FROM ENERGY AMBITION TO CONNECTION

The EU's forthcoming package of energy grid reform

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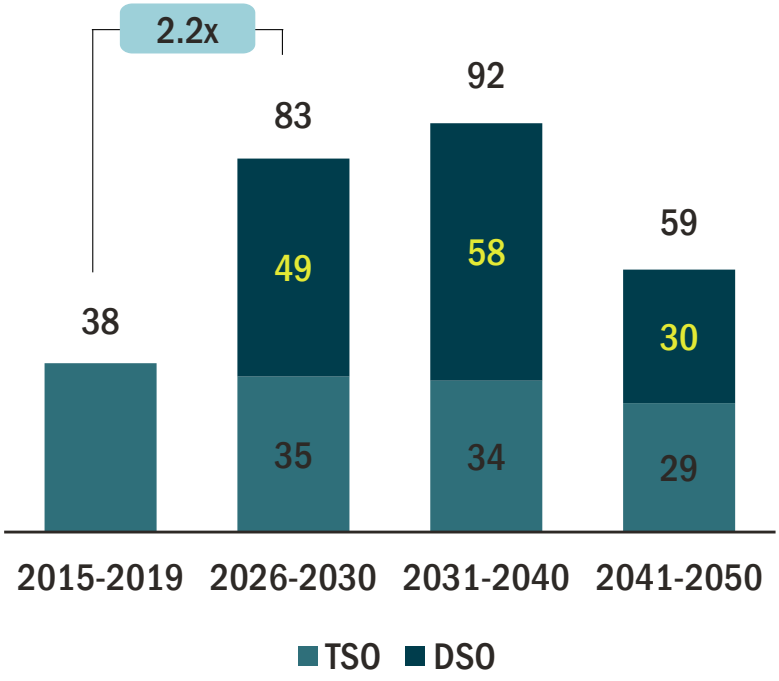
From energy ambition to connection: the EU's forthcoming package of energy grid reform

Insufficient energy infrastructure development could jeopardise the EU's climate neutrality, energy security and competitiveness goals. The European Commission is consulting on potential reforms to address the challenges to grid roll-out ahead of a legislative package due at the end of 2025. This article considers some of the issues raised.

Increasing needs for energy connectivity

In the light of increasingly volatile power supply (e.g. wind and solar capacity are expected to double by 2030 compared to 2023 levels) and rapidly evolving - and often highly localised - power demand (notably driven by increased electrification and data centre demand growth), the EU's energy transition will require a step change in investments in electricity transmission and distribution networks in particular (as illustrated in the figure below).



(Annual average grid investment, EUR bn, real 2023, EU27, Source: E.ON Energy Playbook 2025)

