



# **Volume determination of the strategic reserve for winter 2021-22**

**Answer to the public  
consultation on methodology,  
hypotheses and data sources**

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# 1 Introduction

The consultation aimed to receive any comments of market parties on the methodology, assumptions and data sources to be used for the strategic reserve volume determination for winter 2021-2022. The consultation period was set from Wednesday June 3<sup>rd</sup> to Wednesday July 1<sup>st</sup> 2020, 18h00<sup>1</sup>.

Elia received 2 non-confidential answers to the public consultation from

- FEBEG
- FEBELIEC

totalling 24 questions or remarks.

The feedback and the answers by Elia Transmission Belgium ("Elia") are grouped in five categories in this document:

- Data and Assumptions;
- Publication of results;
- Market response;
- Flow based modelling;
- Total demand forecasting.

In order to facilitate the readability of this report, similar questions from multiple stakeholders are grouped and answered together.

All relevant information to this consultation can be found on the following Elia webpage:

[https://www.elia.be/fr/consultations-publiques/20200603\\_public-consultation-on-the-methodology-of-volumes-of-strategic-reserve-for-winter-2021-2022](https://www.elia.be/fr/consultations-publiques/20200603_public-consultation-on-the-methodology-of-volumes-of-strategic-reserve-for-winter-2021-2022)

Note that an additional consultation on the input data used for the calculation will be organized when this data will be available for Elia. This consultation will start at the end of August.

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<sup>1</sup>[https://www.elia.be/fr/consultations-publiques/20200603\\_public-consultation-on-the-methodology-of-volumes-of-strategic-reserve-for-winter-2021-2022](https://www.elia.be/fr/consultations-publiques/20200603_public-consultation-on-the-methodology-of-volumes-of-strategic-reserve-for-winter-2021-2022)

## 2 Questions on Data and Assumptions

1. *[FEBELIEC] On 3.2.1.1, Elia states that "the FPS Economy will consult the three Belgian communities to obtain forecasts for the installed capacity of onshore wind and photovoltaic production"; Febeliec presumes that the Regions are meant here, as the communities have no jurisdiction on renewable energy capacity? Febeliec is also surprised to see that "the forecasts for installed capacity are combined with the historical production files to obtain 34 different time series for the winter period and for onshore wind, offshore wind and photovoltaic production separately" and wonders whether these 34 years also refer to the 34 winters of the climatological data (1982-2016) and why not any more recent data is used, as technological innovations in wind and photovoltaics over the recent years have been increasing and impacting the production profiles of such new installations (increasing the produced energy per installed capacity), as Elia itself also indicates in many of its own studies. Febeliec would like to have more clarity and also would like to see the impact of this effect for the timeframe of this study, but also any other further-forward-looking adequacy assessments.*

FEBELIEC is indeed correct, the regions were meant here.

The Pan-European Climate Database (PECD) is a database developed by ENTSO-E which consists of reanalysed hourly weather data which are used to compute load factors for variable generation (namely, wind and solar). PECD datasets are prepared by external experts using industry best practices, thus ensuring a representative estimation of demand, variable generation and other climate-dependent variables<sup>2</sup>.

This database takes hence into account the expected technological improvements at several time to compute the load factors based on the historical weather data. The load factors of the different technologies are therefore well reflecting the technological innovations. Concerning this study and given the short timeframe analyzed, such technological improvements are less significant.

The PECD process is in the hands of ENTSO-E that has delivered an additional year every year once data is available (and processed by multiple providers).

2. *[FEBELIEC] On the hypotheses and data sources, Febeliec has some fundamental questions and comments. On the climatological data, Febeliec wonders why the winters 1982-2016 will be taken into account, but not the recent (known) winters of 2017, 2018 and 2019. While it could be argued that for winter 2019, a quarter after its end data on temperature might still not be available (which seems weird, as most of this data is updated almost in real-time), it is very strange that the winters of 2017 and 2018 are not included either. Taking into account that the European Resource Adequacy Assessment methodology proposed by the TSOs (including Elia) refers to climate change as a driver for any forward-looking adequacy assessment, and taking into account the conclusions of a study from the Vrije Universiteit Brussel (Winter is leaving: Reduced occurrence of extremely cold days in Belgium and implications for power system planning; 2020), known to Elia, Febeliec most strongly regrets that Elia*

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<sup>2</sup><https://eepublicdownloads.blob.core.windows.net/public-cdn-container/clean-documents/sdc-documents/MAF/2019/MAF%202019%20Appendix%20%20-%20Methodology.pdf>

*has not done a better job at using the most relevant data by updating the dataset. Indeed, the VUB study's conclusions clearly stipulate that "there is a high degree of co-occurrence of simulated persisting LOLE events with extremely cold days and the probability of such extremely cold days has shown robust decreases across Belgium (and its neighbouring countries) since the 1980s". While indeed the study does not exclude such events, and their impact on the system, it clearly states that their occurrence significantly declines over time. Febeliec in the very strongest possible way wants to state that the Belgium adequacy criterion already allows to cope with such situation, as Belgium has a double criterion, including a P95 LOLE of 20h instead of 3h in general, meaning that the criterion already copes with a once-in-twenty-years event. As such, Febeliec in the strongest possible way urges Elia to apply this criterion for the diminishing probability of a severe winter in its assessment and thus exclude the very skewed effects of a very limited number of winters in the decade 1982-1990 from the base case scenario. This is linked to Elia's methodology, not approved by Febeliec, that next to the base case scenario also foresees sensitivities, for which Elia uses itself a "high impact low probability scenario", which thus would be more fitting for the climatological impact of winters more than 30 years in the past than the base case scenario.*

For questions related to the methodology and assumptions, more details on the ENTSO-E climate database assumptions and data can be found on the latest MAF study page<sup>3</sup>.

Regarding considerations of climate change and climate years for adequacy studies, some elements of answer can be found in the answer of ENTSO-E to the public consultation of proposed ERAA methodology<sup>4</sup> (April 2020) and in the latest PLEF generation adequacy assessment<sup>5</sup> (May 2020). It results from those that:

Incorporating effects of 'climate change' are not straightforward and needs careful analysis as it is key to capture the different probabilities of occurrence without losing in representativeness and confidence of results;

Regarding the mentioned study from the VUB. Elia would like to highlight two points. First, as TSO, Elia does not contest the results of the study regarding the tendency of climate change and the correlation between cold periods and the occurrence of LoLE-hours. We are indeed not climate experts, but consider ourselves however as adequacy experts. And it is exactly the link between those two domains which requires further analysis. Elia believes it requires further analysis and alignment with other TSO's and Member States to integrate the global and thus European effect of climate change on adequacy. Unilaterally making assumptions, without coordination with Member States could lead to incoherent results, having significant impacts on the adequacy of the countries deviating from European practices. This would be particularly the case for Belgium, given the high and structural dependence of imports for its security of supply.

