Preparation of the CRM Y-1 auction with Delivery Period 2026-27, the CRM Y-2 with Delivery Period 2027-28 and the CRM Y-4 auction with Delivery Period 2029-30:

Additional analysis regarding the obtained results.

Contents

Introduction

This explanatory note aims to provide further information regarding the results obtained in the context of the calibration report for the CRM Y-1 auction with Delivery Period 2026-27, the CRM Y-2 with Delivery Period 2027-28 and the CRM Y-4 auction with Delivery Period 2029-30. Additionally, a comparison with the values obtained in the previous calibration report, the CRM Y-1 auction with Delivery Period 2025-26 and the CRM Y-4 auction with Delivery Period 2028-29, will be presented, providing insights to explain any evolutions.

In order to ease the reading the following acronyms will be used:

- 2025-26/Y-1: refers to the Y-1 calibration report for the DP 2025-26;
- 2026-27/Y-1: refers to the Y-1 calibration report for the DP 2026-27;
- 2027-28/Y-2: refers to the Y-2 calibration report for the DP 2027-28;
- 2028-29/Y-4: refers to the Y-4 calibration report for the DP 2028-29;
- 2029-30/Y-4: refers to the Y-4 calibration report for the DP 2029-30.

This explanatory note consists of two main parts.

- An analysis of the key changes concerning assumptions and input data between the reference scenarios of the auctions of the current calibration report and the previous calibration report is presented.
- The results of the simulation of the reference scenario are analyzed, particularly in light of the developments presented in the first part, and compared to the results of the previous calibration.

1. Changes in assumptions between reference scenarios used in the calibration reports

For each CRM auction, the Minister selects a reference scenario, including assumptions on electricity consumption generation, storage, demand-side response, balancing needs, capacity available abroad and economic parameters[1]. The elaboration of the scenario is further explained in the main report. Key changes are highlighted in this section to facilitate understanding of the evolution of the calculated parameters.

1.1. Data and assumptions applicable to Belgium

In the subsections below, assumptions and parameters related to Belgium are detailed, along with any potential changes.

Electricity consumption

The annual consumption selected in the reference scenario is:

- 2026-27/Y-1: 87.7 TWh;
- 2027-28/Y-2: 90.7 TWh;
- 2029-30/Y-4: 98.1 TWh.

The total annual consumption for 2025-26/Y-1 and 2028-29/Y-4 selected last year, by comparison, was respectively 85.7 and 102.4 TWh. The change between the two Y-4 reference scenarios represents a noticeable change, as the electricity consumption in the 2029-30/Y-4 was assumed to be lower than the one selected for 2028-29/Y-4.

It should be noted that the electricity consumption from newly electrified processes includes significant amounts of flexibility. The selected delay in electrification compared to last year also leads to lower volume of flexibility, considering that the share of flexibility is being kept equal compared to last year (see § on demand-side response).

<u>Impact on parameters</u>

➔ The load assumptions have a direct impact on the average load during scarcity. The category of load (from EV, HP, industry, existing usages, …) and the flexibility associated also impacts the energy not served and derating factors.

[1] https://www.ejustice.just.fgov.be/cgi/article_body.pl?language=fr&caller=summary&pub_date=24-10-15&numac=2024009372

Demand-side response

The demand-side response (DSR) consists of 3 main categories and is summarized in Table 1.

- The DSR from existing usages, calculated based on the estimation by N-side on historical volumes (presented during the Working Group Adequacy from 27/08[2]). In the reference scenario selected by the Minister, a volume of 1732 MW is considered.
- The DSR from industry electrification comes from industrial heat pumps, e-boilers, steel, CCS or datacenters. In the reference scenario selected by the Minister, the same share of flexibility by process are considered, resulting in volumes of 194 MW, 370 MW and 632 MW for 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4.
- The potential additional DSR from existing usages submitted to the economic optimization loop of each auction from the preselected capacity types. In this framework, 600 MW of DSR 24h have been added for 2029-30/Y-4 in order to reach the reliability standard. This 600 MW volume corresponds to the two first steps from the stepwise approach considered for the annualized costs of additional DSR.

CRM auction	DSR from existing usages [MW]	DSR from industry electrification [MW]	Additional DSR after economic loop [MW]	**Total DSR Shedding in the model [MW]**
2026-27/Y-1	1732	194	0	**1926**
2027-28/Y-2	1732	370	0	**2102**
2029-30/Y-4	1732	632	600	**2964**
2025-26/Y-1	1843	436	0	2279
2028-29/Y-4	1843	1204	300	3347

Table 1 : Overview of DSR volume in CRM auctions

Compared to 2025-26/Y-1 and 2028-29/Y-4, the DSR capacity is decreased. This reduction affects two categories: existing DSR and DSR anticipated from industry electrification. For the existing DSR, the volume has dropped from 1843 MW to 1732 MW, attributed to the industry demand destruction. For the DSR expected from the industry electrification, the expected volume is lower due to the assumptions retained in the reference scenario regarding electrification of the industry.

Impact on parameters

➔ The flexibility assumptions impact the average load during scarcity as it tends to flatten the load profiles.

[2] https://www.elia.be/en/users-group/wg-adequacy/20240827-meeting

- ➔ The higher the installed capacity of an energy-limited technology in a certain area, the lower the derating factor of that technology might be. Nonetheless, the flexibility associated to the storage in Belgium and at European level will also have an impact on the derating factors of the energy-limited technology. Consequently, the global picture of the flexibility of the system has to be considered to understand the evolution of the derating factor of each technology.
- ➔ DSR is usually associated to a high marginal price (except eboilers and electrolyzers). Decreasing the amount of those technologies dispatched at the end of the merit order will tend to decrease the expected yearly inframarginal rents obtained on the energy market for technologies with a high marginal cost, as OCGT.

Thermal capacities

Reference scenarios for 2026-27/Y-1, 2027-28/Y-2 and for 2029-30/Y-4 incorporate the most up-to-date information regarding thermal capacities. Compared to 2025-26/Y-1 and 2028-29/Y-4, the following changes are noted:

- **Capacity decreases:**
  - Doel 4: Reduced from 1039 MW to 1026 MW
  - Tihange 3: Reduced from 1038 MW to 1030 MW
- **Capacity increases:**
  - Saint-Ghislain STEG: Increased from 378 MW to 385 MW
- **Removed thermal units:**
  - Fluxys Zeebrugge: Reduction of 40 MW
  - Sappi Lanaken GT: Reduction of 43 MW
  - Zwijndrecht Lanxess ST : Reduction of 15 MW
- **Newly considered thermal unit:**
  - Vilvoorde GT: Considered available as from winter 2025-26, following information available on REMIT, with an installed capacity of 255 MW

Impact on parameters

- ➔ The thermal installed capacity in Belgium is increased by 133 MW across all Delivery Periods.
- ➔ No major impact on the calculated parameters.

Renewables

There is a significant increase in installed solar panel capacity for all projected years. This trend reflects the accelerated installation rate observed in recent years.

Regarding onshore wind, the installed capacity for 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 follows the same trajectory than the one for 2025-26/Y-1 and 2028-29/Y-4.

Regarding offshore wind, the generation capacity is set to 2261 MW for 2026-27/Y-1 and 2027-28/Y-2. The generation capacity for 2029-30/Y-4 is set to 2961 MW as the first phase of PEZ is also considered according to the reference scenario.

<u>Impact on parameters</u>

➔ In general, it is observed that the derating factors for renewable technologies decrease with the increase of those technologies. It should be however noted that the impact on derating factors is mainly correlated with the installed capacities of these technologies at European level. Given the substantial ambitions regarding solar and wind energy at European level (see Section 1.2), the derating factors for these technologies are affected.

Storage

Regarding storage capacity, 4 categories are considered:

- Pumped-storage: an installed capacity of 1,305 MW (1161 MW in Coo 1-6 and 144 MW in Plate Taille 1-4) is considered for the auctions, taking into account the reservoir extension and the increased of the turbining capacity of Coo. No change compared to previous simulated years.
- Large-scale batteries: from the reference scenario selected by the Minister, an installed capacity of 331 MW is considered for 2026-27/Y-1 and an installed capacity of 955 MW is taken into account for 2027-28/Y-2 and 2029-30/Y-4. This volume of batteries included those that are already in service and batteries contracted in auctions until 2023 included. For 2026-27/Y-1, an additional derated volume of 42 MW[3] is considered based on the results of 2025-26/Y-1 auction. For 2029-30/Y-4, an additional derated volume of 188 MW is considered based on the result of 2028-29/Y-4 auction.
- Small-scale batteries: 1172 MW, 1226 MW and 1352 MW are respectively considered for 2026-27/Y-1, 2027-28/Y-2 and 2028-29/Y-4, which is higher than in past CRM calibration.
- Vehicle-to-grid: 2% of the electric vehicles are optimized as V2H (vehicle-to-home) in 2029-30/Y-4.

[3] Considering derating factors from 2027-28/Y-4

Impact on parameters

- ➔ The more storage capacity is present in Belgium and in the European system, the more these capacities compete to contribute during scarcity moments, resulting in lower derating factors. As presented in the part on Renewables, this effect is exacerbated with additional flexibility in the system at the European level.

