

EREF Contribution to the Public Consultations on the European Grids Package

Brussels, 01 August 2025

The development of resilient, modern grids is a cornerstone of the European Union's energy transition. Yet across Europe, delays in grid connection and insufficient grid infrastructure are increasingly emerging as one of the main bottlenecks to the expansion of renewable energy. If the EU is to meet its 2030 and 2050 climate targets and ensure a competitive, renewables-based energy system, a comprehensive transformation of electricity networks at all voltage levels, alongside coordinated investments in heating, cooling, and sector integration, must become a political priority. The European Grids Package provides a timely opportunity to deliver this transformation.

Address grid connection bottlenecks and project backlogs

Grid connection delays have become a major bottleneck holding back renewable energy deployment across Europe. Hundreds of gigawatts of new renewables projects are stuck in lengthy queue systems awaiting grid access, creating a backlog that could undermine the EU's renewable energy goals.¹ Such delays are not only slowing the energy transition but also wasting existing renewable generation – an estimated €7.2 billion worth of clean electricity had to be curtailed in 2024 across seven countries due to grid constraints, with costs ultimately borne by consumers.²

The connection bottleneck is now cited as one of the most pressing barriers to renewable energy development in numerous Member States. Often it takes years to obtain a grid connection approval, including for repowering of existing renewable capacity. These timelines are not only caused by limited grid capacity but also by the “first-come-first-served” queue rules, which can be vulnerable to misuse and do not adequately reflect climate and energy policy priorities.

EREF strongly suggests structural reform of these access regimes. Inspired by emerging approaches in European countries such as the UK, France, and Spain – where grid access is increasingly conditioned on project readiness (e.g. financial

¹ Beyond Fossil Fuels, Ember, E3G and Institute for Energy Economics and Financial Analysis, '*How Europe's Grid Operators Are Preparing for the Energy Transition: A Snapshot of Electricity Transmission System Operator Practices and Plans*' (May 2025)

² Ibid.

guarantees, permitting milestones) and, in some cases, contribution to renewable and climate goals — EREF calls for connection prioritisation to be guided by technical maturity and alignment with decarbonisation targets. Transmission and distribution system operators must actively manage queues to allocate capacity to future-proof, ready-to-build projects. In particular, connection readiness (including financing) and the contribution to phasing out greenhouse gases, including but not limited to CO₂, should become key assessment criteria.

Moreover, the Grids Package should promote EU-wide adoption of digital pre-connection tools across the EU, enabling developers to access transparent, real-time information on available capacity and grid usage. Such tools, as piloted by some DSOs, can reduce speculative applications, ease bottlenecks, and facilitate more efficient planning without imposing mandatory burdens.

In addition, due to the high costs of upgrading the electricity grid to meet the ever-increasing demand, there is a need to assess how deferred reinforcement of the electricity grid can be made. Incentivising energy efficiency measures would be in line with current legislation. Alternative solutions for heating homes, such as solar thermal, geothermal, biomass, and prosumer wind/PV, which reduce reliance on the grid, should be prioritised. Virtual battery systems (compensating for voltage variations) and distributed generation, such as small hydro-power, have proven effective in reducing the need for grid upgrades in certain areas. A concerted effort in this area could lower costs, reduce operating expenses for consumers near DNOs with headroom, and minimise environmental and biodiversity impacts as it requires less planning, permitting, and deployment.

Flexibility needs and storage for a future-proof energy system

A resilient and future-proof energy system requires the rapid deployment of flexibility and storage solutions. Flexibility is essential not only for integrating growing shares of renewable energy but also for managing the increasing vulnerability of legacy power generation, such as nuclear and fossil thermal generation, to extreme weather, which adds system uncertainty.

