

November 2021

UFE's reply to the consultation of ENTSO-E and ENTSG on TYNDP 2022 Scenarios

Stakeholder Engagement

Stakeholder engagement is an important part of the joint ENTSO-E and ENTSG scenario development process. The scenario building process aims to engage at multiple times within the process and in various ways, such as physical workshops, online webinars, and written consultation.

4. Are you satisfied with the level of stakeholder engagement during the joint ENTSO-E & ENTSG scenario building process?

- Satisfied
- No opinion
- Unsatisfied: please make suggestions how we can improve for the next process

5. Among the different engagement options, rank them in the order of your preference. Rank from 1 (most preferred) to 3 (least preferred):

- Workshops & Webinars : 3
- Consultations : 1
- Bilateral Discussions : 2

6. Are you satisfied with the format and the level of explanation that was provided at the Scenario Workshop?

- Yes
- Neutral
- No

Clarity of Reports

ENTSO-E and ENTSOG produce several documents that are all available for consultation. In addition to the Scenario Building Report itself, the Scenario Building Guideline also provides greater insight into how the scenarios were developed from the TYNDP 2022 Storyline Report. Furthermore, data from the Scenario Report is also presented on the Visualisation Platform. The goal of this platform was to make key information more easily accessible.

7. Are you satisfied with the format and the level of explanation provided in the TYNDP 2022 Draft Scenario Building Report?

- Satisfied
- No opinion
- **Unsatisfied**

Regarding format and level of explanation, UFE acknowledges the huge work the TYNDP exercise requires and the efforts to make the document as user friendly as possible. However, the choice of assumptions should be clarified and explained. For example:

- Residential heating: Market shares are set in a normative manner and there is no cost reference to support the choices made. Similarly, in 2050, 10 to 20% of methane boiler persist in all countries without explanation.
- Industry: The final energy demand coming from industry has increased compared to the previous TYNDP without explanation.
- The final electricity consumption is significantly higher than the one calculated in the previous TYNDP without explanation.
- Hydrogen: Regarding hydrogen demand, scenario DE shows a 140 TWh and scenario GA a 450 TWh demand in 2050 for residential customer. However, the market shares of heating do not mention hydrogen.

8. Are you satisfied with the format and the level of explanation provided in the TYNDP 2022 Scenario Building Guideline?

- Satisfied
- **No opinion**
- Unsatisfied

9. Are you satisfied with the format and the level of information provided in the Visualisation Platform/Data set?

- Satisfied
- No opinion
- **Unsatisfied**

UFE recognizes the work done by the ENTSOs to provide stakeholders with a large amount of data.

However, some improvements could be envisaged:

- The raw data are provided without any explanation, which make it difficult to understand. An explanatory document would be welcomed.
- Residential heating: The sum of market shares is not always equal to 100%.
- Industry: too few data are available. There are no market shares, no energy breakdowns and no costs provided for this sector.
- There is no breakdown by countries for imports

European Targets and Storylines

The TYNDP 2022 Scenario Report includes three scenarios: ‘**National Trends**’, the central policy-based scenario, reflects Member States’ energy and climate policies and recognising EU climate targets. Due to its policy-orientation, this scenario spans the period up to 2040 (the horizon for most Member State energy and climate policies). A trajectory based on the developments in this scenario allows results up to 2050 to be forecast. The ‘**Global Ambition**’ and ‘**Distributed Energy**’ Scenarios are developed as full energy scenarios (not limited to gas and electricity) and are built in line with the Paris Agreement target and the efforts of the EU-27 to reduce GHG emissions to 55% by 2030 and to net-zero by 2050.

10. Do you agree that the ENTSO-E and ENTSOG’s joint scenarios should be built to be compliant with EU-27 2030 and 2050 targets as a minimum standard?

- Yes
- Neutral
- **No: please comment why**

UFE strongly supports the targets set by European Commission. However, the global set of scenarios should be credible and contrasted enough to assess long-term uncertainties in TYNDP analyses. As ENTSO-E mentions in question 12, “*scenario diversity is essential when it comes to the assessment of future infrastructure needs*”. Therefore, the scenario of a delayed transition, although not desirable, is still a credible option that could lead to possible stranded costs and put at risk highly capitalistic infrastructures investments. Such a scenario is not explored, and it should be to determine at best the “*no regret option*”.

