Climate Action Network (CAN) Europe is Europe's leading NGO coalition fighting dangerous climate change. With 200 member organisations active in 40 European countries, representing over 1,700 NGOs and more than 40 million citizens, CAN Europe promotes sustainable climate, energy and development policies throughout Europe.

24 January 2025

SUBMISSION TO ENTSO-E'S PUBLIC CONSULTATION ON TYNDP 2026 SCOPE OF STUDIES AND STAKEHOLDER ENGAGEMENT PLAN

This is a submission from CAN Europe to the Public consultation on "TYNDP 2026 scope of studies and stakeholder engagement plan by the European Network of Transmission System Operators for Electricity (ENTSO-E). This public consultation covers the following studies that are part of the TYNDP 2026: the system needs study, including Offshore Network Development Plans (ONDPs) per sea basin, and the Cost-Benefit Analysis of projects. It also covers the stakeholder engagement plan for each study. Not in the scope of this consultation are scenarios, which follow a separate consultation process and for which the stakeholder engagement plan was published in July 2024.

Which part(s) of the TYNDP do you most often refer to?

[X] Scenarios

[X] Information on system needs (infrastructure gaps report)

[X] Information on offshore system needs (ONDPs per sea basin)

[X] Information on infrastructure projects (transmission and/or storage)

[X] CBA results

How do you make use of the selected products?

Scenarios: are used in different ways, through their numerical inputs and through the policy alignment that the TYNDP scenarios should provide.

1) Although CAN Europe understands TYNDP 2026 scenarios will assume a different framework and methodology to TYNDP 2024 and previous TYNDP editions, in the past cycles, the scenarios have conveyed a general perspective on predominant European understanding and of the strategic thinking linked to the transition.

Given a new, policy-driven, single-scenario framework for the TYNDP 2026, it is unclear whether the newly set scenarios will serve the same purpose, the resulting implications, and any potential gaps.

2) The scenarios inform efforts to keep in track with the EU's energy and climate policy goals, the remaining carbon budget as well as the EU's contribution to remain within the Paris Agreement +1.5 C target.

3) The share of fossil fuels, and fossil fuel related technology options, can be observed through the TYNDP central scenario, its variants, and associated modelling.

4) Equally importantly, the scenario framework can be interpreted to express the current imagination and vision of European leading energy actors. To a degree, the scenarios have made it possible to assess to what degree the pan-European framework is capable of conveying a changing world of surprises and crises, and inform actual choices, with a view of the ambition levels of a continent-wide energy infrastructure that is being designed, to stay within the +1.5 C target.

Information on system needs (infrastructure gaps report): has been used for data concerning power grids and cross-border connectivity. The System Needs Study also has interesting future potential to explore different aspects of the energy transition.

Information on offshore system needs (ONDPs per sea basin): is expected to provide information on foreseen capacity needs, for understanding the offshore generation and infrastructure expansion needs as per timeline. Such assessments can provide a useful baseline for all civil society organisations and public organisations, with a view to anticipated spatial requirements and environmental considerations, cf. integrated efforts in marine spatial planning (MSPs).

Information on infrastructure projects (transmission and/or storage): is a useful list. As the role of both transmission and storage is assumed to become more important, information on these projects can be expected to advance information on their newest frontiers.

Cost-Benefit Analysis (CBA) results. As a general remark, CAN Europe pays attention to how the CBA methodology is compiled, and its limitations. Methodologically, a CBA analysis is a rather static exercise, and as a remark, the dynamic effects of each project to the energy transition could also be qualitatively described and explored.

Overall, the quality of the scenarios and associated studies, as an evidence-basis generated from the TYNDP process, is highly important for European civil society. Even more integrated, nature-based planning will be of increasing importance in the future.

How would you evaluate the proposed TYNDP 2026 stakeholders engagement plan? What are the most important elements?

The stakeholder engagement activities, using participatory methodologies and related transparency of ENTSO-E is much appreciated.

