ENTSO-E & ENTSOG webinar
Draft TYNDP 2026 Scenarios Key Findings
Q&A

1. **Will you publish scenario data in the same format as they draft scenarios which included e.g., time-series for other non RES? including 3rd countries data**
   The draft Scenario package may be updated during the finalisation process if feedback, quality assurance activities or model updates require changes. This is subject to the European Commission's approval.

2. **Regarding electricity demand, how does the growth rate (c.a.g.r.) of the native demand in NT+ 2030 compare vs recent years? also, how does the growth of electricity demand overall compare vs what we have seen in recent years?**
   We have not performed a specific CAGR comparison against recent historical demand trends as part of the TYNDP 2026 Scenarios exercise. The demand projections are based on TSO inputs, NECPs, national strategies and the TYNDP Scenarios methodology. Detailed demand projections are available in the published datasets for anyone interested in carrying out additional trend analyses.

3. **Will you publish what projects have been included in the reference grid?**
   The reference grids are based on the relevant TYNDP project collections and maturity criteria. Detailed project information is published through the corresponding TYNDP processes. For hydrogen, the starting point is the TYNDP 2024 hydrogen project collection, while the inclusion of projects in each horizon follows the maturity criteria described in the Methodology Report. For Electricity, the TYNDP 2026 project collection is used.

4. **What assumptions are made when coupling H2 to electricity markets via H2 CCGT? Is hydrogen consumed by H2 CCGT at the market price?**
   The current modelling approach preserves the physical coupling between the two systems. Whenever an H_2 CCGT is dispatched in the electricity market, the corresponding quantity of hydrogen is withdrawn from the hydrogen network, creating additional hydrogen demand. This additional demand participates in the hydrogen market clearing and may influence hydrogen prices depending on the marginal hydrogen supply technology.
   The chosen representation ensures a stable and physically consistent coupling between the electricity and hydrogen systems within the 2026 Scenario framework. A modelling simplification is that H_2 CCGTs are represented with a zero fuel cost in the electricity market and therefore do not directly incorporate the value of hydrogen into their bidding behaviour. As a result, the effect of H_2 CCGT dispatch on hydrogen demand and market outcomes is captured,

while the value of hydrogen is not explicitly reflected on the electricity market side. Potential refinements of this representation may be considered in future methodology developments.

5. **What are Other RES and Other Non RES?**
   Other RES includes technologies such as small biomass, geothermal, marine energy, waste and residual renewable categories. Other Non-RES includes thermal generation technologies that are not explicitly represented in the main categories (e.g. CCGT, OCGT, coal, lignite or nuclear), such as certain CHP units and other miscellaneous thermal plants.

6. **Regarding 1.5°/2° compatibility, there are also ESABCC recommendations, which translated IPCC into objectives adapted to EU context. But I have not noted if they were included in previous slides?**
   The scenario mandate is to assess consistency with adopted European energy and climate objectives. Therefore, the scenarios are primarily aligned with official EU targets, including the 2030 climate and energy framework and climate neutrality by 2050. However, some assumptions are also consistent with recommendations from bodies such as ESABCC, including limitations on CCS deployment. ESABCC participates as an observer in the Stakeholder Reference Group, and some relevant recommendations have been considered where consistent with the scenario framework.

7. **Do you consider line pack storage capacity in H2 transport infrastructures?**
   We do not explicitly model hydrogen linepack. The available transport capacities provided by TSOs are assumed to already reflect the operational flexibility offered by linepack. Additional flow and ramping constraints are introduced to avoid unrealistic hourly variations in the system

8. **What about the share of electricity in final energy consumption? (what level, main assumptions)**
   The share of electricity in final energy consumption is not imposed as a standalone target. It is an outcome of the scenario assumptions, including the electrification pathways provided by TSOs, NECPs, etc. The resulting values can be derived directly from the published scenario datasets.

9. **What are the CO2 price assumptions? Are these updated following the 17/07 EU Energy package?**
   The CO2 prices used in the scenarios are those recommended by the European Commission for use in National Energy and Climate Plans (NECPs). The detailed assumptions can be found in Section 5.2 of the Methodology Report.

