ENTSO-E / Mid-term adequacy Forecast 2019

Eurelectric comments

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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WG Wholesale Market Design & Investment Frameworks

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1. **What is your opinion on the MAF 2019 outcomes and, especially, on the low-carbon sensitivity analysis?**

Eurelectric welcomes the MAF 2019 and the opportunity to provide comments on its outcomes.

In general, we believe that **more efforts should be devoted to sensitivity analyses on demand and supply** given their direct impacts on the overall adequacy assessment**:**

- **Sensitivity analysis on supply:**
    - **Low-carbon sensitivity 2025:**
        - The energy transition to a low-carbon economy will require changes to the generation fleet across Europe: more intermittent RES generation, less coal and lignite units and the presence of flexible assets to ensure system adequacy. **This sensitivity could have been a good opportunity to stress the challenge of this transition with respect to the decommissioning of coal/lignite units across Europe.**
        - **This sensitivity is based on a bottom-up analysis in 11 countries only, but other countries could have been added.** For instance, we believe that some capacity in Spain (around 5 GW) should have been included in this important sensitivity analysis. In other words, it would be interesting to understand why Spain has not be considered in this sensitivity analysis while other countries have been included (with smaller capacity).
        - **This sensitivity must also be based on current regulatory framework as it to a great extend influences available supply.** We believe that right now low-carbon sensitivity does not include effects of introducing the new Electricity Regulation's art. 23 in which existing plants emitting more than 550 gr CO2 of fossil-fuel origin per kWh will not be able to participate in capacity mechanisms after July 1st 2025 (for Poland it means roughly 5 GW of capacity will not be economically viable to operate as of beginning of year 2026).
    - **Economic assessments:**
        - **MAF 2019 still does not consider that the generation fleet assumed in the analysis could be impacted by economic circumstances** (e.g. economic mothballing or retirement due to fuels and carbon pricing). This is an important shortcoming as the absence of economic viability could obviously trigger actions regarding asset management and thus adequacy issues.
        - **Given the on-going energy transition, ENTSO-E should make sure that the capacity considered as reliable in the future is also economically viable.** For example, according to the analysis made by ENTSO-E, several countries / bidding zones would have estimates of LoLE and EENS close to zero (e.g. Spain). However, this outcome suggests that some generators (especially marginal units like peaking plants) would be assumed to keep their plants in the system regardless of the losses they would make over 2021-2025. This is not a rationale behavior – some of these capacities could be clear

candidates to exit the system and this would in turn affect the adequacy analysis.

- **Sensitivity analysis on demand levels:**

    - **The model introduces uncertainty of demand on a limited number of criteria**. For example based on temperature or on penetration of electric/hybrid heat pumps or electric vehicles. However, **we are concerned that important uncertainties on demand forecasts triggered by mid and long-term economic drivers** (e.g. GDP; economy-wide energy intensity; etc.) **or by energy policy are not explicit in the MAF analysis**.

    - In practice, **we would welcome more transparency on the demand forecast**. Although Section 1 in Appendix 1 is entitled "Overview of input data and scenarios", it contains no overview of demand data, which nevertheless is important input data for supply-demand balance. Without this transparency, the perception is that potentially more extreme scenarios for demand are excluded. With such a limited approach, our concern is that the resource adequacy risks for adequacy (measured in terms of LoLE and EENS) tend to be underestimated.

We also the following remarks/suggestions for the MAF 2019 and upcoming ones:

- **Transparency of the data collection and assumptions should be further improved:**

    - The data provided by the TSOs builds upon the draft NECPs, making the assumption that all these plans will be realized, It should be considered that **these draft NECPs are sometimes not in line with the industry's own expectations or that the NECPs data have been modified in the final modelling. When conclusions are made on adequacy levels, it should be clearly stated that this result is highly dependent on governments delivering on their NECPs**

    - In addition, **we observe the exogenous addition of non-policy capacity, for some countries between 2021 and 2025 and a difference in treatment in terms of reporting the assumptions made:**

        - Spain: in the absence of country comments, one should rely on the MAF dataset provided to notice this addition. In practice, some 1,000 MW of new hydro capacity in Spain have been added, although the model clearly shows that there would be overcapacity / depressed prices, leaving no room for viable business cases.

        - Belgium: it is clearly mentioned in the country comments that 2.5GW of new-built capacity is considered for 2025 (on top of assumed developments in DSR, storage and RES, as documented in the MAF dataset), but that there is no guarantee that such investments in new capacity would materialize in the future without a market-wide CRM mechanism.

        - Germany: the country comments are not mentioning explicitly any addition of non-policy capacity, but the MAF dataset shows several additions (gas, hydro, others non-renewable).

- **Optimistic assumptions about cross-border exchange capacities in the mid-term are considered**.

