# Preparation of the CRM Y-1, Y-2 and Y-4 auctions with Delivery Periods 2026-2027, 2027-2028 and 2029-30:

# Report of the transmission system operator containing the information to determine the volume to be contracted and proposals for other parameters.

Elia – December 1, 2024

# Contents

# Executive summary – English Version

## Context

Elia Transmission Belgium has drawn up a report containing the information needed to determine the volume to be contracted and the proposed parameters that the TSO has to submit according to the Royal Decree Methodology for the CRM auctions. This report includes Elia's proposals for all three auctions scheduled for October 2025 for the Delivery Period 2026-2027, 2027-2028 and 2029-2030. In the rest of this document Elia will refer to these auctions as 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 respectively. Elia follows the framework and instructions received from the Belgian authorities. In particular, this report is drawn up in accordance with the Royal Decree Methodology[1]. The reference scenario[2] and intermediate values[3] used in this report have been selected by the Minister of Energy and form the basis of this study.

This report consists of three main parts. First, the reference scenario, its calibration according to the applicable reliability standard and the intermediate values considered are presented. Secondly, Elia provides the necessary information and calculations to determine the volume to be contracted for the considered auction, based on the demand curve. Finally, the third part contains proposals from Elia on the other auction parameters, namely the derating factors, the intermediate price cap, the strike price and the reference price.

## Reference scenario and intermediate values selected by the Minister

In order to carry out its tasks, Elia relies on the intermediate values and reference scenarios selected by the Minister in the Ministerial Decrees of the 2nd and 4th of October 2024.

The reference scenarios selected by the Minister is described in the Excel "Assumptions Workbook" provided with this report and integrate the following sensitivities:

- French nuclear availability for 2026-27/Y-1: a lower availability during winter compared to REMIT and calculated as the difference between the minimum EDF forecast and REMIT on the winter only.
- French nuclear availability for 2027-28/Y-2 and 2029-30/Y-4: a lower French nuclear availability of 4 units on average during winter compared to ERAA23.

The intermediate values selected by the Minister, following a proposal made by the CREG, consist in a WACC (Weighted Average Cost of Capital) for a reduced list of technologies needed to determine the net cost of a new entrant in the Belgian control area, together with the associated cost values, and a correction factor X, which is necessary for determining the maximum volume at the maximum price. The correction factor is equal to 1.1 for 2026-27/Y-1

[1] Royal Decree of 28 April 2021 setting the parameters with which the volume of capacity to be provided for is determined, including their calculation methods, and the other parameters necessary for the organization of the auctions, as well as the method for and conditions for granting an individual exemption from the application of the intermediate price cap(s) under the capacity remuneration mechanism
http://www.ejustice.just.fgov.be/eli/arrete/2021/04/28/2021041351/justel
[2] https://www.ejustice.just.fgov.be/eli/arrete/2024/10/04/2024009372/moniteur
[3] https://www.ejustice.just.fgov.be/eli/arrete/2024/10/02/2024009072/moniteur

and 1.5 for 2027-28/Y-2 and 2029-30/Y-4. In the determination of the technology setting the net-CONE and thus the price cap of the auction, an evaluation of the potential of such technology should be made. Elia insists that the technology potential should also be understood as the potential of participation to the CRM, taking into account the known barriers for certain technologies.

Unless explicitly stated otherwise, all prices are expressed in € 2023.

On the basis of these elements and in accordance with the Royal Decree Methodology, Elia has calibrated the reference scenario in such a way as to ensure that the legal reliability standard is met (3h of loss of load expectation (LOLE)). The calibrated reference scenario thus obtained is strictly applicable for the calculations and proposals made in the framework of this calibration report, applicable for the 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 auctions, respectively.

**Information and input for the establishment of the demand curve**

According to the Royal Decree Methodology, Elia is not responsible for providing a proposal for the demand curve. This prerogative is the responsibility of the CREG, based on the necessary information which is provided in this report. The provided list of information and input corresponds at minima with the points as referred to in article 6, §2, 1° to 7° of the Royal Decree Methodology:

- Figure A and Figure B serve as the basis for determining the volume to be reserved for Y-1 and Y-2 auction of the same delivery period, when applicable;
- Table A presents the different inputs required for the determination of the volume parameters of the demand curve;
- Figure C presents the revenues earned in the market by the different technologies from the reduced list of technologies as selected by the Minister serving as input for the net-CONE calculation;
- Table B includes the estimations for annual balancing service revenues for the technologies included in the reduced list of technologies for net-CONE.

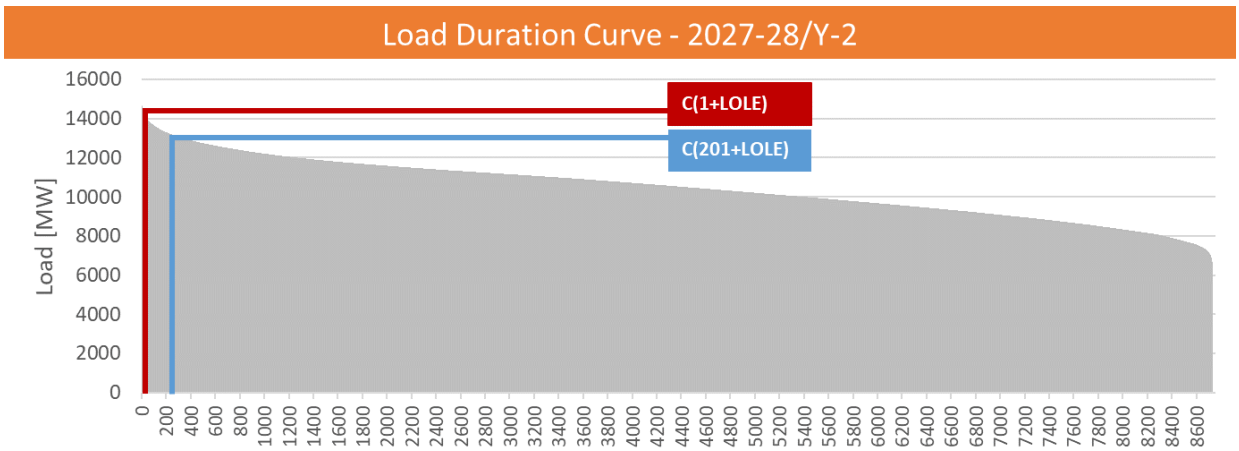



*Figure A : Load duration curve for 2027-28/Y-2*

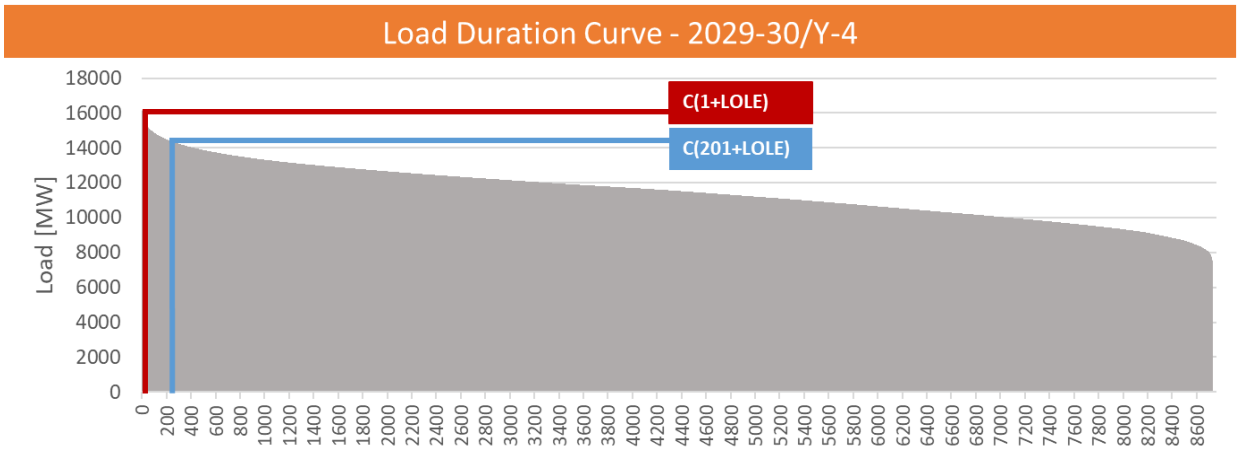



*Figure B : Load duration curve for 2029-30/Y-4*

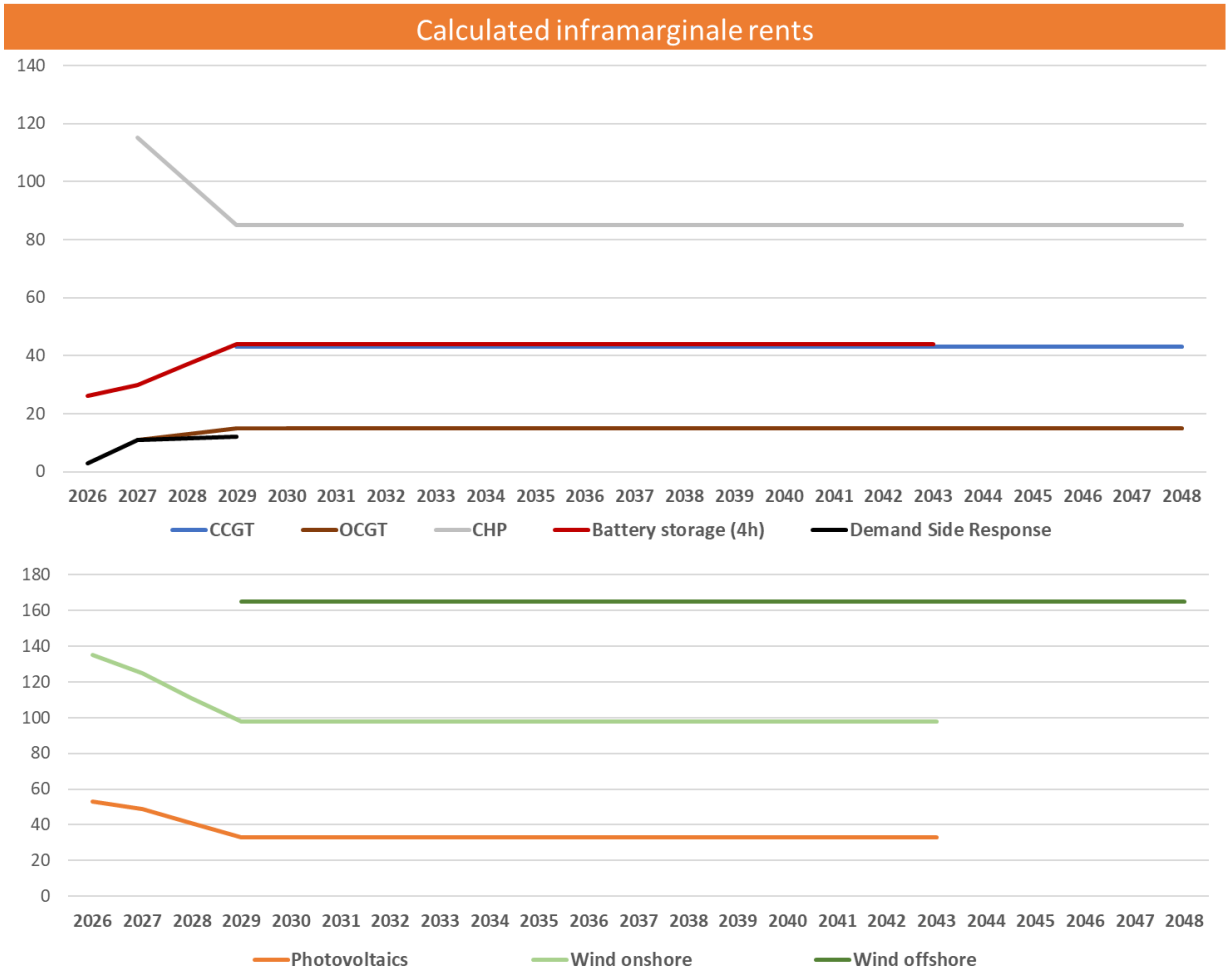



*Figure C: Inframarginal rents*

| Information and input required for the establishment of the volume parameters of the demand curve | | | | |
|---|---|---|---|---|
| **Description** | **RD Reference** | **Capacity [MW]** | | |
| | | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Average load during simulated scarcity period (point A) | Art. 11, §2, 1° | 13719 | 14042 | 15033 |
| Average load during simulated scarcity period (points B and C) | | 13719 | 14201 | 15268 |
| Balancing need | Art. 11, §2, 2° | 1127 | 1127 | 1127 |
| Average energy not served during simulated scarcity period (point A) | Art. 11, §2, 3° | 930 | 671 | 837 |
| Average energy not served during simulated scarcity period (points B and C) | | 930 | 438 | 687 |
| Non-eligible capacity<br>Renewable capacity that receives operating aid | Art. 11, §2, 4°<br>Art. 11, §3 | 956 | 805 | 845 |
| Non-eligible capacity<br>Individually modelled and profiled thermal capacity that receives operating aid | | 1580 | 1565 | 1595 |
| Max Entry Capacity for Cross-border participation<br>France | Art. 14 | 6 | 5 | 133 |
| Max Entry Capacity for Cross-border participation<br>Netherlands | | 2207 | 606 | 225 |
| Max Entry Capacity for Cross-border participation<br>Germany | | 296 | 34 | 420 |
| Max Entry Capacity for Cross-border participation<br>Great-Britain | | 820 | 778 | 433 |

*Table A: Volume parameters*

| Estimations for annual balancing service revenues | | | |
|---|---|---|---|
| **Technology** | **Annual net revenues [€/kW/y]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| CCGT | / | / | 1 |
| OCGT | / | 21 | 20 |
| Battery storage 4h | 21 | 14 | 13 |
| DSM | 15 | 14 | 13 |
| Other technologies | 0 | 0 | 0 |

*Table B: Estimation of annual balancing service revenues*

### Proposals for the other auction parameters

In addition to the inputs for the determination of the demand curve, it is up to Elia to provide concrete proposals for several other parameters for the auction, according to article 6, §2, 7° of the Methodology Royal Decree:

- Table C presents Elia's proposal for **derating factors**, according to Chapter 5 of the Royal Decree Methodology;
- Table D includes Elia's proposals for the **intermediate price caps** according to Chapter 6 of the Royal Decree Methodology;
- Table E includes Elia's proposals for the **strike price** of the respective auctions. Moreover, Elia proposes to consider the Spot DA market price where the Nominated Electricity Market Operators (NEMOs: EPEX or Nord Pool Spot) are active in the Belgian bidding zone (or any NEMO operating in neighboring bidding zones for foreign capacities) for the **reference price**, according to Chapter 8 of the Royal Decree Methodology.

| Category I : SLA | | | |
|---|---|---|---|
| Sub-Category | Derating Factor [%] | | |
| | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
| SLA-1h | 14 | 19 | 16 |
| SLA-2h | 26 | 34 | 29 |
| SLA-3h | 37 | 47 | 40 |
| SLA-4h | 46 | 56 | 49 |
| SLA-5h | 53 | 65 | 56 |
| SLA-6h | 58 | 72 | 63 |
| SLA-7h | 63 | 77 | 69 |
| SLA-8h | 68 | 82 | 74 |
| SLA-9h | 72 | 87 | 79 |
| SLA-10h | 76 | 90 | 83 |
| SLA-11h | 80 | 94 | 86 |
| SLA-12h | 84 | 96 | 89 |
| SLA unlimited | 100 | 100 | 100 |
| **Category II : Thermal technologies with daily schedule** | | | |
| Sub-Category | Derating Factor [%] | | |
| | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
| CCGT | 94 | 94 | 94 |
| OCGT | 92 | 92 | 92 |
| Turbojets | 90 | 90 | 90 |
| IC Gas Engines | 92 | 92 | 92 |
| IC Diesel Engines | 90 | 90 | 90 |
| CHP/Biomass/Waste | 94 | 94 | 94 |
| Nuclear | 90 | 90 | 90 |
| Coal | 90 | 90 | 90 |

| Category III : Energy-limited technologies wih daily schedule | | | |
|---|---|---|---|
| **Sub-Category** | **Derating Factor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Storage 1h | 15 | 21 | 19 |
| Storage 2h | 27 | 36 | 33 |
| Storage 3h | 36 | 46 | 43 |
| Storage 4h | 42 | 52 | 49 |
| Storage 5h | 46 | 57 | 54 |
| Storage 6h | 49 | 60 | 58 |
| PSP | 38 | 51 | 41 |
| **Category IV : Weather-dependent technologies** | | | |
| **Sub-Category** | **Derating Factor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Offshore Wind | 11 | 10 | 8 |
| Onshore Wind | 9 | 8 | 7 |
| Solar | 2 | 1 | 1 |
| Hydro Run-of-River | 50 | 51 | 52 |
| **Category V : Thermal technologies without daily schedule** | | | |
| **Sub-Category** | **Derating Factor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Aggregated thermal technologies | 65 | 65 | 66 |

*Table C : Derating Factors*

| Intermediate Price Cap [€/kW/y] | | |
|---|---|---|
| **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| 21 | 26 | 24 |

*Table D : Intermediate Price Cap*

| Strike Price & Fixed Component [€/MWh] | | |
|---|---|---|
| | **Strike Price** | **Fixed Component** |
| 2026-27/Y-1 | 384 | 210 |
| 2027-28/Y-2 | 384 | 210 |
| 2029-30/Y-4 | 384 | 210 |

*Table E : Strike Price & Fixed Component*

# Executive summary – Version française

### Contexte

Le gestionnaire du réseau, Elia Transmission Belgium, a élaboré un rapport contenant les informations utiles pour la détermination du volume à contracter et des propositions de paramètres dans le cadre des enchères du CRM, prévue en octobre 2025 pour les périodes de fourniture 2026-27, 2027-28 et 2029-30. Dans le reste du document, Elia réfèrera aux différentes enchères respectivement comme 2025-26/Y-1, 2027-28/Y-2 et 2029-30/Y-4. Elia suit le cadre et les instructions reçues des autorités belges. En particulier, ce rapport est réalisé conformément à l'Arrêté Royal Méthodologie[4]. Le scénario de référence[5] et les valeurs intermédiaires[6] utilisés dans ce rapport ont été sélectionnés par la Ministre de l'énergie et constituent la base de cette étude.

Ce rapport est constitué de trois parties. D'abord, le scénario de référence, sa calibration selon la norme de fiabilité applicable et les valeurs intermédiaires considérées sont présentés. Ensuite, Elia fournit les informations et les calculs nécessaires permettant de déterminer le volume à contracter pour l'enchère considérée, sur base de la courbe de la demande. Enfin, la troisième partie contient des propositions de la part d'Elia sur les autres paramètres de l'enchère, à savoir les facteurs de réduction, le prix maximum intermédiaire, le prix d'exercice et le prix de référence.

### Scénario de référence et valeurs intermédiaires sélectionnés par la Ministre

Afin de réaliser les tâches qui lui sont assignées, Elia se base sur les valeurs intermédiaires et scénarios de références qui ont été sélectionnés par la Ministre dans les Arrêtés Ministériels du 2 et 4 octobre 2024.

Les scénarios de référence sélectionné par la Ministre est présenté dans l'Excel « Assumptions Workbook » fourni avec ce rapport. Ils intègrent les sensibilités suivantes:

- Disponibilité nucléaire en France pour 2027-28/Y-2 et 2029-30/Y-4 : une disponibilité du nucléaire en France plus faible de 4 unités en moyenne pour la période hivernale par rapport au niveau repris dans l'ERAA23.
- Disponibilité nucléaire en France pour 2026-27/Y-1 une disponibilité du nucléaire en France plus faible en hiver comparé à REMIT, calculée sur base de la différence entre le productible minimum publié par EDF et la disponibilité dans REMIT pour l'hiver.

Les valeurs intermédiaires sélectionnées par la Ministre, suite à une proposition de la CREG, consistent en un WACC (Weighted Average Cost of Capital) pour une liste réduite de technologies nécessaires pour déterminer le coût net d'un nouvel entrant dans la zone de

[4] Arrêté Royal du 28 avril 2021 fixant les paramètres avec lesquels le volume de la capacité à prévoir est déterminé, y compris leurs méthodes de calcul, et les autres paramètres nécessaires pour l'organisation des mises aux enchères, ainsi que la méthode pour et les conditions à l'octroi d'une dérogation individuelle à l'application du ou des plafond(s) de prix intermédiaire(s) dans le cadre du mécanisme de rémunération de capacité.
http://www.ejustice.just.fgov.be/eli/arrete/2021/04/28/2021041351/justel
[5] http://www.ejustice.just.fgov.be/eli/arrete/2024/10/04/2024009372/moniteur
[6] http://www.ejustice.just.fgov.be/eli/arrete/2024/10/02/2024009072/moniteur

contrôle belge, ainsi que les valeurs de coûts associées, et un facteur de correction X, nécessaire pour déterminer le volume maximal au prix maximal. Le facteur de correction est égal à 1,1 pour 2026-27/Y-1 et 1,5 pour 2027-28/Y-2 et 2029-30/Y-4. Dans la détermination de la technologie fixant le net-CONE et donc le prix plafond de l'enchère, une évaluation du potentiel de cette technologie doit être faite. Elia insiste sur le fait que le potentiel technologique doit également être compris comme le potentiel de participation au CRM, en tenant compte des barrières connues pour certaines technologies.

Sauf mention contraire, tous les prix et coûts repris dans ce rapport de calibration sont exprimés en € 2023.

