



Consultation report of the Public consultation on the scenario's, sensitivities and data for the CRM parameter calculation for the Y-4 Auction with Delivery Period 2027-28

June 2022

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Introduction

Elia organized a public consultation on the scenarios, sensitivities and data for the CRM parameter calculation for the Y-4 Auction with Delivery Period 2027-28. This public consultation took place in the framework of the Royal Decree laying down the method for calculating the required capacity volume and the parameters necessary for the organization of the auctions within the framework of the capacity compensation mechanism (hereinafter 'the Royal Decree').

Article 5, §2 of the Royal Decree sets out the topics to be at least submitted for public consultation, namely:

- the update of data and assumptions regarding the scenario(s), as well as any potentially selected sensitivities to be included in the reference scenario;
- the relevance of the sensitivities, including the data and assumptions on the basis of which they were established;
- the type of additional capacity;
- the public sources of the scenarios for the years subsequent to the year of delivery from which the input data are used to calculate inframarginal rents;
- the shortlist of existing technologies that will be reasonably available and which are eligible for the determination of the intermediate price cap.

The public consultation material consisted of an Excel file, containing all the data and assumptions regarding scenarios, sensitivities and parameters required by the Royal Decree, an explanatory nota in PDF format¹ and the slides presented during Task Force CRM meeting from Friday 6 May 2022².

The consultation aimed at receiving comments from market participants on the presented data and assumptions as well as suggestions for additional sensitivities in order for the Minister to decide on a reference scenario. In line with the Royal Decree, this decision is to be taken on the basis of a proposal from the CREG, to be formulated taking into account this consultation report, including Elia's recommendations, and after an advice on this proposal by the FPS Economy.

The consultation period was set from Friday the 6th of May until Monday the 6th of June 2022, 6:00pm and was publicly announced on the Elia website and during the Task Force CRM meeting of Friday 6 May 2021.

In total 1 partially confidential reaction from Engie and 3 public reactions (FEBEG, Febeliec and Zandvliet Power NV) were received.

This document is structured as follows:

¹ https://www.elia.be/fr/consultations-publiques/20220506_public-consultation-on-crm

² <https://www.elia.be/fr/users-group/adequacy-working-group/20220506-meeting>

- First, the legal and regulatory framework of this public consultation is reminded;
- Then, Elia's recommendation will be added in line with article 5, §3 of the Royal Decree;
- This public consultation report provides the overview of received questions, a justified answer from Elia and how these will be taken into account for the CRM calibration. Elia provides answers on the methodology, the scenario dataset, the proposed sensitivities, the preselected capacity types, the post-delivery scenarios, the intermediate price cap and the strike price.

This public consultation report will be published on Elia's website as well as all the non-confidential feedback received.

Finally, Elia would like to thank all the market parties for their contributions and for providing written feedback during the public consultation.

1. Legal and regulatory framework

The federal electricity law of 29 April 1999 foresees in its article 7undecies §2 that the Transmission System Operator (Elia) elaborates on a yearly basis and after public consultation, the reports providing the calculation for the necessary volume and a proposal of auction parameters. The procedure is further defined in a Royal Decree laying down the parameters with which the volume of capacity to be provided is determined, including their calculation methods, and the other parameters necessary for the organization of auctions, as well as the method and the conditions for granting an individual exemption from the application of the intermediate price ceiling(s) in the context of the capacity compensation mechanism (the Royal Decree) setting out the method for calculating the required volume of capacity and the parameters necessary for the organization of auctions under the capacity remuneration mechanism.

A first concertation and collaboration meeting was organized with the FPS Economy and the CREG on 22 April 2022. A second concertation and collaboration meeting was organized with FPS Economy and CREG on 29 April 2022. A task force was organized to provide market parties all information on 06 May 2022. Then, the public consultation was organized from 06 May 2022 until 06 June 2022 at 6pm. Based on the feedback received, Elia prepared this public consultation report as well as the recommendation required by the Royal Decree. Both the recommendation and answer to stakeholders' feedback were presented during the task force organized on 17 June 2022. The CREG will elaborate a reference scenario proposal based on all available information and the FPS will provide an advice on it. Finally, the Minister will select the final reference scenario by 15 September 2022 based on the proposal from the CREG, Elia's recommendations and advice from the FPS. The Minister can deviate from the CREG proposal with adequate justification.

2. Elia's recommendation

This section aims to provide Elia's recommendation, as mentioned in article 5, §3 of the Royal Decree. This recommendation is formulated to provide a robust, realistic and balanced reference scenario proposal, taking into account the received feedback from stakeholders, while ensuring the security of supply of the country against a limited, but realistic subset of unexpected events, referred to as 'sensitivities' in this report, according to the proposed Royal Decree denomination. These sensitivities are therefore part of the reference scenario. The received feedback from stakeholders and detailed comments can be found in the next chapter.

This recommendation is made for the calculation of the required volume and parameters needed in the framework of the CRM calibration report for the Y-4 auction with Delivery Period 2027-28.

Elia proposes to take into account the scenario dataset presented in "Appendix: Scenario dataset proposed by Elia" as a starting point. This dataset has been constructed based on the latest published European Resource Adequacy Assessment (ERAA 2021³) from ENTSO-E. This initial dataset has been updated to take into account the latest available information on Belgian and European areas as well as feedback from stakeholders during the public consultation process which took place between the 6th of May and the 6th of June 2022.

Furthermore, Elia recommends to integrate into this dataset the following sensitivities as part of the reference scenario:

- Regarding the economic parameters, Elia proposes to integrate a **high fuel price sensitivity** as part of the reference calibration scenario. This sensitivity could be either based on Elia's high price sensitivity (based on an interpolation between available price forecasts and 2030 target from WEO2021) or on price trajectories integrating the REPowerEU package from the European Commission or on more recent studies, if available before the selection by the Minister. All the feedback received from stakeholders tends to agree to consider such a sensitivity in the reference scenario;
- Regarding the demand in Belgium, Elia proposes to take into account the latest economic forecasts that will be published by the Federal Planning Bureau. The resulting electricity demand will be determined using the Total Demand forecasting tool 'BECalc' developed in collaboration with Climact for the FPS Environment. This forecasted demand should be available in the course of August. In addition, Elia proposes to integrate the **impact of high prices on the demand**. In order to assess such impact, it was requested to have such an

³ <https://www.entsoe.eu/outlooks/eraa/2021>

impact evaluated by Climact together with the latest consumption forecasts due in August. All the feedback received from stakeholders tends to agree to consider such a sensitivity in the reference scenario;

- Regarding the integration of flow-based CEP rules, Elia proposes to keep the base scenario, considering a **70%min RAM** in order to be compliant with European regulation. This proposal is aligned with Febeliec's feedback. Note that Engie and Febeg provided an alternative proposal to still consider this effect on the reference scenario;
- Regarding the potential closure of turbojets and/or OCGT due to possible CO₂ thresholds, Elia proposes to integrate an intermediate sensitivity based on stakeholders' feedback, that consists in considering a **partial closure of the turbojets and small-scale OCGT by considering an availability of 50%** of these assets, corresponding to 276 MW;
- Regarding the sensitivity on the nuclear availability in France, Elia proposes to consider **at least 4 units unavailable on top of the availability foreseen in the ERAA21**. This choice is justified by the situation observed in the past winters exacerbated by the current situation observed in France. In addition it provides a central value when considering the feedback of stakeholders (both 0 and 8 units were proposed). The reasons to consider such a sensitivity are multiple (non-exhaustive list):
 - o major overhauls foreseen to extend the lifetime of the fleet beyond 40 years;
 - o recent findings on corrosion defects would greatly impact the availability of all nuclear reactors in the coming years;
 - o the recent publication from RTE regarding the expected generation for next winters⁴ and looking at 2030⁵;
 - o the vulnerability of the nuclear fleet to generic issues;
 - o the French TSO's report that they expect that the reliability standard would not be met in the coming 3 winters based on their reference scenario (prior to the latest announcement on corrosion defects)⁶, despite the market-wide CRM implemented in France.

These sensitivities are proposed by Elia after collaboration/concertation with the FPS/CREG and have been submitted to public consultation. Elia's recommendation intends to integrate the feedback received in order to provide a relevant and justified reference scenario proposal. All answers and proposals from stakeholders can be found in the next section of this consultation report.

⁴ <https://www.edf.fr/groupe-edf/espaces-dedies/journalistes/tous-les-communiques-de-presse/point-actualite-nucleaire-du-18-mai-2022>

⁵ [BP50 Principaux résultats fev2022 Chap14 Analyse des dynamiques 0.pdf \(rte-france.com\)](https://assets.rte-france.com/prod/public/2021-04/Bilan%20previsionnel%202021%20-%20principaux%20enseignements.pdf)

⁶ Figure 3 from <https://assets.rte-france.com/prod/public/2021-04/Bilan%20previsionnel%202021%20-%20principaux%20enseignements.pdf>

Note that all updates based on stakeholders' feedback and proposed sensitivities to be taken into account in the reference scenario are marked in green in "Appendix: Scenario dataset proposed by Elia".

3. Received feedback and Elia's answer

This chapter of the public consultation report provides an overview of the received feedback, a justified answer from Elia and how Elia proposes to take it into account for the CRM calibration, as part of Elia's recommendation.

In the framework of this public consultation on scenarios, sensitivities and data for the Y-4 auction for the delivery year 2027-28, 4 answers were received: 3 non-confidential (Zandvliet Power NV, Febeg, Febeliec) and 1 partially confidential answer from Engie. This document provides answers to the 3 non-confidential feedbacks received.

3.1 Methodology

FEBELIEC	<p>Febeliec continues to strongly regret that Elia still, as for all other adequacy related studies and analyses, only conducts a consultation on the input data, sensitivities and scenarios, and does not conduct a consultation on the methodology itself. Febeliec equally strongly regrets that Elia still does not involve the stakeholders in the development of this methodology, other than the stakeholders imposed by the law (FPS Economy plus coordination with CREG). Even though no such legal obligation exists, Elia could (and according to Febeliec, should) have opted for a much larger involvement from all stakeholders, in order to obtain a much stronger buy-in from stakeholders in the methodology, the study and its results. Febeliec will provide its comments on the consultation but this does not mean that Febeliec agrees with the applied methodology and should in no case be interpreted as such. Amongst others, Febeliec still has a wide range of comments and questions that it considers not (sufficiently) answered or resolved on the bi-annual Adequacy and Flexibility Study, which is the basis for the methodology and model for this study as well as the previous consultations on the scenarios, sensitivities and data for the CRM parameter calculations.</p>
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Elia would like to remind Febeliec that the CRM calibration process and the reference scenario and the methodology to determine the different CRM parameters are described in article 12 of the Royal Decree on the determination of volume and parameters⁷.

Nevertheless, Elia provides some complementary information and clearly indicates in §2.1.6 of the explanatory note⁸ the methodology to be applied in the framework of the

⁷ <http://www.ejustice.just.fgov.be/eli/arrete/2021/04/28/2021041351/justel>

⁸ https://www.elia.be/-/media/project/elia/elia-site/public-consultations/2022/20220506_crm_explanatory_note_dy2027_y-4_auction_en.pdf

parameter calculation for the Y-4 Auction with Delivery Period 2027-28. The methodology applied will take into account the latest European methodologies approved in 2020, as applied in the Adequacy and Flexibility study 2022-32 published in June 2021, in line with article 12, §2 and §3 of the Royal Decree.

Regarding the CRM calibration methodology itself, Elia would also like to remind that it has also been discussed extensively in the CRM Design phase, through the publication of design notes^{9,10}, discussions in task forces¹¹, Royal Decree proposals^{12,13} and different related public consultations^{14,15,16,17,18}.

Regarding the comment on the fact that Elia “only conducts a consultation on the input data, sensitivities and scenarios, and does not conduct a consultation on the methodology itself, as for all other adequacy related studies and analyses”, Elia disagrees with the accusation of Febeliec. For instance, the methodology for the latest Adequacy and Flexibility study was submitted to public consultation and was discussed in details with stakeholders during the associated task force. This methodology is detailed on the webpage of the Adequacy and Flexibility public consultation¹⁹ and in §4.3 of the Adequacy and Flexibility study 2022-32, published in June 2021²⁰. It was exactly the intention of Elia to involve a larger group of stakeholders than those foreseen by the law via the public consultation of the Adequacy and Flexibility public consultation and the interactions during the Task Force meetings. Indeed, the Electricity law and Royal Decree do not include an obligation to consult the market players. Nevertheless, Elia chose to do so, which shows a commitment to take into account the comments received.

