February 2022

Response to the Ten Year National Development Plan of the Hellenic Electricity Transmission System for the period 2023 - 2032

CURRENT
Enabling Network Technology throughout Europe

currENT is the industry association representing innovative grid technology companies that operate in Europe and empower the grid. currENT aims to generate greater awareness of new Grid Enhancing Technologies (GETs) and accelerate their implementation. We do so by working with the broader stakeholder ecosystem on future-proofing regulatory and policy frameworks in Europe.

We believe that renewable generation and energy efficiency are the 'first order' solution for taking the Fit for 55 ambition and the Climate Law from promise to practice. Renewable-based electricity solutions can meet more than 70% of our total energy needs by 2050. Making the 'can do' a 'will do' requires powerful yet climate-proof 'clean' power grids. Such grids 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.
- Enabling network technologies will assist and promote the integration of higher levels of renewables.
- Designing tomorrow's grid using today's technology and an incremental approach is no longer possible if the COP21 and European Green Deal ambition is to be implemented.

Therefore, energy system operators must be informed, encouraged and incentivised to update their toolbox for existing and future grids.
On the qualification and the use of new technologies in NDPs, currENT recommends to:

- Require system operators to consider all possible solutions for an identified network need.
- Use the NOVA principle in regulation to make sure already available new solutions are used for existing grids as the first step in network development. The NOVA approach should be related to ENTSO-E's Technopedia and other available grid enhancing technology overviews.
- Develop 'best practices' across Europe for qualifying new technologies:
    - Increase transparent sharing of learnings among system operators, countries and broader industry.
    - Avoid duplication of pilot projects which slows down the uptake of new solutions and ultimately delays benefit to customers.
- Align the priorities for innovation to ensure the highest potential innovations are funded, developed, trialed and ultimately rolled out.

We specifically refer to the following publications both on available technologies and recommendations for updating the regulatory approach to accommodate new solutions.
Reports on the technological advancement are showcased on a large scale through:

- WATT's Brattle Report of the U.S. market[1];
- ENTSO-E's Technopedia underlining the readiness levels of today's available technologies[2];
- The German Ministry for Economy and Energy's study on the central role of grid optimisation and higher utilisation of the existing networks[3];
- THEMA Consulting's report on higher available capacity and increased market integration in Northern Europe[4];
- IAEW's scientific exemplary study on modular power flow control enhancing the German transmission grid capacity as commissioned by Smart Wires[5];
- Consentec's study for currENT on smart transition technologies[6].

currENT supports changes in regulatory approaches that would enable IPTO to meet the suggestions and review of technology. The recommendations for updating the regulatory approach have been stated by:

- The Ecorys Report at the European Energy Infrastructure Forum 2019[7];
- CSEI's and FSR's paper on the economic issues and regulatory options to promote energy network innovation for a green transition[8];
- Decision No 35/2020 of the European Union agency for the Cooperation of Energy Regulators (ACER)[9].

[1] WATT, Brattle. 2021. Unlocking the Queue with Grid-Enhancing Technologies: Case study of the southwest power pool. https://watt-transmission.org/wp-content/uploads/2021/02/Brattle__Unlocking-the-Queue-with-Grid-Enhancing-Technologies__Final-Report_Public-Version.pdf90.pdf

[2] ENTSO-E Technopedia. https://www.entsoe.eu/Technopedia/

[3] Bundesministerium für Wirtschaft und Energie. 2021. Netzbetriebsmittel und Systemdienstleistungen im Hoch- und HöchstspannungsnetzErster Ergebnisbericht zur „Netzbetriebsmittel Studie". https://www.bmwi.de/Redaktion/DE/Publikationen/Energie/netzbetriebsmittel-und-systemdienstleistungen-im-hoch-und-hoechstspannungsnetz.html

[4] Heimdall Power, THEMA Consulting Group. 2021. Effects of higher available Capacity and increased Market Integration. https://heimdallpower.com/wp-content/uploads/2021/08/Report_Thema_Consulting_Group.pdf.

[5] IAEW, RWTH Aachen. 2020. Modular Power Flow Control enhancing German Transmission Grid Capacity: An Investigation.

[6] Consentec GmbH for currENT Europe. 2021. The Benefits of Innovative Grid Technologies.

