September 2021

Response to EU Action Plan on Digitalising the Energy Sector

DIGITAL GRID INITIATIVE

CurrENT
Enabling Network Technology throughout Europe

currENT is the industry association representing innovative network technology companies in Europe. Our members offer solutions that climate-proof existing power networks and add innovative elements to the new ones that are yet to be built. Power networks can be optimised and reinforced through these solutions, and additional networks can start off with the latest state-of-the-art technology. Our solutions enable power networks to deliver the energy transition at least cost; in a secure, sustainable and socially responsible manner. We aim to generate greater awareness of new grid-enhancing technologies and to accelerate their implementation by working collaboratively with the broader stakeholder community. *Our Vision is a European power network – transmission and distribution – that is the recognised world leader in enabling decarbonisation through the efficient use of modern grid technology.*

The DIGITAL GRID INITIATIVE (DGI) addresses Distributed Network and System Operators with practical information on new digital solutions and the process adaptations required for this. The initiative formulates joint positions for associations and politics with the aim of supplementing the industrial policy of distribution grids from the investment-intensive grid expansion logic with intelligent and future-oriented, digital solutions. The DIGITAL GRID INITIATIVE sees itself as an open and learning network without a formal organisational form. It promotes the exchange of concrete experiences in the planning, implementation and operation of new solutions between the network partners and with the industry. The network operates through public events such as lectures, round tables and trade fairs, as well as through discussion offers, analyses and experience reports.

currENT and DGI have joined forces on the European Commission's action plan that seeks to build a solid framework to guide energy sectors' digitalisation. Both associations encourage European policymakers to take a leading role to leverage the economic, societal and sustainability potential of digitalisation in the energy sector.
This potential remains unrealized today.

Digitalisation of the energy sector is essential to future-proofing Europe's energy and climate frameworks

Digital solutions are a powerful toolbox for efficient energy systems and in particular efficient management of the grid infrastructure. Future-proof infrastructure is the condition for achieving Europe's climate targets. Without digitalisation, the energy and climate agenda as set in the Green Deal will fail.
currENT and DGI welcome the European Commission initiative, and we are grateful for the opportunity to share our perspectives and recommendations on this roadmap initiative.

Digitalising energy infrastructure is central to digitalising the energy system

Climate-proofing our power and energy networks means they can host more capacity and become more flexible.
Gone are the days of central station powerplants simply following load. Network operators must now be able to accommodate variable renewable energy sources, whose share of the European energy mix is set to rise to at least 42% by 2030. Electrification – of industry, heating, cooling, and transport – is projected to drive growth in overall electricity consumption from only about 20% in the European energy mix today to at least 60% by 2050. The scale of the challenge is enormous: electricity travels through networks that must be ready for the steep rise of both electricity consumption overall and the proportion coming from variable renewables.
Our networks must also prepare for a world of infinitesimally more complex relationships, such as those between prosumers and markets, as we seek to optimise the wide range of supply, demand, and even storage solutions across both our transmission and distribution networks. They need a toolbox to address the resulting uncertainties, I.e. how much e-charging at which hour of the day, and what the weather forecast might be, as well as the needed

resilience to cope with the climate change that is already upon us. All our networks will need to transport energy smarter, faster, and more efficiently, and to be managed on a more integrated and optimised basis, not only among TSOs and DSOs, but also regionally and across Europe.

Digitalisation ensures optimal and efficient supply of electricity bottom-up, in more and more distributed and decentralised systems, and avoids the waste of the current top-down non-digitalised energy system of today.

Sadly, it has become all too clear that climate change is happening now, and that the cost to society is high.

How digital technologies contribute

Digital technologies offer a nearly unlimited range of possibilities, ranging from particular applications like dynamic line rating (DLR), static synchronous series compensator (SSSC) and high voltage direct current (HVDC) technologies, to wider use cases ranging from facilitating North Sea offshore wind grids, to ACER's vision for Regional Coordination Centers, to control room flexibility in managing day-to-day network operations and enabling markets. Furthermore, systems for distributed energy resources management (DERMS), including the necessary measuring equipment, planning- and forecast tools, will help optimize local grids.

Such applications of digital technology can help meet the challenges to climate-proofing our energy networks and deliver:

Flexibility. Digital technologies allow us to operate our networks more flexibly, accommodating the development and integration of renewable energy sources, responding to weather and other unforeseen operational challenges, and making possible market interactions based not only on more efficient day-ahead and real-time price discovery, but also on a wide range of potential attributes including community development priorities and environmental sensitivities. Mobility is also a feature of many digital technologies which helps allow flexible redeployment to where it is most useful. Digital technologies like big data can provide the necessary understanding to enable unprecedented optimisation and integration across complex systems, digital communications and sensors can manage the widely distributed nature of such systems, and the declining cost of digital hardware are rapidly expanding the range of possible applications which are now practicable.

Transparency. Digital technologies allow market participants and customers to act rationally, and transparency also provides the needed information for optimised operation of the infrastructure.

Grid resilience. Digitalisation increases the resilience of the energy system and the grid.

Sustainability. Digitalisation increases the sustainability of the energy system in avoiding wasting energy.

Capacity. Digital technologies allow us to make better use of the physical capacity in our networks. Digital technologies can be deployed in a cost-efficient manner, as to allow real-time monitoring and optimisation of capacity, both on new and existing networks.

