

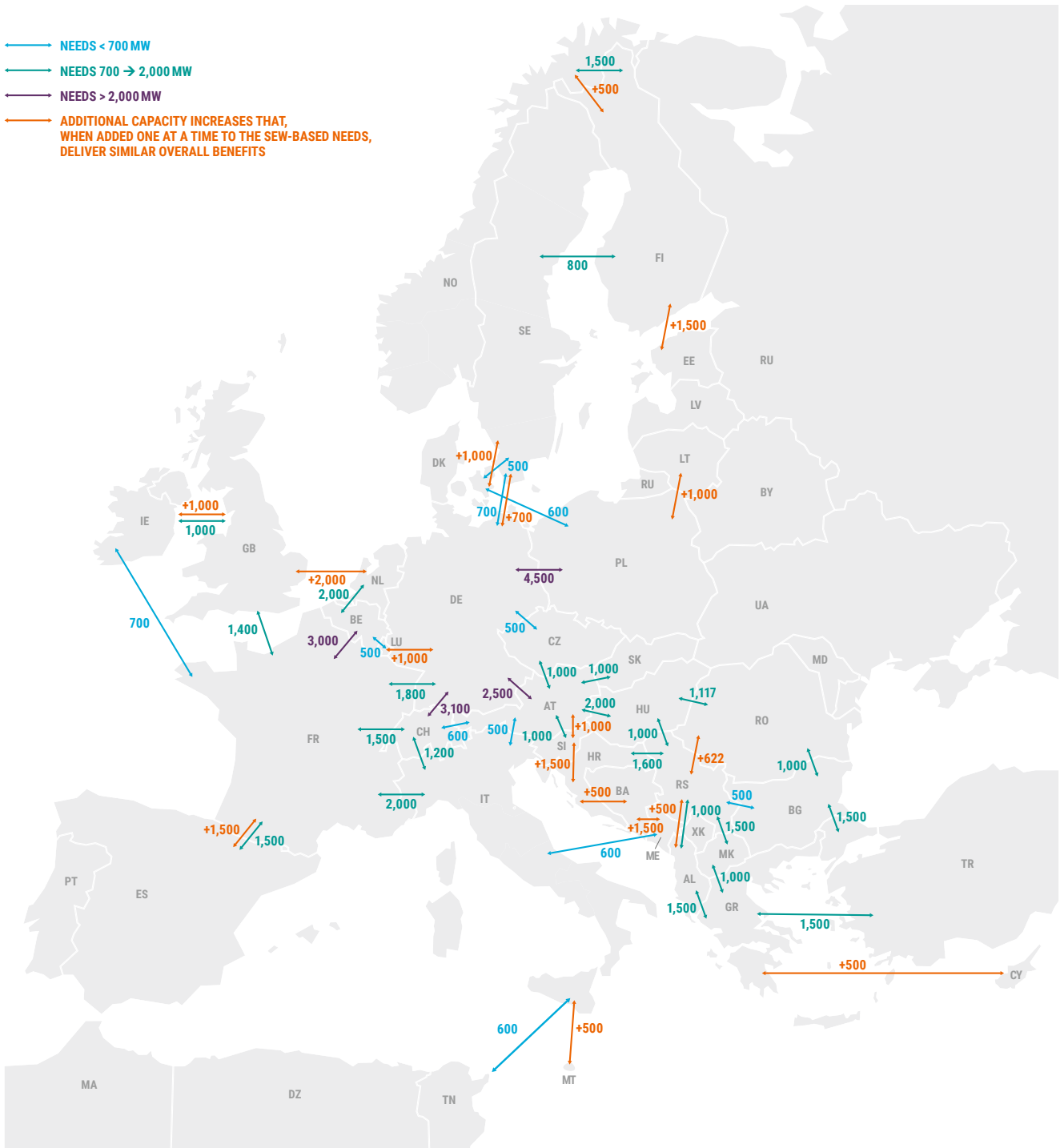
Ten-Year
Network
Development
Plan 2020

At a glance: Power system needs in 2030 and 2040

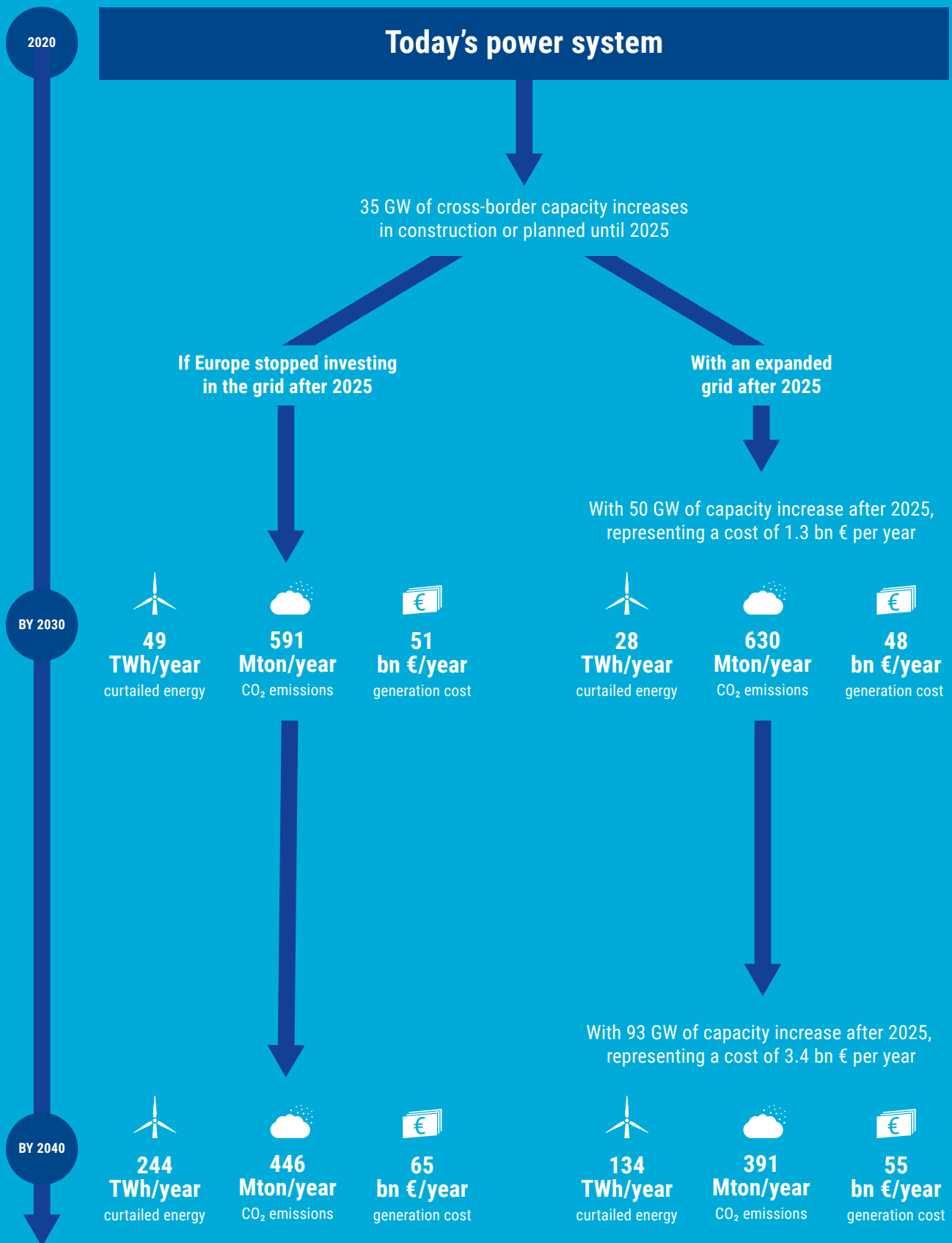
November 2020 · Version for public consultation

› Europe’s power system is evolving rapidly. ENTSO-E’s System Needs study shows where action is imperatively needed by 2040 to ensure continuous access to electricity throughout Europe and deliver on the climate agenda.

