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European Resource Adequacy Assessment 2022 Consultation by ENTSO-E

A Eurelectric response paper

January 2023

Eurelectric represents the interests of the electricity industry in Europe. Our work covers all major issues affecting our sector. Our members represent the electricity industry in over 30 European countries.

We cover the entire industry from electricity generation and markets to distribution networks and customer issues. We also have affiliates active on several other continents and business associates from a wide variety of sectors with a direct interest in the electricity industry.

We stand for

The vision of the European power sector is to enable and sustain:
- A vibrant competitive European economy, reliably powered by clean, carbon-neutral energy
- A smart, energy efficient and truly sustainable society for all citizens of Europe

We are committed to lead a cost-effective energy transition by:

investing in clean power generation and transition-enabling solutions, to reduce emissions and actively pursue efforts to become carbon-neutral well before mid-century, taking into account different starting points and commercial availability of key transition technologies;

transforming the energy system to make it more responsive, resilient and efficient. This includes increased use of renewable energy, digitalisation, demand side response and reinforcement of grids so they can function as platforms and enablers for customers, cities and communities;

accelerating the energy transition in other economic sectors by offering competitive electricity as a transformation tool for transport, heating and industry;

embedding sustainability in all parts of our value chain and take measures to support the transformation of existing assets towards a zero carbon society;

innovating to discover the cutting-edge business models and develop the breakthrough technologies that are indispensable to allow our industry to lead this transition.

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WG Wholesale Market Design & Investment Frameworks

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6. The ERAA target methodology is set to support the achievement of the EU 2030 climate and energy objectives set out in Article 1(a) of Electricity Regulation. Do you agree that the ERAA 2022 is already an important analysis in view of EU ambitious climate and energy targets?
Strongly agree
Agree
Neutral
Disagree
Strongly disagree
Don't know

7. How is the ERAA 2022 useful to you or your business?
Adequacy situation in the mid-term drives our business decisions.
The results of ERAA are a support for our policy or regulatory decisions.
We are interested in understanding the methodology of ERAA for research purposes.
We are interested in understanding the methodology of ERAA for business/consulting purposes.
Other (please explain)
Additional comments/explanations:
Eurelectric acknowledges and welcomes the methodological improvements carried out by ENTSO-E in the development of the second European Resource Adequacy Assessment (ERAA 2022). Since last edition, we particularly appreciate the evolution of the Economic Viability Assessment (EVA). However, at this stage, the underlying methodology still needs further improvements in order to provide reliable results.

8. In your opinion, what are the most important methodological achievements of the 2022 ERAA edition? Rank your answers from 1 (most important) to 4 (least important).
1 - Economic Viability Assessment
3 - Flow-Based Market Coupling
2 - Adequacy simulation with curtailment sharing
4 – Other

Additional comments/explanations:
Eurelectric welcomes the extension of the ERAA and the EVA timeframes to 2030. Limiting the EVA analysis until 2025 as in the previous edition did not allow to accommodate the investment/divestment decisions and the system needs in terms of adequacy. To this regard, economic viability is a key methodological achievement to ensure that ERAA can play its role highlighting potential future adequacy issues. However, it is important to recall that ERAA should not be considered by decision-makers as the only basis for policy decisions on generation adequacy and capacity mechanisms but should be further complemented by more detailed assessments, taking into account local specificities, jurisdictional experiences and national targets for security of supply.

The EVA methodology and underlying assumptions shall:

- Take into account the transmission capacities that best reflect the actual capacities of the network and account the artificial increases resulting from the methodological aspects of capacity calculation. In particular, the inclusion of the 70% rule would require the consideration of cross-border corrective actions such as redispatching, for which availability is not guaranteed in tense situations. These unanticipated actions could lead to a significant underestimation of adequacy problems.

