ENTSO-E

ERAA 2022 Call-for-Evidence on Preliminary Input Data

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As a preamble, UFE emphasizes that, to meet the very purpose of ERAA and the current exceptional gas and electricity supply situation, it is of utmost importance that ERAA diagnoses first and foremost the expected scarcity events until 2025 and the necessary solutions.

Before answering any of the questions asked, it is important to take a step back and put the ERAA in perspective with its very purpose, even more in the current context. As recalled by ACER, "the European resource adequacy assessment describes the expected level of security of supply for a ten-year horizon." "By comparing [the estimated level of security of supply to the reliability standards], resource adequacy concerns can be identified, and the need for additional measures (e.g. temporary capacity mechanisms) assessed."

The current challenge for the European power system and more generally the European energy systems is to move away from imported Russian fuels, in particular Russian gas, in response to the war in Ukraine, and in a context where even before this threat materialized the share of electricity in the energy mix was due to increase considerably. This raises a sharp challenge for the whole security of supply of the European power system in the coming years, especially in 2024 and 2025. UFE therefore welcomes the addition for ERAA 2022 of the years 2024 (and 2027) to the 2025 and 2030 of ERAA 2021 and calls for prioritizing the assessment of the years 2024-2025 to diagnose the potential scarcity events and identify the associated solutions.

While the 2030 horizon is also crucial for accelerating the energy transition, it is nevertheless of lesser importance today compared to the challenge facing the European electricity system to maintain in the short term its security of supply.

8. Please provide your feedback on the Climate Data, i.e. the Pan-European Climate Data Base.

The current Pan-European climate database used by ENTSO-E is temporary and has undergone a basic transformation in order to take climate change into account, at least for temperature. This transformation involves the identification and extrapolation of linear trends in mean and variance. The limits of the former and current databases are well acknowledged, and improvements are expected following a more detailed study foreseen in 2022. Since the production of a climate database essential to anticipate the climate in the next decade and consistent among different variables is still a scientific issue, this can be viewed as

a step forward in the right direction. It is then advised to keep the limitations in mind when analyzing the results.

Besides, the current database used by ENTSO-E is based on 35 historical climatic years (with a temperature detrending). UFE recalls that in the French security of supply assessment, 200 potential forecasting climatic years (consistent with the effect of climate change for the next decade) are modelled with a full correlation between load, solar and wind conditions.

9. Please provide your feedback on the Demand Data.

We appreciate that demand raw data (incl. the 35 climate years) from TSOs has been published for the EU 27+10 countries considered in the assessment. Nevertheless, it is quite complex to do quick analyses and to compare the levels among the countries in the different pivotal years, and unfortunately the slides presented in the webinar #1 aggregate data for all the countries.

Other comments:

- Overall, we notice a big increase (~+450 TWh) in ERAA 2022 from 2024 to 2030. TSOs seem to have considered very ambitious demand scenarios (i.e. where there's more electrification, higher energy efficiency, higher DSR flexibility). We wonder whether there exist disparities among the choice of scenario/dataset uploaded by country. This remark also applies for questions 12 and 13.
- Given the changes in the demand curves due to new consumption patterns (electrical vehicles, heat pumps, ...), ERAA should not only address the increase in average demand between 2024 and 2030 (+12%) but pay more attention to the demand curves profiles, while more flexibility will also be required to accommodate a production profile with a higher share of renewable source.
- Aggregated data doesn't really allow to detect the countries or zones that push the demand higher along the years. Unfortunately, the bullet points are not enough to understand the dynamics behind the demand increase.
- The ideal would have been to make tables/indicators (i.e. CAGR) for the 4 pivotal years; compiling data, for example, on the average annual demand and average peak load, for the 37 countries (plus aggregations EU 27, EU 27+10).
- It would have been useful to have the breakdown of demand by sector (not necessarily raw data, but compiled by country, hence allowing to better understand the drivers that play a big role in electrification and energy efficiency).