Long-duration energy storage, demand response, and other flexibility tools are crucial to ensure a stable, reliable system based on renewable energy. In addition, flexibility solutions reduce grid expansion costs by smoothing out daily, weekly and seasonal imbalances. Demand-side response and storage can relieve pressure on networks, while stronger interconnections between countries increase flexibility and enable

reserve sharing.³

Yet flexibility remains a structurally undervalued component of energy system design in most Member States. National NECPs often acknowledge their importance, but few set clear targets or articulate concrete deployment pathways, as laid out in the Commission NECP assessment.⁴

EREF stresses the importance of mobilising all available flexibility options – short-term and long-term, consumer-side and utility-scale. These include pumped hydro storage, green hydrogen, batteries, virtual power plants, small hydro and biogas. We also highlight the importance of expanding demand response and sector coupling (for instance, using electric vehicles and heat pumps as flexible loads or leveraging BECCS or renewable hydrogen for long-term storage).

Crucially, storage solutions must be incorporated into all stages of grid planning. DSOs in particular should be supported in exploring local, small-scale storage (e.g., 1 MW near generation sites) to relieve congestion and enhance resilience. Current regulatory frameworks often lack sufficient incentives for such systems. Support should be given to sustainable storage solutions that reduce dependency on rare earths and critical materials. This could include support for innovations such as underwater pumped storage power plants, gravity storage, saltwater batteries and hydrogen storage. Promoting the recycling of rare earths from electronic waste and the development of new separation processes for their extraction are equally important steps towards more sustainable utilisation.

Moreover, the Grids Package should include clear provisions ensuring legal certainty for local storage and behind-the-meter flexibility solutions (e.g. electrolyzers, batteries, Power-to-X). Allowing these to operate and consume or store energy before injection into the public grid reduces curtailment, limits grid congestion, and supports local sector coupling.

By deploying modern storage solutions and more dynamic grid management tools, Europe can integrate renewables at scale while maintaining grid stability, reducing price spikes, and minimising reliance on fossil-fuel peaking plants. This will ultimately bring down costs for consumers and ensure the grid is future-proof.

In light of this, EREF strongly supports existing EU-level measures to facilitate storage

³ European Court of Auditors, *Review No 01/2025: Making the EU Electricity Grid Fit for Net-Zero Emissions* (16 April 2025)

⁴ European Commission, '*EU-wide assessment of the final updated national energy and climate plans delivering the Union's 2030 energy and climate objectives*' SWD(2025) 140 final, p 19.

deployment, such as the Commission's 2023 Recommendation on Energy Storage, which urges Member States to identify flexibility needs, remove barriers (e.g. double taxation), and ensure storage can access revenue for the grid services it provides.⁵ The Grids Package should recognise the efforts and support them in a comprehensive way.

In parallel, the market design must evolve to properly value flexibility services. Current market structures often fail to remunerate the full system benefits provided by storage, demand response, and distributed resources. EREF encourages the Commission to ensure that flexibility providers can access fair and transparent revenue streams for the grid services they deliver and that SME flexibility providers are given a status that will enable them to participate favourably in the market.

The need for grid planning, system resilience and European coordination

Grid expansion must not only be faster; it must also be more strategic. Improved coordination between Transmission System Operators (TSOs) and Distribution System Operators (DSOs) is essential to efficient grid development and operation in a renewables-based energy system. Europe's electricity network is undergoing a paradigm shift: approximately two-thirds of new network investments through 2030 will be at the distribution level, as millions of distributed solar PV systems, batteries, electric vehicles and other resources connect to local grids.⁶

This evolution means transmission and distribution planning can no longer occur in silos. National frameworks must require early and continuous information exchange between DSOs and TSOs so that investments are aligned across the whole system. For example, when DSOs prepare their network development plans, they should share data on expected new generation and demand (e.g. large solar parks, electric vehicle charging hubs) with the TSO in a timely manner. Likewise, TSOs must consider the capacity of regional distribution networks when planning upgrades, to avoid bottlenecks "downstream."

