The European Association of Electrical Contractors

Digitalisation in the Energy Sector - Questionnaire

CONTEXT

Within the Energy Union, three key targets and policy objectives have been established in light of the 2030 climate and energy framework of the EC: 40% cut in greenhouse gas emissions, 32% share for renewable energy and 32.5% improvement in energy efficiency.

To achieve these objectives, five mutually reinforcing dimensions work together to balance the overarching energy triangle (energy security, sustainability, competitiveness) and enable the achievement of the **2030 climate and energy framework**. These dimensions are: (1) Energy security; (2) Internal energy market; (3) Energy efficiency, (4) Decarbonisation, (5) Research, innovation and competitiveness**.** The Energy Union Strategy also recognises that an innovation-driven transition to a low-carbon economy offers great opportunities for growth and jobs. This would lead to the increasing flexibility in the electricity sector, emergence of new business sectors, new business models and new job profiles. Nevertheless, the transition will also imply adjustments in some sectors, business models or job profiles.

On the other hand, the data-driven nature of the transformation of the energy sector requires understanding the interdependence with the **Digital Single Market**, to ensure access to online activities for individuals and businesses under conditions of fair competition. The relevant areas include: (1) Interoperability and related standards; (2) Horizontal legislation on data: the General Data Protection Regulation (GDPR), free flow of non-personal data (FFD), e-Privacy Regulation; and (3) Cybersecurity.

The legal basis for bridging the objectives of the Energy Union and the digital transformation of the energy sector is already present in the **Clean Energy for All Europeans package**. The Market Design Initiative introduces new provisions closely related to the digitalisation of the electricity sector. In particular, the provisions within the newly adopted Electricity Directive on demand response, dynamic prices, flexibility procurement, access to data, interoperability and data management. The Energy Performance of Buildings Directive promotes digitalisation of buildings through the establishment of a smart readiness indicator for buildings and through the introduction of requirements for the deployment of recharging infrastructure for electric vehicles. For heating and cooling, the revised Energy Efficiency Directive requires a transition to remote readable metering devices in district heat and cooling networks and in sub-metering systems within multi-apartment and multi-purpose buildings.

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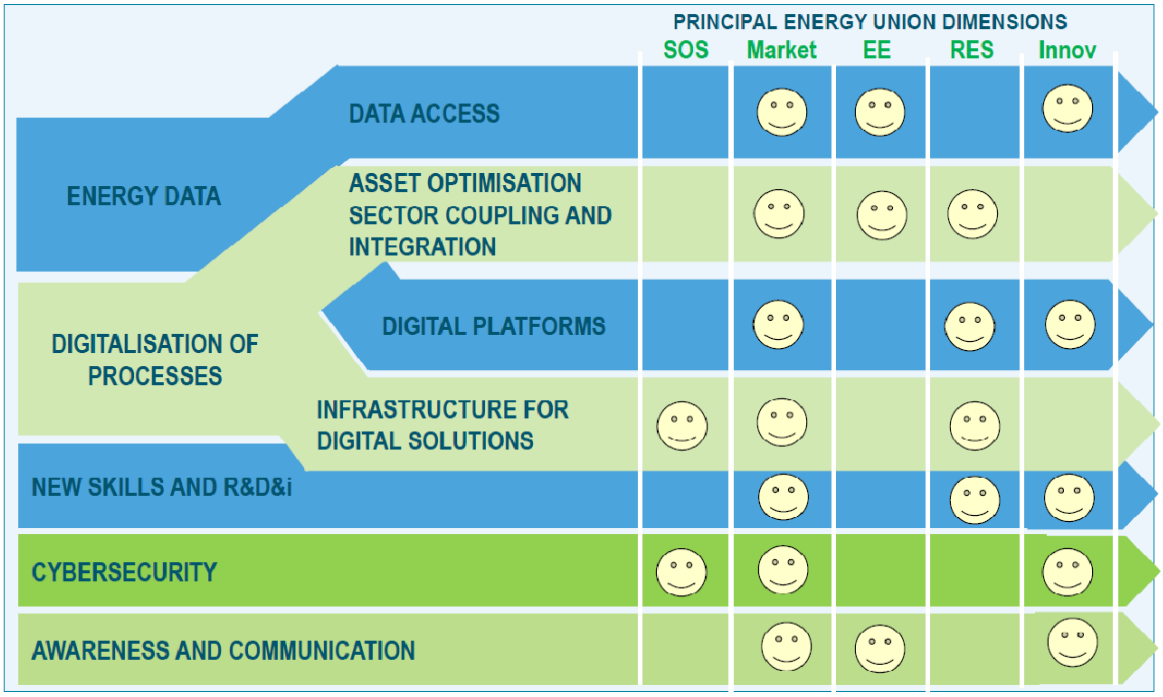
QUESTIONNAIRE