Sur base de ces éléments et conformément à l'Arrêté Royal Méthodologie, Elia a calibré les scénarios de référence de façon à s'assurer que les calculs et les propositions permettent de garantir l'atteinte de la norme de fiabilité légale, correspondant à un critère de LOLE de 3h. Les scénarios de référence calibré ainsi obtenu sont strictement applicables pour les calculs et propositions effectuées dans le cadre de ce rapport de calibration, applicable pour les enchères 2026-27/Y-1, 2027-28/Y-2 et 2029-30/Y-4.

**Informations et données pour l'élaboration de la courbe de la demande**

Conformément à l'Arrêté Royal Méthodologie, Elia n'est pas responsable de fournir une proposition pour la courbe de la demande. Cette prérogative est du ressort de la CREG, sur base des informations nécessaires fournies dans le cadre de ce rapport. L'ensemble des informations et données correspond à minima aux points mentionnés à l'article 6, §2, 1° à 7° de l'Arrêté Royal Méthodologie :

- la Figure A et la Figure B présentent les courbes de durée de la demande, qui servent de base pour la détermination du volume à réserver dans les enchères Y-2 et Y-4.
- le Tableau A fournit les différentes données requises concernant les paramètres du volume nécessaires à l'élaboration de la courbe de la demande ;
- la Figure C présente de manière graphique les rentes inframarginales annuelles perçues dans le marché de l'énergie par les technologies reprises dans la liste réduite de technologies, nécessaires à la détermination du coût net d'un nouvel entrant ; et
- les valeurs reprises dans le Tableau B sont les revenus nets annuels estimés du marché des services d'équilibrage pour les technologies reprises dans la liste réduite de technologies.

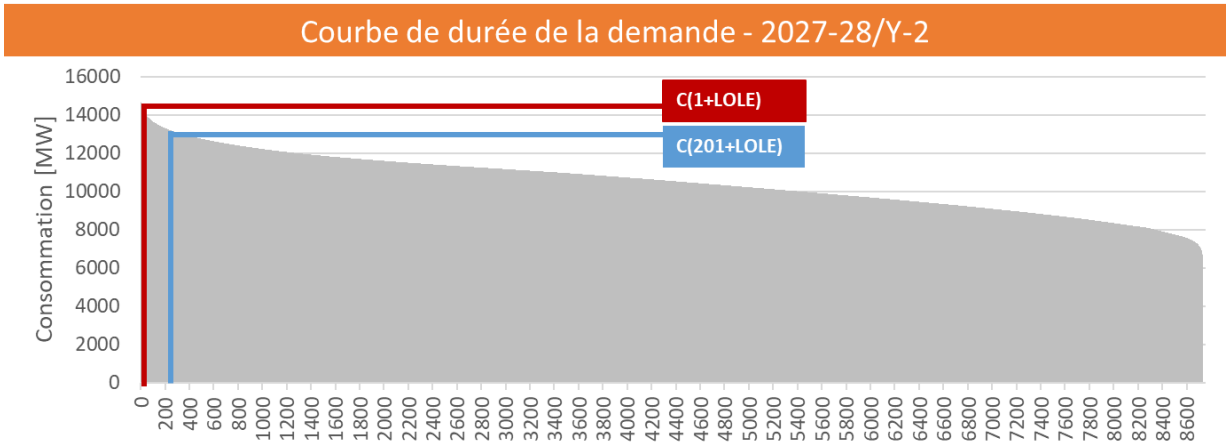



*Figure A : Courbe de durée de la demande pour 2027-28/Y-2 (Art. 11, §2, 5° and Art. 11, §5)*

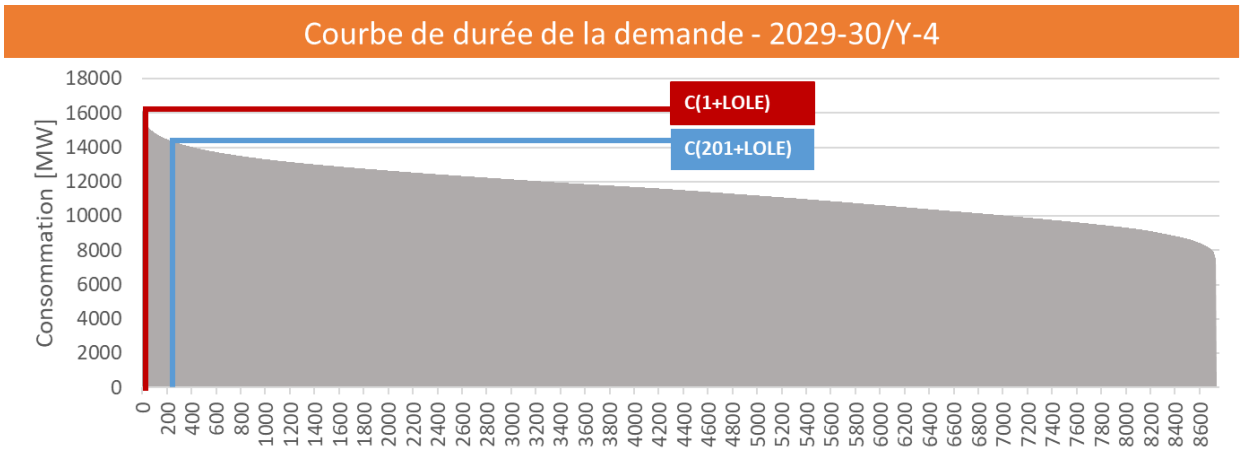



*Figure B: Courbe de durée de la demande pour 2029-30/Y-4 (Art. 11, §2, 5° and Art. 11, §5)*

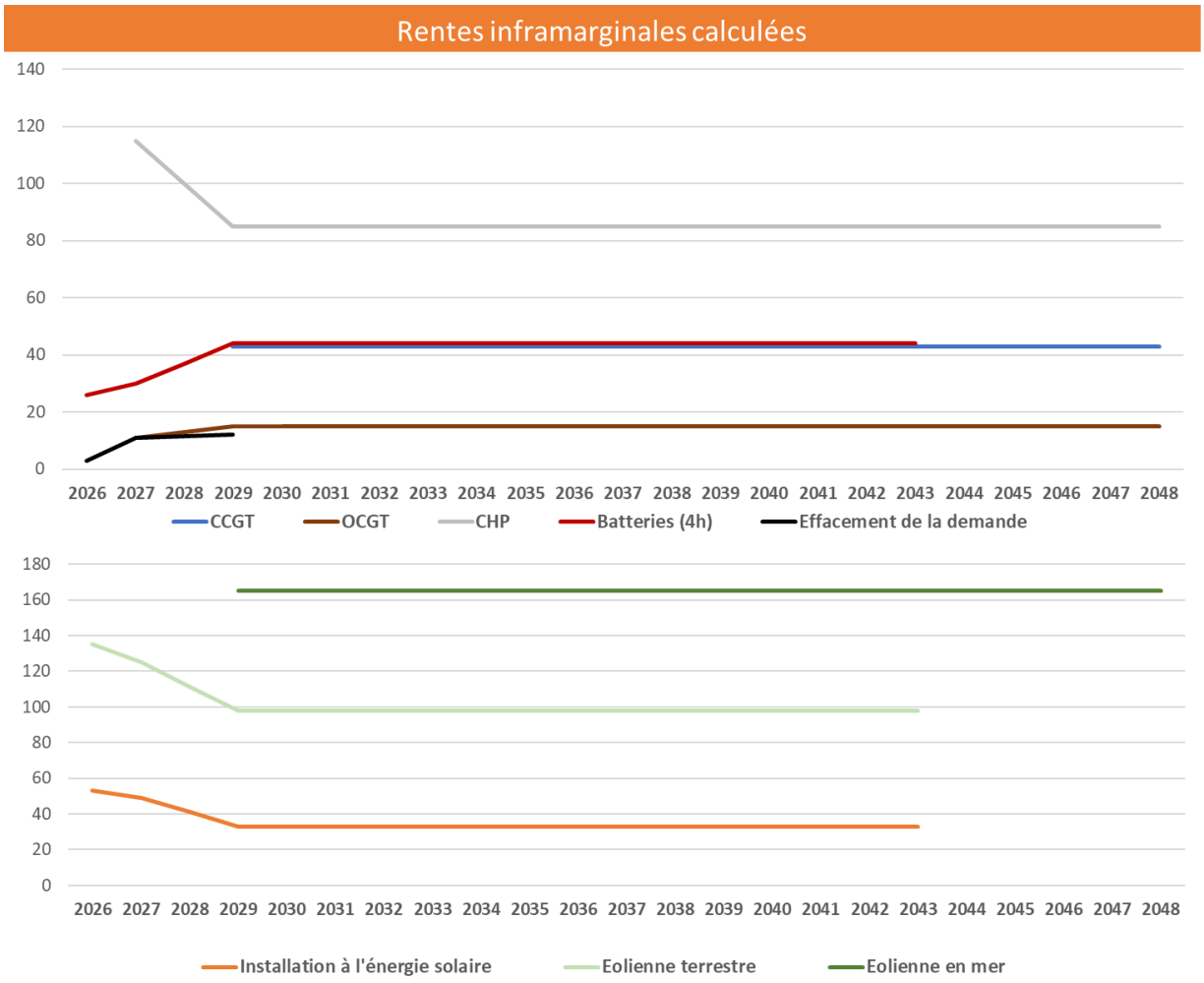



*Figure C: Estimation des rentes infra-marginales*

| Informations et input nécessaires pour l'établissement des paramètres de prix de la courbe de la demande | | | | |
|---|---|---|---|---|
| **Description** | **Référence de l'A.R.** | **Capacité [MW]** | | |
| | | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Charge moyenne pendant les situations de pénurie simulées (point A) | Art. 11, §2, 1° | 13719 | 14042 | 15033 |
| Charge moyenne pendant les situations de pénurie simulées (points B et C) | | 13719 | 14201 | 15268 |
| Besoin en réserves d'équilibrage | Art. 11, §2, 2° | 1127 | 1127 | 1127 |
| Prévision d'énergie non desservie moyenne pendant les situations de pénurie simulées (point A) | Art. 11, §2, 3° | 930 | 671 | 837 |
| Prévision d'énergie non desservie moyenne pendant les situations de pénurie simulées (points B et C) | | 930 | 438 | 687 |
| Capacité non éligible<br>Capacités renouvelables qui bénéficient d'aide au fonctionnement | Art. 11, §2, 4°<br>Art. 11, §3 | 956 | 805 | 845 |
| Capacité non éligible<br>Capacité thermique profilée et modélisée individuellement qui bénéficient d'aide au fonctionnement | | 1580 | 1565 | 1595 |
| Capacité d'entrée maximale disponible pour la participation de capacités étrangères indirectes France | Art. 14 | 6 | 5 | 133 |
| Capacité d'entrée maximale disponible pour la participation de capacités étrangères indirectes Pays-Bas | | 2207 | 606 | 225 |
| Capacité d'entrée maximale disponible pour la participation de capacités étrangères indirectes Allemagne | | 296 | 34 | 420 |
| Capacité d'entrée maximale disponible pour la participation de capacités étrangères indirectes Grande-Bretagne | | 820 | 778 | 433 |

*Tableau A: Paramètres de volume*

| Estimation pour les services d'équilibrage | | | |
|---|---|---|---|
| **Technologie** | **Revenus net annuels [€/kW/y]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| CCGT | / | / | 1 |
| OCGT | / | 21 | 20 |
| Batteries (4h) | 21 | 14 | 13 |
| Réponse du marché | 15 | 14 | 13 |
| Autres technologies | 0 | 0 | 0 |

*Tableau B : Estimation des revenus annuels net de pour les services d'équilibrage*

**Propositions pour les autres paramètres de l'enchère**

Elia est également responsable de fournir des propositions concrètes quant à une série d'autres paramètres de l'enchère, conformément à l'article 6, §2, 7° de l'Arrêté Royal Méthodologie :

- la proposition d'Elia concernant les **facteurs de réduction** est présentée au Tableau C conformément au Chapitre 5 de l'Arrêté Royal Méthodologie ;
- le Tableau D inclut la proposition d'Elia pour le **prix maximum intermédiaire** conformément au Chapitre 6 de l'Arrêté Royal Méthodologie ;
- le Tableau E inclut la proposition d'Elia pour le **prix d'exercice.** De plus, Elia propose et de prendre en compte comme **prix de référence** le prix du marché journalier spot déterminé par les Opérateurs de Marché de l'Electricité Nominés (NEMO : EPEX ou Nord Pool Spot) opérant en Belgique pour la zone de réglage belge (ou un autre NEMO pour les zones de réglage voisines pour les capacités étrangères), conformément au Chapitre 8 de l'Arrêté Royal Méthodologie.

| **Catégorie I : Catégories d'accords de niveau de service (SLA)** | | | |
|---|---|---|---|
| **Sous-catégories** | **Facteur de réduction [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| SLA-1h | 14 | 19 | 16 |
| SLA-2h | 26 | 34 | 29 |
| SLA-3h | 37 | 47 | 40 |
| SLA-4h | 46 | 56 | 49 |
| SLA-5h | 53 | 65 | 56 |
| SLA-6h | 58 | 72 | 63 |
| SLA-7h | 63 | 77 | 69 |
| SLA-8h | 68 | 82 | 74 |
| SLA-9h | 72 | 87 | 79 |
| SLA-10h | 76 | 90 | 83 |
| SLA-11h | 80 | 94 | 86 |
| SLA-12h | 84 | 96 | 89 |
| SLA illimité | 100 | 100 | 100 |

| Catégorie II : Technologies thermiques avec programme journalier | | | |
|---|---|---|---|
| **Sous-catégories** | **Facteur de réduction [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Turbines gaz-vapeur | 94 | 94 | 94 |
| Turbines à gaz | 92 | 92 | 92 |
| Turbojets | 90 | 90 | 90 |
| Moteurs au gaz autonomes | 92 | 92 | 92 |
| Moteurs diesel autonomes | 90 | 90 | 90 |
| Centrales de cogénération / Centrales à biomasse / Installations d'incinération des déchets | 94 | 94 | 94 |
| Centrales nucléaires | 90 | 90 | 90 |
| Centrales à charbon | 90 | 90 | 90 |
| **Catégorie III : Technologies à énergie limitée avec programme journalier** | | | |
| **Sous-catégories** | **Facteur de réduction [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Stockage 1h | 15 | 21 | 19 |
| Stockage 2h | 27 | 36 | 33 |
| Stockage 3h | 36 | 46 | 43 |
| Stockage 4h | 42 | 52 | 49 |
| Stockage 5h | 46 | 57 | 54 |
| Stockage 6h | 49 | 60 | 58 |
| Installations de pompage-turbinage | 38 | 51 | 41 |
| **Catégorie IV : Technologies dépendantes des conditions climatiques** | | | |
| **Sous-catégories** | **Facteur de réduction [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Eoliennes en mer | 11 | 10 | 8 |
| Eoliennes terrestre | 9 | 8 | 7 |
| Installations à l'énergie solaire | 2 | 1 | 1 |
| Centrales hydrauliques au fil de l'eau | 50 | 51 | 52 |
| **Catégorie V : Technologies thermiques sans programme journalier** | | | |
| **Sous-catégories** | **Facteur de réduction [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Agrégation de l'ensemble des technologies thermiques | 65 | 65 | 66 |

*Tableau C : facteurs de réduction*

| Prix Maximum Intermédiaire [€/kW/y] | | |
|---|---|---|
| **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| 21 | 26 | 24 |

*Tableau D : Prix Maximum Intermédiaire*

| Prix d'exercice & Composante Fixe [€/MWh] | | |
|---|---|---|
| | **Prix d'exercice** | **Composante Fixe** |
| 2026-27/Y-1 | 384 | 210 |
| 2027-28/Y-2 | 384 | 210 |
| 2029-30/Y-4 | 384 | 210 |

*Tableau E : Prix d'exercice & Composante Fixe*

# Executive summary – Nederlandstalige versie

**Context**

Elia Transmission Belgium heeft een rapport opstelt met de nodige informatie om het te contracteren volume en de voorgestelde parameters voor de CRM-veiling te bepalen zoals beschreven staat in het Koninklijk Besluit Methodologie[7] voor de CRM veilingen. Dit rapport bevat Elias voorstellen voor de 3 veilingen die gepland staan voor oktober 2025, namelijk die voor de leveringsperiodes 2025-26, 2027-28 en 2029-30. In de rest van dit document zullen deze veilingen respectievelijk 2026-27/Y-1, 2027-28/Y-2 en 2029-30/Y-4 genoemd. Elia volgt het het legaal kader en de instructies ontvangen van de Belgische autoriteiten. In het bijzonder is dit rapport opgesteld in lijn met het Koninklijk Besluit Methodologie. Het referentieschenario[8] en de intermediaire waarden[9] gebruikt in dit rapport werden vastgelegd door de Minister van Energie en vormed de basis van dit rapport.

Dit verslag bestaat uit drie hoofddelen. Eerst worden het referentiescenario, de kalibratie daarvan volgens de toepasselijke betrouwbaarheidsnorm en de in aanmerking genomen intermediaire waarden gepresenteerd. Ten tweede verschaft Elia de nodige informatie en berekeningen om op basis van de vraagcurve het te contracteren volume te bepalen voor de veiling in kwestie. Tenslotte bevat het derde deel voorstellen van Elia over de andere veilingparameters, namelijk de reductiefactoren, de intermediaire maximumprijs, de uitoefenprijs en de referentieprijs.

**Bepaling van het referentiescenario en de intermediaire waarden door de Minister**

Voor de uitvoering van de opdrachten die het werden toevertrouwd, baseert Elia zich op de intermediaire waarden en referentiescenarios door de Minister vastgelegd in de Ministeriële Besluiten van 2 en 4 oktober 2024.

Het referentiescenario is beschreven in de Excel “Assumptions Workbook” die ter beschikking wordt gesteld met dit rapport. Bovenop dit referentiescenario werden er ook sensitiviteiten geselecteerd door de Minister:

- Beschikbaarheid van kernenergie in Frankrijk voor 2026-27/Y-1: een lagere beschikbaarheid van kernenergie in Frankrijk in de winter in vergelijking met REMIT, aaldoor EDF en de beschikbaarheid in REMIT voor de winter.
- Beschikbaarheid van kernenergie in Frankrijkvoor 2027-28/Y-2 en 2029-30/Y-4: een lagere beschikbaarheid van 4 nucleaire eenheden tijdens de winter in vergelijking met ERAA23.

De door de Minister gekozen intermediaire waarden zijn gebaseerd op een voorstel van de

[7] Royal Decree of 28 April 2021 setting the parameters with which the volume of capacity to be provided for is determined, including their calculation methods, and the other parameters necessary for the organization of the auctions, as well as the method for and conditions for granting an individual exemption from the application of the intermediate price cap(s) under the capacity remuneration mechanism
http://www.ejustice.just.fgov.be/eli/arrete/2021/04/28/2021041351/justel
[8] https://www.ejustice.just.fgov.be/eli/arrete/2024/10/04/2024009372/moniteur
[9] https://www.ejustice.just.fgov.be/eli/arrete/2024/10/02/2024009072/moniteur

CREG en bestaan uit een WACC voor een beperkte lijst van technologieën die nodig zijn om de nettokosten van een nieuwe toetreder in het Belgische controlegebied te bepalen, samen met de bijbehorende kostwaarden, en de correctiefactoren van 1,1 voor 2026-27/Y-1 en 1,5 voor 2027-28/Y-2 en 2029-2030/Y-4, die nodig zijn om het maximale volume tegen de maximumprijs te bepalen. Bij het bepalen van de technologie die de net-CONE en dus de maximumprijs van de veiling bepaalt, moet het potentieel van die technologie worden geëvalueerd. Elia benadrukt dat het technologisch potentieel ook moet worden begrepen als het potentieel voor deelname aan het CRM, rekening houdend met de gekende barrières voor bepaalde technologieën.

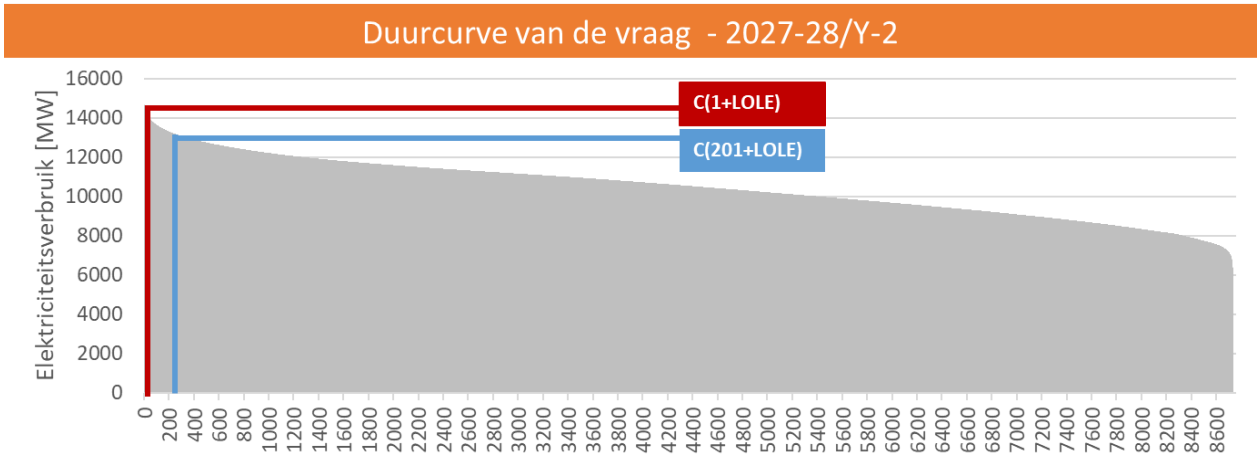
Tenzij expliciet anders vermeld zijn alle prijzen weergegeven in € 2023.