    - Firstly, as a general remark, as security of supply is fully dependent on a functioning transmission and distribution grid, the volumes not served due to these types of challenges also needs to be considered.

    - Secondly, we remind that **interconnectors are not providing firm capacity by themselves**.

    - Last but not least, **the use of optimistic assumptions for cross-border capacities might lead to an underestimation of the adequacy issues.** A good illustration of this issue is provided by the **Flow-based sensitivity for 2021.** The use of a flow-based sensitivity for Central Western-Europe is interesting as: (i) it allows to better reflect the physics of the system (impact of grid infrastructure between countries, but also within countries) and (ii) it is closer to the operational planning approach in place today. This is especially important in the context of the energy transition, with increasing share of intermittent weather-driven generation. **The key take-away of this sensitivity is that the management of the transmission grid in one country and the physics of the interconnected electricity grid could substantially affect the system adequacy of a neighboring country.** The best example is certainly Belgium, where the LOLE for the target year 2021 is increasing from <1 hour to ~3 hours (close to the legal adequacy criteria) when the FBMC sensitivity is performed. This also illustrates why the flow-based market coupling should be considered for all target years.

- **Capacity markets and related changes in the EU regulatory framework should be considered:** As mentioned in Appendix 2 (Figure 12), MAF 2019 does not consider capacity markets in their analysis. As a consequence, it does not take into account the recent changes in the EU regulatory framework and the influence it has on a market, particularly the new Electricity Regulation's art. 23 in which existing plants emitting more than 550 gr CO2 of fossil-fuel origin per kWh will not be able to participate in capacity mechanisms after July 1st 2025.

- **The new adequacy index "Missing Capacity" is welcome but provides only a partial picture of the adequacy situation:**

    - Eurelectric welcomes the fact that ENTSO-E is investigating the use of this concept in order to provide further insights into the outcome of the adequacy forecasts and, more specifically, to quantify the need for firm/reliable capacity in the system.

    - However, **this indicator provides only a partial picture as there is no direct relationship with the national adequacy standards**. In our point of view, **adequacy forecasts should mostly focus on defining the "total level of flexible and reliable/firm capacity"** needed in the mid to long term to achieve the reliability standards across Europe**.** This metric would help the various stakeholders in the market to assess the need for additional investments/divestments based on their own view on the development of existing assets.

- The deployment of huge amounts of new RES capacity needed to achieve the EU's decarbonisation objectives also impacts the level of flexible and firm capacity needed to achieve the national adequacy standards. Despite constant improvements in the forecasting of RES generation, potential RES forecasting errors can have a large impact on security of supply which should therefore be taken into account**.** In addition, it would also be relevant to report the **firmness factor assumptions for RES technologies**, as load factors

of renewables technologies can vary compared to nameplate capacity. In other words, what is the expected contribution of RES technologies during stress events / scarcity moments.

2. **How do you evaluate the improvements made in the input dataset, i.e., unit-by-unit thermal generation data and a complete set of hydro data for all climate years?**

Eurelectric welcomes the improvements made by ENTSO-E on the MAF methodology, namely on thermal generation data granularity.

- **Regarding the increased data granularity for thermal generation:**
    - This is a good step forward but **this analysis should be complemented by a robust economic viability check to allow a better assessment of the adequacy situation.**
    - We would also welcome further clarifications/transparency on what increased data granularity for thermal generation means exactly:
        - For example, are unit-by-unit data on gas CCGT included?
        - **The assumptions around the decommissioning of power plants modelling should be better clarified**. In some countries, the coal generation fleet considered in the MAF dataset in the base case is above the own industry expectations (e.g. shut down of additional coal power plants not considered in 2025 in Spain)[1],[2],[3].
- **Hydro modelling data:** As shown with the French example, where the difference in terms of LOL for 2021 (e.g. 4.1 hours according to the MAF even though the last French national adequacy study did not point out security of supply issues for this time horizon) results mainly from the fact that ENTSO-E and RTE do not use the same climate database. **The addition of a complete set of data for hydro for 35 climate years is therefore welcome but extending the number of climate years going forward would be welcome.** Indeed, in electricity systems highly influenced by weather conditions, particularly the demand, radical events occurred in the period of the analysis should be smoothed by extending the number of climate years.

3. **From your perspective, which additional methodological improvements or insights would you prioritize for the future MAF assessments? Please explain in line with the specific needs of your field of activity.**

The energy transition is accompanied by major changes in generation, transport, storage and consumption. This is even more true as the EU will once again raise the level of ambition within the framework of the EU Green Deal. This will inevitably increase the level of uncertainty regarding medium to long-term security of supply. It therefore seems imperative that future MAFs

- investigate and report even more sensitivities,
- extend the observation period,

[1] Endesa plans to close all coal capacity in Spain, Portugal (link).
[2] Naturgy will close its last three coal plants by 2020 (link)
[3] Iberdrola announces shutdowns of last coal-based plants in Spain (link)

- report and discuss remaining market, technological and political uncertainties (and these will be considerable at the end of a ten-year period).

