Digitalising the Energy System

> Fields marked with * are mandatory.

INTRODUCTION

This consultation will soon also be available in 23 European Union official languages. These versions will be available progressively on this website. If you wish to respond in one of these languages, please wait until then to provide your replies.

BACKGROUND FOR THIS CONSULTATION

To meet the **European Green Deal** objectives to decrease GHG emissions by at least net 55% by 2030 and achieve climate neutrality by 2050, the twin green and digital transition calls for a better-functioning, smart, integrated and cleaner energy system, while guaranteeing affordable energy and a fair transition for all. In addition, the Green Deal aims to deliver growth and jobs, improve competitiveness of the EU companies by enabling new opportunities for businesses and drive innovative solutions by encouraging the development of trustworthy technology. At the same time, the digital transformation must benefit everyone, while putting people at the centre of policymaking, as well as making their contributions as citizens, consumers, prosumers, or as part of energy communities prominent and ensuring they play an active role in the energy markets.

Digitalisation of the energy system is key to deliver all these goals. At each step of the supply chain, namely production, distribution, storage, supply, and consumption, digitalisation provides new tools to manage the energy system more efficiently and facilitates the entry of new market participants and the development and deployment of new data driven energy services. Digitalisation is for example necessary to optimise the production and consumption of energy in order to minimise CO2 emissions, notably by enabling smart homes, buildings and energy devices (from decentralised production, storage and use by machinery or domestic appliances) to provide flexibility and to interact with the energy system, including through smart charging of electric cars. In addition, solutions such as Big Data for predictive maintenance of wind farms or High-Performance Computing for the development of new materials for more efficient batteries or PV panels will help the energy transition.

The **Digitalisation of Energy Action Plan**, which is the object of this public consultation, was announced in the Communication "An EU strategy for Energy System Integration", which stated the Action Plan's key role to accelerate the implementation of digital solutions and the integration of energy systems, which relate to energy carriers, their respective infrastructure, and their consumption sectors.

The Communication on **the Digitalisation of Energy Action Plan** will build on the Communication on "A European Strategy for Data", on the Regulation on the Free Flow of Non personal Data - (EU) 2018/1807

and on the [Regulation on the General Data Protection - (EU) 2016/679](#) in order to ensure a transparent and well-functioning data framework. The Action plan will also propose concrete steps for the development of a common European Energy data space – as one of the nine data spaces identified in the Communication on "A European Strategy for Data". Furthermore, the Action Plan aims to support further cooperation between the ICT and the energy system to ensure a more sustainable use of energy in the ICT sector, supporting the European Green Digital Coalition.

The Communication on **Digitalisation of Energy Action Plan** will also support the implementation of the Clean Energy Package (2019) and will be in line with the Communication on "[the European way for the Digital Decade](#)" - adopted in March 2021.

What is the purpose of the Action Plan?

The digital transformation of the energy system brings a lot of benefits, but it also brings risks and challenges related to the specificities of the energy system, notably how to mix of legacy technologies with new and smart technologies, the cybersecurity threats which might affect the energy supply as an essential service to society, as well as the growing energy consumption linked to the use of ICT technologies (e.g.. data centres). An integrated EU policy response is required to ensure that investments in digital technologies in the energy system contribute to the Green Deal and to a Europe that is fit for the digital age. EU action should also ensure that digitalisation of the energy system contributes to a well-functioning single market for goods and services related to energy and to data.

Policy measures are needed to ensure that new markets based on energy data are open and competitive, while respecting ethics, and ensuring data protection, privacy and cybersecurity, with consideration to the specificity of the energy system. The increased energy demand for ICT systems needs to be adequately managed in the context of an integrated energy system. Thus, digital and energy value chains need ever increasing cooperation.

The **Action Plan** will outline how different EU policies and funding instruments will work together to exploit the benefits of the digital transformation of the energy system, while minimising the inherent risks and environmental footprint of the respective digital solutions. The Action Plan will identify possible complementary actions to ensure synergies between those, for example in relation to data sharing for smart grids, smart buildings and smart cities.

What is the purpose of this consultation?

This questionnaire seeks to collect views from citizens; business communities and industry, including energy and ICT companies; Member States and public authorities; local, economic and social partners, including non-governmental organisations; consumers organisations; academia and research institutes; as well as other digital and energy stakeholders. The questionnaire is divided into the following three sections:

I. Your involvement in digitalisation of energy and interest in the action plan

II. Individuals and consumers in the digitalisation of the energy system

1. An existing example of digitalisation of energy in everyday life: your energy consumption data
2. Consumer empowerment and citizen engagement in the energy transition

III. Tackling specific facets of digitalisation of the energy system:

1. Ensuring climate neutrality of ICT
2. Enhancing the cybersecurity of the energy system
3. Enhancing the uptake of digital technologies in the energy system
4. Developing a European data-sharing infrastructure for new energy services
5. International cooperation on digitalisation of energy

The first section aims to collect knowledge on the profile of the respondents.

The second section is aimed primarily at individuals, independently of their level of knowledge about the energy system or not. It addresses general issues relating to the digitalisation of energy, as well as how individuals perceive the twin green and digital transitions in the energy system. The third section is rather targeted to stakeholders involved in such issues. Non-expert individuals are of course more than welcome to answer all questions should they have views on specific questions.

How can I participate?

You can complete this questionnaire on the Commission website **until 24 January 2022.** Please use the button at the bottom of the questionnaire to upload feedback in other document formats.

A synopsis report of this public consultation, as well as a summary of all consultation activities' results will be published on this page at the end of the consultation period.

RESPONDING TO THIS CONSULTATION AND FOLLOW-UP

In this context and in line with 'better regulation' principles, the Commission is launching this public consultation designed to gather stakeholder views on the digitalisation of the energy system.

This public consultation is part of a planned larger stakeholder consultation which will feed into the Commission's work on the action plan. It builds upon the results from the feedback received from the Roadmap consultation on this initiative, which took place between 23 July and 10 September 2021. Views are welcome from all stakeholders.

Please note: In order to ensure a fair and transparent consultation process **only responses received through our online questionnaire will be taken into account** and included in the report summarising the responses. Should you have a problem completing this questionnaire or if you require particular assistance, please contact *ENER-B5-SECRETARIAT@ec.europa.eu*.

ABOUT YOU

*Language of my contribution
- ○ Bulgarian
- ○ Croatian

- ○ Czech
- ○ Danish
- ○ Dutch
- ● English
- ○ Estonian
- ○ Finnish
- ○ French
- ○ German
- ○ Greek
- ○ Hungarian
- ○ Irish
- ○ Italian
- ○ Latvian
- ○ Lithuanian
- ○ Maltese
- ○ Polish
- ○ Portuguese
- ○ Romanian
- ○ Slovak
- ○ Slovenian
- ○ Spanish
- ○ Swedish

* I am giving my contribution as
- ○ Academic/research institution
- ● Business association
- ○ Company/business organisation
- ○ Consumer organisation
- ○ EU citizen
- ○ Environmental organisation
- ○ Non-EU citizen
- ○ Non-governmental organisation (NGO)
- ○ Public authority
- ○ Trade union
- ○ Other

* First name

Marion

* Surname

Malafosse

* Email (this won't be published)

marion.malafosse@smarten.eu

* Organisation name

255 character(s) maximum

smartEn, the European business association for decentralised and digital-driven energy solutions

* Organisation size

- ● Micro (1 to 9 employees)
- ○ Small (10 to 49 employees)
- ○ Medium (50 to 249 employees)
- ○ Large (250 or more)

Transparency register number

255 character(s) maximum

Check if your organisation is on the [transparency register](). It's a voluntary database for organisations seeking to influence EU decision-making.

