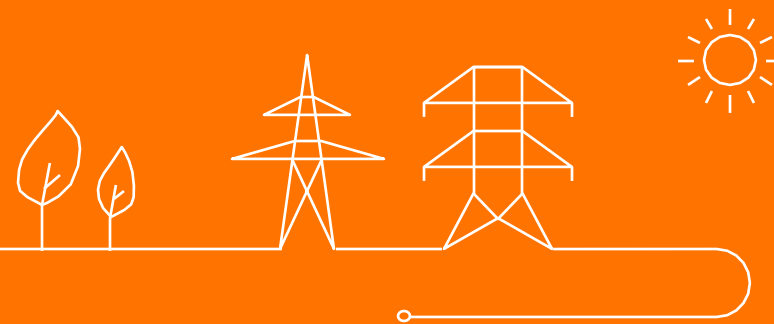# WG Adequacy #10

13 September 2022

# Agenda

➢ Welcome

➢ Minutes of Meeting WG Adequacy #9 (25.08.2022)

➢ PQ Permit Requirements

➢ Auction Timeline

➢ Assessment of the amount of Market Response in Belgium [E-cube]

➢ CRM: proposal for design evolutions

➢ Tender for Low Carbon Technologies : Design
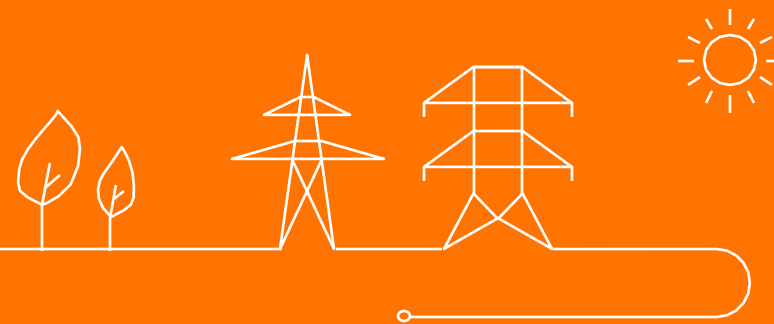
➢ Next meetings

# Minutes of Meetings

# Minutes of Meeting

- **WG Adequacy #9 – 25.08.2022 : To be approved**

- *The MoM were sent on 06.09.2022.  No comments were received.*

# PQ Permit Requirements

# Permit requirements (prequalification)

- **Origin** : Act 28/2/2022 amending E-act; Prequalification criterion introduced in the art 7undecies §12 E-act : "*c) if (a) permit(s) is(are) required under regional regulations for the construction and/or operation of the capacity concerned, proof that the capacity holder has the permit(s) issued at the last administrative instance, prior to the closing date of the submission of the bids in the context of the auction referred to in paragraph 10*" (free translation)

- **Justification** : "*This concerns the situation in which, on the one hand, the holder of a capacity selected in the auction organised in 2021 does not have the permits granted at last administrative instance under regional regulations required for the construction and operation of that capacity on 15 March 2022, and in which, on the other hand, this absence of a permit seriously affects the security of supply of the Belgian control zone for the relevant period of capacity supply.*" "*Specifically with regard to new thermal power plants, it is established that a period of three and a half years after obtaining the permits is necessary to develop, build and commission them.*" "*However, in the case of a capacity of a significant volume which presents a problem such as that of the lack of permit, these measures and penalties do not provide a satisfactory solution to the objective of ensuring security of supply.*" "*The holder of a capacity selected in an auction four years prior to the delivery period could a priori resolve the difficulties associated with obtaining its permits or the delay in the construction of its installation through the secondary market.*" (Preparatory Works – free translation)

# Permit requirements (prequalification)

– **Context:** prequalification (to be distinguished from permitting milestone ! )

– **Scoping**: permits required under regional regulation for the construction and/or operation of a capacity:

   – Flanders: bouwvergunning, stedenbouwkundige vergunning, milieuvergunning and/or omgevingsvergunning

   – Brussels: bouwvergunning, stedenbouwkundige vergunning and milieuvergunning / permis de bâtir, permis d'urbanisme, permis d'environnement

   – Wallonia: permis de bâtir, permis d'urbanisme, permis d'environnemnet and/or permis unique

   – Permit renewal (relates not to construction but to operation of CMU which is subject to limited period) : to be done in due time,

– **Out of scope:**

   – Permits for grid connection and grid reinforcement = out of scope

   – Federal permits (based on art 4 E-Act for production and storage facilities)

   – Federal or regional rights of way (Permission de voirie-declaration d'utilité publique / wegvergunning-verklaring van openbaar nut)

– **Delivered at the last administrative instance: meaning?**

   – Positive permit decision by a public authority without any possibility to attack the decision before a higher public authority

   – Eg. Decision delivered at first instance, but deadline for appeal expired, Decision delivered at first instance but appeal rejected, Decision delivered in appeal against permit refusal