1.2. Assumptions for Neighboring Countries

The assumptions for neighboring countries are part of the reference scenario selected in the Ministerial Decree. It should be noted that it includes the latest available information from the Future Energy Scenario 2024[4] for Great-Britain and the Monitoring Leveringszekerheid 2024[5] for Netherlands.

All of this data is included in the Excel "Assumptions Workbook" attached to the calibration report, and a summary table is presented in Table 2 for 2026-27/Y-1, in Table 3 for 2027-28/Y-2 and in Table 4 for 2029-30/Y-4.

2026-27/Y-1	France	Germany	Netherlands	United Kingdom	Spain	Italy	Poland	Denmark
Demand [TWh]	480	590	137	293	260	335	173	46
Onshore Wind [GW]	26	86	8	19	36	15	12	6
Offshore Wind [GW]	3	13	7	27	0	5	4	4
Solar [GW]	27	132	46	25	40	53	22	8
Coal [GW]	1	19	3	0	0	0	24	1
Nuclear [GW]	62.9	0.0	0.5	3.6	7.1	0.0	0.0	0.0
Gas [GW]	7.2	32.8	12.2	43.4	24.5	42.6	5.8	1.2

Table 2 : Assumptions for neighboring countries, incorporated in the reference scenario for 2026-27/Y-1

2027-28/Y-2	France	Germany	Netherlands	United Kingdom	Spain	Italy	Poland	Denmark
Demand [TWh]	490	610	141	301	264	340	177	49
Onshore Wind [GW]	27	93	8	21	37	16	12	7
Offshore Wind [GW]	3	18	8	29	0	6	6	4
Solar [GW]	32	152	51	28	46	60	23	11
Coal [GW]	1	14	3	0	0	0	23	1
Nuclear [GW]	62.9	0.0	0.5	3.6	6.1	0.0	0.0	0.0
Gas [GW]	7.2	32.8	12.2	43.8	24.5	42.6	5.8	1.2

Table 3 : Assumptions for neighboring countries, incorporated in the reference scenario for 2027-28/Y-2

2029-30/Y-4	France	Germany	Netherlands	United Kingdom	Spain	Italy	Poland	Denmark
Demand [TWh]	509	652	151	321	269	351	185	55
Onshore Wind [GW]	30	107	9	26	44	19	14	7
Offshore Wind [GW]	4	26	17	46	3	10	6	5
Solar [GW]	42	194	59	34	59	75	27	18
Coal [GW]	1	0	0	0	0	0	22	0
Nuclear [GW]	62.9	0.0	0.5	1.2	5.1	0.0	0.0	0.0
Gas [GW]	7.2	25.7	10.1	37.7	24.5	42.6	5.8	0.8

Table 4 : Assumptions for neighboring countries, incorporated in the reference scenario for 2029-30/Y-4

4 https://www.nationalgrideso.com/future-energy/future-energy-scenarios-fes

5 https://tennet-drupal.s3.eu-central-1.amazonaws.com/default/2024-05/20240514%20Monitor%20Leveringszekerheid%202024_0.pdf

1.2.1. Renewables & storage

The increase of the renewable installed capacity is rather stable for the main countries in Europe (+- 80 GW of increase per year). However, a higher jump is expected at European level for offshore wind between 2028-29/Y-4 and 2029-30/Y-4 (+32 GW, compared to ~10GW/year before) The evolution of the installed capacity is depicted in Figure 1.

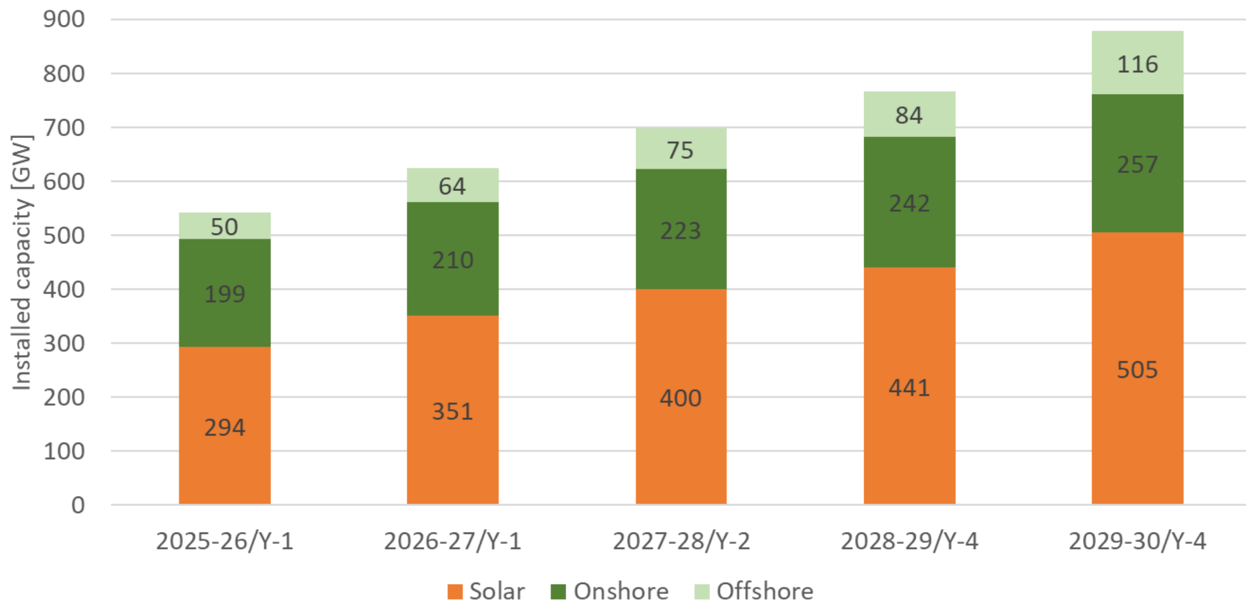


Figure 1 : Evolution of the renewable installed capacity. Only considering the capacities in France, Germany, Netherlands, Great Britain, Spain, Italy, Denmark and Poland, as provided in the assumptions workbook.

Another key increase between 2028-29/Y-4 and 2029-30/Y-4 is the installed capacity of batteries in the main countries of Europe. Compared to 2028-29/Y-4, the installed capacity of batteries foreseen jumped by 50 %, from around 60 GW to 90 GW, following the assumptions set in the ERAA database.

Impact on parameters

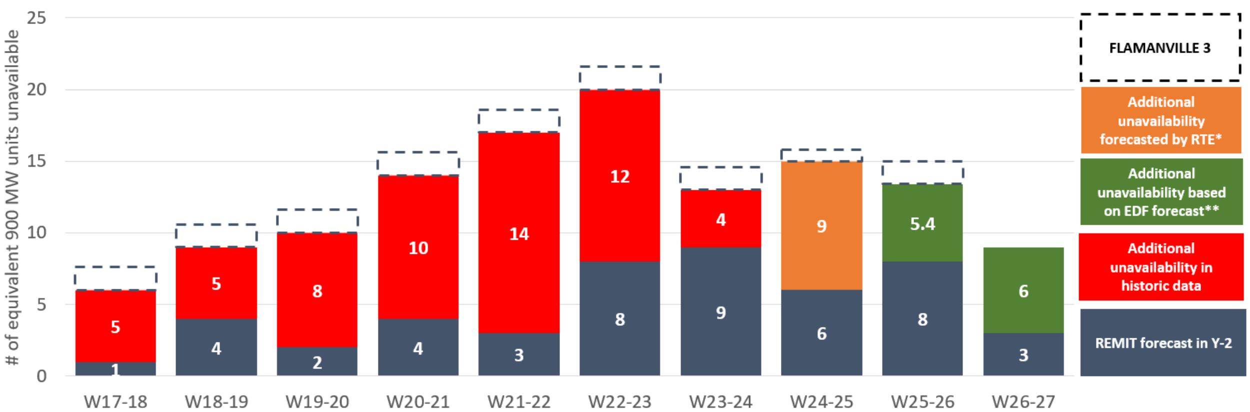
- ➔ The increased share of renewables in the European system will impact the scarcity profiles and the derating factors, as scarcity will be more and more correlated with periods of low RES infeed.
- ➔ As mentioned before, the increased installed capacity of batteries across Europe will tend to decrease the derating factors of the energy-limited technologies.

1.2.2. Nuclear unavailability

As shown in Figure 4.33 of the Adequacy and Flexibility Study 2034-2034[6], the correlation between scarcity situations in Belgium and France is high in the short-term, with nuclear availability in France being one of the main scarcity drivers. For the adequacy in Belgium and its neighboring countries, French nuclear availability is particularly crucial during the critical adequacy periods, from January to mid-February.

As set in the Ministerial Decree, for 2026-27/Y-1, REMIT profiles calibrated to EDF's estimated production are used. REMIT data provides the foreseen planned outages for the French nuclear fleet. However, considering only this data would overestimate the yearly nuclear generation. The data is therefore calibrated to be compliant with the production forecast published by EDF, following a methodology created in collaboration with FPS Economy.