569379418624-07

* Country of origin

Please add your country of origin, or that of your organisation.

○ Afghanistan	○ Djibouti	○ Libya	○ Saint Martin
○ Åland Islands	○ Dominica	○ Liechtenstein	○ Saint Pierre and Miquelon
○ Albania	○ Dominican Republic	○ Lithuania	○ Saint Vincent and the Grenadines
○ Algeria	○ Ecuador	○ Luxembourg	○ Samoa
○ American Samoa	○ Egypt	○ Macau	○ San Marino

○ Andorra	○ El Salvador	○ Madagascar	○ São Tomé and Príncipe
○ Angola	○ Equatorial Guinea	○ Malawi	○ Saudi Arabia
○ Anguilla	○ Eritrea	○ Malaysia	○ Senegal
○ Antarctica	○ Estonia	○ Maldives	○ Serbia
○ Antigua and Barbuda	○ Eswatini	○ Mali	○ Seychelles
○ Argentina	○ Ethiopia	○ Malta	○ Sierra Leone
○ Armenia	○ Falkland Islands	○ Marshall Islands	○ Singapore
○ Aruba	○ Faroe Islands	○ Martinique	○ Sint Maarten
○ Australia	○ Fiji	○ Mauritania	○ Slovakia
○ Austria	○ Finland	○ Mauritius	○ Slovenia
○ Azerbaijan	○ France	○ Mayotte	○ Solomon Islands
○ Bahamas	○ French Guiana	○ Mexico	○ Somalia
○ Bahrain	○ French Polynesia	○ Micronesia	○ South Africa
○ Bangladesh	○ French Southern and Antarctic Lands	○ Moldova	○ South Georgia and the South Sandwich Islands
○ Barbados	○ Gabon	○ Monaco	○ South Korea
○ Belarus	○ Georgia	○ Mongolia	○ South Sudan
◉ Belgium	○ Germany	○ Montenegro	○ Spain
○ Belize	○ Ghana	○ Montserrat	○ Sri Lanka
○ Benin	○ Gibraltar	○ Morocco	○ Sudan
○ Bermuda	○ Greece	○ Mozambique	○ Suriname
○ Bhutan	○ Greenland	○ Myanmar/Burma	○ Svalbard and Jan Mayen
○ Bolivia	○ Grenada	○ Namibia	○ Sweden
○ Bonaire Saint Eustatius and Saba	○ Guadeloupe	○ Nauru	○ Switzerland
○ Bosnia and Herzegovina	○ Guam	○ Nepal	○ Syria
○ Botswana	○ Guatemala	○ Netherlands	○ Taiwan
○ Bouvet Island	○ Guernsey	○ New Caledonia	○ Tajikistan

- Brazil
- British Indian Ocean Territory
- British Virgin Islands
- Brunei
- Bulgaria
- Burkina Faso
- Burundi
- Cambodia
- Cameroon
- Canada
- Cape Verde
- Cayman Islands
- Central African Republic
- Chad
- Chile
- China
- Christmas Island
- Clipperton
- Cocos (Keeling) Islands
- Colombia
- Comoros
- Congo
- Cook Islands
- Costa Rica
- Côte d'Ivoire
- Guinea
- Guinea-Bissau
- Guyana
- Haiti
- Heard Island and McDonald Islands
- Honduras
- Hong Kong
- Hungary
- Iceland
- India
- Indonesia
- Iran
- Iraq
- Ireland
- Isle of Man
- Israel
- Italy
- Jamaica
- Japan
- Jersey
- Jordan
- Kazakhstan
- Kenya
- Kiribati
- Kosovo
- New Zealand
- Nicaragua
- Niger
- Nigeria
- Niue
- Norfolk Island
- Northern Mariana Islands
- North Korea
- North Macedonia
- Norway
- Oman
- Pakistan
- Palau
- Palestine
- Panama
- Papua New Guinea
- Paraguay
- Peru
- Philippines
- Pitcairn Islands
- Poland
- Portugal
- Puerto Rico
- Qatar
- Réunion
- Tanzania
- Thailand
- The Gambia
- Timor-Leste
- Togo
- Tokelau
- Tonga
- Trinidad and Tobago
- Tunisia
- Turkey
- Turkmenistan
- Turks and Caicos Islands
- Tuvalu
- Uganda
- Ukraine
- United Arab Emirates
- United Kingdom
- United States
- United States Minor Outlying Islands
- Uruguay
- US Virgin Islands
- Uzbekistan
- Vanuatu
- Vatican City
- Venezuela

○ Croatia	○ Kuwait	○ Romania	○ Vietnam
○ Cuba	○ Kyrgyzstan	○ Russia	○ Wallis and Futuna
○ Curaçao	○ Laos	○ Rwanda	○ Western Sahara
○ Cyprus	○ Latvia	○ Saint Barthélemy	○ Yemen
○ Czechia	○ Lebanon	○ Saint Helena Ascension and Tristan da Cunha	○ Zambia
○ Democratic Republic of the Congo	○ Lesotho	○ Saint Kitts and Nevis	○ Zimbabwe
○ Denmark	○ Liberia	○ Saint Lucia	

* **Contribution publication privacy settings**

The Commission will publish the responses to this public consultation. You can choose whether you would like your details to be made public or to remain anonymous.

○ **Anonymous**

Only organisation details are published: The type of respondent that you responded to this consultation as, the name of the organisation on whose behalf you reply as well as its transparency number, its size, its country of origin and your contribution will be published as received. Your name will not be published. Please do not include any personal data in the contribution itself if you want to remain anonymous.

● **Public**

Organisation details and respondent details are published: The type of respondent that you responded to this consultation as, the name of the organisation on whose behalf you reply as well as its transparency number, its size, its country of origin and your contribution will be published. Your name will also be published.

☑ I agree with the personal data protection provisions

I. Your involvement in digitalisation of energy and interest in the action plan

1) What is your level of knowledge and perception of the sector?

	Excellent	Very good	Good	Basic	I do not know

My knowledge of the energy value chain and its dynamics is:	○	○	○	○	○
My knowledge of how digital and data-driven solutions apply and could apply to the energy system is:	○	○	○	○	○
My knowledge of who I am sharing my energy data (third parties) with is:	○	○	○	○	○

2) What is your or your organisation's involvement in digitalisation of the energy system?

- ☐ Production or storage of renewable electricity
- ☐ Production of non-renewable electricity
- ☐ Production of another energy source or energy carrier (oil, natural or bio gas, hydrogen, synthetic fuel, etc.)
- ☐ Electricity transmission or distribution system operator
- ☐ Gas transmission or distribution system operator
- ☐ Other energy system operator
- ☐ Electricity supplier
- ☐ Gas supplier
- ☐ Heat supplier
- ☐ Other energy supplier
- ☑ Energy equipment manufacturer
- ☐ Energy consumer association
- ☑ Electricity aggregator
- ☑ Energy service provider or Energy Service Company (ESCO)
- ☐ Energy Regulatory authority
- ☐ Telecom Regulatory authority
- ☐ Data privacy controller
- ☐ Telecom infrastructure operator
- ☑ IT technology provider
- ☑ IT services provider
- ☐ System integrator
- ☐ Investor
- ☐ Public Institution
- ☐ Research/Academia
- ☐ Industrial/business consumer
- ☐ Household consumer

☐ Other

3) Are you or is your organisation involved in Information Technologies and/or data-driven solutions?

