CurrENT
Enabling Network Technology throughout Europe

TYNDP 2024

CurrENT consultation response

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4. Open comments

The main reference grid for the System needs study and the CBA Implementation Guidelines should be the 2050 grid required for a decarbonized Europe - not the 2030 or 2040 grid. We need to establish what is necessary for economy-wide carbon neutrality in 2050 and work back from there, planning and designing a transition to a fit for purpose grid infrastructure at a pan-European level. For the electricity sector, that would require full decarbonization well before 2040.

Overall, the TYNDP approach continues to be an incremental approach that builds on the existing grid and adds projects, which will not necessarily result in the most efficient pan-European system. We need to assume an optimal system for 2050 and work our way back. Projects that deliver the highest contribution earliest should be delivered first, while factoring in their lead times. Anticipatory investment needs to be done in the context of a full decarbonization plan. The better the plan, the better the investment decisions will be. This is a big challenge in that few of the projects needed for 2050 will have a net benefit in isolation.

CurrENT suggests that the ENTSO-E fully implements ACER's recommendation for the ENTSOs to prepare a living roadmap document detailing planned changes and larger innovations to be implemented (ACER Framework Guidelines of 25 January 2023). CurrENT also suggests that ENTSO-E aligns with the recommendations provided by Energy Ministers in the EU Council Conclusions of May 2024, and develop a plan for a holistic, long-term, coordinated, improved and integrated electricity grid infrastructure at European level, covering both a 10 year and a 20-year horizon, taking into account national and European decarbonisation targets to ensure a swift implementation of the EU's climate and energy objectives. This plan must also ensure that EU's electricity grid infrastructure is deployed and used as effectively and efficiently as possible for exchanges of energy, including through flexibility and other non-wire solutions, so that the overall system costs borne by households and companies are mitigated as much as possible.

Innovation & emerging technologies

The report does not factor in expected technological advancements by 2040-2050, limiting its ability to reflect an optimal future grid. It also lacks transparency on which technologies are considered. Innovative grid technologies that are expected to mature in the coming years, such as transmission technology based on superconductors, can significantly improve the efficiency of grids, affecting both the willingness to invest in new grids and the questions of when and where to invest in what kind of grid components. The TYNDP must assume the use of such existing as well as emerging technologies within the 2050 timeframe, when it would be socioeconomic beneficial to apply them.

CurrENT strongly recommends that ENTSO-E aligns with the guidance provided by the Draghi Report, the Competitiveness Compass and the Clean Industrial Deal, which identify innovation as one of the three main pillars supporting Europe's competitiveness. ENTSO-E must acknowledge the key role of innovation for the fast development of an efficient, decarbonised and affordable electricity infrastructure, and systematically include innovative grid technologies in the reference grids for time-horizons.

Cost of delay

The report does not account for the high cost of delayed infrastructure deployment or the benefits of rapidly implementing Innovative Grid Technologies (IGTs). The *CBA Implementation Guidelines* also fail to address reduced critical raw material use, a key factor for sustainability. Prioritizing flexible, fast-acting solutions can optimize existing grids, reduce emissions earlier, and mitigate long-term uncertainties in grid development.

The cost of delay must be reflected in the assessment of TYNDP projects, and flexible solutions must be fairly valued. CurrENT advocates for optimizing the use of existing grids using innovative grid technologies, which benefits can be delivered in the next 1-2 years. Using a scenario 5 – 10 years in the future as a basis for a CBA is not adequate for fast-acting solutions. This is because it does not take into consideration the benefits that can be delivered before the given year of the scenario. Rapidly deployable solutions enable network operators to quickly adapt to the changing needs of the grid and maintain a high standard of security of supply in a cost effective and sustainable way. These solutions can lead to the quicker release of additional capacity on the existing network and can often be re-deployed; giving greater long-term flexibility to network operators and increasing the robustness of grids against future uncertainties. Furthermore, solutions that provide pointed support to maintain grid stability and increase overall observability can enhance the preparedness of European power grids towards risks such as climate change and cybersecurity, thus strengthening the resilience of the network as a whole.

Innovative grid technologies can also deliver earlier benefits to consumers while new infrastructure is in permitting or under construction (e.g., by reducing constraint costs), continue to benefit or improve new infrastructure and can defer or eliminate some of the network needs.
The value of reducing carbon emissions in the near-term and making progress towards a high-RES grid now is far greater than reducing the same carbon emissions in 10-year time. This cost of delay associated with large infrastructure projects must be taken into account when considering which project should be taken forward to meet an identified system need.

Comprehensive cost-benefit analysis

The CBA Implementation Guidelines should expand their benefit indicators by including new ones that reflect the Energy Efficiency First Principle, e.g. a indicator assessing the efficient use of critical raw materials. By all accounts, there will be a shortage of materials in order to carry out all the ambitions of Net Zero. Going forward, this is going to become an increasingly important indicator. Are the materials available to feasibly build this project?

Comprehensive scenario assessment
The Infrastructure Gaps report is based on a single scenario per time horizon, whereas ACER recommends evaluating all scenarios. A broader approach would provide a more accurate representation of future grid challenges and opportunities, leading to better-informed investment decisions.