Figure 2 shows the French nuclear unavailability during these critical periods, representing planned outages. This unavailability is split between REMIT forecasted unavailability in Y-2 and additional unavailability observed based on historical data for past winters. For the critical period 2024-25, as the additional unavailability is still unknown, the latest assumption from RTE in the winter outlook 2024-25 is considered[7]. For 2025-26 and 2026-27, the additional unavailability considered comes from the Ministerial Decree. Since Flamanville 3 is available for 2026-27, an additional theoretical unavailability is added to provide a more realistic comparison of total unavailability.



*based on RTE's winter outlook[8] (50 GW available for critical period winter)
**based on the EDF nuclear production in France[9]

Figure 2 : Historical and forecasted planned outage of the nuclear in France during the critical period for adequacy

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[6] https://issuu.com/eliagroup/docs/adequacy_flexibility_study_for_belgium_2024-203?fr=sOTBhNDYxOTUwMTY
[7] https://assets.rte-france.com/prod/public/2024-11/RTE-synthese-passage-hiver-2024-2025.pdf
[8] https://assets.rte-france.com/prod/public/2024-11/RTE-synthese-passage-hiver-2024-2025.pdf
[9] https://www.edf.fr/groupe-edf/espaces-dedies/journalistes/tous-les-communiques-de-presse/estimation-de-production-nucleaire-en-france-en-2026

Comparing the French nuclear unavailability over the past critical periods reveals that the foreseen unavailability during critical adequacy periods is significantly lower—around at least 14 equivalent units in 2025-26 opposed to 9 for the 2026-27. This reduction of at least 5 units will have a substantial impact on adequacy in France, as well as in Belgium and neighboring countries.

<u>Impact on parameters</u>

- ➔ The higher availability of the French nuclear power plants during the most critical periods for adequacy (January and mid-February) has a massive impact on the adequacy in Belgium as in the short-term, the correlation between the scarcity situations in Belgium and France is high.
- ➔ Scarcity events in Belgium are therefore correlated to the more impactful scarcity situations in France, leading to longer scarcity situations which directly impacts the derating factors for energy-limited technologies.
- ➔ The high nuclear availability in France also contributes to the adequacy of other neighboring countries. This frees capacity in those countries to also contribute more to cross-border participation in Belgium.

1.3. Price assumptions

The evolution of prices represents another significant change in assumptions, as shown in Table 5. The prices considered were historically high in the previous CRM calibration report. The Ministerial Decree used as reference for this CRM calibration report includes lower fuel and CO_2 prices. Note that prices of last year were expressed in €2022, while the CRM calibration reports of this year are expressed in €2023. To facilitate the comparison, all prices are converted in €2023.

Fuel and CO_2 prices	2025-26/Y-1 [€2022/MWh]	2026-27/Y-1 [€2023/MWh]	2027-28/Y-2 [€2023/MWh]	2028-29/Y-4 [€2022/MWh]	2029-30/Y-4 [€2023/MWh]
Oil	39.5	35.4	34.8	34.8	34.3
Gas	37.3	28.3	24.9	27	21.1
Coal	16.4	13.2	11.9	10.9	9.3
	[€2022/tCO2]	[€2023/tCO2]	[€2023/tCO2]	[€2022/tCO2]	[€2023/tCO2]
CO_2	98.5	76.8	79.7	109.1	85.6

Table 5 : Price evolution between the last two calibration reports

Figure 3 illustrates the impact of the evolution of the prices considered on the marginal cost of units in the model, and indirectly on the associated merit order. Compared to the previous calibration report, marginal costs decrease, along with the cost gap between CCGTs and OCGTs.

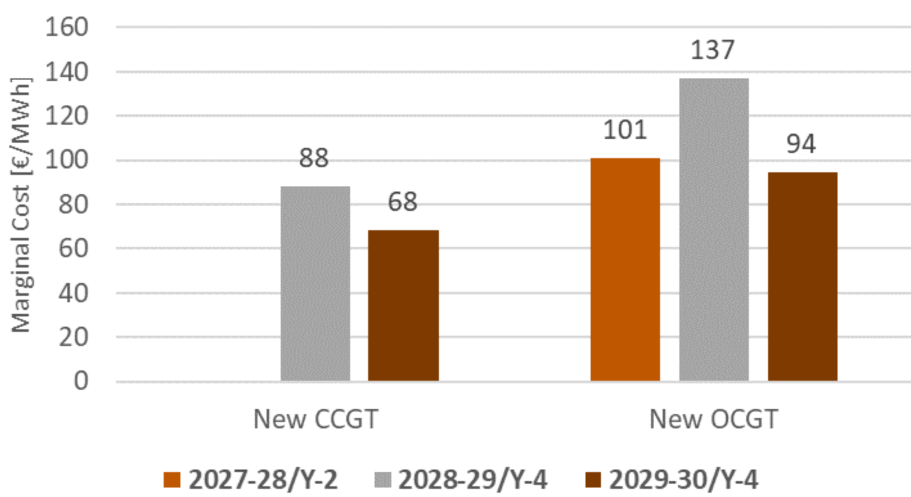

Figure 3 : Evolution of the marginal cost of CCGT and OCGT between the last two calibration reports

Impact on parameters

➔ Lower prices lead to lower marginal cost deltas between technologies and therefore the merit order will be flattened. This effect is expected to lead to lower inframarginal rents, especially for technologies first dispatched in the merit order.

2. Impact on the calibration parameters

2.1. Analysis of scarcity periods

The volume parameters (average electricity consumption, average energy not served, and maximum available entry capacity for indirect foreign capacity participation) as well as the calculated derating factors in the calibration report reflect the average contribution of a specific technology/parameter over all periods in which a scarcity situation occurs in the simulations. The characteristics of these simulated scarcity periods (their length, frequency, and the hours at which they occur) have a significant impact on the final value of the indicators. Therefore, this paragraph provides details and characteristics of these scarcity periods as well as their evolution compared to the previous calibration report.

Distribution of scarcity hours per duration

Firstly, it is important to note that the average number of hours of scarcity per year is the same between the calibration reports. Indeed, this parameter remains constant (by design) and is equal to 3 hours, which corresponds to the reliability standard applicable in Belgium.

Figure 4 presents the histogram and the cumulative distribution of simulated scarcity periods for the last two calibration reports.

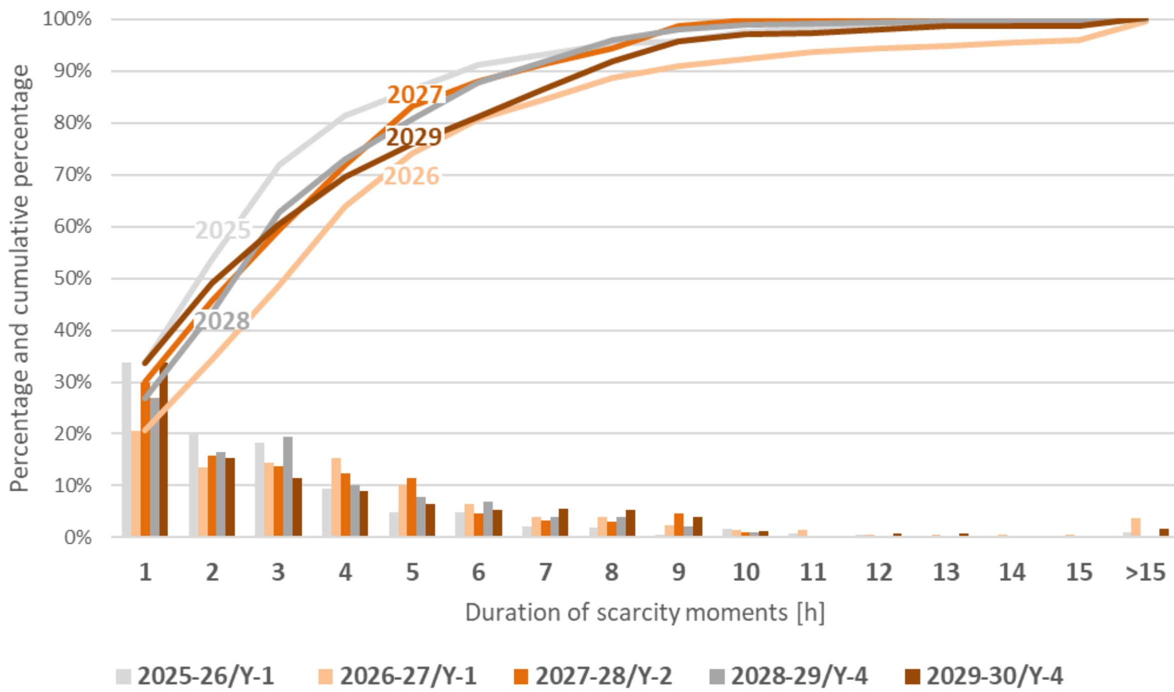

Figure 4: Histogram and cumulative distribution of the length of scarcity periods across the simulated scarcity periods in the last 2 calibration reports.

