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Smarter Grid, Safer Future: Input for the EU Grid Package

Introduction

Frank Bold is an expert group driving the energy transition in Central and Eastern Europe since 2010. We promote systemic change in the energy sector, to make it clean, resilient and accessible to all. By providing legal expertise in Czechia, Poland, and for NGOs and institutions across the EU, we're leading the charge towards a more sustainably designed energy market.

According to the recent report published by the Agency for the Cooperation of Energy Regulators (further referred to as "**ACER**"), annual investments in European energy networks are expected to double in the coming decades, reaching up to EUR 100 billion per year by 2050. However, **if the efficiency principle is not consistently applied, network costs for end customers – both households and industry – could increase by 50 to 100%** compared to now. (ACER: Getting the signals right: Electricity network tariff methodologies in Europe, 26 March 2025, p. 4)

As described in ACER' s report, distribution system operators often prefer capital-intensive infrastructure projects (CAPEX) over cheaper operational alternatives (OPEX), such as smart grid management. This approach is supported by the current price regulation framework in the majority of EU member states, which favors infrastructure investments regardless of their efficiency or long-term necessity. The result may be sub-optimal planning and **inefficient use of existing infrastructure**, which threatens both the availability of electricity and the competitiveness of the entire EU.

The European Grid Package is a great opportunity to reverse this trend and focus more on the efficient use of existing infrastructure. We therefore outline seven smart and cost-effective measures to use the existing capacity of electricity grids more efficiently. **The aim of these measures is to accelerate decarbonisation of the energy sector at the lowest possible cost for European consumers and industry.** Based on international best practices, these measures **could save up to €204 billion EU-wide** (estimate based on data from the Affordable Energy Action Plan, which states that investments in

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electricity grids could reach 584 billion EU-wide, but this could be lowered by 35 % with efficient use of grids).

Seven Key Measures for More Efficient Use of Grids

1. Release of Unused Capacity Reservations

Across the EU, we are dealing to a varying degree with long-standing unrealised power plant projects that, whether intentionally (speculatively) or unintentionally, block the capacity to connect other sources (as described in the EU Action Plan for Grids, part IV). The number of connection requests is still rising, and we need to address this issue proactively. For instance, in the Czech Republic alone, approximately half of the grid reservations of 23 GW will not be realised, and are blocking capacity for other projects which are closer to being ready.

Experience from abroad shows that it is important first and foremost to **thoroughly audit the scope of the problem.** Based on these findings, it is then crucial to introduce the right incentives in the connection process, whether positive, by forgiving financial penalties that projects would otherwise have to pay for leaving the queue (so-called **amnesty**), or negative, by **introducing stricter entry requirements and cancellation of reservations if certain milestones are not met**. In the UK and Spain, they have even combined these two approaches, and thus successfully addressed the network capacity problem.

Given the EU-wide scope of the problem, we therefore propose that the European Union impose the following obligations on Member States:

1) **Regularly audit approved connection requests** and assess how many of these projects are unlikely to be implemented.

2) On the basis of the audit, **propose and adopt concrete measures to remove "stalled" projects from the connection queue** and prioritise projects that are more ready for implementation.

The EU is empowered to impose these obligations on Member States under Article 194(1)(c) TFEU concerning the functioning of the energy market, the promotion of efficiency, and the interconnection of networks, and Article 170(2) TFEU regarding infrastructure interoperability and accessibility of electricity grids.

We recommend incorporating these obligations into Article 32(3) of the Directive (EU) 2019/944 of the European Parliament and of the Council of 5 June 2019 on common rules for the internal market for electricity (further referred to as the **IEMD**). Alternatively,

this section of the IEMD could be supplemented by a new article addressing inactive reservations and introducing a requirement to carry out an audit of such reservations every two years.

The proposed measures to be undertaken by distribution system operators, as well as their subsequent evaluation, could and should be part of the **distribution system development plan** (currently regulated under Art. 32(3) of the IEMD).

As for the specific form of these measures, we recommend leaving their design to the discretion of individual Member States. However, **we recommend that ACER issue a methodological guideline outlining examples of good practice from other countries** (e.g. Spain, the UK), which could serve as inspiration for Member States when adopting similar measures.

These steps would ensure that limited grid capacity is allocated to projects with the highest likelihood of completion, thereby accelerating the integration of renewable energy sources and minimising the need for unnecessary infrastructure investments. It would also mitigate the risk of "queue hoarding" and speculative project registration, by aligning grid access incentives with tangible project progress and delivery. The successful implementation of comparable measures in the United Kingdom provides a concrete example of both the feasibility and the effectiveness of such an approach.