   – Permit decision however still open to judicial review before State Council/Council for Permit Disputes
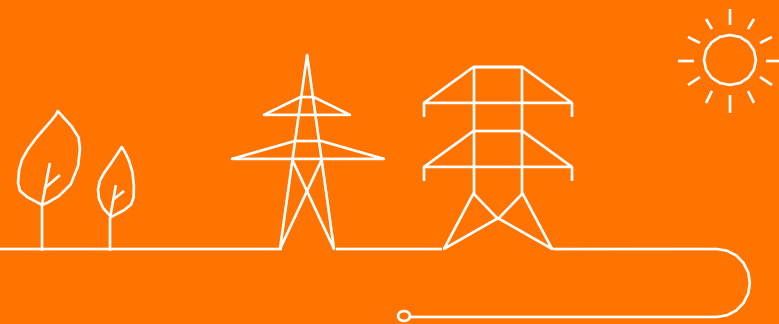
# Permit requirements (prequalification)

**Slide adapted**

– **Proof**: mere declaration is not enough: the deliverance of the permit needs to be proven:

– **Existing CMU:**

  – permit(s) delivered at the last administrative instance (all relevant parts) or certified true copy

  – Declaration of conformity

  – if relevant : other documents, pictures, … providing evidence of the CMU being operational.

– **Additional CMU:**

  – Permit(s) delivered at the last administrative instance (all relevant parts )

  – To allow Elia to check that the deadline to appeal the permit provided has (or not) expired on 30/9/2022: Proof of advertising (aanplakking/affichage) of the permit or a certificate by the relevant public authority that the permit has been advertised

  – Even if the deadline for an appeal is expired on 30/9 : Proof that the decision has not been appealed by 30/9:

    — Flemish Region: see Omgevingsloket

    — Walloon and Brussels Capital Region: contact the cabinet of the relevant administrative appeal authority and ask them the conformation that no appeal has been filed"
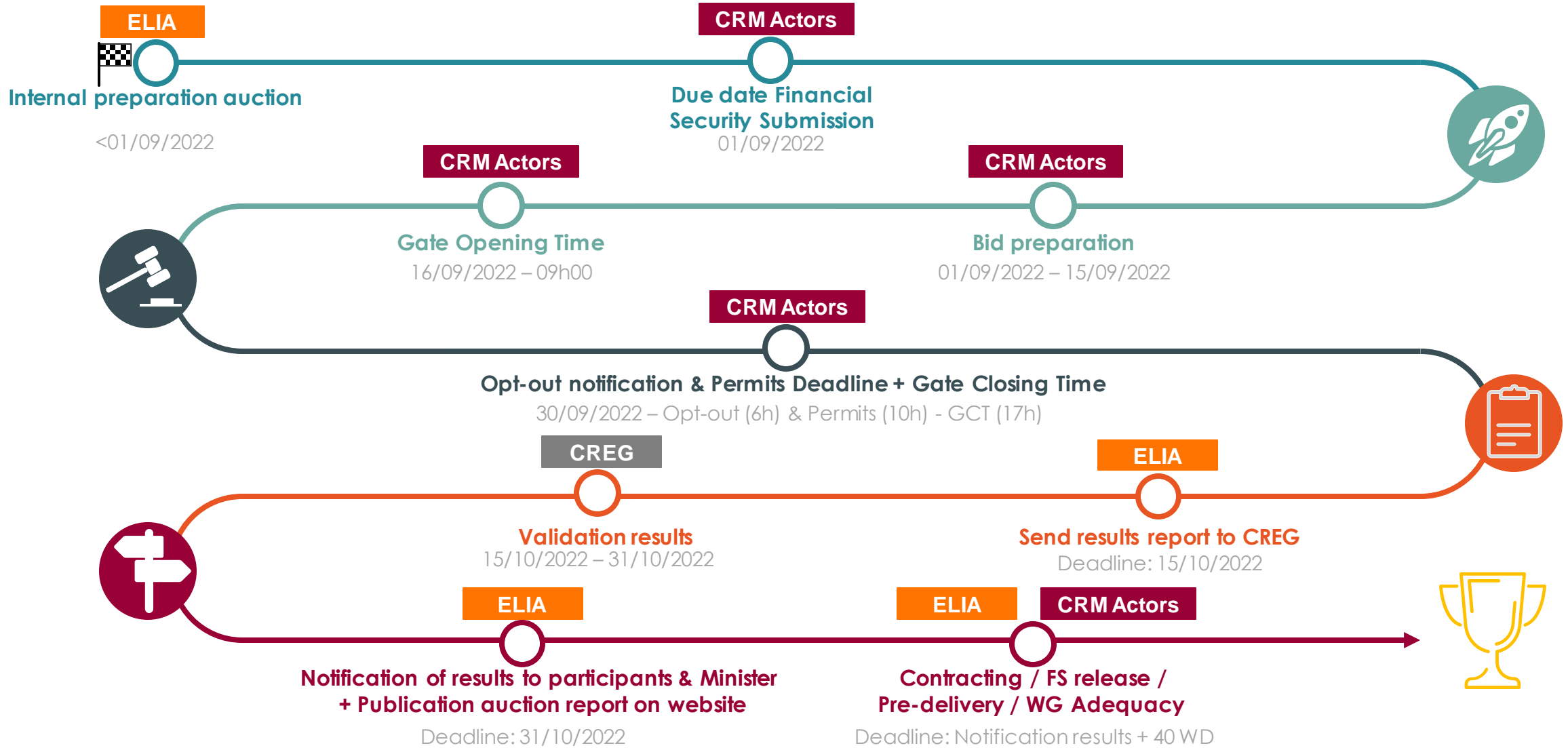
  Conclusion: should a CRM candidate not yet have provided the evidence as required and described above, please provide it by 30/9