- Adequately reflect latest available data without over relying on National Energy and Climate Plans submitted by Member States
- Consider enough climate years to better represent the climate events to avoid underestimating the high variability of climatic conditions on the electricial system and better assess the needs for firm and flexible assets.
- Integrate in the model annual granularity for a decade as it is foreseen in the approved by ACER methodology. Currently, the EVA is modelled over a limited horizon –3-7 years. Economic viability assessments are only realistic enough if they consider the remaining lifetime of the concerned assets and therefore a set of consecutive years.

9. What are in your opinion the most important features to be developed in future ERAA editions with regards to the adequacy assessment? Rank your answers from 1 (most important) to 7 (least important).

5- Improve demand forecasting
3 - Improve explicit demand response modelling
2 - Improve implicit demand response modelling
4 - Improve modelling of climate change
6 - Improve electrolyser modelling
1 - Improve the maintenance optimization methodology (describe in comment below)
7 - Other:

Additional comments:
Eurelectric believes that current elements like the stochastic multi-year EVA and Flow-Based Market Coupling (FBMC) should be further improved before contemplating the addition of new features or items in future ERAA editions. Nevertheless, in addition to the above-mentioned features, future editions of the ERAA shall adequately contribute to the following pillars:
i) the adequacy assessments and to which extent (first order / second order?),
ii) the economic viability assessments (first order / second order?).

This should help find the trade-off between "must have" features and "nice to have" features, keeping in mind the nature of the ERAA exercise - prospective modelling, which will always have limitations on its own.

More generally about future needed methodological improvements, ERAA should strive to align with the requirements of the electricity regulation and ACER methodology to ensure better reliability of assessment results. While the full methodology is expected to be deployed in 2024, there is still room for improvements even if the implementation challenges of the methodology should not be underestimated. To accurately highlight potential adequacy issues, the EVA results must be robust to different scenarios, and they must critically assess the reliability of input data from TSOs.

As important attention points, Eurelectric calls on ENTSO-E to:
- Ensure that an economic viability assessment is properly devised in the methodology, implemented in the ERAA modelling framework and used consistently in the scenarios and sensitivities.
- Define sufficient alignment and comparability of national TSO input data and assumptions and ensure that they are realistic, robust and forward-looking.
- Define a correct delineation of the different scenarios and sensitivities: for example, the treatment of capacity mechanisms (i.e. strategic reserves and capacity markets) and the impact of decarbonisation targets (e.g. emission performance standards or

different RES deployment trajectories).Last but not least, Eurelectric would like to caution the role demand-side response (DSR) as it could lead to underestimation of the need for capacity. To this regard, key improvements to implement are:Making available all the variables related to DSR for all bidding zones (for instance: CAPEX, FOM costs and activation price

- Guaranteeing that different studies/sources -especially in the case of studies conducted at national level - yield consistent DSR estimates.
- Considering forced outages that are not known at the time of the Unit Commitment Economic Dispatch to introduce a disruptive component in the optimization algorithm. In fact, the ERAA should consider a situation of simultaneous shortage of generation capacity in Europe to correctly assess adequacy issues in importing bidding zones (e.g. bidding zone Italy North).
- Providing information on annual operating net revenues of explicit DSR separately by bidding zone broken down by activation price - this could be useful to check the consistency of assumptions and results and could be used for different technologies.
- Modelling DSR mainly as “load-shifting” instead of “load reducing”, and considering the effect of fixed-price contracts and the interaction between implicit and explicit DSR, to avoid and overestimation.
- Avoiding distorted comparisons between generation capacity and DSR if availability rates are less than 100%. In countries with no demand side response schemes (e.g. Portugal) 35% of flexible potential ratio of sector demand available for DSR could be excessive.

