

Response to Public consultation on the EU climate target for 2040

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About SuperNode and Superconductors

SuperNode, headquartered in Dublin, Ireland, is a global technology development company that designs and delivers cutting-edge, 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 with smaller and less obtrusive infrastructure, without electrical losses and at significantly lower voltages. SuperNode's technology will connect electricity markets in a way that facilitates the integration of large-scale 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 Dr. O'Connor and Norwegian green investment group AKER Horizons.

SuperNode welcomes the European Commission's intention to propose a Union-wide 2040 climate target in accordance with Article 4 of the EU Climate Law.

In its call for evidence, the European Commission is right to highlight that Russia's invasion of Ukraine has triggered "the strategic vulnerability that comes with dependence on the use of fossil fuels, which is the main driver of climate change." The European Commission also correctly links the stabilisation of the world's climate to our ability to end our reliance on fossil fuels, pointing out "the need to step up the transition to clean energy, energy efficiency and climate neutrality in the EU". However, the need for modernising and establishing new, innovative electricity grid infrastructure to support the



transition to decarbonisation seems hugely unappreciated. The call for evidence does not mention grids at all.

On 15 June, the EU's advisory body on climate change - The European Scientific Advisory Board on Climate Change (ESABCC) – presented its science based recommendation of achieving EU net emissions reductions of 90-95% before 2040, relative to 1990 levels¹. Such a reduction would require a doubling to more than 50 % of electricity's share of final energy demand (see graphs). Renewable energy source, especially solar and wind (and excluding bioenergy) would be likely to meet more than 85% of electricity, according to ESABCC.

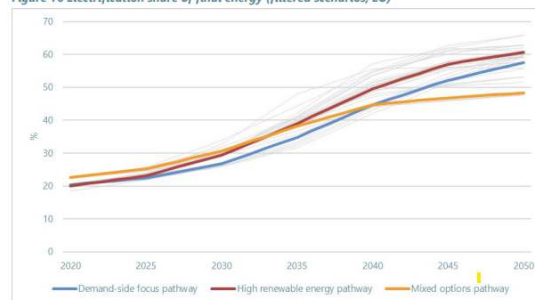
All pathways to meet Europe's agreed 2050 decarbonisation target, would imply a 2040 energy system largely dependent on a fully decarbonised electricity supply, predominantly based on variable wind power and intermittent solar power. For such an energy system to materialise, Europe must start planning, demonstrating and deploying innovative grid enhancing technologies and advanced power cable technology, including superconducting cable systems, capable of moving, massive amounts of electricity at no losses and with minimal use of critical raw materials.

The International Energy Agency has already established² that “almost half of the 2050 reductions in greenhouse gasses must come from technologies that are currently at the demonstration or prototype phase.” It would be prudent of Europe to provide rapid and meaningful support to those innovative technologies.

The pathways to reach decarbonisation and the Union's growing ambitions (Green Deal, Fit For 55, REPowerEU, Net-Zero Industry Act) underscore the need for a realistic consultation framework that puts our future electricity transmission and distribution system at the centre of the analysis. Current recommends the development of reference grids for 2040, as well as for 2030 and 2050. The main reference grid should be the 2050 grid required for a decarbonized Europe and all intermediate reference grids must comply with the pathway and carbon budgets needed to reach the goals agreed by the European Climate Law (Regulation (EU) 2021/1119).

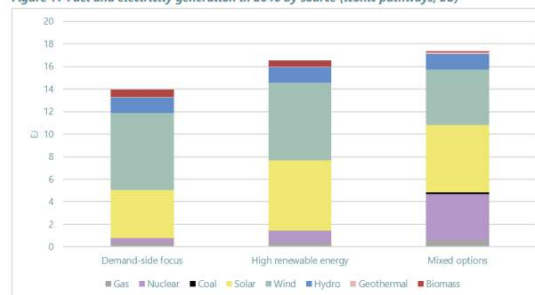
For 2040, the TYNDP must reflect what is needed to reach European economy-wide decarbonization in 2050. For the electricity sector, that would require full decarbonization well before 2040. In addition, the infrastructure must be able to support the decarbonization through electrification of the heating, transport, and industrial sectors. No European grid model depicting the supporting grid infrastructure needed to reach our climate and energy targets currently exist, including the ten-year network Development Plan (TYNDP). SuperNode suggest that such a grid plan with decarbonisation reference grids, that are compatible with the carbon budgets, is developed for the European Commission, by an independent agency in an open and transparent process, for example the Joint Research Centre.

Figure 16 Electrification share of final energy (filtered scenarios, EU)



Source: Advisory Board (2023).

Figure 17 Fuel and electricity generation in 2040 by source (iconic pathways, EU)



Source: Advisory Board (2023).

¹ [EU climate Advisory Board recommends ambitious 2040 climate target and urgent transitions for the European Union \(europa.eu\), June 2023](https://ec.europa.eu/euro-observatory/en/eu-climate-advisory-board-recommends-ambitious-2040-climate-target-and-urgent-transitions-for-the-european-union)

² [Net Zero by 2050 – Analysis – IEA, 2021](#)

We need a technically competent body, that does not own assets, to oversee the deployment of a pan-European transmission grid, identify technology gaps and choices to bring us all the way to decarbonisation. If the endgame is a European grid, capable of supporting a decarbonised economy, then recognising this sooner will save money and enable us to get there quicker than otherwise would be the case, assuming rationality prevails. The European Commission should have a central role to play in this. With such an approach we can model the energy system across all sectors and come up with a fit for purpose post carbon system that consumers can afford and rely upon.

Two years ago, the International Energy Agency said³ all investments in fossil fuels should be brought to a halt, starting that year: “If governments are serious about the climate crisis, there can be no new investments in oil, gas and coal, from now – from this year.”

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³ [Net Zero by 2050 – Analysis – IEA, 2021](#)