For 2026-27/Y-1, scarcity situations in Belgium are strongly correlated to the ones in France. The distribution is therefore strongly impacted by the nuclear unavailabilities in France. The higher nuclear availability in France in 2026-27/Y-1 compared to 2025-26/Y-1 leads to scarcity events in Belgium that are correlated to the most impactful scarcity situations in France, leading to longer scarcity situations which directly impacts the derating factors for energy-limited technologies.

For 2027-28/Y-2, the distribution of simulated scarcity periods is quite similar to 2028-29/Y-4. The nuclear availability is similar and the RES penetration as well as the storage capacity in Europe and Belgium are aligned.

For 2029-30/Y-4, the strong increase of storage capacity in Belgium as well as other European countries leads to scarcity being more spread out around the evening peak and therefore longer scarcity periods. This effect is expected to increase in the future with the higher penetration of RES and storage technologies and the higher share of flexibility on the demand-side.

Consecutive days with scarcity

When observing the number of consecutive days with at least 1 hour of scarcity, as presented in Figure 5, it should be noted that most simulated scarcity periods occur only within a single day. This probability is similar between the different delivery periods. Longer-lasting scarcity periods occur when wind production is low for an extended period or when nuclear availability (both in France and Belgium) is low. This observation will also impact the derating factors for energy-limited technologies, primarily because recharge periods must be available between scarcity periods for these technologies to contribute to adequacy.

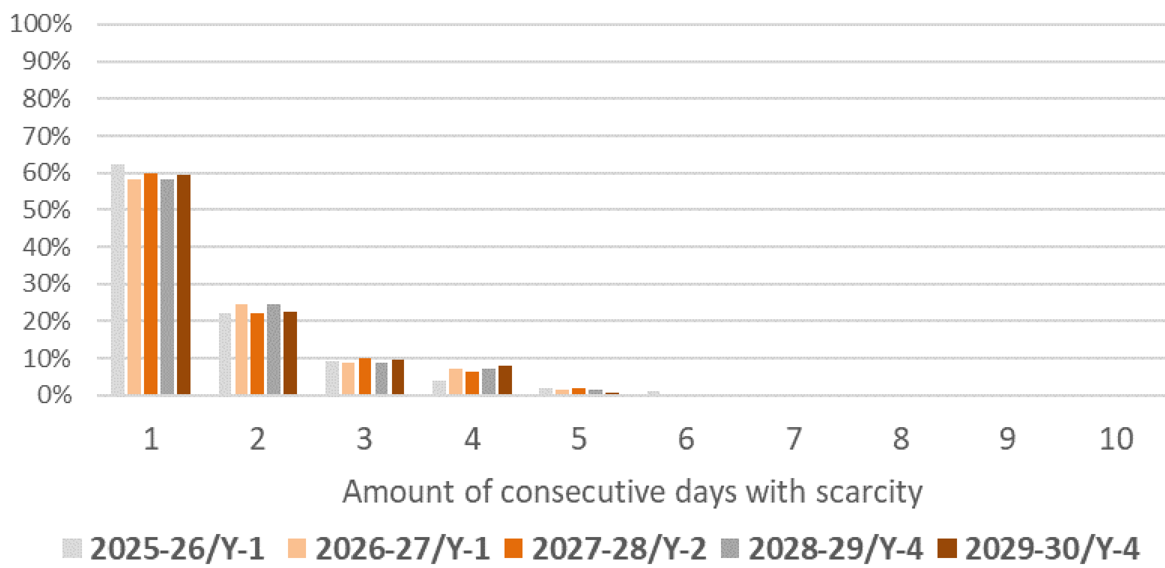

Figure 5: Distribution of consecutive days with at least 1 scarcity moment

Intra-daily distribution of scarcity hours

Figure 6 depicts the intra-daily distribution of simulated scarcity periods, in other words, the times of day during which the simulated scarcity situations occur.

In 2026-27/Y-1, it can be observed that the share of scarcity situations occurring at evening peak is lower and that a significant amount of scarcity events last from the morning to the evening. This profile is the one with the most scarcity occurrences at noon. This results in much lower derating factors for energy-limited technologies.

In 2029-30/Y-4, the scarcity situations are more spread out around the evening peak, following the updated assumptions regarding RES and flexibility in Belgium and at European level.

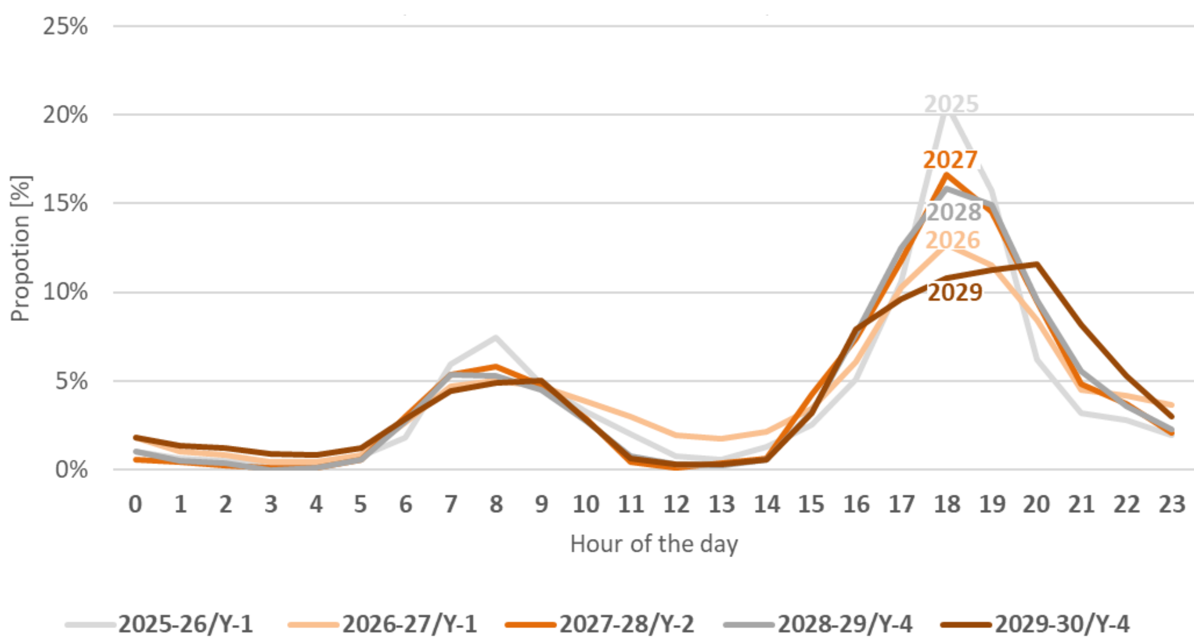

Figure 6: Intra-daily distribution of simulated scarcity periods between the last two calibration reports.

Monthly distribution of scarcity hours

Figure 7 presents the monthly distribution of observed scarcity periods during the winter. Most scarcity situations occur in January. One of the key factors explaining the differences between the various Delivery Periods is the availability profiles of the French nuclear power. Almost each auction employs a different profile:

- 2025-26/Y-1 uses the latest information available on REMIT;
- 2026-27/Y-1 uses the latest information available on REMIT;
- 2027-28/Y-2 and 2029-30/Y-4 uses the profile of ERAA 2023;
- 2028-29/Y-4 uses the profile of ERAA 2022;

Given the significant correlation between scarcity periods and the availability of French nuclear in the short term, the profiles have a substantial impact on the monthly distribution of simulated scarcity periods.

For 2026-27/Y-1 and 2027-28/Y-2, the monthly distribution is higher in December but lower in February compared to last year. This can be mainly attributed to the nuclear availability in France.

In the long-term, scarcity profiles are more correlated to low RES infeed at European level, leading to more simultaneous scarcity situations (see §0). This results in lower derating for renewable technologies and scarcity events occurring more in periods with low RES generation.