The figure below summarises a possible mapping of the different clusters on the digitalisation of the energy sector and the impact into the principal Energy Union dimensions.



The paragraphs below describe each of these clusters and propose relevant questions to understand better their status and impacts. Please, insert your answers under each question in the boxes below and send your contribution back to ENER-DIGITALISATION-TASK-FORCE@ec.europa.eu **before 15 September**. Please indicate whether you reply as individual expert or as an organisation/association; in the last case, please provide the full name and coordinates of the organisation as well as your position in such organisation.

1. Data Access

Data Access refers to the rules ensuring that data should be sourced easily, while its flows should be constrained to the lowest possible extent. Through this area, the Commission should aim at achieving a fair usage of energy data and boost innovative markets and services by ensuring competitiveness, accessibility and consumer engagement.

Questions

1. How could the access to non-sensitive energy data be improved in order to increase the accessibility and eliminate market barriers?
    - To achieve fair competition on the energy market, free flow of data must be ensured. All market players should be guaranteed quick and easy access to non-sensitive energy data. Today, distribution grid operators handle most of the energy data. However, as connected machines and devices, as well as energy management systems (often supported by artificial intelligence) become mainstream technologies, the amount of non-sensitive energy data and related services will grow exponentially, and market actors will increasingly need access to such data. Electrical contractors are amongst the most important market actors needing data access. Indeed, not only do they design and install energy infrastructure, but they also increasingly manage and maintain such infrastructure, particularly in buildings (residential, commercial and industrial). Fair data access for all market parties will be guaranteed particularly by the speedy development of a limited amount of standardised open data platforms, which are easily accessible through websites. Platforms for smart meters are the first ones under development (e.g. smart meter gateway in Germany, data hub in Finland, …), but platforms for other connected objects should follow shortly.

2. How could existing initiatives on interoperability standardisation [e.g. for smart appliances] be used to further data access and consumer engagement?
    - To facilitate data access, these initiatives should result in a limited amount of standardised open platforms, a limited amount of access points (e.g. 3 per building) and very easy access, e.g. websites.

3. What data-driven services and related new business models can help the energy transition (e.g. combining health, mobility and energy data to trigger smart home services)?
    - Energy: peak shaving, grid (ancillary) services, energy efficiency and savings, decarbonisation through renewable and storage technologies, ...
    - Mobility: smart charging of electric vehicles, electric vehicles to provide grid (ancillary) services, to support peak shaving, ...
    - Health: energy consumption data to support assisted living for elderlies and handicapped population, and to support indoor comfort.

4. How can fair access to data contribute to energy efficiency in buildings and consumer engagement in demand response schemes?
    - Fair access to data enables service providers to handle complete energy management systems and deliver smart home services. Energy management systems make buildings more energy efficient. The provision of transparent, clear and meaningful energy data (e.g. via in-home displays) to consumers raises their awareness and can positively influence their energy behaviour, triggering energy savings and efficiencies.

5. How can open data on meteorological conditions be used to help integration and forecasting of variable renewable energy into the electricity system?
    - Meteorological data helps understand when meteorological conditions and consumers' energy needs are in unison and when they defer. For example, if the sun shines, less heating is needed and the energy produced on-site, e.g. by a roof-top solar system, can be stored locally. A smart home system will know when a consumer is at home, when he/she uses energy, and will be able to align with meteorological predictions. As the data stock grows, algorithms supported by artificial intelligence will have to implemented.