Also, it seems odd that the average annual demand is projected higher in ERAA 2022 compared to Fit for 55 Mix data. We would have appreciated more background on the differences. Since the Fit for 55 Mix data was not published, it was impossible to analyze which countries make the most difference.

10. Please provide your feedback on the Critical Network Elements and Contingencies (CNECs).

The CNECs considered are only cross-borders elements. UFE underlines that, neglecting internal elements will overestimate the size of the flow-based domains and the possible exchanges and could thus underestimate adequacy issues.

11. Please provide your feedback on the Transfer Capacities.

The documents delivered by ENSTO-E do not show the relationship between the underlying assumptions and the parameters used for the modeling of cross-border capacities, either with Flow-Based or NTC modeling. In particular, the scenario retained by ENTSO-E for the development plan of new power transmission lines is not known and would be worth comparing to the TYNPD.

Above all, UFE considers that assuming the 70% threshold without consideration to the potential necessary redispatch to ensure the network capacity would necessarily lead to overestimate the transfer capacity in adequacy studies. This is also true for CNECs.

In addition, UFE would like to seize this opportunity for sharing additional questions or comments:

- Flow-based data is not really detailed, except for critical network elements and cross-border contingencies (CNEC). A follow-up on developments since the 2021 ERAA Flow-based POC would be appreciated: What grid model was used? What remedial actions (preventive and curative) have been implemented, and how were they defined? Which contingencies are considered? On this last point, the modeling of outages in NTC is not clear either (number of poles and outage rate).What is the justification of max import and export capacity, added to Flow-Based and NTC values ?
- The "Transfer capacities" file provides NTC data for borders aiming to be modelled in Flow-based : How are they calculated ? What is the rationale for the maximum import and export capacity, added to the Flow-Based and NTC values? Under what conditions could these values be used concretely?
- The level of interconnection between FR and UK is set to 1000 MW (instead of 3000 MW) and remains unchanged until 2030.

12. Please provide your feedback on renewable generation capacities (i.e., solar power, wind power etc.).

As for the demand data, we appreciate that the data by country/market zone for the four years to analyze was published. We recognize some numbers from the NECPs and/or latest scenarios published by TSOs. We acknowledge the boost on PV capacity increase between 2024 and 2030 (+199.5 GW), followed by onshore wind (+104 GW) and offshore wind (+75 GW). It would have been interesting, though, to publish some charts or figures to display the biggest contributors behind these numbers. Also:

- To bear in mind that in some countries to deliver the numbers, renewables capacity increase will be challenged by obstacles that could hinder the development in the medium term (i.e. regulatory framework, environmental permits, social acceptance, rising rents, industry's ability to deliver

new renewable capacities). One might wonder which countries/TSOs have a critical view on this when uploading the data.

- Comparisons with the path to Fit for 55 mix scenario is quite abstract at this stage. Since the data for this scenario was not published and the explanations of the differences compared to ERAA 2022 numbers were scarce, it is difficult to judge at what extent ERAA 2022 renewable capacities are Fit for 55 compliant or not. Same applies for question 13.
- We assume that latest publications and/or announcements made by certain governments have not been addressed yet. For example, in France, there's been recently a shift from onshore wind to offshore wind to accelerate on the later; in Spain, an offshore wind roadmap was published in December 2021 and now considers between 1 to 3 GW by 2030 (200 MW in the data).

13. Please provide your feedback on thermal generation capacities (i.e., gas, coal, nuclear etc.).

In general, it is reassuring to see that numbers match to TSOs and/or from NECP publications. Lignite & Coal show the biggest decrease in capacities from 2024 to 2030 (-21 GW), followed by Nuclear (-5.3 GW) and Gas (-3.5 GW). There is incertitude around factual coal phase-out and nuclear decommissioning, especially in the short term (2024 and 2025 pivotal years could be impacted), under a context of high electricity prices, independence from Russian gas, a taxonomy that seems to encompass nuclear, etc. Fit for 55 Mix scenario seems to capture this at some extent, but the detailed information by country has not been published.