# Auction Timeline

# Y-4 2026-2027 Auction Timeline (normal process, excl. fallback)



**ELIA**
**Internal preparation auction**
<01/09/2022

**CRM Actors**
**Due date Financial Security Submission**
01/09/2022

**CRM Actors**
**Gate Opening Time**
16/09/2022 – 09h00

**CRM Actors**
**Bid preparation**
01/09/2022 – 15/09/2022

**CRM Actors**
**Opt-out notification & Permits Deadline + Gate Closing Time**
30/09/2022 – Opt-out (6h) & Permits (10h) - GCT (17h)

**CREG**
**Validation results**
15/10/2022 – 31/10/2022

**ELIA**
**Send results report to CREG**
Deadline: 15/10/2022

**ELIA**
**Notification of results to participants & Minister + Publication auction report on website**
Deadline: 31/10/2022

**ELIA** **CRM Actors**
**Contracting / FS release / Pre-delivery / WG Adequacy**
Deadline: Notification results + 40 WD

# Bid saving & submission

<u>Bid preparation</u>

➢ CRM candidates can save bids starting from 01/09/2022 at 09:00

<u>Gate opening time</u>

➢ CRM candidates can submit bids starting from 16/09/2022 at 09:00

<u>Gate closing time</u>

➢ CRM candidates can submit opt-outs, permits and bids until Friday 30/09/2022

- 06h00 Opt-out submission deadline
- 10h00 Permit submission deadline
- 17h00 Bid submission deadline (GCT)

# Validation results

➢ Elia will formally send the results to CREG by 15/10/2022 the latest.

➢ CREG needs to validate the results and formally communicate this validation to Elia by 31/10/2022 at the latest.

# Publication results by Elia

➢ Deadline for Elia is 31/10/2022

➢ <u>Communication channels</u>

- Publication of the auction report on the Elia.be website

- IIP Publication (Inside Information Platform)

- Via CRM IT Interface to individual market parties (selected and non-selected candidates)

- Send auction report to Minister

- Email to notify WG Adequacy, User Group and WG Belgian Grid that results are available on the website

- WG Adequacy : presentation of auction report on 17/11/2022

# Assessment of the amount of Market Response in Belgium
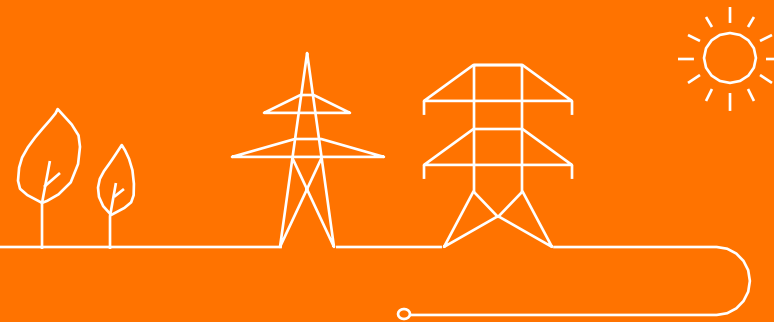
# Context and introduction

- Given the strong change in market circumstances, Elia has identified that the lower price threshold used in the '**Assessment of the amount of Market Response in Belgium**' study is no long fit for purpose.

    - Elia and E-cube propose to only use the higher price threshold to determine the market response (see next slides)

    - Elia and E-cube propose to investigate a **more dynamic price threshold for the next iteration of the study**.

- As indicated in the previous WG, Elia is working on an 'study on the '**quantification of residential and tertiary future consumer flexibility**' study for the upcoming Ad&Flex.

    - Although both studies aim at quantifying flexibility, **their scope and time horizon is different**. The MR study is a look-back study and does not predict future volumes of market response.

