Making Energy Systems Fit for the Green and Digital Transition

Context

The EU has set ambitious targets to decarbonise its energy system as a key component of its commitment to combat climate change and achieve **carbon neutrality by 2050**. Strengthening electricity grids and markets is essential to integrating a higher share of renewable energy sources and ensuring a secure, flexible, efficient and affordable energy supply across the EU. Meeting the new EU targets for renewable energy will lead to a significant increase of intermittent and decentralised power generation. At the same time, the higher use of electricity across sectors (electric mobility, heat pumps, electrification of the industry, hydrogen production, etc.) will increase **electricity demand up to 60% by 2030.**

Electricity grids are a backbone of this system and will need to expand, upgrade, and smarten to accommodate these changes, maintain stability, security of supply, and fair prices for consumers. Right now, the rapid developments of renewable energy generation and electricity demand are outpacing the necessary investments in electricity grids, and as a result, access to the electricity grids has become a major bottleneck for the development of solar and wind energy. The problem is particularly acute at distribution level, where system operators often lack the data, resources and skills to take complex infrastructure planning decisions. The transmission level also faces major challenges to build sufficiently rapidly a solid network, including offshore, to accommodate the future needs.

In order to lower costs in electricity markets, all assets (e.g. generation capacity, transmission infrastructure, and demand-side resources) need to be used efficiently.

While continuing efforts on integration, markets also need the appropriate tools to foster investment, provide incentives to contribute to climate targets, and accommodate the needs of active consumers and prosumers. Finally, the **digitalisation of our energy** system will also be key. Leveraging digital tools, including artificial intelligence, will help to improve the efficiency, security, and reliability of our energy system. These technologies can also empower data-driven decision-making and help consumers make informed choices.

Supporting the urgent implementation of the "EU Action Plan for Grids" [3], the "EU Action Plan to digitalise the energy system" [4], the recent reform of the EU Electricity Market.

Objective

The objective of this flagship is to support Member States strengthen and digitalise their energy systems and adapt their electricity markets as to accommodate the necessary changes in the supply and demand of energy.

Indicative support measures

The below is an indicative, non-exhaustive list of support measures:

- **Improving** the design of procedures and IT tools for electricity grid permitting at the national, regional and local level.
- **Improving** access to funding for distribution system operators, in particular under the regional and cohesion funds or Modernisation Fund, to support the modernisation of the distribution grid and local smart grid deployment.
- **Supporting** the distribution system operators to improve network planning and designing, also in line with the National Energy and Climate Plans.
- **Improving** the design of markets at the local and national level to ensure the integration of renewable energy sources, the development of demand response, energy storage, and other flexibilities, as well as promoting the deployment of renewable energy communities.
- **Supporting** the digitalisation of energy systems, including smart grids and meters, integration of electric mobility including (high-power) charging points, consumer digital tools and services, cybersecurity, and data management to facilitate the development of demand response services.
- **Training** and **capacity building** for public authorities in any of the relevant topics.

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[2] The Commission estimates that overall around €584 billion in investments are necessary for electricity grids this decade alone. Most of these investments are required in distribution grids. Around 40% of the EU distribution grids are over 40 years old.

[3] References to the TSI to support Member States on i) Action 10: funding programmes for smart grids and modernisation of distribution grids; ii) Action 11: streamlining and digitalising the permitting procedures.

[4] Reference to the TSI to streamline permitting processes for grid development.