Op basis van deze elementen en overeenkomstig met het Koninklijk Besluit Methodologie heeft Elia de referentiescenarios zodanig gekalibreerd dat de berekeningen en voorstellen het mogelijk maken te garanderen dat de wettelijke betrouwbaarheidsnorm (3u LOLE) wordt nageleefd. Het aldus verkregen gekalibreerde referentiescenario is strikt toepasselijk voor de berekeningen en voorstellen in het kader van dit kalibratierapport, dat van toepassing is op de 2026-27/Y-1, 2027-28/Y-2 en 2029-30/Y-4 veilingen.

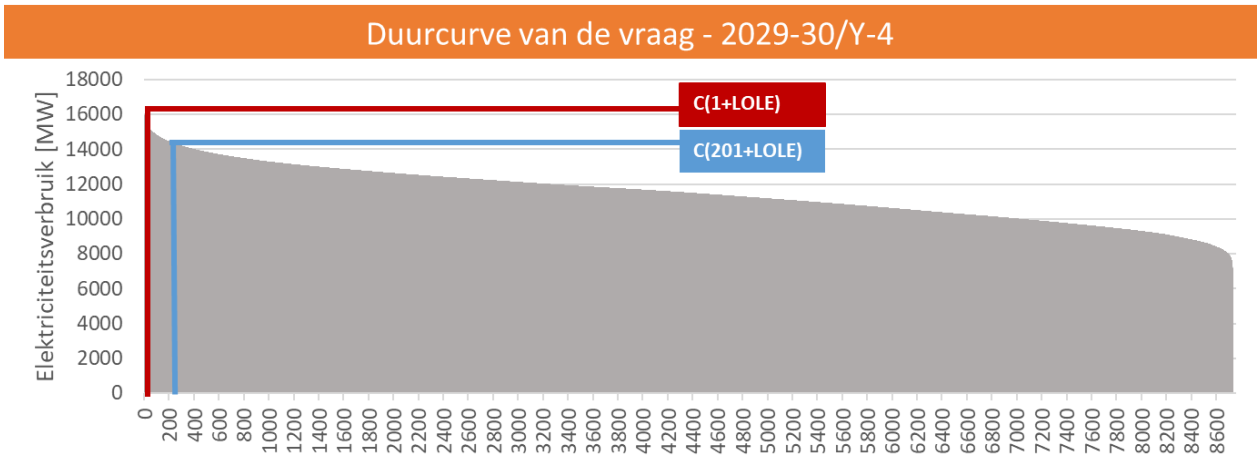
**Informatie en input voor het opstellen van de vraagcurve**

In overeenstemming met het Koninklijk Besluit Methodologie is het niet de taak van Elia om een voorstel te maken voor de vraagcurve. Het is de verantwoordelijkheid van de CREG om op basis van de informatie die in dit verslag verstrekt wordt, een voorstel te maken. Het geheel van informatie en gegevens in dit rapport stemt minstens overeen met de punten vermeld in artikel 6, §2, 1° tot 7° van het Koninklijk Besluit Methodologie:

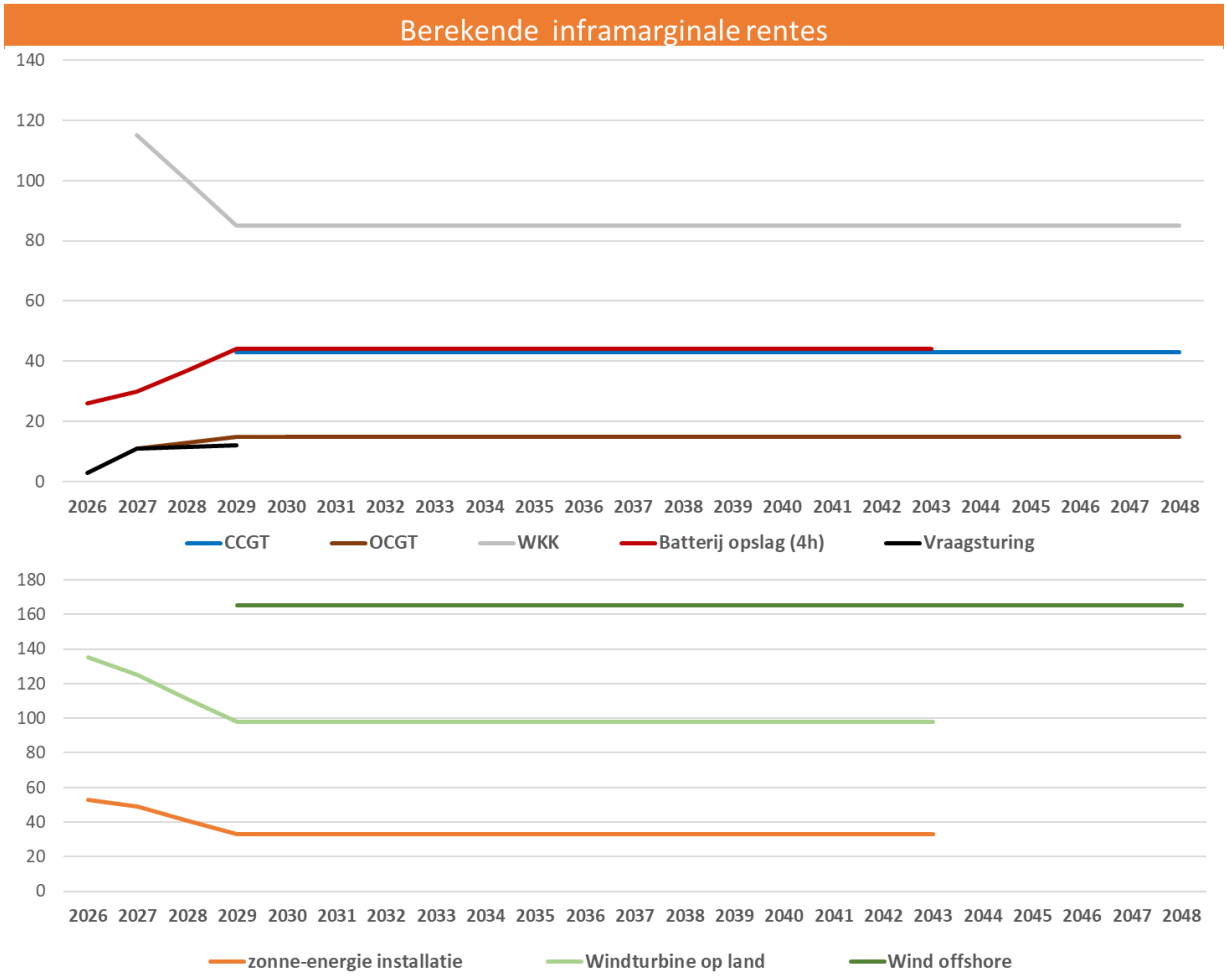
- Figuur A en Figuur B tonen de duurcurves van de vraag, die dienen als basis voor de bepaling van het volume te reserveren in de Y-4 en Y-2 veilingen.
- De jaarlijkse netto-inkomsten uit de markt voor balanceringsdiensten voor de technologieën die in de beperkte lijst van technologieën zijn opgenomen worden de volgende waarden geraamd. Deze zijn te vinden in Tabel 1.
- Figuur C toont de inschattingen van de infra-marginale rents die gebruikt worden voor de berekening van de net-CONE.
- Tabel B bevat de schattingen van de jaarlijkse inkomsten uit balanceringsdiensten voor de technologieën opgenomen in de lijst van beperkte technologieën voor de net-CONE.




*Figuur A : Duurcurve van de vraag voor 2027-28/Y-2 (Art. 11, §2, 5° en Art. 11, §5)*




*Figuur B : Duurcurve van de vraag voor 2029-30/Y-4 (Art. 11, §2, 5° en Art. 11, §5)*




*Figuur C : Infra-marginale inkomsten*

| Informatie en input vereist voor de vaststelling van de volumeparameters van de vraagcurve | | | | |
|---|---|---|---|---|
| **Beschrijving** | **KB Referentie** | **Capaciteit [MW]** | | |
| | | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Gemiddelde elektriciteitsverbruik in gesimuleerde tekortsituaties (punt A) | Art. 11, §2, 1° | 13719 | 14042 | 15033 |
| Gemiddelde elektriciteitsverbruik in gesimuleerde tekortsituaties (punten B en C) | | 13719 | 14201 | 15268 |
| Vereiste reserves voor het bewaren van het evenwicht in het netwerk | Art. 11, §2, 2° | 1127 | 1127 | 1127 |
| Gemiddelde niet-geleverde energie in gesimuleerde tekortsituaties (punt A) | Art. 11, §2, 3° | 930 | 671 | 837 |
| Gemiddelde niet-geleverde energie in gesimuleerde tekortsituaties (punten B en C) | | 930 | 438 | 687 |
| Niet in aanmerking komende capaciteit Hernieuwbare capaciteit die al exploitatiesteun ontvangt | Art. 11, §2, 4° Art. 11, §3 | 956 | 805 | 845 |
| Niet in aanmerking komende capaciteit Individueel geprofileerd en gemodelleerd thermisch vermogen dat exploitatiesteun ontvangt | | 1580 | 1565 | 1595 |
| Maximale beschikbare toegangscapaciteit voor de deelname van de indirecte buitenlandse capaciteiten Frankrijk | Art. 14 | 6 | 5 | 133 |
| Maximale beschikbare toegangscapaciteit voor de deelname van de indirecte buitenlandse capaciteiten Nederland | | 2207 | 606 | 225 |
| Maximale beschikbare toegangscapaciteit voor de deelname van de indirecte buitenlandse capaciteiten Duitsland | | 296 | 34 | 420 |
| Maximale beschikbare toegangscapaciteit voor de deelname van de indirecte buitenlandse capaciteiten Groot-Brittannië | | 820 | 778 | 433 |

*Tabel A : Volumeparameters*

| Inschatting voor de balanceringsdiensten | | | |
|---|---|---|---|
| **Technologie** | **Jaarlijkse netto-inkomsten [€/kW/y]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| CCGT | / | / | 1 |
| OCGT | / | 21 | 20 |
| Opslag (4u) | 21 | 14 | 13 |
| Vraagrespons | 15 | 14 | 13 |
| Andere technologieën | 0 | 0 | 0 |

*Tabel B : Inschatting van de jaarlijkse netto-inkomsten voor de balanceringsdiensten*

### Voorstellen voor de andere veilingparameters

Elia is ook belast met het maken van concrete voorstellen voor een andere reeks veilingparameters, overeenkomstig artikel 6, §2, 7° van het Koninklijk Besluit Methodologie:

- Het voorstel van Elia voor de **reductiefactoren** is opgenomen in Tabel , overeenkomstig hoofdstuk 5 van het Koninklijk Besluit Methodologie;
- Tabel D omvat Elia's voorstel voor de **intermediaire maximumprijs**, in overeenstemming met hoofdstuk 6 van het Koninklijk Besluit Methodologie;
- Tabel E omvat Elia's voorstal voor de **uitoefenprijs.** Daarbij stelt Elia voor om als **referentieprijs** de dagelijkse spotmarktprijs in aanmerking te nemen die door de NEMOs (Nominated Electricity Market Operators: EPEX of Nord Pool Spot) actief voor de Belgische regelzone (of een NEMO actief in een aangrenzende regelzone voor buitenlandse capaciteiten) wordt bepaald, in overeenstemming met hoofdstuk 8 van het Koninklijk Besluit Methodologie.

| Category I : SLA | | | |
|---|---|---|---|
| **Subcategorieën** | **Reductiefactor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| SLA-1h | 14 | 19 | 16 |
| SLA-2h | 26 | 34 | 29 |
| SLA-3h | 37 | 47 | 40 |
| SLA-4h | 46 | 56 | 49 |
| SLA-5h | 53 | 65 | 56 |
| SLA-6h | 58 | 72 | 63 |
| SLA-7h | 63 | 77 | 69 |
| SLA-8h | 68 | 82 | 74 |
| SLA-9h | 72 | 87 | 79 |
| SLA-10h | 76 | 90 | 83 |
| SLA-11h | 80 | 94 | 86 |
| SLA-12h | 84 | 96 | 89 |
| SLA onbeperkt | 100 | 100 | 100 |

| Categorie II : Thermische technologieën met dagelijks programma | | | |
|---|---|---|---|
| **Subcategorieën** | **Reductiefactor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Stoom- en gasturbines | 94 | 94 | 94 |
| Gasturbines | 92 | 92 | 92 |
| Turbojets | 90 | 90 | 90 |
| Autonome gasmotoren | 92 | 92 | 92 |
| Autonome dieselmotoren | 90 | 90 | 90 |
| Centrales met warmtekrachtkoppeling / Biomassacentrales / Afvalverbrandingsinstallaties | 94 | 94 | 94 |
| Kerncentrales | 90 | 90 | 90 |
| Steenkoolcentrales | 90 | 90 | 90 |
| **Categorie III : Technologieën met beperkte energie met dagelijks programma** | | | |
| **Subcategorieën** | **Reductiefactor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Opslag 1u | 15 | 21 | 19 |
| Opslag 2u | 27 | 36 | 33 |
| Opslag 3u | 36 | 46 | 43 |
| Opslag 4u | 42 | 52 | 49 |
| Opslag 5u | 46 | 57 | 54 |
| Opslag 6u | 49 | 60 | 58 |
| Pomp-opslaginstallaties | 38 | 51 | 41 |
| **Categorie IV : Van weersomstandigheden afhankelijke technologieën** | | | |
| **Subcategorieën** | **Reductiefactor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Windturbines op zee | 11 | 10 | 8 |
| Windturbines op het land | 9 | 8 | 7 |
| Zonne-energie installaties | 2 | 1 | 1 |
| Waterkrachtcentrales op waterlopen | 50 | 51 | 52 |
| **Categorie V : Thermische technologieën zonder dagelijks programma** | | | |
| **Subcategorieën** | **Reductiefactor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Geaggregeerde thermische technologieën | 65 | 65 | 66 |

*Tabel C : Reductiefactoren*

| Intermediaire Maximumprijs [€/kW/y] | | |
|---|---|---|
| **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| 21 | 26 | 24 |

*Tabel D: Intermediaire Maximumprijs*

| Strike Price & Vaste Component [€/MWh] | | |
|---|---|---|
| | **Uitoefenprijs** | **Vaste Component** |
| 2026-27/Y-1 | 384 | 210 |
| 2027-28/Y-2 | 384 | 210 |
| 2029-30/Y-4 | 384 | 210 |

*Tabel E: Uitoefenprijs & Vaste Component*

# Introduction

Following article 7*undecies §3* of the Electricity Act[10], Elia Transmission Belgium (hereafter Elia) is tasked with providing a report with the necessary information and proposals for the organization of the CRM auctions. The different parameters are calculated based on the Royal Decree Methodology[11] (hereafter RD Methodology).

Next year, three different auctions will take place: one for the Y-1 auction with Delivery Period 2026-27, one for the Y-2 auction with Delivery Period 2027-28 and another one for Y-4 auction with Delivery Period 2029-30. In the remainder of this document, Elia will refer to these auctions as 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 respectively. Elia wrote one calibration report that includes the required information for all three auctions.

This report is structured as follows: firstly, Elia briefly presents the legal and regulatory framework within which the calibration exercise takes place. The different parameters are then presented in three main parts:

- Part I: the reference scenario deals with the reference scenarios selected by the Minister that Elia is legally required to follow in the elaboration of this report.
- Part II: information and data for the establishment of the demand curves then goes into more detail about the different parameters that are used in the determination of the demand curve.
- Part III: proposals for the other auction parameters involves parameters such as the derating factors, the intermediate price cap and the strike price.

This calibration report also includes annexes regarding:

- maximum values of unproven capacities for Y-4 auction;
- details of the demand curve;
- additional information on the inframarginal rents; and
- price occurrences on the day-ahead market.

Finally, 2 other documents are published on Elia's website, accompanying the calibration report:

- the updated assumptions workbook, aligned with the reference scenario selected by the Minister;
- an appendix providing additional insights on the different parameters.

[10] (NL) Wet van 29 april 1999 betreffende de organisatie van de elektriciteitsmarkt
(FR) Loi du 29 avril 1999 relative à l'organisation du marché de l'électricité

[11] (NL) Koninklijk Besluit van 28 april 2021 tot vaststelling van de parameters waarmee het volume aan te kopen capaciteit wordt bepaald, inclusief hun berekeningsmethode, en van de andere parameters die nodig zijn voor de organisatie van de veilingen, alsook de methode en voorwaarden tot het verkrijgen van individuele uitzonderingen op de toepassing van de intermediaire prijslimieten(en) in het kader van het capaciteitsvergoedingsmechanisme
(FR) Arrêté Royal du 28 avril 2021 fixant les paramètres avec lesquels le volume de la capacité à prévoir est déterminé, y compris leurs méthodes de calcul, et les autres paramètres nécessaires pour l'organisation des mises aux enchères, ainsi que la méthode pour et les conditions à l'octroi d'une dérogation individuelle à l'application du ou des plafond(s) de prix intermédiaire(s) dans le cadre du mécanisme de rémunération de capacité

# Legal and regulatory framework

As already highlighted in the introduction, the legal and regulatory justifications that set the framework for this report can be found in the Electricity Act on the one hand and the Royal Decree (RD) Methodology on the other. This framework has been approved by the European Commission in its decision of August 27, 2021[12]. On the 29th of September 2023, the European Commission confirmed the validity of the Belgian Capacity Remuneration Mechanism, taking into account among others the nuclear extension of two power plants for 10 years [13]. On the 17th of September 2024, the European Commission approved a second set of amendments to the Belgian CRM, including the exemption on the payback obligation for non-fossil fuel capacities[14].

The RD Methodology has been modified on the 31st of May 2024, to include:

- the update of the different deadlines regarding the CRM process;
- the integration of the Y-2 auction;
- the adaptation of the 200h rules for the Y-2 auction; and
- modifications regarding the IPC derogations.

These texts have been adapted over time based on due discussion among market parties. The main platform for interaction between market parties is the Working Group Adequacy[15], whereas the main body between the public authorities is the “Comité de Suivi”, composed of representatives of the FPS Economy, the cabinet of the Minister of Energy, the CREG and Elia.

The elements that need to be included are defined in article 6, §2 of the RD Methodology[16].

[12] State aid: Commission approves Belgian capacity mechanism
[13] https://ec.europa.eu/competition/state_aid/cases1/202340/SA_104336_B04EFF8A-0000-CDF2-866E-13BF028481FA_65_1.pdf
[14] https://ec.europa.eu/competition/state_aid/cases1/202438/SA_114003_69.pdf
[15] Working Group Adequacy
[16] (NL) Art. 6, §2 van het KB methodologie
(FR) Art. 6, §2 de l’AR Méthodologie

# Part I: Reference Scenario

The reference scenario is built on several assumptions with regards to electricity consumption, production from different technologies, storage, active participation or response of the demand, import capacity and other technical and economic parameters and forms the basis for the calculations for the proposals for the parameters for the fifth CRM Auction. It is paramount that these parameters are clearly defined so that market parties can optimally prepare for the auction. As a result, only one reference scenario is defined, resulting in a single proposal for each parameter that needs to be calculated.

As a reminder, the reference scenario is selected by the Minister of Energy based on a proposal of the CREG, recommendations from Elia (after consultation of the market parties) as well as an advice from the SPF economy.

This chapter goes more into detail about the main elements that constitute the reference scenario selected by the Minister, as well as the intermediate values that were retained and to present the calibration of the reference scenario to ensure it satisfies the criteria set in the Electricity Act. The Royal Decree of September 4, 2022[17] sets the reliability standard at 3 hours (LOLE).

## 1.1 Reference Scenario selected by the Minister

The Minister has selected by means of the Ministerial Decree of October 4, 2024[18] the reference scenario that is to be considered for 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4. This Ministerial Decree states that the data included must be considered by Elia in further work and is described in the Excel “Assumptions Workbook” provided with this report.

More specifically the Ministerial Decree takes into account:

- no closure of TJ or OCGT due to the $CO_2$ thresholds;
- a total electricity demand of 87.7 TWh, 90.7 TWh and 98.1 TWh for 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 respectively;
- 1,732 MW of DSR for all Delivery Periods;
- to consider the dataset from the study "European Resource Adequacy Assessment 2023”, updated to take into account the latest information available for Belgium and Europe, and the comments of stakeholders to the public consultation.
- the $CO_2$ and fuel price data based on futures and the World Energy Outlook 2023;

[17] (NL) Koninklijk besluit van 4 september 2022 tot wijziging van het koninklijk besluit van 31 augustus 2021 tot vaststelling van de betrouwbaarheidsnorm en tot goedkeuring van de waarde van de verloren belasting en de kosten voor de nieuwe toegang
(FR) Arrêté royal du 4 septembre 2022 modifiant l’arrêté royal du 31 août 2021 relatif à la détermination de la norme de fiabilité et à l’approbation des valeurs du coût de l’énergie non distribuée et du coût d’un nouvel entrant

[18] (FR) https://www.ejustice.just.fgov.be/eli/arrete/2024/10/04/2024009372/moniteur
(NL) https://www.ejustice.just.fgov.be/eli/besluit/2024/10/04/2024009372/staatsblad

- a minRAM of 70% for cross border calculations;
- to account for an extra unavailability of 4 units of 900 MW in the French nuclear fleet, on top of the nuclear unavailability already considered in the ERAA23 for France in 2027-28/Y-2 and 2029-30/Y-4;
- to account for a lower availability of the French nuclear fleet during winter compared to REMIT and calculated as the difference between the minimum EDF forecast and REMIT on the winter only in 2026-27/Y-1.