We also suggest that ACER and national regulators should oversee compliance and publish annual reports on released capacity to monitor how much investment expenditure has been saved as a result. If possible, the freed-up capacity should also be translated into cost savings, in order to specify how the measure has alleviated the need for network expansion investments—thereby easing the financial burden on consumers and industry.

2. Adequate Capacity Reservations ("Use It or Lose It" Principle)

Applicants often overestimate their grid capacity needs when connecting new energy sources or consumption points, leading to unused reserved capacity. Without incentives to adjust these reservations to actual use, valuable grid capacity remains blocked. As demand grows, this inefficiency becomes increasingly problematic. Preventive and corrective tools exist—based on the principle of "use your capacity or lose it"—to free up unused capacity and improve grid access. Introducing these regulations could also help achieve one of the objectives of the European Grid Package, namely more efficient use of the grid and a reduction of the need for further expansion of the electricity system and related costs, as the capacity already exists but is simply not being utilized.

An example of the “use it or lose it” principle is the GOTORK mechanism introduced by the Dutch regulator ACM in April 2024. This allows grid operators to reallocate significantly underused reserved capacity—specifically in congested areas and for medium- to very high-voltage users—among projects waiting for connection. To protect user rights, this can only occur after a mandatory consultation and if underutilisation exceeds 50% or at least 1 MW. Affected users have the opportunity to justify current or planned usage within a year, and essential services like hospitals or schools benefit from a more lenient regime.

Given the EU-wide scope of the problem, we therefore propose that the European Union impose the following obligations on Member States:

1) I**ntroduce a monitoring mechanism** linked to the voluntary adjustment of capacity reservations to enhance transparency.
2) **Require a reporting obligation on the actual use of reserved capacity** instead of imposing an immediate sanction.
3) **Require Member States to ensure that DSOs have sufficient tools to limit long-term unused reserved capacity** (e.g. by revoking the unused portion of reserved capacity or introducing charges for it).
4) **Introduce regular audits** every two years to monitor unused reserved capacity and progress made by introducing new tools for DSOs.

The EU is empowered to impose these obligations on Member States under Article 194(1)(c) TFEU, which concerns ensuring the functioning of the energy market, promoting efficiency and the interconnection of networks, and Article 170(2) TFEU on the interoperability and accessibility of infrastructure.

These obligations could be reflected in Article 32(3) of the IEMD, by **adding the monitoring obligation as a key component of distribution network development plans.** Alternatively, this section of the IEMD could be supplemented by a new article addressing inactive reservations and introducing a requirement to carry out an audit of such reservations every two years.

Furthermore, this change could also be reflected in Article 18 of the Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019 on the internal market for electricity on network access, capacity allocation and congestion management—specifically in terms of charging for unused reserved capacity within the tariff structure, at least as a matter of cost-benefit consideration during the tariff design process by Member States.

The proposed measures to be undertaken by distribution system operators, as well as their evaluation, should be part of the **distribution system development plans** (currently regulated under Art. 32(3) of the IEMD). The choice of specific measures and audit implementation should remain at the discretion of individual Member States. The core objective of the measure is to ensure that National Regulatory Authorities set out rules

under which DSOs would apply the “use it or lose it” principle. Regulatory measures and tools should target both generation and consumption specifically, as systemic measures must be separated. Some Member States have measures only for consumption, which negatively affects their ability to incentivise producers.

Even when applying the “use it or lose it” principle, the capacity freed up as a result should be translated into cost savings, in order to quantify the financial benefits of this approach and help build a positive public perception of the steps taken by the European Commission in this regard. Financial arguments are key to convincing both public authorities and the general public of the need for change. Conversely, if a government or regulator officially quantifies how much money is being lost through inefficient capacity use, it creates a strong incentive for reform.

3. Prioritization in Connecting to the Network

We propose a move away from the “first-come, first-served” principle in favor of criteria-based prioritization, especially in congested areas. The ‘first come, first served’ approach has faced growing criticism, as it leads to a less strategic allocation of grid capacity and an uneven technological and geographical distribution of projects. According to IRENA, this method can exacerbate grid congestion and increase the curtailment of renewable energy, ultimately driving up system costs and leading to inefficient grid development (IRENA (2017): Adapting market design to high shares of variable renewable energy, p. 14).

