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Submitted to TYNDP 2024 Scenarios Input Parameters
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Introduction

1 What is your full name?

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3 What is your organisation?

Organisation:
European Environmental Bureau (EEB)

Scenario Strategy & Storylines

4 Please provide your comments about the TYNDP 2024 scenarios strategy.

Specify :

The European Environmental Bureau (EEB) welcomes the opportunity to comment on the latest update of the TYNDP scenarios. In the following responses we provide our comments, observations and some recommendations on the different components and the process. Several of our responses are based on the results of the Paris Agreement Compatible (PAC) scenario, a modelling exercise carried out in partnership with the Renewables Grid Initiatives (RGI), Climate Action Network (CAN) Europe and REN21. In addition, some of our responses to this consultation are based on external analysis and input from several like-minded civil society organisations advocating for an ambitious EU energy policy.

As a sign of increased transparency and openness, we welcome the efforts to involve a wide range of stakeholders in the process. The inclusion of a wide range of expertise and perspectives is crucial to the production of more comprehensive and well-rounded scenarios, which will lead to more informed decision making. A further opening up of the process in this direction would therefore be welcomed and would support the continuous improvement of the TYNDP process.

Our concern is the lack of ambition in the integration and expansion of renewables. The scenarios do not seem to put enough emphasis on pushing for greater deployment of renewable energy generation, even though they do not take into account a reduction in electricity demand. This raises doubts as to whether a true energy transition is feasible.

The TYNDP scenario strategy claims to follow the “energy efficiency first” principle, but this is not fully reflected in the scenarios. This aspect should be more prominent in the scenario results, and the positive effects of a focus on energy efficiency in different sectors should be clearer. For example, the Distributed Energy (DE) scenario does not include flexibility or any kind of lifestyle changes that could reduce energy demand in various sectors (transport, industry, buildings, etc.), including those identified as 'hard-to-abate'. Any potential for circularity also does not emerge from the scenarios.

The strategy's methodology is based on EU countries' national energy and climate plans (NECPs). In theory, this could be a valuable bottom-up approach. However, as not all Member States have yet submitted their updated draft NECPs, this could lead to uncertainties and potentially distort the final scenario results.

5 Do you agree on one central scenario in 2030 aligned with ACER's Framework Guideline?

Not Answered

If you selected No, please specify:

6 What are your views about the updates for the 2024 Scenarios Storylines Report?

Specify :

We welcome the increase in transparency and stakeholder engagement efforts. However, further steps should be taken, especially regarding transparency of methane and hydrogen data.

We believe that scenarios should not only reflect the latest political and geopolitical developments and ambitions. Rather, after robust calculations of the remaining greenhouse gas budget, they should also aim to enable system optimisation through the application of energy efficiency and sufficiency at the system level to avoid waste of energy and other resources. In doing so, social, economic and environmental trade-offs and the impact of increased circularity should be further assessed and integrated into the scenarios.

7 What would be the other important drivers (please see the 2024 Scenarios Storylines Report, Figure 3) that you would like to see in the next cycle? (Please provide an explanation on how it could be included and differentiated among scenarios)

Specify :

We are concerned about the low level of climate ambition and energy efficiency in the current scenarios, as mentioned in our response to question 4. Improving the relevance and effectiveness of the scenarios would require further strengthening the impact of the drivers in achieving the desired results. Further consideration should be given to the constraints and enablers that allow the energy system to be optimised and maintained. In this respect, the role of sustainable supply chains and increased rates of circularity should be included as drivers in future cycles. In particular, to ensure that the scenarios represent potential future pathways in line with European climate ambitions, it is essential to address the issue of inefficient use of scarce renewable resources (such as the use of hydrogen or biomass in sectors that could be directly electrified).

8 What are your views about the gap closing methodology for NT+ scenario? (Please see the TYNDP 2024 Scenarios Storyline Report, Annex 2)

Specify :

Demand Figures for DE & GA Scenarios

9 What are your views about the added value of this transition to the new tool (ETM) for the transparency of the scenarios building process?(1 - no added value ; 10 very high added value)

Not Answered

10 Do you think the demand figures within DE & GA scenarios are consistent with their storylines?

Not Answered

If you selected No, please explain:

11 Do you think the market shares of technologies within DE & GA scenarios are consistent with their storylines?

Not Answered

If you selected No, please explain:

12 Do you think the amount of biomass in the scenarios is sustainable?

Not Answered

If you selected No, please explain:

The amount of biomass in the scenarios appears to be very high by 2050 in both the DE and GA scenarios. We recommend including a clear definition of which specific types of biomass are considered in the scenarios. We also suggest that the modelling of biomass volumes be based on strict compliance with the cascading principle. Direct electrification is the preferred solution in most end-use cases, as it is highly efficient, emits no direct greenhouse gases and has minimal conversion losses.