## 1.2 Determination of the intermediate values

The methodology for the determination of the intermediate values is set out in article 4 of the RD Methodology[19]. The intermediate values consist of:

- The gross cost of a new entrant (gross-CONE), determined for a reduced list of technologies;
- The weighted average cost of capital (WACC) used in the determination of the gross-CONE, which corresponds to the sum of the minimum return and a risk premium, determined for a reduced list of technologies; and
- The correction factor X, which allows to determine the global auction price cap as well as the maximum volume to be procured in the auction.

These parameters are required in this calibration report for the following reasons:

- The correction factor X allows to calculate the maximum price of point A of the demand curve, the so-called global auction price cap. This maximum price can be calculated by multiplying the net-CONE calculated for a reference technology and the correction factor X. In the Y-2 and Y-4 auctions, on the abscise, this point A corresponds to the volume that needs to be procured to comply with a reliability standard obtained by multiplying the legal reliability standard determined in article 7*bis* of the Electricity Act[20] and the correction factor X;
- The net-CONE is determined based on the gross-CONE of the reference technology, selected from a reduced list by subtracting the inframarginal rents and the net revenues from ancillary services from this gross-CONE and dividing the result by the derating factor.

[19] (NL) Art. 4 van het KB Methodologie
(FR) Art. 4 de l'AR Methodologie
[20] (NL) Art. 7*bis* van de Elektriciteitswet
(FR) Art. 7*bis* de la Loi Electricité

### 2026-27/Y-1

The Minister decided on the intermediate values for 2026-27/Y-1 in the Ministerial Decree of the 2nd of October 2024[21], which included:

- A reduced list of technologies, their gross cost and risk premium as shown in Table 1;
- Minimal risk premium of 4,4% on top of which a technology specific risk premium is added to calculate a WACC;
- A correction factor X equal to 1,1.

| Technology | EAC [€/kW/an] | Derating factor [%] | CONEfixed,RT [€/kW/an] | WACC [%] |
|---|---|---|---|---|
| Photovoltaics | 88.7 | 2 | 4435.09 | 4.8 |
| Onshore wind | 166.75 | 9 | 1852.8 | 5.7 |
| Battery storage (4h) | 110.65 | 63 | 175.64 | 4.7 |
| DSR (0<300MW) | 25.34 | 59 | 42.94 | 6.0 |
| DSR (300<600MW) | 50.68 | 59 | 85.89 | 6.0 |
| DSR (600<900MW) | 76.01 | 59 | 128.83 | 6.0 |
| DSR (900<1200MW) | 101.35 | 59 | 171.78 | 6.0 |

*Table 1: Intermediate values selected by the Minister – gross cost and derated gross cost for the list of technologies as well as the risk premium per technology for 2026-27/Y-1*

### 2027-28/Y-2

The Minister decided on the intermediate values for 2027-28/Y-2 in the Ministerial Decree of 2nd of October 2024, which included:

- A reduced list of technologies, their gross cost and risk premium as shown in Table 2;
- Minimal risk premium of 4,4% on top of which a technology specific risk premium is added to calculate a WACC;
- A correction factor X equal to 1,5.

| Technology | EAC [€/kW/an] | Derating factor [%] | CONEfixed,RT [€/kW/an] | WACC [%] |
|---|---|---|---|---|
| OCGT (>100 MW) | 95.05 | 92 | 103.32 | 7.7 |
| CHP (<100 MW) | 146.35 | 94 | 155.69 | 6.6 |
| Photovoltaics | 88.7 | 1 | 8870.19 | 4.8 |
| Onshore wind | 166.75 | 7 | 2382.18 | 5.7 |
| Battery storage (4h) | 110.65 | 57 | 194.13 | 4.7 |
| DSR (0<300MW) | 25.34 | 57 | 44.45 | 6.0 |
| DSR (300<600MW) | 50.68 | 57 | 88.9 | 6.0 |
| DSR (600<900MW) | 76.01 | 57 | 133.36 | 6.0 |
| DSR (900<1200MW) | 101.35 | 57 | 177.81 | 6.0 |

*Table 2 : Intermediate values selected by the Minister – gross cost and derated gross cost for the list of technologies as well as the risk premium per technology for 2027-28/Y-2*

[21] (NL) https://www.ejustice.just.fgov.be/eli/besluit/2024/10/02/2024009072/justel
(FR) https://www.ejustice.just.fgov.be/eli/arrete/2024/10/02/2024009072/justel

**2029-30/Y-4**

The Minister decided on the intermediate values for 2029-30/Y-4 in the Ministerial Decree of 2nd of October 2024, which included:

- A reduced list of technologies, their gross cost and risk premium as shown in Table 3;
- Minimal risk premium of 4,4% on top of which a technology specific risk premium is added to calculate a WACC;
- A correction factor X equal to 1,5.

| Technology | EAC [€/kW/an] | Derating factor [%] | CONEfixed,RT [€/kW/an] | WACC [%] |
|---|---|---|---|---|
| OCGT (>100 MW) | 95.05 | 92 | 103.32 | 7.7 |
| CCGT (>800 MW) | 114.16 | 94 | 121.44 | 6.6 |
| CHP (<100 MW) | 146.35 | 94 | 155.69 | 6.6 |
| Photovoltaics | 88.7 | 1 | 8870.19 | 4.8 |
| Onshore wind | 166.75 | 7 | 2382.18 | 5.7 |
| Offshore wind | 271.41 | 9 | 3015.64 | 4.9 |
| Battery storage (4h) | 110.65 | 57 | 194.13 | 4.7 |
| DSR (0<300MW) | 25.34 | 57 | 44.45 | 6.0 |
| DSR (300<600MW) | 50.68 | 57 | 88.9 | 6.0 |
| DSR (600<900MW) | 76.01 | 57 | 133.36 | 6.0 |
| DSR (900<1200MW) | 101.35 | 57 | 177.81 | 6.0 |

*Table 3 : Intermediate values selected by the Minister – gross cost and derated gross cost for the list of technologies as well as the risk premium per technology for 2029-30/Y-4*

Note that the derating factors proposed by the CREG and decided by the Minister for the intermediate values calculation are based on the calibration report for 2025-26/Y-1 and 2028-29/Y-4. Updated derating factors for the Delivery Periods addressed in this calibration report are provided in this calibration report in chapter 3.

## 1.3 Calibration of the Reference Scenario

The necessary steps to establish the reference scenario are described in more detail in article 6 of the RD Methodology[22].

| Type | Technology | Associated Marginal Cost | Applicable in: | | |
|---|---|---|---|---|---|
| | | | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
| 1 | CCGT | Marginal price of a CCGT | No | No | Yes |
| 2 | OCGT | Marginal price of an OCGT | No | Yes | Yes |
| 3 | Large-scale batteries (4h) | / | Yes | Yes | Yes |
| 4 | DSR | Marginal cost of 24h DSR | Yes | Yes | Yes |

*Table 4 : Preselected capacity types following the public consultation of Elia*

In order to select which of the preselected capacity types are added to the scenario, one needs to determine the annualized costs for each technology. These costs are taken from the intermediate values as per section 1.2.

For DSR, a step-wise approach is taken into account to take into account the heterogenous characteristics of the technology, in line with the intermediate values selected by the Minister.

| Type | Technology | EAC [€/kW/an] | WACC [%] |
|---|---|---|---|
| **1** | CCGT | 114* | 6.6 |
| **2** | OCGT | 95** | 7.7 |
| **3** | Large-scale batteries (4h) | 111 | 5.0 |
| **4** | DSR (0<300MW) | 25 | 6.0 |
| | DSR (300<600MW) | 51 | 6.0 |
| | DSR (600<900MW) | 76 | 6.0 |
| | DSR (900<1200MW) | 101 | 6.0 |

**EAC for CCGT >800 MW*
***EAC for OCGT>100 MW*

*Table 5: Preselected capacity types – EAC used for the economic optimization loop*

After the addition of the capacities that have been contracted in previous auctions, the revenues for each preselected technology are determined in subsequent economic optimization loops, thereby taking into account the additional capacity of previous iterations.

The revenues for each Delivery Period are subtracted from the annualized costs to determine the missing money for each technology. The technology with the lowest missing money is considered as the best entrant in the model, and 100MW of this technology is added.

These steps are repeated until the reliability standard is reached for each Delivery Period.

[22] (NL) Art. 6 van het KB Methodologie
(FR) Art. 6 de l'AR Méthodologie

By applying the aforementioned methodology, a mix of additional capacity is obtained that allows the reference scenario to meet the reliability standard. This additional capacity is added to the existing and new capacities that were already taken into account.

The added capacity corresponds to a capacity mix that allows to realistically determine the set of CRM parameters. It depends on the assumptions that were made during the selection of the reference scenario and the hypotheses regarding the gross cost of a new entrant for each preselected technology.

Note that for each auction, the volume contracted with long-term contracts in preceding auctions[23] was also accounted for. The derating factors applicable in the aforementioned auctions can differ from the derating factors calculated in this calibration report. As such, the capacities which are expressed in derated MW may differ from the auction results.

For the auctions 2026-27/Y-1 and 2027-28/Y-2, there is no need for additional capacity as both reference scenarios selected by the minister meet or exceed the reliability standard.

For the auction 2029-30/Y-4, the mix of capacity added on top of the reference scenario consists of:

- 600 MW derated of 24h DSR;
- 400 MW derated of OCGT;
- 188 MW derated of batteries, contracted in 2028-29/Y-4[24].

[23] https://www.elia.be/en/grid-data/adequacy/crm-auction-results

[24] https://www.elia.be/-/media/project/elia/elia-site/grid-data/adequacy/crm-auction-results/2024/2028-2029/20241031_crm-auction-result-for-2028-2029_en.pdf

# Part II: Information and data for the calibration of the demand curve

Following article 6 of the RD Methodology[25] the regulator needs to make a proposal for the demand curve based on the parameters that have been provided in the report of Elia. These parameters are established in this part of the calibration report and include:

- Average electricity consumption during simulated scarcity situations (section 2);
- Volume corresponding to the balancing needs (section 2.2);
- The expected energy not served during simulated scarcity situations (section 2.3);
- Information with regards to non-eligible capacity (section 0):
    - Renewables (section 2.4.1);
    - Thermal units (section 0);
- Information regarding the load duration curve (section 2.5);
- Maximum entry capacity for indirect cross-border participation (section 0);
- Net-CONE: inframarginal rents obtained on the energy markets (section 2.7);
- Net-CONE: net revenues from ancillary services (section 2.8).

These parameters are also elaborated in article 11 of the RD methodology[26] and allow the calibration of both the volume and price parameters of points A, B and C of the demand curve.

[25] (NL) art. 6 van het KB Methodologie
(FR) art. 6 de l'AR Méthodologie
[26] (NL) art. 11 van het KB Methodologie
(FR) art. 11 de l'AR Méthodologie

## 2.1 Average electricity consumption during simulated scarcity situations

The calculation of the average electricity consumption during simulated scarcity situations is based on the consumption profiles that are taken into account in the hourly market simulations following the reference scenario of part I. For every simulated scarcity hour, the average consumption is retained, which corresponds to the amount of consumption after deducting part of the assumed flexibility in the scenario that is considered unlikely to participate to the 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 but before activation of all means of production (centralized or decentralized), of large-scale storage and imports. It does not take into account the possibility of the system to provide these volumes.

The part of the flexibility considered in the average consumption during simulated scarcity situations for the 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 consists of all end-user flexibility and the part of flexibility from newly electrified industry or new usages, corresponding respectively 100%, 75% and 50% of the flexibility from newly electrified industry or new usages reacting to high prices, while flexibility reacting to low prices is deduced from the average consumption.

The values for the point A, B and C of the demand curve depend on the type of auction as well as the two possible cases with a different reliability standard:

- For 2026-27/Y-1, point A, B and C are calibrated on a LOLE equal to 3h;
- For 2027-28/Y-2 and 2029-30/Y-4:
    - For points B and C, the scenario is calibrated based on a LOLE equal to 3h;
    - For point A, the scenario is calibrated based on a LOLE of 4,5h, a value which is obtained by multiplying the legal reliability standard (3h) and the correction factor X that have been defined in the intermediate values, i.e. X = 1,5.

The results of this methodology are summarized in the table below:

| Results obtained by Elia | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
|---|---|---|---|
| Average electricity consumption during simulated scarcity situations (point A) | 13719 MW | 14042 MW | 15033 MW |
| Average electricity consumption during simulated scarcity situations (points B and C) | 13719 MW | 14201 MW | 15268 MW |

## 2.2 Volume corresponding to the balancing needs

The balancing needs correspond to the foreseen upwards operational requirements that need to be provided by thermal production units, demand flexibility and storage in Belgium in order to respond to unexpected variations of the consumption and production. Following the royal decree this volume is directly added to the average electricity consumption during simulated scarcity hours.

The volume that is applied is part of the reference scenario, and only takes into account Belgian units; in scarcity situations it is assumed that no remaining cross-border capacities are available for fulfilling balancing needs.

The volume corresponds to the necessary balancing needs during scarcity and is defined as the sum of the needs of FCR and FRR for the respective delivery periods. The Minister has selected these values, which are listed in the table below.

| Value selected by the Minister | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
|---|---|---|---|
| Volume corresponding to the balancing needs | 1127 MW | | |

## 2.3 Expected energy not served during simulated scarcity situations

When the reliability standard is non-zero, it means that during scarcity situations a particular amount of energy remains unserved. This amount of unserved energy must be deducted from the overall auction volume.

The expected energy not served during simulated scarcity situations is based on the results of the hourly market simulations of the reference scenario and corresponds to the average amount of energy not served as obtained during each simulated scarcity situation.

Similar to the average electricity consumption, the result depends on the reliability standard on which the reference scenario was calibrated. This means that:

- For 2026-27/Y-1, a reliability standard of 3h is used for points A, B and C;
- For 2027-28/Y-2 and 2029-30/Y-4, a reliability standard of 3h is used for points B and C, while a reliability standard of 4,5h is used for point A is used.

By applying this methodology, the following results are obtained:

| Results obtained by Elia | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
|---|---|---|---|
| Volume corresponding to the expected energy not served during simulated scarcity situations (point A) | 930 MW | 671 MW | 837 MW |
| Volume corresponding to the expected energy not served during simulated scarcity situations (point B and C) | 930 MW | 438 MW | 687 MW |

Using parameters from sections 2, 2.2 and 2.3 the required volume for points A, B, and C can be established. This volume is the sum of the average consumption during simulated scarcity hours and the volume corresponding to balancing needs, minus the expected energy not served during those hours. This volume does not correspond to the volume that is effectively contracted in the Y-1, Y-2 and Y-4 auctions. Indeed, as also explained in article 11 of the RD Methodology some other volumes also need to be subtracted.

## 2.4 Information with regards to non-eligible capacity

As mentioned in article 11, §2 of the RD Methodology[27], the volumes that are considered as non-eligible need to be subtracted from the required volume as per section 2.3.

The eligibility criteria have been introduced in article 4 of the CRM Law[28] and are described in in the royal decree concerning the establishment of the eligibility criteria and modalities for the prequalification procedure with regards to the rules concerning the minimum threshold and the cumulation of state aid[29].

More in particular and based on the aforementioned laws, capacities are considered non-eligible if either:

- They benefit from state aid in the course of the Delivery Period; or
- Their installed capacity multiplied with the appropriate derating factor defined in part III of this report is lower than the threshold of 1 MW.

The criterion concerning owners of capacity that do not respect the emission limits set by the EU[30] will not be considered in this report.

It is worth pointing out that units whose installed capacity multiplied with the appropriate derating factor is lower than the eligibility criterion of 1 MW still have the possibility to participate in the CRM via an aggregated CMU. As such the information provided here by Elia is a purely informative estimation for the determination of the non-eligible capacity.

### 2.4.1 Renewables

Elia takes into account the global hypothesis that all CMUs that consist of onshore wind turbines, offshore wind turbines, photovoltaics (PV) and run-of-river hydroelectricity are subject to the first criterion, i.e. the absence of state aid in the course of the considered Delivery Period. After applying the appropriate derating factor (Part III) to the installed capacities presented in Part I, the volumes presented in Table 6.

[27] (NL) Art. 11 van het KB methodologie
(FR) Art. 11 de l'AR Methodologie
[28] (NL) art. 4 van de CRM-wet
(FR) art. 4 de la loi CRM
[29] (NL) KB van 21 mei 2021 tot vaststelling van de ontvankelijkheidscriteria (…) betreffende de organisatie van de elektriciteitsmarkt, wat betreft de voorwaarden waaronder de capaciteitshouders die genieten of genoten hebben van steunmaatregelen het recht hebben tot deelname aan de prekwalificatieprocedure en wat betreft de minimumdrempel in MW
(FR) AR du 21 mai 2021 relatif à l'établissement des critères de recevabilité (…) relative à l'organisation du marché de l'électricité, en ce qui concerne les conditions dans lesquelles les détenteurs de capacité bénéficiant ou ayant bénéficié de mesures de soutien ont le droit ou l'obligation de participer à la procédure de préqualification et en ce qui concerne le seuil minimal, en MW
[30] (NL) Art. 22 (4) van de verordening (EU) 2019/943 van het Europees Parlement en de Raad van 5 juni 2019 betreffende de interne markt voor elektriciteit
(FR) Art. 22 (4) du règlement (UE) 2019/943 du Parlement Européen et du Conseil du 5 juin 2019 sur le marché intérieur de l'électricité

| Category | 2026-27/Y-1 | | | 2027-28/Y-2 | | | 2029-30/Y-4 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Installed Capacity [MW] | Derating Factor [%] | Non-eligible Capacity [MWd] | Installed Capacity [MW] | Derating Factor [%] | Non-eligible Capacity [MWd] | Installed Capacity [MW] | Derating Factor [%] | Non-eligible Capacity [MWd] |
| Offshore wind | 2261 | 11 | 249 | 2261 | 10 | 226 | 2961 | 8 | 237 |
| Onshore wind | 4258 | 9 | 383 | 4588 | 8 | 367 | 5248 | 7 | 368 |
| PV | 12723 | 2 | 254 | 13923 | 1 | 139 | 16323 | 1 | 163 |
| Run-of-river hydro | 140 | 50 | 70 | 143 | 51 | 73 | 148 | 52 | 77 |
| **TOTAL** | | | **956** | | | **805** | | | **845** |

*Table 6 : Non-eligible capacity - renewables*

### 2.4.2 Thermal units

It is assumed that cogeneration units defined in the reference scenario do not renounce to their state aid, and as such these units are considered non-eligible.

In order to realize its estimation Elia takes into account:

- The capacities modelled as aggregated units in the reference scenario, consisting of thermal technologies without daily schedule, biomass, and incineration of gas and waste. These volumes were included in the public consultation of the reference scenario; and
- For individually modelled units, Elia bases itself on the most up-to-date information received from the regions in order to establish which part benefits from state aid.

These considerations lead to the results presented in Table 7.

| Category | 2026-27/Y-1 | | | 2027-28/Y-2 | | | 2029-30/Y-4 | | |
|---|---|---|---|---|---|---|---|---|---|
| | Installed Capacity [MW] | Derating Factor [%] | Non-eligible Capacity [MWd] | Installed Capacity [MW] | Derating Factor [%] | Non-eligible Capacity [MWd] | Installed Capacity [MW] | Derating Factor [%] | Non-eligible Capacity [MWd] |
| Aggregation of thermal technologies without daily schedule | 2077 | 65 | 1350 | 2084 | 65 | 1355 | 2098 | 66 | 1384 |
| Individually modelled units | 281 | 65 or 94 | 230 | 251 | 65 or 94 | 210 | 251 | 66 or 94 | 211 |

*Table 7: Non-eligible Capacity – thermal units*

## 2.5 Information regarding the load duration curve

The load duration curve is used as a parameter to calculate the amount of volume that needs to be reserved for next auctions. The reserved volume, in line with the Royal Decree on "Methodology", as such needs to be subtracted from the required volume of both point A as well as B and C of the demand curve of the Y-2 and Y-4 auction, respectively.

The load duration curve is based on the consumption data used in the market simulations and is in line with the total electricity consumption defined in the reference scenario. The flexibility volumes are considered as defined in the average electricity consumption during scarcity (see section 2). The curves for 2027-28/Y2 and 2029-30/Y-4 are respectively presented in Figure 1 and Figure 2. More numerical details are presented in Annex 2.

The load duration curve is to be determined as follows: let $C(h)$ be the load duration curve where $h$ represents the $h^{th}$ highest electricity consumption.

The volume $V$ that needs to be reserved for the Y-1 auction can then be determined based on the following equation that considers the reliability standard:

$$V = \frac{C(1 + LOLE\ criterion) - C(201 + LOLE\ criterion)}{2} = \frac{C(4) - C(204)}{2} \quad [1]$$

During the Y-4 auction, the volume reserved for later auctions (Y-2 and Y-1) is then increased based on the dynamic correction applied before the clearing.