Indeed, would the lower frequency of occurrence of cold spells in Europe lead to a lower need for capacity, without reducing the SoS standards and thereby the risk profile of the country, this could lead in the long run to less installed capacities in many European countries, with as a result less excess of capacity available that can be used by countries structurally dependent on import like Belgium. Without an in depth

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<sup>3</sup> <https://www.entsoe.eu/outlooks/midterm/#download>

<sup>4</sup> <https://consultations.entsoe.eu/entso-e-general/proposal-for-european-resource-adequacy-assessment/>

<sup>5</sup> [https://www.elia.be/fr/actualites/communiqués-de-presse/2020/05/20200520\\_third-regional-generation-adequacy-assessment-report](https://www.elia.be/fr/actualites/communiqués-de-presse/2020/05/20200520_third-regional-generation-adequacy-assessment-report)

investigation and a thorough European assessment it is not possible to best guess if (and if so to what extent) the 'positive' impact of the lower frequency of cold spells would outweigh the 'negative' impact of the reduced availability of generation in neighboring countries needed for Belgium's import (as Belgium is structurally dependent on import) on Belgium overall capacity need. Such European investigation and assessment are not available yet.

ENTSO-E is currently working on improving its climate database. This process will take a certain time as it is not straightforward. This improved database will not be ready for the Strategic reserve report (due in November 2020). Therefore the current database will be used for this year's strategic reserve study.

3. *[FEBELIEC] For the hydroelectric power stations, Febeliec refers to its previous comments regarding 34 historical years, and would like to have confirmed that this is also the period 1982-2016 and if so, why more recent data is not taken into account.*
4. *[FEBELIEC] On 3.2.2.4 of the sensitivity of load to temperature, Febeliec is surprised to see that now 35 historical climate years (as opposed to 34 before) are used, yet that this leads to only 34 different hourly load profiles for the analysed winters. Febeliec also reiterates its request to clearly indicate which years are investigated and in case, as mentioned before, the most recent years up to and including 2019 are not considered by Elia, why this would be the case and why years almost four decades in the past are considered more relevant by Elia than the most recent years. Furthermore, Febeliec has some issues with the statement by Elia that it has to "keep consistency with the European adequacy assessments", yet does only seem to apply this approach in a consistent way and in any case does not follow the same approach towards validation of its methodology and data, a.o. regarding regulatory approval as is the case with the European Resource Adequacy Assessment or the removal of the use of a high impact low probability scenario.*

The current database used within ENTISOE contains 35 years from 1982 until 2016, from January to December. As the adequacy studies performed by Elia are focused on winters only 34 "winter years" are available at this stage.

Given that nor the methodology for the ERAA is yet approved by ACER, nor it was already used in an ERAA, the latest 'European adequacy assessment' corresponds to the 'ENTSO-E Mid-Term Adequacy forecast report (MAF)'.

5. *[FEBELIEC] On planned outages of interconnectors, Febeliec is surprised to see that planned outages of interconnectors are überhaupt considered during winter, if Elia were to consider such period as a potential concern for adequacy in Belgium. As Elia is shareholder in every interconnector in Belgium, Febeliec would assume that Elia would avoid any unplanned outages during the winter period, especially during periods when the Belgian system would be under stress, and wonders to what extent the applied unavailability factor is not overestimating the unavailability during winter, as it also takes into account planned outages which should resumable under the above premise only happen during non-winter periods. Febeliec also takes note of Elia's comment on the "bathtub curve" and while it has many questions regarding the actual occurrence of such curve, Febeliec strongly wants to indicate that if such curve would exist, in any case Elia in the framework of all its other adequacy assessments, especially those looking further ahead, should then adapt its methodology to take into account the lower unavailability of interconnectors in later years (e.g. 2025) when experience*

*should make that curve bottom out, thus leading to a better availability of interconnectors on average, which should then duly be taken into account in all those assessments (as well as future strategic reserve assessments)*

Elia would like to thank Febeliec for this comment, this text should be updated, only forced outage rate were meant in this paragraph as suggested maintenance on interconnector will not be planned during winter. The outage rates for interconnector are assessed every year within ENTSOE in order to come up with default FO rate. If any TSO has delivered a value differing from the default one this former will be preferred over the later<sup>2</sup>. Elia would also like to remind that explicit outages on interconnectors are only applied on HVDC links between 2 synchronous zones (the other outages are dealt within the flow based domain calculation).

6. *[FEBELIEC] On the thermal production with a CIPU contract, Febeliec would have liked to see a more in-depth analysis of historical availability rates. With respect to planned unavailability, Febeliec reiterates a question it has already asked when the results for the strategic reserve for winter 2019-2020 (and the two following winters) were presented, i.e. to what extent this should be covered by the system and society and not by individual BRPs. If for example the operator of large generation facilities announces to simultaneously make several plants unavailable at the same time, it should be duly and clearly investigated to which extent is this acceptable, to which extent such situation is to be covered by the system and paid by all consumers and to which extent this could lead to intentional actions and thus perverse effects, where such announcements of planned unavailabilities could lead to a desired outcome. In any case, Febeliec in the strongest possible way wants to reiterate its position that the BRPs are to cover all planned unavailabilities in their portfolios and that unplanned unavailabilities are only to be covered by the TSO for the residual imbalance, for which Febeliec has always supported all efforts to provide correct (price) signals.*

The FO rate considered for the Belgian thermal production units with CIPU contract is updated yearly to reflect the historical availability rates.

With respect to the question concerning planned unavailability during winter the planned outages are extracted from REMIT and incorporated as deterministic maintenance profile in the Antares model for short term studies.

Finally, Elia acknowledges the key role of BRPs in the current electricity system applicable in Belgium. This role is embedded in the Federal Electricity law and well elaborated in the Federal Grid Code. Elia obviously respects this legal framework, complemented with the regulatory and contractual framework. In doing so, Elia always strives towards limiting the risks towards adequacy, amongst others in terms of unavailability planning. The existence of a strategic reserve mechanism in the Belgian market design inherently however implies some kind of socialisation of resource adequacy.

7. *[FEBELIEC] Concerning the balancing reserves, Febeliec to a large extent follows the reasoning by Elia, but reiterates its comments on the use of the strategic reserve (or other (slow-start) units) for balancing purposes in extreme situations, such as high impact low probability scenarios, meaning that no additional balancing reserves need to be contracted additionally as the strategic reserve together with all other last resort measures in the balancing timeframe should be sufficient to cover the needs.*

As already stated in previous public consultations, national reserves are used to maintain the balancing of the grid and should not be taken into account when

performing adequacy studies, which is also consistent with European studies, as a balancing issue could be concomitant with an adequacy issue.

8. *[FEBELIEC] On the hypotheses for the other simulated countries, Febeliec reiterates many of its comments it has already made numerous times during previous consultations and discussions on Elia's adequacy assessments, including those for strategic reserve. Febeliec does a.o. not see a reference to the European Resource Adequacy Assessment, while Elia refers to bilateral contacts, without specifying which contacts and how these are impacting the outcome, the latest PLEF adequacy study, which as already indicated at numerous occasions can hardly be considered a balanced report as most market stakeholders, with the exception of producers who have a clear incentive towards increasing the volume of any capacity remuneration mechanisms such as a.o. a strategic reserve, are not allowed to participate in the discussion and provide their comments, national reports, without indicating which reports nor how they are impacting the outcome of the analysis (Febeliec here also strongly wants to suggest looking at the latest economic forecast from the Belgian FPB, if this would not be the case already) and other statistics, without mentioning any sources, thus clearly showing a large issue towards transparency and the possibility to validate and reproduce the outcome and conclusions from Elia's analysis.*

As stated in question 4, given that nor the methodology for the European Resource Adequacy Assessment (ERAA) is yet approved by ACER, nor it was already used in an ERAA, the latest 'European adequacy assessment' corresponds to the latest published 'ENTSO-E Mid-Term Adequacy forecast report (MAF)'.