On the “Engagement plan on the assessment of future system needs” as well as “Engagement plan on the cost-benefit analysis of projects”, it appears that the precise engagement modalities will be later decided.

Webinars, as more one-directional channels, are useful for acquiring information on new topics and emerging issues, and to reach out to a wide range of interested actors.

As concerns follow-up, we appreciate the Consultation Summary Reports that are systematically provided by the ENTSO-E, and we find them very useful.

Provide any other suggestions or areas of improvement

On the key consultations of the TYNDP 2026 cycle, we recommend alerting stakeholders to public consultations already well before they actually start. Circulating information for

stakeholders well in advance (e.g. through newsletters) helps them, and their members/networks, to prepare for such key moments.

Public consultations allow stakeholders to raise issues and comment on the present plans.

At the proposed workshops, it may be possible to discuss specific thematics. However, as mentioned, it has not always been possible to trace how qualitative feedback and ideas from the various workshop participants are integrated into actual operational work of the scenario-building at ENTSOs (or if they are dismissed, and of the related reasons).

Also noting the Consultation Summary Reports, it would be of further use for stakeholders, if they would be able to trace, which parts of their suggestions are taken up and eventually integrated into the TYNDP framework of the ENTSOs. One possibility for this is, for instance, short summaries.

How do you evaluate the proposed scope of studies for TYNDP 2026?

First, the new TYNDP 2026 framework interprets the ACER Scenario Guidelines to build one policy-driven central scenario, and two deviation scenarios, informed by modelling and the underlying data collection by TSOs. Given that the deviation scenarios aim at addressing how economic uncertainties impact infrastructure, it is not fully clear yet to what degree the new framework, and its overall scope, will be able to address other uncertainties, infrastructure drivers or integrate emerging evidence, as concerns the newest frontiers of the energy transition.

Key issues on optimising European infrastructures (demand and supply):

From a demand-side perspective, it could be insightful, if some further demand-side views were considered and introduced as sub-element(s) to the System Needs Study. These could be thematic reviews to inform infrastructure option assessments shaping the Scope of Studies, embedded into the TYNDP cycle, its timeline and associated plans. Alongside supply-side measures, such studies would help alleviate concerns of oversizing infrastructures.

For such studies (e.g. as outlooks or sensitivity analyses) informing the pan-European infrastructure build-out, there could be several options, and some of such options are next raised. Some of these could also combined into one, joint assessment:

1) Integration of the Energy Efficiency 1st Principle into the TYNDP. ACER Opinion 05/2024, Article 14 cites Paragraph (23) of the TYNDP Scenarios Guidelines, in line with TEN-E Regulation Article 12(1) and requests clarity from the ENTSOs on the integration of the Energy Efficiency 1st Principle into the TYNDP. In our reading, this may concern both the scenarios as well as the related studies informing the TYNDP. Alongside the scenarios, could integrating such assessments, as a part of the System Needs Study, make for a meaningful input? Next, some further considerations are discussed.

2) Alternative renovation rates. The rate of renewal of the buildings sector - annually, as shallow or deep renovations - as a demand variant, could also inform the supply-side options. The potential benefits and issues stemming from a renovation wave, discussed by multiple actors, could also strengthen the important link between Energy and Housing. https://energy.ec.europa.eu/topics/energy-efficiency/energy-efficient-buildings/renovation-wave_en

Currently, the annual renovation rate of buildings at EU27 is at around 1%. According to the updated PAC 2.0 scenario (see reference later), it should be increased to around 3% by 2030.

3) Alternative transport demands. An additional variant to the power sector could concern the size of the future electric car fleet. Assuming the majority of transport will be electrified (car fleet, heavy-duty vehicles, etc.), also especially EVs acting as a service to the future electricity grid, variants on this could provide novel insights. Academic studies suggest that a smaller, electrified car fleet than in place today already catalyses the demand-side management (DSM) benefits from battery EVs. As per the following academic studies, if 25% of the total, electrified car fleet of the future participates, it could lead to 10% lower energy system costs. If 35% of the total EV fleet participates, the cost-savings rise up to 1%.

