

# Realising a human-centred digitalisation of the energy sector

POLICY BRIEF



## KEY FINDINGS

- The digitalisation of the energy sector is happening. A human-centred design approach is needed to ensure that it takes place with and for the benefit of the people. This document presents the concept of human-centred digitalisation of the energy system and puts forward policy recommendations for it to happen in an affordable, sustainable and fair manner.
- The main findings include the need for people to access tailored and ready-for-use tools that help realise societal co-benefits, bring individual gains, remove legal, informational and technical hurdles and ultimately ensure just participation of all societal groups.
- Substantial additional resources are required to develop digital tools and products to seize opportunities for citizens to engage, optimise energy consumption and manage active participation in the energy system.

## WHAT DOES A HUMAN-CENTRED DIGITALISATION OF THE ENERGY SECTOR MEAN?

### DISTINGUISHING TWO HUMAN-CENTRED PERSPECTIVES

All citizens have a stake in the transformation of the energy system and, therefore, in the digitalisation aspects connected to the process. In the fundamental changes of decentralising, decarbonising, and restructuring the energy sector, citizens should have a say in the transition process and how the relevant transition policies are designed and implemented. In addition, people are affected as customers of the energy market who demand a reliable and affordable provision of energy services. More and more citizens also become prosumers, producing energy, selling electricity, and offering a range of energy services.

To best realise a transition that benefits society, the digitalisation of the energy sector needs to incorporate, first and foremost, a human-centred design. Only by meeting people's needs will the transition be able to benefit citizens. Moreover, this aspect is critical for them to accept the multiple changes the transition entails and actively engage as citizens and prosumers in the energy market and society.

## **ACTIVELY ENGAGING PEOPLE**

Behavioural theories have shown that needs-based knowledge about the energy system and how it functions is a precursor to enabling entry points for citizens to inform themselves and actively engage in societal transformation. People who become prosumers in the energy market will understand to a deeper degree how the transition affects them and their lives as they are equipped with the necessary knowledge to break down the complexity of the process. For example, they are better able to propose and implement viable and beneficial local solutions. Actively engaging people also underpins democratic practices as it connects them with local public authorities, policy institutions and businesses.

## **DESIGNING TOOLS THAT MEET PEOPLES' NEEDS**

People need access to tailored, user-friendly, ready-for-use, affordable and easily accessible tools. Tools that specifically provide knowledge (knowledge tools), such as information platforms, raise awareness of an environmentally friendly energy transition and empower people in general. Yet, when tailored to specific needs (needs-based tools), they not only help to realise societal co-benefits but also bring individual gains. Needs-based tools can, for example, incentivise energy and resource-saving behaviour, thereby bringing down energy costs. Digital tools can bridge the gap between professionals and laypersons, allowing average citizens to engage and prosumers to compete with incumbents of the energy market.

Two broad categories include 1) tools aimed at seizing opportunities and prospective benefits for citizens to engage and 2) tools intended to optimise (private or collective) energy consumption and to manage active participation in the energy market.

Tools in the first category can be differentiated further by following technical, legal and informational criteria. Examples of technical tools are localised solar cadastre and wind power maps that help individuals to choose the most beneficial technology option to install in a private or community building. Legal tools present notifications on legal requirements or available support schemes, such as retrofitting opportunities, and provide information on how collective engagement is possible. At the informational level, online portals offer updates on policy-steered transition processes and allow observation of policy implementation at the local level.

Tools within the second category of optimisation and management allow for increased competition in the energy market so that their liberalisation benefits the people. For example, this includes tools that could permit switching providers to lower costs or the ability to choose preferred fuels. Such instruments could also include tools to plan, monitor and control local energy grids established by energy communities or reduce household energy demand.

These tools are only attainable with the right policies in place. A clear legal framework can encourage citizen and prosumers' participation and promote businesses to develop the necessary tools.

## **SETTING UP MACHINES TO SERVE PEOPLE**

The digitalisation of society in general, and the energy sector in particular, is an ongoing process that must be carefully managed to align with the needs of people. Digitalisation not only helps to handle transition challenges but also allows society to take advantage of expanding data and interconnectivity of smart devices. Besides the above, the digitalisation of the energy sector empowers individuals to make informed choices through transparency of complex transition processes.

However, human-centred digitalisation rests fundamentally on two pillars, machine-actionability and interoperability between energy system actors and components. This can only be achieved by the ubiquitous implementation of FAIR principles, which ensure the findability, accessibility, interoperability and reusability of data and information in general. The concept of open data adds a layer intrinsically linked to transparency. By complementing proprietary data with novel forms of shared data, new possibilities for collaboration among different agents are created. For example, the resource efficiency envisioned by the circular economy can be fostered if several agents in a supply chain are linked through FAIR and shared data. Similarly, digital energy community networks can more easily transfer best practices and lessons learned between each other, incrementing the positive impact of their progress.