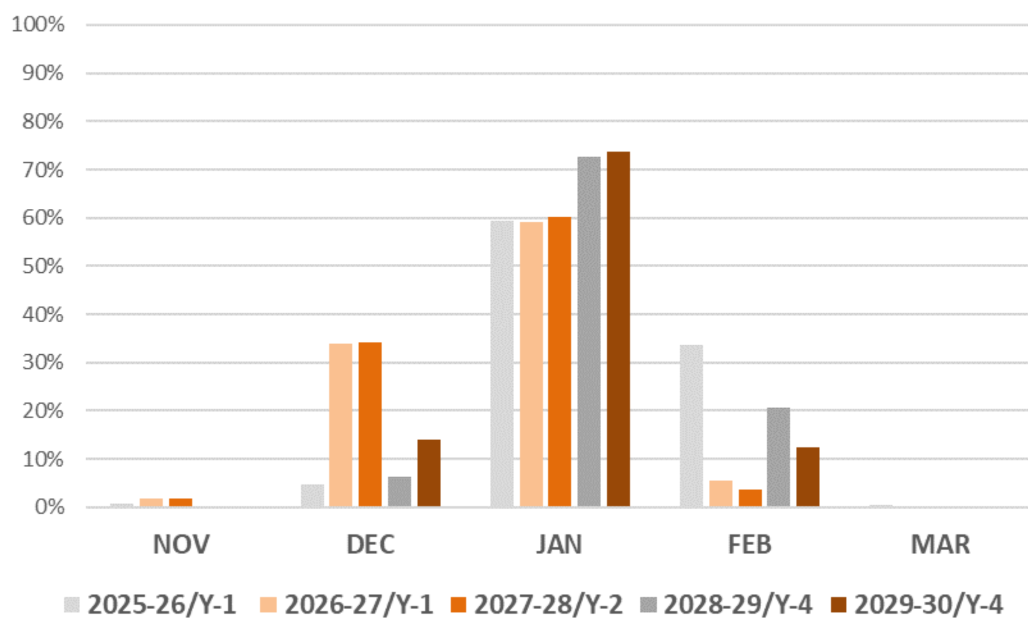

Figure 7: Monthly distribution of simulated scarcity periods during winter

2.2. Derating factors for energy-limited technologies

Derating factors for energy-limited technologies (batteries, demand side management, pumped storage, etc.) are correlated with the profiles of simulated scarcity periods. The shorter the simulated scarcity periods, the higher the derating factors will be. This is because the contribution of these technologies is linked to their ability to provide energy for a certain number of consecutive scarcity hours. Regarding storage technologies (batteries and pumped storage), it should be noted that the reservoir must be filled first so that the technology can contribute during the simulated scarcity periods, meaning that surplus energy must also be available between two simulated scarcity periods. The charge/discharge or pump/turbine efficiency will then determine which technology is used first to achieve an optimal solution.

To understand the impact of shorter simulated scarcity periods on the derating factors of energy-limited technologies, a relevant indicator is the distribution of simulated scarcity periods weighted by event duration, as depicted in Figure 8.

Considering an SLA with an associated availability duration of 3 hours as an example. This SLA will be able to provide energy for all scarcity periods of 1, 2, and 3 hours. However, this SLA can only partially contribute to longer events.

Figure 8 considers the total number of simulated scarcity hours, providing a more precise indicator of the impact on derating factors. While there may be more 1-hour scarcity periods than 2-hour scarcity periods, the fact that the latter have a duration of two hours means that the total number of hours in 2-hour scarcity periods is higher than in 1-hour scarcity periods.

It should be noted that this cumulative distribution does not consider certain aspects, such as:

- The fact that the availability duration of an SLA is determined on a daily basis in the model, which means that a 2-hour SLA can contribute to a 1-hour scarcity period in the morning and another 1-hour scarcity period in the evening. This graph was constructed solely based on the distribution of simulated scarcity period lengths without considering the daily constraints of SLAs.
- The fact that the penetration of energy-limited technologies in the market has an impact on the overall contribution of energy-limited technologies. Indeed, the more these technologies are present in the system, the lower their derating factor will be due to increased competition and scarcity periods being longer.

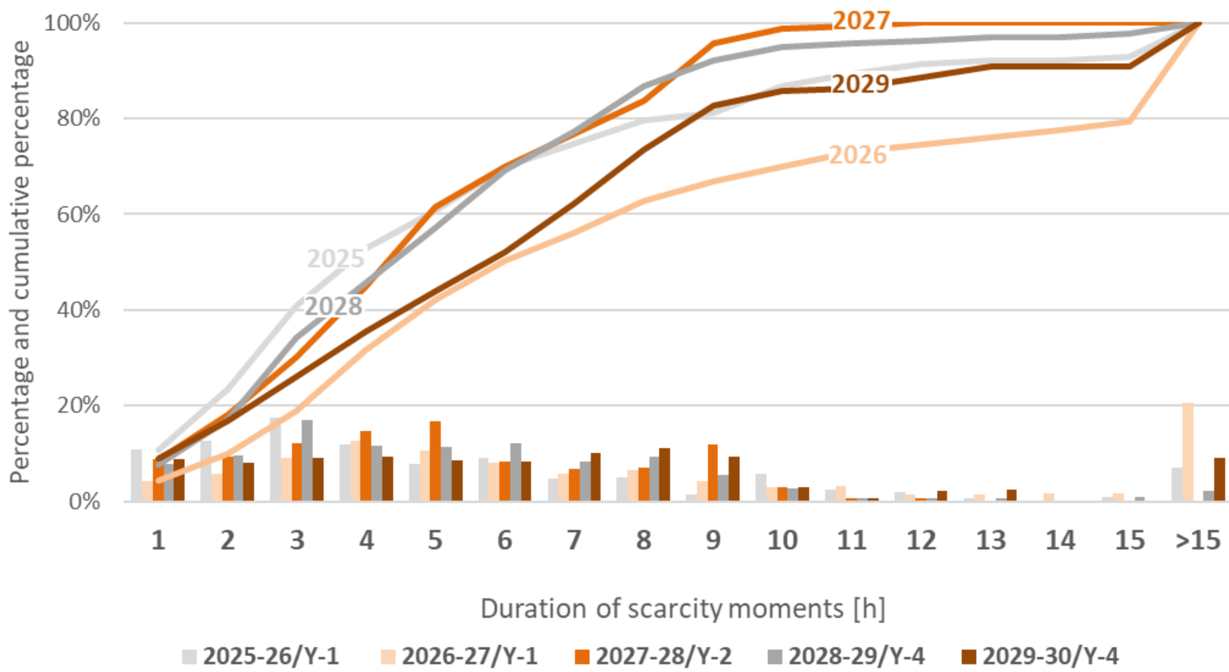

Figure 8: Cumulative and normal distribution of scarcity moments according to their duration and weighted by their duration.

The cumulative distribution shown in Figure 8 provides an indication of the derating factors for energy-limited technologies.

It shows that derating factors are expected to be lower in 2026-27/Y-1, correlated to long scarcity events driven by nuclear unavailability in France, as explained in previous sections.

For 2029-30/Y-4, the derating factors are also expected to be lower. However, for the long-term, it is mainly correlated to the higher volume of RES and flexibility at European level.

Comparison of derating factors between last calibration reports

Figure 9 and Figure 10 present the difference in derating factors between the different auctions of last year and this year calibration reports for a selection of technologies. It can be noted that the derating factors of the renewable technologies decrease over time as RES penetration increases. For the energy limited technologies the derating factors are lower in the short-term due to the increased correlation with nuclear unavailability in France and lower in the long-term due to the strong increase of storage capacity on Belgian and European level and the higher correlation of scarcity events with periods of low RES infeed at European level.

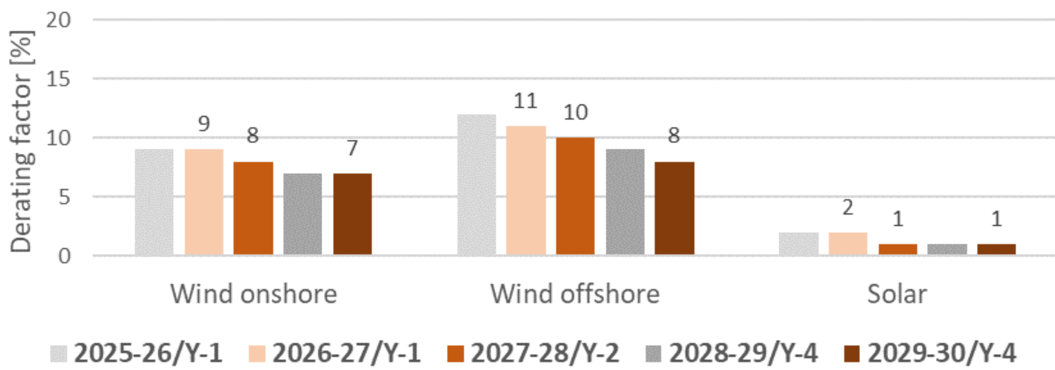

Figure 9 : Comparison of the derating factors for wind and solar

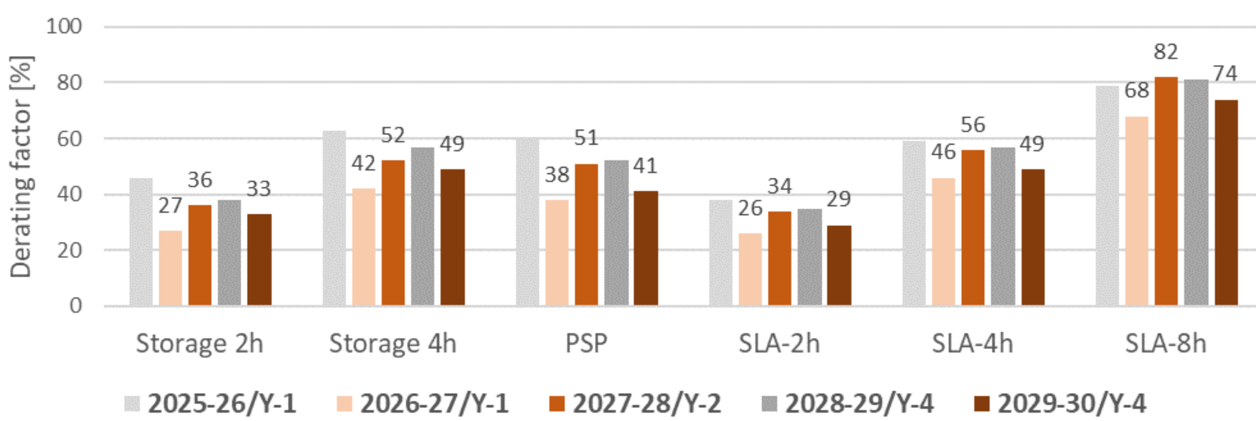

Figure 10 : Comparison of the derating factors for storage and SLA

Comparison of derating factors at European level

Figure 11 presents a comparison of the derating factors for batteries in the 2028-29/Y-4 and 2029-30/Y-4 auctions with derating factors from other countries with a capacity mechanism. Data for Great-Britain comes from National Grid ESO's '2023 Electricity Capacity Report'[10] and data for Ireland from SEM-O's '2028/2029 T-4 Capacity Auction: Initial Auction Information Pack'[11] and '2027/2028 T-4 Capacity Auction: Initial Auction Information Pack'[12].