⁹ <https://www.elia.be/-/media/project/elia/elia-site/users-group/ug/tf-crm/2020/crm-design-notes--september-2019---all.pdf>

¹⁰ <https://www.elia.be/-/media/project/elia/elia-site/users-group/ug/tf-crm/2020/crm-updated-design-notes---march-2020---all---clean-version.pdf>

¹¹ <https://www.elia.be/fr/users-group/crm-implementation/meetings>

¹² https://www.elia.be/-/media/project/elia/elia-site/users-group/ug/tf-crm/landing-page/20191122_royal-decree-methodology-elia-proposal_fr_nl.pdf

¹³ https://www.elia.be/-/media/project/elia/elia-site/users-group/ug/tf-crm/landing-page/20191220_updated-kb-elia_volumeparameters_frnl_clean.pdf

¹⁴ https://www.elia.be/fr/consultations-publiques/20190913_formal-public-consultation-on-the-crm-design-notes-part-i

¹⁵ <https://www.elia.be/fr/consultations-publiques/20190902-formal-public-consultation-on-the-crm-design-notes-part-ii>

¹⁶ <https://www.creg.be/fr/consultations-publiques/consultation-publique-concernant-le-projet-de-note-relative-aux-parametres>

¹⁷ <https://www.creg.be/fr/consultations-publiques/consultation-publique-concernant-le-projet-de-proposition-relative-aux>

¹⁸ https://economie.fgov.be/fr/themes/energie/securite-dapprovisionnement/mecanisme-de-remuneration-de/contexte-du-mecanisme-de#toc_heading_3

¹⁹ https://www.elia.be/fr/consultations-publiques/20201030_public-consultation-on-the-methodology-the-basis-data-and-scenarios-used

²⁰ <https://www.elia.be/fr/marche-de-electricite-et-reseau/adequation/etudes-adequation>

3.2 Scenario dataset

3.2.1 General remarks

FEBELIEC	<p>On the general scope of this input for the CRM parameter calculation for the Y-4 Auction for Delivery Period 2027-2028, Febeliec was very strongly surprised by the lack of consistency and coherence between certain elements, most notably the (non/at most partial) inclusion of the impact of the Ukrainian war and its massive impact on energy (and related) markets and prices. In some instances, this war and its impact are mentioned and (to a certain extent) taking into account, but for other elements this is not done, in particular for the energy prices and economic growth and the related electricity demand forecasts. While according to Febeliec, Elia has already not always been consistent nor coherent in its choices for inclusion or not of certain elements, a major war on the European continent with massive direct and indirect effects on the European economy and specifically the energy sector with important short, medium and longer term effects should be central to any adequacy study for the period 2027-2028 and as such the approach chosen by Elia concerning the (non/at most partial) treatment of this impact is beyond questionable and most severely erodes the relevance, usefulness and validity of the studies by Elia.</p>
FEBELIEC	<p>On the data and assumptions, and related to the above comment, it is not always clear for Febeliec which data is taken into account, most importantly till which point in time. As major elements for Elia's analysis seem to be based on the Adequacy and Flexibility Study 2022-2032 and the ERAA 2021 analysis, but also the WEO 2021 and updates of the Federal Planning Bureau of June 2021, which were all published in 2021 using data in many cases only till 2020 or at best beginning 2021, Febeliec wonders to which extent the underlying data and thus the resulting analyses are still to be considered relevant in light of the recent evolutions. This comment is even more relevant (and has been made many times in the past) concerning the Energy Pact and NEPC, which have been published even earlier based on data that in the mean time is extremely outdated. While Febeliec understands that it is impossible to include all recent data and information and that at some point a data freeze is necessary, Febeliec is extremely surprised that on a qualitative basis no more analyses are provided nor additional sensitivities and scenarios included to cater to these very relevant elements. Febeliec also very strongly regrets that in the end only one single final scenario will be calculated and insists that it would be wise and prudent to run at least some alternative scenarios, even though there is no legal obligation, in order to provide the necessary relevant input for any governmental decisions.</p>

FEBELIEC	In general, Febeliec already wants to indicate the lack of much actual data provided by Elia. Most spreadsheets provide hardly any data, almost no sources and in fact provide hardly any basis to provide input on. It is impossible to discern whether the values are based on external sources, internal estimates, or a mix of both, making it also nearly impossible to validate the data.
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First of all, regarding Febeliec’s first comment, Elia would like to remind that the dataset, sensitivities and other parameters subject of the public consultation were established after concertation and collaboration meetings organized with the FPS Economy and the CREG.

Secondly, the context of this public consultation was particular, taking into account the major evolutions in the electricity sectors and the geopolitical context. The impact of the war in Ukraine on the Delivery Period 2027-28 was (and still is) hard to assess and no available publications exist, even from renowned institutes, to support the quantification of these scenarios and sensitivities. Elia also asked the competent authorities for quantified data which we did not get and asked stakeholders a set of specific questions in the framework of this public consultation and numerous disclaimers during the task force of the 6th of May. However, except for some specific aspects, Elia did not receive alternative quantified proposals.

Elia would like to mention that it has tried to provide as many updates as possible based on available publications. Elia did a lot of proposals either in the scenario or in the sensitivities in order to provide a relevant dataset for the Y-4 auction with Delivery Year 2027-28. On top of this, Elia proactively asked specific questions to stakeholders in order to receive specific feedback on a number of topics for which inputs would have been greatly appreciated. Therefore, Elia does not understand the comments from Febeliec as there were a lot of possibilities in the framework of this public consultation to come with alternative proposals to improve the scenario and enhance the quality of the CRM calibration and stakeholders’ involvement. In the framework of this public consultation report, Elia tried however to provide many updates and alternative proposals in order to take into account quantitative and qualitative feedback from stakeholders.

Regarding energy prices, economic growth and the related electricity demand forecasts, Elia continuously monitors the available publications for the most up-to-date information in order to answer Febeliec’s raised concerns as best as possible and will integrate its findings in the recommendation to the Minister. Additional information could be found in the appropriate sections of this document.

Regarding Febeliec’s general comments on the input data, as explained during the Working Group Adequacy from the 6th of May²¹, the initial dataset indeed starts from the ERAA 21 and the latest Adequacy and Flexibility study from June 2021. However, almost all parameters from the scenario dataset have been updated according to the most recent information (FF55 package, REPowerEU, current trends, geopolitical context...). Elia agrees with Febeliec that for some parameters the update proposed was more limited due to a lack of information (energy prices, evolution of demand with regard to high prices...). For these parameters, Elia looked at the available information and provides an update in the framework of this public consultation report and recommendation to the Minister.

Elia would also like to remind that the CRM calibration report aims to provide the necessary data in order to establish the different parameters of the CRM Y-4 auction for Delivery Year 2027-28. This objective is clearly different from an Adequacy and Flexibility study which provides different indicators on different time horizons and takes into account different scenarios and sensitivities. The objective of the CRM calibration justifies to take a single reference scenario, as stated in the Royal Decree.

Regarding the sources, Elia will indicate in this public consultation report as well as in the framework of the Working Group Adequacy from the 17th of June²² additional information on the sources and trajectories used to define the values proposed in the scenario dataset.

3.2.2 RES capacities

FEBEG	The figures regarding renewables are optimistic and not in line with the actual evolution of these capacities. In addition the societal acceptance is not considered at all and the impacts of the various and long appeal procedures against these kind of projects are simply ignored
FEBEG	The objectives for the coming years are very ambitious, especially for onshore, photovoltaics and biomass where the distrust created by the changing regulatory environment for the photovoltaics and the NIMBY-effect with the delaying effects of the appeal procedures -should unfortunately not be underestimated. We welcome the adaptation for the offshore wind growth ambitions–i.e. the second offshore zone-, where both the timing of the execution of the project as of the infrastructure projects are indeed not compatible with an effective contribution to the Security of Supply in the 2027-2028 period. In our opinion, the scenario where only the 2261 MW of the first zone are present is a realistic one

²¹ <https://www.elia.be/fr/users-group/adequacy-working-group/20220506-meeting>

²² <https://www.elia.be/fr/users-group/adequacy-working-group/20220617-meeting>

	and should be considered in the base-case.
FEBELIEC	For renewables, as only aggregated numbers are given without any explanation, it is impossible to provide any meaningful information (e.g. applied annual growth rates by Elia are missing as well as the starting points on which to apply such growth rates). It is also very unclear which are the “latest developments” that are taken into account (and which cut-off date for updates was chosen).

Elia takes note of the remarks of Febeg and Febeliec. Elia would first like to remind that Elia asked the authorities to provide some numbers but that none were received.

On Figure 1 and Figure 2, Elia provides additional insights regarding the trajectories used to define the values for onshore wind and solar.

Regarding onshore wind, as we did not get any updated values from national public sources, the values for 2030 were deducted from the MIX scenario of the European Commission impact assessment of Fit For 55²³, assuming that an acceleration of the installation rate of the technology would happen from 2025 (Figure 1). It is therefore assumed that the necessary political decisions will be taken in order to unlock the potential of onshore wind in the future (e.g. Pax Eolenica from Wallonia²⁴) as required by the proposed plans at European level.

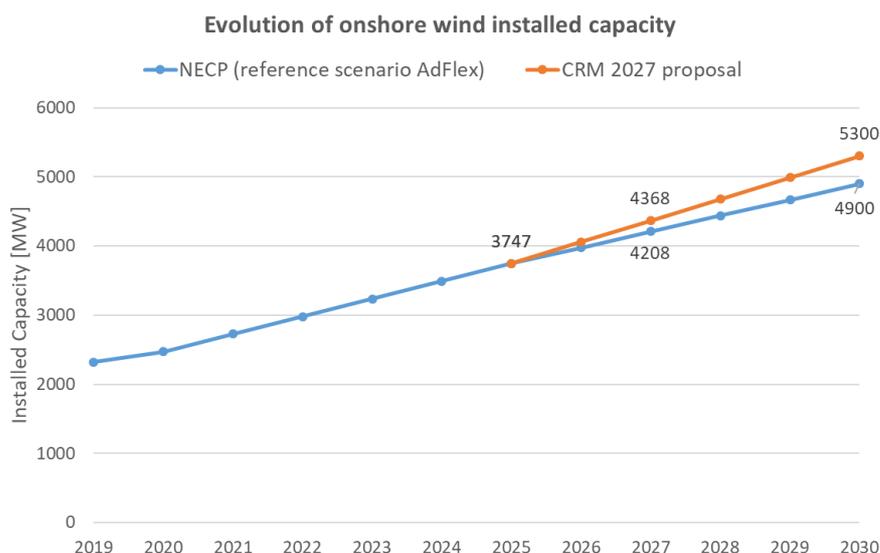


Figure 1: Proposed trajectory for onshore wind

²³ https://energy.ec.europa.eu/excel-files-mix-scenario_en

²⁴ <https://ediwall.wallonie.be/le-developpement-eolien-en-wallonie-2022-numerique-098779>

Regarding solar, the growth rate of the trajectory was increased in the short term compared to the Adequacy and Flexibility study (Elia, 2021), to take into account the massive installation rates currently observed and which are expected to last at least until end 2023. For later years, the latest announcements are assumed to lead to a constant increase of the installed capacity (e.g. obligation for big electricity consumers to install solar panels²⁵, installation of solar panels on new public buildings²⁶). This is illustrated on Figure 2.

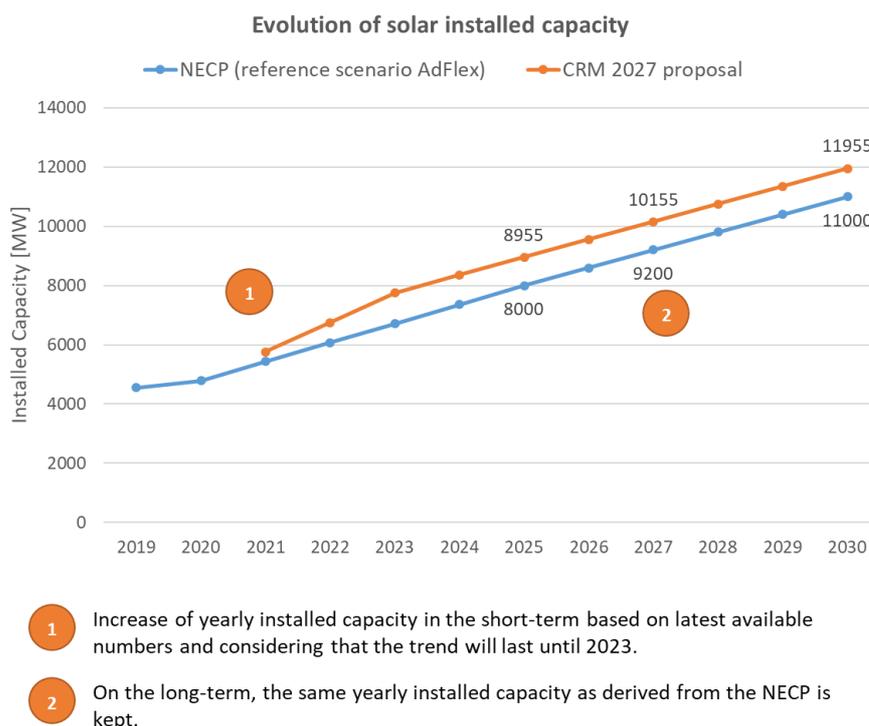


Figure 2: Proposed trajectory for solar

Regarding biomass, Elia takes note of the feedback of Febeg as well as the comments from COGEN in the framework of the Working Group Adequacy from the 6th of May 2022. Based on this feedback, Elia proposes not to consider any new biomass in the scenario dataset compared to the Adequacy & Flexibility study published by Elia in 2021. Therefore, the small-scale biomass installed capacity is decreased from the 624 MW initially proposed, as derived from the MIX scenario from the FitFor55 EC impact assessment, to 504 MW.

²⁵ https://www.hln.be/binnenland/vlaanderen-verplicht-zonnepanelen-voor-2-500-grootverbruikers~a0c3615c/?referrer=https%3A%2F%2Fwww.google.com%2F&cb=f11b293fb7c5f8d0e4a792264cbfb4f4&auth_rd=1

²⁶ <https://www.vrt.be/vrtnws/nl/2022/05/17/verplichte-zonnepanelen-op-nieuwe-openbare-en-bedrijfsgebouwen/>

3.2.3 Thermal generation capacities

FEBEG	<p>While we have no particular comments on the hypothesis put forward by ELIA regarding the thermal generation capacities, we would like to underline that the recent and upcoming review of the CO₂ emission threshold to participate in the CRM puts at risk a series of existing thermal capacities which will be at higher risk of closing if they cannot recuperate their missing money (as they will not be able to participate to the CRM anymore).</p> <p>Changes in relation to the CRM functioning rules and the CRM contract can impact the contractual balance (and hence cause additional costs/risks/obligations for the capacity provider) and have an (financial) impact on the capacity provider to the detriment of the investment climate, especially in the case where the Capacity Provider expected to obtain several yearly contracts in order to recover its initial investment.</p>
FEBELIEC	<p>Febeliec has no comments on the specific units presented, but reiterates a longstanding comment on the lack of transparency on the announced (temporary) closure of power plants in Belgium. Moreover, Febeliec also notices that Elia does not seem to consider any additional units in Belgium in the period till 2028 beyond two CCGTs contracted already in CRM auctions and wonders whether this is a realistic assumption.</p>
Engie	<p>Saint-Ghislain: The value of 378 MW published on the NordPool Platform should be used in the reference scenario.</p>

Regarding the comments of Febeg on the CO₂ emission threshold, Elia notes that it might put at risk a series of existing thermal capacities which will be at higher risk of closing if they cannot recuperate their missing money. Elia proposed a sensitivity to reflect this risk (see §3.3.3).