Affordability. Digital technologies help all this happen affordably. In part, our existing energy networks will need to be expanded. The NOVA Principle has become a widely recognized tool in doing so efficiently by requiring a three-part approach – optimising existing grids, reinforcing them, and requiring newly-built additions to embed new technologies. Digital technologies can ensure that we make the most of aging infrastructure, for example using sensor-based monitoring to gain insights into the remaining expected life of aging assets. Using digital technologies to ensure that our networks are used to their full capacity and maintained efficiently not only helps keep overall costs in check, but also helps address public acceptance issues by making sure that new expansion of network infrastructure is not undertaken until existing infrastructure is used to its full capacity.

Finally, speed matters.

Unlike copper or iron-oriented solutions, digital technologies can be implemented quickly. Traditional network expansion often takes many years of planning, regulatory process and construction, but one of the many advantages of digital technologies is that their technical readiness levels (TRLs) already provide for quick deployment.[1] Digital technologies are thus not only ready to be implemented as part of new network build-out, but consistently with the NOVA Principle described above they can play an important role in making the most of existing capacity concurrently with the development of more traditional forms of network build-out. Thus, although it will likely take years to build out the full range of improvements which are necessary to fully climate-proof our energy networks, some part of the necessary improvements can be achieved in much shorter time frames by applying readily available digital technologies. Needless to say, achieving some part of needed carbon emissions sooner rather than later has real value in meeting emissions targets. Of course, digital technologies should also be part of the planning and construction of all new network infrastructure, to ensure that we only build out as much new infrastructure as we actually need.

Five recommendations and conditions for the uptake of digitalisation and digital technologies in the energy sector

First, regulatory authorities should require efficiency first and NOVA-type principles in planning and approving new energy network infrastructure. Planning should require specific evaluation of digital technologies such as those noted above. Our energy networks will require some degree of new-build expansion, but in coordination with such development it is essential that network optimisation and reinforcement be considered to ensure that our energy networks are developed responsibly and cost-effectively. currENT and DGI particularly urge that such initiatives as the Ten Year Network Development Plan (TYNDP) process should include evaluation of the benefits of incorporating digital technologies.

Second, cost-recovery frameworks for energy network infrastructure projects need to be reviewed and reconsidered. As described in an ENTSO-E report in Spring 2021,[2] energy network infrastructure is often developed on the basis of outdated CapEx-oriented regulatory frameworks, which reward traditional transmission projects that have a high capital cost, as opposed to more technologically forward-thinking approaches which better accommodate technological approaches which are oriented more towards operating expenses. Such review is particularly important given the hybrid nature of digital technologies, which often rely not only on hardware but also on software and services. currENT and DGI believe regulators should consider changes to existing regulatory frameworks to provide appropriate incentives to ensure that more efficient digital technology-oriented solutions are encouraged. currENT and DGI look forward to exploring these issues with other stakeholders going forward, and toward that end currENT has recently hosted a webinar to discuss the issue.[3] In addition to currENT's webinar, several thoughtful analytical reports have already been published, e.g., by Ecorys at Copenhagen Infrastructure Forum[4] and Jacobs University's Paper 35 on output-oriented regulation.[5] Regulators must act to ensure that the technical promise of digitalisation is supported by real-world business cases for their implementation.

Third, the success of digitalisation is closely related to the successful management of cybersecurity issues. Having certification processes can be important to addressing such issues, and currENT hosted a webinar earlier this year to discuss cybersecurity issues with respect to digital technologies.[6] currENT and DGI urge the Commission to consider such issues carefully and to look to the work of other stakeholders and agencies such as ENISA, as well as to global experience such as from PJM or FERC in the US. The industry is committed to working with policy makers to implement the highest possible standards here.

Fourth, interoperability is the Euro of the digital energy world and requires common standards both on technology and processes. We urge the Commission to work closely with ENTSO-E, EUDSO, and other stakeholders and regulatory bodies in attempting to prioritize practical, effective and well-balanced approaches to address these issues.

Fifth, ENTSO-E's Technopedia[7] helpfully describes a wide range of new technologies which can help us meet future needs, and they ascribe technical readiness levels (TLRs) which document which technologies are ready for deployment today. We encourage the DSO associations and the newly created EUDSO to take a similar approach, or to cooperate with ENTSO-E on their own technopediæ, for listing technologies that will deliver the grid we need.

To conclude: the European Commission should provide a pan-European assessment on the value of digitalisation in the energy sector

Given the no-regrets solution that the digital solutions toolbox provides, currENT and DGI encourage the European Commission to come up with a comprehensive study on the value of digitalisation of the energy sector. The study should take already-concluded national or other studies into account, such as the White Paper for innovative network planning. The study should be done in an iterative process with stakeholders.

We would appreciate being associated to next steps of the digitalisation of energy action plan.

[1] ENTSO-E Technopedia, https://www.entsoe.eu/Technopedia/.

[2] See European Electricity Transmission Grids and the Energy Transition (April 14, 2021) https://eepublicdownloads.entsoe.eu/clean-documents/mc-documents/210414_Financeability.pdf.

[3] Working group for optimising Power Grids (September 10, 2021) https://www.currenteurope.eu/register-aligning-incentive-regulation-with-public-interest/.

[4] Ecorys, Do current regulatory frameworks in the EU support innovation and security of supply in electricity and gas infrastructure? (March 2019) https://ec.europa.eu/info/sites/default/files/reportregulatoryfw.pdf.

[5] Gert Brunekreeft et al., Output orientierte Regulierung: ein Überblick. Bremen Energy Research, Jacobs Universität, Paper 35 (2020).

[6] Accelerating the Energy Transition: Cybersecurity, Digitalisation, and the Electricity Grid in Europe (February 2021) https://www.currenteurope.eu/conclusions-cybersecurity-digitalisation-and-the-electricity-grid-in-europe/.

[7] ENTSO-E Technopedia, https://www.entsoe.eu/Technopedia/.