It can be noted that the values from the Belgian's CRM are in line with the values published in other capacity mechanism across Europe. Derating factors for energy-limited technologies in Belgian's CRM are even on the top side of the range.

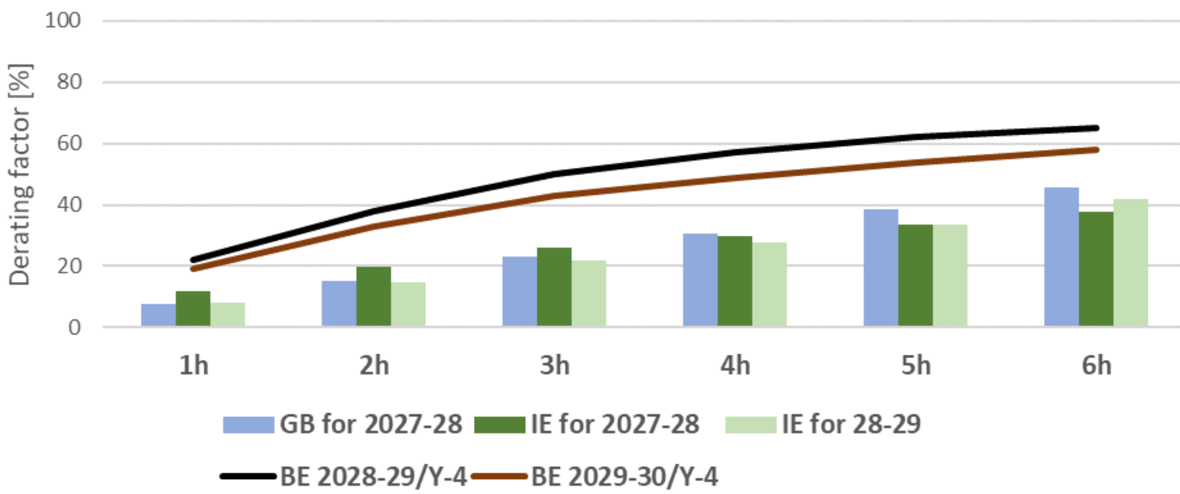

Figure 11 : Comparison of derating factors with capacity mechanism in other countries

[10] PowerPoint Presentation
[11] IAIP2829T-4.pdf
[12] https://www.sem-o.com/documents/general-publications/IAIP2728T-4.pdf

2.3. Average electricity consumption during simulated scarcity situations

The calculation of the average electricity consumption during simulated scarcity situations encompasses both electricity consumption and a predefined flexibility volume, as established in the reference scenario. In the event that the modeling of either electricity consumption or flexibility undergoes changes, their impact on the average electricity consumption during simulated scarcity situations should be correctly taken into account. Table 6 aims to present the different categories of consumption flexibility and how it was considered in the calculation. The following assumptions can be reviewed in the future based on the feedback from past auctions.

- DSR from existing usages is calculated based on the estimation by N-Side on historical volumes, where certain bids on the day-ahead market are considered as DSR. The flexibility from these sources is not considered as a reduction in the average electricity consumption during scarcity but is expected to offer into the CRM.
- End-user flexibility (mainly from electric vehicles, heat pumps and residential batteries) is removed from the average consumption during scarcity. In the short-term, the technology is considered as not mature enough to participate in a CRM auction. For the Y-4 auctions, the lead-time is considered too long for this technology. It is therefore removed from the average consumption during scarcity.
- DSR volumes from newly electrified industry or new usages (industrial heat pumps, e-boilers, steel, CCS or datacenters) also represent a significant share of DSR volume in the reference scenario. Regarding flexibility from newly electrified processes, two categories are considered:
    - DSR volumes reacting to low prices are removed from the average consumption during scarcity;
    - DSR volumes reacting to high prices:
        - for 2026-27/Y-1 are treated similarly as DSR from existing usages. It means that this volume is expected to be contracted in CRM auction for adequacy purpose;
        - for 2027-28/Y-2, 75% is treated similarly as DSR from existing usages and 25% are removed from the average consumption during scarcity;
        - for 2029-30/Y-4, 50% is treated similarly as DSR from existing usages and 50% are removed from the average consumption during scarcity.

  The equivalent share of DSR from newly electrified industry or new usages removed from the average electricity consumption during simulated scarcity situations is provided in Table 6. This results in respectively 78%, 82% and 78% of DSR from newly electrified industry or new usages being removed from the average electricity consumption during simulated scarcity in 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4.

		2026-27/Y-1	2027-28/Y-2	2029-30/Y-4
DSR from existing industry (N-Side)		Not removed from the average electricity consumption during scarcity	Not removed from the average electricity consumption during scarcity	Not removed from the average electricity consumption during scarcity
End-user flexibility	Electric vehicles	Removed from the average electricity consumption during scarcity	Removed from the average electricity consumption during scarcity	Removed from the average electricity consumption during scarcity
	Heating			
	Residential batteries			
DSR from additional electrification in industry	Electrolysers	78% removed from the average electricity consumption during scarcity	82% removed from the average electricity consumption during scarcity	78% removed from the average electricity consumption during scarcity
	E-boilers			
	Data centres			
	Indust. HP			
	Steel			
	CCS			

Table 6: Consideration of flexibility in the calibration reports

Figure 12 compares the average electricity consumption during simulated scarcity situations (point B) between the different auctions in the last two calibration reports.

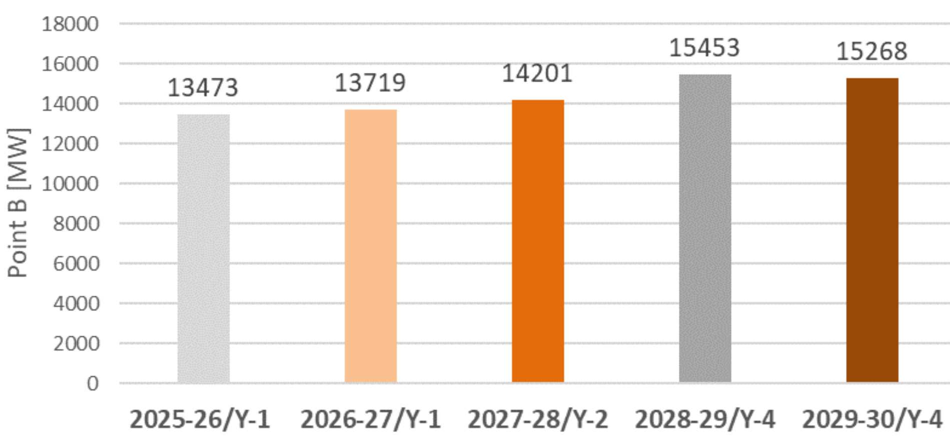

Figure 12 : Average electricity consumption during simulated scarcity situations

The average consumption during scarcity is dependent on a variety of factors of which the annual consumption plays a major role. The annual consumption for the 2025-26/Y-1 and 2028-29/Y-4 auctions were 85.7 TWh and 102.4 TWh respectively whereas the annual consumption for the 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 are 87.7 TWh, 90.7 TWh and 98.1 TWh respectively. The evolution of the average load during scarcity is in line with the evolution of the annual consumption over the delivery periods.

2.4. Expected energy not served during simulated scarcity situations

Another parameter used to determine the target volume is the expected Energy Not Served (ENS) during simulated scarcity situations. This parameter is determined by averaging the unserved energy over all hours in which a scarcity situation is observed. In the context of the calibration, the average ENS for point B is respectively 930 MW, 438 MW and 687 MW for 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4. The values for 2025-26/Y-1 and 2028-29/Y-4 were respectively 478 MW and 443 MW. Figure 13 shows the ENS distribution.

For 2026-27/Y-1, the ENS is much higher than for the other auctions because the scarcity situations in Belgium are correlated to the most impactful scarcity situations in France. For 2027-28/Y-2, the average ENS aligns with 2025-26/Y-1 and 2028-29/Y-4. For 2029-30/Y-4, the higher average ENS can be attributed to the correlation of the scarcity situations with low RES infeed at European level, leading to more simultaneous scarcity situations, and by consequent to more impactful scarcity situations.

