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A Grids Package for a resilient and competitive electricity infrastructure:

CurrENT's top 5 recommendations to the European Commission



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Enabling Network Technology
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Top 5 Priorities for the Grids Package

1. The Grids Package, that will be proposed by the European Commission in Q4 of 2025, must include a 'Grid Preparedness and Innovation Strategy' to support resilience, modernisation, the uptake of innovative grid technologies and ensure that Europe's electricity grids are developed to support a decarbonised, energy independent, and electrified European energy future. This strategy should increase support for the deployment of innovative grid technologies, as well as European manufacturing of critical grid components and technologies, aided by localized supply chains and innovative funding strategies.
2. In order to ensure that climate neutrality by 2050 remains in reach, fully decarbonizing the electricity system well before 2040 must remain the European Commission's top priority.¹ Innovative grid technologies will be an essential pillar in achieving this goal, while simultaneously preparing European grids for the increased demand coming from electrification of industrial processes, AI, and other parts of the economy. Furthermore, the ambitious support to European manufacturing laid out in the Net Zero Industry Act of must include the production of innovative grid technologies. The sum of all measures proposed in the Grids Package must show a clear pathway towards achieving net zero by 2050.
3. When revising the TEN-E Regulation, the European Commission must strengthen the governance structure, including ensuring that all "grid needs assessment and planning complies with the EU climate and energy targets²" with a focus placed on cost effective solutions. In order to ensure grid capacity is increased in a cost-effective manner, the regulation should ensure that all non-wire alternatives and other cost-efficient solutions to increase grid capacity have been exhausted prior to building new lines and expanding physical infrastructure. The regulation should follow the example set by US Federal Energy Regulatory Commission in

¹ European Scientific Advisory Board on Climate Change, [Scientific advice for the determination of an EU-wide 2040 climate target and a greenhouse gas budget for 2030–2050](#), 15 June 2023.

² Council conclusions on advancing sustainable electricity grid infrastructure, <https://data.consilium.europa.eu/doc/document/ST-10459-2024-INIT/en/pdf>, 30 May 2024

FERC order 1920 which mandates that Transmission providers must consider innovative grid technologies as potential solutions during long-term planning processes.

- 4. The European Commission must propose a limited number of binding, quantifiable grid targets at both transmission and distribution level. Regular monitoring of the progress of these targets will demonstrate whether Europe is on track to decarbonize the electricity system well before 2040, and raise the alarm if Europe risks falling behind, particularly as this affects European Competitiveness³.**
- 5. In the light of the recent MFF proposal⁴ and the increased amounts of financing available for electricity grids, the European Commission should ensure that Innovative grid technologies are fully used to optimise costs and provide immediate benefits. Facilitating the mass deployment of innovative grid technologies can ensure grids capacity is boosted cost effectively, amplifying the impact of all money spent, making us more competitive while catalysing electrification of European industry. With regards to financing for electricity grids, (e.g. under the Connecting Europe Facility, the new European Competitiveness Fund, the EIB's grids manufacturing guarantee, etc.), the European Commission must ensure that a significant portion of this financing goes towards supporting the demonstration, mass deployment and scaling of innovative grid technologies, and supporting the build out of European manufacturing capacity of these technologies.**

Introduction

There is no doubt that electricity grids have a key role to play in in decarbonising the EU's economy, in achieving energy independence, and driving competitiveness.

³European Scientific Advisory Board on Climate Change, [*Scientific advice for the determination of an EU-wide 2040 climate target and a greenhouse gas budget for 2030–2050*](#), 15 June 2023.

⁴ MFF proposal

This has been acknowledged by European institutions through various reports such as the 'Affordable Action Plan for Energy' and European Parliament own initiative report, 'On Electricity grids: the backbone of the EU's energy system'.

CurrENT is now calling for urgent action on the deployment of innovative grid technologies to unleash the full potential of Europe's electricity grid at the lowest cost to consumers.

Innovative grid technologies include grid-enhancing technologies that get more out of the existing grid, technologies that enable operation of a power system with a high penetration of renewables, and high-capacity conductors that offer up to ten times the transfer capacity of traditional conductors and significantly reduce network losses.