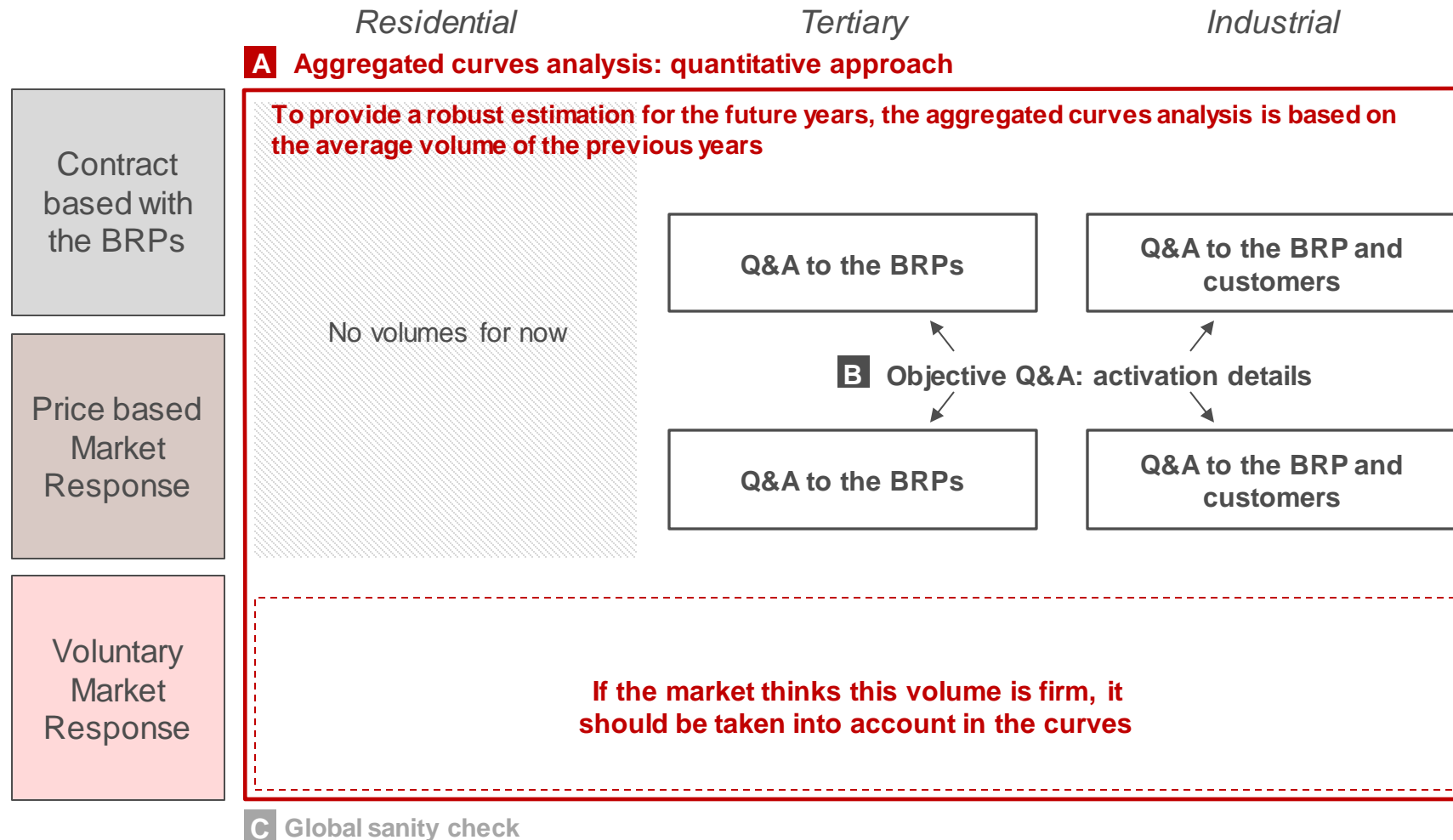# Market Response – update 2022

**Working Group Adequacy**

Brussels, September 8th, 2022

# Table of contents

# In 2017, a robust quantitative methodology was established based on the aggregated curves, and complemented with a qualitative Q&A to define the details of the activation

| | Residential | Tertiary | Industrial |
|---|---|---|---|

**A** **Aggregated curves analysis: quantitative approach**

**To provide a robust estimation for the future years, the aggregated curves analysis is based on the average volume of the previous years**

| Contract based with the BRPs | No volumes for now | Q&A to the BRPs | Q&A to the BRP and customers |
|---|---|---|---|

**B** **Objective Q&A: activation details**

| Price based Market Response | | Q&A to the BRPs | Q&A to the BRP and customers |
|---|---|---|---|

| Voluntary Market Response | | **If the market thinks this volume is firm, it should be taken into account in the curves** | |
|---|---|---|---|

**C** **Global sanity check**

# The 2020 updated methodology enables MR from block orders to be accounted for and allows the use of data from multiple NEMOs

