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Consultation response to the Federal Development Plan of the Belgian Transmission system

CURRENT
Enabling Network Technology throughout Europe

currENT is the industry association representing innovative grid technology companies operating in Europe. currENT aims to generate greater awareness of new and innovative grid technologies and to accelerate their implementation. We do so by working with the wider stakeholder ecosystem on future-proofing regulatory and policy frameworks.

We believe that renewable generation and energy efficiency are the 'first order' solution for taking the Green Deal ambition and the Climate Law from promise to practice. Renewable-based electricity solutions can meet by 2050 more than 70% of our total energy needs. As to making the 'can do' a 'will do' we need powerful climate proof ´clean´ power grids, which are already possible today.

Power networks – both transmission and distribution – have to become even stronger enablers and accelerators of the energy transition, paving the way for further electrification, rising demand and sector coupling.

Innovative grid technologies will assist and promote the integration of higher shares of renewables. Energy system operators need to be encouraged and incentivised to adopt these innovative technologies for the future, while supporting the development and demonstration of new innovative grid technology.

Designing tomorrow's grid by using today's technology and an incremental approach will result in a grid that is not fit for purpose in addressing the challenge.

currENT recommends generally on the qualification and use of new technologies in NDPs to:

Develop '**best practices'** for qualifying new technologies to accelerate transition from innovation to business-as-usual following successful trials and oblige system operators to consider all possible solutions for an identified network need.

Increase **transparent sharing of learnings** among system operators, countries and wider industry – avoid duplication of pilot projects which slows down the uptake of new solutions and ultimately delays benefits to consumers.

Align the **priorities for innovation** to ensure the highest potential innovations are funded, developed, trialled and ultimately rolled out if successful. [1]

Avoid closed shop innovation policies:

- Closed loop discussions lead to sub-optimal closed shop innovation
- Ensure innovation funding for new transmission technologies with open door for the private sector.

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[1] For more information read our Policy Recommendations.

- Ensure policy support for utilities to facilitate development of new technologies from TRL6 to TRL9 establishing sand boxes and / or other incentives.
- The NDP has to mandate and incentivise TSOs to engage in external R&D partnerships to facilitate the demonstration and deployment of innovative network technologies.

currENT welcomes the Federal Development Plan of the Belgian Transmission System which focuses on successfully tackling the energy transition through the use of five principles, targeted at meeting the three objectives of the energy trilemma which include:

1. Having a reliable electricity system, by having demand and supply in constant balance
2. Having a sustainable system which makes maximum use of the integration of renewable energy sources.
3. Having an affordable system thanks to a strong and optimally expanded electricity grid.

We congratulate the Elia Group for their sound and detailed proposal, their documented openness for new solutions, and their commitment to reduce bottlenecks for large scale integration of renewable energy which in turn speeds up the energy transition for the interest and wishes of the Belgian society.

Elia is to be commended on providing long term guidance and vision on the development of the future European offshore electricity grid. currENT strongly shares Elia's ambition for the Princes Elisabeth Island "to be the first building block of a meshed European offshore electricity grid that connects to the future north-south connection in the North Sea".

We welcome that the development of the Belgian electricity grid not only focuses on expansion but also focuses on optimization of the existing electricity grid, increasing the capacity of the 380kV corridor over the next 15 years.

The following response summarizes our suggestions for further improvement of the first draft of the Federal Development Plan for the Belgian transmission system over the period 2024-2034.

We appreciate the opportunity to contribute, and we see such transparency as paramount for best possible NDPs, and for the buy-in of society on behalf of which and for who the networks are developed.

Detailed comments on the Belgian federal development plan

1. Innovative grid technologies are ready for wide-scale use in Belgium

currENT is pleased to see that the Elia Group have already incorporated many optimisation technologies such as those represented by currENT membership into their Federal Development Plan. Dynamic Line Rating, FACTS devices and modular SSSC, as described in ENTSO-E's Technopedia, can significantly contribute to increasing the optimisation of the Belgian electricity grid. currENT therefore encourages the implementation of innovative grid technologies throughout all aspects of the Belgian Federal

Development Plan, as these technologies can help with optimisation, system stability and flexibility. Furthermore, within the timeframe of the Federal Development Plan, it must be assumed that new DC transmission and distribution technology based on superconductors will be available for both offshore and onshore application. These technologies should be reflected in the federal Development Plan.

2. NOVA principle to be integrated in the Belgian grid planning

While currENT appreciates the commitment to further optimisation of the Belgian electricity grid, currENT would recommend formally incorporating the NOVA principle into the Network Development Plan. Countries like Germany, Austria and Switzerland have already committed to using the so-called NOVA principle, which means optimisation of the existing grid should happen before reinforcement and grid expansion. currENT advocates that we will need to efficiently combine optimisation, reinforcement, and expansion to address the electrification and renewables uptake where networks move centre stage. The introduction of the NOVA principle into the Belgian Federal Development plan, could support the Elia Group in realising its commitments to use infrastructure as efficiently as possible.