The detailed recommendations below have been developed with the expertise of our members, who are at the forefront of the uphill struggle to make Europe's grids more modern, responsive, secure and efficient. All recommendations build towards the goal of decarbonizing Europe's electricity grid as much as possible by 2030 which will be essential step for Europe to net zero by 2050.

Policy Recommendations

1) The Grids Package, that will be proposed by the European Commission in Q4 of 2025, must include a 'Grid Preparedness and Innovation Strategy' to support resilience, modernisation, the uptake of innovative grid technologies and ensure that Europe's electricity grids are developed to support a decarbonised, energy independent, and electrified European energy future. This strategy should increase support for the deployment of innovative grid technologies, as well as European manufacturing of critical grid components and technologies, aided by localized supply chains and innovative funding strategies.

1. The strategy should include a comprehensive assessment of where Europe is falling behind on the roll-out of grid capacity required to meet decarbonisation and electrification targets, and where innovative grid technologies can help fill this gap as a priority action.
2. Simultaneously, the strategy should ensure immediate deployments of innovative grid technologies to realize benefits which can be achieved in

- the short-term to provide missing grid capacity, taking into account the NOVA principle, where grid infrastructure should be optimised first through the deployment of innovative grid technologies and non-wire alternatives to relieve the most pressing demands for grid connection and congestion.
3. The strategy should provide a clear, coordinated vision for accelerating the development, testing, scaling and deployment of innovative grid technologies at both transmission and distribution levels, involving key stakeholders across the whole value chain including: National Governments, TSOs, DSOs, technology developers, regulators, research bodies, and financial institutions.
 4. The strategy should address key elements needed to foster an innovative grid, including:
 - a. An EU-wide assessment of barriers to scaling up innovative grid technologies at both transmission and distribution levels. This assessment should aggregate the barriers at the level of all Member States.
 - b. An assessment of whether both existing and proposed EU funding instruments are fit for purpose to develop, scale and accelerate the deployment of innovative technologies. This includes the Innovation Fund, Connecting Europe Facility, Horizon Europe, the new Competitiveness Fund, and future innovation funding.
 - c. Furthering on from the initial MFF proposal announced, a framework for testing, piloting, and fast-tracking deployment of innovative grid solutions (e.g., regulatory sandboxes, innovation zones) where several system operators can collaborate with technology providers and regulators, to quickly deploy technologies onto their system once they have been demonstrated. An emphasis must be placed on fast tracking the deployment of innovative grid technologies that are already at TRL 7 – 9.
 - d. Clear targets and milestones for innovation uptake aligned with the Grids Action Plan⁵ and the 2040 climate target trajectory. The specifics of these targets are further elaborated under Section 4.
 - e. A systemic reinvestment cycle which allows both manufacturing and deployment to be constantly reinforcing each other, further clarified in Section 5 below.

⁵ *Grids, the missing link – An EU Action Plan for Grids*, 2023, European Commission

2) In order to ensure that climate neutrality by 2050 remains in reach, fully decarbonizing the electricity system well before 2040 must remain the European Commission's top priority.⁶ Innovative grid technologies will be an essential pillar in achieving this goal, while simultaneously preparing European grids for the increased demand coming from electrification of industrial processes, AI, and other parts of the economy. The ambitious support to European manufacturing laid out in the Net Zero Industry Act of must include the production of innovative grid technologies. The sum of all measures proposed in the Grids Package must show a clear pathway towards achieving net zero by 2050

The Commission has highlighted a consistent downward trend in greenhouse gas emission intensity of power generation in the European Union, where generating one kilowatt hour emitted 36% less greenhouse gases in 2023 than it did in 2013⁷. However, Europe must continue to push this ambition even further to ensure that these reductions are significant enough to enable the decarbonization of the electricity system by 2040 in a cost-effective manner. The Commission has highlighted the need for and benefit of early intervention, highlighting that “the less action the EU takes in the next ten years, the steeper and more challenging the reduction path after 2030”⁸. The suggestions below outline some of the ways that the push for electrification can be expedited and sped up by:

1. Supporting alternative connection projects, such as co-financing connections with private financing, to speed up grid connections for industries.
 - a. With the support of ACER, ENTSO-E, the European Commission, and key industry stakeholders mandate the development to develop a clear, harmonised framework for merchant transmission projects to support timely grid development and cross-border capacity⁹.
 - b. This framework should provide legal and regulatory certainty for private investment in transmission infrastructure, while ensuring that

⁶ European Scientific Advisory Board on Climate Change, [Scientific advice for the determination of an EU-wide 2040 climate target and a greenhouse gas budget for 2030–2050](#), 15 June 2023.

