

Response to European Commission Call for Evidence

EU Startup and Scaleup Strategy

17 March 2025



About SuperNode and Superconductors

SuperNode, headquartered in Dublin, Ireland, is a global technology development company that designs and delivers cutting-edge, cryostats and superconducting cable systems for bulk electricity transmission.

Conventional transmission cables are limited in terms of current levels which in turn limit their power transfer capability. Networks based upon superconducting cable systems can move larger quantities of power over longer distances or through densely populated urban areas, with smaller and less obtrusive infrastructure, without electrical losses and at significantly lower voltages. SuperNode's technology will connect electricity markets in meshed grids to facilitate the integration of large-scale onshore and offshore renewables and the achievement of a decarbonised pan-European energy system.

SuperNode was founded in 2018 by Dr. Eddie O'Connor and renewable energy developer Mainstream Renewable Power Ltd. SuperNode is jointly owned by the O'Connor family and Norwegian green investment group AKER Horizons.



Introduction

SuperNode welcomes the European Commission's call for evidence on an EU startup and scaleup strategy. The company was established in 2018 to develop products based on superconductors that can increase the transfer capacity of electricity cables by 5-10 times of conventional copper or aluminium electricity cables.

SuperNode's technology addresses the most pressing challenges in grid modernisation and decarbonisations:

- Urban grid congestion (mainly AC): Compact and thermally efficient cables allow distribution system operators (DSOs) to retrofit existing infrastructure and meet rising electrification demands (including large data centres and AI-infrastructure) without disruptive upgrades in dense urban areas.
- Long-distance transmission AC or DC: High-temperature superconducting cables empower transmission system operators (TSOs) to transport renewable energy from remote sources (terrestrial and subsea) to demand centres with unmatched efficiency and reliability, using less space and raw materials.

Our first products will be commercially available in the near future. Therefore, we are currently preparing for scaling up manufacturing of our first AC products and components, while seeking funding for large-scale demonstration of our DC technology with our partners.

Our superconducting cables will enhance the interconnection of the EU power grid, facilitate cross-border energy exchange, reduce transmission losses and curtailment, and help EU countries meet their climate and energy independence goals, while reducing cost to consumers.

As a company determined to advance electricity transmission and distribution technology, to support Europe's electrification and achieving a real internal market in electricity by developing cutting-edge new, innovative products, we are highly dependent on the EU framework conditions. We look forward to support the Commission's important initiatives in this area.

This response reflects the view of SuperNode as a developer and manufacturer of highly innovative and potentially disruptive electricity transmission technology that – if fully developed, scaled and deployed in Europe – would provide resilient infrastructure for a European energy system, that can unlock the internal market for energy.

1. Do you agree that startups and/or scaleups face the hurdles identified in this document (access to finance, regulatory and bureaucratic burdens and fragmentation, access to markets, access to talent, and access to infrastructure, knowledge and services)?

Yes. SuperNode does face many of the hurdles identified by the European Commission.

2. Are there any additional hurdles faced by startups and/or scaleups?

In addition to the hurdles identified in the Call for Evidence, SuperNode would like to recognise the challenges for scaleups and startups identified by the Commission's Clean Transition Dialogue on Energy Infrastructure on 27 February 2024 and the stocktaking that followed¹.

¹ COM(2024) 163 final: The Clean Transition Dialogues – stocktaking. A strong European industry for a sustainable Europe



It emphasised a need for simplification of the rules for the Innovation Fund and increasing support for green scale-ups while it “considered access to EU funds to be complex and lengthy due to different eligibility criteria, application procedures, and red tape. They underlined the challenge of navigating the different EU and national funds, especially for SMEs”

The Commission’s stocktaking rightly states that “the full benefits of the energy transition will only materialise when zero- and low-carbon technologies will more permanently replace fossil fuels, and when major investments in grids, storage and flexibility are completed”.

Grid technologies are enabling technologies, that often operate under very complex conditions when seeking to demonstrate and scale up production of innovative products. The market for energy infrastructure is regulated, due to the nature of the electricity sector. Often there are no incentives for distribution and transmission system operators to demonstrate and apply innovative technologies, even those that can demonstrate positive economic, environmental and circularity benefits.