In the current context, UFE calls European Member States to reconsider the consequences of decommissioning national power plants on the resilience of the European power system as a whole and calls for greater coordination of assessment of adequacy across Europe. Several European countries are considering extending the lifetime of powerplants which were planned for early phase out (mainly coal and nuclear).

UFE calls for ERAA 2022 to take into account these new adjustments and latest governmental announcements.

14. With respect to fuel and CO2 prices, ENTSO-E considers that prices would reach 110€/ton for CO2 , 6.71 €/net GJ for gas and 2.34 €/net GJ for coal in 2030. What is your view on the trajectory of CO2 and fuel prices in ERAA 2022? Please include source/reference for your proposal.

Fuel and CO_2 price assumptions are very little explained and the elements published (1 slide only with two graphs) do not value the importance and impact these figures will have in the study.

- On Fuel prices: Even if, the current situation shows the difficulty to predict prices in 2030, fuel price scenarios could be interesting to better understand the impact of fuel price shifts. The assumptions taken for 2030 for gas and coal (6.71 €/net GJ for gas and 2.34 €/net GJ for coal), based in ERAA 2022 on IEA World Energy outlook "stated policies" scenario seem to be consistent with those retained by the French government (6.2 €/net GJ for gas and 3 €/net GJ for coal) in its Multiannual Energy Programme (PPE 2023-2028) preparatory work.

- On CO2 prices: reaching 110 €/t by 2030 seems to be in line with the average of different consultants/sources (Morgan Stanley, S&P Global, Berenberg, Energy Aspects, etc.). In comparison, the short term is more difficult to assess since there's wide dispersion among the sources without a general consensus.

15. Please share with us any other comments related to this preliminary input data package for ERAA 2022.

With respect to the availability of dispatchable assets: it is necessary to reconsider the modeling of planned outages, in particular to take into account the risks associated with the simultaneous extension of the duration of dispatchable assets (see question 13).

ERAA 2022 also needs to reconsider data in the context of recent adjustment to accounts of stress corrosion cracking on nuclear power plants in France in order to adjust security of supply analyses accordingly.As an example, the French generation adequacy study combines a deterministic approach for all planned outages (information shared via official transparency channels - REMIT) for which each duration is extended probabilistically in line with what has been observed in previous years. ERAA should also revise its approach for representing the duration of outages in a deterministic manner combined with a probabilistic manner.

For general data: the data are required to be "fit for 55" consistent, but most countries have not yet a NECP drafted for this purpose. For France, regarding the next NECP (expected by 2023), the generation data is consistent with the current NECP and the demand data is in line with the Fit for 55 scenario.

Furthermore, some points on methodology:

- The choice of a reduced number of climatic years for EVA can lead to underestimate the high variability of the climatic conditions (renewable production, thermal sensitivity) and their impact on electricity prices.
- The choice of a reduced number of climatic years forbids the use of standard statistical indicators of the revenue distribution commonly used in finance for risk/ investment decisions and obliges to use modified WACC values by technology which are difficult to determine with sufficient transparency and confidence.
- One of the proposed methods ("probabilistic" approach) to assess investment and retirement of units is not in line with the state of the art: optimizing deterministically on each scenario individually in order to meet the reliability standard and taking the average number of units per technology over all scenarios to build the "optimal" generation fleet is not a satisfying solution. A standard stochastic approach, where investment and retirement of units are optimized over all scenarios (simulated all together) to meet the reliability standard and build the optimal generation fleet should be preferred.
- UFE welcomes ENTSO-E's decision to take into account the day-ahead price cap in its central scenario. The decision for ERAA 2021 to set the price cap at 15 k€/MWh (a proxy for the value of lost load or VoLL) was not consistent with today's market cap reality. This value is of first order of

importance when assessing revenues of generation units during scarcity events. Setting a too high value for price cap may lead to highly unrealistic results in terms of commissioning of units. Price caps should be modelled following ACERS's 2017/04 regulation and reflect real conditions. Furthermore, potential investors might not consider revenues from extreme price situations in their analyses and one could also mention that today gas/power price caps are envisaged which could lower the current cap on day-ahead prices.