The following improvements are probably worth considering before the implementation of the full methodology being developed for European Resource Adequacy Assessments.

- **Further improve modelling of the expected volume of Demand Response and its value in relation to security of supply** we would welcome in the future additional information on the number of hours in which demand side response (DSR) is critical (e.g. those hours for which in the absence of DSR capacity there wouldn't be sufficient resources [generation+imports] to meet electricity demand. One should also go one step further and consider the characterization of the stress events in terms of duration (cf. "dunkelflaute" effect). This is mainly a reporting aspect that entails no additional simulations.

- **Widened sensitivities modeling on supply and demand forecasts in order to better reflect the potential impacts on security of supply:** see our comments to Q1. For instance, a sensitivity could be run considering that units with a utilization below a certain threshold are most probably at the end of the merit order and are therefore most likely to quit the system at some point (esp. if price spikes do not materialize of if no capacity market is in place).

- **Inclusion of political risks:** The continuous growth of renewable energies and increased energy efficiency are linked, among others, to political targets. Eurelectric is strongly committed to meeting these targets and will continue to do so with the utmost determination. However, acceptance problems, for example, could make it more difficult to achieve the targets. This, in turn, can have an impact on adequacy. Future reports should therefore try to assess what effect failure to meet the RES growth target / efficiency target for 2030 of X percent would have on security of supply.

- **External validation of data accuracy and assumption:** it is very pertinent for stakeholders to have the opportunity to actively contribute, in a transparent and well-informed manner, to the elaboration of ENTSO-E's assumptions and hypothesis ahead of the final consultation on MAF results. We would for example welcome the organisation of a public workshop or a public consultation by ENTSO-E early in the MAF modelling, similarly to what the EC is doing for its input data.

- **Consideration of the latest regulatory changes:** it would be very relevant for the upcoming MAF to take into account the recent changes in regulatory framework on EU level and the influence it has on a market, particularly the provisions of the new Electricity Regulation on capacity mechanisms.

- **Progress towards the 10 years period assessment required by the CEP:** The MAF 2019 analysis submitted presents results for two target years (2021 and 2025). Obviously, this analysis does not cover the 10 years period foreseen in Regulation 2019/943 for the future European resource adequacy assessments. However, it does not propose an intermediate increase of the granularity towards this goal compared to the previous MAF exercise. We would therefore welcome further progress towards the number of target years for the MAF 2020, for instance by having 2022/2024/2026/2030 as target years.

4. What additional insights on the results would you be interested to see in future MAF reports?

- **Demand**: see above our answer to the first question – the demand side should be treated at least on an equal footing to the supply side when reporting detailed results, sensitivities and input data. This is even more important as TSOs have all the information needed to

perform this reporting after having included all major uncertainties in the demand modelled.

- **Available generation. Forward-looking available generation sets should be based on currently existing generation :**

    - Plants ending their lifespan and any decommissioning / mothballing announced by the owner of the plants in questions.

    - While the provisions of Article 23 of the electricity regulation require that the ERAA is based on the assessment of the likelihood of new-build of generation assets, it should take into account whether it is a merchant or 'non-policy' project for which there is not yet a Final Investment Decision. There is huge uncertainty regarding the economic viability of non-policy assets, and any assumption made by TSOs on their viability could influence the result of adequacy assessment for respective country. However, needed non-policy assets should be clearly identified so that policy-makers can decide how to best address the adequacy gap

- **Economic viability**: Although importance of looking at economic viability of generation assets is mentioned through MAF2019, there is no results showing how it was taken into account during the scenario building process, during the setup of sensitivities and how it could have influenced LOLE in each particular zone;

5. Please tell us below if you have additional suggestions or comments?

<u>Country specific comments:</u>

<u>Greece</u>

- The final NECPs when submitted (typically by end 2019) may have information substantially different than the information taken into consideration in the base-case and low-carbon scenarios of ENTSO-E.

- We are afraid that this is the case for Greece: The initial (draft) NECP submitted in January 2019 considered 3.1 GW of lignite-fired capacity in operation in 2025. The base-case scenario of ENTSO-E has incorporated this consideration into its calculations. For the low-carbon scenario (as there was no official information available at the time, but only an announcement by the new Greek Government, about accelerated lignite phase-out), ENTSO-E considered 2.4 GW of lignite-fired capacity in operation in 2025. The result of ENTSO-E's calculation for both base-case and low-carbon scenarios is that the Greek Power System is far from having any adequacy problems.

