BACKGROUND DOCUMENT

INFORMAL MEETING OF ENERGY MINISTERS

PLENARY SESSION III – A RESILIENT, FLEXIBLE AND INTEGRATED ELECTRICITY SYSTEM AS THE KEY TO DECARBONISING THE ECONOMY

HOW TO ACHIEVE A SUSTAINABLE, FLEXIBLE AND AFFORDABLE ELECTRICITY SYSTEM

15 - 16 JULY 2024, IN BUDAPEST

Interconnected and stable electricity grids are the backbone of a well-functioning energy market and have a crucial role in the achievement of the EU energy and climate goals and a safe and sustainable energy transition. A well integrated and connected European electricity network is key to ensure the security of the whole system and to drive the decarbonisation in the most cost-effective way. The smooth functioning of the internal market is a precondition for the competitiveness of the EU.

The European Council of 17-18 April 2024, in its Conclusions[1] called for *„the achievement of a genuine energy union by securing the supply of abundant, affordable and clean energy, that serves the dual objective of pursuing European energy sovereignty and climate neutrality; requiring an ambitious electrification using all net-zero- and low-carbon solutions, flexibility, and substantial deployment of and investment in grids, storage and interconnections."*

During the Spanish Presidency of the Council, a High-Level Forum on the 'Future of our Grids' was organised on 9 September 2023 by ENTSO-E, under the patronage of the Commission, to discuss with stakeholders the outlook and challenges for grids development. On the basis of the discussions the Commission

[1] https://www.consilium.europa.eu/en/press/press-releases/2024/04/18/european-council-conclusions-17-and-18-april-2024/

presented its *EU Action Plan for Grids*[2] in November last year, where it identified 14 concrete and tailor-made actions to address seven challenges for accelerating the pace of grid development in Europe:

1) accelerating implementation of existing Projects of Common Interest and developing new projects; 2) enhancing long-term network planning; 3) introducing a supportive, future-proof regulatory framework; 4) making better use of existing grids and smartening them; 5) improving access to financing; 6) ensuring faster and leaner permitting processes; and 7) strengthening supply chains.

The Council acknowledged this work and under the Belgian Presidency it adopted Council conclusions on *"Advancing Sustainable Electricity Grid Infrastructure"*[3] on its meeting on 30 May where it called for the implementation of the EU Action Plan for Grids without delay in close cooperation with all relevant actors. The Council also highlighted that a fully integrated and interconnected European power system can only be achieved if the EU's electricity grid infrastructure is deployed and used as effectively and efficiently as possible, including through flexibility and other non-wire solutions, so that the overall system costs borne by households and companies are mitigated as much as possible.

For the energy transition the EU and its Member States have to create a decarbonised energy system which will be able to integrate a large share of variable renewable power and manage the growing demand linked to clean mobility, heating and cooling, and the electrification of industry. Therefore, grids need to adapt to a more decentralised, digitalised and flexible electricity system with the active participation of millions of consumers and local energy communities. In order to reach our ambitious energy and climate goals, especially to significantly increase the level of renewable energy in the energy system, massive investments will be needed both in renewable energy sources, but also in transmission and distribution infrastructure.

[2] https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=COM%3A2023%3A757%3AFIN&qid=1701167355682
[3] https://data.consilium.europa.eu/doc/document/ST-10459-2024-INIT/en/pdf

The TEN-E regulation and the PCI selection procedures facilitated the development of cross-border infrastructure. However, beyond cross-border needs, the bulk of the investment will be within borders, mainly on distribution levels. Distribution grids have to be adapted to connect large amounts of decentralised renewable generation, they will need to become smart and digital, while cyber- resilient.

In order to achieve the climate targets, massive electrification is needed from the current 23% to 58-71% in 2050[4]. Moreover, around 40% of Europe's distribution grids are over 40 years old and need to be modernised. Industry estimates around EUR 375-425 billion of investment in distribution grids is necessary by 2030[5].

Overall, the distribution system is facing several challenges:
- The integration of variable and decentralised renewable energy sources necessitates a more flexible and adaptive grid.
- Increasing energy demand driven by electrification of transport, heating, and industrial processes, places additional pressure on the grid and requires a more efficient and smart use of the grid and flexibility solutions.
- Modernisation of the existing grid infrastructure requires substantial upgrades to accommodate new technologies and increased loads.
- Significant investments are required to expand and strengthen distribution systems while maintaining security and affordability for consumers.