For illustrative purposes the application of [1] is added to Figure 1 and Figure 2.

| **Results obtained by Elia** | |
|---|---|
| Load duration curve | Cf. Figure 1 and Figure 2 & Annex 2 |

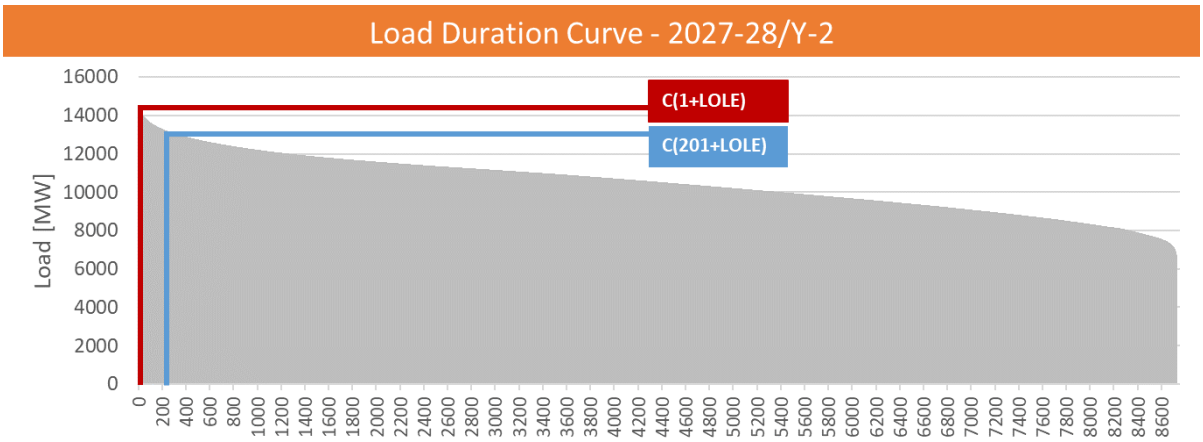



*Figure 1: Load duration curve for 2027-28/Y-2*

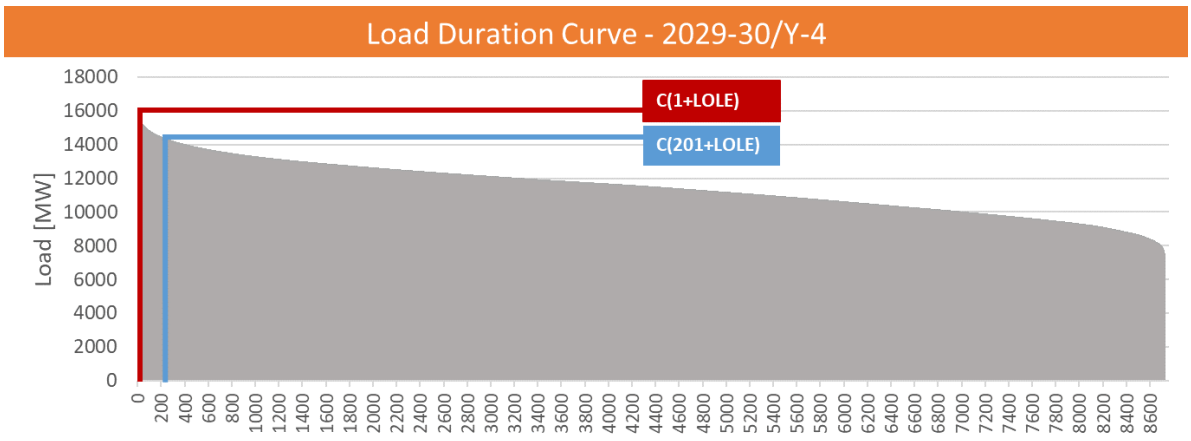



*Figure 2: Load duration curve for 2029-30/Y-4*

## 2.6 Maximum entry capacity available for participation of foreign indirect capacities

The Belgian CRM allows for the participation of capacities of neighboring countries that are part of the European Union. The contribution of Great Britain is implicitly taken into account.

The methodology for the calculation of the maximum entry capacity follows article 6 of the RD Methodology[31]. The results are as such based on the hourly market simulations.

The results of this approach can be found in the table below.

| Maximum entry capacity per border obtained from the simulations | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
|---|---|---|---|
| France | 6 MW | 5 MW | 133 MW |
| The Netherlands | 2207 MW | 606 MW | 225 MW |
| Germany | 296 MW | 34 MW | 420 MW |
| Great Britain | 820 MW | 778 MW | 433 MW |
| **Total** | **3329 MW** | **1423 MW** | **1211 MW** |

[31] (NL) art. 6 van het KB Methodologie
(FR) art. 6 de l'AR Méthodologie

## 2.7 Net-CONE – yearly inframarginal rents obtained on the energy market

The yearly inframarginal rents are determined for the technologies that have been retained in the shortlist of technologies, which has been determined by the Minister in the context of the intermediate values as per section 1.2.

The inframarginal rents are determined as per article 10, §3 and §6 of the RD Methodology[32].

The shortlist of technologies as well as their associated parameters such as the Equivalent Annual Cost (EAC), the derating factor and the economic lifetime have been established by the Ministerial Decree of 2nd of October 2024[33] and are presented in chapter 1.2.

One important element in the hourly market simulations is the variable cost of each technology, which takes into account the efficiency as well as the fuel and $CO_2$ costs as defined in the Ministerial Decree on the reference scenario.

Regarding the efficiency and VOM of each technology, the assumptions are based on AdeqFlex'23 and the Entras Cost of Capacity study. They are summarized in Table 8.

| | Categories | Efficiency [%] | VOM [€/MWh] | Fuel price [LHV] [€/MWh] | CO2 price [€/t] | CHP credits [€/MWh] | Marginal cost [€/MWh] |
|---|---|---|---|---|---|---|---|
| 2027-28/Y-2 | **OCGT** | 44 | 1.6 | 27.4 | 79.7 | NA | 101 |
| | **CHP** | 33 | 2.5 | 27.4 | 79.7 | 71 | 64 |
| 2029-30/Y-4 | **CCGT** | 61 | 1.6 | 23.2 | 85.6 | NA | 68 |
| | **OCGT** | 44 | 1.6 | 23.2 | 85.6 | NA | 94 |
| | **CHP** | 33 | 2.5 | 23.2 | 85.6 | 66 | 60 |

*Table 8: Net-CONE: Assumptions for the marginal cost for different technologies*

In order to determine the revenues for the overall lifetime for each technology different time horizons have been simulated based on scenarios of existing studies. The scenarios that have been used for this purpose are highlighted in Figure 3.

[32] (NL) Art. 10 van het KB Methodologie
(FR) Art. 10 de l'AR Méthodologie
[33] (NL) http://www.ejustice.just.fgov.be/eli/besluit/2024/10/02/2024009072/staatsblad
(FR) https://www.ejustice.just.fgov.be/eli/arrete/2024/10/02/2024009072/moniteur

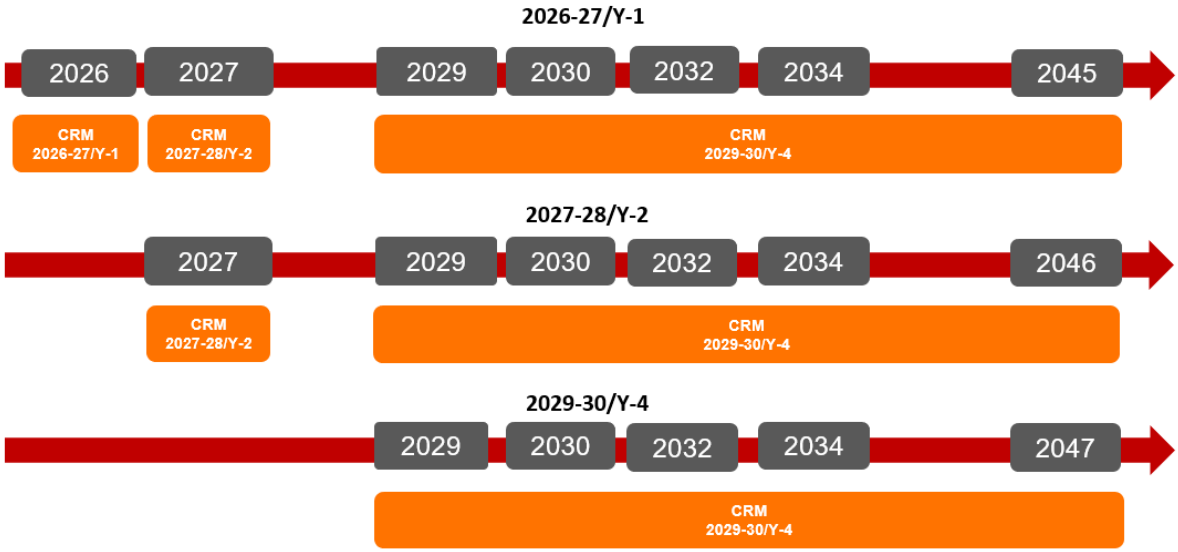



*Figure 3 : Choice of scenarios from other studies for the time after the delivery periods*

For the years 2026, 2027 and 2029, the inframarginal rents are based on the reference scenarios selected by the Minister as defined in Part I. For 2028 on the average between 2027 and 2029. The inframarginal rents of 2029 are taken for the later years as the central fuel and CO2 prices from the AdeqFlex'23 scenario were significantly higher than the ones from the reference scenario approved for the calibration of these three auctions. In order to keep consistency in the CRM parameters, Elia proposes to deviate from what was proposed in the public consultation as Elia believes this gives a better estimate of the inframarginal rents taking into account the latest evolutions in the energy markets.

The results for the inframarginal rents obtained on the energy markets for the different technologies can be found in Annex 3 and are presented on Figure 4.

| **Results obtained by Elia** | |
|---|---|
| Yearly inframarginal rents | Annex 3 |

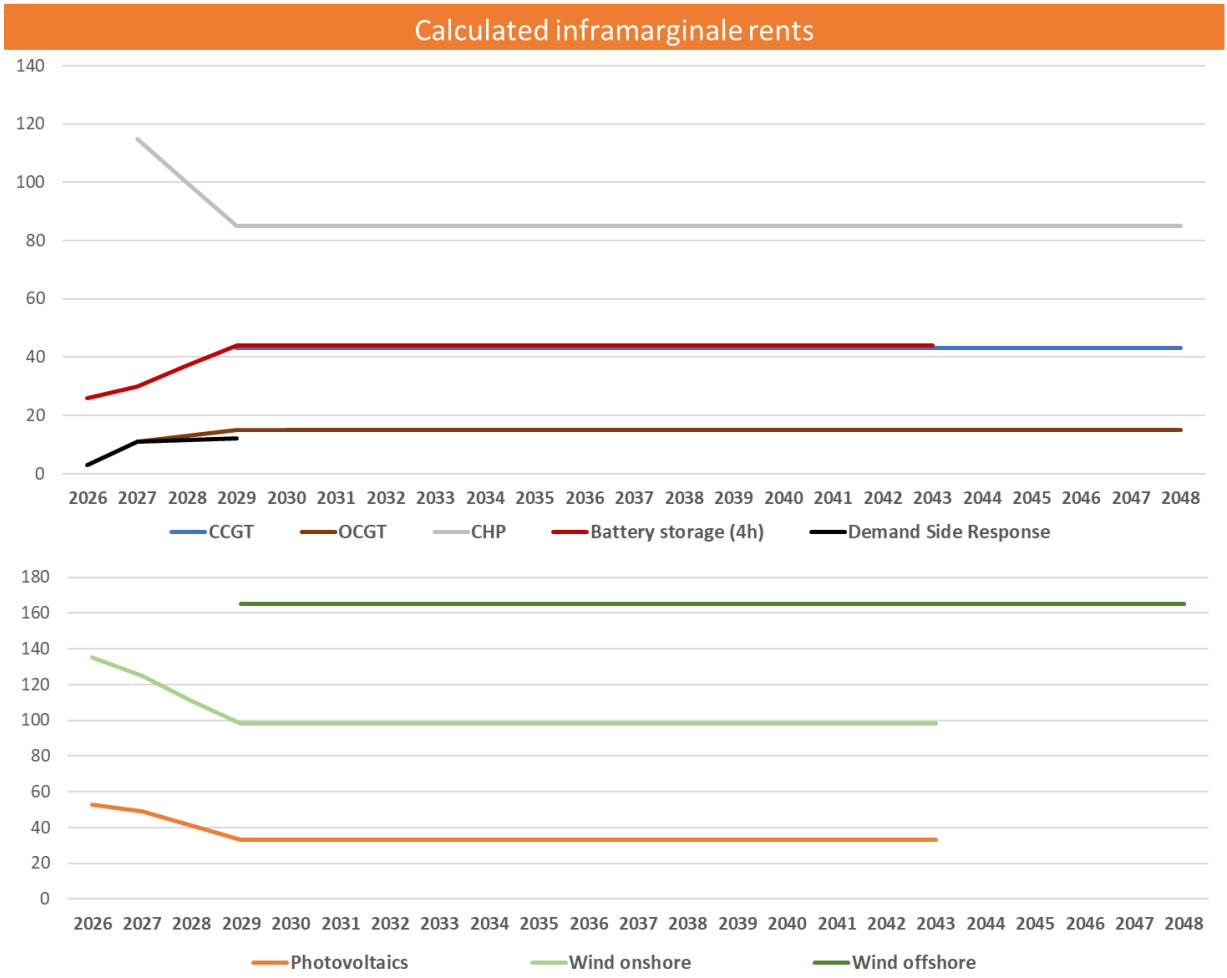



*Figure 4: Calculated annual inframarginal rents received in the energy market by the technologies included in the reduced list of technologies for the net-CONE*

## 2.8 Net-CONE – net revenues from ancillary services

This section deals with the determination of the net annual revenues obtained from ancillary services for the technologies that are included in the list of technologies eligible for the determination of the net-CONE. The determination of the net revenues happens based on the stipulations of Article 10, § 7 of the RD Methodology[34].

In collaboration with Compass-Lexecon, Elia aimed at improving the estimation of the net balancing revenues for the previous calibration report. The same methodology has been applied for the present calibration exercise. The results of this study form the basis of the determination of the net balancing revenues used in this calibration report. It should be noted that the results of the study itself are available online (presented in the Working Group Adequacy of 27 September 2024[35]) and that this report summarizes the findings but does not elaborate on the details of the methodology itself.

The estimations with regards to the different ancillary services available are described here. In this report the focus is per technology and their impact on the calculation of the net-CONE. Only reservation revenues have been calculated in accordance with the provisions of the Royal Decree on Methodology, based on reserve historical reservation costs over the last 36 months.

Net revenues are computed starting from the revenues earned from the provision of balancing services, while considering some difference. Market actors must consider additional aspects to account for potential arbitrage between energy and balancing market and the associated opportunity cost of being present in one market against the other. Going from gross balancing revenues to net balancing revenues, Elia considers cost assumptions to deduce running, start-ups and operational costs for each concerned technology to deduce direct costs and market opportunity costs.

Finally, adjustments were made to keep a certain consistency using the available data. On one hand, Elia takes into account the foreseen trend regarding the volume of capacity and the mix of technologies able to provide such services and the potential evolutions of the prices of these products. On the other hand, an adjustment factor was used for the energy crisis period for all aFRR and mFRR products based on the period of highest net revenues to obtain crisis-corrected revenues.

**Batteries:**

Given the initial assumption that the FCR is covered solely by batteries and the volume of batteries considered in the reference scenario, there is strong competition between batteries to supply the necessary FCR capacity. This competition is expected to be reflected in the net revenues earned by batteries when supplying FCR. In other words, a higher amount of capacity providing FCR is expected, all things equal, to exert a downwards pressure on the bidding of the capacities participating and to push their net revenues downwards as well.

Batteries are also aFRR provider, the estimate of these revenues was based on an analysis of aFRR data (both upward and downward reservation). However, the net revenues they

[34] (NL) Art. 10 van het KB Methodologie
(FR) Art. 10 de l'AR Méthodologie
[35] Working Group Adequacy of 27 September 2024

capture must also take into account the opportunity costs they may incur by participating in the energy market via the day-ahead market and the intraday market. The net revenues that can be received by batteries are therefore adjusted for the opportunity cost associated with their participation in the aFRR provision.

Given the current level of competition and given that it can be expected to continue to inflate with an increase in installed capacity, Elia considers a growth factor reflecting the future evolution of the installed capacity. In turn, the average net revenue per kW installed battery capacity is multiplied with this growth factor which allows to assess, on average, what installed battery capacity could gain by participating in the FCR and aFRR capacity auction in addition to its potential gain on the day ahead energy market.

Taking all this into consideration, the revenues for the 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 auctions are estimated at 21 €/kW/y, 14 €/kW/y and 13 €/kW/y, respectively.

**CCGTs:**

CCGTs are the technologies in which the main participation in aFRR has been observed before batteries. CCGTs differ by their cost structure compared to batteries, more particularly by their opportunity costs. Indeed, CCGTs when participating to the balancing market can have important costs to cover. Providing aFRR with a CCGT implies a possible start-up cost, running at an inefficient power level (Pmin or lower than Pmax) or running at Pmax when the asset is not competitive in the Day-ahead market. These costs will directly impact the price when offering volumes to the ancillary market, consequently the bidding price will include the whole cost structure. To quantify the impact of these costs on the net revenue, the Clean Spark Spread (CSS) is used to deduce the net revenue, the CSS is the difference between the market price and the cost of the CCGTs. The CSS, when positive, represents an opportunity cost for CCGTs. When they decide to participate in the supply of aFRR instead of participating in the Day-ahead market, the value of the CSS in such situation represents a possible missed opportunity that has to be considered when correcting for net balancing revenues. A negative CSS represents the cost that they have to bear if they would be providing ancillary services.

In conclusion, net revenues for CCGTs are estimated at 1 €/kW/y for the 2029-30/Y-4 auction.

**OCGTs:**

Thermal technologies like OCGTs participate mainly in mFRR. The estimated net revenues from mFRR are based on the analysis of mFRR data (upwards) collected for a period of 36 months in accordance with the requirements of the Royal Decree Methodology. It is worth mentioning that these are estimated using the mFRR Standard (considering the fact that net revenues from mFRR Flex are close to zero and are therefore approximated at 0). Compared to CCGTs, OCGTS do not have to bear considerable costs to participate in the mFRR capacity auction. The Clean Spark Spread (CSS), when positive, represents an opportunity cost for OCGTs (or IC gas Engines). When they decide to participate in the supply of mFRRs instead of participating in the Day-ahead market, the value of the CSS in such situation represents a missed opportunity that has to be considered as well when correcting for net balancing revenues. When negative, OCGTs (or IC gas Engines) have incentives to participate to the supply of mFRRs as their costs of participation are zero. Therefore, these considerations have to be integrated in their bidding and must be corrected for when assessing their net revenues. The revenues of OCGTs and IC gas engines from the provision of mFRRs must be adjusted

accordingly in order to be considered net. The last factor impacting the net revenues of OCGTs is the high expected DSR capacity participation to the mFRR, the details of which are mentioned in the paragraph describing DSR participation to ancillary Services.

In conclusion, for the calculation of the net-CONE, net revenues for OCGTs are considered 21 €/kW/y for the 2027-28/Y-2 auction and 20 €/kW/y for the 2029-30/Y-4.

**DSR:**

In the case of DSR, still in the context of net-CONE calculations, the reasoning shown above is somewhat different. This technology has zero opportunity costs to participate in the mFRR capacity auction to which they are the main providers, just before OCGTs. This means that the corrections made for thermal units above do not apply to DSR. In terms of installed capacity, it is likely to evolve into participating in the provision of mFRR and Elia expects it to keep growing by 2029-30. It is indeed the first factor to be considered when calculating the net revenues of technologies participating in the mFRR provision. The second factor relates directly to DSR, the growth of installed capacity, all other things being equal, will lead to greater competition for DSR wishing to participate in the delivery of mFRR. As a result, estimated net revenues from DSR are impacted downwards by this expected increase. Additionally, it is worth mentioning that the amount of installed capacity of OCGTs is also increasing, therefore grasping more market shares on mFRR capacity auction.

In conclusion, for the calculation of the net-CONE, net revenues are considered decreasing over the years therefore the auctions: 15 €/kW/y for the 2026-27/Y-1 auction, 14 €/kW/y for the 2027-28/Y-2 auction and 13 €/kW/y for the 2029-30/Y-4 auction.

With regards to the other technologies listed in the Ministerial Decree, Elia would like to stress that renewable energy sources are more suited for downward balancing provision as they are not capable of providing the upward balancing services targeted in this framework.

It is important to remember that these revenues are to be considered when determining the net-CONE, which answers a 'marginal' question, i.e. how much revenue a unit of this technology, or even a single MW of this technology, is likely to receive. This reasoning obviously cannot be extrapolated simplistically to (too) large a volume, as this would influence the price obtained on the market for ancillary services, where several players and technologies are active and where the volume is limited to the need for ancillary balancing services to be covered.

| **Results obtained by Elia** | | **2026-27/Y-1 [€/kW/year]** | **2027-28/Y-2 [€/kW/year]** | **2029-30/Y-4 [€/kW/year]** |
|---|---|---|---|---|
| Net revenues from Ancillary Services | CCGTs | / | / | 1 |
| | OCGTs | / | 21 | 20 |
| | Batteries storage 4h | 21 | 14 | 13 |
| | DSM | 15 | 14 | 13 |
| | Other technologies | 0 | 0 | 0 |

# Part III: Proposals for the other auction parameters

This part concerns the proposals for the other parameters that are necessary for the organization of the auction as defined in Article 7*undecies*, §2, 2° of the Electricity Act[36]. Following article 6, §2 of the RD Methodology[37] these parameters include:

- the derating factors (section 3)
- the intermediate price cap (section 3.2)
- the reference price (section 3.3.1)
- the strike price (section 3.3.2)

## 3.1 Derating factors

The derating factors are defined in article 2, 83° of the Electricity Act[38] as the weighting of a considered capacity determining its contribution to security of supply in order to establish the eligible volume to participate in the auction. The proposed derating factors are in line with article 13 of the RD Methodology[39].

The methodology described in the aforementioned article of the Royal Decree is summarized in Table 9 and is applied to the reference scenario for the 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 auctions.