Concerning data from neighboring countries, Elia strives to use the most updated data available for its Strategic reserve study. Hence Elia uses the most recent ENTSO-E database (collected amongst TSOs) which can be complemented with national studies or relevant new information from the market/TSOs/... as it is key to have the most up-to-date dataset to perform the study. The information and sources used will be detailed in the report.

### 3 Questions on the Publication of Results

9. *[FEBELIEC] Febeliec also proposes to include other sensitivities, not in the least a sensitivity linked to the impact of Covid-19 (a clearly high probability (100%) and high impact event as compared to other sensitivities Elia takes into account) and its impact on a.o. total electricity demand in Belgium, while Febeliec also wants to voice its issues with including French generation as a pivotal element in the adequacy assessment, as France has an operational CRM and thus by definition is to be adequate (unless Elia could quantitatively indicate that the French CRM would not deliver and that both the French TSO and regulator have not implemented solutions for French adequacy).*

Elia is only looking at what capacity would be available in France at the three time horizon studied. This capacity will be based on the data and assumptions provided by RTE in the dataset of the Mid-Term Adequacy Forecast and can be complemented with more recent information from the market or updated national studies. It is neither foreseen to look at the French security of supply nor to assess the performance or the choices made for calibration of a CRM abroad in the framework of the Strategic Reserve study.



This sensitivity on the nuclear availability in France is proposed in order for the Belgian authorities to cover themselves against lower nuclear availabilities in France as also experienced in the most recent winters. It is similar to the sensitivity used during past years for the calibration of the strategic reserve and follows entirely the decision taken by the EU Commission on the approval of the strategic reserve mechanism and the commitments taken by the Belgian State in this context.

Note that this can be the observations in the most recent 4 winters where the unavailability of the French nuclear fleet significantly increased (compared to the historical trend prior to winter 15-16) tend to confirm the relevance of such sensitivity. This observation is recently again confirmed for the winter to come. Comparing the forecasted unavailability before the winter with the realized unavailability shows that the forecasts are under-estimating the unavailability of the nuclear fleet. This trend was confirmed by RTE (the French TSO) and can be clearly observed for last winter (W19-20) or already for the winter to come (W20-21) where the planned and the realized availability show a difference of 6 GW on average over the winter

Moreover, there are several indications that such trend is likely to repeat itself in the future:

- The nuclear fleet is ageing and several reactors need longer downtimes for their '4th Decennial inspections';
- More stringent safety rules might require additional unplanned works/upgrades during those downtimes;
- Common mode failures (e.g. issues found in one reactor which can affect more than one nuclear unit due to their similar design) are likely to occur as observed in the past.

*10. [FEBELIEC] Febeliec regrets that the consultation does not cover any potential sensitivities that will be analysed while Febeliec also regrets that for the low probability high impact scenario that is referred to, Elia has not indicated which would be the parameters that will be applied for this sensitivity as Febeliec has indicated for the previous exercise (as well as other related exercises) that an increase in the height of the impact (e.g. increase of nuclear unavailability from 1GW to 1,5GW as a result of the unavailability of several nuclear plants operated by the incumbent producer in Belgium during one exceptional winter) leads to an increase of the need for strategic reserve and thus cost for consumers, while it is unclear to what extent such scenario is relevant towards the future (very low probability as compared to low probability) and to what extent the (recent) past has not shown that under exceptional circumstances mitigating solutions have been found within the market that were not identified before (relating also to the previous comment on the underperformance of the methodology for the assessment of market response). Moreover, Febeliec, as already indicated, would like to see how the impact of the Covid-19 crisis, a high impact and high probability (100%) scenario, will be taken into account, especially taking into account official data and reports that are taking into account the impact of this major health crisis, such as a.o. the FPB.*

The 'low probability – high impact scenario' aims to capture unforeseen events of large scale (+ 1GW) as have been observed in the previous winters. This approach has been approved by the European commission DG competition (in the context of the state aid evaluation of the strategic reserve mechanism). While one can debate how relevant historical outages are towards future estimations, it is a fact that the real Belgian adequacy situation for winter 2018-19 and winter 2019-20 are worse than estimated

in the 'low probability – high impact' volume determination of November 2017 and November 2018 respectively. Elia believes the approach holds its merits in identifying, apart from a base case volume need (or margin), also an extreme case volume need (or margin). It is then up to the Minister to decide how much should be contracted.

The impact of Covid-19 will be taken into account in the total demand based on the latest economic projections from the authorities (see section 6).

*11. [FEBELIEC] On the appendices Febeliec also wants to provide a short and non-exhaustive overview of comments, also referring to its numerous comments on these in previous years which still have not all been addressed. On the adequacy criteria, Febeliec wants to refer to the on-going European discussion on the determination of the adequacy criteria, but also to its previous comment on the LOLE95 of 20 hours which can be applied for severe situations such as those referred to in Elia's high impact low probability scenario, instead of only applying the LOLE 3 hours criterion, even in such situations. LOLE95 is indeed referring to "a statistically abnormal year", thus in its design conceived to cover high impact low probability scenarios. With respect to the SGR and SDR assumed to be available during winter, with an assumption never to undergo planned maintenance during the winter, Febeliec refers to its comment on the interconnectors. Febeliec also wants to reiterate its position, already also expressed in previous years, towards the methodological approach of increasing the margin and/or strategic reserve volume by blocks of 100MW in the iterative process for the determination of the potential required volume. For Febeliec, a finer granularity than 100MW should be used, as even the lack of 1MW under the current approach would immediately lead to a need of 100MW additionally. Applying a finer granularity would avoid sourcing unneeded volumes. Alternatively, an approach could be implemented where very marginal transgressions of the LOLE criterion do not automatically lead to an increased contracting of strategic reserve volumes, through the application of a deadband, taking into account the multiple layers of sensitivity already applied by Elia in combination with low probability, high impact scenarios, which already skew all the results towards a very conservative approach. For Febeliec, it should in any case be avoided to increase the cost for the grid users unnecessarily by following a much too conservative approach.*

Elia wishes to remind that the P95 or the average of 3 hours is calculated based on a set of Monte-Carlo years. Indeed, it must be looked at the average obtained from the Monte-Carlo set for a specific scenario: you have a set of Monte-Carlo years which has to be compliant with the 3 hours criterion and the P95 results obtained from the same Monte-Carlo dataset must be compliant, at the same time, with the criterion of 20 hours. Following the legally set reliability standard, both criteria have to be looked at when looking at the output of the Monte-Carlo simulations.