Supply Figures for DE & GA Scenarios

13 In your view, are the RES trajectories (wind, solar, battery) & nuclear capacities reasonable?

RES trajectories:

No.

According to the results of the PAC scenario, energy demand in the EU countries is reduced by more than 50% between 2020 and 2040. At the same time, renewable generation capacity would essentially have to triple between 2020 and 2022, e.g. from 35 GW per year to 105 GW per year. In our view, both the DE and GA scenarios lack ambition in terms of renewable energy deployment.

The projected capacities for solar, onshore and offshore wind in the DE scenario are very low in absolute terms. In the GA scenario, installed capacities are in line with the PAC scenario, but are intended to meet a much higher final energy demand.

In terms of solar deployment trajectories, Solar Power Europe's market outlook (https://www.solarpowereurope.org/insights/market-outlooks/eu-market-outlook-for-solar-power-2022-2026-2) foresees 1,150 GW installed by 2030. The 785 GW in the GA scenario falls well short of this figure. Furthermore, the best estimate for 2040 is 989 GW, while the PAC scenario (https://www.pac-scenarios.eu/pac-scenario/how-a-europe-on-track-of-meeting-the-15c-would-look-like.html) sees installed capacity of around 1300-1400 GW in 2040, coupled with robust demand reduction efforts.

This reflects a low level of electrification, coupled with a heavy reliance on natural gas and bio-methane, and on hydrogen beyond its most efficient use.

The significant demand for hydrogen in both scenarios is a further cause for concern. In fact, meeting this demand would require an even higher level of

deployment of renewable energy sources than is currently indicated. Without a corresponding increase in renewable energy generation capacity, meeting hydrogen demand without recourse to less sustainable energy sources will be a challenge.

14 In your view, are the technology costs appropriate?

technology costs:

Regarding the cost assumptions on hybrid air heat pumps combined with gas and/or hydrogen boilers in the Energy Transition Model, the reduction of investment costs to €3819 per unit seems very optimistic compared to the €9177 including installation that the European Commission's study supporting the Ecodesign revision of the standards for boilers indicates for 2014 to 2017 (see European Commission: Space and combination heaters. Ecodesign and Energy Labelling Review Study. Task 2 Market Analysis, July 2019, https://www.ecoboiler-review.eu/Boilers2017-2019/downloads/Boilers%20Task%202%20final%20report%20July%202019.pdf).

For the hypothetical use of hydrogen boilers, the investment cost must reflect the additional cost of removing the fossil gas pipework in the building and replacing it with pipework and grid connection suitable for the distribution of hydrogen. Based on a study by Element Energy commissioned by BEUC (https://www.beuc.eu/sites/default/files/publications/beuc-x-2021-111_consumer_cost_of_heat_decarbonisation_-_report.pdf), the total cost is estimated to be much higher, around €5000, if the costs of removing and installing heating equipment such as pipes are taken into account.

15 In your view, are the prices (presented in the 20230704 – Draft Supply Inputs for TYNDP 2024 Scenarios.xlsx, sheet 3) appropriate?

prices:

16 In your view, are the extra-EU methane import potentials reasonable?

No

If not, please provide us an alternative source (should be reliable and cover 2050 time-horizon):

Methane imports should follow an ambitious phase-out trajectory to maximise independence. ACER Opinion No. 06/2023 on ENTSOG Draft TYNDP 2022 should be taken into account for significant improvements also in the 2024 cycle (https://acer.europa.eu/Official_documents/Acts_of_the_Agency/Opinions/Opinions/ACER_Opinion_06-2023_ENTSOG_draft_TYNDP_2022.pdf)

17 In your view, are the extra-EU H2 import potentials & prices reasonable?

No

If not, please provide us an alternative source (should be reliable and cover 2050 time-horizon):

Hydrogen import prices come from a study by the European Hydrogen Backbone (EHB), which has very low import prices and even includes some unrealistic imports from Ukraine. In addition, the study lacks overall transparency in its own scenario data.

We believe that hydrogen import prices are underestimated and that there is a lot of uncertainty regarding import volumes.

Regarding prices:
This EHB study contains network assumptions that are very rigid. They assume the realisation of a trans-EU hydrogen transport network. If this network is not built, and until it is built, hydrogen import prices would be much higher. Assumptions of changing hydrogen prices seem reasonable. More dynamic results on the hydrogen network can be found in Neumann, F., Zeyen, E., Victoria, M., & Brown, T. (2023). The potential role of a hydrogen network in Europe. Joule. https://www.cell.com/joule/pdfExtended/S2542-4351(23)00266-0

For hydrogen import prices, we suggest considering the evidence from Glachant, J. M., & dos Reis, P. C. (2021). A snapshot of clean hydrogen costs in 2030 and 2050. European University Institute. https://fsr.eui.eu/publications/?handle=1814/70971

Regarding import volumes:
The EHB study mentioned above underestimates the aggregated potential of MENA countries in case of massive deployment of Concentrated Solar Power (CSP) coupled with electrolysis capacity for hydrogen production and consequent reorientation of hydrogen import terminals to Southern Europe (IT, ES).