- ⦿ Yes, including specifically for the energy market
- ○ Yes, but not specifically for the energy market
- ○ No
- ○ I do not know

4) For energy consumers (enterprises or households): To what extent do you agree with the following statements?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	I do not know
I compare offers and prices of different energy suppliers regularly.	○	○	○	○	○	○
I believe digital technologies in the energy system will help me better understand how the energy system works.	○	○	○	○	○	○
I am interested to be a more active consumer (e. g. changing my energy consumption habits) if digital solutions can help me do so easily.	○	○	○	○	○	○
I treat third-party access to my energy data (e.g. my electricity consumption habits) with less importance than third-party access to other personal data (e.g. on the internet).	○	○	○	○	○	○
I am willing to give third parties more access to my energy data if I will benefit from it (e.g. a lower electricity bill).	○	○	○	○	○	○

I am willing to give third parties more access to my energy data if I understand how it contributes to the transition to a climate neutral society.	○	○	○	○	○	○
Under no circumstances am I willing to give more access to my energy data than I currently am giving.	○	○	○	○	○	○
I believe that the benefits of having more connected devices (e.g. an electric car, a smart heating system) outweigh the possible risks they bring (e.g. privacy).	○	○	○	○	○	○
I believe that the benefits of having more connected devices outweigh the increased energy consumption they may generate.	○	○	○	○	○	○
It is unclear to me what digitalisation of the energy system would bring to me as an individual consumer.	○	○	○	○	○	○

5) To what extent do the following areas require further EU policy action when it comes to digitalisation of energy? *[Please rank from 1 (highest priority) to 5 (lowest priority)]*

	1	2	3	4	5
Developing a European data-sharing infrastructure for new energy services	○	●	○	○	○
Empowering individuals to fully participate in the energy transition	○	○	○	●	○
Enhancing the uptake of digital technologies in the energy system	●	○	○	○	○
Enhancing the uptake of digital technologies in the energy system	○	○	○	○	○
Ensuring climate neutrality of ICT	○	○	●	○	○

6) Which other areas would you consider important to further support the digitalisation of the energy system?

> The EU data sharing infrastructure should set a EU energy data space based on interoperability & data sharing obligations covering all data relevant for providing energy services, incl. sub-metering data. It should be supported by a governance framework to ensure transparency & equal data access to all market parties. Other priorities are to support smart active buildings/smart EVs as essential players in the energy system & ensure a high common level of cybersecurity w/ a risk-based approach.

7) What are the three main risks that the integration of digital solutions may bring to the energy system and which should be addressed?

at most 3 choice(s)

- ☐ Lack of investments
- ☐ Complexity of technologies and lack of simple plug-and-play solutions
- ☐ Lack of a consistent regulatory framework
- ☐ Lack of market flexibility, understood as market structures that are unable to promptly integrate intermittent renewables
- ☑ Lack of interoperability because of insufficient use of commonly agreed standards for data exchange for systems and devices
- ☐ Risks related to privacy and data protection
- ☐ Lack of sufficient data exchange due to commercial confidentiality/ existing business models
- ☐ Lack of digital competences and skills
- ☐ Lack of trust and/or public acceptance
- ☑ Risk of cyber attacks
- ☑ Other

If other, please specify

> Other risks should be addressed such as risks related to data protection, lack of trust or public acceptance, cybersecurity (CS)– although CS by design would limit the increase of risks coming from DERs, market fragmentation due to different rules on data sharing/access & distortion to competition in case data access is not open to all relevant market parties following consumer consent. The lack of investments in data infrastructure & lack of digital competences/skills should also be addressed.

8) What other sectors can the energy sector learn the most from when it comes to the integration of digital solutions?

- ☑ Transport and mobility
- ☑ Financial services, Banking, Insurance
- ☑ Building automation/domotica
- ☑ Public Administration

- ☐ Agriculture
- ☐ Water distribution
- ☐ Meteorology
- ☐ Education
- ☐ Culture
- ☐ Advertising & marketing
- ☑ Healthcare
- ☐ All of the above
- ☐ I do not know/No Opinion
- ☑ Other

If other, please specify

500 character(s) maximum

> Beyond other sectors, the Action Plan should build on existing energy projects to improve data access /sharing between different actors connected to the elec system and participating in the market. Various H2020 projects such as TDX Assist, EU Sysflex, Interrface & Onenet are developed to identify the data exchange needed to boost consumers participation in electricity markets, building on CIM-based IEC62325 APIs to support harmonisation of interfaces, facilitate interoperability & data exchange.

9) Please elaborate on the above choice(s) for question 8.

1000 character(s) maximum

> To integrate digital solutions, the energy sectors should look at positive experience from other sectors such as healthcare, public administration when it comes to data protection, communication protocols, data sharing /access using standard-based interoperability. The EU should seek to set up an Energy Data space for sharing energy data based on transparent access by market parties and interoperability between: devices & smart assets (prosumer data), data exchange platforms and marketplaces as the basis for a digital ecosystem connecting all level of the energy system.

II. Individuals and consumers in the digitalisation of the energy system

1) An existing example of digitalisation of energy in everyday life: your energy consumption data

ISSUES

10) How do you expect having access to regular information on your energy consumption (or generation) could impact your role as final customer in the electricity market?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	I do not know
Paying only for what I use (no more estimated bills or back-billing).	○	○	○	○	◉	○
Incentivising to reduce energy consumption and GHG emissions.	○	○	○	○	◉	○
Comparing real consumption figures with those of peers, and better tracking my behaviour.	○	○	○	○	◉	○
Shopping around for the price that is right for me; checking competitive offers and opportunities to switch.	○	○	○	○	◉	○
Adjusting my energy use and making savings; keeping my bills in check.	○	○	○	○	◉	○
Accessing services that could help me improve my carbon footprint.	○	○	○	○	◉	○
Accessing innovative services where I can get tailored energy efficiency advice.	○	○	○	○	◉	○
Accessing innovative services where I can shift my consumption during the day and get rewarded for it (demand response).	○	○	○	○	◉	○
Accessing services that could help me engage with my local energy community.	○	○	○	○	◉	○
Accessing innovative services beyond energy.	○	○	○	○	◉	○

10 a) If other impact, please specify:

100 character(s) maximum

> Also access to services that empower consumers to support system efficiency beyond consumer benefits

11) What could be the risks when you decide to allow service providers of your choice access your metering and consumption (generation) data?

	No risk	Low risk	Medium risk	High risk
Personal data breaches and potential misuse of my leaked data	○	○	○	○
Giving away personal information on my personal habits through detailed data	○	○	○	○
The right permissions for access to my data are not in place, or not properly validated or timely revoked	○	○	○	○
Malpractices or unlawful processing or storage of data by service providers	○	○	○	○
Losing control of my energy consumption	○	○	○	○

11a) If other risk, please specify:

100 character(s) maximum

BARRIERS

12) Have you experienced difficulties when requesting access to your own metering and consumption (generation) data?
- ○ Yes
- ○ No
- ● Not applicable
- ○ I do not know / no opinion

ACTIONS

13) Should it be made easier for final consumers to have access to their real-time and historic consumption and metering data?
- ● Yes
- ○ No

13a) If yes, which mechanism(s) would help achieve this?

- ☑ Having the right tools in place, such as smart meters, for making reliable and granular energy data available.
- ☑ A wide choice of consumer-friendly feedback channels, e.g. in-home display, mobile apps, portals, bills.
- ☐ Common rules for utilities to communicate final customer energy data and ensure a consistent customer experience.
- ☐ A one-stop-shop for online access to energy use data.
- ☐ Enhanced comprehensibility of the collected data and consumptions, and user-friendliness of relevant portals and displays.
- ☑ Other
- ☐ I do not know / no opinion

13b) If other, please specify

200 character(s) maximum

> Sub-metering devices/IoT sensors that communicate with interoperable EMS should be supported as they are key to provide real energy & flex measurements, bringing benefits to both consumers & system

14) Should it be made easier for third parties (such as suppliers, network operators, energy service providers) to have access to data of final customers?

