European Network of
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for Electricity

entsoe

Mid-term Adequacy Forecast 2018

ENTSO-E's response to the public consultation

15 March 2019

The response of ENTSO-E to the MAF 2018 public consultation feedback

We would like to thank the stakeholders that replied to the MAF 2018 public consultation. The stakeholders recognize the usefulness of the MAF as a reference for adequacy studies and appreciate the methodological improvements and sensitivities performed in MAF 2018, particularly the low-carbon sensitivity analysis. The present document focuses on the suggestions for further improvements. Proposals and comments received from stakeholders during this public consultation will be considered by ENTSO-E for further improvements in the following MAF publications.

Interconnections and Flow-Based

a) Improve reliability of interconnection assumptions and include a sensitivity analysis with respect to interconnectors availability

Interconnection availability is important for assessing adequacy. In MAF 2018, a complementary detailed analysis of results has been presented in order to identify the impact of interconnections to balance supply and demand under individual and simultaneous scarcity situations. The corresponding analysis is presented in Section 2.3 of the "Methodology and Detailed Results" publication that accompanied MAF 2018 executive report. Following the same approach, we plan to provide further insights on the interconnections' contribution to adequacy in the following editions of MAF.

Interconnection capacity assumptions in MAF will implement in a step-wise manner the directions provided in the Clean Energy Package, notably regarding the requirement of the 70% rule[1].

Equally for Capacity Calculation under Flow-Based, MAF will follow the state-of-the-art rules and evolutions agreed at EU and/or regional level (CWE, CORE) for the calculation of the day-ahead flow-based domains at the time of each analysis.

b) In current Continental West Europe (CWE) Flow-Based Market Coupling, how is MinRAM taken into consideration in the DA assessment?

During 2018, CWE NRAs asked CWE TSOs to implement a 20% minimum Remaining Available Margin (MinRAM20%) for the day-ahead Flow-Based Market Coupling (FBMC). The agreed MinRAM20% level equals 20% of the maximum allowed power flow (Fmax), applied on each Critical Network Element and Contingency (CNEC). The feasibility of the MinRAM20% application

[1] Electricity Regulation trilogue compromise, Article 14 (7) "For borders using a coordinated net transmission capacity approach, the minimum level shall be 70% of the capacity respecting operational security limits taking into account contingencies (…)."

is verified by TSOs for each business day. The go-live of the MinRAM20% implementation was on 24 April 2018 in D-2 (for FBMC Business Day 26 April 2018)[2].

The MinRAM20% process is applied to provide a minimal flow-based domain to the market. It is applied using the "Adjustment for Minimum RAM" (AMR) attribute of each affected CNEC which guarantees a minimal RAM per CNEC.[3] The implementation of MinRAM20% provides increased capacity for commercial exchanges under FBMC.

The effect of MinRAM20% was taken into account as baseline assumption for the 2020 FB sensitivity performed in MAF 2018. Any further FB assessments to be performed in future MAFs will include the MinRAM20% feature, since it is currently operational in the capacity calculation of the FBMC framework.

Reliability metrics

Definition of the level of reliable capacity to comply with a predefined reliability standard, as well as the capacity surplus/deficit (MW).

ENTSO-E is working towards a novel complementary set of methods based on market modelling tools, to identify the levels of missing capacity in countries with adequacy issues, in order to comply with their national adequacy standard. This should offer an additional metric of adequacy level. At the same time, similarly to investigating the missing capacity, the overcapacity could also be studied in countries that do not present any adequacy issues but provide assumptions on future new built capacity. ENTSO-E aims to present results of these type of assessments in future editions of MAF.

[2] "Update on 20% minRAM implementation" Joint Allocation Office (JAO) webpage, http://www.jao.eu/news/messageboard/view?parameters=%7B%22NewsId%22%3A%22bbb7dbda-a15d-454c-9225-a8c8012bb828%22%7D

[3] "Documentation of the FB MC solution". September 2017, Version 2.1, http://www.jao.eu/support/resourcecenter/overview?parameters=%7B%22IsCWEFBMCRelevantDocumentation%22%3A%22True%22%7D

Sensitivities

The Stakeholders' requests for more sensitivities show the general interest in the MAF assessment. However, the number of sensitivities needs to match with the constrained scheduling of the MAF yearly publication. In addition, sensitivities should be carefully designed to avoid, whenever possible, arbitrary assumptions.

a) **Include sensitivities based on different reliability standards and electricity demand growth pattern due to decarbonisation.**

The methodology for defining reliability standards is a complex topic where ENTSO-E will be involved, as defined in the Clean Energy Package. ENTSO-E is, however, not responsible for explicitly setting any reliability standard. For each of the sensitivities that will be considered, the above-mentioned analysis between reliability standards and missing capacity is foreseen. Sensitivities might deal both with demand and supply assumptions, depending on the storyline (economic risk, decarbonisation, stress tests, etc..).

b) **Perform sensitivity of capacity decommissioning based on running hours of each generation type and per zone (e.g., setting a threshold of X hours, below which the Y power generation technology is not viable and exits the market).**

Running hours might not be sufficient to provide a complete overview of the economic viability of power plants. Simplified approaches to assess economic viability and, thus, potential capacity decommissioning will be investigated in future MAF editions.

c) **Test various levels of capacity exit based on scenarios and not a single bottom-up scenario.**

The MAF team aims to setup different sensitivities dealing with the "level of capacity exit" scenarios in the future. However, such type of scenarios can be setup in many combinations (e.g., faster nuclear exit in one region, lower in another, coal phase-out per region, demand side improvements, etc…). MAF as Pan-EU assessment will work on scenarios based on a Pan-EU consistent storyline, and to the degree that it is timewise feasible. In addition, national/regional studies which follow the same methodology and use the same data with MAF, e.g., in the PENTA adequacy study[4] and/or national studies, perform additional sensitivities focusing on the specific regions. This comprises a complementary approach which provides the most complete overview regarding "levels of capacity exit/entry".