Identifying the system needs is the second step, after the definition of scenarios, in the development of the Ten-Year Network Development Plan (TYNDP), the pan-European long-term plan on how the electricity transmission grid should evolve in Europe to implement the EU energy and climate objectives. The TYNDP 2020 will perform a cost-benefit analysis of 171 electricity



Needs for capacity increases identified in the 2030 (left) and 2040 (right) horizon, additional to the 2025 network and additional network increases included in grid solutions that were only slightly more expensive than the SEW-based Needs



- › Addressing system needs puts Europe on track to realize the Green Deal, with 110 TWh of curtailed energy saved each year and 55 Mtons of CO₂ emissions avoided each year until 2040. Market integration would progress, with price convergence increasing between bidding zones thanks to an additional 467 TWh/year of cross border exchanges by 2040.
- › The System Needs study expresses needs in terms of cross-border transmission capacity increase and identifies the most cost-efficient combination of increases, but it does not mean that the identified set of increases are the only solution. The identified needs can be addressed in multiple ways such as increased transmission capacity, storage, hybrid offshore infrastructure, smart grids and power to gas.
- › Investing in infrastructure will be key to support the economy in the post COVID era, where the goal of developing Europe towards a decarbonized economy is an opportunity not only to fulfil the ambitious European objectives, but also to support the European industry. Addressing the identified needs by 2040 would represent 45 bn € of investment, translating directly into jobs and growth.
- › Some of the identified needs are already covered by concrete TYNDP projects, while about 50 GW do not correspond to actual projects in the 2040 horizon. All options should be considered when these needs turn into projects and coordinated planning will be needed across sectors. This is especially important in the subsequent steps where further analyses in terms of environmental impact, viability, benefits beyond socio-economic welfare and refined costs are carried out in order to complement the definition of the best project portfolio.
- › The energy transition is also creating needs for system operations. Trends show a reduction of system inertia due to increasing integration of renewable energy sources and distributed generation, leading to higher vulnerability of the system to frequency mismatches. Flexibility options will gain in importance, both at generation and demand level, and in this context the role of TSOs in securing network stability will be key.

Q&A

What are system needs?

System needs show borders/areas where new solutions for electricity exchange are needed to reach decarbonisation targets and keep security and costs under control. This study focuses on needs beyond the next anticipated wave of cross-border grid investments (35 GW by 2025). They use the National Trend scenarios for 2030 and 2040, which means that the system needs identified exist in a world where significant uptake of renewable energy sources and system flexibility already happened.

System needs or transmission needs?

The System needs study describes needs, not the solutions to the needs. The study uses interconnection transmission capacity to express the needs because it is based on electricity TSOs' expertise, data and models, but it does not mean that electricity infrastructure is the unique solution. The methodology only provides indication of where, for example, market integration could be improved, but it cannot prioritise between possible solutions. ENTSO-E expects that addressing tomorrow's challenges will require the parallel development of all possible solutions, including for example storage, the role of prosumers and generation, in addition to reinforcing the transmission grid.

Will TSOs plan the future grid based on identified system needs?

The System needs study is not a network development plan. It is a study that investigates one particular dimension of the future, which is where increases in network capacity would be the most cost-efficient from a pan-European perspective. To plan future network development, TSOs consider a multitude of aspects, including socio-economic welfare but also other benefits of projects (for instance in term of security of supply or reductions of CO₂ emissions) and other scenarios of evolution of the energy system. TSOs will use the study's findings as a tool to develop future National Development Plans, in complement to national and regional planning studies.

How are stakeholders involved in the identification of system needs?

The System Needs package, including the System Needs report and the six Regional investment plans published alongside it, will be submitted to a public consultation with the other deliverables composing the TYNDP 2020 package in early November 2020. The scenarios on which the system needs study and the TYNDP are based were submitted to a public consultation in late 2019. To further engage with stakeholders, a webinar took place on 28 September 2020.

Stakeholders comments will serve to improve the reports. Comments regarding the methodology itself will be taken into account to improve the future editions of the System needs study, as time does not allow to re-run the study. Stakeholders wishing to discuss how the assessment of system needs could be further improved are welcome to contact ENTSO-E at tyndp@entsoe.eu.

In January 2021, the entire TYNDP 2020 package will be submitted to ACER for a formal Opinion.



Read the full report



Visualise the system needs

Alongside the System needs report, ENTSO-E is publishing six regional investment plans diving into details of the specific needs at regional level for 2030 and 2040 and including additional studies.

Northern Sea



Baltic Sea



Continental Central East



Continental South West



Continental Central South



Continental South East





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