

Proposal for a European resource adequacy assessment methodology

A Eurelectric response paper

January 2020

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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KEY MESSAGES

- Eurelectric welcomes the proposed methodology as **a tool to improve the evaluation of resource adequacy at EU level**. In particular, we welcome the integration of an economic viability assessment which we have been asking for several years.
- Eurelectric however strongly regrets that the proposed methodology for the economic viability assessment procedure consists in practice of a form of **improved capacity expansion model**.
- **To ensure that generation assets included in the scenarios are economically viable to operate and that the economic viability assessment's results are therefore not distorted**, Eurelectric would recommend the following improvements:
 - **No assumption should be made on the realisation of new capacity**. The assessment should only give an indication of what new capacities would be required, while clearly highlighting the uncertainties.
 - **Clarifications are required on the criteria used to decide whether an asset will be considered as mothballed or decommissioned in the modelling**. Capacities with negative economic outlook (e.g. negative expected discounted cash flows) should automatically be considered as decommissioned unless there is another mechanism in place.
 - **Market exit barriers – where they exist - should not be considered in the economic assessment**. A strict implementation of the Regulation 2019/943 Art.3.(n) should be applied.
 - **The proposed distinction between “policy” and “non-policy assets” is too simplistic and therefore not very relevant**. Policy assets should also be subject to economic viability checks as it cannot be inferred that these plants are automatically/systematically in a positive business case. Such check should apply all plants relying on market revenues (and not only energy-only market ones) to ensure long-term investments.
 - **The capacity mechanism sensitivity should be improved by ensuring that relevant legislative restrictions** (e.g. CO2 EPS criteria as per art. 23 of the Regulation 2019/943)

introduced after the approval of the mechanism are duly taken into account. Our proposal would be to **define 3 different scenarios to assess the impact of CM on adequacy** instead of the two proposed ones (CM and without CM):

- a scenario without any CM;
 - a scenario with existing CMs “as applicable”
 - and finally, a scenario with CMs “as planned” (e.g. under development)
- **When it comes to assumptions taken to build the central scenarios, Eurelectric would like to highlight the following:**
- As a general remark, **the requirement to base the metrics used in ERAA on a “perfect foresight” principle could lead to over-estimated wrong assumptions.** The use of a “best estimate” should be preferred instead. **On the supply side, Eurelectric welcomes and supports the clarification on the treatment of balancing reserves (FCR/FRR)** suggesting to deduct them from the available resources in the adequacy assessment. Such approach should be extended to RR reserves.
 - **On the demand side, more details are needed to better understand the fundamentals behind the forecasts,** in particular on the assumption taken for DSR & storage potential, (e.g. estimated duration).
 - **On the network side, the capacities used should reflect to the best possible extent the *real* capabilities of the network.** In particular, Eurelectric recommends to assess the sensitivity of the results to some key assumptions behind the Flow-based Market Coupling modelling and its underlying dataset.
- **Regarding data collection, serious efforts are needed to ensure sufficient alignment and comparability of national TSO input data and assumptions** in order to add up to a realistic European resource adequacy assessment. Consistency between European, regional and national adequacy studies should be improved in terms of (1) input structure (incl. scenarios) and assumptions; (2) methodologies and parameters; and (3) metrics and granularity for conclusion/evaluation.
- To further improve the stakeholders’ trust in the European resource adequacy assessment performed by ENTSO-E, **Eurelectric urges to ensure that ERAA preliminary results are presented and discussed before the publication of the report.** Furthermore, **the national input to ERAA data done by TSOs should be based on regular national stakeholder interaction and workshops.**

1. What is your general feedback on the methodology?

Eurelectric welcomes the proposed methodology as a tool to improve the evaluation of resource adequacy at EU level. This represents an additional step in the right direction, although the implementation challenges of this methodology should not be underestimated.

As important attention points, Eurelectric calls on ENTSO-E to introduce the following improvements to further enhanced the proposed methodology:

- **Ensuring that an economic viability assessment is properly devised in the methodology, implemented in the ERAA modelling framework and used in the scenarios and sensitivities**, in line with our comments on art.1 and art.6.
- **Defining sufficient alignment and comparability of national TSO input data and assumptions and ensuring their realism**, as mentioned in answers to art.3, art.5 and general comments.
- **Defining 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).

2. Do you have comments on the description and data collection of the European Resource Adequacy Assessment (Articles 4 & 5)?