Regarding the associated regulatory framework, Elia follows the proposal from the DG Energy, as asked by the Cabinet of the Minister of Energy and invites stakeholders to react to the public consultation from the DG Energy of the FPS Economie on a trajectory proposal to reduce the CO₂ emission limits progressively starting in 2023 in the framework of the Belgian CRM²⁷.

Regarding Febeliec's first comment, Elia can only refer to the legal procedure related to the closure announcement of power plants in Belgium (article 4bis of the Electricity Law). Any question or request on this matter should be addressed to the competent authorities.

²⁷ <https://economie.fgov.be/sites/default/files/Files/Energy/Consultation-proposition-trajectoire-de-reduction-limites-CO2-des-2023.pdf>

Regarding Febeliec’s second comment, Elia took into account all the available information regarding the units in the market for the delivery period 2027-28. This information includes the 2 new CCGT but also the lifetime extension of 2 nuclear units (Doel 4 and Tihange 3). If the reference scenario selected by the Minister is not compliant with the applicable reliability standard (LOLE = 3h for now), Elia adds new capacities from preselected capacity types, which are also submitted to public consultation. It might therefore happen that additional units are integrated in the reference scenario. Regarding this last point, Elia commits to explicitly mention in the CRM calibration report the capacity mix that is added (if required to meet the reliability standard) to the reference scenario.

Note that the installed capacity of St Ghislain has been updated to 378 MW, in order to be compliant with the value published on the NordPool Platform, in line with Engie’s feedback.

3.2.4 Profiled non-renewable capacities

FEBEG	Could ELIA explain what type of projects are behind this increase of capacity? Only official projects which are still on track should be considered in the reference scenario.
FEBELIEC	Febeliec regrets that it is not completely clear which power plants are included here, in particular diesel generators, emergency generators (all considered market response?) and process generators. Febeliec has made this comment on previous versions of this consultation and regrets that yet again this comment has not been treated and no additional information is provided. Because of a lack of breakdown (only aggregated data is shown), it is impossible to identify which periods these categories are available/producing and to have a view on their contribution to system adequacy.

Regarding the increase of capacity for profiled non-renewable capacities, the forecast takes into account both existing installed capacity and tangible planned future projects from Elia’s internal database (fed by DSO information). Only these capacities are considered for the proposed forecast. This analysis leads to an increase of the installed capacity by 72 MW.

In order to answer Febeliec’s concerns, Elia refers to the Excel file submitted to public consultation. The sheet ‘1.1 Summary’ provides a clear overview of the split between the different categories and the associated generation capacity.

Regarding gas-CHP, biomass and waste, a part of the units are individually modelled in the simulation and presented in detail on the sheet ‘1.2 Ind. mod. thermal gen.’.. For the other part a thermal generation profile based on historical data is used and is presented on the sheet ‘1.4 Renewable and profiled’. This sheet mentions that 1451 MW of profiled gas CHP without daily schedule is taken into account.

For modelling purposes there is a need to distinguish the ‘large’ units which are individually modelled (with an associated forced outage) and the ‘smaller’ units which are taken into account with an historical average generation profile as their generation output is not only driven by the electricity prices.

In order to perform this split, Elia maintains a database of centralized and decentralized generation units, which is updated on a monthly basis following exchanges with DSOs and grid users directly connected to the Elia grid. The database includes both units with and without a CIPU contract.

Regarding the units without daily schedule:

- The waste category includes all incineration stations in Belgium;
- The biomass category includes all technologies for which the fuel type is referred to as “bio”, including IC engine and CHP;
- The CHP category includes the units functioning with gas but also steam.

The profiled generation time series are constructed on the basis of available historical data. Further analyses can be found in the appendix G.2 of the Adequacy and Flexibility study 2022-32. In the CRM calibration report for Y-4 auction looking at Delivery Period 2026-27, the contribution to adequacy of this profiled category without daily schedule was equal to 65%²⁸.

Regarding Febeliec’s comment, note that diesel generators and emergency generators, except the ones referring to a fuel type categorized as “bio”, are not explicitly taken into account in the profiled thermal generation but are included in the DSM shedding and shifting categories.

In the framework of the CRM auction, these capacities are eligible as long as they are compliant with the eligible criteria defined in the Functioning rules. They can participate in the auction either by choosing the appropriate SLA category or by considering the derating factor “Category V : Thermal technologies without daily schedule”.

²⁸ https://www.elia.be/-/media/project/elia/elia-site/users-group/ug/wg-adequacy/2021/20211223_dy2026---y-4-auction---calibration-report_v3_without_annex_psp_with_erratum.pdf

3.2.5 Forced outage rates

FEBELIEC	Febeliec regrets that no methodology for the calculation has been provided, making it difficult to assess the information (e.g. are forced outages uniformly spread over the year or are there periods with higher/lower forced outage rates, e.g. due to preventive maintenance before winter period with on average higher prices). Febeliec also wants to reiterate a comment it has voiced in the past on the calculation of outage rates taking into account only the remaining elements in the system (e.g. not taking into account the performance with respect to outages of units in the past that are no longer maintained in the system, a.o. related to CCGTs, OCGTs and nuclear plants), which should be modified to filter out specific effects related to plants or technologies that are no longer no longer applicable.
FEBEG	FEBEG is surprised to see such an important variation in the forced outage rate. Could ELIA provide, just for information, the yearly FO from the dataset?
FEBELIEC	On nuclear outages, Febeliec wants to refer to the above comment, and insists that while it has no specific preference for any of the proposed derating factors, it should be clear that for the two most recent nuclear reactors without micro-fissures only those elements are taken into account that are relevant for these reactors and not elements relative to specific situations or other technological configurations (e.g. Doel 1 and 2), while also a part of the historic investment program (e.g. non-availability because of upgrades of bunkers, which should then not occur in the future anymore) is taken into account. In any case, the outage rates should not be cumulated and pancaked as this would lead to a too conservative approach according to Febeliec, which would thus overestimate any potential adequacy concern

Regarding Febeliec's first comment, the explanatory notes of the public consultation specifies the applied methodology applied for the calculation of the forced outage rates. The methodology takes into account the forced outages and availability periods of the units on a rolling period of 10-years. This rolling periods explains the sharp drop in forced outage rates, as a year with very high forced outage rates was dropped (2011) and a year with very low forced outage rates was added to the time-frame (2021). In the CRM framework, the assumption is taken that forced outages are not influenced by electricity prices and that they are equal over the whole year, while planned outages are assumed not to be executed during the winter.

Elia agrees that further analysis of the spread and evolution of forced outages could be valuable. As such, Elia proposes to perform an additional profound analysis of the forced outages in the context of the next Adequacy and Flexibility study with an external consultant in order to answer remarks from both Febeg and Febeliec.

Regarding Febeliec’s second comment on nuclear assets, Elia provided a full note in the framework of the explanatory note in order to take into account all the parameters that might affect the Belgian nuclear availability and its associated derating factor. This note included several categories: ‘technical’ forced outage, ‘long-lasting’ forced outage and planned outage during winter periods, that might all be integrated in a derating factor definition, according to Elia. The different outage rates proposed are independent from each other, meaning that e.g. the total unavailability of Belgian nuclear assets during winter periods is equal to the sum of the ‘technical’ forced outages, ‘long-lasting’ forced outages and planned outages during winter periods. Regarding this parameter, Elia does not propose anything but provided the authorities all the necessary information to select the value to be used in the reference scenario.

In particular, Elia included in its proposal the ‘long-lasting’ forced outage rate to represent potential future issues linked to exceptional events that can appear on nuclear power plants. The purpose of this rate is to estimate the impact of these exceptional events on a sufficient broad number of nuclear power plants. That is why the study is performed on all nuclear units and not only on Doel 4 and Tihange 3.

3.2.6 Batteries

FEBEG	The hypotheses regarding batteries are not based on any factual market evolution but are derived from arbitrary assumptions.
FEBEG	<p>FEBEG notes that the figures in this consultation are much higher than those used for the delivery year 2026-2027. We considered these figures much too optimistic, we still believe that the assumptions used by ELIA are overestimated both in terms of small and large-scale storage and V2G.</p> <p>Regarding the potential of small & large-scale storage: we believe it is unlikely that this capacity would enter the market, outside of the CRM, with uncertain future market conditions and regulatory framework, without additional visibility on their business cases in the coming years. Furthermore, we assume that the market depth does not permit for the figure proposed in the study (cf. ancillary markets’ potential). Regarding the uptake of small scale batteries, it is unclear to which extent such increase will materialize even with the subsidies in Flanders.</p> <p>Regarding the potential of V2G: the volume not only highly depends on the number of electric vehicles in Belgium but also on the roll-out of the available technology to make them active market participants in the electricity market (smart meters roll-out but also compatibility of cars to</p>

	<p>being smartly charged).</p> <p>FEBEG has strong doubts that the deployment of smart/bi-directional charges will be generally available by 2027 as it is unlikely that the chargers that will be deployed with the increasing amount of electrical cars will be bi-directional or will be replaced by bi-directional chargers by 2027 (note that V2G charging infrastructure is also more expensive than normal “smart” charging infrastructure). Next to the availability/compatibility issue, it should be noted that the (financial) added value for the consumer remains very marginal and will probably not be impacting enough to drive a behavioral change.</p> <p>Considering all the above uncertainties and hurdles, we think the figure of 242MW of V2G by 2027 is overly optimistic.</p>
FEBELIEC	<p>For storage no full methodology is available describing volume determination for e.g. small scale storage, making it impossible to provide any meaningful comments to the proposed data. The same applies for the lack of reasoning explaining the proposed growth paths.</p>

Elia agrees with Febeg in its comment that the evolution of the installed capacity of batteries is highly dependent on the correct regulatory and technological framework. In this dataset, it is assumed that a CRM is in place and can secure a part of the batteries revenues.

Regarding the comments made on the capacity of large scale batteries. Elia proposes to use the same capacities as put forward in the Adequacy and Flexibility study of 2021, as until now no better data on this is available. The current market conditions with high variability in power prices make the business case for batteries more attractive, which additionally supports the assumptions made. Observations on registered projects also support the proposed trajectory.

For small scale batteries, Elia updated its targets based on observed recent higher installation rates²⁹. Elia assumes that the higher installation rates will continue for the next few years until the end of the subsidies scheme foreseen in 2024³⁰ and drop afterwards. The high electricity prices and subsidies for small scale batteries make them more profitable to install, supporting the upward trajectory update.

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https://www.nieuwsblad.be/cnt/dmf20220208_92986655#:~:text=Vlaming%20installeert%20maasaal%20thuisbatterij%2C%20maar,er%20wel%20mee%20bezig%20zijn%E2%80%9D&text=In%202021%20zijn%20er%20bijna,er%20dat%20nog%20maar%20152.

³⁰ <https://www.vlaanderen.be/premie-voor-de-aankoop-of-leasing-van-een-thuisbatterij-voor-zelf-opgewekte-energie>

The methodology for volume determination is explained in the Adequacy and Flexibility study.

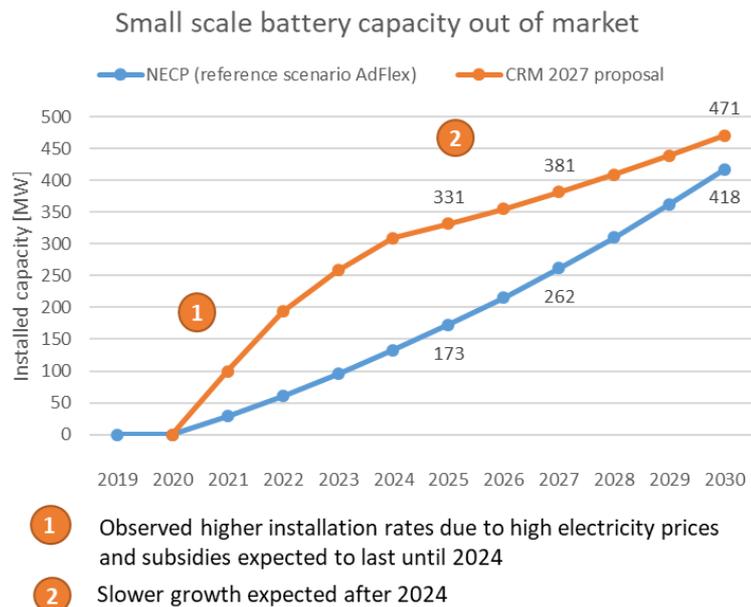


Figure 3: Proposed trajectory for small scale batteries

Regarding V2G, Elia agrees with Febeg that the proposed installed capacity (242 MW) might be too high given the current evolution of the technology and market and regulatory environments. Elia therefore proposes to consider the value for 2026 from the Adequacy and Flexibility study 2021, considering a delay on the implementation of the technology. The updated value would then be equal to 129 MW. Elia also proposes to further investigate the future of this technology in the framework of the next Adequacy & Flexibility study in order to communicate the results to stakeholders in the appropriate public consultation.

3.2.7 Consumption

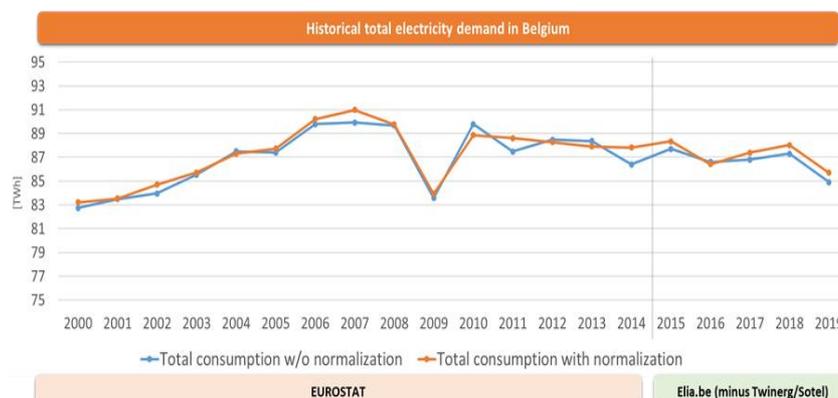
FEBEG	<p>ELIA does not provide any information regarding the total electricity consumption yet as it will be updated with the latest Climact calculations based on Plan Bureau economic estimates to be published in June 2022. We invite ELIA to transparently inform and to ask feedback from the stakeholders once these figures are known.</p> <p>While on one hand some might put forward that the electricity consumption could be reduced due to the possible high electricity prices and collateral effects of the war in Ukraine, the fact that the momentum is being used to accelerate the energy transition (eg RePowerEU) with an increased rate for further electrification will without any doubt increase the total electricity consumption and peak demand more than currently anticipated. FEBEG therefore strongly recommends ELIA to consider these evolutions in the determination of the demand (and peak demand).</p>
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FEBELIEC

o Febeliec is surprised to see that only one absolute value is provided, without any curve before and after 2027, making it very difficult to provide comments by lack of data.

o On demand, Febeliec most strongly opposes the number provided by Elia as it is based on the projections of the Federal Planning Bureau of June 2021, predating the price increases which started after the summer of 2021 as well as the massive impact of the Ukrainian war on both the starting point (total demand for 2022 will be lower than 2021) as well as the growth path, which already has been impacted by the ongoing war and on which the further impact could also be very significant in a negative way if this war and its impact on energy prices will be exerting its impact for a longer period, potentially up to years.

o Febeliec in this context wants to refer again to data that was provided by Elia on Belgian overall electricity demand in the period 2000-2019 (both non-normalised and normalised data), which was provided by Elia in 2020.