Elia has already shown that the statistical convergence of the model prohibits the use of a block smaller than 100MW<sup>6</sup>. Indeed, too many parameters impact the end result, that using a block less than 100MW would break reproducibility of the outcome. Elia has shown this by means of an extensive analysis, involving 5000 Monte Carlo year simulations and corresponding LOLE and P95 boxplot analysis. This result was in line with earlier European findings. Elia does not apply a deadband as the needed volume,

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<sup>6</sup><https://www.elia.be/en/users-group/wg-balancing/taskforce-strategic-reserve/2018-07-09-meeting>

when it has to be contracted, is a fixed number and no ambiguity should exist when the analysis is complete.

12. [FEBELIEC] Febeliec would most strongly also like to get some clarity on the relation between this exercise on the dimensioning of strategic reserve compare to the previous exercises, especially for those winters covered by several calculations, the link with the Elia Adequacy and Flexibility study of June 2019, the MAF study Elia refers to, the adequacy assessment Elia is presumably to carry out in the framework of a potential introduction of (another) CRM in Belgium and the (future) European and regional resource adequacy assessment that will have to be. It is clear that all these studies will analyse system adequacy in Belgium, but with different scope and time horizons as well as governance. However, it is unclear to what extent the current study with respect to the strategic reserve 2021-2022 is modified compared to the study for the strategic reserve for winters 2019-2020 and 2020-2021 in light of the discussions of Elia with other stakeholders, both market and non-market, on the other study currently being developed and the new or improved insights resulting from these (a.o. on total demand growth or the volume of market response).

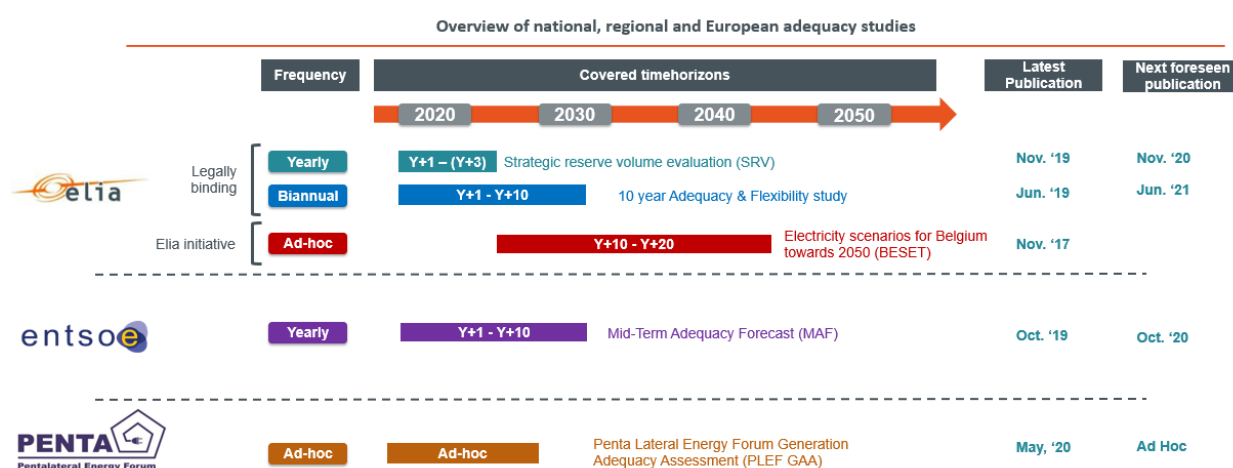


Figure 3-1

Elia strives towards maximum consistency between its different studies. The adequacy assessment methodology is in line with European studies. The reasons for discrepancies between subsequent studies are either due to input data or methodological changes which are both consulted on in the context of the strategic reserve. These improvements could be explained by the following reasons:

1. As shown in Figure 3-1, the time horizons of Elia's studies differ. Short term and mid-term studies may require different approaches;
2. Input data are the same for horizons covered by 2 or more studies. Nevertheless differences may occur due to the different period of data collection. Elia performs indeed a data collection for every study. New market information, driven by legislation (e.g. CEP), or national policies (e.g. German coal phase out), are always incorporated as soon as possible;
3. Evolutions that allow for a more detailed modelling of specific market parameters are preferred over older methods, that would ensure backwards compatibility. Different research questions beg for different approaches.

One must understand that Elia does not perform an individual assessment of each methodological or input modification and can only provide insights on the impact of the updates when comparing the results of several studies.

13. *[FEBELIEC] Moreover, Febeliec would like to reiterate its request to indicate very clearly in case of limitation of cross-border flows, in this as well as other adequacy related studies, whether this is the result of either lack of cross-border interconnection capacity or lack of energy in interconnected markets, as this is very valuable information and will become of much more significance in the future when the Clean Energy Package will be fully implemented. On 3.4.2.3, Elia mentions that "changes to historical domains will be applied when relevant" and Febeliec wonders who will determine the relevance and compared to what the relevance will be assessed.*

This was relevant with the previous framework using historical domains. With the new framework used within Elia this is no longer relevant as the domain will be based on the representative grid of the target year and will hence take into account international grid reinforcements.

## 4 Questions on Market Response

14. *[FEBELIEC] On Market Response, Febeliec would clearly like to insist that it has never agreed with the methodology for market response as it was developed by E-Cube for Elia, but rather that it was overruled by Elia and that Elia has chosen to proceed with this methodology despite comments and concerns from Febeliec. Febeliec appreciates that efforts are made to improve the proposed methodology yet Febeliec remains strongly of the opinion that the (preliminary) results for market response (which is broader than demand side response) presented as outcome of this methodology in the framework of the previous adequacy assessments conducted by Elia clearly show that the methodology leads even for historic periods (winter 2018-2019) to lower volumes of market response than have been announced and observed in the system. This continues to worry Febeliec as a methodology that is not even able to backtest historic data results in a wide range of questions on its overall validity and performance. While the document states that "market response is a crucial dynamic parameter when difficult situations arise on the electricity grid", Febeliec wants to insist that market response and demand response not only provide value to the system under such conditions but at every point in time contribute to better market functioning in general. Febeliec as already indicated numerous times did not approve the proposed methodology nor the process to come up with the proposed methodology (e.g. specifically referring to the 2015 questionnaire with non-representative results due to limited scope of the consultation). While a process was put in place to discuss a possible methodology, the outcome of that process has never been formally approved, in any case not by Febeliec and to its knowledge neither by any official body, and as such all considerations by Elia and E-Cube in their approach are solely the choice of those parties. When the report mentions that "based on the workshops and input from consultants, it was concluded that the entire available market response can be taken into account by following the threefold approach set out below", Febeliec wants a clear indication by whom this was concluded as Febeliec did most definitely not make such conclusion and this should thus also be clearly reflected. Also referring to prices above 150€/MWh as exceptionally high is not in line with the position of a.o. Febeliec, as such*

