ENTSOs' public consultation on the TYNDP 2026 Scenarios' input assumptions, data, parameters and methodologies

Eurelectric response paper

14 July 2025

Eurelectric represents the interests of the electricity industry in Europe. Our work covers all major issues affecting our sector. Our members represent the electricity industry in over 30 European countries.

We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:

- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

TYNDP Drafting Team
All Committees

Contact:
Abi Afthab Olikathodi
Senior Analyst - Distribution & Market Facilitation
aolikathodj@eurelectric.org

4. How would you rate the Innovation Roadmap (clarity, comprehensiveness and format)? (rank 1 to 10 - 10 most satisfactory)
(Required)
1 (least satisfactory)
2
3
4
5
6
7
8
9
10 (most satisfactory)

5. Do you think that the prioritisation of innovations for the TYNDP 2026 planning cycle could be improved, and if yes, why and how?

Yes, the prioritisation of innovations for the TYNDP 2026 scenario modelling could be improved by better incorporating developments at the Distribution System Operator (DSO) level.
Given the growing role of DSOs in the electricity system as a whole, also integration distributed energy resources (DERs), enabling local flexibility, and deploying digital and operational innovations, it is increasingly important for the TYNDP scenario modelling to reflect these evolving dynamics. Many innovations at the DSO level—be they technical (e.g. ICT solutions), customer-facing (e.g. flexible tariffs, community storage), or organisational—will shape how the power system behaves and evolves in the future.

Closer cooperation between TSOs and DSOs, including joint engagement with relevant R&D institutions, would help ensure these innovations are adequately represented in the modelling assumptions, particularly when it comes to demand-side flexibility, local congestion management, and decentralised investment trends. This is not only important for accurate system representation but also to avoid overestimating needs at the transmission level when solutions may already be emerging at distribution level.

6. Are any innovations missing in the Scenarios Innovation Roadmap that should be mentioned in future editions?

We propose the following innovations to be added to the roadmap.

1) Integrating Evolving Regulatory Frameworks into Scenario Design
The EU and national regulatory frameworks are being continuously adapted to the evolving needs of the power systems, also regarding the coordination of markets and grids. For example, moving towards more dynamic grid fee regimes, offering flexible connection agreements, setting new queue management rules can affect the attractiveness of markets for new generation and loads, and influence the use of the grid and the need for grid expansion. These aspects should be explicitly considered in the scenario design.

2) Accounting for Climate-Induced Stress in Energy System Modelling

Additionally, extreme weather events should be appropriately considered in the model. As these events become more common, they should be explicitly taken into account to assess the impact on security of supply and the adequacy of the power systems. For example, the likelihood of heat-related outages of nuclear power plants (as happened on July 1st in

France), as well as the risk of grid equipment failures during extreme heat events (+45 °C) or floods is expected to rise.
3) The Need to Include Innovative Grid Technologies in TYNDP Modelling
Furthermore, it is mentioned in 9.17 that innovative grid technologies (e.g. Dynamic Line Rating and Modular Power Flow Control, but also grid forming technologies) are out of scope. However, these technologies enhance the operational capabilities of the grid and would potentially result in a higher performance of the grid and overall system efficiency in a more cost-optimal manner than capital intensive grid buildout. Therefore, leaving these innovative grid technologies out of scope will most likely lead to an overestimation of the need for grid build-out in the TYNDP.

4) Balancing Security of Supply and Flexibility in Grid Dimensioning
Another point worth mentioning is the bigger economic and political debate concerning the primary parameters and methodologies used by TSOs to dimension their grids. In the sake of security of supply, grids are currently built for peak capacity, even though this is only reached for a limited number of hours per year. However, it is important, as point out in Directive (EU) 2019/944, grid planning shall also incorporate the contribution of flexibility services needed. This could result in a more cost-optimal dimensioning of the European power grids and potentially enhance socio-economic welfare. It is worthwhile to fundamentally reassess and reiterate whether the current design criteria of our European electricity grids are still fit for purpose and optimal to facilitate a continuous acceleration of the decarbonization (via electrification) of our economies towards 2050.

5) The Overlooked Role of Heavy-Duty EVs in the EV modelling

EV modelling in the TYNDP scenarios should explicitly model heavy duty buses and trucks. While heavy-duty electric vehicles (HDVs) are fewer in number than passenger EVs, their energy demand is comparable, making them a crucial yet often underestimated part of transport decarbonisation. Despite comprising less than 10% of the vehicle fleet, HDVs contribute over 50% of road transport CO_2 emissions. Given that commercial vehicles make up nearly 60% of new vehicle registrations in Europe, their electrification presents both challenges and opportunities for the energy system.

Is there anything that you would like to add?
Since the content is technical and meant for an informed audience, some technical terms and abbreviations (e.g., NT+, TSO, SRG) may require prior knowledge for full clarity. More visual summaries would enhance the overall comprehension.

Draft supply assumptions – encompassing H2 import potential and prices, technology cost, and commodities prices, CO2 cost and synfuel import cost
The draft supply assumptions, figures and their methodologies can be reached via [link].

8. Do you think that the draft import potentials for H2 and ammonia could be improved, and if yes, why and how?
More transparency in the elaboration of the whole assumptions on H2 and gas, including obviously H2 and ammonia could be improved.