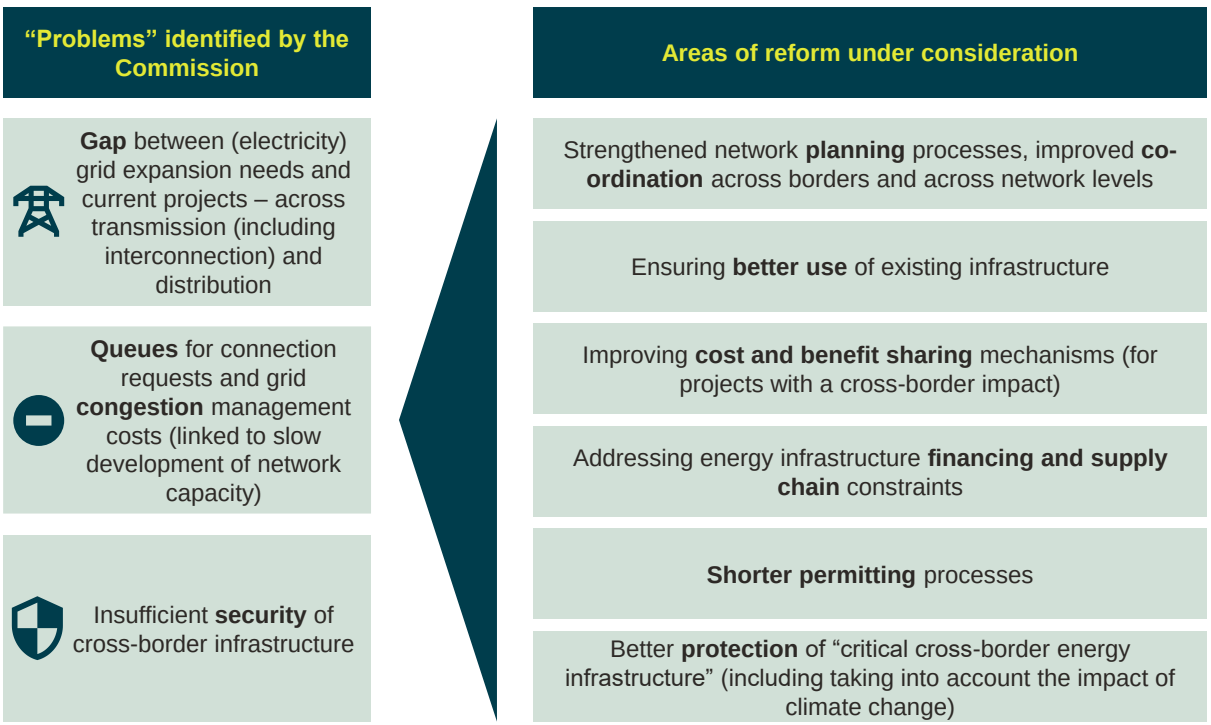
Cross-border interconnection will also support growing flexibility needs and ensure low-cost generation resources are shared effectively across the EU. The role of grids has also come into focus, given the recent Iberian blackout.

Underinvestment will be costly. Recent JRC modelling estimates that European redispatch volumes could rise dramatically - from 50 TWh in 2023 to as high as 374 TWh by 2030, incurring massive additional costs. The same JRC analysis estimates that investing around €6 billion annually in cross-border grid infrastructure could save approximately €9 billion per year by avoiding 42 TWh in renewable curtailment and preventing around 31 million tons of CO_2 emissions annually.

The transition will also drive the ramp-up of hydrogen (H2) and carbon dioxide infrastructure, primarily to support the decarbonisation of EU industrial and transport sectors and, in the case of H2, provide low-carbon flexibility in the power system over longer duration. At the same time, existing natural gas infrastructure will need to be either decommissioned or repurposed as demand continues to decrease. This transition will require careful choreography: repurposing can lower the cost of transitioning to H2. But the gas system still needs to ensure reliability for remaining network users, including being able to cater for peak loads and growing biomethane injections. Again, coordination across borders will be needed to allow potential for production and storage of new gases to be shared across Europe.

Potential areas of reform

The need to accelerate grid roll-out has come under renewed focus, given the emphasis in the EU policy debate on competitiveness and economic security. The Commission plans to issue legislative proposals in Q4 2025 as part of a "European Grid Package", and has issued a call for evidence and public consultation to inform these proposals. The figure below summarises the key "problems" the Commission aims to tackle, and the areas of reform being considered.



The first four of the areas of reform (network planning, use of infrastructure, cost sharing, and financing and supply chains) touch on issues that surface regularly in our work with energy clients. We discuss them briefly below.

A joined-up approach

To address infrastructure barriers to energy market integration, the European Commission established the Project of Common Interest (PCI) status under the Trans-European Network–Energy (TEN-E) regulation. Benefits of PCI status notably include accelerated permitting processes and eligibility for Connecting Europe Facility (CEF) funding.

Originally covering electricity, gas, and CO_2 transport, PCI eligibility changed in 2022 with the implementation of the revised TEN-E regulation: gas infrastructure is now excluded, while the full hydrogen value chain as well as CO2 storage are included – reflecting a stronger focus on sustainability. The 2022 TEN-E revision also brought into scope Projects of Mutual Interest (PMI) that include connections with third countries. A recent delegated act from the Commission includes, for the first time, a PMI: Medlink, which aims to develop solar, wind, and battery storage in Algeria and Tunisia.

Distribution is also represented in the EU network planning process, with a dedicated EU DSO entity (which will also pick up responsibility for gas and hydrogen DSOs).

In its call for evidence, the Commission has said it plans to propose a "*...planning approach that better integrates regional and EU needs and interests, including across sectors, ensuring that the planning aligns with the EU and Member States' climate and energy objectives*".