11. ENTSO-E and ENTSOG introduced National Trends as the central policy scenario. National Trends is aligned with national energy and climate policies and strategies as stated at the end of 2020. Do you agree that member state energy and climate policies should be used to develop National Trends?

- **Yes**
- Neutral
- No: please comment why

12. Scenario diversity is essential when it comes to the assessment of future gas and electricity infrastructure needs. In your opinion, do the 3 scenarios cover a broad enough range of plausible pathways aiming to achieve 2050 EU-27 targets?

- Yes
- Neutral
- **No: please comment why**

The TYNDP must capture a large scope of robust, sustainable, and consistent possible futures to highlight the risk to invest in infrastructures and explore different pathways of decarbonation. Different scenarios should be envisaged to cover the uncertainties: higher electrification scenarios (in France, EV accounts for 94% of the fleet in 2050 and electric heating for 70% in RTE “Futurs énergétiques 2050” scenarios), a lower growth rate for hydrogen, different nuclear shares...

Paris Targets and Decarbonisation

ENTSO-E and ENTSOG have attempted to develop scenarios that go beyond electricity and gas infrastructure and reflect real-world developments. We are keen to hear from stakeholders on how we can ensure that the ambition and scope of our scenarios are representative of EU energy and climate goals.

13. The COP21 Paris Agreement and IPCC Special Report 1.5°C provide evidence on the need for a carbon budget in the global effort to tackle climate change. ENTSO-E and ENTSOG compare the carbon budget resulting from the scenarios to benchmarks based on equity and population. Do you agree that these benchmarks are appropriate?

- **Yes**
- Neutral
- No: please comment why

14. The Distributed Energy and Global Ambition scenarios aim at achieving a carbon-neutral EU-27 economy by 2050. Do you think the scenarios are helpful in identifying / assessing those challenges?

- Yes
- Neutral
- **No: please comment why**

The main objective of the TYNDP is to capture a large scope of robust, sustainable, and consistent possible futures to highlight the risk to invest in infrastructures and not to identify the challenges of the energy transition. For example, one of the main challenges of the energy transition will be the cost of its implementation depending on the choices made and the cost of each scenario.

Whereas scenarios of the previous TYNDP were partly based on disruptive technologies (CCS) and massive import of carbon-free energy (methane, hydrogen), the TYNDP 2002 scenarios are more contrasted. Yet, the GA scenario, which assumes less direct electrification and relies more on gas still requires massive imports and strong development of CCS to achieve carbon neutrality. This makes the

achievement of carbon neutrality more risky.

UFE also notes that both GA and DE rely on a strong development of hydrogen without assessing the uncertainties that remain (storage capacities, renewable capacities for electrolyzers). The TYNDP should consider alternatives and network requirements if hydrogen development were to be lower than expected.

15. ENTSO-E and ENTSOG use a total energy model to capture the impact of sector coupling between energy carriers. Modeling of sector coupling has been expanded in the Draft Scenario Report 2022. Do you agree that the ENTSO-E and ENTSOG's approach identifies the potential benefits and challenges of sector coupling?

- Yes
- Neutral
- No: please make suggestions on improvements that could be addressed in the next process

The interactions between energy carries are not straightforward. A deep dive into data is necessary. An explanatory document would be welcome.

16. ENTSO-E and ENTSOG scenarios use external data on LULUCF (Land Use, Land Use Change, and Forestry) to provide input to the scenarios on carbon sinks. The scenarios also consider the development of net negative emission technologies. Do you agree that including external LULUCF and net-negative emission technologies within the scenario is appropriate?

- Yes
- Neutral
- **No: please comment why**

The external data could be inconsistent with the assumptions of each scenario. For example, biomethane production impacts the LULUCF.

17. Based on feedback from the TYNDP 2022 Storyline Report, ENTSO-E and ENTSOG's scenarios consider different levels of deployment of Carbon Capture and Sequestration (CCS) for pre- and post-combustive processes. Do you agree that the CCS assumptions in the different scenarios sufficiently capture the storylines?

- Yes
- Neutral
- **No: please comment why**

CCS is a disruptive technology and still appears as a very uncertain breakthrough which would require to cope with both cost and technical challenges. Decarbonation cannot be strongly based on CCS in all scenarios and UFE acknowledges the precaution taken towards CCS penetration in DE compared to the TYNDP 2020.