- ◉ Yes
- ○ No
- ○ I do not know / No opinion

14 a) If Yes, which mechanism(s) would help achieve this?

- ☑ An attractive offer to use the data that brings benefits to the individuals.
- ☐ Practical solutions that allow individuals to exercise control, such as mobile and online dashboards or apps.
- ☑ Use of commonly agreed rules and standards to allow for interoperability when it comes to data access and exchange.
- ☑ Security measures to protect the data.
- ☑ Transparent reporting on how the eligible party uses the data.
- ☑ Specific limitations regarding how (long) an eligible party may use specific datasets.
- ☑ Other
- ☐ I do not know / no opinion

14b) If other, please specify

> interoperability w/ open API +data traceability mechanisms to allow new business models access data

15) What measures could mitigate the risks you have identified?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	I do not know
Security measures to protect my data in line with EU rules.	○	○	○	○	◉	○
Transparent reporting on how my data gets used.	○	○	○	○	◉	○
Specific limitations regarding how (long) a party, that is allowed by law or chosen by me, may use specific datasets.	○	○	○	○	◉	○

15a) Any other measure, please specify:

> Consumer to grant access based on full info on use of their data & support EU sharing best practices

2) Consumer empowerment and citizen engagement in the energy transition

ISSUES

16) What are the most important ways for digitalisation of the energy system to significantly improve the engagement of citizens and the empowerment of consumers in the clean energy transition?

at most 3 choice(s)

- ☐ Facilitating decision-making by making it easier for consumers to access relevant information.
- ☑ Raising awareness about energy consumption (e.g. via accessing real-time data, historical comparisons, benchmarking and metering data).
- ☐ Providing tailored advice to reduce the carbon footprint (e.g., energy saving tips based on consumers' past behaviour) and their energy bill(s) for gas and electricity.

- ☐ Improving the understanding of the functioning of the energy system so to reduce their potential distrust (e.g. communication and awareness raising campaign).
- ☐ Empowering consumers to better understand their energy needs and consumption patterns (e.g. keep track of their spending, check their prices, and help save money on their bills).
- ☐ Empowering consumers to choose their supplier / service provider.
- ☑ Encouraging consumers to change their consumption patterns and reduce their energy use during peak times.
- ☐ Enabling more mobilisation at local and regional level by facilitating exchanges and data sharing through energy communities, peer-to-peer trading and group purchasing.
- ☑ Other

16a) If other, please specify

100 character(s) maximum

> Enabling smart energy management & DSF activation, creating revenue for participating in elec market

17) What are the most important services that digital tools can provide to engage citizens or empower consumers in the energy transition?

at most 3 choice(s)

- ☑ Accessing data in a safe, secure and timely manner.
- ☐ Raising awareness through applications that facilitate social interaction and community action.
- ☐ Facilitating the access and visualisation of energy data and information to all in a safe, secure, timely and cost-effective manner.
- ☐ Easier identification of the origin of energy (e.g. if it is produced from renewables or not).
- ☐ Offering services that enable consumers to better understand, control and eventually change without cost their contract (e.g. by tailoring it to their needs in terms of power required on a continuous basis, on a seasonal basis or over a limited period of time), or their behaviour based on their energy production /consumption patterns (with the aim to lower their energy consumption bills also accessible to non-smart phone users (e.g. older persons) or persons with disabilities.
- ☑ Offering smart home services that combine energy services with non-energy services and benefits (e.g. health, safety, convenience).

☐ Offering innovative tailor-made services (e.g. analysis of energy efficiency improvements or investments, peer-to-peer exchange and energy sharing).

☑ Other

17a) If other, please specify

100 character(s) maximum

> Optimising energy consumption/DERs, lower carbon footprint, reward for activating demand-side flex

BARRIERS

18) What are the most important barriers to address so that digital solutions help citizens to engage actively and easily in the energy transition?

at most 3 choice(s)

☐ Lack of social acceptance and mistrust in data sharing.

☐ Lack of appropriate digital tools for individuals to understand and use easily.

☑ Lack of knowledge and awareness from consumers of digital solutions in energy, their use and their benefits.

☐ Lack of skills in using digital solutions in the energy system.

☑ Lack of a framework that fully unleashes the potential benefits of digital solutions for end-consumers (e.g. public incentives, clarity on contractual conditions or switching procedures).

☐ Perceived or real cost of deployment of digital solutions compared to unclear or insufficient benefits.

☐ I do not know/No opinion.

☑ Other

18a) If other, please specify

100 character(s) maximum

> Lack of easy installation/use of digital solution (e.g plug&play connection) & seamless data access

ACTIONS

19) In what order of priority should the European Commission consider the following measures to encourage a more consumer-centric approach to the uptake of digital technologies in the energy system? *[Please rank from 1 (highest priority) to 5 (lowest priority)]*

	1	2	3	4	5

EC action should stimulate the development and implementation of digital tools to support citizens (including at community level) becoming active consumers and invest in the energy transition.	○	●	○	○	○
EC action should encourage an innovative data-driven energy services market to boost consumers' benefits and rights.	●	○	○	○	○
EC action should develop reskilling and upskilling pathways as well as "digital energy literacy".	○	○	○	●	○
EC action should consider additional measures to guarantee that EU citizens' rights that apply offline (in the energy market or when buying a product) can also be fully exercised when procuring digital energy services.	○	○	○	○	●
EC action should use digital tools to support tailor-made solutions to engage individuals in the energy transition that take into account socio-economic and national/regional cultural differences, paying particular attention to the digital divide and energy poverty issues.	○	○	●	○	○

20) Are there other actions that the EU should consider to encourage a more consumer-centric approach to the uptake of digital technologies in the energy system?

1000 character(s) maximum

To support the uptake of prosumers business models, the EU should: 1) Seek to promote best practices of new services/tools that provide information to consumers on the use of their data, allowing them to grant access to their data in an easy/informed way. This should be accompanied by better consumer information on their reference consumption baseline, their flex potential & benefits from activating their demand-side flex (DSF) (e.g. reduced electricity bill, additional revenue streams). 2) Set clearer principles & requirements on data anonymisation & aggregation to ensure the protection of consumer's privacy while supporting the development of prosumer business models. This includes rules governing the possibility for aggregators to handle personal data. 3) Enable data portability & interoperability of both metering & submetering data used for activation, baseline, settlement of demand-response (DR) and associated grid services through the IA on interoperability of DR data.

This is the end of the first part of the questionnaire. The following sections are rather targeted to individuals or organisations with knowledge of the existing EU framework in the relevant fields of intervention. You may submit the questionnaire (at the bottom of the page) at any moment; all questions do not need to be answered.

Would you like to answer the second part of the questionnaire, dealing with specific facets of the digitalisation of the energy system (climate neutrality of ICT, cybersecurity, uptake of digital solutions, data-sharing infrastructure, international aspects) ?

