiple providers and their systems. In the example mentioned above on real-time meters, a common standard should be adopted so that the direct link between a meter and the individual company installing it is severed and consumers do not run the risk of having to buy a new meter every time they change supplier.

6. Unfair price personalisation

When consumers use connected devices or services (e.g. smart meters, online websites), they are comprehensively tracked, profiled and categorised for commercial purposes. One of the reasons companies track peoples' behaviour online is to be able to provide personalised offers. A personalised price can be designed so that each consumer pays the exact price at which they value the product or service. In other words, the same product and service can be offered at a difference price to each consumer.

Over the last years, BEUC members have gathered a lot of evidence that prices are also being personalised.⁶ In early 2025, preliminary findings of an investigation of the US Federal Trade Commission confirmed that retailers frequently use consumer data from location and demographics to their mouse movements on a webpage to set targeted, tailored prices for goods and services.

Personalisation can be very convenient for consumers, for instance if products and services are recommended or advertised to them that match their interest. But personalisation may also be misleading or exploit the knowledge that businesses have about consumers. For instance, personalised offers can be misused to hide certain offers from consumers or steer consumers towards more expensive offers within the range of offers that they are likely willing to pay for. Likewise, personalised advertising can also be misused to exploit the vulnerability of the consumer.

A few years ago, Citizens Advice found that more than 4 in 5 respondents stated that they felt uncomfortable with personalised pricing in essential services, and 3 in 4 stating that they would not trust their provider if it used personalised pricing.

Energy is an essential service, and many consumers are willing to pay a significant part of their income for it. For this reason, policymakers must pay particular attention to deployment of unfair price personalisation techniques in this sector. For example, in Germany, companies have blocked consumers that are changing suppliers too frequently. Companies make the most money out of loyal customers. Certain companies have blocked contracts with consumers that are profiled as disloyal.

⁶ See evidence from [Arbeiterkammer](#) here, [Verbraucherzentrale](#) here, [Sveriges Konsumeter](#) here, and [Forbrukerrådet](#) here.

BEUC recommendations:

- Non-personalisation of apps and websites, except for personalisation based on functional cookies, should be the default option. If consumers opt-in to personalisation (e.g. in the context of an energy comparison tool), traders shall disclose the parameters used for the personalisation and shall allow consumers to modify these parameters.
- EU policymakers should prohibit personalised pricing, in the sense of first-degree personalisation⁷, except for price reductions.

7. Risk of digital exclusion

Many EU consumers experience digital exclusion and will remain in this situation in the foreseeable future. According to data from 2023, only 56% had basic or above basic digital skills.

While BEUC is supportive of the digitalisation of the energy system, EU policymakers must be careful to ensure that no citizens are left behind. If the energy system and the information about it was to become exclusively digital, this would significantly impact the ability of many consumers to navigate markets and make informed decisions.

For example, many energy companies use online comparison tools as their main way to market their products. These can be useful for consumers under certain conditions (see more details on Chapter 8 below) but energy companies must also provide comprehensive comparisons of their offers in the markets off-line. Those with lower access to internet should receive the same level of customer service, access to effective consumer complaints and complete information to compare and find affordable products.

Another example concerns the need to have physical ‘one-stop shops’ to help consumers undergoing a house renovation project. Energy retrofitting is currently more of an obstacle course than a walk in the park and consumers are often lost in an overflow of information. One of the tools available to help facilitate the consumer renovation journey is ‘one-stop-shops’, where consumers can get independent advice and concrete assistance with their housing retrofit project.

⁷ *First-degree personalisation* is based on personal characteristics of individuals and charges each individual the maximum price they are willing to pay. *Second-degree personalisation* charges each individual a price based on quantity of products.

BEUC recommendation:

Energy regulators need to make sure that energy companies provide comprehensive and easy to understand information to consumers about their offers, consumer rights and relevant information in both digital and printed form.

8. Product information

Information about energy-related products and their characteristics constitutes an essential safeguard of consumer health, rights, and interests. There is growing interest, especially among some industry groups, in moving this information online.

While digital information tools such as QR codes have undeniable potential to improve both the availability of product information and the capacity to effectively reach consumers, they also entail major challenges – and risks – for consumers’ access to essential information. Therefore, they must not replace established means of communicating product information to consumers, such as on-pack labels or paper leaflets. This also applies where new mandatory disclosure obligations for essential product information are under consideration.

BEUC recommendation:

EU policymakers should keep information essential to consumer health, rights, and interests on product labels; this will ensure access to information for all consumers both at the point of sale as well as after purchase – without the use of additional devices or internet connectivity.

9. Comparison tools

Consumers find it hard to navigate increasingly complex energy markets. New tariff structures (flexible contracts, aggregation), bundled offers (e.g. with electric car charging), and concepts such as energy sharing will only increase this difficulty. Comparison tools are essential to find the best deal.

BEUC members report highly varying experiences with these tools. Even where there is a regulated tool, this may not be reliable. For example, Denmark's Forbrugerrådet Tænk advises consumers not to use the independent tool operated by the energy regulator, as the data is not sufficiently verified. Our German members have pointed specifically to the challenges in terms of dynamic contracts. Verbraucherzentrale Bundesverband (vzbv) found that some websites use the same price methodology for dynamic and fixed tariffs, while Stiftung Warentest spotted tariffs marketed as 'dynamic' that cannot be considered as such.

Only a few tools on the market are regulated under the Electricity and Gas Market Directives. The law requires comparison tools to be, among others, independent from market participants; base their comparison on clear and objective criteria; and provide accurate and up-to-date information and state the time of the last update.

However, a growing number of models rely on similar services operated by non-independent actors, for instance, comparison tools operated by energy suppliers, rating- or review-based platforms, and algorithm-based recommendation systems promoted by virtual assistants with comparative tools. These tools are not legally required to comply with aforementioned requirements and therefore, they may not provide fully impartial information to consumers.

BEUC recommendation:

All platforms comparing or switching energy offers should be subject to the specific requirements set out under EU electricity and gas market legislation.