Sources:

- Brown, T., D. Schlachtberger, A. Kies, S. Schramm, M. Greiner (2018) Synergies of sector coupling and transmission reinforcement in a cost-optimised, highly renewable European energy system, *Energy* 160, 720-739. https://doi.org/10.1016/j.energy.2018.06.222
- Victoria, Marta, Kun Zhua, Tom Brown, Gorm B. Andresen, Martin Greiner (2019). The role of storage technologies throughout the decarbonisation of the sector-coupled European energy system. *Energy Conversion and Management* 201, 111977. https://doi.org/10.1016/j.enconman.2019.111977

Linking electrification to the transport sector that is difficult to decarbonise could provide new insights, also as a signal from the pan-European TYNDP process to the TSOs. Nationally, TSOs can be assumed to face a challenging task to optimise their national grid infrastructures, and full information on different demand- and supply-side alternatives could encourage all relevant actors to explore maximal system-wide efficiency.

Key issues on advancing system integration:

4) The role of hydrogen (H2) in the scenarios / variants. As concerns the consumption and role of hydrogen (H2), we would also hope the suggested studies across the TYNDPs of the ENTSOs (ENTSO-E, ENTSOG, forthcoming ENNOH) can advance understanding on key demand and supply points on the crucial role of hydrogen, as renewable hydrogen. Coordinating assessments of H2 demand independently, with e.g. variants on its role, would be imperative.

In practice, more detailed studies, e.g. modelling tools that allow the modelling of hydrogen infrastructures at a level of several nodes per country, would assist in ensuring efficient system planning. If the chosen level of a study is too coarse or general, suggested studies or models will likely be unable to provide detailed understanding that is required for optimal infrastructure planning of H2.

Such new insights could also assist in prioritising investment needs into energy infrastructure across vectors.

Key issues on remaining within +1.5 C:

5) An interesting variant, previously not included in the TYNDP Scope of Studies, also concerns a simulation and modelling of supply that adopts a 100% renewable energy system approach. As more and more academic research groups already provide such analyses, with existing studies for a number of European countries as well as internationally, it is high time to model and simulate this approach, and simulate it within the TYNDP. As a result, it could be possible to explore more deeply the kinds of results it produces on infrastructure and

European-wide system needs. As the energy transition advances, this would be a natural element to assess.

6) An interesting analysis could concern higher ambition (e.g. climate neutrality already in 2040 instead of 2050), to study its implications on the greenhouse gas budget as well as energy infrastructure needs.

As a concrete example, when the PAC 2.0 scenario approach was simulated with two different time horizons, we learned that the EU27 saves -16.5 Gt CO2eq, when climate neutrality is reached already in 2040 (instead of 2050).

To put this level of ambition into perspective, a 2020-2040 climate-neutral pathway meant 37.5% less GHG emissions than a 2020-2050 pathway, as a remarkable measure.

Source: Paris Agreement Compatible Scenarios 2.0: Executive Summary, page 11-12. https://caneurope.org/content/uploads/2024/09/PARIS-AGREEMENT-COMPATIBLE-SCENARIO-2024.pdf

Key issues on methodologies

7) Page 6 of the Consultation Document: "TYNDP 2026 will investigate system needs in 2040 and 2050." As a remark, we hope for clarity in how the 2035 snapshot will be developed. While cross-border transmission projects may take 10 years or more to develop, some projects such as storage, potentially can be realised faster and well before 2040. So that faster infrastructure deployment options are assessed on a par with cross-border transmission projects, methodological considerations may be warranted to alleviate any concerns of inadvertent bias.

8) The TYNDP 2026 cycle should be compatible with the EU climate and energy policy targets. At least one further change in the policy context meriting attention across all relevant studies is the EC proposing a -90% climate target for 2040. Accordingly, are we right to assume that in the design of the individual sub-studies, this updated policy context will be harmonised? Is a list of included policy targets also communicated? Documenting this clearly, across any methodologies and methods deployed, is warmly recommended across studies.