However, in GA, the CCS assumption is based on the highest scenario of benchmark (studies from Hydrogen for EU excluded) and is much higher than the most ambitious scenario of LTS. A more cautious assumption should be envisaged.

18. The Distributed Energy and Global Ambition scenarios consider different technology pathways to decarbonisation. The Distributed Energy is a scenario focusing on higher RES development and aiming at EU energy autonomy. The Global Ambition scenario focuses on the development of a global clean energy economy with low-carbon technologies and large-scale RES development. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- **Neutral**
- No: please comment why

Demand & Supply Ranges

In the public consultation for the TYNDP 2022 Storyline Report, stakeholders were asked to define ranges for demand and supply of key energy carriers and technologies in 2030 and 2050. The scenarios in this Scenario Report have been built based on the feedback received from that public consultation (for more information on these storylines, please see the TYNDP 2022 Storyline Report, released in April 2021).

19. Biomass: As outlined in the Storyline Report in April 2021, the biomass assumptions for the Distributed Energy and Global Ambition scenarios were based on the EC Impact Assessment scenarios.

Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- **Yes**
- Neutral
- No: please comment why

20. BEV and FCEV: The Storyline Report outlined ranges for the development of battery electric vehicles and fuel cell electric vehicles based on stakeholder consultation feedback. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- Neutral
- **No: please comment why**

A scenario with a stronger penetration of electric vehicle for passenger cars and heavy trucks should be considered. For example, for France, DE, scenario with the highest market share of EV, forecasts 82% of EV in 2050 for passenger cars whereas the freshly released reference scenario of RTE forecasts 94% of EV in 2050. Likewise, most of heavy trucks journeys are lower than 300km (60% in France), which would be in line with a higher penetration of electricity scenario.

Moreover, while there is a consensus on the development of electric vehicles, the market share of EVs in GA in 2050 remains low to the detriment of hybrid vehicles. It is surprising that for France, in GA in 2050, EVs represent only 29% of the fleet while hybrid vehicles 45%. Even if it is essential to make contrasting scenarios, the share of EV in the fleet should be revised upwards and to higher levels than those of hybrid.

21. Heat Pumps: The Storyline Report defined ranges for the share of electric and hybrid heat pumps in 2030 and 2050 based on stakeholder consultation feedback. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- Neutral
- **No: please comment why**

For France, the penetration of electric heating (heat pumps...) is lower than 50% in DE and GA in 2050 whereas the RTE's reference scenario makes the assumption of 70% of electric heating in 2050. A scenario with a higher penetration of electric heating in residential should be envisaged.

22. District Heating: The Storyline Report defined ranges for the share of district heating in 2030 and 2050 based on stakeholder consultation feedback. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- **Neutral**
- No: please comment why

23. Wind Energy: The Storyline Report defined ranges for the share of wind energy in 2030 and 2050 based on stakeholder consultation feedback. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- Neutral
- **No: please comment why**

For 2050, for France, the onshore wind capacity reaches 175 GW in DE and 115 GW in GA which are much higher than the highest RTE's scenarios (about 75 GW in 2050). Such ambitious trajectories in both scenarios would require a modification of the current regulatory framework and reinforced political support.

24. Solar/PV: The Storyline Report defined ranges for the share of solar/PV energy in 2030 and 2050 based on stakeholder consultation feedback. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- Neutral
- **No: please comment why**

Both scenarios are based on the highest RTE's scenarios of PV development. These trajectories are ambitious and constitute an industrial challenge. A more cautious approach should also be considered.

25. Nuclear: The Storyline Report defined ranges for the share of nuclear in 2030 and 2050 based on stakeholder consultation feedback. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- Neutral
- No: please comment why

In DE, no new nuclear capacity is envisaged. This assumption is quite restrictive, and the installed capacity is strongly lower than in the LTES scenarios. Even if a reduction of installed capacity of nuclear is considered, no development at all seems to be restrictive.

26. Energy Imports: The Storyline Report defined ranges for the share of energy imports in 2030 and 2050 based on stakeholder consultation feedback. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- Neutral
- No: please comment why

The breakdown of imports by country is not available. Some countries bet on massive imports to decarbonize their economies, others have chosen not to include imports in their decarbonation strategies. Therefore, there is no common strategy at European level on this issue and only detailed data by country can enlighten on this question.