- Art. 1 & Art. 4.(a):
 - In order to comply with the Electricity Regulation (EU) 2019/943, **the ERAA should provide an assessment of the economic likelihood of “retirement, mothballing, new-build of generation assets”**. This means making clear whether generation assets included in the scenarios are economically viable to operate. In particular, we would welcome this clear assessment for assets above the EPS criteria as per art. 23 of the above mentioned Regulation.
 - **To do so, the ERAA methodology should foresee retiring capacities with negative economic outlook** (e.g. negative expected discounted cash flows) **from the adequacy assessment**. ENTSO-E should include a detailed breakdown of the capacities economically retired per country technology and fuel as the effect of conducting this line of analysis.
- Article 4: ERAA – Description:

General

- Art.4.1.(f): **The requirement to base the metrics used in ERAA on a “perfect foresight” principle for some aspects seriously limits the relevance of the assessment**. Indeed, the choices made in reality (with regard to exploitation and revisions of assets) will certainly deviate from the assumptions taken. The outcome will then necessarily be less ‘optimal’ compared to a “perfect foresight” scenario. **The use of a “best estimate” should be preferred instead**. Alternatively, one could simulate a myopic foresight (where foresight is restricted to a certain period) instead of a perfect one.

Demand & Storage:

- Demand:
 - **More details are needed to better understand the fundamentals behind the demand forecasts** – e.g. for heat pumps, one should get also the split between hybrid and electric heat pumps.
- DSR & Storage:
 - **More information should be given on the methodology used to estimate the DSR & storage potential, in order to have best possible estimates for each bidding zone.** In this sense, the surveys to evaluate the VoLL for the domestic and tertiary sectors (see Art. 5.1 of the Methodology for Calculating the VoLL proposed) could also be used to assess their potential for DSR. In particular, stakeholder involvement should be ensured and the improving demand optimisation tools should be taken into account.
 - **More transparency on the assumption taken for the estimated duration of DSR and storage is needed.** We would like to understand how ENTSO-E is factoring in the duration/volume limitations (MWh/GWh) of different types of storage / demand response. In particular, the assumptions for all the triplets (potential, maximum duration for activation, marginal activation price) should be detailed per country and technology (DSR & storage).
 - **More details on the treatment of hydro storage would be welcome.**

Supply:

- Art. 4.4.(b):
 - **In bidding zones where strategic reserves are already implemented, the final ERAA scenarios should highlight how using these specific capacity mechanisms - as opposed to not utilizing those resources - contributes to achieving security of supply and economic welfare.** Only such approach gives the right overview of the adequacy situation in different frameworks.

We therefore suggest to implement the following approach is:

- **In the scenario without capacity mechanisms (CM), strategic reserves should be excluded.**
 - **In the scenario with CM, strategic reserves should be included.** Such scenario could also be divided into 2 sub-scenarios:
 - (a) one including only market-based capacity mechanisms;
 - and (b) the other one including market-based capacity mechanisms and strategic reserves.
- Art. 4.4.(j):
 - **Eurelectric welcomes and supports the clarification on the treatment of balancing reserves (FCR/FRR) suggesting not to use them as available resources in the adequacy assessment.** Moreover, balancing reserves should be assessed according to the expected evolution of capacity (e.g. increase of intermittent generation).

Furthermore, we do not see any valid reason to give to RR a different consideration than to FCR and FRR – the fact of being optional is not a justification for not deducting it from the available resources in the adequacy assessment.

- Art. 4.4.(f):
 - **The requirement to model planned outages considering “perfect foresight”** (e.g. the use of optimized maintenance schedules at system level) **might yield to an optimistic outcome.** The use of the “best estimate available” should be preferred instead.

Network:

- **Eurelectric recommends to assess the sensitivity of the results to some key assumptions behind the FBMC modelling and its underlying dataset.** Indeed, the MAF 2019 results illustrate very well the impact of Flow Based Market Coupling (FBMC) for some countries. The impact on Belgium for the Flow-Based sensitivity in 2021 is particularly striking.
- **Eurelectric would also welcome more details on the capacity calculation process:** does ENTSO-E intend to perform the calculation with an hourly resolution, as for the market simulations?
- **Finally, Eurelectric underlines that the capacities used should reflect to the best possible extent the *real* capabilities of the network.** It should not take into account artificial increases stemming from capacity calculation methodological aspects (e.g. the 70% threshold pursuant to Regulation 943/2019 or the thresholds resulting from national trajectories in MS with national action plans). Indeed, the resulting network constraints may have to be dealt with through cross-border remedial actions (e.g. countertrading) whose availability is not guaranteed in tense situations.