Achieving the transformation of the EU's energy grid requires substantial investment. It is needed to mobilise the necessary private financing, leveraging a mix of public funding, including EU funds, alongside private sector investments to finance grid developments while keeping energy prices affordable. In addition to an ambitious Connecting Europe Facility (CEF) for Energy that reflects needs on cross-border infrastructure, we should explore innovative financing mechanisms to attract investment in grid infrastructure. In order to reduce costs, cost-effective investments should be prioritized that deliver high value in terms of grid

[4] based on Decarbonisation Speedways of Eurelectric: https://www.eurelectric.org/publications/decarbonisation-speedways-full-report
[5] See Connecting the dots, conducted by Eurelectric in cooperation with E.DSO. Grids' share of total energy supply costs has evolved from 27% on average in the previous decade, to 37% this decade

performance focusing on areas with the highest potential for reducing bottlenecks and improving efficiency.

At the same time, these investments need to be accompanied by a market structure and governance which allow infrastructure investments to be used efficiently and to maximise cross-border trade benefits. In this context grid flexibility is critical to balancing supply and demand, particularly with the increasing share of variable renewable energy. There could be different solutions to improve the flexibility of the grid: demand response could be promoted, encouraging consumers to adjust their energy use in response to supply to reduce peak demand and increase grid stability. The roll out of smart meters and smart solutions is essential. Battery storage and other forms of energy storage can absorb excess energy during low demand periods and release it during high demand, smoothing out fluctuations. Interconnections between Member States and enhancing regional coordination can optimize the distribution of electricity across the EU, so that it flows where it is most needed, reducing bottlenecks and enhancing stability. To enable this, it will be important to ensure that Europe's interconnectors are effectively used for their intended purpose of enabling trade of electricity between Member States.

Effective policy and regulatory frameworks are essential to support the transition towards a more flexible and efficient energy grid.

The framework should aim to optimise investments and reduce costs with proper measures to protect consumers from excessive price increase by:

- Incentivizing and rewarding grid operators and other stakeholders for investments in flexibility, efficiency, and innovation.
- Remove obstacles to the market-based roll out of non-fossil flexibility.
- Ensure that sufficient infrastructure is not only physically available but can also be more effectively used for commercial exchanges of electricity.
- Promoting the harmonisation of technical standards and regulations across Member States to facilitate the integration of new technologies and cross-border energy flows.
- Making grid development more efficient through integrated planning across different sectors (e.g. in the updated National Energy and Climate Plans) and strengthened cooperation among different players (gas, electricity, district

heating and cooling producers, energy intensive industries) DSOs and TSOs on different levels to align grid development with electrification goals.

- Promote anticipatory investments to make grids future-proof and more efficiently integrate new generation and load into the system
- Promoting energy efficiency measures to reduce overall energy consumption throughout the whole energy supply chain and lower energy bills.
- Designing tariffs that reflect the new objectives, challenges and investment needs.
- Implementing targeted support for low-income households and other vulnerable groups to shield them from potential energy price increases.

Eurelectric, the European Federation of electricity industry in its *Grids for Speed* study underlined that distribution systems have to be strategically upsized in order to cope with the renewable and industrial connection needs. In order to reach the EU's decarbonisation targets, Eurelectric estimates that the network investment and framework needed on distribution system operators' level in the 27 EU Member States plus Norway, should be twice the current level, reaching 67 billion EUR per year until 2050 on average. There are grid strategies, including anticipatory investments, grid friendly flexibility and asset performance excellence, which may reduce the investments costs, if the regulatory framework supports these strategies and solutions. Anticipatory no-regrets investment is the most cost-effective strategy for building out distribution grid capabilities that are fit for a decarbonised future. The study also shows that the individual costs of consumers reflected in the tariffs can be kept relatively stable only as long as electrification accelerates in tandem with the buildout of the grid.

The transformation of the EU energy grid and the accompanying regulatory framework is crucial for achieving a sustainable, secure, and resilient energy system. By enhancing grid flexibility, improving distribution system efficiency, and securing the necessary investments while maintaining affordability, the EU can lead the way towards a cleaner, reliable and more competitive energy future.

Ministers are invited to share their views on the following questions:

1. What kind of solutions or measures do you suggest in order to optimize and realise the investments necessary for the future grids while keeping the costs linked to system management as reflected in tariffs and final energy price affordable for consumers?

2. What are the main challenges in the swift development and modernisation of the distribution grid to make it more efficient, smart and flexible? Do you see the need for further actions in this regard?

Please limit your interventions to 3 minutes.