9) We also recommend advancement of open source modelling practice in pan-European infrastructure planning. As understanding of the energy transition is continuously advancing, such exercises can expand knowledge on future infrastructure needs. In addition, there is further potential for collaboration on this front, also when it comes to alignment with the EC Reference Scenario. In this regard, we also recommend future alignment of system planning across voltage levels and, thus, advancing more precise integration of demand data. When a wide range of key actors and stakeholders understand the underlying data fully, this can assist in elevating discussions on infrastructure optimisation across sectors, vectors, countries and levels.

10) CAN Europe has mentioned in the past how the use of the NECPs to build the central scenario poses methodological and data challenges, due to their varied nature. Further clarity is recommended on the advancement of this issue.

11) Finally, CAN Europe recommended the use of state-of-the-art foresight practice and methods in its consultation response to the TYNDP 2024 Scope of Studies and Stakeholder Engagement Plan. The deployment of foresight can be useful to assist in

scanning for the newest developments and their innovative aspects, as related to the energy transition.

1. **General comments - Please use this field to share any additional idea or comment**

It is useful to reflect on the analytical understanding that the proposed studies, and their scope in totality will generate. To establish a broad and wide picture of future infrastructure needs, it is useful to shortly discuss where gaps might remain.

As a topical example, at the moment, as concerns Infrastructure Gaps, the goal posts seem to be moving. Over the years, the importance of demand-side analyses, including on demand-side flexibility, has become increasingly well-established, and analyses on demand-side alternatives could be increasingly important. Digitalisation is a key enabler for the future energy system, and at the same time, an uncertainty on future electricity demand stems from data centres to power e.g. artificial intelligence. Although TYNDP emphasises cross-border infrastructures and the supply-side, amidst socio-technical change across sectors, system-wide efficiencies are easily overlooked without new analyses or variants.

As a recommendation, different types of demand-side analyses by ENTSOs and/or the TSOs can lower cost, material, labour and resource needs of the energy transition. Therefore, they provide useful opportunities, as associated learning processes that can inform the key energy stakeholders in national levels and across Europe.

The ACER Scenario Guidelines establish the Stakeholder Reference Group (SRG) to the Ten-Year Network Development (TYNDP) process. While the SRG engages important stakeholders into the TYNDP process, an advancement of a deliberative approach with dialogues is encouraged as an integral, co-creative element.

ENTSO-E could also invite guest experts from leading modelling groups on the energy transition to comment upon the TYNDP process, or provide comparative, state-of-the-art approaches.

As WMO reports, as per latest data, keeping within the 1.5°C Paris Agreement target is in increasing jeopardy. According to the WMO's Global Annual to Decadal Climate Update, there is an 80 percent likelihood that the annual average global temperature will temporarily exceed 1.5°C above pre-industrial levels for at least one of the next five years (2024-2028). https://wmo.int/publication-series/wmo-global-annual-decadal-climate-update-2024-2028

Therefore, to conclude, we would like to inform the ENTSO-E of two new publications from the "Paris Agreement Compatible Scenarios for Energy Infrastructure" (PAC 2.0) project. The updated Paris Agreement Compatible (PAC) energy transition scenarios are now documented in a Technical Report as well as its Executive Summary, with associated modelling, as one new pathway to climate neutrality, achieved already by 2040.

Access to the Paris Agreement Compatible (PAC) 2.0 energy transition scenarios:

- the Executive Summary of PAC 2.0 (39 pages). Available at: https://caneurope.org/content/uploads/2024/09/PARIS-AGREEMENT-COMPATIBLE-SCENARIO-2024.pdf
- the Technical Report of PAC 2.0 scenarios (219 pages). Available at: https://www.pac-scenarios.eu/fileadmin/user_upload/PAC/PAC_documents/202408_PAC20_Technical_Summary.pdf

We warmly thank the ENTSO-E for providing an opportunity to comment on the proposed scope of studies and stakeholder engagement plan, and are open to further discuss our views and suggestions.

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