27. Hydrogen: The Storyline Report gave an outlook of hydrogen sources available for each scenario. Do you agree that the hydrogen supply in these scenarios is consistent with the assumptions made in the Storyline Report?

- Yes
- Neutral
- No: please comment why

As UFE noted before, more contrasted trajectories should be considered when it comes to hydrogen to make sure uncertainties are taken into consideration.

Moreover, the assumptions for France are not consistent with RTE's recently published reference scenarios. Indeed, for both TYNDP's scenarios, final hydrogen demand (198 TWh in DE and 229 TWh in GA in 2050) is considerably higher than the highest RTE's scenario (120 TWh in 2050), which already considers uncertainties related to transmission and storage infrastructures.

28. Electrolysis: The Storyline Report defined ranges for the level of electrolysis capacity in 2030 and 2050 based on stakeholder consultation feedback. Do you agree that these scenarios are consistent with the assumptions made in the Storyline Report?

- Yes
- Neutral
- **No: please comment why**

The production of hydrogen through electrolysis seems to be set at a high level, particularly for France (430 TWh in GA, 2050), which leads to a French power generation above 1000 TWh in both scenarios. The rationale behind this assumption should be clarified.

As for hydrogen capacity, scenarios foresee a French electrolyser capacity of 25-32 GW in 2040 (depending on the scenario), reaching 28-54 GW in 2050. These values are not in line with the scenarios recently released by RTE. They are also high compared to other countries, particularly Germany (20-27 GW in 2040 and 16-31 GW in 2050, with an electrolyser capacity in GA scenario that is even declining between 2040 and 2050).

TYNDP 2022 Scenarios Improvements

The development of the TYNDP scenarios is an iterative process based on feedback from stakeholders. In this cycle, ENTSO-E and ENTSG have followed stakeholder advice and made amendments to several aspects of their methodologies.

29. ENTSO-E and ENTSG have made several improvements to methodologies in relation to prosumer and vehicle-to-grid modeling. Do these improvements reflect your expectations?

- Yes
- Neutral
- **No: please comment why**

UFE welcomes the improvements made. However, as the DE scenario relies on local initiatives to maximize wind and solar development, it would have been appropriate to insist on the expected development of self-consumption (prosumers) and energy communities. The same is true for V2G, as the significant growth of these solutions is foreseeable in the time frames considered by the scenarios.

30. ENTSO-E and ENTSOG have made several improvements to methodologies in relation power-to-gas configurations. Do these configurations reflect your expectations about the future operation of these units?

- Yes
- Neutral
- No: please comment why

Further Use of Scenarios

31. As a stakeholder, do you intend to use our scenarios, or do you see opportunities for further use of these outside the TYNDPs?

- Yes: how would you consider them?
- Neutral
- No

The scenarios could be very useful for UFE and its members, as they could be used for studies, discussions, and benchmarks.

32. If you have any further comments on the scenarios, please state them here.

- The production of biomethane in France in 2030 is between 69 TWh (GA) and 85 TWh (DE). These levels of production are much higher than the previous TYNDP. Moreover, the French NRA (CRE) has just launched a public consultation concerning the ten-year development plan for French gas network and the assumption of production of biomethane for 2030 is between 30 TWh (consistent with French strategy) and 49 TWh. The French regulator considers that the highest scenario is not justified enough from an economic point of view. Therefore, the fact that both scenarios of the TYNDP consider such high trajectories, also much higher than defined in the French energy strategy, raises questions.
- It should be useful to evaluate the existing infrastructure use to optimize the need for interconnections. Any new infrastructure should be analyzed with regards to the existing ones.
- The efficient use of existing infrastructure and the need for new ones could be reinforced / justified by building via hybrid interconnections, i.e. for example, connecting sea (offshore installations) & land.
- There is not enough discussion regarding the value of promoting and using flexibilities. The increased role of flexibility solutions should be extensively highlighted, given the benefits they bring to the grid and its users. Beyond grid related solutions, Market solutions should also be considered to determine the most optimal solutions. It would be useful to quantitatively assess, in terms of total costs, the differences between flexibility solutions and investment in grid reinforcements.