- **Article 5 : Data collection:**

- Art.5.5:
 - **More details should be given on the exact content of the “economic assumptions” that market participants have to provide to TSOs** as part of the economic viability check.
 - In particular, **a clear prerequisite for all contributions of market participants is that the “appropriate scenarios of projected demand” are made available by ENTSO-E in a very transparent way.** In other words, the demand side should be properly assessed and communicated.
 - Eurelectric would like to stress that **such data are commercially sensitive information and should therefore be handled carefully by TSOs/ENTSO-E and in compliance with the relevant regulatory text.**
 - **Eurelectric insists that ENTSO-E publishes the PECD database in order to be able to understand the main assumptions and parameters used.** For the PECD it is crucial that the load-factors follow the technology developments. For wind, there are now significantly different load factors than for earlier generations of the same technology. This will continue to develop, not least impacted by merchant projects and auction design that drives new turbine design with different combinations of generators to blades so as to increase the capture price as much as possible (capture price is the whole-sale price in the hours when the turbine is producing). Relying on old data for

load-factors (and when the turbines are producing) and projecting forward on this basis will not give accurate results.

- Art. 5.6:
 - **Data collection responsibility should lie exclusively on the TSOs. Therefore,** ENTSOE should not be entitled to make any formal data request to external market parties even in exceptional cases.
- Art.5.10.(a):
 - **More precisions should be given on how the model would deal with daily reserve dimensioning** that RTE currently already uses, and Elia is planning to implement.
- Art. 5.10.(b):
 - See the comment to Art. 4.4.(j) with regard to RR.
- Art. 5.11:
 - It is necessary to clearly describe how cost items such as taxes and levies (e.g. G-charges), and which have a potentially significant impact on economic viability, are to be considered in the modelling.
- Art. 5.7.(a):
 - **We welcome the requirement to collect thermal generation data unit by unit.** However, we would appreciate clarification/confirmation from ENTSO-E on whether the model is considering individual thermal power plant efficiency or average efficiency. The efficiency will also vary depending on the load factor which is considered.

3. Do you have any remarks on the economic viability assessment and the associated scenarios (Articles 3 & 6)?

- Article 3 - Scenario framework:
- Article 3.3: Baseline scenario:
 - ENTSO-E proposes to build the baseline scenario on a bottom-up approach using reference TSO scenarios. However, **it is not clear how the consistency between the different data input will be ensured when being aggregated by ENTSO-E to add up to a realistic EU scenario.** In particular:
 - Are TSOs bottom-up data all based on the same set of assumptions (e.g. demography, GDP, etc...) ?
 - How will the base assumptions on economic parameters such as CO2 prices, fuel prices, investment costs, market price cap be added by ENTSO-E to those TSO bottom-up data? The baseline data are obtained by “concatenating” national outlooks, which could be based on national assumptions contained in the NECPs. Therefore, the baseline dataset could ultimately be composed of inconsistent data (e.g. macro-economic data, penetration rate of technologies, cost reduction). This could have consequences for demand and supply outlooks.