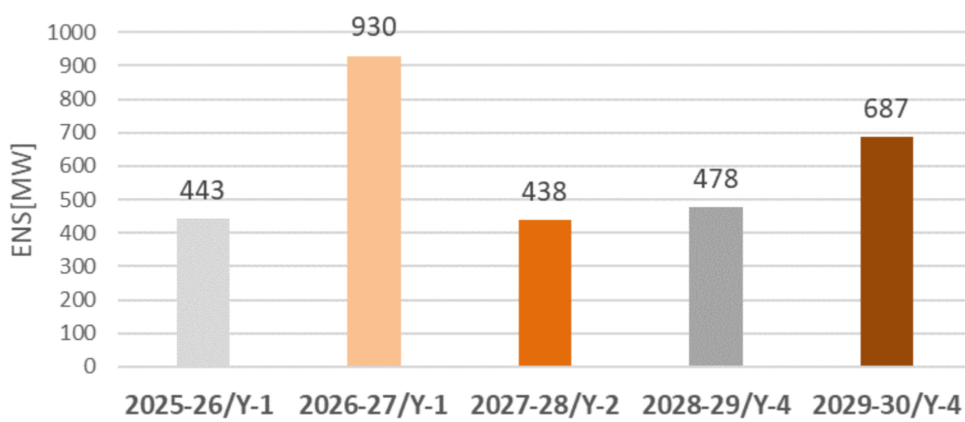

Figure 13 : Average Energy Not Supplied

2.5. Maximum Available Entry Capacity for Indirect Foreign Capacity Participation

The maximum available entry capacity for indirect foreign capacity participation also changed between the calibration reports, as shown in Table 7.

In general, the global trend consists in a decrease on the imports during simulated scarcity situations. In the short-term, the scarcity situations are strongly correlated to France and the French nuclear availability, but other countries have some margin left and can contribute to scarcity situations in Belgium. In the long-term, the margin in neighboring countries tends to decrease, as most scarcity situations happens simultaneously between the different countries, as illustrated on Figure 14, leading to lower imports during scarcity situations.

The maximum entry capacity is twice as high for 2026-27/Y-1 compared to other auctions. As explained before, the scarcity situations in Belgium are highly correlated to scarcity or near-scarcity situations in France, leading to France contributing almost nothing to this increased capacity. However, lower occurrence of scarcity periods are observed in the Netherlands, Germany, and Great Britain, resulting in more cross-border capacity being available to contribute to scarcity events in Belgium.

	2025-26/Y-1 Volume [MW]	2026-27/Y-1 Volume [MW]	2027-28/Y-2 Volume [MW]	2028-29/Y-4 Volume [MW]	2029-30/Y-4 Volume [MW]
France	0	6	5	10	133
Netherlands	976	2207	606	497	225
Germany	284	296	34	132	420
Great Britain	709	820	778	379	433
TOTAL	**1969**	**3329**	**1423**	**1018**	**1211**

Table 7 : Comparison of the Maximum Available Entry Capacity for Indirect Foreign Capacity Participation during scarcity situations between the last two calibration reports

The analysis of simultaneous simulated scarcity periods (Figure 14) highlights the differences in correlation of simulated scarcity periods in Belgium with other countries and its effect on the cross-border contribution of those countries.

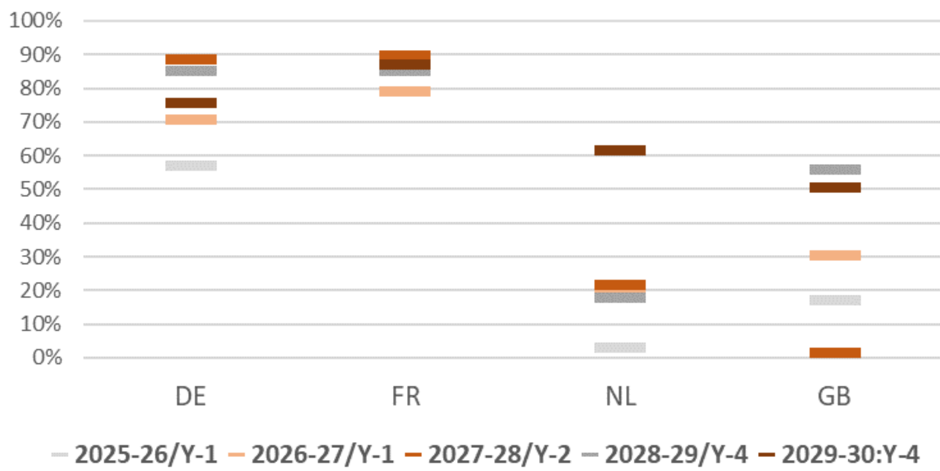

Figure 14: Comparison of the correlation of scarcity moments between Belgium and neighboring countries

2.6. Electricity prices & yearly inframarginal rents obtained on the energy market

The following section explains how the prices have evolved compared to last year's auctions and provides insights into the consequences on the thermal revenues. This section is new compared to last year and follows stakeholders feedback on the CRM calibration report.

The price duration curves for the auction of this year and the auctions of last year are displayed on Figure 15. Generally speaking, prices are lower for the auctions of this year compared to the one of last year. This follows the update of the assumptions on fuel and CO_2 prices, as explained in §1.3. Additionally, one can observe that the prices decrease over time. In 2028-29/Y-4 and 2029-30/Y-4, there are more moments of low prices due to high-RES penetration in the EU.

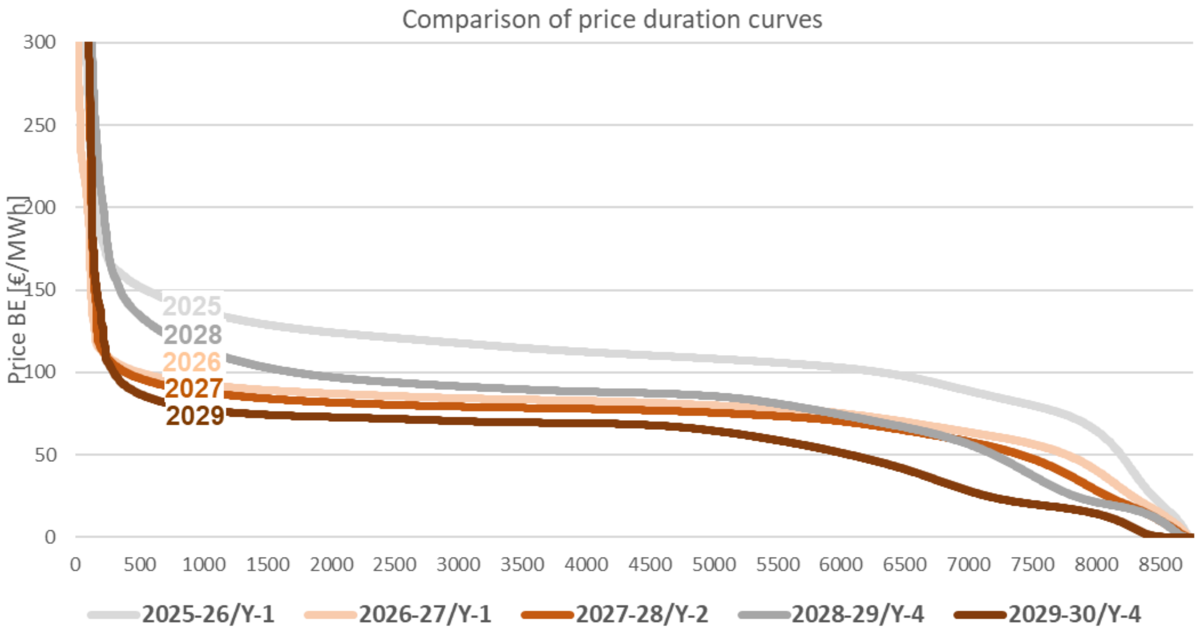

Figure 15 : Comparison of price duration curves for the auction of last year and the ones of this year

Figure 16 presents the price duration curve for the auction 2028-29/Y-4 of last year and the visual representation of revenues from CCGT and OCGT. This is meant to be used as a starting point to explain the values of this year. The main changes in terms of revenues are the following:

- decrease of the proposed strike price compared to last year's auctions;
- review of electrification assumptions leading to a general decrease of the price curves and less flexibility reacting to high prices;
- decrease of the marginal price of thermal technologies, which tends to flattening the price curves
- increase of the RES penetration in the EU, which leads to higher occurrence of low prices and hence a decrease in the running hours of CCGT's.

All this together explains the major decrease in the revenues of OCGT' and more particularly

CCGT units compared to last year auctions.