*prices are only a fraction of market cap prices in the day ahead, intraday and balancing markets and as such do not at all reflect scarcity conditions in the system. While the document states that irrational behaviour by stakeholders is not taken into account in the study, Febeliec can only observe that rational behaviour, such as BRPs ensuring not to be exposed to potentially very high imbalance prices, as could be clearly observed a.o. in winter 2018-2019, is not taken into account by Elia either. Yet the document states that market players will anticipate events with high prices (correlated to increasing scarcity), which Febeliec also assumes in particular to be the case for extreme situations. In any case the last step of the methodology developed by E-Cube for Elia entails a sanity check, but Febeliec regrets that this step is continuously overlooked and that as a result no lessons learned are drawn nor the methodology adapted in order to find a solution that better captures a.o. historically observed market response volumes. Febeliec strongly urges Elia to perform this sanity check and if the results would not be in line with the past (as is the opinion of Febeliec), either Elia should yet again revise and improve the methodology or at least use any higher value that could have been observed in the market as an underlimit for its forecasts. Moreover, Febeliec also to refer to its aforementioned comment on the impact of electrification on system peak (e.g. in case of electrification through more electric vehicles or installations with buffering effects such as heating and cooling).*

15. *[FEBELIEC] On 3.2.3 market response, Febeliec very strongly wants to react towards the statement by Elia "as agreed in the context of the Implementation Strategic Reserve task force during 2017", as while the statement that a yearly rerun of the analysis will be done seems indeed a very sound approach, Febeliec has explicitly and at multiple moments in time, including task force meetings and public consultations, stated that it did not whatsoever approve nor agree with the approach proposed by Elia as it still has according to Febeliec some fundamental issues regarding a correct estimation of market response in Belgium, both historically and forward looking (Febeliec refers a.o. to its comments on the market response volumes that were available in winter 2018-2019, yet cannot be reproduced by the methodology, thus indicating the fact that the applied methodology by Elia results in at best a gross underestimation of the true volume of market response in the Belgian system (see below also for further comments on the proposed methodology).*

Elia takes note of the views of Febeliec. Winter 2018-19 was unprecedented in terms of Belgian adequacy situation, leading to higher prices on EPEXspot in general, but also to exceptional price peaks from September to November 2018 for Belgium (as analysed by CREG<sup>7</sup>). Having applied alternative approaches in the past, in the 2017 Market response working group, this methodology was thoroughly discussed and finally retained as it takes into account observable price-driven market response. It was the preferred option of the 8 proposed in the E-cube workshops. Elia wishes to remind that in the past alternative methods (e.g. based on surveys) have been used, but they have been abandoned based on feedback received and a potential 'respondent bias' in the outcome. The rationale behind the current method and the assumed underlying rational behaviour still apply according to Elia. Elia is open to consider any practical and concrete suggestions of enhancing this quantified analysis.

For the current assessment, the methodology has been enhanced to capture block bids as well as the addition of a new NEMO (i.e. Nordpoolspot) in order to reflect the current reality and the bidding behavior of the market players.

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<sup>7</sup> <https://www.creg.be/sites/default/files/assets/Publications/Studies/F1950NL.pdf>

In order to capture future evolutions of the market response, the different evolution such as smart-meter rollout or the 'Internet of Energy' project are taken into account to justify different growth scenarios.

16. *[FEBELIEC] On the way ANTARES takes into account demand response, Febeliec regrets that the tool has still not developed a better way to approach demand response other than modelling it as "very expensive generation units", despite many comments about this in recent years. Febeliec would also like to stress that Elia is referring here to demand response, whereas actually market response should have been used, unless Elia is incorporating all non-demand response elements of market response elsewhere in the model. If the latter would not be the case, this would imply an underestimation of market response in the model.*

Elia confirms that it refers to market response. Elia would like to clarify that it does not model them just as "very expensive generation units", but rather mimics the true market behaviour of such technology. The modelling of market response fully considers the input from the E-Cube study:

Elia model considers 7 different categories of MR each as a share on the total volume of market response, and each with a different cost;

Each of these categories is modelled as a "technology unit" in the model subject to a capacity constraint plus maximum duration constraints and maximum number of activations per week.

This modelling approach is also the one used by ENTSO-E.

## 5 Questions on Flow based

17. *[FEBELIEC] On flow-based modelling, Febeliec continues to wonder, despite already having formulated this exact same comment in the framework on the consultation for winter 2020-2021, what will be the (quantitative) impact of the incorporation of ALEGRO into the flow-based domain, a question Febeliec also already voiced in 2019-2020, yet this aspect remains unclear, despite ALGERO entering into service presumable in Q4 2020. The same applies to the HTLS upgrades on certain parts of the 380kV grid. On the hypotheses for interconnectors, Febeliec regrets that based on the consulted document and despite numerous requests for this in the past, it is still impossible to evaluate the impact of the Alegro interconnector. On the evolution of simultaneous import capacity restrictions and cross-border import in general, Febeliec is surprised to see that Elia still applies a restriction of 6500 MW for reasons of "adequate voltage regulation capability of the Belgian system", while at the same time Elia is currently rolling out new mechanisms and products in exactly this domain and Febeliec would have expected that the on-going developments and roll-out would at least have had a positive impact on the import capacity restriction (if not, it should be investigated if those costly evolutions should be continued).*

The scope of the strategic reserve study is to analyse the security of supply on Belgium for the next year and not to provide an interconnection assessments. This request is therefore out of scope of the current study. The added value of ALEGrO was already determined within the SPAIC process.

From the go-live of ALEGrO, scheduled end of 2020, a maximum import of 6500MW can be attained. After the commissioning of voltage control infrastructure, which is

expected by end of 2022 the limit can further be increased to 7500MW. This restriction is hence evolving along the infrastructural investments.

18. *[FEBELIEC] Moreover, Febeliec would like to state very strongly that the Clean Energy Package has entered into force, including the provision of minimum 70%minRAM cross-border capacity that has to be given to the market. Even with derogations and action plans (and the obligation to respect 20%minRAM in CWE), Febeliec hopes that this will be included in the analysis for the following three winters and would like Elia to detail how this has been done and what the impact is on the adequacy assessment.*

19. *[FEBEG] It should be clear in the methodology what are the assumptions that are taken in terms of cross-border capacity given to the market for the Day-ahead timeframe where EUPHEMIA is applied. The recent entry into force of the Clean Energy Package imposes 70% of cross-border capacity to be made available for commercial trades. Most of the TSOs and Member States have requested either a Derogation or an Action Plan. Those should be properly represented in the model used by Elia for assessing the volume of the Strategic Reserves.*

The exact minRAM that will be considered will be consulted on during the input data consultation that will happen by the end of August. This consultation will indeed try to reflect the trajectory implied by the different action plans and derogations submitted by the TSOs. Nevertheless the framework only allows to perform a minRAM allocation per country.

