

Electricity networks – a crucial infrastructure for the European energy transformation requiring holistic and smart development

Position Paper

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In its communication on “Achieving the 10 % electricity interconnection” the Commission highlighted that the completion of the internal electricity market requires more than 10 % interconnection capacity, and efforts by the EU and Member States must be guided by the need to reach at least a 15% interconnection capacity by 2030. A European Commission study estimated we need to spend €50 billion to modernise electricity transmission networks by 2030. But we cannot stop our efforts simply here. That’s why a parallel investment of €215 billion in distribution networks is estimated. How can this level of connection be implemented? Where are the hot points? And is this requirement sufficient for the success of the energy transformation?

Since the introduction of the single market for electricity, interconnection has been identified as key enabler for a truly European market for electricity. The ambitious renewable energy targets of the European Union will require additional focus on trans-national and on the long-run even trans-regional interconnection. A modern transmission backbone in combination with adequately developed, modern distribution networks is the enabler for integrating the high shares of wind and solar power Europe is striving for in order to decarbonise its energy system.

Performant networks are the pre-requisite for all other elements of a successful system transition, such as e. g. increasing consumer participation. But this transition will not happen, if connecting remote sources of renewable energies and levelling their volatility across the continent would stick in grid congestion. A boundless right of way for **electrical power** is key to achieve high shares of renewable energy. Among others, this has been shown recently in the FP7 project e-Highway 2050.

Where are we today? The need for more interconnection and its deployment in acceptable time has been widely understood and addressed. The introduction of the TYNDP process and the National Grid Development Plans as part of the 3rd Energy Package have established a process to define the transmission grid required by the society. Adaptations of the legal framework in member states have increased certainty in planning and permission procedures and in some cases also increased flexibility to use more costly technologies with higher public acceptance in order to accelerate deployment. The definition of interconnection targets has highlighted the importance of network development, and we expect the European Commission’s forthcoming Communication on the achievement of the 15% electricity interconnection target to reinforce the ongoing positive dynamics. Last but not least, the recently launched Expert Group on electricity interconnection targets again has confirmed the

Commission's focus on this important topic and has ensured engagement of the broad European expertise in developing interconnected power systems.

Within this in general very positive development there are some points requiring special attention in our point of view:

- Working on cross-border interconnection targets without any doubt raises awareness for an important topic. However, eventually we need to discuss a truly European network infrastructure. The most important bottlenecks are not necessarily on the borders of the member states, but may also be within the states.
- The adequacy of the network infrastructure is not limited to the transmission level. The majority of future generation capacity will be connected to the sub-transmission or even local distribution networks. While important steps were done with the introduction of the network planning process on transmission level, nothing comparable is available on distribution level today. Only a well-coordinated, holistic view on the networks will ensure a smooth and successful energy transformation.
- Before defining interconnection targets we need to agree on the available capacities and in particular the balance between capacity made available for cross-border trading and capacity reserved for system stability reasons. In that context high-voltage direct current transmission (HVDC) may offer an efficient technology option to decouple actively controlled cross-border transmission from reserve pooling for increasing system stability and security of supply.
- We are facing an unusually uncertain future. Rapid technological development may have a strong impact on the network infrastructure required in future. Current examples for such technologies are solar photovoltaic and batteries, but others may also occur in future, also on consumption side or within the infrastructure. There is an obvious conflict between this uncertainty and the need to define, build and maintain an infrastructure with long life cycles and deployment times. A dynamic approach regularly reviewing the needs and the state of development as well as technological opportunities, involving the key stakeholders with operational, technological and regulatory background, is the most promising way to deal with this situation in our opinion.

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