The obtained values are presented in Table 10.

| **Proposal from Elia** | |
|---|---|
| Derating factors | Cf. Table 10 |

[36] (NL) art. 7*undecies* van de Elektriciteitswet
(FR) art. 7*undecies* de la Loi Electricité
[37] (NL) art. 6 van het KB Methodologie
(FR) art. 6 de l'AR Méthodologie
[38] (NL) art. 2 van de Elektriciteitswet
(FR) art. 2 de la Loi Electricité
[39] (NL) art. 13 van het KB Methodologie
(FR) art. 13 de l'AR Méthodologie

| Category | Calculation method | Associated technologies |
|---|---|---|
| **Thermal technologies with daily schedule** | 100 – forced outage rate[40] | CCGTs<br>OCGTs<br>Turbojets<br>IC gas engines[41]<br>IC diesel engines[42]<br>CHPs<br>Biomass units<br>Waste incineration<br>Nuclear plants<br>Coal plans |
| **Energy constrained technologies with daily schedule** | Average expected contribution of each technology category during simulated scarcity situations based on a fictional unit of 1 MW[43] | Pumped storage installations<br>Large-scale storage |
| **Categories with service level agreement (SLA)** | | 1h to 12h<br>No limit |
| **Weather-dependent technologies** | Average expected contribution of each technology during simulated scarcity situations / aggregated nominal reference power of the applicable technology | Onshore wind<br>Offshore wind<br>PV installations<br>Run-of-river installations |
| **Thermal technologies without daily schedule** | Average expected contribution of these technologies during simulated scarcity situations / aggregated nominal reference power of the applicable technology | Aggregated thermal technologies |

*Table 9: Methodology for the calculation of the derating factors*

[40] The forced outage rates have been subject to public consultation and are part of the Ministerial Decree concerning the reference scenario.
[41] For IC gas engines the same forced outage rate as OCGT's is assumed.
[42] For IC diesel engines, the same forced outage rate as turbojets is assumed.
[43] In order to ensure an identical calculation of the derating factor for each technology whether it exists in the market based on the reference scenario or not.

| Category I : SLA | | | |
|---|---|---|---|
| Sub-Category | Derating Factor [%] | | |
| | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
| SLA-1h | 14 | 19 | 16 |
| SLA-2h | 26 | 34 | 29 |
| SLA-3h | 37 | 47 | 40 |
| SLA-4h | 46 | 56 | 49 |
| SLA-5h | 53 | 65 | 56 |
| SLA-6h | 58 | 72 | 63 |
| SLA-7h | 63 | 77 | 69 |
| SLA-8h | 68 | 82 | 74 |
| SLA-9h | 72 | 87 | 79 |
| SLA-10h | 76 | 90 | 83 |
| SLA-11h | 80 | 94 | 86 |
| SLA-12h | 84 | 96 | 89 |
| SLA unlimited | 100 | 100 | 100 |
| **Category II : Thermal technologies with daily schedule** | | | |
| Sub-Category | Derating Factor [%] | | |
| | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
| CCGT | 94 | 94 | 94 |
| OCGT | 92 | 92 | 92 |
| Turbojets | 90 | 90 | 90 |
| IC Gas Engines | 92 | 92 | 92 |
| IC Diesel Engines | 90 | 90 | 90 |
| CHP/Biomass/Waste | 94 | 94 | 94 |
| Nuclear | 90 | 90 | 90 |
| Coal | 90 | 90 | 90 |
| **Category III : Energy-limited technologies wih daily schedule** | | | |
| Sub-Category | Derating Factor [%] | | |
| | 2026-27/Y-1 | 2027-28/Y-2 | 2029-30/Y-4 |
| Storage 1h | 15 | 21 | 19 |
| Storage 2h | 27 | 36 | 33 |
| Storage 3h | 36 | 46 | 43 |
| Storage 4h | 42 | 52 | 49 |
| Storage 5h | 46 | 57 | 54 |
| Storage 6h | 49 | 60 | 58 |
| PSP | 38 | 51 | 41 |

| Category IV : Weather-dependent technologies | | | |
|---|---|---|---|
| **Sub-Category** | **Derating Factor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Offshore Wind | 11 | 10 | 8 |
| Onshore Wind | 9 | 8 | 7 |
| Solar | 2 | 1 | 1 |
| Hydro Run-of-River | 50 | 51 | 52 |
| **Category V : Thermal technologies without daily schedule** | | | |
| **Sub-Category** | **Derating Factor [%]** | | |
| | **2026-27/Y-1** | **2027-28/Y-2** | **2029-30/Y-4** |
| Aggregated thermal technologies | 65 | 65 | 66 |

*Table 10: Derating factors*

## 3.2 Intermediate Price Cap

This section deals with the proposal for the Intermediate Price Cap or IPC following the stipulations of chapter 6 (i.e. articles 15 up until and including article 20) of the RD Methodology[44].

In accordance with article 18 of the RD methodology the IPC is established based on a study carried out by an independent consultant. This study has been carried out by Entras, the results of which have been published on the Elia website[45]. These values have also been subject to the public consultation.

Moreover, it is relevant that these costs are determined for a list of eligible technologies for the determination of the IPC. By definition this list is composed only of existing technologies, in contrast to the list of technologies associated to the determination of the net-CONE which refers to new units.

Elia has already shared several input parameters in the context of the public consultation on the reference scenario[46]. More specifically, these included:

1) The list of technologies under consideration for the IPC;
2) The cost elements for said technologies, including the FO&M and the activation costs for DSM;
3) The revenue elements for said technologies, including the VO&M and the efficiencies.

This section is structured as follows:

- Section 3.2.1 goes more into detail about the reduced list of existing technologies;
- Section 3.2.2 describes the different cost elements;
- Section 3.2.3 elaborates on the revenues;
- Section 0, based on the previous sections, involves the calculation of the missing money;
- Finally, section 3.2.5 concludes with a proposal for the IPC.

[44] (NL) hoofdstuk 6 van het KB Methodologie
(FR) chapitre 6 de l'AR Méthodologie
[45] Cost of Capacity study by Entras
[46] Public consultation on the scenarios, sensitivities and data for the CRM parameter calculation for the Y-1 Auction for Delivery Period 2026-2027, the Y-2 Auction for Delivery Period 2027-28 and the Y-4 Auction for Delivery Period 2029-2030 (elia.be)

### 3.2.1 Reduced list of existing technologies

In accordance with article 18, §1 of the RD Methodology[47] Elia establishes a reduced list of existing technologies in function of the calibration of the IPC, based on the study of an independent expert, in this case Entras.

The final reduced list of existing technologies that are taken into account for the calibration of the IPC consists thus of:

- CCGTs;
- OCGTs;
- Batteries;
- DSR with an activation duration of 4h.

### 3.2.2 Estimation of the costs

Pursuant the aforementioned article 18 of the RD Methodology, Elia has evaluated, based on the study of Entras, the different cost elements that are relevant for the calibration of the IPC for each technology included in the reduced list.

Elia has already submitted the values for the fixed operating and maintenance cost (FOM) to a public consultation.

For the different technologies as mentioned above, the following assumptions have been made:

- For CCGTs, the estimation of the FOM is based on the 2024 “Cost of Capacity”-study performed by Entras;
- For OCGTs, the estimation of the FOM is based on the 2024 “Cost of Capacity”-study performed by Entras;
- For batteries, the estimation of the FOM is based on the 2024 “Cost of Capacity”-study performed by Entras;
- For DSM with an activation period of 4 hours, the estimation of the FOM is based on AdeqFlex’23.

The 2024 “Cost of Capacity”-study differs from the 2023 version that was used in the public consultation on the reference scenario. Over the Summer an update of this study was carried out. Even though the numbers of this update were not consulted upon, Elia proposes to use these updated numbers: the primary goal of this update was to align the cost structure of the Entras study with the updated structure of article 22[48] of the RD Methodology concerning the IPC derogations. Indeed, by using an identical cost structure in the calibration of the IPC, consistency is maintained in case any derogation procedures occur.
The 2024 update of the “Cost of Capacity”-study carried out by Entras has been added as an appendix to this report.

Table 11 gives an overview of the fixed operations and maintenance costs for the reduces list

[47] (NL) art. 18 van het KB Methodologie
(FR) art. 18 de l’AR Méthodologie
[48] (NL) art. 22 van het KB Methodologie
(FR) art. 22 de l’AR Méthodologie

of existing technologies that are taken into account for the IPC.

| Technologies | FOM costs [€/kW/an] (Including non-yearly maintenance costs such as major overhauls) | | |
|---|---|---|---|
| | **Low** | **Mid** | **High** |
| *CCGT* | 33 | 35 | 39 |
| *OCGT* | 20 | 23 | 29 |
| *Batteries* | 14 | 20 | 24 |
| *DSM with an activation duration of 4h* | 8 | 13 | 19 |

*Table 11: Estimations of the FO&M costs for the existing technologies included in the reduced list*

For the estimation of the revenues discussed in section 3.2.3 multiple components of the variable costs are needed. To that extent, Table 12 presents an overview of the efficiencies as well as the variable operating and maintenance (VOM) costs. These estimations were also included in the Assumptions Workbook. A Low, Mid and High estimation is included. It is worth noting that DSM is not included seeing as this technology does not consume fuel but act in function of opportunity costs of electricity consumption.

| **Technologies** | **Efficiency[49] [%]** | | | **VOM cost [€/MWh]** | | |
|---|---|---|---|---|---|---|
| | **For revenues Low** | **For revenues Mid** | **For revenues High** | **For revenues High** | **For revenues Mid** | **For revenues Low** |
| ***CCGT*** | 50 | 54 | 58 | 0,9 | 1,2 | 2,1 |
| ***OCGT*** | 35 | 40 | 44 | 2 | 3 | 3,6 |
| ***Batteries*** | 85 | 85 | 85 | 0,1 | 0,2 | 0,4 |

*Table 12: IPC - Estimation of the variable costs for the existing technologies of the reduced list*

Elia also provides an estimation of the activation costs for the availability tests as per the royal decree. These costs were also consulted during the public consultation on the reference scenario[50].

Taking into account the average price for an activation of 4 hours during the winter of 2015-2016 for DSM, and considering one availability test of 15 minutes per year, the activation costs for availability tests are calculated as follows:

$$0.9\ \frac{€}{kWh} * 0.25\ \frac{h}{year} = 0.225\ \frac{€}{kW.year} \quad [4]$$

In line with the RD methodology, Elia multiplies these costs with the risk premium seeing as the FOM costs need to be borne by market parties in order to be able to be present in the CRM. As a result these costs are considered as investment expenses that are done by market actors with a capacity contract of one year. Subsequently, based on the principle of risk

[49] Or « roundtrip efficiency » in the case of batteries.

[50] Originally this analysis yielded a value of 0,74 €/kWh, expressed in €2015. Seeing as this report is written in €2023, the result is indexed correspondingly.

aversion of investors, the risk premium is applied to these expenses.

### Total costs

Pursuant article 20 of the RD Methodology[51] the final costs supported by the different technologies in the reduced list of technologies eligible for the IPC are equal to the FOM costs provided by Entras. These are presented in Table 13, multiplied with 1 plus the risk premium. For reference, these risk premia can be found in the annex 1 of the MD on the Intermediate Values[52].

| Technologies | **FOM costs [€/kW/year]** (Including non-yearly maintenance costs such as major overhauls) | | | **Activation costs for availability tests [€/kW/year]** | **WACC [%] to be applied** | **Total costs [€/kW/year]** | | |
|---|---|---|---|---|---|---|---|---|
| | | | | | | FOM costs multiplied with (1 + total risk premium) | | |
| | **Low** | **Mid** | **High** | | | **Low** | **Mid** | **High** |
| *CCGT* | 34 | 36 | 40 | 0 | 6,6% | 36 | 38 | 42 |
| *OCGT* | 23 | 27 | 33 | 0 | 7,7% | 25 | 29 | 35 |
| *Batteries* | 14 | 20 | 24 | 0 | 4,7% | 15 | 21 | 25 |
| *DSM with an activation duration of 4h* | 8 | 13 | 19 | 0,2 | 6% | 9 | 14 | 20 |

*Table 13: Summary of the costs applicable for the determination of the missing money in the context of the IPC*

[51] (NL) art. 20 van het KB Methodologie
(FR) art. 20 de l'AR Méthodologie
[52] (NL) Ministerieel besluit tot vastelling van de intermediaire waarden
(FR) Arrêté ministériel déterminant les valeurs intermédiaires

### 3.2.3 Estimation of the revenues

Following article 19, §1 of the RD Methodology[53] Elia provides an estimation of the annual revenues for each technology that was included in the reduced list determined based on article 18 of the same RD Methodology[54]. The components of these annual revenues are the following:

- Inframarginal rents captured on the energy markets (in €/kW/year) based on the simulation of the reference scenario selected by the Minister (see also section 1.1); and
- The net revenues obtained from ancillary services (in €/kW/year), which represent (in some cases) additional revenues on top of the aforementioned inframarginal rents.

**Inframarginal rents captured on the energy markets (€/kW/year)**

The inframarginal rents captured on the energy markets are based on a probabilistic simulation of the energy markets in accordance with article 12 of the RD Methodology[55], thereby taking into account the reference scenario described in Part I of this report for the Delivery Period 2026-27, Delivery Period 2027-28 and Delivery Period 2029-30 following the stipulations of the aforementioned article 19 of the RD Methodology.

Moreover, again in accordance with article 19 of the RD Methodology, the inframarginal rents are calculated based on average revenues, taking into account a strike price of 384 €/MWh that caps the revenues from the energy markets, which follows from the proposal for the strike price in section 3.3.2 in this report.

It is important to emphasize that the calibrated strike price is comprised of two distinct components: a fixed component and a variable component. The fixed component is established in the current report, as detailed in Section 3.3.2. On the other hand, the variable component is derived from the monthly average price of the day-ahead market. Consequently, Elia has the possibility to compute the variable component for each month, enhancing the precision of capturing inframarginal rents.

The average revenues captured on the energy markets are considered in the framework of this calibration. In order to take into account the risk aversion of investors, an additional risk premium is considered on top of the average revenues to calculate the missing money.

The annual inframarginal rents captured on the energy markets are represented in Table 14, Table 15 and Table 16 at the end of this section.

**Net revenues obtained from ancillary services**

In accordance with article 19, §3 of the RD Methodology the net revenues from ancillary services are evaluated for each technology considered in the reduced list of eligible technologies. As such, the estimation for these revenues is based on the average of the

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[53] (NL) art. 19 van het KB Methodologie
(FR) art. 19 de l'AR Méthodologie
[54] (NL) art. 18 van het KB Methodologie
(FR) art. 18 de l'AR Méthodologie
[55] (NL) art. 12 van het KB Methodologie
(FR) art. 12 de l'AR Méthodologie

historical reservation costs of the last 36 months and takes into account the associated costs – including the opportunity costs – in order to avoid double-counting with regards to the aforementioned inframarginal rents.

The reasoning considered for the estimation of net revenues arising from the reservation of balancing products applying here for IPC is partially similar than the one elaborated for net-CONE in section 2.8 with some difference(s) to be highlighted:

- It is worth highlighting again that different types of units are to be considered here with respect to the estimated net revenues presented in section 2.8 since existing units are the ones to be considered here compared to new units for net-CONE purpose. The type of unit impacts the efficiency of thermal units and impacts therefore the estimation of net balancing revenues of these units as well.
- The technologies as well as their technical specifications considered can be different for net-CONE & IPC purposes.

The estimate of these revenues was based on the analysis of data for the different products collected for a period of 36 months in accordance with the requirements of the Royal Decree Methodology.

We describe the considerations for each technology used for the net revenue estimation.

**Batteries:**

Batteries are the technologies relevant for the provision of FCR and aFRR. Therefore, their revenues will be considered. Seeing as there are no meaningful differences between existing batteries (considered for the IPC) and new-built batteries (considered for the net-CONE) the calculation of the opportunity costs is identical to the ones explained in the section 2.8.

**CCGTS:**

As raised in the section 2.8 above, CCGTs can have important costs inherent in their participation in the balancing market that can be significant. The difference relies mainly on the efficiency of the CCGT. In the framework of the net-CONE, it is worth adding that existing CCGTs may have, all things equal, a lower opportunity cost given their smaller chance of running on energy markets due to their lower efficiency. This reduced opportunity cost impacts their net balancing revenues upwards given that in general, they have a higher chance to be selected to the capacity auction when participating to balancing markets, compared to new CCGTs having a higher opportunity cost. Consequently, the net revenue decreases through the years.

In line with the results from Compass Lexecon's study, net ancillary services revenues are estimated at 2 €/kW/y, 1 €/kW/y and 0 €/kW/y for the 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 auction, respectively.

**OCGTs:**

The methodology for OCGTs net revenue calculation follows what is mentioned in section 2.8. New built OCGTs are more efficient and more competitive on the Day-ahead market compared to existing OCGTs: the latter are less efficient thus more expensive. The Clean

Spark Spread (CSS) of a new build OCGT is more advantageous compared to an existing OCGT which makes the former less competitive on the ancillary market. Consequently, new built OCGTs will be more present on the Day-ahead market while existing OCGTs, that are relevant for the computation of the IPC, will be more able to provide ancillary services. The effect of the Clean Spark Spread is two-fold:

- On the one hand, when the clean spark spread is negative the opportunity costs for participation in ancillary services of both new build and existing OCGTs are zero;
- On the other hand, when the clean spark spread is positive new build OCGTs will have a higher clean spark spread compared to existing OCGTs, making existing OCGTs more competitive on the ancillary services market.

Taking all those elements into consideration, the net revenues for OCGTs in the framework of the IPC are at 15€/kW/y for both the 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 auction.

**DSR:**

Following the same reasoning as for existing battery revenues also for DSR section 2.8 explains thoroughly the considerations used for the calculation of the net revenue.

**Total revenues**

Table 14, Table 15, and Table 16, represent an overview of the estimated and simulated revenues for the technologies of the reduced list for each respective delivery year, thereby containing both the inframarginal rents as well as the net revenues from ancillary services.

In order to estimate the total annual revenues for each technology in the reduced list, the two components are summed. In this calibration exercise the revenues from ancillary services – including the opportunity costs – are effectively net revenues on top of the inframarginal rents. In doing so, a more realistic estimation of the total annual revenues is presented. The assessment of the degree of the net balancing revenues (Low – Mid – High) is assessed based on the degree of efficiency of the units considered for thermal units. Units with a higher degree of efficiency are expected, all things equal, to be running on energy markets and thus have a higher opportunity cost leading to a small net income coming from balancing provision.

| Technologies | Average inframarginal rents captured on the energy markets [€/kW/year] | | | Net revenues from ancillary services [€/kW/year] | | | Total revenues [€/kW/an] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | Mid | High | Low | Mid | High | Low | Mid | High |
| ***CCGT*** | 12 | 20 | 39 | 2 | 2 | 2 | 14 | 22 | 41 |
| ***OCGT*** | 3 | 5 | 7 | 15 | 15 | 15 | 18 | 20 | 22 |
| ***Batteries*** | 25 | 25 | 26 | 21 | 21 | 21 | 46 | 46 | 47 |
| ***DSR with an activation duration of 4h*** | 4 | 4 | 4 | 15 | 15 | 15 | 19 | 19 | 19 |

*Table 14: Intermediate Price Cap – revenues for delivery year 2026-27*

| Technologies | Average inframarginal rents captured on the energy markets [€/kW/year] | | | Net revenues from ancillary services [€/kW/year] | | | Total revenues [€/kW/an] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | Mid | High | Low | Mid | High | Low | Mid | High |
| ***CCGT*** | 17 | 26 | 44 | 1 | 1 | 1 | 18 | 27 | 45 |
| ***OCGT*** | 6 | 8 | 10 | 15 | 15 | 15 | 21 | 23 | 25 |
| ***Batteries*** | 29 | 29 | 30 | 14 | 14 | 14 | 43 | 43 | 44 |
| ***DSR with an activation duration of 4h*** | 12 | 12 | 12 | 14 | 14 | 14 | 26 | 26 | 26 |

*Table 15: Intermediate Price Cap - revenues for delivery year 2027-28*

| Technologies | Average inframarginal rents captured on the energy markets [€/kW/year] | | | Net revenues from ancillary services [€/kW/year] | | | Total revenues [€/kW/an] | | |
|---|---|---|---|---|---|---|---|---|---|
| | Low | Mid | High | Low | Mid | High | Low | Mid | High |
| ***CCGT*** | 19 | 24 | 34 | 0 | 0 | 0 | 19 | 25 | 34 |
| ***OCGT*** | 10 | 12 | 15 | 14 | 14 | 14 | 24 | 26 | 29 |
| ***Batteries*** | 43 | 44 | 44 | 13 | 13 | 13 | 56 | 57 | 57 |
| ***DSR with an activation duration of 4h*** | 13 | 13 | 13 | 13 | 13 | 13 | 26 | 26 | 26 |

*Table 16: Intermediate Price Cap - revenues for delivery year 2029-30*

### 3.2.4 Estimation of the missing money

In this section the estimations of the costs and revenues that have been determined in section 3.2.2 and 3.2.3, respectively, are combined in order to provide an estimation of the missing money for each of the technologies in the reduced list. The estimation of the missing money is established by means of formula [7], described in article 20 of the RD Methodology:

$$Missing\ money\ = (FOM\ cost + Activation\ costs\ for\ availaiblity\ tests) * (1 + hurdle\ rate) - Total\ revenues) \quad [7]$$

To reflect the variability with regards to the costs and revenues different levels of missing money are estimated. The six levels are established as follows:

- **Level 1**: costs *Mid* and revenues *High*
- **Level 2**: costs *Mid* and revenues *Mid*
- **Level 3**: costs *Mid* and revenues *Low*
- **Level 4**: costs *High* and revenues *High*
- **Level 5**: costs *High* and revenues *Mid*
- **Level 6**: costs *High* and revenues *Low*

Similar to last year, the costs Low have not been considered. Indeed, the IPC is defined in the RD methodology as the technology with the highest missing money among the technologies that are part of the list. In order to reach this highest missing money, it is redundant to consider Low costs seeing as they will not result in a meaningful assessment of the missing money in the framework of the IPC determination.

