



# **Volume determination of the strategic reserve for winter 2019-20**

**Update 20 May 2019**

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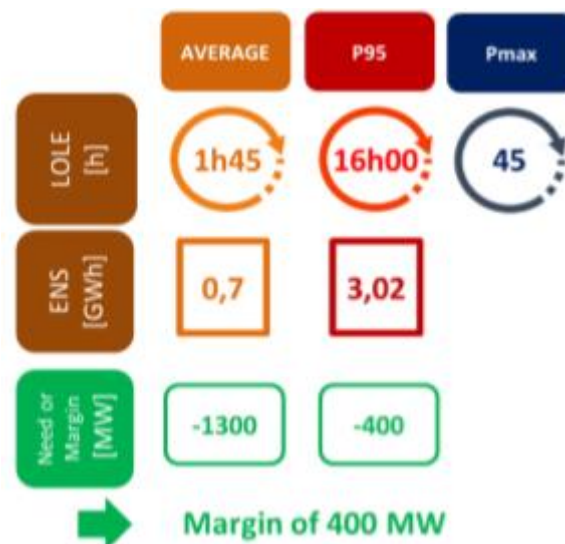
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# 1 Introduction

The “Adequacy study for Belgium: The need for strategic reserve for winter 2019-20 and outlook for 2020-21 and 2021-22” was sent to the Minister and DG Energy on 15 November 2018 (as requested in the law) and published by Elia on its webpage on 30 November 2018<sup>1</sup>.

The results for the winter 2019-20 ‘base case’ scenario led to a margin of 3300 MW, with an average LOLE of less than 15 minutes and no LOLE95. Under the assumptions made for this ‘base case’ scenario, the analysis did not identify a need for contracting strategic reserve for winter 2019-20 in order to meet the legal criteria.

In order to capture the effect of low nuclear availability, as observed in Belgium and France during the last six winters, a “low-probability, high-impact” sensitivity analysis was performed. In this sensitivity, 1.5 GW of nuclear generation capacity in Belgium as well as 3.6 GW of nuclear generation capacity in France is considered out of service for the entire winter on top of the Planned and Forced Outages as simulated in the “base case”. This analysis resulted in an average LOLE of 1h45 and P95 of 16 hours. Both values meet the legal adequacy criteria. The corresponding margin was found to be 400MW. The overview of this sensitivity analysis is provided in the figure below.



The DG Energy provided its advice to the Minister on 14 December 2018<sup>2</sup> and concluded that the Minister should instruct Elia not to acquire a strategic reserve. On 15 January 2019 the Minister instructed Elia, via Ministerial Decree not to contract a strategic reserve for winter 2019-20<sup>3</sup>.

According to this Ministerial Decree and more precisely its article 3, and art. 7quater of the federal electricity law, the Minister can decide to review the volume until 1 September 2019 at the latest.

<sup>1</sup> <http://www.elia.be/en/products-and-services/Strategic-Reserve/Information-produit>

<sup>2</sup> <https://economie.fgov.be/sites/default/files/Files/Energy/Strategische-reserve-Advies-AD-Energie-winterperiode-2019-2020.pdf>

<sup>3</sup> « Arrêté ministériel donnant instruction au gestionnaire du réseau de constituer une réserve stratégique à partir du 1er novembre 2019, 15-1-2019 ».

In that respect, an official request for an update of the volume assessment was addressed to Elia by the Minister on 29 April 2019. This report provides this updated volume assessment.

## 2 Main evolutions

In the request, the Minister indicates a need to update the volume of strategic reserve to account for recent changes in available production capacity for the upcoming winter.

In that respect, the following elements are taken into account in this updated analysis for the volume for strategic reserve for winter 2019-20.

### 2.1 Return to the market of the Vilvoorde generation unit

On 2 October 2018, EM Generation Brussels (EMGB) announced the return of the generation unit of Vilvoorde to the market. The Royal Decree of 9 October 2018 allowed the unit to return to the market in winter 2018-19 already to mitigate the detected adequacy issues.

The EMGB announcement can be found on the website of FPS Economy<sup>4</sup>.

This unit was initially not considered in the market in the analysis for the strategic reserve requirement for winter 2019-20 following the public consultation held in the summer of 2018 on input data to be used for the volume assessment 2019-20 and earlier communication of the power plant owner.

In accordance with the electricity law art. 4bis §1bis the unit will also be available in winter 2019-20. The extra 265MW of thermal generation capacity has a positive effect on the Belgian adequacy situation.

### 2.2 Change in nuclear generation unit availability

On 29 January 2019, ENGIE announced changes in the start & end dates of the planned revisions of the nuclear generation units DOEL 1, DOEL 2 and TIHANGE 1.