2. Digital Platforms

Digital platforms are data-driven solutions that have the potential to create new markets and services throughout the whole energy chain. Through this area, the Commission should strive to achieve (1) open markets through fair competition and market access, (2) interoperability to boost technological change and (3) consumer choice to strengthen consumer participation in the energy transition.

Questions

1. Which digital platforms already exist in the energy sector for (i) flexibility markets (congestion management) and (ii) trading day ahead, intraday and balancing? Can they be used for selling electricity and demand side flexibility products?

- In addition to the platforms offering the functions / services mentioned in the question, new platforms for peer-to-peer trading are emerging across Europe. They allow energy measurements and physical (between neighbours) or virtual (across districts and regions) energy exchanges.

2. In order to create fair competition and access to new markets and services, how should the role of existing and new digital platforms be developed? What should be the criteria to harmonise or not those digital platforms?

3. How should we ensure that the governance of platforms facilitates data access, exchange, interoperability and ensures data sovereignty (i.e. no lock-in) for those who supply data to the platform?

   - A key element is the presence of an independent third-party, which market actors, who have problems accessing relevant data, can contact and lodge a complaint with.

4. What are the data-driven service models of the future? In order to stimulate the creation of new data-driven services, could technological innovations [such as Big Data, AI, Blockchain, Service Platform Architectures] be used to (i) manage how electricity flows, (ii) perform energy forecasting, (iii) create new remuneration/financing mechanisms, and (iv) create new ways of managing transactions (smart contracts, Blockchain)?

5. Which digital platforms are being developed to support sharing energy within energy communities, including for allowing them to be open to cross-border participation)?

3. Asset optimisation, sector coupling and integration

The Commission aims to establish to what extent digitalisation can accelerate to the optimisation of processes and infrastructure to further decarbonise the energy sector and integrate renewables into the energy network. This are will assess whether ICT can be of use to link energy carriers, integrate the energy sector with other sectors and/or optimise assets such as buildings and wind turbines.

Questions

1. How can digitalisation facilitate sector coupling and sector integration? What are the existing use cases? Which digital technologies applicable to sector coupling exist in the market?
    - The place where digital technologies can facilitate sector coupling is definitely buildings, which are at the crossroads of the electricity, heating and transport sectors. Digitalisation should turn buildings into "smart nodes" supplying energy-related data through gateways, to support the management of the local grid and its components.

2. How to speed up the investment in digitalised (remotely monitored and controlled) assets, in particular in areas/sectors where this is not the priority (e.g. buildings, electricity or district heating grids in Southwest and Central Europe)?
    - There must be incentives, both at EU and national/local level, for consumers and property owners to invest into smart homes, renewable energy plants and into clean vehicles. There has to be a pricing system which internalises environmental costs, therefore showing that above mentioned technologies are good for the environment and for the economy.

3. What are the socio-economic and regulatory preconditions for enhancing the use of digital technologies that facilitate sector coupling? For example, how could digitalisation facilitate the deployment of power-to-gas?
    - The precondition is making the consumer understand how he/she uses energy, which source this energy comes from, what impact the use has on the environment and what can be improved. Digitalisation enables systems to connect and combine data and make such data easily available to the user.

4. In order to integrate renewable and low-carbon gas into the gas network, how would connectivity and data analytics contribute to measuring and metering?

5. In order to improve consumer's energy consumption awareness, how would smart meters measuring calorific value, in addition to gas volume, contribute to more accurate billing?

6. How can policy instruments support the deployment of a critical mass of energy-smart appliances?

7. How can smart buildings and energy-smart appliances contribute to a broader integration of RES, optimise local consumption and improve energy efficiency?

8. What digital solutions are available to allow for differentiation of electricity sources at charging stations for electric vehicles?

4. Infrastructure for digital solutions

Digital infrastructure enables decarbonisation and further decentralisation, which can lead to more flexibility in the energy sector. Through this area, the EC should assess whether legislative action is needed to support the development of IT infrastructure for digital assets and services in the energy sector.

Questions

1. What opportunities would a digitalised energy network bring to decentralised and/or energy communities models?

2. In order to enable the decarbonisation of the energy sector, how would digitalisation contribute to system/grid management assets and services?

3. How to ensure that the future telecommunication infrastructure provides the type and quality of services (at a competitive/reasonable cost) that the energy transition requires?