The activation costs for availability tests are only taken into account for DSM. This follows from article 20, §1, 1° of the RD Methodology, which explains that this cost element should only be taken into account for technologies with a high activation cost. Seeing as availability tests are particularly important for units with high activation costs following the functioning rules, Elia reckons that this cost component is particularly relevant for DSM.

The estimated levels of the missing money are divided by the derating factor linked to each technology in order to consider an intermediate price cap that is sufficiently representative with regards to the behavior of market parties in the auction. Indeed, seeing as the potential capacity remuneration is only applied to the eligible volume, i.e. the nominal reference power multiplied with the derating factor, this derating factor needs to be taken into account in the bidding strategy of the market parties and, as such, in the IPC.

The derating factors are derived from section 3 of this report, whereas the total costs and revenues have already been presented in section 3.2.2 and 3.2.3, respectively.

The missing money for each of the technologies part of the reduced list is estimated for the different delivery periods in the following tables:

- Table 17 concerns delivery year 2026-27;
- Table 18 concerns delivery year 2027-28;
- Table 19 concerns delivery year 2029-30.

Note that the missing money has been set to zero when the calculation resulted in a negative value.

| Technology | Derating factor [%] | Total costs [€/kW/year] | | | Total revenues [€/kW/year] | | | Missing Money (divided by the derating factor) [€/derated kW/year] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Mid | High | Low | Mid | High | Lvl. 1 Mid Cost – Hig Rev | Lvl. 2 Mid Cost – Mid Rev | Lvl. 3 Mid Cost – Low Rev | Lvl. 4 High Cost – Hig Rev | Lvl. 5 High Cost – Mid Rev | Lvl. 6 High Cost – Low Rev |
| ***CCGT*** | 94% | 36 | 38 | 42 | 14 | 22 | 41 | **0** | **17** | **26** | **2** | **21** | **30** |
| ***OCGT*** | 92% | 25 | 29 | 35 | 18 | 20 | 22 | **8** | **20** | **12** | **15** | **17** | **19** |
| ***Batteries*** | 42% | 15 | 21 | 25 | 46 | 46 | 47 | **0** | **0** | **0** | **0** | **0** | **0** |
| ***DSR (activation duration of 4h)*** | 46% | 9 | 14 | 20 | 19 | 19 | 19 | **0** | **0** | **0** | **3** | **3** | **3** |

*Table 17: IPC: estimation of the Missing Money for DY 2026-27*

| Technology | Derating factor [%] | Total costs [€/kW/year] | | | Total revenues [€/kW/year] | | | Missing Money (divided by the derating factor) [€/derated kW/year] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Mid | High | Low | Mid | High | Lvl. 1 Mid Cost – Hig Rev | Lvl. 2 Mid Cost – Mid Rev | Lvl. 3 Mid Cost – Low Rev | Lvl. 4 High Cost – Hig Rev | Lvl. 5 High Cost – Mid Rev | Lvl. 6 High Cost – Low Rev |
| ***CCGT*** | 94% | 36 | 38 | 42 | 18 | 27 | 45 | **0** | **12** | **22** | **0** | **16** | **26** |
| ***OCGT*** | 92% | 25 | 29 | 35 | 21 | 23 | 25 | **4** | **7** | **9** | **11** | **14** | **16** |
| ***Batteries*** | 52% | 15 | 21 | 25 | 43 | 43 | 44 | **0** | **0** | **0** | **0** | **0** | **0** |
| ***DSR (activation duration of 4h)*** | 56% | 9 | 14 | 20 | 26 | 26 | 26 | **0** | **0** | **0** | **0** | **0** | **0** |

*Table 18: IPC: estimation of the Missing Money for DY 2027-28*

| Technology | Derating factor [%] | Total costs [€/kW/year] | | | Total revenues [€/kW/year] | | | Missing Money (divided by the derating factor) [€/derated kW/year] | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Low | Mid | High | Low | Mid | High | Lvl. 1 Mid Cost – Hig Rev | Lvl. 2 Mid Cost – Mid Rev | Lvl. 3 Mid Cost – Low Rev | Lvl. 4 High Cost – Hig Rev | Lvl. 5 High Cost – Mid Rev | Lvl. 6 High Cost – Low Rev |
| ***CCGT*** | 94% | 36 | 38 | 42 | 19 | 25 | 34 | **4** | **14** | **20** | **9** | **19** | **24** |
| ***OCGT*** | 92% | 25 | 29 | 35 | 24 | 26 | 29 | **0** | **3** | **5** | **7** | **10** | **12** |
| ***Batteries*** | 49% | 15 | 21 | 25 | 56 | 57 | 57 | **0** | **0** | **0** | **0** | **0** | **0** |
| ***DSR (activation duration of 4h)*** | 49% | 9 | 14 | 20 | 26 | 26 | 26 | **0** | **0** | **0** | **0** | **0** | **0** |

*Table 19: IPC: estimation of the Missing Money for DY 2029-30*

### 3.2.5 Conclusion: Proposal of Elia for the Intermediate Price Cap

Based on the estimations of the missing money presented in section 0, this section presents Elia's proposal for the IPC. Pursuant article 16, §1 of the RD Methodology[56] the IPC is equal to the missing money of the technology with the highest missing money among the technologies part of the reduced list of existing eligible technologies.

For each of the delivery years in question, the following considerations were made:

- For delivery year 2026-27, the highest missing money is observed for CCGTs. Elia believes that the proximity of the delivery year translates into a lower uncertainty with regards to the range of revenues. A similar reasoning was used by the CREG in its proposal (C)2822[57], paragraph 67. As a result, Elia proposes to use "level 5: High Costs – Mid Revenues", resulting in an IPC of **21 €/derated kW/year**.
- For delivery year 2027-28, the highest missing money is observed for CCGTs. Elia proposes to align with the definition of the IPC, i.e. the highest missing money. As a result, Elia proposes to use "level 6: High Costs – Low Revenues", resulting in an IPC of **26 €/derated kW/year**.
- For delivery year 2029-30, the highest missing money is observed for CCGTs. Elia proposes to align with the definition of the IPC, i.e. the highest missing money. As a result, Elia proposes to use "level 6: High Costs – Low Revenues", resulting in an IPC of **24 €/derated kW/year**.

| **Proposal from Elia** | |
|---|---|
| Intermediate Price Cap for 2026-27/Y-1 | 21 €/derated kW/y |
| Intermediate Price Cap for 2027-28/Y-2 | 26 €/derated kW/y |
| Intermediate Price Cap for 2029-30/Y-4 | 24 €/derated kW/y |

[56] (NL) art. 16 van het KB methodologie
(FR) art. 16 de l'AR Méthodologie
[57] (NL) voorstel (C)2822
(FR) proposition (C)2822

## 3.3 Reference Price and Strike Price

The strike price and reference price are defined in the Electricity Act, art. 2, 80° and 81°[58], respectively.

The **strike price** is the pre-defined price indicating the price level above which the capacity provider has to reimburse the difference with the strike price.

The **reference price** is the price reflecting the price that is considered to have been obtained by the capacity provider on the energy markets.

Following the RD Methodology the calibration of the strike price is based on data from EPEX and NordPool Spot, the two NEMOs[59] that are active at this moment in Belgium. The data analysis has been realized by Elia based on the resulting prices in the Belgian bidding zone. That being said, the resulting strike price is also applicable to foreign capacities if they are contracted.

This data analysis forms the first step in the calibration of the strike price as per article 27 of the RD Methodology[60] and is based on the elastic volume on the day-ahead market as well as block orders during periods relevant for adequacy. The result of this analysis is the calibration curve and forms the basis for the remainder of the calibration process.

The analysis is based on data that spans the winter periods of 2021-22, 2022-23 and 2023-24.

This part of the report is structured as follows:
Section 3.3.1 presents more information with regards to the reference price and includes Elia's proposal for the reference price.
Section 3.3.2 includes the different steps of the calibration of the strike price, as well as Elia's proposal.

[58] (NL) art. 2 van de Elektriciteitswet
(FR) art. 2 de la Loi Electricité
[59] NEMO: Nominated Electricity Market Operator
[60] (NL) art. 27 van het KB Methodologie
(FR) art. 27 de l'AR Méthodologie

### 3.3.1 Reference price

The parameters with regards to the reference price are defined in the Electricity Act and the RD Methodology. Following these, the reference is not subject to a quantitative calibration like the strike price.

Articles 24 and 25 of the RD Methodology[61] explain the requirements for the reference price.

As a result, the NEMO where the reference price is observed can be chosen by capacities operating on the Belgian energy market at this moment, which are EPEX and Nord Pool Spot.

Moreover, § 3 of the aforementioned article 25 of the RD Methodology already sets out the modalities and conditions for NEMOs for foreign capacities. To that extent the following NEMOs are available for the respective neighboring countries that can participate in the Belgian CRM:

France: EPEX or Nord Pool Spot

Germany: EPEX, Nord Pool Spot or EXAA AG

The Netherlands: EPEX or Nord Pool Spot

It is worth pointing out that should a new NEMO become active on the Belgian, French, German or Dutch bidding zone before the start of the respective Delivery Period (starting on November 1) this NEMO can equally be selected by a CRM candidate, regardless of the fact that this NEMO was initially not included in de decision of the Minister.

| **Proposal from Elia** | |
|---|---|
| Reference price | Day-ahead Market segment of a NEMO operating in the Belgian bidding zone: EPEX or Nord Pool Spot<br><br>Day-ahead Market segment of a NEMO operating in the French bidding zone: EPEX or Nord Pool Spot<br><br>Day-ahead Market segment of a NEMO operating in the German bidding zone: EPEX, Nord Pool Spot or EXAA AG<br><br>Day-ahead Market segment of a NEMO operating in the Dutch bidding zone: EPEX or Nord Pool Spot[62] |

[61] (NL) art. 24 van het KB Methodologie ; art. 25 van het KB Methodologie
(FR) art. 24 de l'AR Méthodologie ; art. 25 de l'AR Méthodologie

[62] Or eventually any other NEMO operating on the day-ahead market segment for the Belgian, French, German or Dutch bidding zone if he becomes active after the decision of the minister with regards to the reference price regarding the Delivery Period 2026-27, 2027-28 or 2029-30 and before the start of said Delivery Period.

### 3.3.2 Strike price

**Determination of the 75-85 % calibration window**

The calibration method for the strike price is based on an analysis of the elastic volume observed on the day-ahead markets from EPEX and Nord Pool Spot, as well as the prices at which these volumes were offered over the last three relevant winters on weekdays during peak hours. These so-called calibration curves are established based on the principles set out in article 27 of the RD Methodology[63].

The calibration curves take into account the regular bids and block orders of the NEMOs EPEX and Nord Pool Spot.

**Based on the analysis of Elia, the calibration window equal to [75 - 85] % of the elastic volume observed on the Belgian day-ahead market for the average weighted curve over the winters of 2021-22, 2022-23 and 2023-24 is equal to [276 - 384] €/MWh for 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4 auction.**

Following the calculation of the calibration window that was presented during the Working Group Adequacy of 27 September 2024[64], Elia applies the different criteria that are listed in the aforementioned article 27 of the RD Methodology.

The calibration window is also visualized on Figure 5.

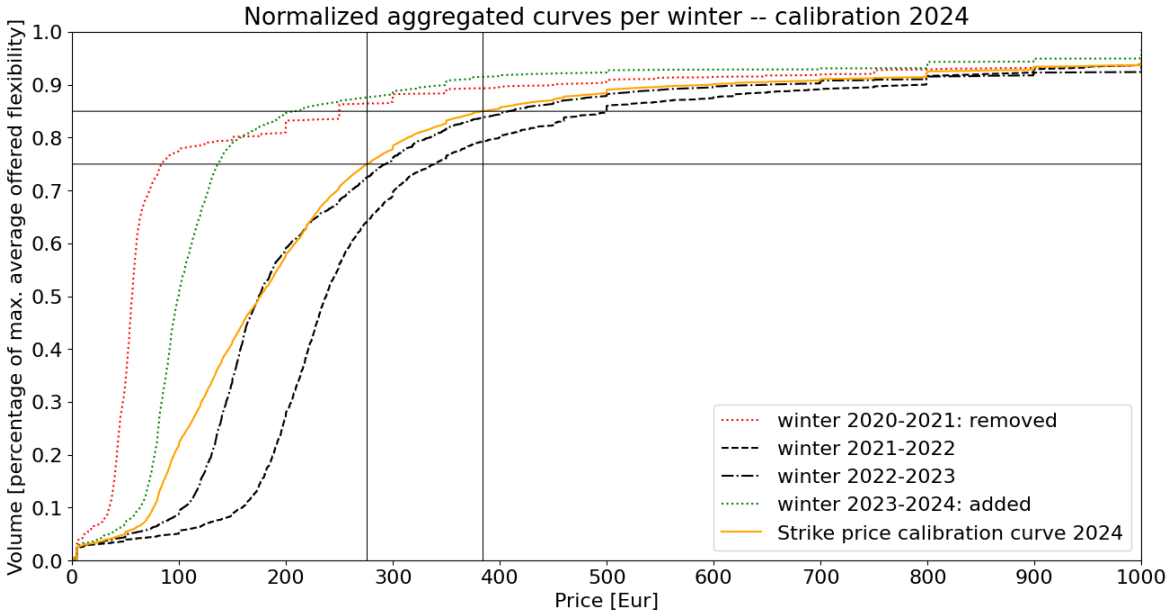


*Figure 5: Calibration curve of the strike price*

Once the price window corresponding to an elastic volume of [75 - 85] % has been established at a level of [292 - 384] €/MWh, the calibration exercise boils down applying the 5 criteria of

[63] (NL) art. 27 van het KB Methodologie
(FR) art. 27 de l'AR Méthodologie
[64] Working Group Adequacy of 27 September 2024

article 27 of the RD Methodology. Each of these criteria is discussed in the subsequent section.

**Application of the criteria detailed in article 27, §2 of the RD Methodology**

Article 27, §2 of the RD Methodology[65] lists the 5 criteria for the calibration of the strike price, namely that it must take into account:

The variable costs of units with a daily schedule on the market, so that the strike price exceeds this variable cost; and
The shape of the calibration curve; and
The evolutions on the energy market; and
The stability strike price, thereby taking into account the actualization mechanism; and
A reasonable chance that the reference price reaches the strike price.

The calibration process is as such based on an individual evaluation of each of these criteria. These individual considerations are then assembled in order to make a proposal for the calibrated strike price.

**Criterion n°1: the variable costs of daily schedule units must be covered by the strike price**

The first criterion calls for an analysis of the variable cost of daily schedule units, i.e. units with a capacity exceeding 25 MW. As a result the following technologies are considered, based on the hypotheses in the Assumption Workbook excel file joint to this report:

- CCGT
- OCGT
- Turbojets (TJ)
- CHP

The variable cost of these technologies is the result of multiple parameters that can vary depending on the delivery year. For delivery year 2026-27, 2027-28 and 2029-30, these are included in Table 20, Table 21 and Table 22, respectively.

[65] (NL) art. 27 van het KB Methodologie
(FR) art. 27 de l'AR Méthodologie

| Technologies | Efficiency [%] | VOM [€/MWh] | CO2 price [€/ton] | Fuel price [€/MWh] | CHP credits [€/MWh] | Variable cost [€/MWh] |
|---|---|---|---|---|---|---|
| CCGT | 50 | 2,1 | 76,8 | 31,1 | NA | 95,9 |
| OCGT | 35 | 3,6 | 76,8 | 31,1 | NA | 137,6 |
| TJ | 21 | 4 | 76,8 | 48,5 | NA | 337,6 |
| CHP | 33 | 2,5 | 76,8 | 31,1 | 75,8 | 68,8 |

*Table 20: Parameters for the calculation of the marginal cost of daily schedule units for delivery year 2026-27*

| Technologies | Efficiency [%] | VOM [€/MWh] | CO2 price [€/ton] | Fuel price [€/MWh] | CHP credits [€/MWh] | Variable cost [€/MWh] |
|---|---|---|---|---|---|---|
| CCGT | 50 | 2,1 | 79,7 | 27,4 | NA | 89,6 |
| OCGT | 35 | 3,6 | 79,7 | 27,4 | NA | 128,6 |
| TJ | 21 | 4 | 79,7 | 47,7 | NA | 337,5 |
| CHP | 33 | 2,5 | 79,7 | 27,4 | 70,7 | 64,4 |

*Table 21: Parameters for the calculation of the marginal cost of daily schedule units for delivery year 2027-28*

| Technologies | Efficiency [%] | VOM [€/MWh] | CO2 price [€/ton] | Fuel price [€/MWh] | CHP credits [€/MWh] | Variable cost [€/MWh] |
|---|---|---|---|---|---|---|
| CCGT | 50 | 2,1 | 85,6 | 23,2 | NA | 83,7 |
| OCGT | 35 | 3,6 | 85,6 | 23,2 | NA | 120,1 |
| TJ | 21 | 4 | 85,6 | 47 | NA | 342 |
| CHP | 33 | 2,5 | 85,6 | 23,2 | 65,9 | 60,2 |

*Table 22: Parameters for the calculation of the marginal cost of daily schedule units for delivery year 2029-30*

The analysis shows that in order to cover the variable cost of all daily schedule technologies the strike price should be:

- higher than 337,6 €/MW for delivery year 2026-27;
- higher than 337,5 €/MWh for delivery year 2027-28;
- higher than 342 €/MWh for delivery year 2029-30.

**Elia concludes that following an analysis for the first criterion, for 2026-27/Y-1 a strike price with a minimal value of 337,6 €/MWh, for 2027-28/Y-2 a strike price with a minimal value of 337,5 €/MWh and for 2029-30/Y-4 a strike price with a minimal value of 342 €/MWh should be considered.**

**Criterion n°2: the calibration of the strike price needs to take into account the shape of the calibration curve**

The second criterion is based on a scrutiny of the shape of the calibration curve.

When looking at the general shape of the calibration curve as presented in Figure 6 one can clearly observe that the curve only starts to display asymptotic behavior when it reaches the upper edge of the calibration window. Indeed, the curve only starts to truly flatten out starting from a value of around 500 €/MWh. As a result, in order to take into account the second criterion Elia believes that a value should be considered in the upper part of the calibration window.

**According to Elia the second criterion shows that the strike price should be selected from the upper range of the calibration window.**

**Criterion n°3: the calibration of the strike price needs to take into account the evolution of the energy market**

The third criterion underlines that the calibrated strike price must take into account evolutions on the energy market. Put differently, this criterion requires to estimate how the energy market might change structurally under normal market circumstances.

As also reflected in the shift to the left of the calibration curve, lower prices have been observed last winter compared to previous years. Be that as it may, it is hard to say whether this drop is structural. In the upcoming years Europe will need to invest in order to become energy independent, which might drive up prices on the short- and mid-term.

**According to Elia, the third criterion does not provide an indication for the calibration of the strike price.**

**Criterion n°4: the stability of the strike price over time**

The fourth refers to the need for a strike price that is stable over time.

It is important to highlight that the RD Methodology specifically foresees to take into account the actualization mechanism that has been introduced in the CRM Functioning Rules. This actualization mechanism foresees splitting the strike price into a fixed and a variable component.

The variable component is determined ex-post. As such, Elia can at this moment make no estimation of its evolution to take it into account for the calibration here.

The fixed component can be calculated here. As a result, in order to ensure stability over time of the strike price Elia will assess the stability of the fixed component.

Following section 12.3.1.2.2 of the CRM Functioning Rules, “the fixed component is equal to the difference between the calibrated strike price (…) and the DAM simple average prices for the winter months of the same years than as the ones used for the calibration of the strike price (…).” Later, it is further specified that this DAM simple average is “the average of Day-Ahead prices during peak hours, working days and winter months (…).

Figure 6 below gives an overview of the fixed components of the Y-4 auctions that have already taken place.

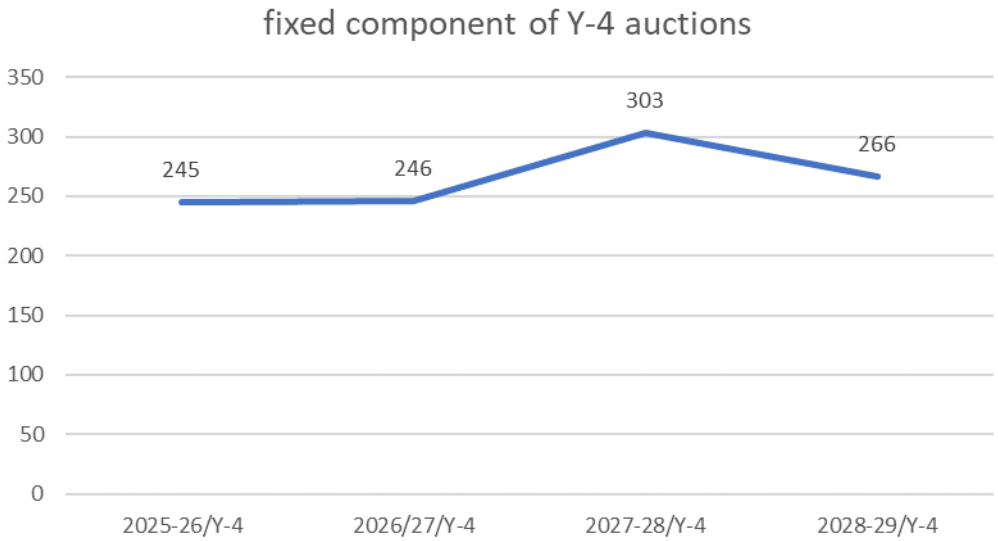


*Figure 6: Evolution of fixed component for previous Y-4 auctions*

For the Y-1 auction, only one previous calibration took place: in the 2025-26/Y-1 auction, a Strike Price of 409 €/MWh was used, which corresponds to a fixed component of 245 €/MWh. This is the first calibration exercise of a Y-2 auction, meaning there are no previous calibrations to compare to.

