

# Response ID ANON-GHQK-BTPM-X

Submitted to ENTSO-E & ENTSOG 2022 TYNDP SCENARIOS CONSULTATION  
Submitted on 2021-11-18 16:32:40

## Introduction

1 What is your name?

Name:  
Elisabeth Cremona

2 What is your email address?

Email:  
elisabeth@ember-climate.org

3 What is your organisation?

Organisation:  
Ember

## Stakeholder Engagement

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

Satisfied

If 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):

Stakeholder Engagement - type - Workshops & Webinars:  
2

Stakeholder Engagement - type - Consultations:  
3

Stakeholder Engagement - type - Bilateral Discussions:  
1

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

Yes

Please comment::

## Clarity of Reports

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

Unsatisfied

Please comment::

The draft Scenario Report is a well-designed document which successfully condenses the vast information on the scenarios into short, informative pieces. However, Ember would like to draw attention to the following points:

- Data on total emissions and carbon intensity of electricity generation for the EU27 (section 4.4.4) do not appear to correctly correspond with the data on electricity generation by fuel source. Furthermore, the 2025 carbon intensity (279 gCO<sub>2</sub>/kWh) is higher than the historical points for 2019 and 2020 (253 and 231 gCO<sub>2</sub>/kWh, respectively).
- While acknowledging the modelling required to extend the National Trends scenario to 2040, it is disappointing that almost no quantitative information is provided at this draft stage. Given the significant implications of the National Trends for the PCI assessment, stakeholders should have the opportunity to provide their feedback on the full extent of the National Trends scenario.
- To understand the role of natural gas infrastructure under different energy pathways, it would be helpful if the charts and information presented in section 4.2.3 distinguishes between methane and hydrogen fired capacity and generation, in line with the following text of the same report: "there is a need to distinguish methane from hydrogen." Currently, the split between the two can only be seen in Figures 21 and 22, hidden within the full power

generation mix.

- V2G batteries are included under the broader category of batteries. It is suggested that the former is split and featured separately in the report given key differences from large scale batteries in: (i) cost (ii) availability and (iii) policy implications.

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

Unsatisfied

Please comment::

This report offers helpful insight into the process undertaken to develop the scenarios and provides a detailed description of the underlying assumptions. However, Ember finds the latter lacking in three, interlinked aspects relating to demand, and requests that more information/clarifications are included in the final version of the document on the following:

- Energy efficiency: Firstly, the draft Scenario Report places significant emphasis on the energy efficiency first principle but no information is provided in the Guidelines on how this factored into the development of the two top-down scenarios. Secondly, the draft Scenario Report indicates a significant impact of efficiency on total energy and electricity demand; however, the Guidelines are unclear on the assumptions taken in this regard. Reference is made to the POTEnCIA Central Scenario as the primary source for efficiency assumptions, but it unclear if this refers solely to the technical efficiencies of technologies or the specific pathways of technology switch and turnover set out in the POTEnCIA Central Scenario.

- Electrification and market shares: the assumptions informing the rate of electrification and market shares per technology are not provided. As electrification is a crucial aspect of the energy transition and will have a significant impact on future levels of demand (of various energy carriers) and thus, energy infrastructure, it is essential to understand the range of electrification rates foreseen by the ENTSOs for different sectors and the assumptions informing the evolution of technology market shares.

- Hydrogen: the draft Scenario Report shows an emphasis on indigenously produced hydrogen from electrolysis. However, the Scenario Building Guidelines do not provide information about the assumptions which allow the reader to understand this preference. While it is understandable in the Distributed Energy scenario due to its emphasis on autonomy, the reasons for the emphasis on indigenous, green hydrogen production in the Global Ambition scenario are missing. Given the significant impact of hydrogen production on electricity demand, including explicit information on the assumptions driving electrolyser capacity and consumption would substantiate the modelled production levels.

Ember is disappointed to note that the assumptions on carbon capture and storage (CCS) in both the Scenario Building Guidelines and the draft Scenario Report are rather basic, the capacity prescribed by assuming a fixed percentage of the global CCS capacity included in the IEA's Net-Zero Report. CCS has important implications on (i) the potential role of natural gas infrastructure in the energy transition and (ii) the massive carbon budget overshoot projected in both COP21 scenarios.

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

Unsatisfied

Please comment::

Ember welcomes the level of data accessibility and detail provided through the downloadable datasets and Visualisation Platform. However, we note several sections where the data portrayed in the draft Scenario Report (which was kindly made available to download) was inconsistent with that provided in the other downloadable spreadsheets e.g. power sector capacities.