The Grids Package should incentivise and, where needed, require robust TSO-DSO cooperation (in network planning, operational coordination, and innovation) so that the entire grid, from high-voltage lines to low-voltage feeders, evolves as a unified system aligned with Europe's renewable energy ambitions. This includes closer integration between the Ten-Year Network Development Plans (TYNDPs), the national energy and

⁵ European Commission, *'Recommendation on Energy Storage – Underpinning a decarbonised and secure EU energy system'* (14 March 2023) C 103/01, OJ C 103, pp. 1-5

⁶ Heussaff C and Zachmann G, *Upgrading Europe's Electricity Grid is About More than Just Money* (Policy Brief 04/2025, Bruegel 2025).

climate plans (NECPs), and the implementation of the Renewable Energy Directive (RED III). In particular, grid development plans must explicitly integrate national acceleration areas for renewables and related infrastructure zones to ensure that these areas, designated to fast-track renewable deployment under RED III, are supported by timely grid reinforcement and investment. Moreover, the EU's Electricity Market design has formalised some requirements (e.g. obliging DSOs to publish network development plans and establishing the EU DSO Entity to interface with ENTSO-E), but practical cooperation still varies widely by country.

Moreover, dedicated EU funding instruments should not only support grid expansion but also prioritise modernisation, digitalisation, and reinforcement of distribution grids. Leveraging instruments such as CEF and InvestEU with a stronger focus on distribution-level needs will mobilise private investment and accelerate renewable integration. These instruments must also ensure access for smaller actors and decentralised grid investments.

Additionally, the recent Iberian blackout has exposed the urgent need to embed resilience more firmly into European grid planning. This means preparing for extreme weather, cyberthreats, and variable energy production, with clear fallback scenarios at all voltage levels. While certain regions face a geographic imbalance between renewable generation and demand, others struggle with seasonal variability. In all cases, reinforced interconnectors and smart, regional coordination are vital to ensure security of supply and mitigate structural imbalances. To do so, Member States must take concrete steps to reach the EU's interconnection target of at least 15% by 2030.

Finally, the Grids Package should embed technological innovation (including flexible connection agreements, dynamic line rating, and smart grid technologies) to make the most efficient use of existing infrastructure while preparing for future needs.

Access to finance and recognition of smaller market actors

Smaller actors, including SMEs, cooperatives, and energy communities, are key drivers of the transformation to a renewables-based energy system. They must have fair grid access and equal ability to feed in and draw energy from the networks. This also includes communal small power supplies, which the Commission fails to recognise as SMEs due to their large share of public ownership. These companies, that fulfil all other SME criteria, should also have fair access to the grid.

However, connection agreements with TSOs and DSOs often impose highly demanding technical or financial thresholds which constitute a significant barrier to the development of decentralised project development across Member States.

Additionally, smaller actors face increasing difficulty in navigating the complexity of grid-related investment frameworks, including costly connection procedures and capacity constraints on local grids, which often are set up in a way that is easier for larger commercial developers to navigate. Financing is another constraint, as grid upgrade costs or high connection charges can be prohibitive for smaller actors.

When grid capacity is allocated or network tariffs and connection fees are designed, the needs and scale of smaller actors must be considered. For example, capacity reservation rules might set aside a portion of local grid capacity for SMEs and community projects, or connection cost schemes could be adjusted (or subsidised) for community installations to prevent them from being priced out. Member States should also actively use the provisions in EU law that allow priority dispatch or curtailment exemptions for small renewable energy plants and demonstration projects, ensuring that community projects can operate without undue interruption.

Empowering small consumers and businesses as active grid participants brings system-wide benefits. When households and SMEs install renewables, batteries, or smart energy controls, they become “active consumers” who can help balance the grid by consuming, storing, or even selling power at optimal times. As the European Court of Auditors observed, consumers who produce electricity locally and energy communities that generate and consume collectively can play an important role in providing flexibility and supporting the grid.⁷

EREF urges the Commission to promote a structural approach to financial access and legal certainty for smaller actors. EU funding instruments, regulatory templates, and national grid development incentives must explicitly account for the participation of diverse market actors. Market entry should not be conditioned on size or financial leverage. This is essential not only for fairness and citizen support, but for the resilience of a decentralised, renewables-based energy system.