- In late November 2019, an updated NECP was announced by the Greek Ministry of Energy, with a much accelerated lignite phase-out plan, where only 0.6 GW of lignite-fired capacity remain in operation in 2025. We expect that is radical decrease of available capacity will have a tremendous impact in the adequacy of the Greek Power System in 2025 and most probably much earlier (e.g. 2021). This makes MAF2019's conclusions for Greece completely outdated and irrelevant. Normally ENTSO-E should re-run their simulation models with the updated official information.

- One additional comment is that ENTSO-E considers that imports of electricity from adjacent countries is fully available at maximum potential at any time during the simulation period, which is not what we see in practice. Indeed, taking into consideration that Greece is at the edge of South Eastern Europe, and has only limited connectivity with other EU countries (only Bulgaria at the North and Italy at the west), there is a high probability of

limited imports during certain critical time-periods (e.g. harsh weather conditions in winter). This is in-line with what we have seen historically.

Spain:

- We consider the outcome of MAF2019 does not reflect the situation of resource adequacy in Spain in 2025. MAF analysis is based on Spanish NCEP, however:

    1- Peak demand is estimated in 44.7 GW in 2025 in MAF19 (see Demand Time Series 25 sheet in the dataset), whereas NCEP is considering 46.2 GW .

    2- MAF assumes an addition 875 MW of hydro pump storage in 2025 (plus 120 MW of hydro run). This assumption is also part of NCEP. However there is no evidence that any investor is now building any MW of these non-policy assets.

    3- MAF assumes 4318 MW of coal will still be in operation in 2025. However the owners of these plants have already announced (with the exception of 556 MW in Aboño 2) the decommission of these units no later than 2022.

    4- Whereas there is a clear appetite for investing in wind and solar PV (more than 90 GW of grid access permits already granted), it is not the case for CSP (no investor is announcing new capacity). However MAF assumes 2500 MW of new CSP capacity in 2025.

    5- MAF assumes that the whole fleet of CCGTs in Spain (24.560 MW) will be in operation in 2025 with an average of 525 hours of operation, what seems to be a quite optimistic assumption

Poland:

- We are happy to see that thanks to implementing CM in Poland there is no threat for adequacy in 2025 in Base-Case scenario. However this calculations were conducted assuming that there is a CM in place in Poland in 2025. This must be noted that due to the Electricity Regulation's art. 23 existing plants emitting more than 550 gr CO2 of fossil-fuel origin per kWh will not be able to participate in capacity mechanisms after July 1st 2025. **For Poland this translates into the reality where for roughly 5 GW of capacity it will not be economically viable to operate as of beginning of year 2026. This means simply that for Poland it is more accurate to show a Low-Carbon Scenario as a Base-Case scenario for 2025.** This change will allow to reflect an ailing urge for adequacy measures in Poland from July 2025 when circa 25% of our fleet covering peak demand starts to be not economically viable. 27.5 h LOLE that Poland is facing in 2025 (in the light of before Low-Carbon and now Base-Case scenario) is the highest in continental UE. Similar level is foreseen only for Lithuania (27,46h), however the numbers cannot be directly compared as demand for electricity in Lithuania is c. 17 times lower than in Poland.
- In light of the above we propose to have a new sensitivity scenario prepared for Poland including actual stress testing for more ambitious CO2 intensive generation phase-out, above what we already can see going off the market from July 2025. In our opinion new Low-Carbon scenario should especially take into account foreseen EU legislative amendments undermining economic viability of plants based on fossil-fuels, (e.g. BAT revision).

Netherlands:

- The Netherlands was not included in the country comments. Therefore, our ability to comment is very limited. Much more information and transparency is needed on which assumptions are made.

- Considering the coal exit, we are surprised to see the low LOLE results for the Netherlands and are wondering whether this outcome can be somewhat optimistic. However, due to the lack of transparency around the Netherlands, we cannot further support on the potential causes of this.

Germany:

- The growth of installed renewable capacities and increased energy efficiency currently fall short of the respective political targets. Within the framework of onshore wind auctions, the quantities put out to tender have not been fully awarded since February 2018. As of October 2018, even the volume of bids submitted fell short of the tendered quantity. It was not until December 2019 that the submitted bids again exceeded the tendered capacity. However, even in this auction, not all of the quantity put up for auction could be awarded. This can be attributed in part to of the lack of public acceptance and in part to inadequate political framework conditions for the new-built of onshore wind power capacities.

  All this results in the assessment that since 2018 around 2 GW of tendered – and thus forecasted - onshore wind capacity has not been built. Therefore, the obstacles to the expansion of wind power must be removed quickly. Clearly, future MAFs will have to address these shortcomings and take account of eventual gaps between quantitative political targets and the capacity that is/will be effectively added to the system.

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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