The historical data sources are indicated on the chart.
 For the normalization, Elia applies a simple linear method based on the equivalent HDD, 'jours ouvrés' and amount of days in the year (correction for leap years).
 The normalization methodology is currently under review at Elia and could lead to slight differences in the historical normalization values. It is also important to note that the data above were never normalized before 2010 and that the same impact is used for the whole horizon.
 In past studies other sources have been also used for historical data (ENTSOE.net for instance) where the same definition of consumption was used across all countries. Since the introduction of a common tool at ENTSO-E (since MAF2019), the consumption source for future studies will be the one published on the Elia.be website which represents an estimation of the 'total electricity consumption' of Belgium.

The value provided for 2020 (with a very significant impact from the sanitary crisis and the lockdowns) is at 81,0 TWh (82,1 TWh normalised) demand more than substantially under the value for 2019. Even 2021, at 84,2 TWh (84,4 TWh normalised) is below the total demand in 2019. As mentioned above, the current economic turmoil due to the Ukrainian war will presumably also have a more than significant negative impact on

	<p>Belgian total demand for 2022, yet Elia forecasts a total demand in 2027-2028 of 94,6 TWh or more than 12% increase compared to the 2021 value, based on assumptions pre-dating the Ukrainian war. Febeliec finds the approach by Elia non-representative of reality, resulting in a probably severe overestimate of total Belgian demand and thus an overestimate of adequacy needs, which will then result in potentially unnecessary higher costs for consumers (if needs are unnecessarily and artificially increased) who are currently already facing the very negative impact of higher energy bills.</p> <p>o On peak demand, Febeliec also most strongly opposes the number provided by Elia as it is based on the same outdated projections as above, while Elia also mentions that it does not take into account additional flexibility, e.g. from an increased share of V1G, higher level of out-of-market batters which will level out the peak load. Peak load being in many ways an even more important metric for system adequacy, Febeliec does not understand at all why Elia artificially wants to increase this value, by omitting potentially more than substantial dampening elements (on top of using much outdated and irrelevant data for its calculations).</p>
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As mentioned in the explanatory notes of the public consultation, Elia proposes to take into account the most up-to-date forecast of electricity consumption based on the latest economic figures to be published by the Federal Planning Bureau in June 2022. The projected electricity consumption will be updated in line with the updated economic projections. The electricity demand will be determined using the Total Demand forecasting tool 'BECalc tool' developed in collaboration with Climact for the FPS Environment and should be available in the course of August.

In order to answer Febeliec's remark, please note that Elia only mentioned a value in order to provide stakeholders with an order of magnitude of the impact of the assumptions considered. This consumption estimation was made on outdated economic data published by the Federal Planning Bureau and will be updated with the latest available economic projections.

In addition, the updated consumption of Belgium will include a central scenario as presented in the public consultation as well as a sensitivity to evaluate the impact of high prices, as proposed in the sensitivities (see §3.3.4).

Regarding Febeg's comment to take into account increased electrification due to recent announced plans such as RePowerEU, this has been taken into account through expected increases in electric vehicles (EV) and heat pumps (HP) deployment and higher electrification rates in industry. The associated assumptions for EV and HP have been presented in the framework of the public consultation and will be considered in the updated numbers for yearly consumption.

Since the expected annual electricity consumption for the period until 2027 will be updated, Elia proposes to provide the yearly numbers once the economic forecast has been published and the forecast is updated.

The same disclaimer on demand data applies for peak demand for which an estimate was provided based on available information. This value will be updated with the updated forecast from Climact tool based on the latest economic figures to be published by the Federal Planning Bureau in June 2022.

3.2.8 Demand side response

FEBEG	The market response capacity are very high and overly optimistic when comparing with the potential of DSR in other countries.
FEBEG	<p>Shedding capacity: While FEBEG is convinced about that the potential of Demand Side Response identified by ELIA will effectively contribute to the SoS and will play a real big role the market in the coming years. We estimate that the strong increase observed in the last few years may not necessarily continue to materialize in the following decade –pending the full roll-out of the smart meters especially in Wallonia and Brussels- as the additional DSM potential for certain types of grid users will be limited. FEBEG doubts that the DSM potential expected by ELIA would become effective outside of the CRM at the 2027 horizon: very high ambitions regarding DSM are expressed in the framework of the CRM given the significant volume that is left open for the T-1 auction.</p> <p>Shifting capacity: FEBEG considers that the figures presented are also very ambitious.</p>
FEBELIEC	<ul style="list-style-type: none"> o Febeliec continues as in previous years to voice important questions and comments towards the values used for demand side response, as Elia until 2023 uses a detailed analysis with a 7% growth rate, resulting from extensive discussions, yet for the future merely uses an interpolation to the in the mean time very much outdated values from the 2019 Energy Pact (but upscaled for higher electrification assumptions). As Febeliec has made comments on Elia’s methodological approach for this topic for many years now and requested a detailed analysis and quantitative modelling, it most strongly regrets that Elia still has not developed a quantitative approach and continues to use outdated data with some quantitative tricks to overcome the lack of modifications of the applied targets based on the (quantitatively non-substantiated) Energy Pact. o On demand side response, Febeliec most strongly urges Elia to take into account not only voluntary direct and indirect demand response based on peak prices but also voluntary demand side response to longer periods with high energy prices (below peak price levels but for extended periods) as can be observed at this moment. The impact on overall

	<p>demand of such higher (but not peak) prices on overall demand are becoming visible due to the many hours of prices (significantly) above 150 €/MWh (which Elia applied as a proxy for high prices for its analysis with E-Cube) and should according to Febeliec in any case be included in any serious adequacy analysis. Febeliec even hopes that the current high prices will not lead to demand destruction instead of (temporary) demand response if they persist for a significant longer period.</p> <p>o Febeliec continues to wonder, after already having made this comment in several previous consultations, how emergency generators (see also above) are treated, as it remains unclear if and how such generators are taken into account, and if so, for which volumes. Febeliec wants to stress that in Belgium literally 100s of MWs of emergency generators are installed, with its own members already having massive volumes of emergency generators (in at least one case even 100s of MWs for certain grid users), not even taking into account the 100s of MWs installed at a.o. hospitals, where a CREG study indicated an installed capacity of at least 200 MW.</p>
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Elia takes note of Febeg’s comment regarding DSM shedding and shifting targets. However, the trajectory is based on the Adequacy and Flexibility study which is derived from the Energy Pact values for 2030 as a basis. Elia believes that the additional electrification coming from the REPowerEU packages amongst others and taking into account additional electric vehicles, heat pumps... will unlock additional potential for DSM. Since no updated quantified ambitions regarding DSM were received from or published by the authorities, Elia believes this is the best possible approach.

Elia would also like to point out that the volume of DSM is independent from the methodology to calculate the volume to be reserved in the Y-1 auction.

Elia also takes note of Febeliec’s comment regarding Elia’s methodology. Elia will perform a specific study by an external consultant in the framework of the next Adequacy & Flexibility study in order to improve the assumptions regarding DSM.

Regarding Febeliec’s second comment, Elia refers to its sensitivity proposal regarding the impact of high prices on the demand, which is included in Elia’s recommendation as well.

Finally, note that diesel generators and emergency generators, except the ones referring to a fuel type categorized as “bio”, are not explicitly taken into account in the profiled thermal generation but are included in the market response shedding and shifting categories. In the framework of the CRM auction, these capacities are eligible as long as they are compliant with the eligibility criteria defined in the Functioning rules and can participate in the auction either by taking into account the appropriate SLA category or by considering the derating factor “Category V : Thermal technologies without daily schedule”.

3.2.9 Economic parameters

FEBEG	Considering the announced European ambition to reduce its significantly (if not to suppress) the dependence of Europe to Russian’s gas and oil it might be useful to base the determination of fuel prices on those of LNG.
FEBELIEC	Febeliec refers to its previous comments on outdated data (WEO 2021 predates the Ukrainian war) and hopes Elia will at least conduct some meaningful sensitivity analyses on these parameters, as they will have an enormous impact on the outcome. Febeliec would like to see how Elia justifies its proposed price levels for oil, gas and coal for 2027-2028, as Febeliec has many questions related to the proposed calculation approach in the explanatory note, including a.o. the applied inflation rate forecasts, while more generally having a lot of questions about the proposed methodology as it is not sure that inflation is the driver for high energy prices but rather the result and as thus in the current situation not a good precursor for determining energy prices.

The fuel prices proposed by Elia in the public consultation were based on forward prices and the WEO 2021 prices for 2030. Given the latest geopolitical context and the long-term ambition of the EU to be less reliant on Russian resources (RePowerEU) it is fair to assume that the WEO prices are not up to date anymore since these price for 2030 were assessed before the war in Ukraine. However, due to the lack of available forecasts on the long-term, Elia proposed those values as a potential future. In addition, it is unclear how the prices will evolve in the coming 5 to 10 years and how the current situation will impact those.

In order to avoid discussions on the best methodology to be used, an alternative proposal could be to use price trajectories from a recent European Commission document on fuel price trajectories between 2020 and 2050 for gas, oil and coal³¹ (see Figure 3).

“Oil and coal prices are based on historical data for 2020-2021, combined with estimates of prices in 2022 and complemented by a linear interpolation to the long-term trajectory assumed in the EU Reference Scenario 2020 for the following years. The same approach is followed for gas prices except that these are expected to remain higher than in the Fitfor-55-scenario in the long run.”³²

³¹ <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=SWD:2022:230:FIN&from=EN>

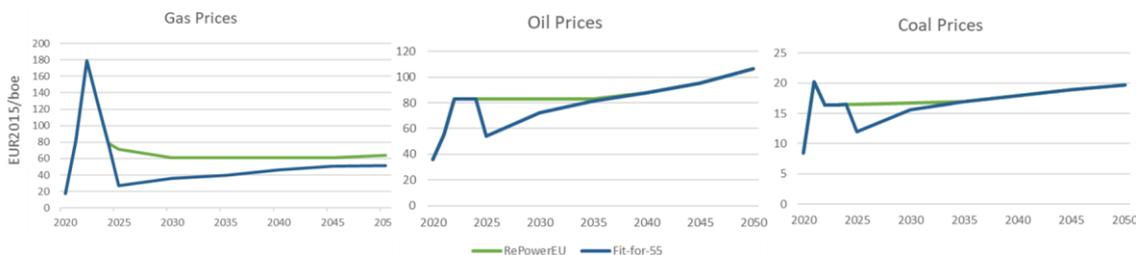


Figure 3: Price trajectories from European Commission document on price trajectories between 2020 and 2050 for gas, oil and coal³²

The methodology used by the European Commission is in line with the proposed approach of Elia in the public consultation but the price levels themselves differ. Figure 4 presents the difference between the base scenario and 2 sensitivities proposed by Elia and the value set in the EC document.

Regarding CO₂ price, Elia proposes to keep the value proposed in the public consultation.

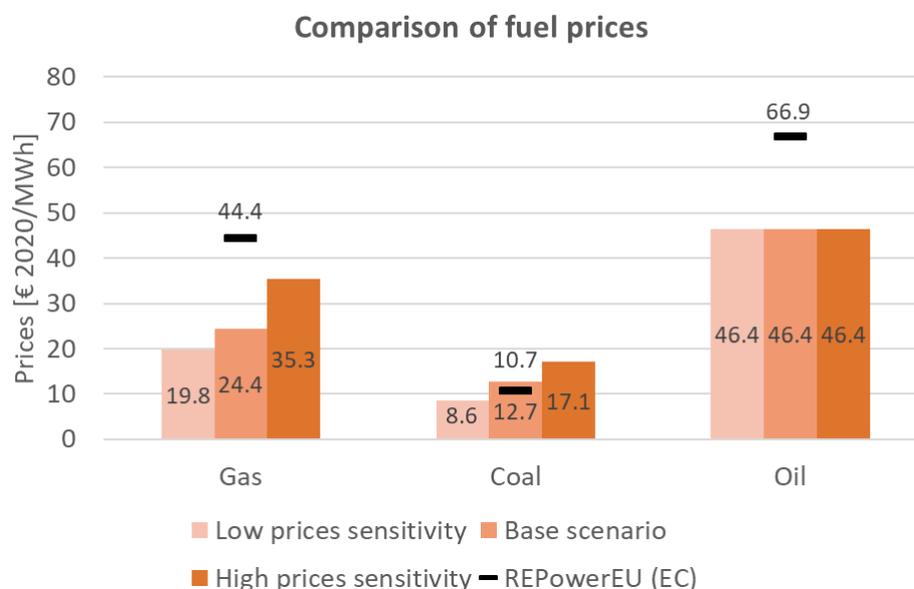


Figure 4: Economic parameters

The applied inflation rates are only used to convert values with a different base year to €2020. The inflation rate is only used to make prices comparable and not to estimate the actual prices. The future inflation rates can be updated once the Federal Planning Bureau publishes its new economic estimates.