In addition, to the clarify assumptions informing the scenarios and improve transparency, we request that the following data is added to the relevant datasets:

- Market shares of technologies in the industrial and transport sectors (currently only available for the residential and tertiary sectors)
- Energy demand broken down by energy carrier for residential, tertiary and industrial sectors (currently only available for transport and all sectors combined)
- Hydrogen fleet capacity and generation (kindly refer to response in question 3)
- Capacity and dispatch of V2G storage, separate from the broad category of batteries (kindly refer to response in question 3)

## European Targets and Storylines

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

If no, please comment why::

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

If 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?

No

If no, please comment why::

Ember notes that the two top-down scenarios are not well contrasted between themselves, nor with the National Trends scenario (until 2030), both on the supply and demand side. It is disappointing that the exploration of the uncertainties around the energy transition, the specific purpose of the two COP21 scenarios, is limited to a narrow range. Some examples are included below to highlight the narrow range of pathways explored for key elements of the energy transition:

- Supply: The power generation mix is similar across the scenarios, and both COP21 scenario feature a slow decline in fossil fuel generation. Indeed, natural gas capacity and methane consumption for power generation follows almost identical paths. As a result, carbon intensity of electricity generation decreases at an almost identical rate.
- Demand: The rate of electrification is moderate and similar across the scenarios: 25-27% in 2030 and 38-44% in 2050. This high degree of similarity is also present in all end-use sectors. The potential impact of higher levels of electrification on the power system (including the impact on peaks) is not explored.
- Demand: Both scenarios prioritise indigenous hydrogen production, with no exploration of the impacts of a scenario with a more equal distribution between import and domestic production for hydrogen.
- Demand: As a result of the two above points, growth in electricity demand in the two scenarios follows similar trajectories.

Furthermore, it is disappointing to see that neither COP21 scenarios explore the impact of early action and the potential pathways to decarbonise the power sector by 2035. This was identified in the IEA's Net-Zero Report as a key milestone to reach net-zero by 2050, a commitment legally enshrined in the EU's climate commitments.

Finally, it is concerning to see that both scenarios considered to be aligned with the Paris Agreement massively overshoot the EU's carbon budget by 2050. Remediating this by placing the onus on untested carbon negative technologies after the time horizon covered by the TYNDP scenarios only serves to delay action and should not be considered compatible with the EU's energy and climate goals.

## Paris Targets and Decarbonisation

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

If 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?

No

If no, please comment why::

Kindly refer to our response to question 12.

Challenges to achieving carbon-neutrality are hidden due to the lack of contrast between scenarios and the lack of a scenario which focuses on early action and remaining within the carbon budget of the EU27.

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?

Neutral

If no, please make suggestions on improvements that could be addressed in the next process::

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?

No

If no, please explain why::

Given that net-negative emission technologies are at very early stages of development and are untested, a heavy reliance on these technologies for remaining within the carbon budget by 2100 is not appropriate. This is compounded by the fact that the report makes reference to them coming online some time after 2050; there is no foresight on the scale of the carbon budget overshoot by the time such technologies are at commercial stage and therefore the costs involve to install the potentially massive capacities required.

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?

No

If no, please explain why::

Kindly refer to our response to question 8.

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?

Neutral

If no, please explain why::

## Demand & Supply Ranges

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?

Neutral

If no, please explain 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?

Neutral

If no, please explain why::

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?

Neutral

If no, please explain why::

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?

Neutral

If no, please explain 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?

Neutral

If no, please explain why::

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?

Neutral

If no, please explain why::

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?

Neutral

If no, please explain why::

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?

Neutral

If no, please explain why::

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?

No

If no, please explain why::

Kindly refer to our response to question 8.

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?

Neutral

If no, please explain why::

## TYNDP 2022 Scenarios Improvements

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

Neutral

Please comment::

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?

Neutral

Please comment::

## 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

If yes, how would you consider them?:

Ember acknowledges the significant data collation from a vast array of sources and stakeholders, and the robust modelling framework developed by the ENTSOs. In this regard, the scenarios provide insight on the outlook TSOs and the industry have on the potential evolution of the power generation sector and demand from end-use sectors. The scenario data made available is also often used for benchmarking purposes.

Furthermore, the scenarios - specifically the National Trends scenario - are considered key to understanding and framing the Projects of Common Interest (PCI) selection process and subsequent list.

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

Please comment::

## Confidentiality

33 I want my answer to remain anonymous. If you tick this box, we will publish your comments, but we will not publish your name and organisation.

I want my answer to remain anonymous.:

No

34 I want my answer to remain confidential. If you tick this box, we will not publish your answer to this consultation.

I want my answer to remain confidential:

No

35 I agree to ENTSO-E's Consultation Hub privacy policy.

I agree to ENTSO-E's Consultation Hub privacy policy:

Yes