This would clearly address several issues integrated network development is facing today:

- There is a potential disconnect between what happens at member state level and the pan-European approach adopted by the EU. The Commission has so far primarily focused on improving cross-border grids (i.e. implementing TEN-E), leaving intranational network planning largely to member states. However, we observe significant divergence in both the degree of proactive network planning (e.g. for hydrogen) that member states have implemented to date, as well as diverging maturity in regulatory frameworks or support mechanisms (in particular for CO2 and hydrogen).
- While there is already some form of centralisation via the ten-year network development plans (TYNDP) managed by ENTSO-E and ENTSOG respectively, these are established with little explicit regulatory oversight or coordination – with ACER only responsible for forming an opinion on the

proposed draft TYNDPs. In fact, in its latest opinion[1], ACER continued to criticise the methodology underlying the project assessment and general transparency of the TYNDP process.

The Commission's current consultation does not, however, explicitly address the complementarity or substitution between different energy vectors (e.g. "sector coupling" between electricity and hydrogen), nor does it address the role of natural gas and biomethane (which, as noted above, is no longer covered by TEN-E). Relatedly, there also remains some uncertainty regarding how the necessary coordination across gas and hydrogen will be achieved and the respective roles of ENTSOG and ENNOH in the process (TEN-E currently does not mention the latter).

Making the most of it

As a complement to grid investments, the Commission also discusses the need to ensure that (electricity) infrastructure is better utilised.

This is in part a question of market design – including the (sometimes politically charged) question of bidding zone configuration, as well as the potential for locational signals within renewable support mechanisms and capacity mechanisms. These options are briefly considered in the aforementioned JRC study. It is conceivable the Commission may draw on some of the JRC's thinking for its White Paper on deeper electricity market integration, to be published alongside the European Grid Package.

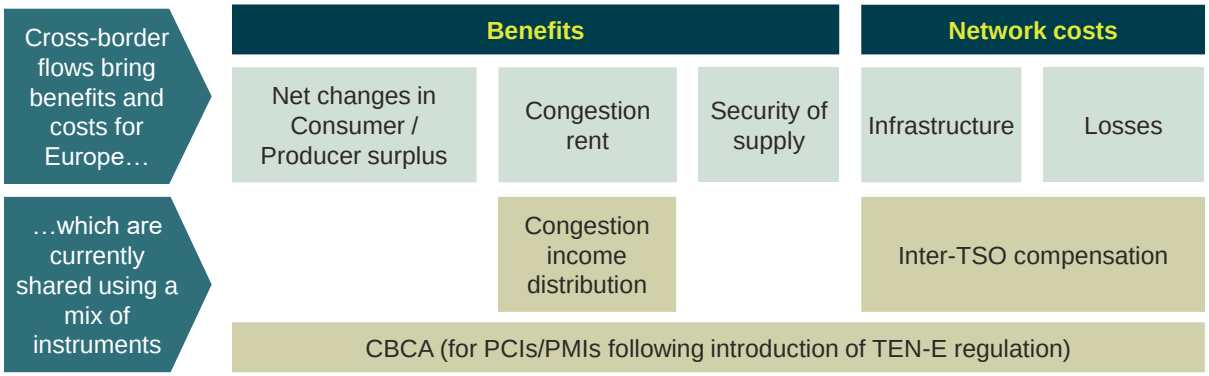
Alongside market design, network tariff design, and the connections framework can also support better utilisation of existing network capacity. This is recognised by the Commission in its guidance on tariff design in July 2025. The guidance also indicates that where authorities deem "*…grid reinforcement not to be the most cost-efficient solution, then flexible connection agreements should be enabled on a permanent basis…*"

It remains to be seen whether the Commission will propose legislative reform on tariffs and connections as part of the Grid Package. If it does, it will need to tread carefully. Based on our experience, tariff reforms frequently involve considering fairness and distributional impacts on customer groups, typically the preserve of member states. And our experience in countries such as Belgium that have sought to legislate for flexible connections is that, depending on their implementation, they can result in uncertainty surrounding the definition and enforcement of flexible access rights (and, in turn, affect investments in renewables).