The Grids Package should enforce and enhance the rights of energy communities and SMEs. This could involve requiring regulators to review grid codes and connection rules for barriers to small-scale projects, mandating transparency from DSOs on available connection capacity (so communities can plan projects realistically), and ensuring that network tariffs are designed in a proportionate way (for example, avoiding excessive fixed charges that disadvantage small injection or consumption).

By creating a level playing field, Europe can unlock the vast potential of SME and citizens’ energy contributions, bringing additional investment, innovation, and public

⁷ ECA, *Review No 01/2025* (16 April 2025), pp. 37-38.

support to the energy transition while making the grid more resilient and flexible at the local level.

Improve permitting and coordinated planning for grid expansion

Lengthy and cumbersome permitting procedures for grid infrastructure are a well-documented cause of delays in strengthening Europe's electricity networks.⁸ Just as renewable generation projects have faced slow permitting, grid expansion projects (such as new transmission lines, substations, distribution upgrades) often encounter protracted planning processes, environmental clearances, and public opposition.

EREF welcomes the recognition in the Commission's Grid Action Plan that permitting is one of the core challenges faced by grids in the energy transition, and the proposal of tailored measures to speed up these procedures. Notably, Action Point 11 of that plan stresses full implementation of the improved permitting rules in the revised RED III (which, for the first time, extends certain streamlined procedures to grid projects), including declaring grid developments of overriding public interest and using dedicated grid areas with lighter environmental assessment requirements.

EREF strongly suggests the implementation of these measures, as long as these areas remain strictly reserved for the connection of renewable energy and storage projects and not be diverted for fossil-based or non-renewable technologies. Swift transposition and enforcement of these new provisions are critical, as delays in Member States transposing RED III's grid-permitting clauses have already prompted infringement actions by the Commission.

In addition, the Commission should build upon its experience with RED to enable more coordinated planning for grids. This should include promoting a "one-stop shop" permitting authority. Another best practice is coordinated planning between generation projects and grid expansion, to avoid sequential, duplicative processes. This ensures that grid build-out is not a post hoc obstacle but part of the initial project development, and it enables stakeholders (developers, grid operators, local authorities, environmental bodies) to address issues in a synchronised fashion.

Finally, EREF stresses the importance of stakeholder engagement and public acceptance in accelerating grid permits. Local opposition and lengthy legal challenges frequently slow down grid projects. The Commission's "Pact for Engagement", launched in November 2023, aims to improve this by fostering early dialogues with

⁸ ECA, *Review No 01/2025* (16 April 2025).

communities and stakeholders for grid development.⁹ EREF supports such initiatives and encourages their systematic integration into national permitting processes to strengthen trust and ensure transparent decision-making.

Harmonised, transparent legal frameworks are needed to guarantee priority access for renewables and to prevent the misallocation or underutilisation of grid capacity. EREF supports streamlined permitting procedures, predictable criteria for infrastructure deployment, and legal safeguards to ensure that accelerated permitting results in real investment and project delivery.

Conclusion

The European Grids Package must be more than a technical upgrade. It is a litmus test for Europe's commitment to a future-proof energy system. Grid infrastructure can no longer be considered a background enabler; it is a crucial prerequisite for decarbonisation, competitiveness, and security. Without resilient, sustainable, flexible, and fair grid systems, the implementation of the Green Deal and the aspirations of the Clean Industrial Deal will remain incomplete.

Special consideration for small and medium scale flexibility, storage, planning and SMEs is required with the emphasis on faster deblocking of bottlenecks, rationalising planning, improved permitting and access to finance.

The Commission should also recall the proven benefits of priority grid access for renewables over the past two decades, which had fostered robustness and flexibility pathways in our grid systems and should inform future queue management reforms.

EREF strongly suggests the Commission deliver a bold and integrated package that aligns grid planning and access with an accelerating energy transition.

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⁹ European Commission, *A Pact for Engagement: Ensuring Early, Regular and Meaningful Stakeholder Engagement in Grid Development* (28 November 2023)