- **In our view, consistency between European, regional and national adequacy studies should be ensured through aligned (1) input structure (incl. scenarios) and assumptions; (2) methodologies and parameters; and (3) metrics and granularity for conclusion/evaluation.** Without alignment on these three elements (input–processing–output), it is not possible to meaningfully compare/combine adequacy studies performed at different levels. The objective is not necessarily to use the same numbers everywhere as local variations, specificities and circumstances should be correctly reflected. However, they should follow a similar structure so that variations/changes/evolutions can be easily detected, queried/challenged and changed/substantiated. The use of publicly available software (commercial /open source) would help ensuring the buy-in from all stakeholders regarding the processing aspect. Furthermore, it is crucial to take into account import/export and cross-border capacity availability in a consistent manner, in particular for national adequacy studies.
 - **To ensure such consistency and get a complementary view, ENTSO-E could also take into account other references.** For example regarding the economic viability of groups of power plants, ENTSO-E could also take into consideration reports from consultants or investment banks, market reports on clean sparks or dark spreads. These elements could provide useful estimates of power plants’ economic viability in each market and help ENTSO-E developing different scenarios for power plants’ economic viability.
- Art. 3.3.(b):
- ERAA methodology suggests to take interconnection between binding zones from *“Best estimates regarding the state of the grid in line with the TYNDP and the most recent national development plans”*. Such proposal will not ensure compliance with the provision from the Electricity Regulation to “takes into account real network development¹” would not be met with the proposed ERAA methodology.
 - **To achieve consistency with real network development as required by the Electricity Regulation, ERAA should consider projects in development phase only.** Indeed, a conservative approach would facilitate the assessment of resource adequacy issues that would be solved by a subsequent development of planned-only projects and other resources. To this extent, we should highlight that new interconnection projects are only a way to solve potential adequacy issues, among several other measures/assets (e.g. storage, DSR, new generation, CRMs).
 - We would welcome clarifications on whether data regarding capacity interconnections will be taken from NECP or TYNDP.
- Article 6 : General comment on economic viability checks:
 - **The proposed methodology for the economic viability assessment procedure (see Art.6.3.f) consists in practice of a form of improved capacity expansion model.** Indeed, it starts from the baseline data and refines the available resources by retiring economically unviable existing capacities and building new viable capacities if needed.

¹ Art. 23.5.(l) Regulation (EU) 2019/943: “The European resource adequacy assessment shall be based on a transparent methodology which shall ensure that the assessment... (l) takes into account real network development”.

Our understanding is that this process would in turn creates the two Central Reference Scenarios (i.e. one with and one without a Capacity Mechanism).

- **Eurelectric considers this approach as flawed as all intermediary steps in the reasoning are not documented:** indeed, it seems fundamentally dependent on the assumptions made regarding the existence of market failures, externalities, etc.
- Therefore, Eurelectric would propose the following alternative approach. **The economic viability check should mainly be used for identifying the decommissioning or mothballing of existing assets, and no assumption should be made on the realisation of new capacity.** While we understand that Art. 22.5.b requires the TSOs to make “an economic assessment of the likelihood of retirement, mothballing, new-build of generation assets” the ERAA methodology should only give an indication of what new capacities would be required, while clearly highlighting the uncertainties. Practically, this could be performed in three main steps:
 - **Identification of any adequacy problems with the current available capacity,** including any decisions regarding the decommissioning or building of assets;
 - **Economic assessment of existing capacity,** leading to any decommissioning or mothballing of currently available capacity (with / without Capacity Market);
 - **Identification of any additional capacity required** (and the related uncertainties).
- We would like to highlight that the **scenario with CM considers CMs “as approved”**. **This does not allow to take into account relevant legislative restrictions introduced after the CM was approved.** For instance, the Emission Performance Standard of 550 g CO₂/kWh and Carbon Budget of 350 kg CO₂/kWh per annum introduced in the Electricity Regulation have a strong impact on CMs. Such legislative restrictions are impacting CMs, even though the mechanisms themselves have been approved before.
- **We therefore recommend that the scenario with CM does not consider the CMs “as approved” but “as applicable”**. This would allow to take into account additional legislative restrictions introduced after the approval of the CM. Indeed, a scenario with CMs as approved has little relevance given that the Electricity Regulation impact the scheme and its effectiveness.
- **Our proposal would therefore be to have three scenarios to assess the impact of CM on adequacy** instead of the two proposed ones (CM and without CM):
 - **a scenario without any CM;**
 - **a scenario with existing CMs “as applicable”**. As mentioned previously, such scenario should include strategic reserves. It could even be sub-divided into two to isolate the impact of strategic reserves on adequacy:
 - (a) one including only market-based capacity mechanisms;
 - and (b) the other one including market-based capacity mechanisms and strategic reserves.
 - **And finally, a scenario with CMs “as planned”** (e.g. under development): the same principle as mentioned for the scenarios with existing CMs “as applicable” should apply.

- Last but not least, **when it comes to CM scenarios, it is important to clarify if cross-border participation is taken into account** to the extent in which it is technically available, due to e.g. redispatching availability? Indeed, foreign capacity may have access to CMs through cross-border participation, replacing national resources which may be viable in a CM scenario.
- Article 6.3:
 - One should make somehow explicit the link with the market design – in the case investments are made by the model, the model prices might not reflect the actual market design and this should therefore be taken into account.
 - **We would welcome clarifications on the assumptions behind the “assumed backward propagation” of scarcity pricing.** This is relevant given the doubts that i.e. Elia has indicated on this backwardation in its study on scarcity pricing.
 - **We would recommend not to make scarcity pricing mutually exclusive to capacity mechanisms** – both are rather serving different purposes (flexibility/ ST reserve vs adequacy/LT reserve).