10. **Regarding the methane demand/supply, can you please clarify the precise levels of P2M domestic production and imports and the sources for these estimations?**

11. *The methane system is not explicitly represented as a dedicated market within the PLEXOS model. Instead, methane-related assumptions, including supply-demand balances, are addressed*

through dedicated tools and complementary analyses outside the PLEXOS simulations. Within this framework, P2M features as fixed demand for H2, as do other synfuels.

12. **Does the planned Installed capacity in 2040 meet the challenges and the lack of renewables during the „Dunkelflaute" which was 50% of the days for 4 winter months in Austria…**
The scenarios are assessed using representative future climate years and include weather-dependent renewable generation and demand modelling. The scenarios include weather-dependent renewable and demand modelling, but they are not intended to assess the resilience of specific historical Dunkelflaute events.

13. **The scenarios were delivered in 2 years and this is criticised. How is that reflected in the upcoming grids package planning a 4 years cycle? Given also the fact that there is a mentioned governmental gap the TSOs cannot solve: NECPs being not target compliant.**
No written response has been provided for this question by ACER/SRG.

14. **What do you mean by missing transparency about the gap-filling? All numbers for all countries seem to be published. What do you miss in terms of transparency (apart from maybe debatable methods)?**
No written response has been provided for this question by ACER/SRG. An oral answer was given by ACER during the webinar.

15. **You have H2 Zone 2 and Zone 1. What simulated clearing market price of H2 will be used to estimate changes in market rents for the H2 market in the CBA - that of Zone 2?**
Zone 1 and Zone 2 are connected through a unidirectional H_2 pipeline, from the interconnected H_2 market (Zone 2) to isolated consumption zones supplied by grey SMRs (Zone 1). As a result, they have the same hourly market prices.
It is also worth noting that market prices are an output of the techno-economic optimization, not an input.

16. **Is there H2 commercial exchange between countries? if so, what are the assumptions on infrastructure?**
Cross-border hydrogen trade is explicitly represented through the European hydrogen network. The hydrogen transmission grid determines the spatial distribution of production, consumption and trade, while imports and domestic production compete within the hydrogen market merit order. Infrastructure assumptions are based on the scenario grid described in Chapter 7 in the Methodology Report.

17. **Not clear on answer re EV flex versus fixed. Is there an overall % of EV's which are deemed to be flexible?**
The share of flexible and non-flexible passenger EVs was collected through a dedicated TSO survey, with country-specific assumptions for each target year. The model therefore reflects national expectations regarding smart charging and flexibility deployment. Further details on

the EV modelling approach and flexibility assumptions can be found in Section 8.3 and Annex I of the Methodology Report.

18. **How do you estimate self-consumption based on retail photovoltaic production or retail battery storage?**
The prosumer node combines Rooftop Solar PV, Residential Batteries and residential electricity demand. The model determines whether demand is supplied by local PV generation, battery discharge or electricity imported from the power system. Further details are provided in Chapter 8 of the Methodology Report.

19. **How exactly the methane demand is projected? ETM? TSOs?**
Methane demand originates from the ETM process. TSOs populate ETM using assumptions based on NECPs and national strategies, and ETM produces the resulting final energy demand by sector and energy carrier used in the scenarios.
The methane system is not explicitly represented in the PLEXOS Scenario model. The methane supply-demand balance, together with all assumptions related to the methane system, is addressed upstream and downstream of the PLEXOS simulations through dedicated tools and post-processing analyses.

20. **What assumptions are made regarding RESE generation profiles. Especially future changes in e.g. RoR generation due to climate change?**
Renewable generation profiles are based on PECD climate datasets and future climate projections. Consequently, future climate conditions are already reflected in renewable generation profiles, including technologies such as run-of-river. Additional details are provided in Annex II and the weather-year methodology.

21. **Why are heat pumps only/automatically connected to the prosumer case? Not all heat pump owners are prosumers**
Not all heat pump owners are prosumers. In the model, the prosumer node should be understood as an aggregated representation of residential and tertiary consumers with distributed energy resources. Fully electric heat pumps are included implicitly within the prosumer demand profiles rather than being represented as separate optimisation assets. Utility scale / district heating HPs electricity demand is part of the electricity market demand.