GENERAL METHODOLOGY FOR THE CURVE ANALYSIS
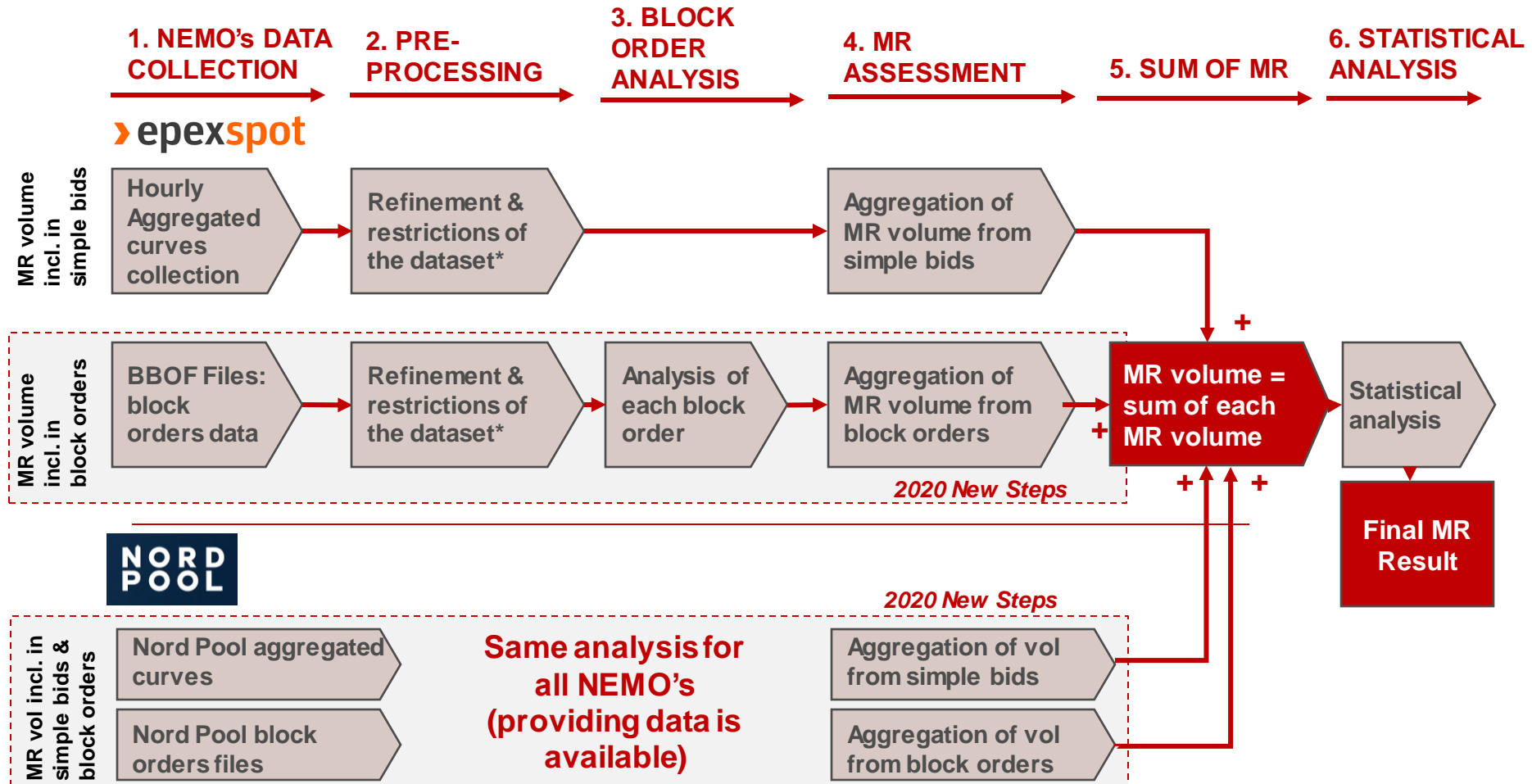


MR = Market Response       * refinement: national holidays considered as Sundays; restrictions: 1.11 –> 31.3, weekdays, 8 AM to 8 PM)

Source: E-CUBE Strategy Consultants

# Historically MR was calculated on a threshold of 150€/MWh & 500€/MWh, but in the current context of high energy prices only the 500€/MWh will be analysed for the winter 21/22
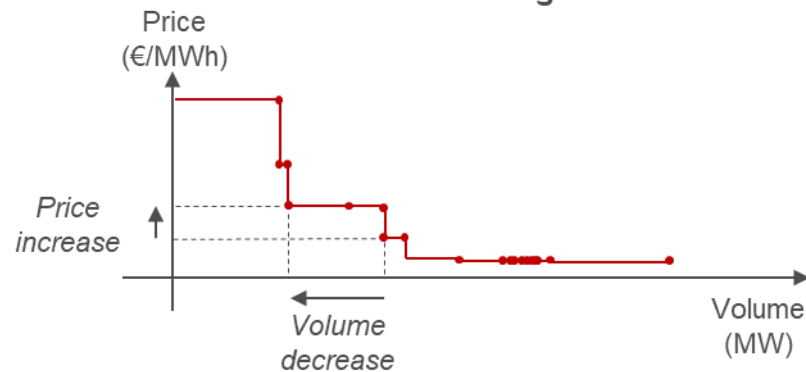
GENERAL METHODOLOGY

**Market Response volumes valued in the DA market**

## Demand decrease

- This part can be analyzed directly in the aggregated demand curve, by studying the decrease of volume when price increases

**Demand curve for a given hour**



## Offer increase

- Instead of a demand decrease, suppliers can value Market Response as new offer in the market: this part would appear in the supply curve

- Historically, due to the possible presence of generation bids in the offer curve, two price thresholds have been set up:
  - Volumes above 150€/MWh, which correspond to the base case of Market Response volumes
  - Volumes above 500€/MWh, which enable to exclude all possible generation bids

In the context of soaring energy prices, it is more reasonable to carry out the quantitative analysis **only with the 500€/MWh mark**. The 150€/MWh mark was proposed at a time where electricity prices where significantly lower (around 40-50€/MWh). The 500€/MWh mark is deemed more relevant in the current context of higher energy prices.