³² <https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=SWD:2022:230:FIN&from=EN>

3.2.10 Flow based domain

FEBEG	FEBEG considers that there remain uncertainties on whether the ambition of minRAM 70% will really be achieved by 2027. For instance, we observe that derogations are still claimed by some countries, while for others action plans are put in place to reach the minRAM (e.g.: Germany). FEBEG considers that the risk of non-achievement of this rule should be included in the reference scenario (see comment below on the sensitivity).
FEBELIEC	<ul style="list-style-type: none"> o Febeliec agrees that for the minimum minRAM 70% is chosen (although Febeliec insists that this value is a legal minimum and TSOs should strive to do better as consumers pay for 100% of the (cross-border) infrastructure). Febeliec wonders why in the table Belgium comes with an asterisk, as no explanation is provided (the same applies to PSTs with double asterisks). Febeliec also opposes any value below 70% as his 70% is a strict legal requirement already before the period 2027-2028. o On cross-border capacities, Febeliec does not see any information on which future grid (based also on investments) is taken into account, which is a.o. very relevant in light of many recent announcements (e.g. on hybrid offshore grids) and which cut-off point in time is used to include such announcements.

Regarding the flow-based domain, Elia takes note of the feedback from both Febeg and Febeliec on the ambition of minRAM 70% for Delivery Period 2027-28.

Regarding Febeg's comment on the uncertainty of reaching a minRAM of 70%, from 31/12/2025 onwards, the 70% minRAM requirement has to be applied rigorously to all CNECs. It is therefore considered that for the 2027-2028 delivery period, this requirement should be met. There is indeed a risk that this requirement is not met but Elia considers this risk low due to the delivery period being 2 years after the start of the legal requirement. If the requirement is not met by some countries, it is assumed that the differences between the actual and required minRAM will not be very significant.

Concerning the asterisk, this was a mistake and will be corrected.

Concerning the PSTs, the explanation is the following: the set point will be determined based on the nodal flow estimation and base case simulation in order to maximize the size of the Flow-Based domain in the expected market direction. They are optimized in order to maximize the exchanges and the welfare. Today, PST are not used in the capacity allocation nor are there concrete plans to do so in the coming years.

Regarding Febeliec's comment on the future grid considered, Elia takes the reference grid from ERAA 21, following the methodology described in the Royal Decree, and on top of it applies the flow-based domains as presented in the public consultation.

The full information on the net transfer capacities applied in the ERAA21 can be found on ENTSO-E website³³. More specifically, the ‘hybrid offshore grids’ that are planned (such as Triton Link) are not to be considered for 2027-28 as the commissioning date is expected after the period relevant for this study.

3.2.11 Balancing capacity

FEBELIEC	<ul style="list-style-type: none"> o Febeliec regrets that Elia takes every year higher volumes of balancing capacity to be reserved, while at the same time watering down certain balancing obligations for BRPs (e.g. Day Ahead balancing obligation). If Elia considers needs for balancing capacity to rise over time (not even yet taking into account the possible impact of the second wave of offshore wind), it should rather strengthen balancing obligations, in order to ensure that not evermore capacity needs to be contracted and paid for by consumers. o Febeliec has questions on the inclusion of the impact of cross-border balancing capacity, as by 2027-2028 all European balancing platforms should be functional and thus should impact the balancing capacity reservation needs, while at the same time also inter-TSO capacity must be taken into account. Moreover, Febeliec also wants to point to studies conducted by Elia which could result in less or no reservation of balancing capacity, while this impact is not at all taken into account in this report. o Febeliec does not understand why Elia makes a distinction between the volumes for balancing capacity from demand response and other sources of flexibility, as it is the overall capacity need which is the parameter that should be taken into account, without a split between technologies. o Febeliec is also surprised to see that Elia does seem to take into account the net revenues from the provision of balancing services as a revenue stream. Especially in case of scarcity situations, it can be expected that these revenues would increase (if adequacy concerns would start to appear, market parties could expect to see an increase in their revenues from balancing services and alternatively, if no scarcity situations occur, this revenue stream would not occur, but would also indicate ample capacity in the market and thus no need for a CRM).
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³³ <https://eepublicdownloads.azureedge.net/clean-documents/sdc-documents/ERAA/Net%20Transfer%20Capacities.7z>

For the amount of balancing capacity taken into account, Elia relies on its best estimates to fulfill the legal requirements on the need to dispose of sufficient reserve capacity. The effect of the relaxation of the DA balance obligation on the system imbalance could be negative in case of massive wrong bets by the players, which Elia considers very unlikely thanks to the financial incentive that represent the Imbalance tariffs. Nevertheless, Elia analyzed and simulated a worst case scenario concluding that the impact of the relaxation of the DA balance obligation on the balancing capacity needs would be negligible. This scenario was consistent with the scenarios carried out by Elia in the framework of the “MOGII System Integration Study.

Concerning the modelling in Antares, Elia reminds that full FRR needs need to be deducted from the assets modelled in Antares. Even if Elia is able to count on reserve sharing or non-contracted balancing energy bids to reduce its balancing capacity to be procured, this capacity still needs to be considered ‘firm’, i.e. guaranteed availability.

Regarding the distinction between the volumes for balancing capacity from demand response and other sources of flexibility, the split proposed by Elia is performed for modelling reasons, as the reserved capacity needs to be allocated to specific units (and therefore technologies) which are modelled in the economic dispatch simulations. This methodology is in line with the one performed in the ERAA 21³⁴ (see §3.1.6).

Elia would like to point out that there is a difference between net revenues and actual revenue streams. It is very well possible that market parties make money from the provision of balancing services. However, Elia only considers the additional revenue on top of the market revenues for the calculation of the IPC since the market revenues are fully considered in the missing money calculation. Moreover, Elia would like to stress that balancing services, and the revenues that come from them, serve vastly different purposes in terms of adequacy compared to the CRM. Balancing services aim to provide relatively small volumes to match supply and demand, whereas the CRM serves to close a gap of several GW. A lack of revenues from balancing services as such do not necessarily indicate that a CRM is not necessary, and vice versa.

3.2.12 Other countries data

FEBELIEC	Febeliec takes note that Elia proposes to apply linear interpolation for the data for the period 2027-2028 based on ERAA 2021 but wonders whether this is the best approach. Moreover, Elia proposes some updates on ERAA 2021 for Germany, France, the Netherlands and the UK (where it is unclear which were the initial values and what is the reasoning behind the updates proposed by Elia, nor the coherence between the different choices that are made), but none for other
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³⁴ https://eepublicdownloads.azureedge.net/clean-documents/sdc-documents/ERAA/ERAA_2021_Annex_3_Methodology.pdf

	countries (e.g. Poland on a delay of the coal phase-out) which could have a significant impact on the energy mix and cross-border flows in Europe. Febeliec also refers to its comments on the impact of the Ukrainian war, where it is unclear to which extent announcements made after the start of this war are taken into account and to which extent. Febeliec thus reiterates its fundamental question on the consistency and coherence of the choices made by Elia.
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In order to perform the updates for other countries, Elia took into account the ERAA '21 dataset combined with the latest announcement from each neighbouring country and the publications from the European Commission (Fit For 55 package, REPowerEU). All sources were summarized in the explanatory note and illustrated in the slides presented to the Working Group Adequacy of the 6th of May 2022. The purpose of this update was to align the model with the most recent information as stated in article 3, §3 of the Royal Decree.

However, as discussed during the WG Adequacy, Elia agrees that this update should be extended to other relevant and impacting countries. Therefore, Elia proposes to consider the values as presented in Table 1 in addition to the ones presented in the explanatory note.

Countries	Proposed Updates for 2027-28				
	Lignite/Coal [MW]	Wind Onshore [MW]	Wind Offshore [MW]	Solar [MW]	Demand [TWh/y]
IT	0	20,700	1,300	56,200	340
PL	21,600	10,500	3,600	8,800	182
ES	0	49,500	0	50,700	271

Table 1: Updates for neighboring countries based on latest available information

For demand data, an interpolation was performed between the ERAA21 values for 2025³⁵ and the scenarios for 2030 from the TYNDP 2022³⁶, taking into account a higher value to reflect the additional electrification foreseen in the Fit For 55 and REPowerEU packages.

³⁵ <https://eepublicdownloads.azureedge.net/clean-documents/sdc-documents/ERAA/PEMMDB%20National%20Estimates.xlsx>

³⁶ <https://2022.entsos-tyndp-scenarios.eu/visualisation-platform/#electricity-data>

Regarding coal and lignite, it is assumed that IT and ES will phase-out their coal generation by 2027. For Poland, it is assumed that the installed capacity foreseen in ERAA21 for 2025 will be maintained in-the-market at least until 2027³⁷.

Regarding solar and wind onshore, the values proposed are based on an interpolation between the ERAA21 values for 2025 and the scenarios for 2030 from the TYNDP 2022. For solar in Poland around 14.5GW of solar PV installations are expected by the end of 2030³⁸. The interpolation was therefore made taking into account this value.

Regarding wind offshore in Italy, wind farms of Salento³⁹ are considered to be available for the Delivery Period 2027-28. No offshore capacity is foreseen in Spain, in line with the value foreseen in ERAA21 for 2030. The value for Poland is obtained by interpolation between the ERAA21 values for 2025 and the scenarios for 2030 from the TYNDP 2022. This value is confirmed by looking at the scenarios from the Polish TSO⁴⁰.

3.3 Reactions on proposed sensitivities

In the framework of the public consultation, Elia submitted a set of sensitivities to stakeholders, including the source of the data and assumptions used. The purpose is to potentially include in the reference scenario one or multiple sensitivities that can have an impact on the Belgian security of supply and are located inside or outside the Belgian market zone, as described in article 3, §4 of the Royal Decree. These sensitivities can be integrated in the reference scenario (i.e. only one scenario will therefore be constructed). The Minister will decide on the data and assumptions that will be selected as reference scenario, including the potentially selected sensitivities, based on a proposal from the CREG, the advice from the FPS on this proposal and Elia's recommendations. Note that all the comments received from stakeholders during the public consultation will also be provided to the Minister, the CREG and the DG Energy.

The set of sensitivities proposed during the public consultation is presented on Figure 5.

³⁷ <https://www.pse.pl/documents/31287/84e7121a-e0c0-4dee-ab2c-61bba30f4646?safeargs=646f776e6c6f61643d74727565> (Figure 2-9)

³⁸ [s expected to have around 14.5GW of solar PV installations by the end of 2030](#)

³⁹ https://www.repubblica.it/green-and-blue/2022/02/07/news/rinnovabili_buocrazia_parco_eolico_odra_energia_salento_puglia-336752711/

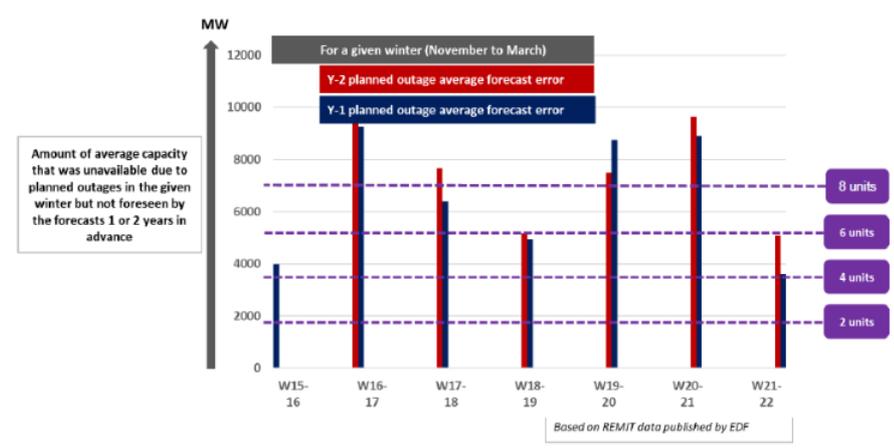
⁴⁰ <https://www.pse.pl/documents/31287/84e7121a-e0c0-4dee-ab2c-61bba30f4646?safeargs=646f776e6c6f61643d74727565> (Figure 4-2)

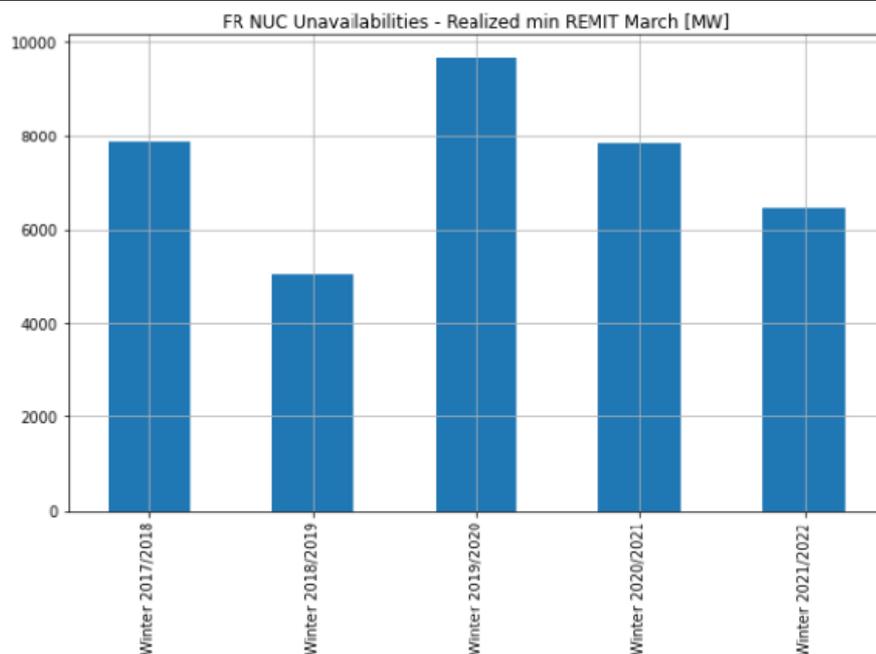
French nuclear availability 1	Decreased French nuclear availability in continuity of last year's reference scenario Lower availability by 2 units on average during winter
French nuclear availability 2	Decreased French nuclear availability based on historical figures Lower availability by 4 units on average during winter
French nuclear availability 3	Decreased French nuclear availability based on historical figures Lower availability by 6 units on average during winter
French nuclear availability 4	Decreased French nuclear availability based on historical figures Lower availability by 8 units on average during winter
FB CEP rules	Non achievements of the CEP rules for 2027 to reflect the uncertainty on capacity calculation. Fixed RAM 70% instead of 70% minRAM
TJ closure	Closure of turbojets due to possible CO2 threshold -158 MW
OCGT closure	Closure of both turbojets and old OCGT due to possible CO2 threshold -511 MW
High prices	Maintain high prices in Europe Higher fuel costs (35,4 €2020/MWh for gas and 17,1 €2020/MWh for coal)
Low prices	Back to low prices in Europe Lower fuel costs (19,8 € 2020/MWh for gas and 8,6 €2020/MWh for coal)
Lower demand	Lower demand in Belgium due to high prices Lower yearly consumption due to high electricity prices