20. *[FEBELIEC] On the flow-based method, and notwithstanding previous comments on this such as the impact of Alegro, Febeliec also wonders what will be the impact of ongoing evolutions in CWE and CORE, including a.o. the go-live of CORE FBMC in 2021 as well as all other expected evolutions.*

Elia has worked on an improved method to take into account the different evolutions planned in the cross-border capacity calculations: the CEP rule, the extension of the flow-based perimeter, etc. Elia is to date the only TSO in Europe (to our knowledge) that takes those evolutions into account in adequacy studies. The methodology to calculate available cross border capacities is an improvement from what was used in the PLEF study (and Elia's 'adequacy and flexibility study of June 2019') as it will integrate more bidding zones to the 'flow based' capacity calculation zone. This adds complexity to the calculation (as it adds more variables and constraints). The aim of this study is not to assess the impact of the different market rules evolutions but to estimate the needed volume of strategic reserve required in Belgium (if any), for a given winter and taking into account the expected data, rules, ... for that winter.

## 6 Questions on Total Demand Forecasting

21. *[FEBELIEC] On the total demand growth, Febeliec appreciates that Elia has tried to address the concerns related to the HIS Markit data and has proposed a new methodology. However, Febeliec has not yet seen, despite some workshops and discussions, whether the proposed approach will lead to a better outcome; with the side comment that for the analysis in the framework of a strategic reserve, only looking forward one year to three maximum, the model could potentially provide some useful primary insights as presumably most fundamentals wouldn't change over a short time*

*period. However and exactly in 2020, the world and Belgium have been undergoing (and still are) the worst economic crisis of recent history (Covid-19) and as such even the very recent past will presumably not be the best precursor for the (near) future as both the starting point and the growth path will have been substantially modified. Febeliec will come back to this in more detail below. Nevertheless, the impact of Covid-19 is completely absent in the proposal of Elia and it is also unclear how and even überhaupt if this can be mimicked with the proposed total demand growth methodology (that for the record has not yet been finalised and in any case not validated by Febeliec).*

The starting point is updated given the best knowledge available, i.e. Elia total load for 2019.

It is important to recall that the proposed methodology determines the linear regression between macro-economic indicators (income and added value) and sectoral activity (residential, tertiary, industry) on past data. As indicated in the methodology description, the slope of this linear regression is found to be positive for most considered activity variables, e.g. the tertiary buildings surface is increasing with the tertiary added value.

The methodology computes projections for the sectoral activity (which in turn allows to compute electricity consumption) based on linear regression and macro-economic projections. Hence, if macroeconomic projections do forecast a slump, this will be reflected on the sectoral activity as well given the positive slope of the regression. Thus, the activity will shrink and the electricity consumption as well. These trends were already presented in a 'pessimistic scenario', with industry production levels equal to the ones observed in 2009 during the economic crisis.

The final figures that will be published for the public consultation in August will be based on the latest projections from the Federal planning Bureau, accounting for the COVID crisis. These projections do represent a general recession in 2020, with a progressive recovery up to 2023. This is reflected in the activity and electricity consumption.

As a conclusion:

- No forecasting methodology is 100% accurate, and the current one, which should be seen as a starting point, has certainly room for improvement. Elia and Climact want to iteratively improve this forecasting methodology over time;
- Nonetheless, given the link that is made with macro-economic indicators, the electricity forecast is only as good as the available macro-economic projections. If the Federal Planning Bureau projections are to be challenged, Climact would be glad to discuss about it with Elia stakeholders.

*22. [FEBELIEC] On the Climact study regarding total electricity demand forecasting, Febeliec appreciates that Elia is undertaking endeavours to provide a better approach for determining future total electricity demand in Belgium. Febeliec is interested to see what the outcome will be, and also wonders how the Covid-19 crisis will be taken into account, to which is specifically referred in the document at multiple occasions. Febeliec refers in this framework to the latest report from the FPB, as Climact also refers to the FPB as a relevant source for macro-economic data. Febeliec is in any case relieved to see that, as compared to the rest of the methodologies applied in the framework of this public consultation, at least reference is made to the existence and*



*potential impact of the Covid-19 sanitary crisis. On the methodology itself and as already indicated during the discussions with Climact and Elia and other stakeholders, Febeliec wonders to what extent the proposed methodology, even with the latest improvements, will be able to grasp the impact on total electricity demand in Belgium, in the short term, medium term and long term framework, with the first one being the most relevant in the framework of this consultation, but the latter also very relevant in the framework of other adequacy assessments. A.o. the impact of import/export and the trade balance on the outcomes of the model are as of yet still unclear, while for example (much) higher electricity prices in Belgium could lead to substitution of local production of goods towards imports and thus lowering the demand for electricity in Belgium while not necessarily impacting to the same extent a.o. overall GDP numbers. When looking at the macro-economic variables taken into account by Climact (Table 1), Febeliec wonders if those would be sufficient to ensure that all aspects are covered, in particular for example the impact of Covid-19 on electricity demand in Belgium. Moreover, in 2.4.1 Climact states that "to establish a link between a macroeconomic variable and a BECalc variable, a linear regression analysis is performed between their historical values", which makes Febeliec wonder how this will be conducted in light of the macroeconomic impact of Covid-19 (and also which years will be considered the relevant years for a macroeconomic analysis); Febeliec for this also refers to the electricity demand data provided by Elia, shown above, which show that if such analysis were to be conducted over the period 2000-2008, the expected value for 2009 would have been greatly exaggerated, as would have been all further years. Moreover, when looking at the period 2010-2019 (so even after the financial crisis of 2008-2009 itself), the trend line is decreasing, with in 2019 (pre-covid-19) even a sharp decline, not shown by any previous Elia estimations (nor for any of the previous years for that matter, where Elia always predicted increases in total electricity demand in Belgium). Febeliec in this light is very pleased to see that Climact has conducted some backtesting of the methodology on years 2016-2017, yet wonders whether the Climact model would have been able to predict the 2019 decrease (pre-covid-19). Febeliec yet wonders to what extent the model can cope with the Covid-19 crisis and thus wonders to what extent the backtesting of the Climact model also results in robust results for the period 2007-2010 for which all historical data is available. Febeliec would not be surprised that the model would perform less well and would thus also perform less good for 2020 and all future years. While it cannot be blamed to the model that it is unable to cater to crises such as the current Covid-19 crisis, it is very important then to ensure that the final input to the Elia adequacy assessments at least has a very thorough reality check, in order to avoid that total Belgian electricity demand is overestimated and thus also any potential future adequacy risk in Belgium, which could lead to unduly and unnecessary high costs for consumers. On the illustrative results for years 2021-2023, Febeliec will not comment until the impact of the Covid-19 crisis is included, while the new projections from the FPB are now available. As stated, they are only to be seen as an example without any relevant quantitative results for the assessment by Elia. Lastly, Febeliec would clearly like to stress that it has not agreed with the methodology at this stage and that it is looking forward to all improvements in order to see whether it would be able to approve it.*

This suggestion to include the trade balance in the considered economic indicators makes a lot of sense. The model contains this variable. Hence, a link between electricity price and trade balance could be specifically assessed on past years to forecast the trade balance given electricity prices forecasts. This element could be part of future improvements.