Distinction between mothballing/decommissioning in the modelling

- **The proposal lacks clarity regarding the criteria used to decide whether an asset will be considered as mothballed or decommissioned in the modelling.** In our view, it should be clarified that **an uneconomic context of thermal plants should automatically lead to their closure/decommissioning unless there is another mechanism in place.** To this extent, mothballing can only be considered in countries with mothballing mechanism/regulation in place.
- **On the other hand, market exit barriers – where they exist - should not be considered in the economic assessment. This would only distort the results of the economic assessment.** To this extent, ENTSOE should take for granted the provisions included in the Regulation 2019/943 Art.3.(n): *“market rules shall allow for entry and exit of electricity generation, energy storage and electricity supply under takings based on those undertakings’ assessment of the economic and financial viability of their operations”*. Operators should be entitled to withdraw capacity in an uneconomic context. We are fully conscious that there may be a discrepancy between the economic decision (e.g. plant taken out in the economic assessment) and the reality (e.g. the plant cannot leave the market due to exit barriers even if economic – therefore clearly in contradiction with the Electricity Regulation rules). However, we believe this is important to apply strictly the rules in order not to distort the results of the economic assessment.
- **Article 3-6 : Policy/Non-policy assets:**
 - Eurelectric believes that **the proposed distinction between “policy” and “non-policy assets” is too simplistic and therefore not very relevant.** Indeed, it assumes a very static distinction between assets that would be valid throughout their economic lifetime. In reality, assets may move from one category to the other within their economic lifetime.
 - Furthermore, **we would welcome clarifications on the reason why policy assets are not subject to economic viability checks. In our opinion they should be subject to economic viability checks taking into account the revenues obtained via policy decisions at least in the period of time when they are still on the market and**

influencing adequacy assessment. Indeed, it is unclear how power plants receiving legacy capacity payments (schemes no longer available but with pending commitments made even before the establishment of State Aid Guidelines 2014-2020) would be considered under this classification. These plants wouldn't be "exclusively" exposed to EOM revenues to ensure long term investment (as defined in Article 6.3 b), as they have legacy capacity contracts. However, it cannot be inferred that these plants are automatically/systematically in a positive business case (e.g. being able to recover their annual fixed costs). We therefore suggest to extend the criteria for the application of the economic viability check. Such check should apply all plants largely or mostly exposed to market revenues. **Concretely, we would recommend to modify the definition of non-policy technologies/assets as follows: "technologies that exclusively rely on market revenues (instead of energy-only market (EOM) revenues) to ensure long-term investments".**

- We would also welcome the following clarifications:
 - All non-policy capacities, incl. DSR and storage: link between assumed capacities and business cases?
- Criteria for categorisation of capacity as "policy" or "non-policy" on national level should be specified (whether this includes NECPs or Energy strategies only, or also other instruments?) **Would you have any comments on the adequacy assessment process and the different stakeholder interactions (Articles 7 and 8)?**

Eurelectric finds the consultation process satisfactory. However, we would recommend the following to further improve the stakeholders' trust in the adequacy assessment:

- **Stakeholders should also have the opportunity to comment on the capacity assumptions during the ERAA process** and not only during the NECP process.
- **The national input to ERAA data and the overall ERAA work done by national TSOs should be based on regular national stakeholder interaction and workshops.** It would allow TSOs to use the best stakeholder knowledge and ensure stakeholder support of the ERAA work. As a consequence, **the methodology should foresee that the ERAA preliminary results are presented to stakeholders mandatorily (and not "preferably") before the publication of the ERAA report.** Otherwise, their feedback would have little chance to be taken into account in the report.

4. Do you have any further comments on the methodology that you would like to share?

- Difference between market assumptions by ENTSO-E and other stakeholders: how to reconcile the outcomes, esp. for economic viability tests?
- There should be (as it was conducted in MAF2019) a sensitivity scenario in which consequences of stricter climate policy on generation adequacy are assessed (such as EU ETS Directive revision, climate neutrality targets, BATs revision).

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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