**Disclaimer:**

The details on the activation cannot be estimated with the aggregated curve methodology, it is not possible to extract it from the curves. This has been validated with EPEX SPOT
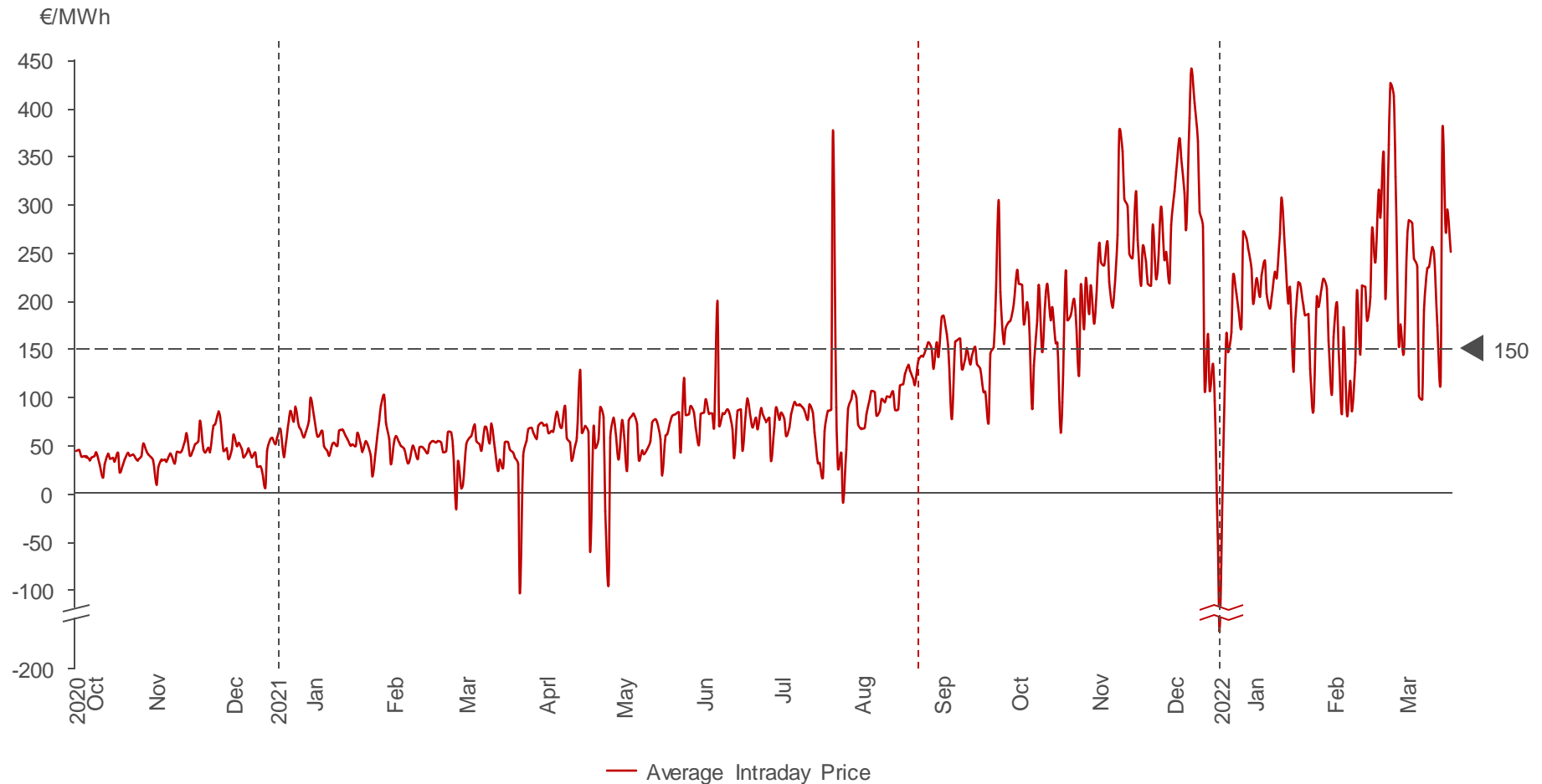
Source: E-CUBE Strategy Consultants

# We propose to take the 500€/MWh threshold for the winter 2021/2022 as from end of August 2021 prices were frequently above the 150€/MWh mark making it not relevant anymore