A more coordinated and value-based approach would **prioritize projects that offer the greatest benefit to the energy system**. Europe-wide, the volume of renewable projects currently waiting in queues already outstrips the additional installation required to reach 2030 National Energy and Climate Plan targets (561 GW wind and solar combined between 2024 and 2030)[1]. In the Czech Republic, the “first-come, first-served” principle has led to grid queues dominated by earlier, but often less-prepared applicants, sidelining projects with greater societal or system value. Despite these concerns, the majority of Transmission System Operators (TSOs)—19 out of 25—still rely on the ‘first come, first served’ model[2]. The same goes for the DSOs.

However, reform efforts are underway in several countries, including France, the Netherlands, and Great Britain. In Great Britain, the independent National Energy System Operator is overhauling its connection process to ensure that only **projects**

[1] EMBER, BFF, E3G and IEEFA report „*How Europe’s grid operators are preparing for the energy transition*“, str.14
[2] Elia, HOPS, Cyprus TSO, ČEPS, Engerinet, Elering, Fingrid, RTE, the four German TSOs, Eirgrid, Terna, PSE, Transelectrica, Svenska Kraftnat, Tennet and National Grid – vypsat co je to za země?

demonstrating both strategic relevance to the 2030 clean power targets and **readiness for connection** are prioritised (this reform aims to eliminate so-called 'zombie' projects from the queue, improving overall efficiency and system value).

Given the EU-wide scope of the problem, we therefore propose that the European Union impose the following obligations on Member States:

1) Abandon the "first come, first served" principle in favour of a "first ready, first served" approach to connecting new generation facilities.
2) Establish a legal framework for project prioritisation based on objective criteria, under which a designated entity would assess the readiness of individual projects as well as their strategic relevance, and introduce a multi-criteria scoring system to evaluate it, while allowing Member States to adapt the framework to their national context.

The EU is empowered to impose these obligations under Article 194(1)(c) TFEU, as prioritisation contributes to the development of renewable energy sources, Article 170(2) TFEU on ensuring access to networks, and Article 191 TFEU on supporting climate objectives.

These obligations should be reflected in a new article of the IEMD. Unless this change is anchored at the EU level, some Member States are unlikely to implement such reforms on their own initiative (especially in the CEE region).

4. Cable pooling

Cable pooling enables multiple renewable energy sources to share a single grid connection point, reducing the total network capacity required. For example, wind power plants (WPP) and photovoltaic (PV) systems generate electricity at different times and complement each other seasonally, so combining their connection through cable pooling requires less reserved grid capacity than connecting them separately.

This approach can also be applied to connect power plants with battery energy storage systems (BESS). As with the release of unused capacity and the principles of "use it or lose it" and "first ready, first served," the introduction of cable pooling would contribute directly to improved coordination between different levels of network planning, and to more efficient use of existing infrastructure, in line with the principle of "energy efficiency first."

In practice, however, this tool may also face obstacles related to a lack of information—developers generally do not have access to data on already connected generation facilities unless they directly know the owners or operators of these sources. **For broader use of cable pooling, it would therefore be essential to ensure not only the legal**

and technical conditions but also greater transparency. Key to this would be, for example, the availability of **maps or databases** that would enable investors to **identify locations suitable for shared grid connection**.

Cable pooling is only in the pilot phase in Czechia, but its practical benefits have been demonstrated and proven in the Netherlands, France and Poland. In October 2023, Poland amended its Energy Act to allow cable pooling for two or more renewable energy sources (RES), enabling new RES to be added to existing ones, or new projects with multiple RES to be connected with each other. Experts estimate that cable pooling could free up 6–10 GW of capacity for RES in Poland. While standalone battery storage cannot yet be connected in this way, it is planned for the future.

Given the EU-wide scope of the problem, we therefore propose that the European Union impose the following obligations on Member States:

1) **Revise national connection rules to permit cable pooling** and define the conditions under which it can be implemented.

2) **Ensure that distribution system operators enable shared connections** and that the national regulatory authority approves the applicable sharing models.

3) **Take proactive steps to facilitate cable pooling, including improving transparency** and simplifying the identification of suitable connection points.

The EU is empowered to impose these obligations under Article 194(1)(c) and (d) TFEU, which support efficient network use, the integration of renewable energy sources, energy efficiency, and interconnection, and under Article 170 TFEU, which promotes better utilisation of existing infrastructure for the benefit of the internal market. These obligations should be reflected in an amendment to Article 32 of the IEMD, concerning access to the distribution system.