Regarding the overall potential of hydrogen imports into the EU in 2040 and 2050, including e-fuels, we suggest to contrast the available scenarios with a scenario in which climate policy is in line with international commitments, as provided by the Paris Agreement-Compatible (PAC) scenario. See: https://pathwaysexplorer.climact.com/pathways?visualisation=0&region=EU27&source=model&scenario=EU27%3A+Preliminary+%28CE%29+Net+Zero+2040+100

18 Do you agree with the methodology on how the demand is supplied per energy carrier and how the conversion factors are used? (See 20230704 - Draft Supply Tool (EU-level).xlsx)

Not Answered

If you selected No, please specify:

19 Do you think the preliminary supply figures are differentiated according to the storylines?

Not Answered

If you selected No, please specify:

20 What are your views on the cost methodology of H2 investment projects? I.e., 75% repurposing and 25% new build, European Hydrogen Backbone report as cost basis, 15% distance between capitals?

Specify :

The EEB is concerned that the input data for the Hydrogen Reference Grid are collected and presented exclusively from national gas TSO data. This approach lacks verification, legitimacy and certainty. It also risks including projects with a low level of maturity, similar to ACER's finding in Opinion 06/2023, which would lead to increasing system costs and waste of valuable resources.

Regrettably, the European Hydrogen Backbone study is the only source used in the methodology due to a lack of real world data, which in turn leads to significantly underestimated costs for H2 candidate projects.

In particular, the CAPEX cost split between repurposed and new hydrogen pipelines of 75% and 25% respectively is unrealistic and could further lead to lock-ins. Furthermore, the use of a 15% distance between capitals is a major simplification that ignores the reality of infrastructure deployment. In reality, the constraints on infrastructure deployment, such as land use and availability, nature protection restrictions, societal impacts, etc., increase complexity and cost.

21 What are your views on the cost methodology to for electricity investment candidates? I.e., to use submitted candidate projects as electricity investment candidates?

Specify :

Modelling Methodology and Assumptions

22 In your view, is the carbon budget methodology appropriate?

No

If you selected No, please provide an alternative source:

We welcome the alignment of the carbon budget methodology with the report of the European Scientific Advisory Board on Climate Change, ESABCC (https://climate-advisory-board.europa.eu/reports-and-publications/scientific-advice-for-the-determination-of-an-eu-wide-2040/scientific-advice-for-the-determinat

However, we urge the ENTSOs to include stricter carbon budget enforcement in the storylines and scenario development. The full implications of exceeding the carbon budget should be explored and presented in a transparent manner, including the impact on the planning of infrastructure before and after 2050. The risks of carbon budget overshoot include a further exacerbation of extreme climate patterns and weather events, so stronger constraints on gross emissions between 2030 and 2050 should be introduced, at least in the DE deviation scenario.

23 What do you think about the EV innovation & its relevance to the scenario model? (rank 1 to 10 - 10 most satisfactory)

Not Answered

24 In your view, are the assumptions on the EV methodology reasonable?

Not Answered

If not, please provide us an alternative source (should be reliable and cover 2050 time-horizon):

25 How could the methodology be improved for the next cycle?

Please explain:

26 What do you think about the P2G innovation & its relevance to the scenario model? (rank 1 to 10 - 10 most satisfactory)

Not Answered

27 In your view, are the assumptions on the P2G methodology reasonable?

Not Answered

if not please provide us an alternative source (should be reliable and cover 2050 time-horizon):

28 How could the P2G methodology be improved for the next cycle?

Please explain:

29 What do you think about the offshore innovation & their relevance to the scenarios model? (rank 1 to 10 - 10 most satisfactory)

Not Answered

30 In your view, are the assumptions on the offshore methodology reasonable?

Not Answered

if not please provide us an alternative source (should be reliable and cover 2050 time-horizon):

31 How could the methodology for offshore be improved for the next cycle?

Please explain:

32 What do you think about the Hybrid Heat Pump innovation & its relevance to the scenario model? (rank 1 to 10 - 10 most satisfactory)

Not Answered

33 In your view, are the assumptions on the Hybrid Heat Pump methodology reasonable?

Not Answered

If not, please provide us an alternative source (should be reliable and cover 2050 time-horizon):

34 How could the methodology for hybrid heat pumps be improved for the next cycle?

Please explain:

35 Do you find the assumptions on the H2 steel tanks methodology appropriate?

Not Answered

If not, please provide us an alternative source (should be reliable and cover 2050 time-horizon):

36 What are the most important modeling innovations that you would like to see in the next cycle?

Please explain:

Conclusion

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