BELGIAN DAY-AHEAD PRICE EVOLUTION FROM 15/10/2020 TO 31/03/2022



Source: E-CUBE Strategy Consultants, Entsoe
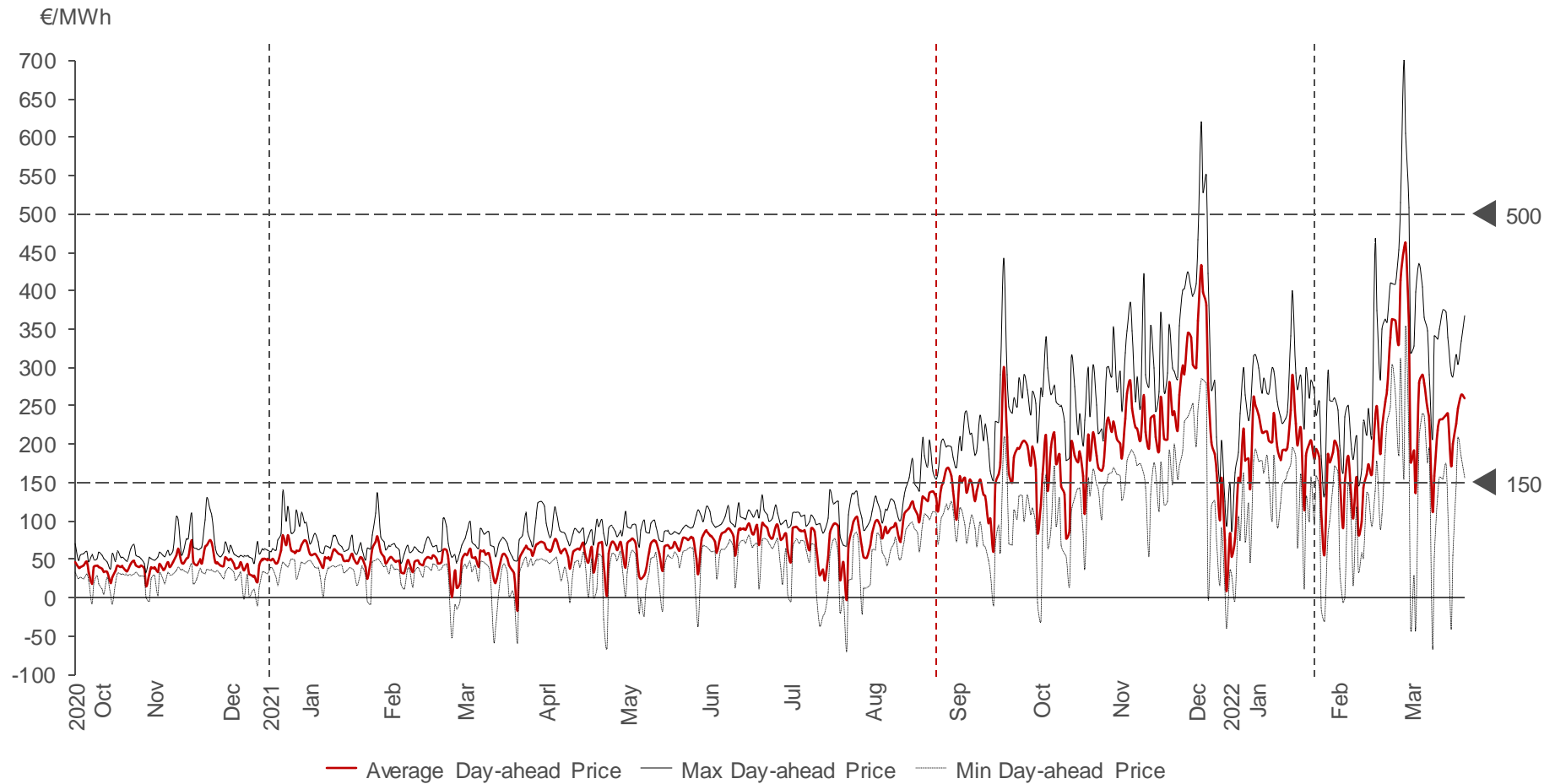
# Intraday prices are also regularly above the 150€/MWh mark after August 2021