Moreover, It is a widespread perception that decarbonisation and electrification of Europe’s energy supply is merely a matter of better planning and accelerating the pace of grid buildout. Reality is that without transformative innovation in transmission technology, the EU risks falling short of its climate and energy independence ambitions and fail on its objective of providing more affordable energy to its households and businesses, keeping Europe at a competitive disadvantage. Already, the effects of inadequate interconnection and growth in renewables are being felt by European electricity consumers. Over the period 2022-23, in Germany alone, 33 TWh of electricity was curtailed at a cost of €7.3B to German electricity consumers.

3. What actions do you think the EU and/or its Member States should take to address these hurdles?

Based on more than three years of engagement and evaluation, SuperNode has found the eligibility criteria associated with past and current Innovation Fund calls inadvertently disqualifies enabling technologies such as innovative grid technologies. No innovative electricity grid technology has ever received funding under the EU Innovation Fund.

Funding, large-scale demonstration and regulatory support for grid innovation remain insufficient to match the scale of the challenge. The Horizon Europe programme has started to acknowledge the importance of research and innovation in electricity grids - particularly in areas such as MVDC, HVDC, and high-power superconducting cable systems. However, we are still far from meeting the actual needs of a modern, decarbonized, and resilient European power infrastructure.

Action 7 of the European Commission’s EU Action Plan for Grids calls for rapid deployment of innovative grid solutions, including high-temperature superconducting cables. To address the identified hurdles, and those challenges specific to delivering a pan-European electricity grid, enabling the free movement of electrons over borders, European institutions and Member States should take immediate action in the areas below, identified by CurrENT, the Brussels-based association of innovative grid technologies:

1. Establish regulatory sandboxes for testing innovative grid technologies

Grid technologies are recognised as innovative net-zero technologies in the EU Net Zero Industry Act². Net-zero regulatory sandboxes for innovative net-zero technologies should be rigorously applied to grid technology innovation in accordance with the regulation to provide for “controlled real-world environment, under a specific plan, developed and monitored by a competent authority”. These controlled real-world environments should be developed with participation of system operators

² Regulation (EU) 2024/1735.

energy regulators and technology providers and allow for the development, testing, and validation of cutting-edge grid technologies, accelerating their deployment and integration into the energy system.

2.Streamline access to funding for innovative grid technologies

The European Commission must prioritize funding access for enabling technologies such as innovative grid solutions. This includes making the Innovation Fund accessible for grid innovation and demonstration by introducing sector-specific calls for electricity grid technologies, or find other ways of avoiding the de facto exclusion of superconducting grid technology funding from Innovation Fund, because of the way the selection criteria is formulated (see above).

Of the EUR 3.1 billion allocated since 2020, 74% of total funding has gone to Hydrogen (24%) and CCUS (50%) Projects, while Renewables and Storage has only received a combined 18 % of funding. No innovative grid technology funding has ever been allocated – for demonstration or manufacturing projects – under the Innovation fund. From our perspective, there is an urgent need to adjust the evaluation criteria for electricity transmission and introduce dedicated calls for electricity grid technology.

While the CEF programme offers substantial funding opportunities, its administrative complexity and lengthy procedures make it ill-suited for disruptive grid technologies, which can be deployed in months rather than years. The programme should introduce more agile and flexible funding mechanisms, tailored to the needs of fast-deploying, high-impact grid technologies. Reducing administrative burdens and accelerating approval timelines will be crucial in ensuring that Europe remains competitive in grid innovation.

3. Foster Cross-Border Standardization and Market Access

To eliminate fragmentation and facilitate scaling, the EU should:

- Accelerate the development of unified grid operation standards, similar to how interoperability was achieved in the telecom sector.
- Support a pan-European grid sandboxing initiative to enable cross-border testing and deployment of innovative grid solutions. This could also be pursued through a revised framework for Important Projects of Common European Interest (IPCEI), in accordance with Article 107(3)(b) of the Treaty on the functioning of the European Union.
- Create an EU-wide marketplace for digital grid services, ensuring that startups have a platform to offer solutions to DSOs and TSOs across multiple Member States.

4. Simplify Administrative Processes for Grid Innovation Startups

Startups in the energy sector face disproportionate administrative burdens due to lengthy approval processes, complex compliance requirements, and differing national grid regulations. The EU should:

- Introduce and incentivize a “Fast Track” approval process for disruptive energy technology companies to receive regulatory clearances more efficiently.

Encourage a centralized, one-stop regulatory access point for grid technology startups, similar to the European Digital Innovation Hubs for AI