Figure 5: Sensitivities menu, as proposed during the public consultation

3.3.1 French nuclear availability

FEPEG	The unavailability of nuclear units in France should be increased to at least 8 when considering the historical observations where the French nuclear availability was systematically below the forecast and the recent corrosion defects which are expected to have lasting effects on the availability of the French nuclear fleet.
FEPEG	FEPEG firmly supports the need to include a sensitivity regarding the French nuclear availability in the reference scenario: in fact, based on past unavailability of the French nuclear these last years, it is clear that for SoS reasons and as a matter of precaution principle for Belgium, at least 8 units should be considered as unavailable. As stated at numerous occasions, FEPEG considers that the French nuclear availability constitutes a major risk for the Belgian Security of Supply. The current low availability of the French nuclear due to abnormal corrosion phenomena and its possible impact on the upcoming winter clearly demonstrates that this risk should be taken very seriously. Considering the historical observations where the French nuclear availability was systematically below the forecast and the recent

	<p>corrosion defects which is expected to have lasting effects on the availability of the French nuclear fleet, FEBEG recommends to consider at least the unavailability of 8 units. This is also supported by the analysis of the amount of average capacity unavailable but not foreseen by the forecasts 1 or 2 years in advance.</p>  <p>Amount of average capacity that was unavailable due to planned outages in the given winter but not foreseen by the forecasts 1 or 2 years in advance</p> <p>For a given winter (November to March)</p> <p>Y-2 planned outage average forecast error</p> <p>Y-1 planned outage average forecast error</p> <p>8 units</p> <p>6 units</p> <p>4 units</p> <p>2 units</p> <p>Based on REMIT data published by EDF</p>
FEBELIEC	<p>As already discussed in the past, Febeliec is surprised that this is even included, as France already has a CRM in place, guaranteeing the adequacy of France and according to the ERAA methodology, NRAAs can only take into account national impacts and not those cross border. Febeliec is also surprised that Elia now includes lower availability of even 8 nuclear units in France.</p>
Engie	<p>Lower availability of the French nuclear availability based on historical values: according to ENGIE, based on the past performance of the French nuclear units and recent issues encountered by the French nuclear park, at least 8 units should be considered unavailable on average during a winter (on top of planned maintenances announced). Most adequacy studies, whether national or European, rely on modelling of power plants availabilities based on transparency platforms (REMIT obligations) declarations from operators. The French TSO (RTE) studies consider some drift, notably for the longest outages related to 10-year checks, but experience shows us that recurring “generic” issues have kept EDF from reaching the declared availability levels essentially every year in the recent past, whether due to steel defects, earthquake safety issues, pipe cracks or the impact of Covid on maintenance. The below graph shows that these unavailabilities are assessed on the basis of published shutdown forecasts for each nuclear unit. These unit-by-unit forecasts are always optimistic, with a lot of drift and almost never a shortening (except for work delays).</p>



What is shown for the past on the figure above is very likely to be repeated in the future: the guaranteed nuclear capacity, for every delivery year of the French capacity market, has always been lower than initially forecasted by EDF, with very low numbers expected in the next few years. EDF's reactors have historically produced more than 400 TWh per year, but the recent very low targets suggest a low availability for the coming years. In addition, we have observed, in the last months, announcements for the unavailability of plants during the same year or year to come (cf. press release 7/2/22: "*EDF ajuste son estimation de production nucléaire en France pour 2022*" and press release 11/02/22: "*EDF ajuste son estimation de production nucléaire en France pour 2023*"). Indeed, the recent issues faced by the nuclear parc in France linked to the corrosion checks on the nuclear reactors have a big impact on their future availability (at least in the short term but with no certainty for the medium term): currently there is 12 reactors stopped due to the abnormal corrosion phenomena, which affect the safety injection circuits (supposed to allow the injection of boron water to cool the reactor in case of a leak). The group EDF also said recently in the press it was "adjusting its nuclear production estimate for 2022 to 280-300 TWh from the previous 295-315 TWh announced in February 2022 (which was already a reduction from 300-330 TWh). At this stage, and pending the completion of checks and repairs, the nuclear production estimate for 2023, i.e. 300-330 TWh, is not modified"² but those units could be at risk in at least both 2023-2024 and possibly beyond. Given the impact that the capacity available (MW) in our neighboring countries has on

	a highly interconnected country such as Belgium, this risk is certainly not to be underestimated as our country could be subject on other evolutions in neighboring countries and changing energy polities in these countries.
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In the framework of the CRM calibration, Elia is only looking at what capacity would be available in France in the 2027-28 delivery period. This capacity is based on the data and assumptions provided by RTE in the dataset of the European Resource & Adequacy Assessment 2021, as presented in the explanatory note, in line with article 3, §2 of the Royal Decree.

This sensitivity on the nuclear availability in France is proposed in order for the Belgian authorities to cover themselves against lower nuclear availabilities in France compared to ERAA21. Such reasoning is compliant as it is justified and quantified as described in the explanatory note, in line with article 3, §4 of the Royal Decree.

This sensitivity is based on multiple arguments:

- the French nuclear fleet is going through major overhauls to extend the lifetime of its ageing fleet beyond 40 years that will last a decade at least;
- the maintenance calendar was greatly affected by the COVID sanitary restrictions leading to the situation experienced the last 2 winters in France with consequences for the upcoming winters as well;
- in addition, recent findings on corrosion defects will greatly impact the availability of all nuclear reactors in the coming 5 years as they will be undergoing inspections and possible works. According to latest EDF publication⁴¹, 12 reactors are currently stopped for additional inspections. Due to this issue EDF made a review of the nuclear generation for 2022 to 280-300 TWh (against 295-315 TWh previously);
- the nuclear fleet is very vulnerable to generic issues given the same technological conception used in the reactors. A similar situation was already experienced during winter 2016-17;
- RTE expects that the nuclear uncertainty is of about 100 TWh in 2030... corresponding to around 11 GW if spread over the year.

Regarding French nuclear, Elia takes note of Febeg's argument to consider 8 units unavailable on top of the ERAA 21 unavailability.

⁴¹ <https://www.edf.fr/groupe-edf/espaces-dedies/journalistes/tous-les-communiqués-de-presse/point-actualite-nucleaire-du-18-mai-2022>

Regarding Febeliec’s comment, despite having a market-wide CRM, the French TSO expects that its reliability standard will not be met in the coming 3 winters. The latest ‘Bilan Prévisionnel’ of RTE published in 2021 (see Figure 3 from the document “Enseignements principaux”)⁴² has identified in its reference scenario that the system would not be adequate according to their reliability standard. Such results indicate that even though the country has put in place a mechanism to guarantee a certain level of reliability, it is not always guaranteed that the system will be able to cover it. There might be externalities that are not covered by the design of the mechanism or the development of new capacities might not be feasible in the required timeframe. Note that the ‘Bilan Prévisionnel’ was published before the announcement regarding corrosion on French nuclear power plants which will further decrease the nuclear availability in France.

In conclusion, Elia believes that considering the sensitivity with 4 units unavailable for the reference scenario associated to Y-4 auction for Delivery Period 2027-28 should be taken into account and integrates this sensitivity in its recommendation to the Minister.

3.3.2 Flow-based CEP rules

FEBEG	A MinRAM of 70% may not be reached for all countries taking a country-per-country approach could be applied to better capture the uncertainty.
FEBEG	As mentioned in the section regarding the assumptions, FEBEG considers that there remain high uncertainties on whether the ambition of minRAM 70% will really be achieved by 2027 in all countries. For instance, we observe that derogations are still claimed by some countries, while for others action plans are put in place to reach the minRAM70% target(e.g.: Germany).However, there are important risks on their achievement in due time. We therefore consider it prudent to embed this risk in the reference scenario, also because the assumption that the transmission grid will be fully available in the winter period is ambitious as mentioned by ELIA in the report (“in determining the flow-based domains for winter periods, the optimistic assumption is taken in this study that the transmission grid is always fully available”).These elements show that even a fixed RAM70% will be optimistic for some countries. A country-per-country approach could be applied to better capture the uncertainty.
Engie	ENGIE strongly recommends Elia and the Belgian Authorities to integrate, in the reference scenario, at least two sensitivities: (...)

⁴² <https://www.rte-france.com/analyses-tendances-et-prospectives/les-bilans-previsionnels#Lesdocuments>

	<p>The non-achievement of the CEP rules for 2027 to reflect uncertainty on capacity calculation.</p> <p>2025 is the target year for reaching the so-called CEP rule of “minRAM70%” on EU network elements. However, ENGIE considers that it is complicated to assess the compliance with this rule by 2027. Germany is currently following its action plan towards the 70% by 2025, but we observe that it goes slowly, and this is clearly not given they will succeed on time.</p> <p>As explained by Elia in its consultation document, there exist several exit doors to not apply the 70% in order to consider internal network element in DA capacity calculation. Therefore, a sensitivity on the non-achievement of this CEP rule should be integrated in the reference scenario. However, defining the level to be used across Europe is complicated. Therefore, using some differentiation amongst TSO could be a better approach than defining a general sensitivity across Europe. We suggest for instance that Elia looks at the TSOs that are today not respecting the 70% requirement and define a specific sensitivity for those ones and have a fixed RAM at 70% for those TSO that are on the good track already today (rather than a minRAM70%). Of course, these elements should be integrated in the reference scenario to reflect the risks linked to this rule.</p> <p>In addition, Elia assumption on a complete transmission grid availability in the winter period is also risky according to ENGIE. A non-complete grid will increase internal flows on network elements which will put under pressure the compliance with the so-called CEP rule of minRAM 70%. This is also a reason to use a sensitivity that is more pessimistic by using RAM values lower than 70% rather than fixed RAM 70%.</p>
FEBELIEC	<p>On the flow-based CEP rules sensitivity, Febeliec opposes the inclusion of any sensitivity which would reduce the minRAM below 70% as this the minimum threshold. Febeliec already considers the fixed RAM 70% a very conservative approach by Elia.</p>

Regarding the flow-based domain, Elia takes note of the feedback from Febeg, Engie and Febeliec on the sensitivity on the flow-based CEP rule.

Elia first noted that no stakeholders proposed to consider the sensitivity with fixed RAM 70% and that Febeliec opposed to it explicitly. Elia takes note of Engie and Febeg’s proposals to consider an approach rather based on a country-by-country assessment than on a global criteria. Even though the proposal makes sense, it would require a lot additional work to implement it (which is not foreseen in Elia’s current workload) and a lot of information/assumptions regarding the parameter to be considered for each country.

Such a sensitivity could be investigated to be assessed in the next Adequacy and Flexibility study.

For these reasons, Elia proposes to consider the base case with a minRAM 70% for the flow-based domains determination.

3.3.3 Uncertainties on Belgian thermal units

FEBEG	The closure of some existing thermal capacity in Belgium should be considered due to the recent and upcoming review of the CO ₂ emission threshold to participate in the CRM
FEBEG	FEBEG is convinced that the impact of the new CO ₂ threshold for the participation in the CRM that will be further be strengthened may cause the closure of several units.
FEBELIEC	On the uncertainties for turbojets and OCGTs, Febeliec insists that under the current discussions on the crisis related to the Ukrainian war, a lot of realism and pragmatism has been shown to ensure that European adequacy is maintained under crisis conditions and as such Febeliec finds the sensitivity proposed by Elia which would remove more than 500MW of very flexible assets (increasingly needed for balancing intermittent renewable energy) seems extremely conservative and an overshoot.

Elia takes note on Febeg and Febeliec reactions regarding the impact of a potential implementation of a trajectory for the CO₂ emissions expressed in gCO₂/kWh instead of the one on the yearly emissions expressed in gCO₂/kW/year applied previously for the participation to the CRM on the availability of the TJ and OCGT.

Regarding the regulatory framework associated, Elia follows the proposal from the DG Energy currently under public consultation. Regarding Febeg's feedback on this topic, Elia invites stakeholders to react to the public consultation from the DG Energy of the FPS Economie on a trajectory proposal to reduce progressively the CO₂ emission limits starting in 2023 to be applied in the framework of the Belgian CRM⁴³.

⁴³ <https://economie.fgov.be/sites/default/files/Files/Energy/Consultation-proposition-trajectoire-de-reduction-limites-CO2-des-2023.pdf>

Regarding the opposite feedback received, Elia will propose in its recommendation to integrate this sensitivity partially: 50% of the total installed capacity of TJ and OCGT will be integrated in the model reflecting the potential risk of closure of those units, corresponding to 276 MW.

3.3.4 Price and demand uncertainties

FEBELIEC	<ul style="list-style-type: none"> o On the sensitivity on the uncertainty on prices of gas and coal (and oil?), while Febeliec supports such sensitivities (and regrets, as mentioned above that only one single scenario will be modelled and calculated by Elia, thus not providing additional insights from these sensitivities), it does not understand the relevance of the methodology proposed by Elia to calculate the high prices and thus cannot understand the validity of the proposed price levels by Elia. o On the lower demand due to high prices, Febeliec supports, as mentioned above, such approach yet the explanatory note lacks any content to evaluate what Elia is actually proposing as methodology to determine such lower demand (and peak demand?) levels.
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Elia takes note of the comment by Febeliec regarding the lower demand due to high prices. As Febeg also provided a positive feedback regarding this sensitivity (see §3.2.7), Elia proposes to integrate the sensitivity with lower demand due to high prices in the scenario and adapts its recommendation accordingly. Elia would like to remind that it was not possible to assess the impact of structurally higher prices in the timing set for this public consultation. Elia has taken action to request such impact assessment when updating the demand forecasts for Belgium.