● Yes

○ No

III. Tackling specific facets of the digitalisation of the energy system

1) Supporting the development and uptake of climate neutral solutions for Information and Communication Technologies

ISSUES

21) Which areas of the ICT sector should further contribute to the EU's climate objectives? *[Please rank from 1 (highest priority) to 4 (lowest priority)]*

	1	2	3	4
Data centres, servers, and other data processing	○	●	○	○
Communication infrastructure	○	○	○	●
Distributed devices (e.g. appliances)	●	○	○	○
Software (e.g., communication protocols, blockchain, artificial intelligence or supercomputing applications)	○	○	●	○

22) Please explain your above choices if you deem necessary

1000 character(s) maximum

> The IT-sector electricity demand is expected to increase by nearly 50 % by 2030 vs 2020. Yet, IoT enabled technologies have great potential to reduce energy demand/carbon emissions in all end-use sectors (transport/buildings/H&C/industries). This requires decentralised energy resources (DERs) to be smartly managed &digitally connected among themselves (incl. with interoperable energy management systems) and w/ the energy system to be capable of adjusting their consumption/production automatically & activate their DSF in a time-dependent way in reaction to external signals. This needs a communication infrastructure based on data interoperability & transparency to allow data from these smart assets to be exchanged & valorised in order to support cost-effective decarbonization of the energy system, while reducing consumers' carbon footprint. Data centres are also crucial to allow real-time matching of clean electricity consumption /production & become providers of flex services to the grid

BARRIERS

23) What are the most important barriers for the ICT sector in the EU to invest in sustainable energy and energy efficiency?

at most 3 choice(s)

- ☑ Lack of available climate neutral solutions for the ICT sector
- ☑ Lack of regulatory measures, common standards or rules for greening the ICT sector
- ☐ Lack of private investment in climate neutral solutions for the ICT sector
- ☐ Lack of public investment in research and innovation

- ☐ Lack of awareness or interest of the ICT sector to invest in sustainable energy solutions
- ☐ Lack of interest from consumers to use/procure IT solutions based on sustainable energy
- ☐ Lack of coordination between ICT companies and energy companies (e.g. to use excess heat from data centres for heat supply to buildings, industries or storage)
- ☐ Lack of capital to invest in sustainable energy solutions
- ☐ Lack of sectoral goals for renewable energy sources (RES)
- ☐ Greening requirements would harm the competitiveness of the solutions and industry
- ☑ Other

23a) If other, please specify

100 character(s) maximum

Lack of incentives for flex RES-E consumption by end-users supported by 24/7 carbon&RES-E accounting

ACTIONS

24) In what order of priority should the European Commission consider the following measures related to the greening of the ICT sector? *[Please rank from 1 (highest priority) to 5 (lowest priority)]*

	1	2	3	4	5
EC action should support the IT industry to propose self-regulatory measures and pledges to achieve climate neutrality.	●	○	○	○	○
EC action should consider sustainable energy requirements for the ICT sector, such as energy efficiency targets, and renewable energy use targets.	○	○	○	●	○
EC action should consider establishing a principle of full-lifecycle end-to-end transparency for ICT products and services.	○	○	●	○	○
EC action should consider planning requirements for ICT infrastructure, such as on freshwater use and heat reuse.	○	○	○	○	●
EC action should support research and innovation of climate neutral digital solutions via additional targeted funding.	○	●	○	○	○

25) Are there other actions the EU should consider to green the ICT sector?

1000 character(s) maximum

> The EU should eliminate existing barriers & promote revenue streams that reward DSF activation. Swift implementation of electricity market design is key! Incentives to activate DSF are also needed & should encourage the flexible & time-dependent consumption of energy/optimization of DERs in reaction to external signals. This requires 1) smart technologies capable of interacting with the grid and not just about onsite optimization (e.g. interoperable EMS) and 2) access to system operators essential data by all market parties on real-time network constraints and GHG/RES-E to know when best activate DSF. It will also provide info on the ICT sector's real carbon footprint. This data should be shared in an interoperable manner. TSO/DSO should seek to align their datasets & harmonize open data format to avoid market fragmentation. We recommend revising the Transparency Regulation 543/2013 leveraging CIM-IEC62325 at TSO/DSO level and the work done by ETSI-CEN-CENELEC on smart grid standards.

2) Enhancing the cybersecurity of the energy system

ISSUES

26) Do you believe the energy transition will introduce new cybersecurity risks? Please provide your view on the risk-level per part of the energy system:

26a) Production assets:

	No risks	Yes, low risks	Yes, medium risks	Yes, high risks
Electricity: Centralised production	○	○	○	●
Electricity: Decentralised production (PV, wind farms)	○	○	○	●
Gas, including renewable gases	○	○	○	○
Oil and other liquid fuels	○	○	○	○

26b) Transmission and/or distribution infrastructure

	No risks	Yes, low risks	Yes, medium risks	Yes, high risks
Electricity transmission networks	○	○	○	●
Electricity distribution networks	○	○	○	●
Public charging points for electric vehicles	○	○	○	●
Heat (district heating networks)	○	○	○	●
Gas (including future renewable gases) pipelines, compressor stations, storage facilities	○	○	○	○
Oil pipelines, other fuel pipelines, storage facilities	○	○	○	○

26c) Consumption by household consumers (per type of consuming devices)

	No risks	Yes, low risks	Yes, medium risks	Yes, high risks
Electricity for heating and cooling (e.g., electric radiators, heat pumps, air conditioning)	○	○	●	○
Electricity for appliances and electronics (e.g., lighting, white goods, consumer electronics)	○	○	●	○
Electricity for transport (home charging points, electric cars)	○	○	●	○
Home electricity storage in batteries	○	○	●	○
Gas (e.g. boilers)	○	○	○	○

26d) Consumption by non-household consumers (Industrial and Business)

	No risks	Yes, low risks	Yes, medium risks	Yes, high risks
Electricity	○	○	●	○
Gas	○	○	○	○
Oil, other liquid fuels	○	○	○	○
Home electricity storage in batteries	○	○	●	○
Industrial size storage (industrial batteries, electrolysers)	○	○	●	○

26e) IT infrastructure used by the energy system

	No risks	Yes, low risks	Yes, medium risks	Yes, high risks
Smart Meters for Electricity	○	○	○	●
Smart Meters for Gas	○	○	○	○
Tele-communication infrastructure	○	○	○	●
Data storage (data centres, cloud infrastructure)	○	○	○	●
Data exchange interfaces of electricity-consuming devices	○	○	○	●

27) Specifically related to electricity risks, will the large-scale deployment of connected devices and infrastructures (such as electric vehicles & charging points,

heat pumps, photovoltaic panels & inverters, home or industrial batteries) increase the cybersecurity vulnerabilities of the electricity grid by having an impact in the following areas?

	No risks	Yes, low risks	Yes, medium risks	Yes, high risks
The uninterrupted service/ security of electricity supply	○	○	●	○
Reliability of data for other commercial operations (B2B or B2C), like billing for charging, trading, aggregation	○	●	○	○
Personal data collected and processed by those connected devices	○	○	○	●
Security and reliability of connected devices to the grid	○	○	○	●

28) Out of the suggested actors, which ones would be best placed to manage and mitigate the cyber risks for the sectors listed in the table?