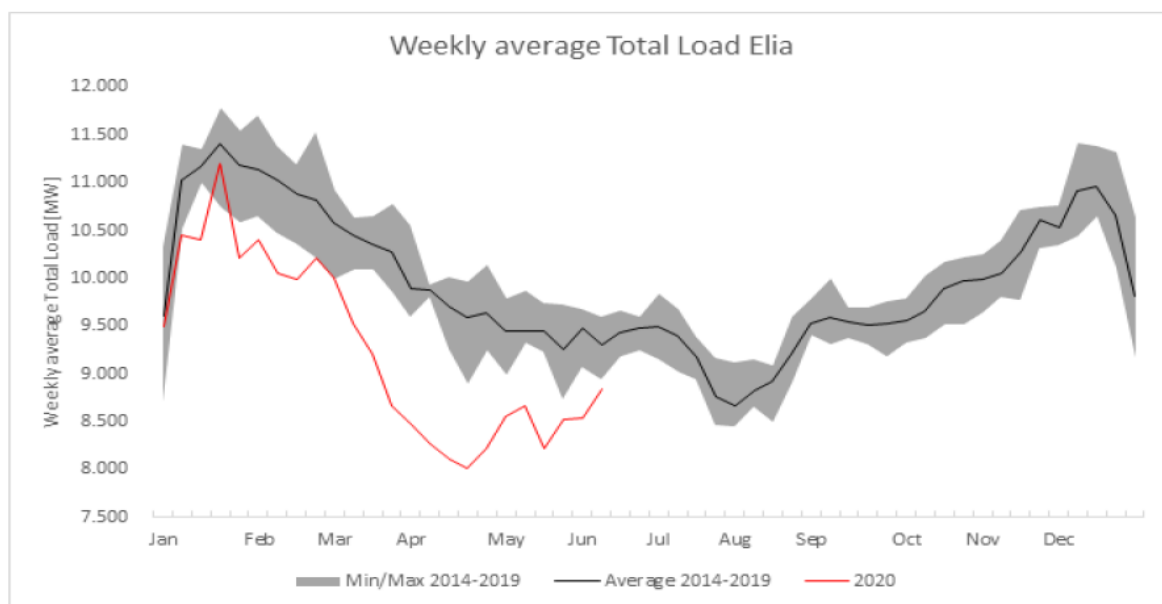
Regarding the backtesting of the methodology on the 2009 crisis, the model is likely to reproduce the shrinking effect if it is given a shrinking industry/tertiary added value

as input for this precise year. Nonetheless, this is “artificial” as it is easy to know this afterwards, while pre-2008 macroeconomic projections did probably not foresee such a crisis in 2008. Hence, once again, the model results can only be as good as the macroeconomic projections that are used as an input.

The modelling exercise undertaken by Climact is iterative and should benefit from continuous improvement over time.

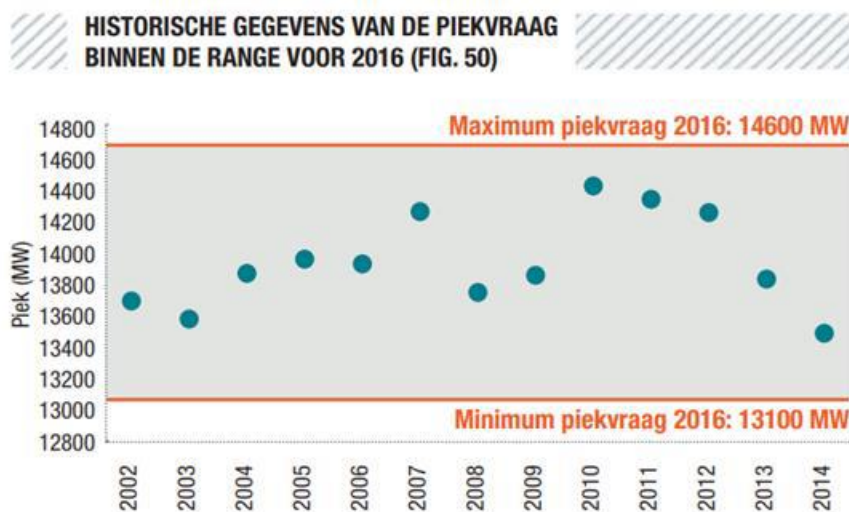
23. [FEBEG] FEBEG is not convinced of the added value of a bottom-up methodology to forecast the evolution of the demand in Belgium. Such an approach requires many hypotheses on a large number of underlying macro-economic parameters (on household, industry, tertiary sector, societal evolutions etc.) as well as on policy choices at different levels. While the exercise may be feasible for the short-term horizon, it becomes less tangible in the medium and longer term. The current COVID-19 crisis makes this shortcoming even more apparent: for all of the underlying risk factors of the demand model, the COVID-19 impact needs to be quantified. We consider that, in any case, the obtained result should be compared and benchmarked with other sources. This will give the Belgian Authorities, stakeholders and market parties some confidence with the hypotheses Elia and the consultant Climact will make on the underlying macro-economic parameters. As the comparison with an official benchmark might imply that the underlying hypotheses used in the bottom-up forecasting tool are tuned to approach the reference benchmark, the question then remains what the added value of the bottom-up approach might be.

Regarding the impact of the COVID-19 in the short and long run, FEBEG is of the opinion that the debate, when it comes to the security of supply, should rather focus on the impact of the crisis on the peak load rather than on the total annual demand. It is clear that the lock-down has impacted the baseload demand, but recent press communication of Elia (June 18th 2020) has shown that the impact of the crisis is already starting to fade away: “Electricity consumption in Belgium has started rising again and is gradually returning to normal. It [the weekly average Total Load] is currently 5% lower compared to the average for the last five years”.



Source: Elia - Press Release – 18th of June 2020

Looking in the past, FEBEG observes, from the charts published in the Elia's adequacy study 2016-2017, that the impact of the previous crisis on the peak demand was relatively limited (i.e., the financial crisis of 2007-2009). When comparing data from 2006 and 2009 (these being similar climatic years), one can observe that, while the annual demand dropped with ~7% due to the crisis, the peak demand was only marginally affected with a decrease of ~ 1%. For this reason, FEBEG is of the opinion that the impact on the security of supply and thus the sizing of the strategic reserve, should be much more limited than any estimate of the impact on the annual demand.



Generally speaking, it is very complex to predict the medium-term impact of the COVID-19 at this stage as it will depend on the evolution of the pandemic in the next months and years and the ability of individuals, companies and nations to adapt and properly manage the sanitary risk and to relaunch the economy with defined measures. In Europe, one can expect that these measures will be oriented towards a further push to decarbonize the society in the medium and long term and an increased electrification of some sectors. FEBEG refers to the recent statement of Ursula von der Leyen, President of the European Commission: "By using the European Green Deal as our compass, we can turn the crisis of this pandemic into an opportunity to rebuild our economies differently and make them more resilient. We can make our society and our planet healthier by investing in renewable energy, by driving clean cars, by renovating our houses and making them energy efficient." One can observe that France and Germany<sup>2</sup> have already put forward, in the last few weeks, very ambitious targets and related supports with regards to electric vehicles and charging infrastructure. This indicates a greater chance of faster electrification of mobility in the post-Corona period.