10. What are in your opinion the most important features to be developed in future ERAA editions with regards to the Economic Viability Assessment (EVA)? Rank your answers from 1 (most important) to 6 (least important)

2 - Consideration of a combined multi-year EVA
5 - Inclusion of additional technologies as investment candidates in the EVA (name technologies in comments).
3 - Increased number of climate years (CY) for the EVA
4 - Improvement in the methodology for CY scenario reduction for the EVA
6 - Implementation of the EVA on a Flow-Based model instead of a Net Transfer Capacity model
1- Other

Additional comments:
Further comments on reported answer options:

Inclusion of additional technologies as investment candidates in the EVA: pumped hydro energy storage systems should be considered as investments candidates in the EVA since their impact on the adequacy parameters can be significant considering the increasing penetration of non-programmable RES. Furthermore, electrolyzers should also be considered, taking into account their importance in reaching the EU 2030 climate and energy objectives.

Improvement in the methodology for CY scenario reduction for the EVA: we understand that only representative climate years are simulated in the EVA model due to computational cost.
However, the selection of representative climate years should take into account the expected climate evolutions of the next decade in order to better represent the future climate conditions.

To do that, representative climate years should be built considering the expected impact of climate change or, as a second best, significant past years (i.e. years characterized by high temperature) having climate characteristics similar to the ones expected in the Target Years can be considered as representative. Additionally, in some instances – e.g. in Portugal - only average and wet years were used for CY. It could be important to also include dry years as only using wet/average years risks of compromising the accuracy of the result.

Implementation of the EVA on a Flow-Based model instead of a Net Transfer Capacity: the implementation of Flow-Based model should contribute to a better representation of the adequacy contribution of neighbouring countries, which is important in particular for bidding zones heavily relying on imports.

General comments on future EVA features:

1. Key priority is that EVA should transition to a multi-year assessment. Despite some progress - the EVA is now in pairs of years rather than single-year – its impact on investment decisions is limited as the trajectory is not provided. Additionally, the modelling must allow consider risk but also appropriate risk apportionment - i.e. risk accurately placed on those who can address the risk.

2. The EVA methodology does not consider some of the difficulties that market players face in the real world: market risks and the underlying uncertainties over the long term, regulatory risks (e.g. changes in energy policy, permitting), technology risks (e.g. which options will prove profitable over the long term), etc. Moreover, EVA does not consider additional revenue for the generating units besides the wholesale electricity market, i.e., revenues from district heating or ancillary services, which may also impact their economic viability. Instead of evaluating their impact on the economical situation, EVA simply excludes them from the analysis.

3. The EVA methodology should consider market failures, coordination problems, uncertainty and risks to fully represent key challenges for investors.

4. The use of the National Estimate scenario (bottom-up aggregation of NECPs) as the starting point for the EVA should be further analysed. As these remain targets whose actual materialization should not be taken for granted. Second, the starting point of an iterative algorithm can affect the results (steady states). The Low Thermal Capacity Scenario, for instance, could be used as an alternative starting point to carry out a sensitivity analysis of EVA results.

5. Assumptions based on the modelling of the realisation of new capacity should be complemented with clarification of uncertainties. It is important to ensure full transparency on the assumptions around installed capacity that are considered as existing for any given target year. The assessment should only indicate what new capacities would be required, while clearly highlighting the uncertainties. In this context, the EVA should question both the existing and new generation capacities considered in the NECPs. Just as the existing generators may see their operation compromised if not economically viable, the expected new generation capacity (at least non-renewable capacity), should not be incorporated into the system if they are not considered profitable in the scenario for their assumed lifetime. Furthermore, some of the EVA results seem impossible, e.g., in the Netherlands, EVA indicates the decommissioning of more coal capacity than the total capacity in the National Estimates dataset.

6. Eurelectric suggests the acknowledgement of the following elements in future EVA on mothballing/demothballing decisions:

- The EVA must consider mothballing if the concerned TSO explicitly declares that a detailed regulatory framework at national level (incl. environmental permitting aspects) is in force and this framework guarantees free exit.
- The EVA should not consider mothballing a large a plant if the plant would be needed again in the short term . The EVA should consider a minimum duration of mothballing in order to reflect a real plant owner's decision (e.g. face risk of technical problems when the plant is demothballed but small savings during mothaballing period).