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5. For what purpose do you use the TYNDP? (Required)

☐To learn about possible future of the European energy system (scenarios)
☒For information on transmission projects
☒For information on storage projects
☒For information on future system needs in 2030/2040
☒I use TYNDP data in my own research/work
☐For personal knowledge
☐Other (please specify)

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6. Which TYNDP product(s) did you find most useful?

(Required)	I have not read this document	I've had a look. It's not useful to me.	Somewhat useful	Very useful
Infrastructure Gaps Report	☐	☐	☐	☒
Interactive data visualisation tool on system needs	☐	☐	☐	☒
Online project sheets, including CBA results	☐	☐	☐	☒
Scenarios	☐	☐	☐	☒
Offshore Network Development Plans	☐	☐	☐	☒
CBA Implementation Guidelines	☐	☐	☐	☒
System Needs study Implementation Guidelines	☐	☐	☐	☒

7. Use this field for any further comment on the quality, clarity and length of TYNDP deliverables. How easy was it for you to understand TYNDP 2024? Do you have suggestions to improve?

The TYNDP 2024 follows a very much similar format to the TYNDP 2022 and therefore was not too difficult to approach.

However, there are some pivotal assumptions and decisions to the TYNDP and the overall outcome of the plan that would benefit from being highlighted and discussed in the main infrastructure gaps report. Most of these at present are only briefly discussed in the detailed methodological documents making their impact hard to find or understand.

For brevity let us consider one example, the economic assessment in the system needs report. This economic assessment assumes that a solution is an overhead line cost and does not account for lower cost alternatives that could justify an increase in the interconnection capacity and a greater reduction in congestion costs and/or price differential between member states or price zones.

This is pivotal as the system needs report identifies the economic target level for interconnection between countries and focuses developers to resolve these needs. At present the use of overhead line as the basis for economic appraisal is counter to the requirement to optimize the existing network (lower cost) before developing new infrastructure (e.g. a new overhead line). Using an overhead line for the needs assessment will reduce the needs that network optimisation technology could provide a solution for. Also, it will present in many cases a lower interconnection level than is desirable. As a result, other technologies which can provide greater capacity with a lower €/MVA than an overhead line will appear oversized and hence have an artificially poorer CBA but will ensure that the higher cost of an overhead line will have a positive CBA.

The selection of a suitable benchmark technology may be necessary to complete the process of the system needs assessment, but as it is pivotal, its importance and selection should be clearly discussed and justified.

CurrENT would recommend that this and other pivotal decisions be clearly described and justified in the main document and publicly consulted upon for each subsequent TYNDP before being used. Other pivotal decisions would be how each of the scenarios are used in the TYNDP, the base level assumed reinforcements not already constructed for each study year, the number of study years.

8. Is the TYNDP consistent with the relevance of the power system in achieving the EU Green Deal and the ambitions for competitiveness described in the Draghi report, in identifying the value of infrastructure projects and the way forward? Any suggestion for improvement?

The TYNDP could play a crucial role in advancing European decarbonization objectives and supporting economic competitiveness, as outlined in the EU Green Deal and the Draghi report. However, while the TYNDP provides an EU-wide approach to infrastructure planning, several gaps must be addressed to fully align with these ambitions.

Further alignment with EU Green Deal targets
As mentioned in the above answer, the TYNDP approach continues to be an incremental approach that builds on the existing grid and adds projects, which will not necessarily result in the most efficient pan-European system. We need to assume an optimal system for 2050 and work our way back. In addition, the infrastructure must be able to support the decarbonization through electrification of the heating, transport, and industrial sectors - ideally, for Europe as a whole - and work our way back, planning and designing a transition to a fit for purpose, modern pan-European grid. Projects that deliver the highest contribution earliest should be delivered first, while factoring in their lead times. Anticipatory investment needs to be done in the context of a full decarbonization plan. The better the plan, the better the investment decisions will be. This is a big challenge in that few of the projects needed for 2050 will have a net benefit in isolation.

Further alignment with European Competitiveness Goals (Draghi Report)
The Draghi report acknowledges that grids play a crucial role in achieving European competitiveness goals, being the key enabler to accelerate the supply of cheaper power generation sources and for the electrification of EU economy. To build a pan-European grid that can fulfill this role, the report calls among all for measures to foster innovation in the energy sector. As mentioned in the above answer, the TYNDP does not account for any technological innovation and assumes only the further deployment of technologies that are already in use. Innovative grid technologies that are expected to mature in the coming years can significantly improve the efficiency of grids, affecting both the willingness to invest in new grids and the questions of when and where to invest in what kind of grid components. The TYNDP must align with the indications provided by Draghi Report, as well as by the Competitiveness Compass and the Clean Industrial Deal and define a strategy to deploy innovation in the grids sector.

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9. How do you think the System needs study and the ONDP should complement each other in future TYNDP cycles?

Please see comments on item 7 above. Notably as offshore is developing but with completely new technologies to land based networks the needs assessment needs to reflect the technological choices that are available, which will impact on the economic assessment.

The economic assessment should avoid the trap of only using the technologies that are in service now in such a rapidly developing field, and therefore technologies with better €/MVA capacity should be included for example superconductors where capacity needs demand these.

Running two divergent methods is not practical and presents a risk on not aligning and hence the system needs assessment[s] will need to be updated and interlinked.

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10. Is system integration adequately reflected in the TYNDP? Any suggestion for improvement?

Please see the above answers.

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11. Any other recommendations for future TYNDPs?

Please see the above answers.