9. If you answered to the previous question, please reference a source to support your claim.
No response.

10. Do you think that the draft technology costs could be improved, and if yes, why and how?
No response.

11. If you answered to the previous question, please reference a source to support your claim.
No response.

12. Do you think that the draft commodities prices, CO2 cost and synfuel import cost could be improved and if yes, why and how?
No response.

13. If you answered to the previous question, please reference a source to support your claim.

14. Is there anything that you would like to add?
We would like to raise our concern on the new approach to the framework of scenarios for the TYNDP 2026 scenarios. From our point of view, it is not sufficient to have only one central scenario. Even if there are two different economic variants (to be commented in the separate consultation), modelling only one scenario brings a too narrow view on the possible development of the economy and society in Europe. We understand the economic variants are stemming from the ACER framework guidelines. However, the guidelines don't restrict TYNDP to have multiple scenarios.

Draft Methodologies and Assumptions

When answering the following questions, please make sure to include references to studies or other publicly available documents whenever relevant.

15. Do you think that the draft market modelling methodologies and their relevant assumptions could be improved and if yes, why and how?
EV modelling can be further improved. Currently, trucks and buses are not explicitly modelled. This is to be modelled if we want to assess the impact of trucks and buses on the grids and also to assess the flexibility they could provide.
Furthermore, currently it is assumed that 70 % home charging for EVs and 30 % street charging for EVs. This should be improved as this split will evolve over years. Also, this split is same across all the countries, however, this should be differentiated considering the availability of charging infrastructure is different across countries.

16. Do you think that the draft target compliance and gap filling methodologies can be improved and if yes, why and how?
To ensure full transparency, both the original data and the resulting input data after gap-filling should be made publicly available. This is essential to allow stakeholders to fully scrutinize and understand the data processing steps. For example, in the methodology it is not clear how the decarbonisation potential will be decided. Therefore, we request to publish the rankings of the sectors and carriers with their GHG emission potential and decarbonisation potential.

17. Do you think that the draft carbon budget methodology can be improved and if yes, why and how?
No response.

18. Do you think that the draft scenarios grid methodology can be improved and if yes, why and how?
Care should be taken when including conceptual hydrogen projects in the 2050 reference grid. These projects represent potential interconnection capacities that TSOs are currently exploring, rather than confirmed developments. It is essential to clearly define and communicate the criteria used to select these projects for inclusion. Transparency in this process is crucial to ensure stakeholder trust. Stakeholders must have confidence that the TYNDP scenarios do not overestimate project capacities or rely on overly optimistic cost assumptions.

19. Do you think that the draft scenario weather years selection methodology can be improved and if yes, why and how?

Eurelectric welcomes the improvements made to the methodology for selecting representative weather years. This is a critical step forward in ensuring that energy system modeling reflects a more realistic range of climatic conditions. However, we would strongly encourage a more detailed and transparent presentation, upon publication of the results, of how extreme weather events—such as *Dunkelflaute* periods—are identified and captured within this process. These rare but impactful events play a key role in assessing system adequacy and resilience, particularly in scenarios with high shares of variable renewables.

In addition, it would be valuable to demonstrate how the methodology accounts for the effects of global warming on future weather patterns. This includes potential shifts in temperature extremes, wind and solar availability, and the frequency or intensity of extreme weather events. Providing this level of transparency will strengthen stakeholder confidence in the robustness and realism of the TYNDP scenarios and support better-informed policy and investment decisions.

20. Is there anything that you would like to add?

Eurelectric urges caution regarding the new TYNDP approach of using fixed capacities instead of modeling future capacity expansion, as it has both strengths and limitations.

Leveraging TSOs' insights ensures scenario realism by aligning with national plans, infrastructure developments, and non-market drivers like policy commitments and permitting progress.
However, this approach introduces notable limitations, especially when it comes to long-term system adequacy and economic viability. By not allowing the model to perform endogenous capacity expansion, the scenario may overlook key market signals and fail to capture whether the system, as configured, can deliver the required investments under realistic market conditions.

This could lead to a situation where the fixed/predefined capacity mix may not be economically viable in a liberalized market setting. If the model assumes that certain technologies will be built regardless of profitability, it risks masking structural investment gaps, especially for firm

capacity or flexibility resources that may not be adequately remunerated under current market arrangements.

Without a clear representation of investor behavior and potential market-driven capacity buildout, the results may underestimate the need for support mechanisms, market reform, or policy intervention to ensure security of supply and economic efficiency.

A hybrid approach could be more robust—using known capacity developments for the near term while allowing for potential endogenous capacity expansion (or at least some level of cost-optimization) in the longer term. This would enable testing the economic and operational feasibility of the system under market-driven conditions, without implying any prescriptive role for system operators. Transparency on these modelling choices—and their implications—is critical for stakeholders to interpret the results accurately and in the right context.

Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development

- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

Social Responsibility

- Transparency, ethics, accountability

Union of the Electricity Industry - Eurelectric aisbl
Boulevard de l'Impératrice, 66 – bte 2 - 1000 Brussels, Belgium
Tel: + 32 2 515 10 00 - VAT: BE 0462 679 112 • www.eurelectric.org
EU Transparency Register number: 4271427696-87