Regarding the comment on high prices, Elia refers to the answer provided in §3.2.9.

3.3.5 Conclusion

FEBEG	<p>In conclusion FEBEG considers that at least following sensitivity should be selected for the CRM parameter calculation for the Y-4 Auction for Delivery Period 2027-2028:</p> <ul style="list-style-type: none"> • An additional unavailability of at least 8 nuclear units in France. • MinRAM 70% rule not reached. • The closure of some existing thermal capacity in Belgium
FEBELIEC	<p>On sensitivities, Febeliec strongly regrets that Elia only calculates one single configuration of the base scenario and a combination (or one single) sensitivities. This approach does not provide for additional meaningful insights by comparing different constellations, which would however be very useful.</p>

Elia takes note of Febeliec’s comment. Elia follows the Royal Decree on this matter, which consider only one reference scenario to be selected by the Minister after a clear process including a collaboration and concertation phase with the FPS and the CREG, this public consultation, including a complete consultation report integrating Elia’s recommendations, a reference scenario proposal from the CREG and an advice from the FPS on this latest proposal.

However, Elia will perform a wide range of scenarios and sensitivities and quantify their impact on Belgium’s adequacy in the framework of the Adequacy and Flexibility study which is due for next year. Elia invites Febeliec to make proposals in this framework (the public consultation will be held in the second semester of 2022) in order for Elia to provide meaningful insights based on suggestions from the stakeholders.

Elia takes note of Febeg’s feedback regarding the sensitivities to be integrated in the reference scenario and considered it in order to propose its recommendation to the Minister.

3.4 Preselected capacity types

FEBEG	<p>As mentioned last year, it is questionable whether IC engines are relevant technologies to ensure the long-term adequacy in Belgium in (i) a European green deal context and (ii) a context where the additional capacity to ensure the security of supply is expected to replace baseload capacity.</p> <p>While we welcome the increase of CAPEX for batteries, we still consider that the used value are at the lower end (a figure of 400€/kW seems to be a good ballpark value).</p>
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Firstly, Elia would like to remind that the preselected capacity types will only be used in order to calibrate the reference scenario, as mentioned in article 5, §1 of the Royal Decree. This calibration is only applicable for a particular delivery year and reference scenario. However, regarding the feedback from first auction results and the potential emission limits (see §3.3.3), this technology doesn’t seem representative of the Belgian electricity market nor is it relevant regarding the CO₂ emission levels and might therefore be removed from the preselected capacity types.

Regarding batteries, based on available literature and feedback received, Elia proposes to update the values for batteries by 1) splitting large-scale batteries between the one with 1h energy content, 2h energy content and 4h energy content and 2) update the CAPEX according to Figure 6. The economic for batteries are summarized on Table 2. Finally, Elia proposes to only consider 1 single large-scale batteries category for the preselected capacity types. The most relevant choice according to Elia would then to consider 4h energy content batteries as this is the category with the highest share foreseen (see §3.2.6).

Large-scale batteries	CAPEX [€/kW]	FOM [€/kW/y]	Economic lifetime [y]
1h energy content	250	15	15
2h energy content	400	15	15
4h energy content	750	15	15

Table 2: Economic parameters

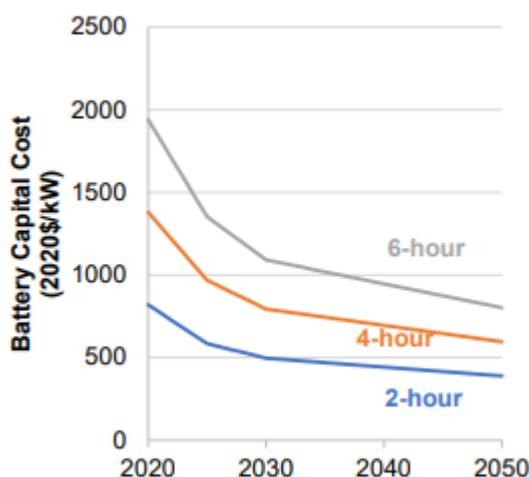


Figure 6: CAPEX for batteries based on NREL ⁴⁴

3.5 Post-delivery scenarios

FEBELIEC	<p>Febeliec regrets that Elia has not foreseen data or an analysis for every year in scope, specifically for 2029 and 2031 but more importantly for none of the years between 2032 and 2040, where merely an interpolation seems to be used although this according to Febeliec does not provide a sound enough basis for the needs for the CRM, as an auction for the period 2027-2028 could lead to a very high and unnecessary overprocurement of capacity if only a very limited number of years would be identified with potential adequacy concerns (e.g. also due to the impact of all announcements for additional investments, which could greatly limit the need for assets with long subsidy cycles, which would then erode the business cases of other asset and technology classes).</p>
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⁴⁴ <https://www.nrel.gov/docs/fy21osti/79236.pdf>

Elia agrees with Febeliec's comment on post-delivery scenarios. However, it is not foreseen in the CRM calibration framework, to perform multi-year assessment. For this reason, Elia proposes to into account the most up-to-date publicly available studies. Therefore, Elia proposes to consider the most suitable scenarios from the last Adequacy & Flexibility study in order to determine post-delivery year revenues for 2030 and 2032.

However, Elia would like to remind that the post-delivery year are only used to get market revenues for later years. These data are then used by the CREG in order to provide a proposal for the net-CONE, setting point B ordinate of the demand curve. It doesn't impact in any way the volume to be auctioned and cannot therefore lead to any overprocurement.

3.6 IPC

Zandvliet Power N.V.	<p>Q7: voor de berekening van de Intermediate Price Cap door Elia, is het belangrijk dat de reële kostenstructuur van een CCGT in rekening wordt gebracht. Daarbij horen ook overhead kosten, lokale belastingen en vaste kosten voor de aankoop van elektriciteit tijdens (economische en technische) stilstand van de eenheid. Zandvliet Power had daarom graag een update van de studie uit 2020 van AFRY (en voorafgaand FITCHNER) gezien, die deze kosten ook in overweging neemt en transparant is over de opgenomen kostenelementen en aannames. Ook een peer check met resultaten van de CRM veilingen in de buurlanden (IPC drempels en effectieve clearing prices) is hierbij aangewezen.</p> <p>Daarenboven wensen we een bijkomend recent kostenelement aan te halen in de bepaling van de IPC, met name het significant verhoogd risico op de Payback Obligation bij het overschrijden van de Strike Price (van 300 EUR/MWh). (...)</p>
Engie	<p>ENGIE insists on the need that all costs supported by capacities are considered for the computation of the IPC. From the recent decision of CREG with regards to the template to be used for the derogations to the IPC, it appears that some costs would not have been fully considered by AFRY (including local taxes, electricity offtake costs, rental fees, ...). The AFRY report does not currently provide sufficiently transparency on which cost components are actually integrated in the computations and on the details of the hypothesis behind cost blocs. In this respect, ENGIE pleads for an update of the cost evaluation for the thermal units.</p> <p>With regards to the revenues for the provision of balancing services, ENGIE considers that Elia should definitely include, in its estimates, a projection of the future market share of the different technologies in those markets. Historical revenues are, for those</p>

	markets, not representative for future revenues.
FEBEG	<p>Considering the significant market evolutions we consider that results of the expert study delivered by Fichtner (2020) followed by a peer review realized by AFRY (2020) are outdated and require an update.</p> <p>Contrary to what ELIA states in its explanatory note, we are persuaded that an update of the studies realized by Fichtner and AFRY are justified (impact of the inflation, staff costs, ensuring that all the costs are included in the analysis,...) We therefore invite ELIA to start the necessary action in order to perform an update of these studies without any delays for which the results should be integrated in the IPC computation for the delivery year 2027-28</p> <p>Indeed, it is not only important that the IPC is correctly computed for the existing capacities. But, the impact of the cost components used for the IPC computation seems to impact other CRM-related elements, and in particular the IPC derogation procedure.</p> <p>This has been confirmed in the CREG decision B2356 of 31/03/2022:</p> <p><i>"CREG confirme que les catégories de coûts reprises dans la demande de dérogation doivent correspondre aux catégories prises en compte dans l'étude d'AFRY "Peer Review of « Cost of Capacity for Calibration of Belgian CRM » Study" sur laquelle ELIA s'est basée pour sa proposition du prix maximum intermédiaire dans son rapport de calibration".</i></p> <p>In this respect, FEBEG is particularly concerned by a statement of the CREG in this decision:</p> <p><i>"La CREG considère donc que ces coûts (les frais généraux, les taxes locales, les frais de location et les coûts fixes d'achat d'électricité), exclus lors du calcul de l'IPC, ne doivent pas être pris en compte lors de l'analyse des demandes de dérogation à l'IPC".</i></p> <p>If it is true that these costs (overheads, local taxes, rental fees and fixed electricity offtake costs) were not considered in the AFRY study, they should be in any case added as they need to be included for the "missing money" in the IPC derogation.</p> <p>FEBEG however remains convinced that the reasoning of the CREG is incorrect: to ensure the level playing field among all capacities (incl. capacities eligible for long-term contract and those who have a "missing money" below the IPC), all relevant and real costs for the CRM Candidates for the concerned capacities should be integrated in both the IPC computation but also in the missing money computation for the derogation files.</p> <p>Finally, as mentioned in FEBEG's comments on CREG's public consultation on the formal requirements for a request for a derogation from the IPC (dd 17/03/2022), FEBEG calls for a broad</p>

	review of the IPC derogation mechanism and in the short term, for a sound and manageable derogation procedure allowing market parties to correctly reflect their business cases in the CRM bids.
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ELIA agrees with Zandvliet Power n.v., Engie and FEBEG that an update of the AFRY study is necessary in the framework of the upcoming calibration exercise. To that extent Elia has taken the necessary steps to update the study ahead of the next calibration report.

In addition, ELIA naturally wishes that the update of the AFRY study forms an accurate depiction of the cost structure of the units that are currently available on the Belgian market. As highlighted in the presentation of the Working Group Adequacy of 17/06/2022, market parties have the opportunity to notify ELIA of any cost components that they specifically want to have reviewed. ELIA will then discuss whether and to what degree these elements can be integrated in the update.

ELIA understands the concerns from some market parties that the Payback Obligation would reach levels that are excessively high. However, ELIA would like to remind that the simulations that are used to calculate inframarginal rents on the revenues side of the IPC calibration make use of a price cap equal to the Strike Price, as a result of which they automatically reflect the impact of the Payback Obligation.

As for the balancing services, ELIA assumes that Engie refers to the revenues from the reservation of ancillary services rather than their provision, since the latter are presumed to be not relevant in the framework of the CRM, as discussed in section 3.2.3 of last year's calibration report. ELIA then wishes to highlight that it does actively take into account the evolution of the AS market. For example, section 2.8 of last year's calibration report explains how the FCR revenues are divided by a factor 5 to reflect the capacities that are expected to be available compared to what is needed. From the moment ELIA deems it appropriate that such reflections are also relevant for mFRR they will also be used in the calibration of the IPC.

ELIA furthermore wishes to confirm that it recognizes the difference between the cost components that should take into account for the IPC determination and the IPC derogation, respectively. Indeed, the IPC determination aims to set a value for the entire market, whereas the IPC derogation is a deep-dive for one specific unit. In that perspective ELIA hopes to, in part, provide clarity on the cost components through the updated of the Afry study.

<p>FEBEG</p>	<p>Availability testing:</p> <p>FEBEG is surprised that the activation cost for availability testing is only considered for technologies with a high short-run marginal cost.</p> <p>In the current functioning rules, it is not explicit that only these unproven technologies, for which ELIA has no continuous mean to verify the availability, would be subject to this availability testing. Some thermal units with low running hours could also be subject to availability testing. If all technologies are subject to the availability test (even at a lower risk), the estimated associated cost for each technology should also be considered in the determination of the intermediate price cap.</p>
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ELIA fully realizes that the description of the selection procedure for Availability Tests is vague. This was done on purpose, however, since it needs to be avoided that CMUs can prepare specifically for these tests.

Elia assures that as long as the CMU does not fail any controls in the framework of the Availability Monitoring the probability of being selected for an Availability Test for these units is very low.

<p>FEBEG</p>	<p>Payback obligation:</p> <p>According to FEBEG, and looking at today's situation, the current strike price of 300 €/MWh is too low and creates significant risks for capacity providers as special market conditions arise.</p> <p>If the strike price methodology and indexation formula for the strike price is not updated to consider the risk of important changing market evolutions (sudden increase of CO2 price, gas price, ... which are still possible in the future), ELIA should consider a cost linked to the payback obligation for the IPC as some market participants may have to repay revenues they have not earned (n.b. a payback obligation could occur while the unit would even not be "in the money").</p> <p>FEBEG has already formulated several proposals to correct this anomaly: a better definition of the strike price (for example, as in other countries where the strike price is the highest option between (1) fuel cost plus CO2 cost or (2) demand management cost), a more dynamic indexation formula that takes into account the unexpected and structural changes in the market and the Clean Spark Spread (CCS), a stop loss on a weekly or monthly basis, a force majeure clause, etc.</p>
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ELIA refers to the most recent iteration of calibration of the range of the Strike Price, and notes that the Strike Price has already increased significantly. If anything, this proves that the Strike Price methodology works.

As for the Capacity Contracts that have been contracted with Strike Prices from previous iterations, ELIA has confirmed in its response to the Haulogy report that it understands the recommendation to also index the Strike Price of Capacity Contracts with a duration of 1 Delivery Period. Moreover, as mentioned in the response, ELIA will review the modalities of the Payback Obligation with the market parties to ensure no unnecessary risks are created.

ELIA takes note of FEBEG's other proposals for the Strike Price, but wants to stress that the CRM is conceived as a technology-neutral and that it must be avoided that parameters are determined by one specific technology on the Belgian Market.

FEBEG	<p>Revenues (provision of balancing services):</p> <p>FEBEG would like to highlight that historical costs per technology are not representative of future revenues for the concerned technologies. It is of utmost importance that:</p> <ol style="list-style-type: none"> 1) ELIA considers the expected market shares of each technology in the delivery period and the increase of new technologies participating in the balancing services' markets at the 2027-28 horizon. This is even more relevant as new technologies and capacities (batteries, DSM,...) are entering the market and will continue to do in the context of the CRM (cf. large volume reserved in T-1 auctions for such technologies). 2) ELIA corrects for the non-representative historical values linked to special events and market circumstances.
FEBELIEC	<ul style="list-style-type: none"> ○ Activation cost and net revenues from balancing: Febeliec , as already mentioned before, wonders whether the referred value, coming from the totally different context of the Strategic Reserve, is the correct reference in this context. For net revenues from the provision of balancing services, Febeliec considers Elia's approach too conservative.