[1] OPINION NO 04/2025 OF THE EUROPEAN UNION AGENCY FOR THE COOPERATION OF ENERGY REGULATORS OF 26 MAY 2025 ON ENTSO-E'S DRAFT TEN-YEAR NETWORK DEVELOPMENT PLAN 2024 AND ON ENTSO-E'S DRAFT INFRASTRUCTURE GAPS REPORT 2024

A fair share

While EU network planning processes aim to identify investments beneficial from an overall EU perspective, network regulation and cost recovery arrangements remain national. So additional arrangements are required to ensure that costs and benefits associated with cross-border trade are shared at EU-level. The figure below summarises the current arrangements for doing so.



However, these rules are increasingly coming under pressure, with risks to member state (and wider public) support for cross-border trade:

- The total value of payments under the Inter-TSO Compensation (ITC) mechanism have risen by almost a factor of five since 2018 (based on ACER analysis). This has resulted in growing transfers between countries, from countries such as Norway and Italy located closer to the periphery of Europe, to countries such as Switzerland and Austria, which are estimated to host significant transit flows.
- As concerns cross-border cost allocation (CBCA), it will be important to ensure that costs and benefits are appropriately accounted for, in particular where projects concern novel energy vectors or molecules (such as H_2 or CO_2) or take innovative forms (e.g. how to account for costs and benefits associated with transit countries in projects that cover more than two neighbouring countries).
- The arrangements as a whole focus on fairness in terms of societal welfare – including impacts on producer welfare. However, with growing focus on cost-of-living issues in recent years, impacts on consumers may be given more weight by policymakers.

Where will the money come from?

This is not an abstract question. The substantial increase in required investments going forward means that for many, if not most, network companies, the rate of investment will exceed retained earnings. Additional debt will help, but many companies will need substantial equity injections.

This is a particular challenge for publicly owned operators, who often face political and fiscal constraints. They'll need clear equity strategies, backed by proactive shareholder involvement. Otherwise, they risk being unable to match the required pace of change.

The Commission is aware of the issue and has launched an Investors' Dialogue and is exploring guarantees and blended finance. The EU DSO entity has published a paper on the subject. But the extent to which the EU is responsible for solving these issues (other than through greater central funding and considering the role of the EIB) is unclear.

In addition, the supply chain has been a particular pinch-point for investment in grids, and there are concerns regarding its ability to keep pace as investment ramps up. Lead times for new transformers can be upwards of one year. Skilled labour is tight. Similar challenges apply to new H2 pipelines.

The EIB will introduce a 'grids manufacturing package' for the European supply chain to provide counter-guarantees to manufacturers of grid components, with an indicative amount of at least EUR 1.5 billion. The European Grid Package may put forward further measures, such as increasing visibility over future orders for the supply chain. The EU has recently experimented with similar measures involving some form of demand/supply transparency and/or aggregation (including for gas and H2). But again, the question is the extent to which EU-level co-ordination can add genuine value.

The way forward

Given the need for grid development and the challenges identified, it is clearly positive that the Commission is consulting on reforms. But the Commission's consultation is but a stepping stone. The discussion above has highlighted some key areas to consider:

- **Network planning:** Aligning EU and Member State approaches and providing greater clarity on how infrastructure planning is co-ordinated across energy vectors;
- **Efficient use of networks:** whether to legislate in these areas and, if so, the appropriate degree of flexibility to leave to member states;
- **Cost-sharing mechanisms:** how best to design arrangements that account for costs and benefits of cross-border infrastructure and ensure wider buy-in for investments; and
- **Financing and supply chain:** the role of EU-level co-ordination in addressing barriers to finance and bottlenecks in manufacturing and skilled labour.

Conclusion

Potential reforms in the above areas could be wide-ranging. They would not only involve changes to TEN-E, but could also touch on wider European legislation such as the Electricity Market Design reforms, Hydrogen and Decarbonised Gas Market Package, and the Renewable Energy Directive (RED III).

forthcoming legislative proposals on CO_2 markets and transportation infrastructure, as well as with the various non-legislative initiatives that are in train (such as EIB support and discussions on the EU Budget for 2028-34).

We look forward to the legislative proposals due by the end of the year and assessing these together with stakeholders.

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