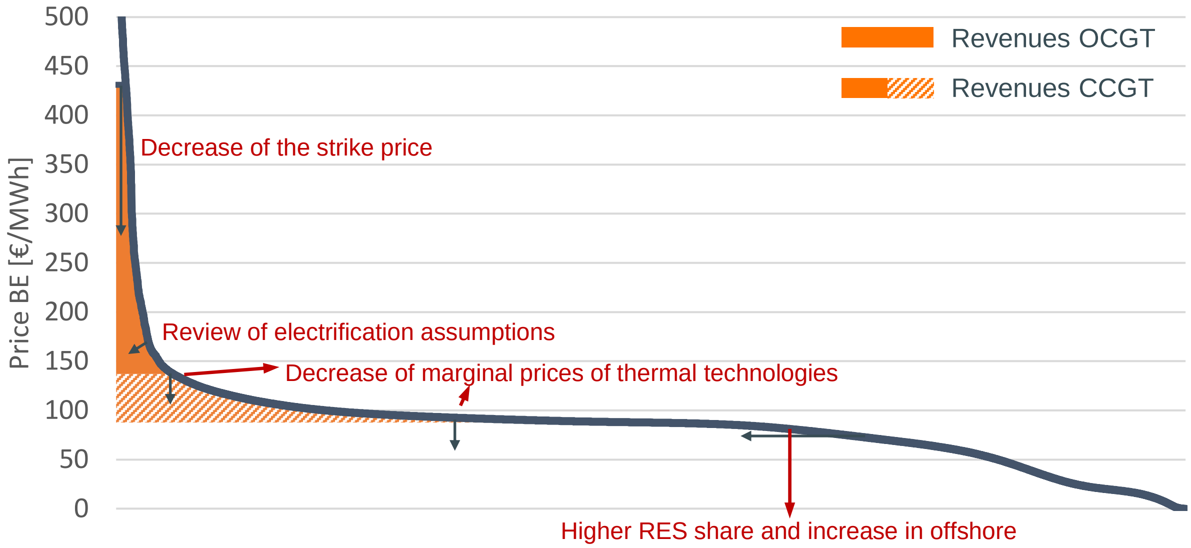

Figure 16 : Price duration curve with CCGT and OCGT revenues for 2028-29/Y-4 including changes happening in the auctions of this year and their causes

Figures 17 presents the comparison of revenues from CCGT and OCGT, compared to the CRM calibration report of last year. A significant decrease of the revenues are expected for both technologies. However, the trend in the revenues observed last year remains:

- Lower revenues for CCGT in the long-term, due to more RES penetration and decrease of fuel prices;
- Higher revenues for OCGT in the long-term, due to electrification and higher share of flexibility.

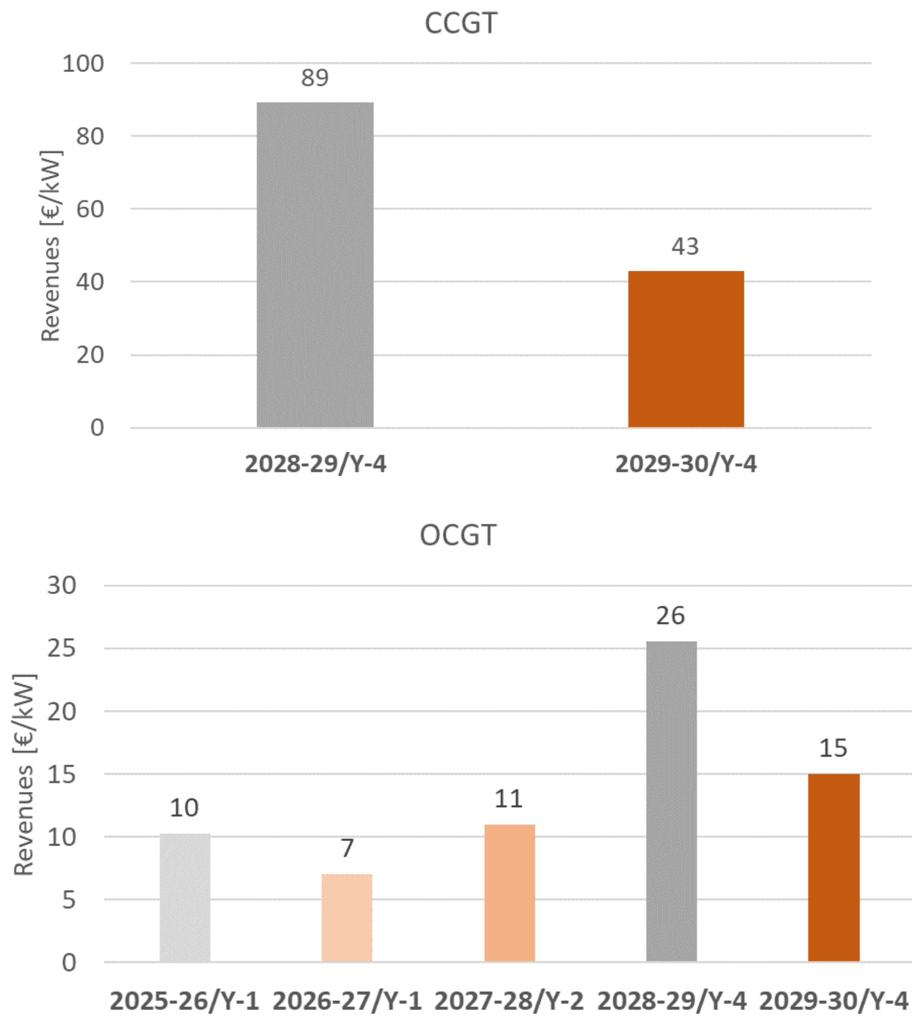

Figure 17 : CCGT and OCGT revenues

Figure 18 provides the comparison of revenues from DSR compared to the CRM calibration report of last year. The revenues for DSR increases due to the application of the DSR exemption.

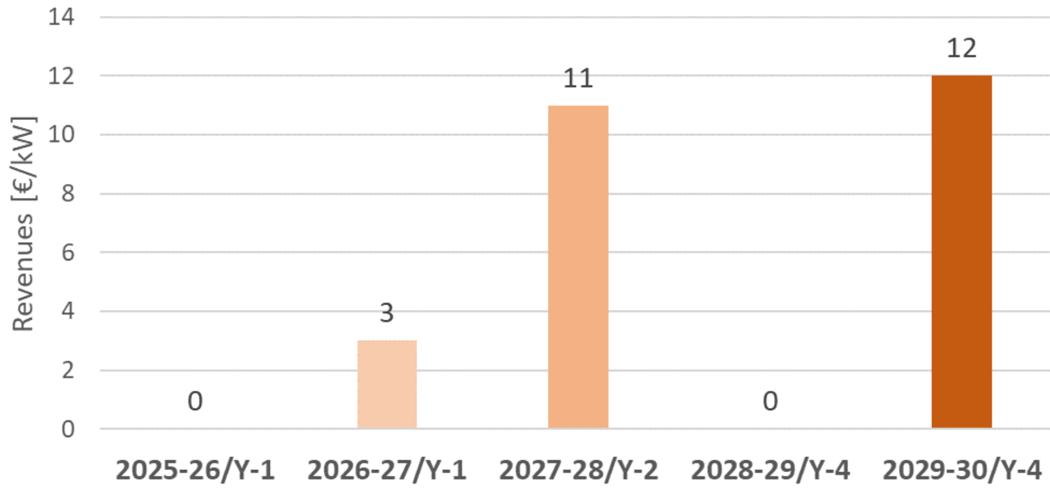

Figure 18 : DSR revenues

Figure 19 provides the comparison of revenues from 4h batteries compared to the CRM calibration report of last year. The trend observed last year seems confirmed, with higher revenues in the long-term, due to higher price variations, following the assumptions on RES penetration and electrification.

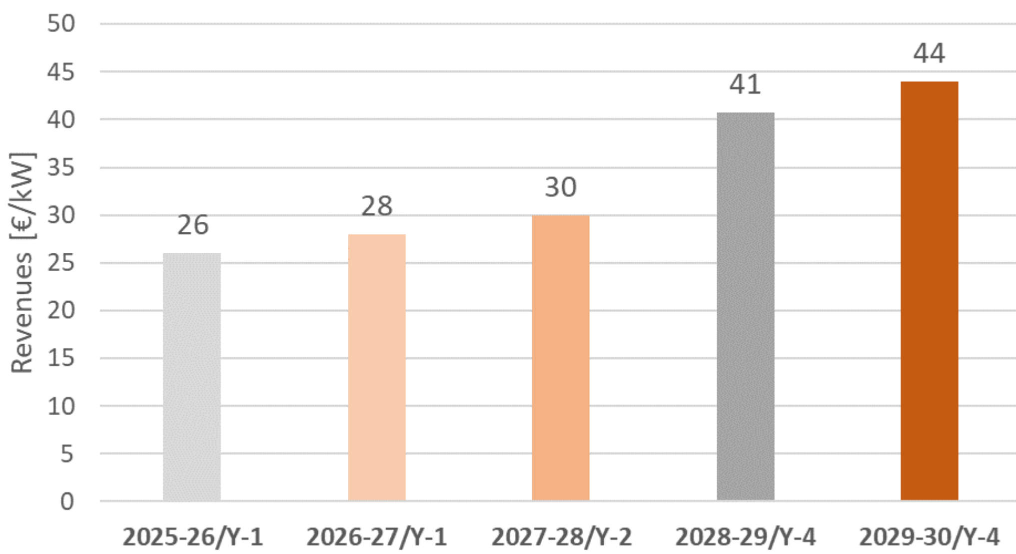

Figure 19 : Batteries revenues