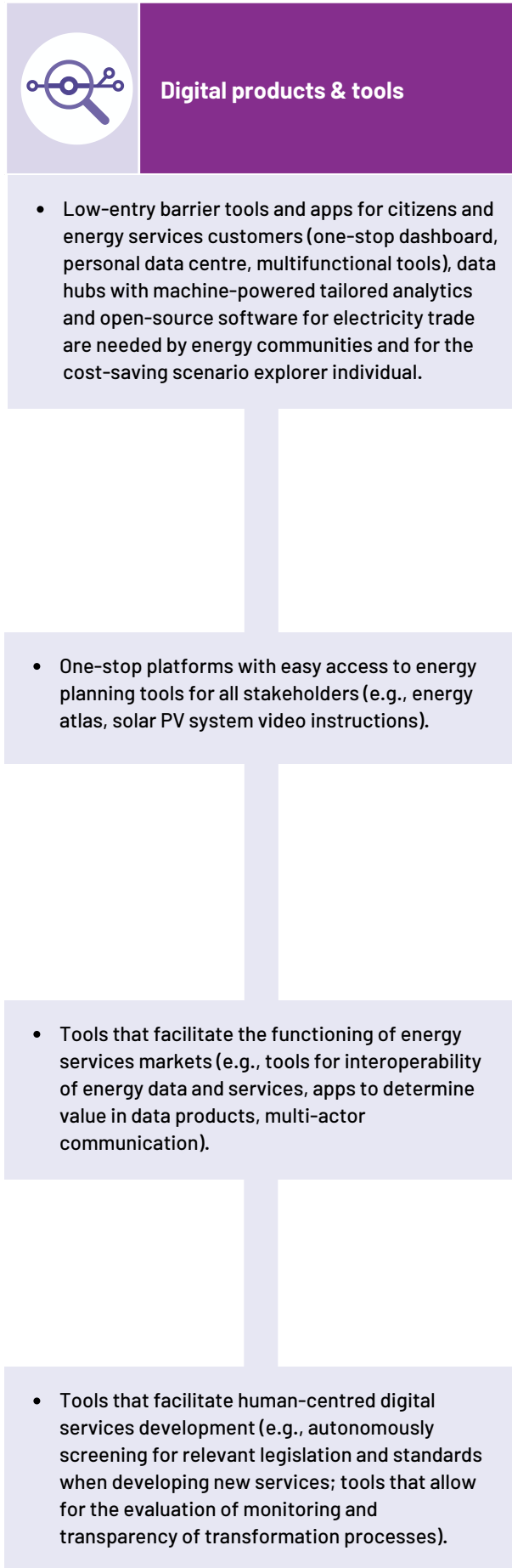
## **PAVING THE WAY FOR A HUMAN-CENTRED DIGITALISATION**

The development of human-centred digital tools and the implementation of interoperability and machine-actionability of data and devices requires substantial additional resources. In terms of knowledge base and technical uptake, this implies a synergistic effort of all stakeholders invol-

-ved, from policymakers and planners to businesses and academics. However, this is outside the scope of what can be accomplished if the weight of this effort comes in addition to their everyday tasks and responsibilities. Therefore, supplementary measures with corresponding resources are required to accomplish a human-centred digitalisation of the energy system to make it more affordable, sustainable and fair.

## TOOLS AND PRODUCTS THAT FACILITATE HUMAN-CENTRED DIGITALISATION







### Digital products & tools

- Tools for holistic human-centred evaluation (e.g., that help to incorporate customer-centric and citizen-centric perspectives through integrated evaluation; apps, software, platforms to collect feedback that evaluate the usability of services).



### Role of the European Commission: legal provisions, standard setting, and funding opportunities

- Supporting the development of platforms and tools that enable systematic elicitation of feedback, trade-offs and synergies between the customer-centric and citizen-centric perspectives.

---

## ABOUT EERADATA



The EERAdata project develops, explores, and tests a FAIR (findable, accessible, interoperable, re-usable) and open data ecosystem in the low-carbon energy field. The new data infrastructure will be established through broad community involvement and applied in four use cases.

EERAdata also implements an open platform for seamless access to energy data and establishes a pool of experts and data stewards to facilitate a mental shift towards FAIR and open data practices.



This project has received funding from the European Union's Horizon 2020 research and innovation programme under grant agreement no. 883823.