	Pnom [MW]	Previous start	Previous end	New start	New end
DOEL 1	433	24-08-2019	27-12-2019	05-10-2019	15-05-2020
DOEL 2	433	31-08-2019	20-12-2019	28-09-2019	10-04-2020
TIHANGE 1N	481	03-08-2019	28-11-2019	03-08-2019	14-02-2020
TIHANGE 1S	481	03-08-2019	28-11-2019	03-08-2019	14-02-2020

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<sup>4</sup> <https://economie.fgov.be/sites/default/files/Files/Energy/EMGB-verzaking-buitenwerkingstelling-centrale-Vilvoorde.pdf>



Figure 2.1 Change in the nuclear availability calendar during the winter months

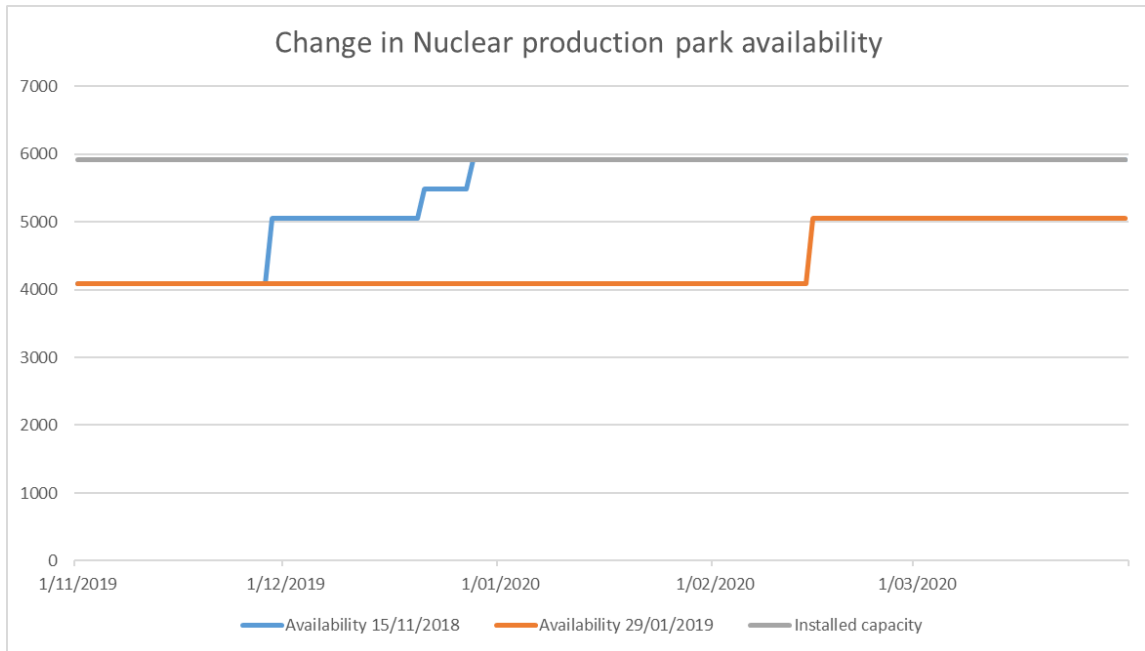


Figure 2.2 Available nuclear generation power during the winter months

The new data was made available on REMIT, which is publically accessible<sup>5</sup> and is the most up-to-date information available to consider for the nuclear generation availability in Belgium.

The change in the revision dates increases the available capacity by 1GW in September 2019 yet decreases available capacity by 2GW from ca. mid-December through mid-February. Thereafter, until the end of the winter, 1GW remains equally unavailable. The modification in the nuclear availability deteriorates the system's adequacy.

<sup>5</sup> [http://transparency.engie.com/REM\\_REMIT/](http://transparency.engie.com/REM_REMIT/)

## 2.3 Change in Luminus generation unit availability

On 29 March 2019, Luminus revoked the announced closure of the generation units HAM GT (39MW)<sup>6</sup>, IZEGEM (20MW)<sup>7</sup> and ANGLEUR TG 31-32 (2x25MW)<sup>8</sup>. Therefore, these 4 units are again available for winter 2019-20.

The additional availability of the 109MW of thermal generation capacity has a positive effect on the Belgian adequacy situation.

## 2.4 Change in 'low impact-high probability' quantification

The initial analysis of November 2018 constructs a sensitivity where 1.5GW of nuclear generation capacity is additionally unavailable in Belgium. This value is obtained on the basis of the effectively observed availability of nuclear generation units over the past few years as described more in detail in the November report. As today, on the basis of currently already confirmed nuclear unavailability for winter 2019-2020 (cf. section 2.2), already 2GW will be unavailable for almost the entire winter 2019-20, a review of this sensitivity is necessary.

For the sensitivity in November 2018, 1.5GW out of in total 6GW represents 25% of capacity unavailable. If we apply the same ratio on the currently remaining available nuclear capacity of 4GW, this proportionately implies to consider 1GW out (25% of 4GW). Moreover, a 1.5GW sensitivity is no longer realistic as all 500MW units are in scheduled maintenance. This approach was informally agreed upon by FOD, cabinet & CREG prior to running the simulation. The unavailability of the French nuclear fleet is unchanged in this sensitivity.