⁷ Greenhouse gas emissions intensity of electricity generation in Europe, <https://www.eea.europa.eu/en/analysis/indicators/greenhouse-gas-emission-intensity-of-1>, 27 June 2025

⁸ Stepping up Europe's 2030 climate ambition – Investing in a climate neutral future for the benefit of our people, <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:52020DC0562>, 17 September 2020

⁹ In this sense, merchant transmission projects should be understood as collaboration between the EU and heavy industry users where all parties participate in the planning and development of grid infrastructure and connections needed to electrify their process

- such projects are aligned with EU energy system needs and security of supply.
- c. Member States and NRAs should be encouraged to facilitate merchant transmission initiatives, particularly where they address identified grid bottlenecks, integrate renewables, or enhance market integration, while safeguarding system planning coherence and fair cost-sharing.
2. Expanding the rollout of 'Output-based' incentives schemes across Europe that reward system operators for deploying innovation and improving the efficiency of existing infrastructure
- a. Mandate the use of alternative incentive schemes that support the deployment of innovation into grids.
 - b. Expediate the rollout of Output based incentives schemes across Europe, such as Benefit Sharing schemes, by allowing for proven success of alternative incentive schemes in a European context to negate the need to pilot such incentive programs.

3) When revising the TEN-E Regulation, the European Commission must strengthen the governance structure, including ensuring that all “*grid needs assessment and planning complies with the EU climate and energy targets*”¹⁰ with a focus placed on cost effective solutions. In order to ensure grid capacity is increased in a cost-effective manner, the regulation should ensure that all non-wire alternatives and other cost-efficient solutions to increase grid capacity have been exhausted prior to building new lines and expanding physical infrastructure. The regulation should follow the example set by US Federal Energy Regulatory Commission in FERC order 1920 which mandates that Transmission providers must consider innovative grid technologies as potential solutions during long-term planning processes.

Building on the Council's Conclusions on Advancing Sustainable Electricity Grids Infrastructure in May 2024, which called for “*a European grid needs assessment and planning that complies with the EU climate and energy targets*” and “*increase transparency, traceability and appropriate independent oversight for*

¹⁰ Council conclusions on advancing sustainable electricity grid infrastructure, <https://data.consilium.europa.eu/doc/document/ST-10459-2024-INIT/en/pdf>, 30 May 2024

the whole transmission grid planning and development process", the announced TEN-E revision must include:

1. A mandate created for a transparent review of selection processes that details all alternatives that were considered, the extent to which they were considered, and reasons for their non-selection in PCI projects.
2. A streamlined approval process to allow technologies that can be deployed rapidly, under 3 years, to be recognized and approved for PCI status, hence making the technology eligible for CEF Funding.
3. Mandate the use of TOTEX Cost-Benefit Analysis that accurately reflects the benefits of rapid deployment, yearly spend, and benefits accrued
4. The creation of a forward-looking technological vision that projects the maturity of technologies needed to achieve a pan-European supergrid by 2050, such as high-capacity conductors, further encouraging grid investment to support the widescale deployment of necessary and enabling technologies.
5. Require that innovative grid technologies are considered in all cross-border projects to ensure that the benefits of innovative grid technologies are accounted for.
6. Ensure that the benefits of innovative grid technologies, (including grid-enhancing technologies and high-capacity conductors), are integrated into the planning, assessment, and implementation of all Projects of Common Interest (PCIs), regardless of the project category. This should include:
 - a. Mandate all PCI promoters to assess the potential contribution of innovative grid technologies during the project design phase, with results reported in project proposals submitted for PCI status.
 - b. Mandating that the TEN-E Regulation implementation guidelines include provisions for technology-neutral evaluation criteria that reflect the system-wide value and deployment-readiness of innovative grid solutions.
 - c. Ensuring that CEF funding eligibility for PCIs is conditional on a demonstrated assessment of innovative technology alternatives and the justification of choices made.
 - d. Requiring ENTSO-E and ACER to report annually on the integration of innovative grid technologies across the PCI portfolio, including measurable impacts on grid efficiency, cost-effectiveness, and speed of deployment.