28a) Production assets:

	The asset owners or Operators on behalf of owners	The manufacturer of the equipment	The network operator	The internet service provider	Data exchange or storage service providers	Member State or national authority to oversee the management and mitigation of cyber risks by the private sector	EU level authority to oversee the management and mitigation of cyber risks by the private sector
Electricity: Centralised production	☑	☐	☑	☐	☑	☑	☑
Electricity: Decentralised production (PV, wind farms)	☑	☑	☑	☐	☑	☑	☑
Gas, including renewable gases	☐	☐	☐	☐	☐	☐	☐
Oil and other liquid fuels	☐	☐	☐	☐	☐	☐	☐

28b) Transmission and/or distribution infrastructure

	The asset owners or operators on behalf of owners	The manufacturer of the equipment	The network operator	The internet service provider	Data exchange or storage service providers	Member State or national authority to oversee the management and mitigation of cyber risks by the private sector	Member State or national authority to oversee the management and mitigation of cyber risks by the private sector
Electricity transmission networks	☐	☐	☑	☐	☐	☑	☑
Electricity distribution networks	☐	☐	☑	☐	☐	☑	☑
Public charging points for electric vehicles	☐	☑	☐	☐	☑	☐	☐
Heat (district heating networks)	☑	☑	☑	☐	☑	☑	☑
Gas (including future renewable gases) pipelines, compressor stations, storage facilities	☐	☐	☐	☐	☐	☐	☐
Oil pipelines, other fuel pipelines, storage facilities	☐	☐	☐	☐	☐	☐	☐

28c) Consumption by household consumers (per type of consuming devices)

	The asset owners or operators on behalf of owners	The manufacturer of the equipment	The network operator	The internet service provider	Data exchange or storage service providers	Member State or national authority to oversee the management and mitigation of cyber risks by the private sector	EU level authority to oversee the management and mitigation of cyber risks by the private sector
Electricity for heating and cooling (e.g., electric radiators, heat pumps, air conditioning)	☑	☑	☐	☐	☑	☑	☑
Electricity for appliances and electronics (e.g., lighting, white goods, consumer electronics)	☑	☑	☐	☐	☑	☑	☑
Electricity for transport (home charging points, electric cars)	☑	☑	☐	☐	☑	☐	☐
Home electricity storage in batteries	☑	☑	☐	☐	☑	☑	☑
Gas (e.g. boilers)	☐	☐	☐	☐	☐	☐	☐

28d) Consumption by non-household consumers (Industrial and Business)

	The asset owners or operators on behalf of owners	The manufacturer of the equipment	The network operator	The internet service provider	Data exchange or storage service providers	Member State or national authority to oversee the management and mitigation of cyber risks by the private sector	EU level authority to oversee the management and mitigation of cyber risks by the private sector
Electricity	☑	☑	☐	☐	☑	☑	☑
Gas	☐	☐	☐	☐	☐	☐	☐
Oil, other liquid fuels	☐	☐	☐	☐	☐	☐	☐
Home electricity storage in batteries	☑	☑	☐	☐	☑	☑	☑
Industrial size storage (industrial batteries, electrolysers)	☑	☑	☐	☐	☑	☑	☑

28e) IT infrastructure used by the energy system

	The asset owners or operators on behalf of owners	The manufacturer of the equipment	The network operator	The internet service provider	Data exchange or storage service providers	Member State or national authority to oversee the management and mitigation of cyber risks by the private sector	EU level authority to oversee the management and mitigation of cyber risks by the private sector
Smart Meters for Electricity	☑	☑	☐	☐	☑	☑	☑
Smart Meters for Gas	☐	☐	☐	☐	☐	☐	☐
Tele-communication infrastructure	☑	☐	☐	☐	☐	☑	☑
Data storage (data centres, cloud infrastructure)	☑	☑	☐	☐	☑	☑	☑
Data exchange interfaces of electricity-consuming devices	☑	☐	☐	☐	☑	☑	☑

BARRIERS

29) What are the most important barriers to strengthening cybersecurity in the various segments of the energy value chains?

at most 3 choice(s)

- ☑ Organisational barriers (e.g. the insufficient cooperation at sectoral level or the lack of appropriate skills in companies)
- ☐ Financial barriers (e.g. relevant organisations not investing enough in cybersecurity compared to other areas of investment)
- ☐ Market barriers (e.g. market mechanisms do not incentivise cybersecurity enough)
- ☐ Technical barriers (e.g. lack of credible cyber-certification schemes)
- ☑ Information barriers, diversity of standards, lack of clarity on what should be used/adopted (e.g. Regulations in force or internal company rules prevent the exchange of relevant information with other market participants)
- ☐ Regulatory barriers (e.g. lack of regulatory requirements)
- ☑ Other barriers

29a) If other barriers, please specify

100 character(s) maximum

> Current regulatory focus limited to cross-border flow & not Cybersecurity of the entire elec system

ACTIONS

30) In addition to the existing framework, in what order of priority should the European Commission consider the following measures to enhance cybersecurity of the energy system? *[Please rank from 1 (highest priority) to 5 (lowest priority)]*

	1	2	3	4	5
EC action should elaborate non-binding guidance on cybersecurity in energy, complementing the existing Commission recommendation C (2019)2400 on the cybersecurity in the energy sector.	○	○	●	○	○
EC action should enhance European energy cybersecurity cooperation, for example by promoting the exchange of information and best practices, in line with Directive on measures for high common level of cybersecurity across the Union known as the NIS directive and future NIS2, but also including specific requirements if deemed necessary.	●	○	○	○	○
EC action should consider establishing a network code for the cybersecurity of gas operations.	○	○	○	○	○

EC action should consider additional cybersecurity certification schemes (and/or promote the use of internationally recognized cybersecurity standards), in line with the Cybersecurity Act (Regulation 2019/881) of 17 April 2019. They would be linked to specific levels of assurance for energy related products and services (complementing others like "basic", "substantial", "high").	○	●	○	○	○
EC action should foster international cooperation with like-minded partners (states) and require equivalent level of privacy and data protection.	○	○	○	●	○

31) Are there other actions the EU should consider to further ensure the cybersecurity of the energy system?

1000 character(s) maximum

> The EU should set a EU framework focusing on ensuring the Cyber-Security (CS) of the entire electricity system and not only of the cross-border flows. All entities across the value chain should be responsible for ensuring their own CS. A common set of harmonised min requirements for all energy entities connected to the power system, including at grid-edge, should be set with proportional obligations based on their actual risk level & impact on the system. CS requirements should rely on existing families of standards that are interoperable to avoid any vendor lock-in risks. Without mandating their adoption as the unique certifiable standard, standard families ISO27000 for ICT management and IEC62443 for ICT products could be used. CS protection needs to be embedded in the active control devices. CS by design would limit the increase of CS risks coming from DERs but should be accompanied by interoperability requirements to support the use of these data in providing energy services.

3) Enhancing the uptake of digital solutions in the energy system

ISSUES

32) Do you agree that the below list of digital solutions as key enablers of the energy transition is exhaustive?

- 5G (5th Generation Network Technology)
- Advanced Distribution Management Systems (ADMS)
- Artificial Intelligence (AI)
- Big Data
- Blockchain/ Distributed Ledger Technology (DLT)
- Aggregation Platforms in the field of Demand Response and Electromobility and Virtual Power Plant (VPP) Platforms
- Homes and Building Energy Management Systems (HEMS and BEMS) automating data processing
- Cybersecurity technologies
- Distributed Energy Resource Management Systems (DERMS)

- Hardware/infrastructure and Software for EV charging (Public Key Infrastructure PKI) only for automated charging
- High Performance Computing (HPC)
- Internet of Things (IoT)
- Machine Learning
- Smart Meters / Advanced metering infrastructure (AMI)
- Smart Thermostats and heat pumps with flexible energy management
- Software platforms for Operations & Maintenance (O&M)

○ Yes
◉ No

32a) If no, please complete

500 character(s) maximum

> To be exhaustive the list should include all digital DERs present in all end-use sectors (buildings, transport & industries) such as smart controllable load (H&C systems, V1G/V2G, small home appliance); storage devices & small scale-RES generation. But it should specify that these digital solutions need to be interoperable with the grid if they want to contribute to the energy transition and adjust their load/activate DSF in reaction to external signals. This is also the case for H/BEMS.