4. Given the development of new technologies such as 5G, IoT, blockchain and AI, how can consumer's connectivity and security be ensured?

5. What digital solutions are available to allow remote management of isolated electricity systems in rural areas and/or islands?

5. Cybersecurity

Given that energy services are essential to the economy, and that these services are progressively subject to data-driven transformation, their cybersecurity should be ensured. Hence stressing the interaction and interdependence between energy and digital infrastructure. Through this area, the Commission should therefore ensure the security of the digitalised energy services and infrastructure, in order for consumers to make digital choices.

Questions

1. To what extent is the Commission Recommendation on Cybersecurity[1] implemented? What needs to be further considered to address the particularities of the energy sector in terms of cybersecurity, namely real-time requirements, cascading effects and the mix of technologies?
    - An area which is not covered by the Recommendation is the role of installers of products or infrastructure which could be exposed to cyberattacks. Installers often integrate connected objects, which may meet cybersecurity protection standards at single level, but which may become more vulnerable to cyber-attacks when connected to each other. Moreover, if a system suffers a cyberattack, the installer may be the first professional whom the consumer would contact, rather than the product manufacturer (especially when systems are made of products from different brands). This means that installers should be involved in government initiatives for the implementation of the Recommendation, particularly in initiatives aiming at building up knowledge and skills related to cybersecurity in the energy sector.
2. How would you estimate the costs of addressing the particularities? Can you provide examples?

[1] Commission Recommendation of 3.4.2019 on cybersecurity in the energy sector, C(2019) 2400 final, https://ec.europa.eu/energy/sites/ener/files/commission_recommendation_on_cybersecurity_in_the_energy_sector_c2019_2400_final.pdf

3. How can digitalised distributed renewable power generation contribute to the resilience of the EU electricity system?

4. How can we ensure that digitalised distributed power generation (renewables, flexibility via e-mobility, etc.) is not a liability to the resilience of the EU electricity system?

5. What is the right approach of information sharing at a higher level? (e.g. events, etc.)

6. New skills and capabilities, Research and Development

The digitalisation of the energy transition must be supported by new technological developments and upgrade of skills of energy companies and public administration.

Question

1. How can we promote digitalisation in energy Research & Innovation as part of the next framework programme, ensuring a close link with energy policies and full consistency with EU energy and climate objectives.

    - European and national policy makers should not only invest in the development and deployment of digital technologies and solutions in the energy sector. They should also invest in the digitally-skilled energy professionals that Europe needs to drive the energy transition forward. Electrical contracting is one of the professions, which are most affected by technological changes. The profession is becoming multifaceted and professionals need to have a wider range of digital skills, to integrate products and systems and guarantee that they communicate and are interoperable, and to offer operation and maintenance services based on connected objects data. We are aware of the upcoming EU initiative titled "Blueprint for Sectoral Cooperation on Skills / Energy value chain – digitalisation". We look forward to seeing the results of this initiative, which we hope will be lean and fast. In the meantime, our sector is raising awareness about the skills challenge for electrical contractors (se for instance this report from Installatorsvoretagen, the installers' association in Sweden) and is participating in national initiatives aimed at identifying the skills gap in our sector or

more broadly along the electrical value chain and adapting education, training and apprenticeship programmes to bridge this gap (see for instance the Novellierung der Ausbildungsberufe im Elektrohandwerk in Germany, or the Accord pour le développement des compétences dans la filière électrique in France).

7. Horizontal actions, communication and awareness

In order to increase its impact on the energy sector, digital solutions must be understood throughout the energy sector including consumers. SMEs and consumers will need support in understanding the processes and seizing the benefits of digitalization. Industry is likely to apply innovative ICT solutions, however, optimizing the consumer interface might remain a challenge. The entire sector should gain awareness about engaging in digital solutions in a legal and secure way.

Questions

1. How could consumer trust and engagement be fostered when implementing digital solutions in the energy sector?
    - Making information transparent is a very important part of building trust. Consumers need to be able to understand how they use energy and from which sources it comes from.

2. What are the benefits of digitalisation? Which initiatives already exist in Europe? How can awareness be fostered?