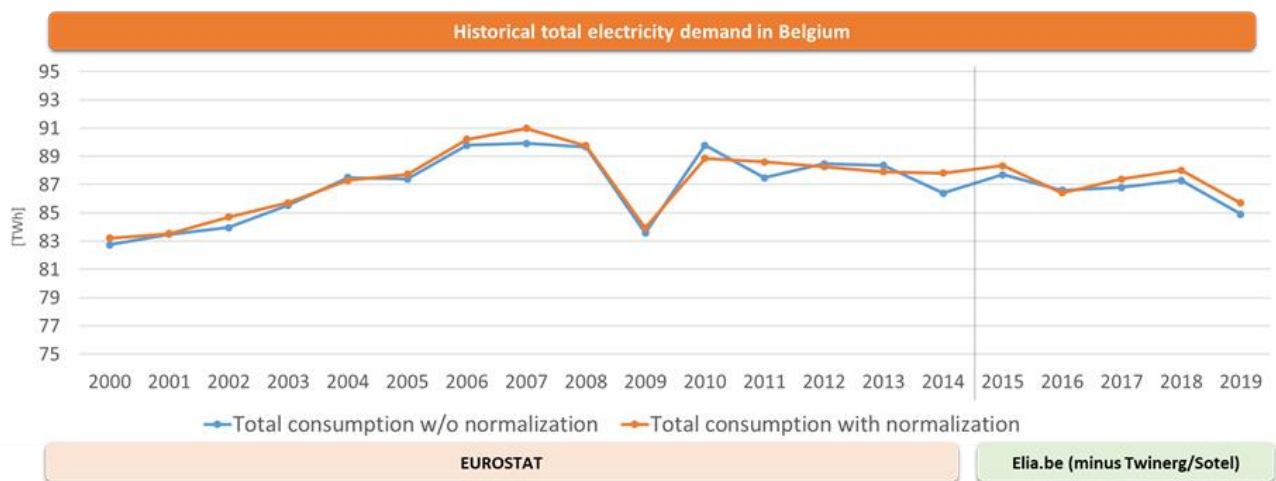
As answered in question 23, the modelling exercise undertaken by Climact is iterative and should benefit from continuous improvement over time.

The remark made above, regarding the lesser impact on peak load than on total demand, while being valid, is out of scope for this part of the methodology. Indeed, the sole purpose of the proposed methodology is to compute the annual total demand.

The remark of the last paragraph above is entirely valid. However, we think that the potential acceleration of EV uptake is more likely to be seen on the medium-term (2025-2030) than on the short term horizon (2020-2023), which is the scope of this exercise.

24. [FEBELIEC] On the section on the hypotheses on the Belgian electricity demand, Febeliec has both issues with the methodology as well as the underlying assumptions applied by Elia. Febeliec agrees with Elia that the growth in Belgian overall electricity demand is indeed influenced by several different parameters, including in particular economic indicators such as GDP growth. However, Febeliec continues to wonder whether the methodology by Climact to determine overall Belgian demand is able to correctly estimate Belgian electricity demand (see also below for a more detailed analysis of the proposed methodology by Climact).

Febeliec also wants to refer to the figure below which was provided by Elia on 27/05/2020 based on Elia data and calculations showing total electricity demand and normalised total electricity demand for Belgium over the period 2000-2019.



The historical data sources are indicated on the chart.  
 For the normalization, Elia applies a simple linear method based on the equivalent HDD, 'jours ouvrés' and amount of days in the year (correction for leap years).

The normalization methodology is currently under review at Elia and could lead to slight differences in the historical normalization values. It is also important to note that the data above were never normalized before 2010 and that the same impact is used for the whole horizon.

In past studies other sources have been also used for historical data (ENTSOE.net for instance) where the same definition of consumption was used across all countries. Since the introduction of a common tool at ENTSO-E (since MAF2019), the consumption source for future studies will be the one published on the Elia.be website which represents an estimation of the 'total electricity consumption' of Belgium.

Figure 2: Belgian electricity demand (Source: Elia, 27/05/2020)

Febeliec wants to indicate explicitly two elements that can be seen on this graph: on the one hand the financial crisis of 2008 leads to a more than significant drop in Belgian electricity demand (a decrease with more than 5TWh or more than 5%) towards 2009 and on the other hand a very different growth path before and after 2008-2009, with the curve reversing from an increase towards a decrease in overall electricity consumption. Electricity consumption in 2018 (a full decade after the financial crisis of 2008) remains a few TWh below the pre-financial-crisis level and towards 2019 drops even an additional 2 TWh (instead of all the increases in electricity demand that Elia predicted over all its previous adequacy assessments, including all previous strategic reserve assessments like the one that is the subject of this consultation). Febeliec also wants to refer to the report of the Belgian Federal Planning Bureau (FPB) of 23/06/2020 which is the first official report from the FPB taking into account the effect of the Covid-19 sanitary crisis, an element that despite its extremely pronounced impact on the

*entire range of economic indicators, both nationally and globally, is not taken into account by Elia whatsoever. The FPB in this report clearly and explicitly indicates that the deep recession of 2020 (due to Covid-19, with a GDP decrease of 10,5%, the largest decrease in the post-war era) will be followed by renewed economic growth in 2022, yet this reprisal of economic activity will not suffice to return within five years (so by 2025) to the level of economic activity that would have been possible without the Covid-19 crisis. Moreover, the FPB also explicitly indicates that final energy consumption in the period 2020-2025 would decrease with on average 0,4% per year, and while the FPB at this point does not provide a breakdown over the different energy vectors, it would be very unrealistic (or even surrealistic) to imagine that electricity demand would not be affected also with a decrease, unless robust data and analyses should be provided that would undeniably indicate that a.o. electrification would completely offset this decline and would lead to an increase or stabilisation of electricity demand in Belgium despite a decrease in final energy demand. Moreover, in such case, it should also be explicitly investigated which sources of electrification would lead to such effect and to what extent those would lead to an impact on peak load in the Belgian system (as opposed to overall energy consumption), as many often cited sources of electrification (e.g. electric vehicles and heat pumps) are exactly examples of energy demand sources that are controllable and can be used to buffer or where demand shifting is possible, especially in times of potential scarcity, during which electricity prices would be rising and giving correct price signals and incentives. Based on the fact that at this point Climact has not shown that its methodology is able to predict electricity demand under the current economic situation and the fact that, based a.o. on the analyses and data from the FPB, the Belgian economy is undergoing the worst economic catastrophe in the post-war era, largely surpassing the financial crisis of 2008 in its economic effects, Febeliec in the strongest possible way urges Elia to take this information duly into account, in order to avoid that any adequacy assessments would unduly and unjustified come to any unwarranted and unfounded yet potentially very wrong and costly conclusions.*

As mentioned above, the figures that will be presented to the public consultation in August 2020 will be based on this report.

The point is valid. Nonetheless, the electrification trend (among others transport, heating) is not likely to be reversed given the climate and energy policy framework in Europe and Belgium. Hence, this effect counterbalance the foreseen decrease in final energy consumption.

As a future potential improvement, it would be interesting not only to take FPB projections as an input but also compare the underlying modelling hypotheses (efficiency effects, technology trends, ...) to justify the potential differences.