ELIA understands FEBEG's and FEBELIEC's concern that historic revenues for the reservation of ancillary services might not be representative for future revenues. However, by definition any kind of forecast will in the end be proven wrong by reality. From that perspective, ELIA remains convinced that an estimation based on historic data is still the most accurate assessment that is available. More specifically for FEBELIEC's point, ELIA wishes to point out that the method seeks to establish a general estimate for

the market. If a Capacity Provider finds that this value is not representative for his CMU, he has the possibility to provide his personal estimate when applying for an IPC derogation.

ELIA then wishes to highlight that it does actively take into account the evolution of the AS market. For example, section 2.8 of last year's calibration report explains how the FCR revenues are divided by a factor 5 to reflect the capacities that are expected to be available compared to what is needed. From the moment ELIA deems it appropriate that such reflections are also made for mFRR they will also be made for these products.

Furthermore, ELIA agrees with FEBEG that efforts must remain to be made to ensure that non-representative values are filtered out.

3.7 Strike Price

Zandvliet Power N.V.
Daarenboven wensen we een bijkomend recent kostenelement aan te halen in de bepaling van de IPC, met name het significant verhoogd risico op de Payback Obligation bij het overschrijden van de Strike Price (van 300 EUR/MWh). Met de huidige hoge aardgas- en CO2-prijzen, en de missende link tussen de Strike Price en deze prijzen, zien we dat het overschrijden van deze Strike Price het afgelopen halfjaar reeds vaak realiteit was. Op dergelijke momenten was de marginale kostprijs van een CCGT regelmatig nog hoger dan deze marktprijs. Dat leidt tot een situatie waarbij de Payback Obligation niet gedekt is door marktinkomsten en dus een eenheid een terugbetaling moet doen terwijl hij niet eens "in het money" was. Hierdoor ontstaat een reële extra netto kost. Het risico op deze Payback Obligation zou ook inbegrepen moeten worden in de IPC berekening voor CCGT's.
We wensen daarom een herziening van de methodologie voor het bepalen van de Strike Price zodat de hierboven vermelde versturende effecten tot een minimum worden beperkt.

ELIA begrijpt de bezorgdheden van Zandvliet Power N.V. maar wenst te benadrukken dat de Strike Price reeds significant stijgt in de meest recente iteratie van de bepaling van het interval voor de Strike Price.

Uiteraard beseft ELIA dat deze stijging vooralsnog enkel betrekking heeft op de Veiling voor Leveringsperiode 2027-2028. Te dien einde merkt ELIA op dat zij de aanbeveling van Haulogy met betrekking tot het indexeren van de Strike Price, ook voor contracten met een duur van slechts één Leveringsperiode, in acht neemt. Zoals reeds beschreven in ELIA's reactie op de voorstellen van Haulogy zullen de modaliteiten van de Terugbetalingsverplichting herbekeken worden samen met de marktpartijen opdat geen onnodige risico's gecreëerd worden.

Tot slot wenst ELIA op te merken dat de berekening van de inkomsten uit inframarginale rente voor de kalibratie van de IPC reeds expliciet rekening houdt met de Strike Price door deze te gebruiken als cap op de inkomsten. Als dusdanig worden de eventuele kosten van de Terugbetalingsverplichting reeds accuraat meegenomen.

Appendix: Scenario dataset proposed by Elia

Updates compared to the excel from the public consultation and sensitivities selected in Elia's recommendation are presented in green.

Generation and Storage

Generation/Storage Type	Capacity [MW]
Nuclear	2077
Gas	7061*
Oil	158*
Hydro RoR	143
PSP	1305
Onshore Wind	4368
Offshore Wind	2261
Solar	10155
Other non RES	1451
Biomass	572
Waste	334
Batteries	968

* Elia proposes to reduce the total installed capacity of TJ and small-scale OCGT by 50% to reflect the potential risk of closure of those units in line with the proposed sensitivity(see §3.3.3). This sensitivity is not reflected in the numbers above.

Individually-modelled thermal generation

Owner	Generation unit name	Type	Fuel type	Generation capacity [MW]
Engie - Electrabel	AALST SYRAL GT	CHP	Gas	43
Engie - Electrabel	AALST SYRAL ST	CHP	Gas	5
Engie - Electrabel	AALTER TJ	TJ	Oil	18
Engie - Electrabel	AMERCOEUR 1 GT	CCGT-GT	Gas	289
Engie - Electrabel	AMERCOEUR 1 ST	CCGT-ST	Gas	162
Luminus	ANGLEUR TG 31	GT	Gas	25
Luminus	ANGLEUR TG 32	GT	Gas	25
Luminus	ANGLEUR TG 41	GT	Gas	64
Luminus	ANGLEUR TG 42	GT	Gas	64

Engie - Electrabel	AWIRS 4	CL	Biomass	-
Engie - Electrabel	AWIRS NEW	CCGT	Gas	890
Engie - Electrabel	BEERSE TJ	TJ	Oil	32
Indaver	Beveren 2 Indaver	IS	Waste	21
Indaver	Beveren 3 Indaver	IS	Waste	24
Engie - Electrabel	Beveren Ineos Phenol Chem	CHP	Gas	25.1
Indaver	Beveren Sleco	IS	Waste	41
Biopower	BIOMASSA OOSTENDE	IS	Biomass	18
Biostoom	BIOSTOOM OOSTENDE	IS	Waste	19.4
Borealis	Borealis Kallo Cogen GT_ST	CHP	Gas	32
Engie - Electrabel	CIERREUX TJ	TJ	Oil	18
Engie - Electrabel	DOEL 4	NU	Nuclear	1039
Engie - Electrabel	DROGENBOS GT1	CCGT-GT	Gas	150
Engie - Electrabel	DROGENBOS GT2	CCGT-GT	Gas	150
Engie - Electrabel	DROGENBOS ST	CCGT-ST	Gas	160
Euro-silo	Euro-Silo	CHP	Gas	12.9
Indaver	E-wood	IS	Waste	22
Engie - Electrabel	Fluxys Zeebrugge	CHP	Gas	40
Green Power	Greenpower Oostende	IS	Waste	20
Luminus	HAM 31	GT	Gas	58
Luminus	HAM 32	GT	Gas	58
Luminus	HAM Gent-GT	CHP	Gas	39
Luminus	HAM Gent-ST	CHP	Gas	-
Engie - Electrabel	HERDERSBRUG GT1	CCGT-GT	Gas	157
Engie - Electrabel	HERDERSBRUG GT2	CCGT-GT	Gas	156.3
Engie - Electrabel	HERDERSBRUG ST	CCGT-ST	Gas	167
INEOS	INESCO GT1	CHP	Gas	44.8
INEOS	INESCO GT2	CHP	Gas	44.8
INEOS	INESCO ST	CHP	Gas	48.5
INTRADEL	INTRADEL	IS	Waste	32
IPALLE	Ipalle THUMAIDE	IS	Waste	34
Engie - Electrabel	ISVAG	IS	Waste	12
Lampiris	IVBO	IS	Waste	16
Engie - Electrabel	IXELLES-VOLTA TJ	TJ	Oil	18
Luminus	IZEGEM	CHP	Gas	20
Inovyn	JEMEPPE-SUR-SAMBRE GT1	CHP	Gas	48
Inovyn	JEMEPPE-SUR-SAMBRE GT2	CHP	Gas	48
Inovyn	JEMEPPE-SUR-SAMBRE ST	CHP	Gas	10
Engie - Electrabel	KNIPPEGROEN STEG	GT	Gas	305
Lillo Energy	Lillo Degussa GT1	CHP	Gas	43
Lillo Energy	Lillo Degussa GT2	CHP	Gas	32
Lillo Energy	Lillo Degussa ST	CHP	Gas	10

Direct Energie	MARCINELLE ENERGIE TGV	CCGT	Gas	413
Engie - Electrabel	MONSANTO LILLO WKK EBL	CHP	Gas	43
Engie - Electrabel	NOORDSCHOTE TJ	TJ	Oil	18
Engie - Electrabel	Oorderen Bayer	CHP	Gas	43
Luminus	RINGVAART STEG	CCGT	Gas	385
Engie - Electrabel	RODENHUIZE 4	CL	Biomass	-
Engie - Electrabel	SAINT-GHISLAIN STEG	CCGT	Gas	378
Engie - Electrabel	SAPPI LANAKEN GT	CHP	Gas	43
Engie - Electrabel	Schaerbeek SIOMAB 1	IS	Waste	15
Engie - Electrabel	Schaerbeek SIOMAB 2	IS	Waste	15
Engie - Electrabel	Schaerbeek SIOMAB 3	IS	Waste	15
EXXONMOBIL	SHELDELAAN EXXONMOBIL	CHP	Gas	140
Luminus	SERAING TG1	CCGT-GT	Gas	150
Luminus	SERAING TG2	CCGT-GT	Gas	150
Luminus	SERAING TGV	CCGT-ST	Gas	-
Luminus	SERAING NEW	CCGT	Gas	885
STORA	STORA LANGERBRUGGE CHP 1	CHP	Biomass	10
STORA	STORA LANGERBRUGGE CHP 2	CHP	Biomass	40
Taminco	TAMINCO GENT CHP	CHP	Gas	6.3
Engie - Electrabel	Tihange 3	NU	Nuclear	1038
T-Power	T-POWER	CCGT	Gas	425
Engie - Electrabel	VILVOORDE GT	CCGT-GT	Gas	-
TOTAL	WILMARSDONK TOTAL GT1	CHP	Gas	43
TOTAL	WILMARSDONK TOTAL GT2	CHP	Gas	43
TOTAL	WILMARSDONK TOTAL GT3	CHP	Gas	43
Zandvliet Power NV	ZANDVLIET POWER	CCGT	Gas	386.2
Engie - Electrabel	ZEDELGEM TJ	TJ	Oil	18
Engie - Electrabel	ZEEBRUGGE TJ	TJ	Oil	18
Engie - Electrabel	ZELZATE TJ	TJ	Oil	18
Engie - Electrabel	Zwijndrecht Lanxess GT	CHP	Gas	43
Engie - Electrabel	Zwijndrecht Lanxess ST	CHP	Gas	15

Legend Unit-Type	
CCGT	Combined Cycle
CL	Classic
GT	Gas Turbine
ST	Steam Turbine
IS	Incineration Station
NU	Nuclear
TJ	TurboJet
CHP	Cogeneration Unit

Storage

Pumped-storage facilities:

	Reservoir Volume [MWh]
Storage reservoir	6150
Storage reservoir derating (black-start services)	500
Available storage for economical dispatch	5650

	Turbining capacity [MW]
Total capacity	1305
Coo 1-6	1161
Platte Taille 1-4	144

Batteries:

Total capacity [MW]		968
Capacity [MW]	Large scale storage ("in-the-market")	458
	Small scale storage ("out-of-market")	381
	Vehicule-to-Grid (V2G)	129
	V2G "in-the-market"	18
	V2G "out-of-market"	111
Reservoir volume [MWh]	Large scale storage ("in-the-market")	1557
	Small scale storage ("out-of-market")	1143
	Vehicule-to-grid	516
	V2G "in-the-market"	72
	V2G "out-of-market"	444

Profiled thermal without daily schedule

profiled thermal without daily schedule units	Capacity [MW]
Gas CHP - without daily schedule	1451
Biomass - without daily schedule	504
Waste - without daily schedule	48

Forced Outage Rates

	Average forced outage rate over 2012-2021
CCGT	7.0%
GT	7.4%
TJ	3.5%
CHP, waste & biomass	6.7%
Pumped storage	4.3%
HVDC link	6.0%

Nuclear

	'Technical' forced outage rate over 2012-2021	'Long-lasting' forced outage rate over 2012-2021	Planned outage rate during winter periods over 2012-2021
Nuclear	4.0%	16.5%	8.1%

Demand

Regarding demand data, Elia proposes to take into account the latest Plan Bureau economic forecasts that will be published end of June 2022 and integrate the effect of structurally high electricity prices on the electricity demand.

Assumptions associated to the electrification of heat and transport to be integrated in the demand forecasts:

	2027
Number of Equivalent Electric Vehicles	850,000
Number of Heat Pumps	250,000

DSM Shedding:

Categories	Total volume [MW]
Max use of 1 hour	175
Max use of 2 hours	610
Max use of 4 hours	657
Max use of 8 hours	523
No limit	262
Total shedding capacity	2,226

DSM Shifting : 1 GWh/day in winter periods

Balancing need

	Volume [MW]
Total FCR	75
Total FRR	1175
Total reserve capacity	1250

Neighboring countries

The dataset is based on ERAA21 dataset and updated with the following values:

Countries	Proposed Updates				
	Lignite/Coal [MW]	Wind Onshore [MW]	Wind Offshore [MW]	Solar [MW]	Demand [TWh/y]
DE	10,700	74,300	22,000	137,200	623
FR	0	24,100	6,200	44,000	482
NL	2,671	7,800	11,500	26,900	143
GB	0	24,200	36,300	31,900	306
IT	0	20,700	1,300	56,200	340
PL	21,600	10,500	3,600	8,800	182
ES	0	49,500	0	50,700	271

On top of the ERAA21 reference grid, Elia will consider a flow-based with 70% minRAM.

Regarding French nuclear availability, Elia proposes to take into account a lower availability by 4 units on average during winter (see §3.3.1)

Economic parameters

Elia proposes to integrate a high fuel price sensitivity. This sensitivity could be either based on Elia's high price sensitivity (based on an interpolation between available price forecast and 2030 target from WEO2021) or on price trajectories integrating REPowerEU from European Commission (see §3.3.4) or on a more recent study, if available before the selection by the Minister by the 15th of September. For the CO2 price, the table below summarizes Elia's proposal.

Category	Price
	[€ 2020/tCO ₂]
CO₂	97.3