22. **Are the detailed assumptions of reference grids available?**
Yes. The Methodology Report describes the scenario grid methodology, including project maturity categories, inclusion criteria by target year and infrastructure selection logic for both electricity and hydrogen networks.

23. **What are assumptions of EV flex versus fixed?**
The share of flexible and non-flexible passenger EVs is based on a dedicated TSO survey and differs by country and target year. Flexible EVs can optimise their charging behaviour in response to electricity prices and charging infrastructure availability and may also provide V2G services where

enabled. Non-flexible EVs follow predefined charging profiles. To avoid overestimating flexibility, the flexible fleet is further divided into commuter and non-commuter vehicles, with commuter EVs assumed to be unavailable for charging during weekday daytime hours. Further details can be found in Section 8.3 and Annex I of the Methodology Report.

24. **What are the assumptions on imports for H2 or derived products from outside EU?**
Non-EU hydrogen imports are represented through both pipeline corridors and shipped hydrogen carriers (including ammonia, LH_2 and LOHCs).
For each target year, the import capacity is defined as the minimum of the available supply potential and the import infrastructure capacity.
Import capacities are divided into two price bands, with a 50/50 volume split between long-term contracted imports and market-based imports.
Hydrogen imported via pipeline corridors from Morocco (MA), Tunisia (TN), Algeria (DZ) and Ukraine (UA) is assumed to be renewable.
All non-EU hydrogen imports (including ammonia and pipeline imports) are converted into gaseous hydrogen before entering the European hydrogen network.
More details are included in section 5.7 of the Methodology Report

25. **Slide 19, 20, the consideration of H2 makes distinction on its source and colour-base classification (blue green, grey, ..)?**
Yes. The model distinguishes between hydrogen supply pathways. Zone 1 is dedicated to grey hydrogen production without CCS in selected countries, while Zone 2 represents the integrated hydrogen market, which may include green hydrogen, blue hydrogen and imported renewable hydrogen.

26. **General question, from your expert view, what is the best way to integrate this scenarios, its outputs and assumptions with other data like weather data sets?**
The scenarios already incorporate future climate assumptions through the weather datasets used to derive renewable generation, hydro production and demand profiles. If alternative weather conditions need to be assessed, the recommended approach is to rerun the analysis using alternative meteorological datasets and corresponding renewable generation, hydro and demand profiles.

27. **Does that mean, H2 should be integrated in the electricity market model instead of an own h2 market model? (Slide 20)**
The framework is a sector-coupled model where electricity and hydrogen interact through electrolysers, hydrogen-fired power plants and other cross-sector technologies. Electricity can be converted into hydrogen through electrolysis, and hydrogen demand increases when hydrogen-consuming technologies operate, but the electricity and hydrogen markets remain distinct.

28. **Slide 16, is there also a consideration to meet IPCC 1.5 / 2.5 climate targets. As it seems EU targets are falling short in comparison with the IPCC objectives?**

The scenarios are designed to ensure consistency with adopted European policy objectives rather than directly targeting IPCC pathways. Compliance is assessed against agreed EU energy and climate objectives, including the 2030 targets and climate neutrality by 2050.

29. **Slide 13, defines one item for higher economic variant as long-term sustainability orientation? Can you elaborate more about sustainability orientation and how sustainability is defined/measured?**
    The Higher Economic Variant reflects behavioural assumptions associated with a stronger economy, including a greater willingness to invest in innovative and low-carbon technologies and a faster uptake of electrification and hydrogen solutions. In practice, this is translated into different demand-side assumptions, technology adoption rates and sectoral activity levels, while generation capacities and network infrastructure remain unchanged. The Higher Economic Variant therefore remains a stress test around the central scenario, rather than a separate sustainability scenario.

30. **Are all numeric figures referring to EU27?**
    For the figures presented during the webinar, the values shown refer to EU27 aggregates. However, country-level results and assumptions are also available through the published scenario datasets and the Visualisation Platform, where users can explore the data in greater detail for individual countries and regions.