Having observed the fixed components from previous auctions. It is worth examining how the fixed component of this calibration would compare to the previous calibration iterations.

The average DAM price calculated as described above over the winter periods 2021-22, 2022-23 and 2023-24 yields a result of 174 €/MWh. Correspondingly, if we deduct this value from the calibration window of [276 - 384] €/MWh, the resulting fixed component is a value between [102 - 210] €/MWh. In order to assess how this range compares to the previous auctions, it has been added in Figure 7 below:

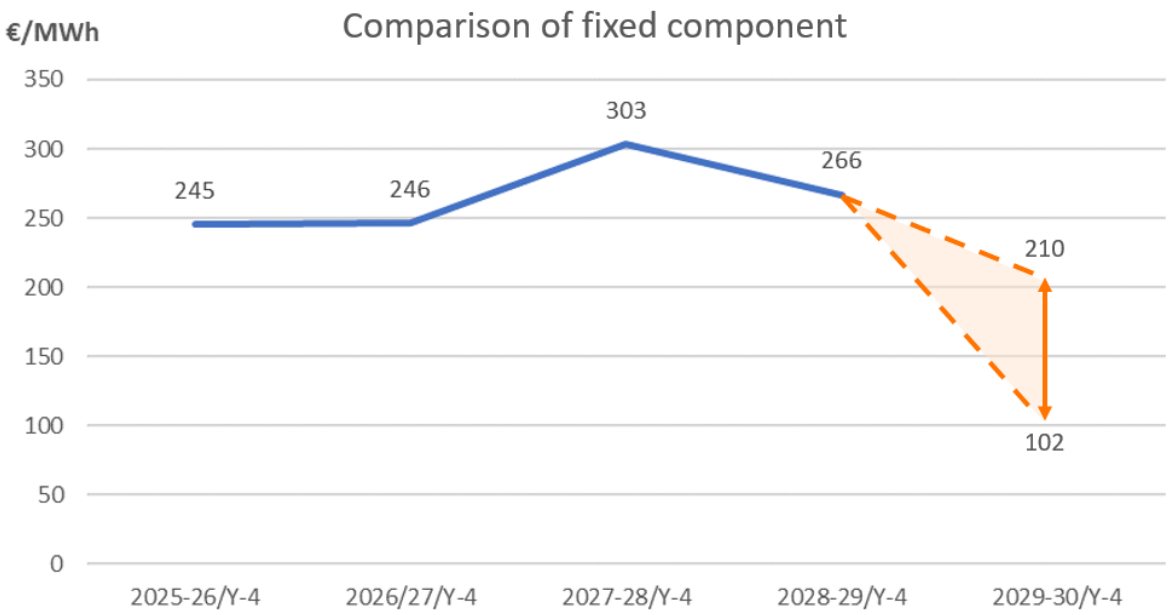


*Figure 7: Comparison of fixed component of current calibration to previous iterations*

It is immediately striking that the resulting range for the fixed component is significantly lower compared to previous Y-4 auctions. In order to obtain a fixed component that is stable compared to previous Y-4 auctions, this strongly suggests that the highest possible value for the Strike Price must be selected for the Y-4 auction, i.e. 384 €/MWh.
With regards to the Y-1 auction, the same range for the fixed component of [102 - 210] €/MWh is also significantly lower than the fixed component of 2025-26/Y-1, 245 €/MWh. As a result, also for the Y-1 auction the conclusion should be that the highest possible value of 384 €/MWh must be selected.
Seeing as this is the first calibration of a Y-2 auction, no comparison can be made. Still, in Elia's point of view it is advantageous to have consistency across the three different auctions, which means that also for the Y-2 auction a value of 384 €/MWh should be selected.

**The conclusion of the fourth criterion is according to Elia that 384 €/MWh must be considered for the calibration of the strike price for both 2026-27/Y-1, 2027-28/Y-2 and 2029-30/Y-4.**

**Criterion n°5: the strike price must be able to guarantee a reasonable probability for the payback obligation**

The fifth and last criterion reflects the probability that the strike price is reached, and as such serves to ensure that the payback obligation is triggered with a reasonable probability.

In order to evaluate this criterion, Elia has performed an analysis of the day-ahead prices on the Belgian market since 2006. For the price levels between 276 €/MWh and 384 €/MWh, i.e. the minimal and maximal values of the calibration window of [75 - 85] %, the occurrences these price levels are observed. For the sake of argument price levels until 500 €/MWh are added as well.

The results of this analysis can be seen in Annex 4 of this report. It can be seen that over the observed period prices exceeding 400 €/MWh occurred regularly during the 2022 energy crisis.

It is for this reason the actualization mechanism has been introduced. It is worth pointing out that prices above 400 €/MWh have not been observed in 2023 or 2024[66]. This, however, does not hamper the goal of the payback obligation, namely that exceptional windfall profits must be paid back; these exceptional price levels just haven't taken place (yet) in 2023 or 2024. Moreover, the introduction of the actualization mechanism means that it is hard to assess this criterion based on the calibrated strike price rather than the actualized strike price.

**As a result, the fifth criterion does not provide an indication for the calibration of the strike price.**

### Conclusion

Having considered the five criteria listed in the RD Methodology individually, in order to ensure stability over time of the fixed component based on the arguments listed for criterion n°4, Elia proposes to use the maximal value of the calibration window for the strike price.

As a result, and in accordance with the criteria listed in the RD, Elia proposes to consider a strike price equal to 384 €/MWh for each auction. This results in a fixed component of 210 €/MWh.

| **Proposal from Elia** | | |
|---|---|---|
| | Strike Price | Fixed Component |
| 2026-27 Y-1 | 384 €/MWh | 210 €/MWh |
| 2027-28 Y-2 | 384 €/MWh | 210 €/MWh |
| 2029-30 Y-4 | 384 €/MWh | 210 €/MWh |

[66] Due to the availability of data, for 2024 only prices up until September were used

# Annex 1: Maximum values of unproven capacities

Following discussions with market parties and the interactions that took place in the framework of the CRM, the concept of unproven capacities has been defined as the capacities that, at the moment of submission of the prequalification file, have not yet been associated to a specific delivery point.

This type of capacity is also not associated to a particular technology but represent the capacity with a limited maturity that could still develop in the course of the pre-Delivery Period. For this reason, the pre-delivery monitoring, as explained in the functioning rules, gives strong incentives to accurately monitor the development of these capacities.

Be that as it may, it can be justified to limit the volume that can be contracted from this type of capacity in order to not needlessly expose a volume too large of the CRM to the risks that are associated to a capacity with such limited maturity.

Moreover, this volume must still be sufficiently large so that it can still be competitive in the auction.

Correspondingly, Elia makes a proposition for the maximum value of unproven capacities that can be contracted in the Y-4 auction. Elia proposes to set this value at 400 MW for the auction linked to this calibration report, for the following reasons:

- This volume corresponds to the typical size of large units currently present in the Belgian market, allowing such new units of this size to participate;
- This volume does not pose an excessive risk in terms of adequacy for the considered Delivery Period, seeing as the Y-1 auction still allows to contract the needed volumes;
- This volume has been thoroughly discussed in the Working Group Adequacy and has been found reasonable by its participants;
- The pre-delivery controls have, so far, not lead to capacities that should have been taken into account for the volume that has been identified for previous calibration exercises.

A second limit considers the maximum amount of unproven capacity that could be offered by one single capacity provider. A value below the total 400 MW could lead to certain projects not being offered, thereby potentially preventing the contracting of the most cost-efficient solution. As a result, Elia proposes to put the limit of the unproven capacity offered by a single capacity provider at 400 MW.

Unproven capacities are not allowed to participate in Y-1 and Y-2 auctions. Hence, no proposals are made for the 2026-27/Y-1 and 2027-28/Y-2 auction.

| **Proposal from Elia** | |
|---|---|
| Maximum value of unproven capacity in the 2029-30/Y-4 auction | 400 MW |
| Maximum value of unproven capacity for one capacity provider in the 2029-30/Y-4 auction | 400 MW |

# Annex 2: Details of the demand curve

| h | C(h) 2027-28/ Y-2 | C(h) 2029-30/ Y-4 |
|---|---|---|
| 1 | 14934 | 16303 |
| 2 | 14817 | 16172 |
| 3 | 14741 | 16081 |
| 4 | 14686 | 16016 |
| 5 | 14637 | 15960 |
| 6 | 14598 | 15908 |
| 7 | 14559 | 15867 |
| 8 | 14527 | 15827 |
| 9 | 14498 | 15793 |
| 10 | 14468 | 15762 |
| 11 | 14445 | 15733 |
| 12 | 14421 | 15705 |
| 13 | 14398 | 15679 |
| 14 | 14377 | 15653 |
| 15 | 14356 | 15629 |
| 16 | 14335 | 15608 |
| 17 | 14317 | 15588 |
| 18 | 14300 | 15568 |
| 19 | 14283 | 15549 |
| 20 | 14267 | 15530 |
| 21 | 14252 | 15512 |
| 22 | 14238 | 15496 |
| 23 | 14224 | 15479 |
| 24 | 14211 | 15464 |
| 25 | 14199 | 15450 |
| 26 | 14186 | 15435 |
| 27 | 14175 | 15422 |
| 28 | 14163 | 15408 |
| 29 | 14152 | 15395 |
| 30 | 14141 | 15381 |
| 31 | 14130 | 15368 |
| 32 | 14120 | 15355 |
| 33 | 14109 | 15343 |
| 34 | 14098 | 15332 |
| 35 | 14088 | 15320 |
| 36 | 14078 | 15309 |
| 37 | 14068 | 15298 |
| 38 | 14059 | 15287 |
| 39 | 14050 | 15277 |
| 40 | 14041 | 15267 |
| 41 | 14032 | 15257 |
| 42 | 14022 | 15248 |
| 43 | 14014 | 15238 |
| 44 | 14006 | 15229 |
| 45 | 13997 | 15219 |
| 46 | 13988 | 15210 |
| 47 | 13980 | 15202 |
| 48 | 13971 | 15193 |
| 49 | 13964 | 15184 |
| 50 | 13956 | 15176 |
| 51 | 13949 | 15168 |
| 52 | 13941 | 15160 |
| 53 | 13933 | 15152 |
| 54 | 13926 | 15144 |
| 55 | 13918 | 15136 |
| 56 | 13911 | 15127 |
| 57 | 13904 | 15119 |
| 58 | 13896 | 15112 |
| 59 | 13889 | 15104 |
| 60 | 13883 | 15097 |
| 61 | 13876 | 15089 |
| 62 | 13870 | 15081 |
| 63 | 13863 | 15074 |
| 64 | 13856 | 15066 |
| 65 | 13849 | 15059 |
| 66 | 13843 | 15053 |
| 67 | 13836 | 15046 |
| 68 | 13830 | 15039 |
| 69 | 13824 | 15032 |
| 70 | 13818 | 15026 |
| 71 | 13813 | 15019 |
| 72 | 13807 | 15013 |
| 73 | 13801 | 15006 |
| 74 | 13795 | 15000 |
| 75 | 13789 | 14994 |
| 76 | 13784 | 14988 |
| 77 | 13778 | 14981 |
| 78 | 13772 | 14975 |
| 79 | 13766 | 14969 |
| 80 | 13761 | 14963 |
| 81 | 13755 | 14957 |
| 82 | 13749 | 14951 |
| 83 | 13744 | 14946 |
| 84 | 13739 | 14939 |
| 85 | 13733 | 14934 |
| 86 | 13728 | 14928 |
| 87 | 13723 | 14922 |
| 88 | 13718 | 14917 |
| 89 | 13713 | 14912 |
| 90 | 13708 | 14906 |
| 91 | 13703 | 14901 |
| 92 | 13698 | 14895 |
| 93 | 13693 | 14890 |
| 94 | 13688 | 14885 |
| 95 | 13683 | 14879 |
| 96 | 13678 | 14874 |
| 97 | 13674 | 14869 |
| 98 | 13669 | 14864 |
| 99 | 13664 | 14859 |
| 100 | 13660 | 14854 |
| 101 | 13655 | 14849 |
| 102 | 13650 | 14844 |
| 103 | 13645 | 14839 |
| 104 | 13641 | 14834 |
| 105 | 13637 | 14829 |
| 106 | 13632 | 14824 |
| 107 | 13628 | 14820 |
| 108 | 13624 | 14815 |
| 109 | 13619 | 14810 |
| 110 | 13615 | 14805 |
| 111 | 13611 | 14800 |
| 112 | 13606 | 14795 |
| 113 | 13602 | 14791 |
| 114 | 13598 | 14786 |
| 115 | 13594 | 14782 |
| 116 | 13590 | 14777 |
| 117 | 13585 | 14773 |

| | | |
|---|---|---|
| 118 | 13581 | 14768 |
| 119 | 13577 | 14764 |
| 120 | 13573 | 14759 |
| 121 | 13569 | 14755 |
| 122 | 13565 | 14751 |
| 123 | 13561 | 14747 |
| 124 | 13557 | 14742 |
| 125 | 13553 | 14738 |
| 126 | 13549 | 14734 |
| 127 | 13545 | 14730 |
| 128 | 13541 | 14725 |
| 129 | 13537 | 14722 |
| 130 | 13533 | 14717 |
| 131 | 13530 | 14713 |
| 132 | 13526 | 14709 |
| 133 | 13522 | 14705 |
| 134 | 13519 | 14701 |
| 135 | 13515 | 14697 |
| 136 | 13511 | 14693 |
| 137 | 13508 | 14689 |
| 138 | 13504 | 14685 |
| 139 | 13500 | 14681 |
| 140 | 13497 | 14678 |
| 141 | 13493 | 14674 |
| 142 | 13490 | 14670 |
| 143 | 13486 | 14666 |
| 144 | 13483 | 14662 |
| 145 | 13479 | 14658 |
| 146 | 13475 | 14655 |
| 147 | 13472 | 14651 |
| 148 | 13469 | 14647 |
| 149 | 13465 | 14643 |
| 150 | 13462 | 14640 |
| 151 | 13458 | 14636 |
| 152 | 13455 | 14632 |
| 153 | 13451 | 14628 |
| 154 | 13448 | 14624 |
| 155 | 13444 | 14621 |
| 156 | 13441 | 14618 |
| 157 | 13437 | 14614 |
| 158 | 13434 | 14610 |
| 159 | 13431 | 14607 |
| 160 | 13428 | 14603 |
| 161 | 13424 | 14599 |
| 162 | 13421 | 14596 |
| 163 | 13418 | 14592 |
| 164 | 13415 | 14589 |
| 165 | 13411 | 14585 |
| 166 | 13408 | 14582 |
| 167 | 13405 | 14578 |
| 168 | 13402 | 14575 |
| 169 | 13399 | 14571 |
| 170 | 13396 | 14568 |
| 171 | 13393 | 14564 |
| 172 | 13390 | 14561 |
| 173 | 13386 | 14558 |
| 174 | 13383 | 14554 |
| 175 | 13381 | 14551 |
| 176 | 13377 | 14548 |
| 177 | 13374 | 14545 |
| 178 | 13371 | 14541 |
| 179 | 13368 | 14538 |
| 180 | 13366 | 14535 |
| 181 | 13363 | 14532 |
| 182 | 13360 | 14529 |
| 183 | 13356 | 14525 |
| 184 | 13354 | 14522 |
| 185 | 13351 | 14519 |
| 186 | 13348 | 14516 |
| 187 | 13345 | 14513 |
| 188 | 13342 | 14509 |
| 189 | 13339 | 14506 |
| 190 | 13336 | 14503 |
| 191 | 13334 | 14500 |
| 192 | 13331 | 14497 |
| 193 | 13328 | 14494 |
| 194 | 13325 | 14491 |
| 195 | 13322 | 14488 |
| 196 | 13319 | 14485 |
| 197 | 13316 | 14481 |
| 198 | 13314 | 14478 |
| 199 | 13311 | 14475 |
| 200 | 13308 | 14472 |
| 201 | 13305 | 14470 |
| 202 | 13303 | 14467 |
| 203 | 13300 | 14464 |
| 204 | 13297 | 14461 |
| 205 | 13295 | 14458 |
| 206 | 13292 | 14455 |
| 207 | 13289 | 14452 |
| 208 | 13287 | 14449 |
| 209 | 13284 | 14446 |
| 210 | 13281 | 14443 |
| 211 | 13279 | 14440 |
| 212 | 13276 | 14437 |
| 213 | 13273 | 14434 |
| 214 | 13271 | 14432 |
| 215 | 13268 | 14429 |
| 216 | 13266 | 14426 |
| 217 | 13263 | 14423 |
| 218 | 13260 | 14420 |
| 219 | 13258 | 14417 |
| 220 | 13255 | 14414 |

*Table 23: Details of the demand curve*

# Annex 3: Details on the inframarginal rents

This annex provides more details with regards to the inframarginal rents observed on the energy markets for the reference plant of each technology mentioned in the list of technologies applicable for the calculation of the net-CONE.

The inframarginal rents are determined:

- for the years 2026, 2027 and 2029, based on the reference scenarios selected by the Minister as defined in Part I;
- for 2028 on the average between 2027 and 2029 ;
- the inframarginal rents of 2029 are taken for the later years as well as the revenues from the AdeqFlex scenarios not in line with the scenarios for Delivery Periods covered in this calibration report. This deviates from what was proposed by Elia in the public consultation but Elia believes this gives a better estimates of the inframarginal rents taking into account the latest evolutions in the energy markets.

Table 24 provides these different inframarginal rents expressed in €/kW per year.

| €/kW | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 | 2034 | 2035 | 2036 | 2037 | 2038 | 2039 | 2040 | 2041 | 2042 | 2043 | 2044 | 2045 | 2046 | 2047 | 2048 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **CCGT** | | | | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 | 43 |
| **OCGT** | | 11 | 13 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 | 15 |
| **CHP** | | 115 | 100 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 | 85 |
| **Battery storage (4h)** | 26 | 30 | 37 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | 44 | | | | | |
| **Demand Side Response** | 3 | 11 | | 12 | | | | | | | | | | | | | | | | | | | |
| **Photovoltaics** | 53 | 49 | 41 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | 33 | | | | | |
| **Wind onshore** | 135 | 125 | 111 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | 98 | | | | | |
| **Wind offshore** | | | | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 | 165 |

*Table 24: Net-CONE – Details on the inframarginal rents captured on the electricity markets over the economic lifetime*

# Annex 4: Price occurrences on day-ahead prices since 2006

| | *Occasions of payback obligation if the strike price would be equal to:* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| **year** | **300 €/MWh** | **310 €/MWh** | **320 €/MWh** | **330 €/MWh** | **340 €/MWh** | **350 €/MWh** | **360 €/MWh** | **370 €/MWh** | **380 €/MWh** | **390 €/MWh** | **400 €/MWh** |
| **2006** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **2007** | 33 | 29 | 29 | 29 | 29 | 28 | 26 | 25 | 24 | 24 | 24 |
| **2008** | 5 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 | 4 |
| **2009** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2010** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2011** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **2012** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2013** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2014** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2015** | 14 | 12 | 9 | 9 | 8 | 7 | 7 | 7 | 7 | 7 | 5 |
| **2016** | 5 | 5 | 5 | 5 | 4 | 4 | 4 | 3 | 3 | 3 | 3 |
| **2017** | 2 | 1 | 1 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2018** | 9 | 9 | 8 | 6 | 5 | 5 | 3 | 3 | 3 | 2 | 2 |
| **2019** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2020** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2021** | 271 | 237 | 199 | 180 | 157 | 135 | 110 | 92 | 87 | 80 | 64 |
| **2022** | 2447 | 2277 | 2119 | 1959 | 1823 | 1693 | 1589 | 1471 | 1353 | 1252 | 1143 |
| **2023** | 3 | 2 | 2 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2024** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **2791** | **2579** | **2379** | **2197** | **2033** | **1879** | **1746** | **1608** | **1484** | **1375** | **1248** |

*Table 25: Price Occurrences between 300 and 400 €/MWh on the Belgian day-ahead market since 2006*

| *Occasions of payback obligation if the strike price would be equal to:* | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| **year** | **410 €/MWh** | **420 €/MWh** | **430 €/MWh** | **440 €/MWh** | **450 €/MWh** | **460 €/MWh** | **470 €/MWh** | **480 €/MWh** | **490 €/MWh** | **500 €/MWh** |
| **2006** | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 | 2 |
| **2007** | 22 | 22 | 21 | 21 | 21 | 20 | 19 | 19 | 18 | 18 |
| **2008** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **2009** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2010** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2011** | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 |
| **2012** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2013** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2014** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2015** | 5 | 5 | 5 | 5 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2016** | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 | 3 |
| **2017** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2018** | 2 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 1 | 0 |
| **2019** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2020** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2021** | 51 | 41 | 35 | 30 | 29 | 25 | 20 | 16 | 14 | 12 |
| **2022** | 1056 | 964 | 879 | 803 | 733 | 654 | 594 | 535 | 490 | 441 |
| **2023** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **2024** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| **Total** | **1145** | **1042** | **950** | **869** | **793** | **709** | **643** | **580** | **532** | **480** |

*Table 26: Price Occurrences between 410 and 500 €/MWh on the Belgian day-ahead market since 2006*