33) Among the following potential benefits of integrating digital solutions in the energy system, what would you say are the most important ones?

at most 3 choice(s)

☐ Increasing flexibility and resilience of the energy system (e.g. increasing average time between failures, and limiting the consequences of power failures to a smaller number of users and for a smaller period of time).

☐ Increasing the efficiency of the management of the energy system

☐ Increasing the energy efficiency and sustainability of the energy system

☐ Decreasing the GHG emissions of the energy system and its impact on climate

☐ Improving the safety and productivity of the energy system

☐ Increasing the share of renewable energy in the energy system

☐ Optimising the use of energy in different sectors, better balancing energy supply and demand

☐ Reducing the use of energy use in different sectors (buildings and homes, transport, industry)

☐ Improving the engagement of market actors, including empowering consumers and engaging citizens.

☐ Integrating sectors, notably electricity, heating and cooling and transport

☐ Integrating energy services with non-energy services and benefits

☑ Other

33a) If other, please specify

100 character(s) maximum

> All + savings on grid expansion and fossil generation investment due to active system management/DSF

BARRIERS

34) What are the most important barriers preventing <u>the development of new innovative digital solutions</u> in the energy system?

at most 3 choice(s)

☐ Lack of Public R&I investments

☐ Lack of private R&I investments

☑ Lack of finance to move from research to demonstration

☑ Lack of harmonisation and standards

☐ Lack of skills and digital innovators in the field of energy

☐ Lack of pilot projects

☐ Lack of acceptance in the energy system

☐ IT companies focus on other more profitable sectors

☐ Energy companies are not sufficiently aware

☐ Inadequate Energy market regulation

☐ Lack of availability of open-source solutions

☑ Other

34a) If other, please specify

100 character(s) maximum

> Barriers to1)data access 2)transform end-users into smart assets +no incentive to activate their DSF

35) What are the most important barriers to <u>the wide deployment of more mature di</u><u>gital solutions</u> in the energy market?

at most 3 choice(s)

☐ Lack of public investments

☑ Lack of private investments

☐ Lack of finance to move from demonstration to commercialisation

☐ Lack of harmonisation and standards

☐ Lack of skills to use existing solutions and integrate them to the energy system

- ☐ Lack of pilot projects
- ☐ Existing solutions lack quality
- ☐ Access to capital to buy existing solutions
- ☐ Lack of a developed energy market
- ☐ Lack of acceptance of the actors in the energy system
- ☐ Energy companies are not sufficiently aware of existing digital solutions
- ☐ Social awareness and acceptance, lack of trust of potential users
- ☑ Inadequate Energy market regulation
- ☐ Lack of information, good examples and best practices are not sufficiently promoted
- ☐ Lack of availability of open-source solutions
- ☑ Other

35a) If other, please specify

100 character(s) maximum

> Lack of requirement to transform end-users into flex assets +low reward/incentive for DSF activation

ACTIONS

36) In what order of priority should the European Commission consider the following measures related to the uptake of digital technologies in the energy system? *[Please rank from 1 (highest priority) to 5 (lowest priority)]*

	1	2	3	4	5
EC action should foster research and innovation to develop new digital solutions in the energy system and explore synergies between digitalisation and energy objectives.	○	●	○	○	○
EC action should further help innovators move from innovation to commercialization.	○	○	○	●	○
EC action should stimulate investments on market uptake of already developed digital solutions to be further integrated in the energy system.	●	○	○	○	○
EC action should promote the development of open-source software for the energy system.	○	○	○	○	●
EC action should set minimum requirements or targets for the use of IT in the energy system and monitor its progress.	○	○	●	○	○

37) Are there other actions the EU should consider to further exploit the uptake of digital solutions in the energy system?

1000 character(s) maximum

> The EU should ensure technology roll-outs for smart assets in end-use sectors as it can achieve significant energy efficiency/GHG gains in these sectors and enable local flexibility and well-functioning electricity system. Technology rollouts & country specific provisions should not lead to negative lock-in effects & should cater for future needs (e.g. bidirectional charging). It should also promote best practices of new services /tools aiming at improving consumer info & trust on the use of their data & benefits of digital solutions. Innovation is also a key pillar & the EU should investigate and support projects that aim to facilitate data exchange for the different use cases (e.g. buildings & renovation data, EV data) and which will support consumer's participation in electricity markets. We recommend investigating projects that would allow aggregator to request access & use EMS data, in the case of EMS interacting with the system) and their valorisation in the electricity markets.

4) Data exchange, data spaces and data sharing infrastructure for new energy services

ISSUES

38) What type of data are most important to develop data-driven or data-based activities/services in a way that contributes to the energy transition?
- ☑ Data generated by my own activities
- ☑ Data generated by my clients/users of my products
- ☑ Data generated by other actors in the energy system
- ☑ Data generated by other actors in other sectors

39) What type of data is most important to develop data-driven or data-based activities/services in a way that contributes to the energy transition? Data from:
at most 5 choice(s)
- ☑ Smart metering
- ☐ Energy-consuming appliances
- ☐ Heating and cooling
- ☑ Energy network operations (e.g. electricity grid)
- ☑ Building automation/domotica
- ☑ Electric vehicles
- ☐ Other transport and mobility services
- ☐ Financial services, Banking, Insurance
- ☐ Social media
- ☐ Public Administration
- ☐ Meteorology
- ☐ Advertising & marketing
- ☐ Healthcare

☐ All of the above

☐ I do not know

☑ Other

39a) If other, please specify

100 character(s) maximum

> Consumers' submetering data + system operators' data on network constraint & 24/7 RES/GHG share

40) Among the potential benefits of data exchange for the clean energy transition listed below, what would you say are the three most important ones?

at most 3 choice(s)

☑ Enabling better strategic planning and decision-making for the development of the energy system, in particular for infrastructure.

☐ Optimising the efficiency of energy production by using data for better asset management.

☑ Balancing energy supply and demand through demand response and flexibility markets.

☐ Better linking infrastructure investment and use of the various energy carriers - electricity, heat, cold, gas, solid and liquid fuels - with each other and with the end-use sectors, such as buildings, transport or industry.

☐ Developing new and providing better data-driven energy services to consumers.

☐ Empowering consumers to engage in the clean energy transition, for example through increased awareness, energy communities or behavioural changes.

☐ Facilitating investments in building renovations.

☐ I do not know

☑ Other

40a) If other, please specify

100 character(s) maximum

> All are important to meet Green deal goals, system integration & implement EE1st principle

BARRIERS

41) What are the most important barriers to unlock the potential of data for the EU's energy transition...?

41a) ...at an operational level * :

☐ Lack of experience in data sharing and valorisation.

- ☑ Lack of possibilities to access or share data in a safe and reliable manner.
- ☐ Fear of loss of autonomy and control on the use of data once shared.
- ☐ Uncertain or unbalanced data monetisation models (e.g. due to single or collective market power or dominance of one or more enterprises)
- ☑ Little incentives for the data provider/generator to share data
- ☑ The lack of interoperability for data exchange between devices and/or actors (e.g., energy suppliers, citizens, network operators, building managers, public authorities).
- ☑ The lack of common EU-wide standards for data exchange between devices and actors (e.g., energy suppliers, citizens, network operators, building managers, public authorities).
- ☑ The lack of open Application – Programming Interfaces (API's) for data exchange between devices and/or actors.
- ☐ The lack of easy and digital identification to validate access to consumer /customer data (e.g. the use of a digital identity)
- ☑ The lack of a European cloud infrastructure that can safely manage data exchange between EU companies.