To unlock the potential of cable pooling, it is merely necessary for Member States to ensure that national legislation permits such an option. **The European Grid Package could play a facilitating role by requiring Member States to take proactive steps to enable cable pooling** within their territory and to simplify the process for users, particularly in terms of transparency.

5. Flexible Grid Connection Agreements

A flexible connection contract allows energy producers or consumers to connect to congested parts of the grid without the guarantee of continuous access, meaning their production or consumption may be limited at certain times. There are two types: dynamic

(with unpredictable curtailment) and fixed (with scheduled curtailment periods). **In exchange, customers receive financial incentives** such as lower distribution fees or compensation for undelivered electricity. This approach helps optimize existing grid capacity and is currently used in 15 EU member states, according to ACER (ACER: Getting the signals right: Electricity network tariff methodologies in Europe, 26 March 2025, p. 53).

Facing significant electricity grid capacity challenges, the Netherlands responded with the National Grid Congestion Action Programme in December 2022, introducing flexible grid connection agreements (fixed or dynamic) that allow the curtailment of power generation in cases of congestion, with agreed compensation covering undelivered energy, lost RES support, and lost green electricity profits. The first such contracts with large producers began in November 2023. Denmark, meanwhile, addresses capacity issues by offering reduced network tariffs—up to 50% lower—to large consumers willing to accept occasional, brief supply interruptions, reducing the need for costly grid investments by lowering reliability requirements.

In EU law, flexible connection agreements are already regulated in Article 6a of Directive (EU) 2024/1711 of the European Parliament and of the Council of 13 June 2024 amending Directives (EU) 2018/2001 and (EU) 2019/944 as regards improving the Union's electricity market design. **However, member states are not obliged to provide financial compensation for limiting continuous access to the grid.** Therefore, producers are not motivated to enter into flexible connection contracts in some member states (including the Czech Republic). Given the EU-wide scope of the problem, we therefore propose that the European Union impose the following obligations on Member States:

1) Amend flexible connection agreements (dynamic and fixed) that let energy producers or consumers connect to congested grid areas without the guarantee of continuous access, **with curtailment compensated financially** (e.g., lower fees or payments for undelivered electricity), and ensure these contracts have clear compensation rules or capacity limits based on methodological guidance.

2) **Expand flexible connection agreements to cover both energy generation and consumption**, considering specific grid conditions, and require national regulators to approve sharing and compensation models for these agreements.

The EU is empowered to impose these obligations under Article 194(1)(a), (b), and (c) TFEU, which cover energy supply security, efficient network use, support for renewable energy, and internal market functioning, as well as under Articles 170 and 171 TFEU on interoperability and the efficient use of trans-European energy networks. These obligations should be reflected by amending Article 6a of Directive (EU) 2024/1711 to improve the design of the Union's electricity market concerning connection agreements.

These measures should be primarily addressed at the Member State level, reflecting their specific grid conditions. However, European legislation should unify the general framework to avoid unequal market conditions caused by differing practices concerning compensation between Member States.

6. Dynamic Network Tariffs

Dynamic network tariffs provide consumers with real-time or near-real-time pricing based on current grid capacity, encouraging them to shift energy use—such as heating water or charging EVs—to off-peak times. Unlike static time-of-use tariffs, which set prices well in advance for longer periods, dynamic tariffs update prices shortly before consumption, making them more responsive to grid conditions but less predictable. These tariffs require smart meters to track consumption almost in real time and better align energy use with grid capacity.

In France, medium-voltage users can access dynamic tariffs where the most expen-sive electricity periods are announced a day in advance, based on TSO estimates. In Switzerland, dynamic tariffs are being tested by the local DSO Group E through their Vario2 product, which updates prices every 15 minutes according to expected network load and publishes them daily before 6 p.m. These prices are accessible online and via API for automatic integration into consumers' energy management systems. This option targets consumers using up to 100 MWh annually, especially smart households, and is part of the NeDeLa research project exploring dynamic tariffs for decentralized network load management.

Given the EU-wide scope of the problem, we therefore propose that the European Union impose the following obligations on Member States:

1) Use the current legal framework in the Electricity Market Regulation (especially Article 59 on tariff regulation) or amend it by adding a provision to Article 18 to **require Member States to introduce dynamic network tariffs**.

2) **Rely on methodological guidance from ACER** to implement these tariffs, promoting transparency and better network utilization for smarter, more efficient grids with innovative technologies.