[7] https://ec.europa.eu/info/publications/energy-infrastructure-forum-2019-background-papers_en

[8] Copenhagen School of Energy Infrastructure (CSEI), Florence School of Regulation (FSR). 2020. Energy Network Innovation for Green Transition: Economic Issues and Regulatory Options.

[9]https://documents.acer.europa.eu/Official_documents/Acts_of_the_Agency/Individual%20decisions/ACER%20Decision%2035-2020%20on%20Core%20RDCT%2035.pdf

currENT thanks the Independent Power Transmission Operator (IPTO) for the opportunity to contribute to this NDP. currENT is happy to deepen our exchange through a joint workshop and organise a public webinar by mid 2022 focusing on the Greek NDP.

currENT proposes the following five points for consideration:

1. GRID ENHANCING TECHNOLOGIES ARE READY FOR WIDE-SCALE USE IN GREECE

A lot more optimisation and grid enhancement will be needed to significantly increase the levels of transferred capacity. Optimisation technologies such as those represented by currENT membership - FACTS devices, modular SSSC, Dynamic line rating, and future superconductors - can largely contribute here. Those technologies are widely described in ENTSO-E's Technopedia[10], as well as on currENT's website[11].

2. NOVA PRINCIPLE TO BE INTRODUCED IN GREEK GRID PLANNING

Countries like Germany, Austria and Switzerland are committed to the so-called NOVA principle[12], saying that optimisation of the existing grid should happen before reinforcement and grid expansion. currENT recognises the need to interconnect the Greek islands, but once this achieved to minimise further reinforcements the use of this network should be maximised with the NOVA principle being applied. currENT advocates to efficiently combine optimisation, reinforcement and expansion to address the electrification and renewables uptake where networks move centre stage. The potential of GETs has been assessed by studies that are listed at the beginning of our contribution.

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 taken into account when planning new grids. currENT recommends that IPTO (ADMIE) reviews the processes for qualification of new technologies that have been proven in other geographies (though similar to Greece in terms of power network structure, power flow constraints, physical conformations and climate) to ensure that technologies that can deliver significant value to Greece in the long-term are sufficiently

[10] ENTSO-E Technopedia - ENTSO-E (entsoe.eu)
[11] www.currenteurope.eu
[12] see the principle explained for example here on the website of TransnetBW NOVA principle | TransnetBW GmbH

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 IPTO (ADMIE) and other network companies and stakeholders to minimise 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 GETs in the current and future NDPs, particularly those GETs 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[13]. This is valuable for the Greek transmission network and national targets and on cross borderlines where GETs can support Greece's linear progress towards the EU 70% market available capacity target (so-called MinRam).

4. RAPIDLY DEPLOYABLE SOLUTIONS ENABLE DELIVERY OF PROJECTS AND RENEWABLES INTEGRATION

Given the common delays associated with implementing new infrastructure projects due to permitting and public acceptance complexities and the identified limitations in volume of connecting new renewable generation in the NDP, the value of rapidly deployable solutions must be recognised, e.g. Dynamic Line Rating and modular power flow control solutions such as SSSC devices[14]. Rapidly deployable solutions can often be delivered in less than a year, leading to the quicker release of capacity and increased efficiency of the existing network, without compromising safety of operation. currENT recommends that the Regulatory Authority for Energy 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. As highlighted in the Annex of the NDP this technology has already been deployed in research projects. Following this, IPTO (ADMIE) should also review existing selection and evaluation processes for projects to ensure that the methods fairly value the benefits of rapidly deployable solutions. This approach doesn't preclude ROI and "time-to-money" evaluations and benchmarking.

5. COMPLEMENTARY SOLUTIONS OPTIMISE USE OF THE EXISTING GRID

currENT would like to highlight the complementarity of GETs, particularly in maintaining network resilience,

[13] Please see the report commissioned by currENT's sister association in the US, WATT Report: Unlocking the Queue – WATT (watt-transmission.org). See here also the JRC report of December 2020 Improving Energy Efficiency in Electricity Networks | EU Science Hub (europa.eu).

[14] The static synchronous series compensator (SSSC) is a power quality FACTS device that employs a VSC connected in series to a transmission line through a transformer or multilevel inverters [ENTSO-E Technopedia].

managing congestion and optimising the power flows across the network. By leveraging multiple GETs 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 IPTO (ADMIE) considers GETs 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.