41b) ...at a management level:
- ☑ The lack of EU-wide platforms or marketplaces to manage data sharing in the energy system.
- ☑ The lack of cooperation of national organisations to harmonise evolving data sharing infrastructure in the energy system.
- ☑ The lack of a mandate of the existing organisations to harmonise a data sharing infrastructure in the energy system.
- ☑ The lack of support for the existing organisations to establish a data sharing economy in the energy system.

41c) … from a legal perspective:
- ☑ The lack of legal certainty on the responsibilities of involved actors in relation to data sharing.
- ☑ The lack of an EU-wide public authority to ensure that operators in the energy system comply with their obligation to share data.
- ☑ The lack of cooperation of national public authorities to ensure data sharing in the energy system.
- ☑ The lack of enforcement to ensure data sharing in the energy system.

41d) Any other barrier, please specify

500 character(s) maximum

> 1) lack of data portability to avoid consumer lock-ins to be supported by an open API; 2) lack of universal connector on smart meters across EU & barriers to real-time local access to smart meters' data; 3) insufficient rules for aggregators to handle personal data. EU should strike balance bet/ consumer data privacy & prosumer business models devpt. 4) Access to grid operators' essential data 5) Access to sub-meter data used for baseline & settlement of DR and grid services.

* More information is available [here](#).

42) What key elements to enable EU-wide data sharing in the energy system are missing* ?

- ☑ Data and messaging standards
- ☑ Model operational agreements for data sharing
- ☑ Legal agreements for data sharing
- ☑ Pricing/earning models to gain revenues from data or data sharing
- ☑ Connectivity
- ☑ Governance of data access and exchange
- ☐ Metadata (information about data that helps describe, structure or administer that data)
- ☐ A clear framework for authorisations (consents) for data sharing
- ☐ Identification and authentication
- ☐ All of the above
- ☐ I do not know
- ☑ Other

42a) If other, please specify

100 character(s) maximum

> Interoperability of prosumers (incl. sub-meter) & grid/market data + datasets for grid/market data

* More information is available [here](#): presentation by InnoPay at the Alliance for the Internet of Things (AIOTI) Webinar of 8 March 2019.

43) Have you ever experienced difficulties/issues to get access to final customer's metering and consumption data?

- ⦿ Yes
- ◯ No

43a) If yes, what was the nature of such difficulties / issues?

	Strongly disagree	Somewhat disagree	Neither agree nor disagree	Somewhat agree	Strongly agree	I do not know
Legal uncertainty due to different rules across Member States	○	○	○	○	◉	○
Commercial disincentives or lack of willingness by company	○	○	○	◉	○	○
Lack of interest or awareness by consumer	○	○	○	◉	○	○
Lack of appropriate infrastructures	○	○	○	○	◉	○
High cost of providing or processing such data (e. g. interoperability issues)	○	○	○	○	◉	○

ACTIONS

44) In what order of priority should the European Commission consider the following measures related to facilitating data exchanges and creating a data sharing infrastructure for new energy services? *[Please rank from 1 (highest priority) to 5 (lowest priority)]*

	1	2	3	4	5
EC action should create a legal framework that defines rules, roles and responsibilities for access to data and data exchange for the energy system.	◉	○	○	○	○
EC action should set EU wide standards and protocols for access to data and data exchange.	○	◉	○	○	○
EC action should create a governance structure that involves stakeholders to organise access to data and data exchange in the energy system.	○	○	◉	○	○
EC action should aim to provide an EU-wide secure cloud infrastructure for data storage and data exchange for the energy system.	○	○	○	◉	○
EC action should leave the market to organise access to data and data exchange in the energy system.	○	○	○	○	◉

45) Are there other actions the EU should consider to enable data exchange in the energy system?

1000 character(s) maximum

The EC should set a EU Energy Data space to support data access by all market parties, which should be built on transparency and interoperability of data covering both 1) prosumers data which include metering and submetering data & 2) System operators essential data on network constraint, GHG and energy mix. A EU-wide harmonised rule-set for the sharing & interoperability of sub-meter data when needed for baseline, DR settlement & grid services should be developed as part of the IA on interoperability of DR data. The relevant data parameters should also be based on harmonised prequalification requirements, defined for instance by means of flexibility service APIs. Grids/markets data should be shared in an interoperable manner. TSO/DSO should seek to align their datasets and harmonize open data format to avoid market fragmentation. We recommend revising Transparency Regulation 543/2013 leveraging CIM-IEC62325 at TSO/DSO level and the work done by ETSI-CEN-CENELEC on smart grid standards

5) International cooperation

46) For what issues do you consider international cooperation the highest priority when it comes to digitalisation of energy? *Please rank from 1 (highest priority) to 5 (lowest priority).*

	1	2	3	4	5
Developing a European data-sharing infrastructure for new energy services.	○	●	○	○	○
Empowering individuals to fully participate in the energy transition	○	○	○	○	●
Enhancing the uptake of digital technologies in the energy system	○	○	●	○	○
Ensuring cybersecurity, data protection and privacy	●	○	○	○	○
Ensuring climate neutrality of ICT	○	○	○	●	○

47) Who is it most important for the European Union to cooperate with at an international level when it comes to digitalising the energy system?

at most 3 choice(s)

- ☐ Canada
- ☐ China
- ☐ India
- ☐ Japan
- ☑ United States of America
- ☑ United Kingdom
- ☐ Russia
- ☐ All Asian countries
- ☐ All African countries
- ☐ All North-American countries
- ☐ All Latin-American countries and Regional Organisations (CELAC)

☐ European Economic Area (EEA) and European Free Trade Association (EFTA) member countries (that are not EU members)

☐ EU candidate countries

☐ Energy Community Contracting parties

☑ OECD-member countries (that are not EU members)

☐ Union for the Mediterranean

☐ Other

48) What should international cooperation focus on? *Please rank from 1 (highest priority) to 5 (lowest priority).*

	1	2	3	4	5
Development of standards and technical rules (for example for information security, interoperability of appliances/devices).	●	○	○	○	○
Development of governance to oversee data exchange between companies and public authorities in the energy system.	○	○	○	●	○
Exchange of best-practices (for example through joint data-bases) on all 5 issues listed in question 47.	○	○	○	○	●
Address digitalisation of energy in bilateral cooperation discussions and high-level dialogues.	○	○	●	○	○
Address digitalisation of energy in multi-lateral forums (e.g. IEA, OECD, IRENA, G7, G20, Mission Innovation, Clean Energy Ministerial).	○	●	○	○	○

49) Are there other actions the EU should consider to promote international cooperation on digitalisation of energy?

1000 character(s) maximum

> smartEn recommends the European Commission to work with international partners such as the US to develop international standards related to the interoperability of data exchange platforms and marketplaces in view of strengthening Europe's industrial leadership (and thus ease the re-export of European approach and technologies as part of the EU industrial strategy and Standardisation strategy).

IV. Further comments or suggestions

50) Do you / your company / your organisation have any further comments?

1000 character(s) maximum

smartEn welcomes the Action Plan's core objective to develop a market for DSF which is key to boost consumers' participation & increase system efficiency. It is a key opportunity to support the 'Fit for 55'. As a 1st priority the Action Plan should support the uptake of digital techno capable of communicating w/ the grid & 2nd, create a EU data-sharing infrastructure with a common EU energy data space, based on data transparency & interoperability. This should cover 1) prosumers data from both smart meters & sub-meters as the latter are key to ensure full coverage of DSF potential & 2) system operators essential data on network constraint & energy mix in order to give appropriate signal on when it is best to activate DSF. The governance framework needed to ensure equal data access should be based on stakeholder engagement. Finally, Cybersecurity is a prerequisite for all data driven business models & should ensure the operational security of the entire energy system, from end to end.

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