3) **Encourage cooperation among system operators** and the adoption of ACER's recommendations, aligned with the EU Action Plan for Grids.

The EU is empowered to impose these obligations on Member States under Article 194(1)(c) TFEU, since supporting dynamic distribution tariffs contributes to the efficient use of energy, reduces load on the electricity system during peak times, and increases

market flexibility, thereby fulfilling the energy efficiency objective. This measure is also supported by Article 191 TFEU as it helps reduce the environmental burden through a lesser need for operating reserves and a lower peak load.

7. Transparency in Network Capacity and Connection

Applicants often overestimate their grid capacity needs when connecting new energy sources or consumption points, leading to unused reserved capacity. Without incentives to adjust th Transparency of network capacity is crucial for renewable energy developers to make informed investment decisions. Tools like interactive maps, offering detailed and regularly updated information down to individual properties, help provide clarity on connectivity options. Additionally, maintaining an anonymized list of connection applicants clarifies expected waiting times, while providing estimates for connection times and costs supports and accelerates the development of renewable energy projects.

In Belgium, the local TSO Elia provides open data about network capacities through a map displaying the remaining capacity at individual substations and voltage levels, allowing investors to filter by resource type, such as PV, wind, or battery storage. The Flemish TSO Fluvius offers an even more detailed interactive map, launched in 2024, showing capacity for new generation connections, distance to substations, connection time, and costs. Developed specifically to support energy transition in the business sector, Fluvius created the tool based on feedback from industry representatives to ensure usability.

Given the EU-wide scope of the problem, we therefore propose that the European Union impose the following obligations on Member States:

1) For regions where **highly transparent connection capacity maps** do not yet exist, we recommend **introducing an obligation to produce them**.

2) Ensure **maps cover all voltage levels and individual connection points**, providing detailed and anonymized data on connection request queues (type, size, evaluation stage). Make key information, including estimated connection costs, directly accessible through the map interface.

3) **Digitize and update connection capacity maps regularly** (at least monthly), aiming for near real-time updates (e.g., every 15 minutes) where possible, following best practices like those in Belgium.

The EU is empowered to impose these obligations under Article 194(1)(a) TFEU, concerning the functioning of the internal energy market, and Article 170 TFEU, supporting

interoperability of energy networks. We recommend incorporating these obligations into Article 31(3) of the IEMD, which regulates necessary information for system access.

Furthermore, within the European framework, we propose developing a standardized methodology—potentially through ACER —and issuing a best practice document to guide implementation of the connection maps.

Conclusion

By integrating these measures into the upcoming initiative, the EU Grid Package can help unlock significant grid capacity, accelerate the integration of renewables, and ensure the most beneficial projects are prioritized—delivering cost savings and climate benefits across the Union, reducing the need for costly new infrastructure investments, and supporting the EU's climate and energy goals. If adopted EU-wide, harmonized legal frameworks across the EU would facilitate cross-border adoption of these measures.

In the comments above, we proposed seven non-investment measures aimed at enhancing the capacity of the EU electricity grid:

1) **Release of Unused Capacity Reservations**
Regular audits should identify and help remove stalled grid connection projects, using incentives or penalties to free capacity for more ready projects, ensuring efficient grid use across the EU.

2) **Adequate Capacity Reservations ("Use It or Lose It" Principle)**
Introduce monitoring and regulatory tools so unused reserved grid capacity can be revoked or charged, encouraging applicants to align reservations with actual use.

3) **Prioritization in Connecting to the Network**
Replace the "first-come, first-served" rule with a "first ready, first served" approach based on objective readiness criteria to prioritize projects that are more prepared and beneficial.

4) **Cable Pooling**
Allow multiple renewable sources to share a single grid connection point to optimize capacity use, supported by transparency and clear national rules.

5) **Flexible Grid Connection Agreements**
Enable connections with variable access and financially compensated

curtailment, optimizing grid use for both producers and consumers, especially in congested areas.

6) **Dynamic Network Tariffs**
Implement real-time or near-real-time pricing to incentivize consumers to shift energy use to off-peak times, improving grid efficiency and load management.

7) **Transparency in Network Capacity**
Mandate frequent updates of detailed, accessible maps showing grid capacity, costs, and waiting lists, and promote EU standards and pilots to support transparent, efficient connections for renewables.

We thank the European Commission for considering our proposals. Should you have any further questions, please feel free to contact us.

Yours Sincerely

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