d) **More detailed comparison with the results of previous MAF version.**

A comparison of the MAF 2018 and MAF 2017 results was presented in the latest MAF edition, highlighting the monitoring role of MAF. However, it should be noted that the foreseen improvements and evolutions in data and methodologies are considerable and might pose

[4] http://www.elia.be/en/about-elia/newsroom/news/2018/20180131_Second-regional-generation-adequacy-assessment-report-published

significant implications in drawing straightforward conclusions on the source of potential differences. To give an example, recent National Energy Policies with faster coal phase down will significantly change the expected adequacy landscape, even for the same target year. Moreover, updates of the input assumptions in one country, such as updates in demand, generation, storage or interconnectors, may have a regional impact, complicating the direct comparison and identification of the causes for any observed changes in the outcomes.

e) "What-if" analysis to investigate what happens if capacity markets were absent.

We acknowledge that this is an important topic which relates to the "missing capacity" assessment (cf. a) and the new Clean Energy Package. Assessing the impact of the absence of capacity markets is an additional sensitivity which would be interesting for future editions of MAF.

f) Extend simultaneous scarcity analysis to all regions in more detail.

The simultaneous scarcity analysis was well-received and, thus, we consider extending it in the future versions of MAF assessment.

g) Provide more detailed explanations of hydro modelling and its impact on the results (opportunity cost, water value, etc.).

Hydro modelling is a topic of increased complexity and importance on adequacy assessments. In MAF 2018 we have included a section which highlights and compares different approaches for hydro modelling and constrained optimization. The request for more detailed description of hydro modelling and its impact on the result is well-received by ENTSO-E and will be considered in our future publications.

Furthermore, the Pan-European Climate Database (PECD) of ENTSO-E is currently being extended to consider geographical correlations of hydro production with hydrological conditions, and will include more detailed information, being the result of the collaboration of ENTSO-E with hydro and data analysis experts. The new database will be used in the forthcoming adequacy assessment of MAF 2019.

h) Provide a detailed flexibility analysis.

It is indeed foreseen to perform a more detailed flexibility analysis, evaluating the flexibility adequacy and flexibility needs for the target years.

i) Perform a sensitivity analysis considering also the capacity that is out-of-market (e.g., strategic reserves) to monitor the level of security of supply when also those resources are dispatched.

MAF has focused so far on assessing adequacy based on statistical reliability standards that are used by most European countries and referring only to supply-demand balance within market operation. The use of strategic reserves belongs to a wider set of actions that are taken by TSOs outside the market and, thus, are considered out of the context of the MAF. This assumption might need to be revised as the definition of 'different types of CMs' in the new Clean Energy Package encompasses cross-border participation of Strategic Reserves.

Transparency and other topics

Better granularity of data publication with respect to generation types, NTC calculations and differences from one scenario to the other, fuel and CO2 prices, hourly demand data, inflows and classification of hydro units, input data of the FBMC (e.g., historical FB domains etc.).

ENTSO-E is making continuous progress towards increasing transparency and extending data publication, with respect to modelling input and output data. Further extension of the data publication is, indeed, considered by ENTSO-E subject to confidentiality restrictions. Lastly, it should be highlighted that, from ENTSO-E perspective, any published information is useful only if followed by a clear explanation and description, in order to avoid misinterpretations.

To this end, following consultation comments, ENTSO-E has already updated the initial data package to include NTC values, fuel and CO2 prices, Demand Side Response assumptions as well as hourly demand data for a selection of climatic years.

Other methodological improvements

a) Try to quantify the impact of having an optimized maintenance schedule on adequacy, as an optimal maintenance schedule might not accurately reflect reality.

Owners of all generation units are obliged to transparently publish the latest information on the unavailability of units in their fleet via official transparency channels (REMIT & ENTSO-E TP), over a three-year time horizon. However current experience shows that the data published by generation owners might change significantly for a time horizon of more than 1 year ahead (>1 year) of the extraction of the data from the REMIT channels mentioned, which is typically the range considered in the scenarios analyzed in MAF.

As the maximum availability of domestic generation during the critical periods for adequacy is crucial to maintain adequacy, ENTSO-E welcomes that owners of the generation units avoid all planned maintenance of their units during critical periods (e.g. winter periods). Therefore, the assumptions made in this study regarding the optimal maintenance schedule follow the aforementioned assumption.

b) Report the distribution of simulated outages, length and unavailable capacity.

The outage probability and repair duration is available in the following dataset: link (sheet “Other Data”).

c) Justify the levels of available demand response, being much lower than the references.

Demand Side Response (DSR) assumptions have been incorporated into the MAF process. However, current assumptions in terms of volume of DSR are subject to a significant uncertainty and are not consolidated or agreed at EU level. For instance, price bands for DSR activation should be based on forecasted expectations of future prices, rather than current prices. For future editions of MAF, ENTSO-E plans to add a new sensitivity with higher DSR availability and possibly battery management at consumer’s level.

d) Justify the relatively low number of electric vehicles in 2025 compared to other studies. The MAF 2018 has been performed based on previous ENTSO-E scenario storylines not fully aligned with respect to the most recent forecasts about the growth of electric vehicles.

The MAF assumptions are in strong link to ENTSO-E scenarios, prepared in coordination with Stakeholders. The scenarios should, indeed, consider the latest policies of each country. The yearly update of MAF aims to depict the best estimates for the underlying data according to the most up-to-date information available.