3. Innovative new grid solutions must be added to the network planning toolbox

Given the 40 years plus lifetime of new grid assets, the latest innovative and technological advancements must be considered when planning new grids. currENT recommends that the Elia Group reviews the processes for qualification of new technologies that have been proven in other geographies to ensure that technologies that can deliver significant value to Belgium in the long-term are sufficiently included and reasonably considered as possible solutions as part of the network development plan process. This would need to be supported by a substantial sharing of learnings and 'best practices' between the Elia Group and other network companies and stakeholders to minimize the risk of wasting research money and duplicating work on proving a technology that has already been proven on other networks. There is a need to include Innovative Grid Technologies in the current and future NDPs, particularly those that have higher TRLs (Technology Readiness levels) and thus proven benefits. This is in line with recent European legislation which seeks to accelerate the transition to smarter low carbon grids, such as the Smart Grid Indicator, which NRAs were tasked to develop by the end of 2020 and the relevant provision in the Energy Efficiency Directive relating to the efficiency of networks.

4. Rapidly deployable solutions enable delivery of projects and renewables integration

currENT recommends that the Elia Group considers whether any of the existing projects identified in the NDP could be improved through using rapidly deployable solutions as an interim or enabling measure, or in some cases, as a solution that can defer the need for other reinforcement. Elia Group should also review existing selection and evaluation processes for projects to ensure that the methods fairly value the benefits of rapidly deployable solutions.

5. Complementary solutions optimise use of the existing grid

currENT would like to highlight the complementarity of Innovative Grid Technologies, particularly in maintaining network resilience, managing congestion, and optimising the power flows across the network. By leveraging multiple Innovative Grid Technologies with different functionalities to meet a network need, in most cases, the overall impact will be far more significant than if only one technology was used in isolation. currENT recommends that the Elia Group considers Innovative Grid Technologies not only as standalone solutions but also as solutions that can be combined to maximise the benefits of an existing or new project, and ultimately provide maximum value to both the network and consumers.

Realisation of a first offshore energy hub as gateway to the North Sea

The consultation highlights that Belgium will need connect or import 15 – 66 TWh of non-Belgian renewable energy to meet its energy and climate ambitions. will need to be imported or connected to the Belgian grid. That distant future is already being prepared for today. currENT agrees with Elia that it is important to prepare for 2050 already today, i.e., "to define further steps in the development of the European offshore grid" in close cooperation with the other North Sea countries.

currENT strongly shares Elia's ambition for the Princes Elisabeth Island "to be the first building block of a meshed European offshore electricity grid that connects to the future north-south connection in the North Sea". The energy island should not only contribute strongly to the green transition and increased electrification of Belgium, but also to meeting the need to import large-scale renewables while fostering innovation through the development and testing of new, innovative grid technology. It would be natural to take advantage of Princes Elisabeth Island's vast potential for testing, developing and demonstrating superconducting cables as part of a larger Belgian and wider European innovation effort for more efficient, affordable, circular and sustainable offshore transmission technology.

The way to achieve a "meshed European offshore electricity grid" is not through radial point-to-point interconnections but through larger, high-capacity, meshed grids. If we are to move around the power that is targeted in the North Sea (North Seas Energy Cooperation targets at least 260GW by 2050) and in UK waters (50GW by 2030), we need to rethink our approach to grid planning. Any radial point-to-point interconnectors will be required to transfer vast amounts of power, 5-10 GW. It is too great a risk for this level of power to be point-to-point with no alternate routes to supply. A truly meshed grid must have built in redundancy with multiple routes to market, while also having fewer landing sites and require less infrastructure and raw materials.

Furthermore, it is essential that we do not assume a 'fixed-technology' world. There are many novel grid technologies that are being developed that will enable and optimise a meshed grid approach, such as the capability to carry up to 10GW of power in a single cable. Strathclyde University released a study in 2022

showing the greater benefits and cost savings, approximately €55 billion, offered by a meshed offshore UK grid using superconducting transmission cables compared to conventional cables.

Within the timeframe of the Federal Development Plan, it must be assumed that new DC transmission technology based on superconductors will be available for both offshore and onshore application. The technology is capable of transferring 5 or 6 times as much energy as conventional HVDC technology at a given voltage level. Alternatively, the technology could transfer the same amounts of energy at a much lower voltage level. Superconducting transmission cables will be associated with far fewer environmental impacts, e.g. both land works and offshore facilities. It is therefore important that the economic, environmental and technical advantages and disadvantages of using new DC technology, such as superconducting cables, are highlighted in the Plan.

The transmission concept for the energy island, including the choice of voltage level, has a very large impact on virtually all areas of environmental impact, including noise, magnetic fields, area involvement for the establishment of switching stations and expansion of existing high-voltage stations and cable corridors. currENT proposes that the positive environmental impacts of applying new innovative grid technologies are assessed and treated as potential mitigation measures in line with the Energy Efficiency First Principle and the Do No Significant Harm Principle.