**Error! Reference source not found.** shows the change in average nuclear available generation capacity in Belgium between the analysis of 15/11/2018 and the current analysis.

# 3 Results

For the updated analysis, the exact same model and assumptions are used as for the analysis of November 2018, except for the evolutions as mentioned in chapter 2. This means that no additional changes are applied to the load profiles, thermal availabilities, RES generation capacity, pump storage or demand side response (DSR) in any of the countries in the model. For this last category, preliminary results of the updated E-CUBE study, incorporating aggregated EPEXSpot offer & demand curves for winter 2018-19, did not indicate an increase in DSR volume as could have been expected given the stress conditions present in the previous winter. Additionally, the extrapolation analysis has not been completed at the time of writing. A DSR growth coefficient will be agreed upon in the upcoming taskforce 'implementation of strategic reserve' of July. Hence, no change in DSR volume for winter 2019-20 has been applied.

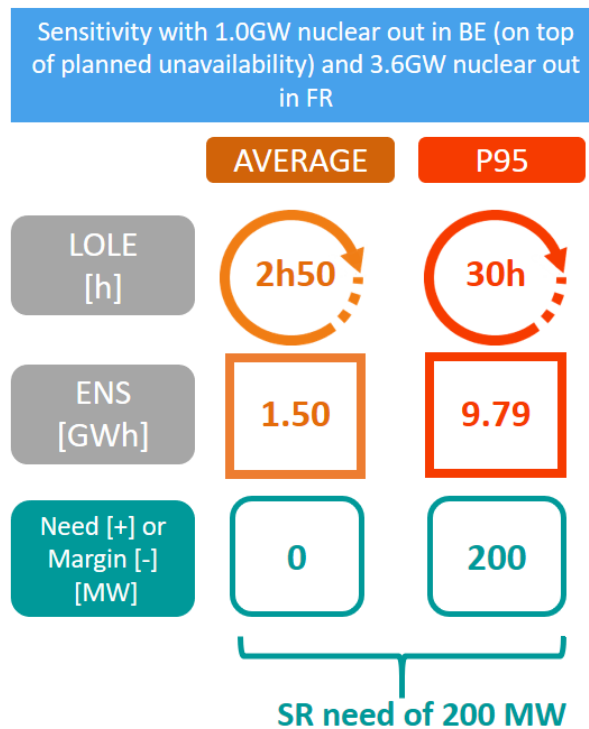
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<sup>6</sup> <https://economie.fgov.be/sites/default/files/Files/Energy/EDF-Luminus-verzaking-tijdelijke-buitenwerkingstelling-centrale-Ham.pdf>

<sup>7</sup> <https://economie.fgov.be/sites/default/files/Files/Energy/EDF-Luminus-verzaking-tijdelijke-buitenwerkingstelling-centrale-Izegem.pdf>

<sup>8</sup> <https://economie.fgov.be/sites/default/files/Files/Energy/EDF-Luminus-verzaking-tijdelijke-buitenwerkingstelling-centrale-Angleur.pdf>

The figure below shows the results obtained for both LOLE [h] and ENS [GWh], both average and P95. These values refer to a situation without any strategic reserve volume.



The prolonged nuclear revisions, leading to an additional unavailable generation capacity (of up to 2GW) from December onwards, outweigh both the additional capacity made available by Vilvoorde, Ham, Angleur & Izegem (in total 374MW) and the adequacy benefits from modifying the applied sensitivity from 1.5 to 1.0GW nuclear unavailability.

Two main reasons are driving this result:

- The combined available capacity of the additional classic thermal generation units (Vilvoorde, Ham, Angleur, Izegem) is less than the additional unavailable production capacity due to the new revision schedule.
- The FO rates of these classical thermal generation units is defined at 6.5-8.5% according to the updated analysis that was published in the November report. This is higher than the FO rates of nuclear generation units (3.5%). Therefore, and especially for a P95 criterion, the statistical availability of these classical thermal generation units, and hence their contribution to adequacy, is less than when compared to nuclear generation units.

The new analysis reflects these changes in the Belgian adequacy situation for winter 2019-20 and shows that the margin of 400MW has been evolved to a need of 200MW in the low probability, high impact scenario.

## 4 Conclusions

The changes in thermal generation availability between 15 November 2018 and the time of writing of this report are significant for the Belgian adequacy situation in winter 2019-20. The impact of the prolonged nuclear revisions exceeds the benefits gained from the additional available classical thermal

generation units. The legally binding security of supply criteria are no longer satisfied for the upcoming winter (more in particular the  $LOLE_{95} \leq 20$  h) in the low probability, high impact scenario.

The analysis has shown that a strategic reserve volume of 200MW would be required to ensure compliance with the legal adequacy criteria in a “Low probability, High impact” scenario where an extra unavailability of 1 GW would occur on top of the already planned outage of 2 GW of nuclear units for the winter 2019-20.