7. Last, but not least, the introduction of a cap at EU level on inframarginal technologies should be included in future EVA – especially in the case should such cap be prolonged or repeated.

11. Which additional scenarios or sensitivities would you be interested to see in future ERAA editions? Rank your answers from 1 (most interested) to 6 (least interested).
2- Sensitivities on the CO2 price assumptions
3- Different price cap
6- Scarcity pricing
1- Sensitivities on the demand levels
5 - Extreme weather conditions
4 - Other - Sensitivity on price

Additional comments:
Sensitivity on natural gas price should be included.

Key is to define a correct delineation of the different scenarios and sensitivities: for example, the treatment of capacity mechanisms (i.e. strategic reserves and capacity markets), and the impact of decarbonisation targets (e.g. emission performance standards or different RES deployment trajectories)

In particular, Eurelectric underlines that:

- The capacities assumed in scenarios should reflect, to the best possible extent, the real capabilities of energy networks. It should not take into account artificial increases stemming from capacity calculation methodological aspects (e.g. the 70% threshold under Regulation 943/2019 or the thresholds resulting from national trajectories in MS with national action plans). The resulting network constraints may have to be dealt with through cross-border remedial actions (e.g. counter trading) whose availability, in practice, is not guaranteed in tense situations.
- A common definition for scarcity pricing should be included in future ERAA analysis.
- It is key to rapidly assess the sensitivity of the results to some key assumptions taking into consideration Flow-Based Market Coupling and its underlying dataset (e.g. list of CNEC to consider) and modelling (e.g. adequacy patch to tackle the Flow Factor Competition).
- Sensitivities on the CO2 price assumptions and on demand levels (test different levels of electrification for example, cf. TYNDP-2022 assumptions) would be very insightful. In particular:
  - Modelling and sizing of implicit DSR is of importance, especially for the smart charging of EVs with view to the development of E-mobility.
- When it comes to DSM, the projected volumes should be backed-up with solid studies and not only political ambitions; when it comes to storage potential, the distribution and transmission operators should definitely check the possibilities to connect (e.g. due to congestion issues), for the concerned horizons, the MW

projected. The adequacy studies should take reasonable assumptions in terms of availability of cross-border capacity and should properly reflect the related risks, including the modelisation a worst-case scenario (cf. changes in neighbouring countries energy & climate policy such as coal/nuclear phase out, unavailability of firm dispatchable capacity during stress events, etc…)

In any case, the ERAA should include more analysis on how these elements are considered in the methodology, what are the assumptions retained, a more detailed description of the TSO input data and justify the reasoning behind these assumptions. (esp. any divergence between modelling and reality).

12. Do you have additional suggestions or comments?
More analysis of the results should be provided: the current report is rather descriptive of the results obtained, while further analysis of the fundamentals behind should be reported.

Eurelectric would also appreciate that ENTSO-E :

- Provides a pedagogical document introducing the most recent improvements (by comparison with to the previous exercise). In particular, the comments made by ACER in its February's decision could have been the subject of a dedicated chapter in ERAA 2022.
- Provides details on the state of the network for the modelled years, on the FMBC model and the underlying assumptions driving simulation (including information about the commissioning and decommissioning of network elements that significantly affect cross-zonal capacity).
- Explains how the results obtained are in line with the expected economics behind adequacy assessments and how deviations from the modelled situations would impact the results/conclusions.

In particular, it would be interesting to get more in-depth comparison between ERAA and NRAA exercises, both on the assumption side and on the result side. Some TSOs are already pointing out the quality of their NRAA analysis, but it would be good that their best practices would progressively be included in the ERAA.

Eurelectric pursues in all its activities the application of the following sustainable development values:

Economic Development

- Growth, added-value, efficiency

Environmental Leadership

- Commitment, innovation, pro-activeness

Social Responsibility

- Transparency, ethics, accountability

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