- e. Prioritize alternative financing avenues, such as a systemic reinvestment cycle, supported by the European Investment Bank, which allows both manufacturing and deployment to be constantly reinforcing each other, further elaborated in Section 5 below.

4) The European Commission must propose a limited number of binding, quantifiable grid targets at both transmission and distribution level. Regular monitoring of the progress of these targets will demonstrate whether Europe is on track to decarbonize the electricity system well before 2040, and raise the alarm when Europe risks falling behind, particularly as this affects European Competitiveness¹¹.

The Grids Package must act upon the European Parliament's call for putting clear metrics in place to measure whether the EU is on track to deliver the grid expansion and reinforcements needed to meet 2050 objectives. A key feature is to require Member States and system operators to include quantitative grid efficiency targets in their National Development Plans (NDPs), such as:

1. Reduction in transmission losses of new infrastructure by 25%
2. Reduction in distribution losses of new infrastructure by 25%
3. Reduction in renewable energy curtailed (max 5% by 2030)
4. Reduce year-on-year redispatch costs by 15%, building towards a wide European target of reducing redispatch costs by 2030. To achieve this goal, 50% of the savings must be reinvested into improving the grid via the deployment of innovative grid technologies.
5. Improved asset utilisation where all projects must consider the deployment of approved technologies that can increase asset utilisation in their assessments measured by GW-km per euro invested. These technologies must be proven to be impactful in the short-term, such as innovative grid technologies, which include grid-enhancing technologies and high-capacity conductors.

The European Commission should monitor these targets at a Union level, and report on it in the State of the Energy Union. Member States should be recommended to already include such targets in their National Energy and Climate Plans, and this should feed into future revisions of the post-2030 Climate Framework.

¹¹ European Scientific Advisory Board on Climate Change, [*Scientific advice for the determination of an EU-wide 2040 climate target and a greenhouse gas budget for 2030–2050*](#), 15 June 2023.

5) In the light of the recent MFF proposal¹² and the increased amounts of financing available for electricity grids, the European Commission should ensure that Innovative grid technologies are fully used to optimise costs and provide immediate benefits. Facilitating the mass deployment of innovative grid technologies can ensure grids capacity is boosted cost effectively, amplifying the impact of all money spent, making us more competitive while catalysing electrification of European industry. With regards to financing for electricity grids, (e.g. under the Connecting Europe Facility, the new European Competitiveness Fund, the EIB's grids manufacturing guarantee, etc.), the European Commission must ensure that a significant portion of this financing goes towards supporting the demonstration, mass deployment and scaling of innovative grid technologies, and supporting the build out of European manufacturing capacity of these technologies.

It is critical that the €100 billion Industrial Decarbonisation Bank allocated in the Clean Industrial Deal¹³ to “mobilize manufacturing” supports developers and manufacturers of innovative grid technologies. It is vital that once these technologies are manufactured there is a clear pathway for mass deployment. There must be a clear focus on facilitating cost effectiveness electrification of Europe's economies through the mass deployment of enabling technologies

Within all new and repurposed EU funds, there must be dedicated spending allocated to grids, grid technology developers, and grid technology deployment in all proposed EU funding platforms that contribute to a decarbonised energy system, such as Horizon Europe, the Innovation Fund, the Competitiveness Fund.

1. The €1.5 billion of counter-guarantees launched by the European Investment Bank to support component manufacturers to promote the manufacturing of critical components for innovative grid technologies must be matched by an equal batch of counter-guarantees that support the deployment of innovative grid technologies.
2. The selection criteria for such European level funds must recognise and reflect the pivotal role that innovative grid technologies, (including grid-enhancing technologies and high-capacity conductors), can play in decarbonising Europe's energy systems.

¹² MFF proposal

¹³ Clean Industrial Deal citation

3. Create a dedicated EU-level financial instrument under the supervision of the European Investment Bank (EIB) to support the first deployment of innovative grid technologies on the networks of European system operators. The instrument should:
 - a. Provide a performance risk guarantee for the deploying technologies at TRL 7–9 to enable real-world demonstration on live grids in partnership with TSOs and DSOs, supported by the EIB
 - b. Allow a fixed share of the guarantee (e.g. 25%) to be converted into an interest-free loan for the system operator to scale deployment if the technology is proven effective.