BELGIAN INTRADAY PRICE EVOLUTION FROM 15/10/2020 TO 31/03/2022
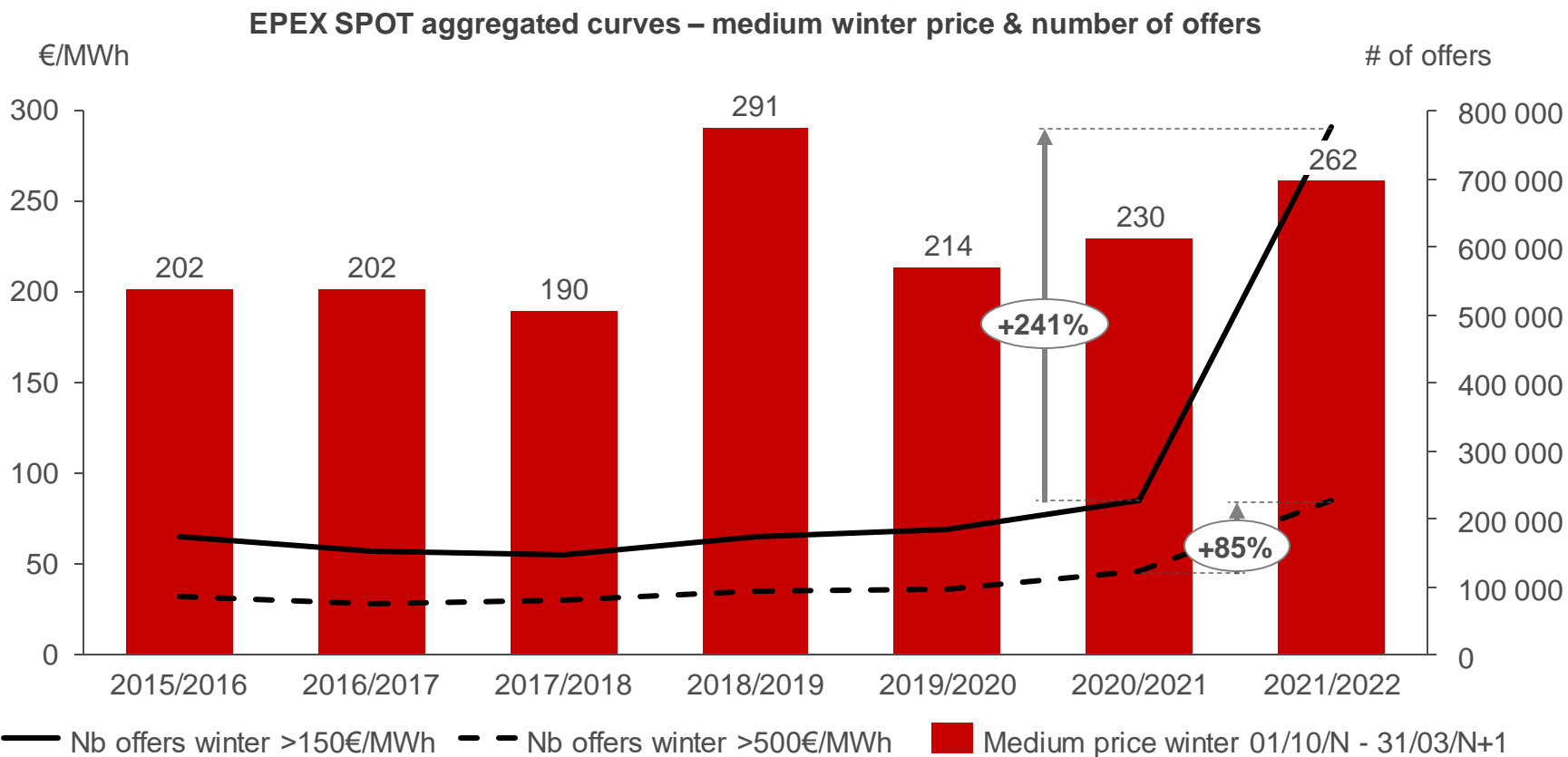


— Average Intraday Price

Note : For clarity of representation purposes Min & Max prices were not represented on the graph
Source: E-CUBE Strategy Consultants, Elia

# Between winter 2021/2022 and 2020/2021, the number of offers >150€/MWh saw an increase by 241% and 85% for the >500€/MWh

OVERVIEW OF BLOCK ORDERS

There is a strong increase in the number of offers >150€/MWh and >500€/MWh. This evolution also makes the 500 €/MWh more relevant than the 150 €/MWh (this last threshold would lead to very high MR volumes)

**EPEX SPOT aggregated curves – medium winter price & number of offers**



Legend:
— Nb offers winter >150€/MWh    - - - Nb offers winter >500€/MWh    ■ Medium price winter 01/10/N - 31/03/N+1

Source: E-CUBE Strategy Consultants, EPEX SPOT

# The methodology is based on three restrictions, in line with the past years

GENERAL METHODOLOGY

**Initial analysis**

### Analyses conducted: impact of parameters

- 3 analyses were conducted to assess the impact of various parameters on the dataset:

  - Load (Elia grid load)
  - Price (Day-ahead prices)
  - Temperature

The principle of the analysis is to restrict the dataset to the hours when the parameter are above (or bellow) a threshold. Key statistics (standard deviation, number of values and average) are then calculated.

### Focus on the DA prices

Among the previous parameters, the DA prices has the most important impact on the dataset:

- **In periods of important DA prices, the Market Response volumes are more pertinent** (there is a decrease of the standard deviation, along with a variation in the average)

### Restriction of the dataset

Though, the DA prices vary strongly according to the period. **The restriction of the dataset to periods of important DA prices should be studied:**

- Season
➔ **Restriction 1:** winter months

- Day type
➔ **Restriction 2:** weekdays

- Hours:
➔ **Restriction 3:** hours from 8 AM to 8 PM

**Update**

**The impact of the 3 parameters (load, price, temperature) is assessed on the updated dataset**

**The restriction of the updated dataset is compared to the restriction conducted in the past years**

# Table of contents

# 2021/2022 sees a high increase of average MR volumes for 500€/MWh thresholds after restrictions

SUMMARY OF THE TWO CATEGORIES (REFINED AND RESTRICTED DATASET) – EPEX SPOT DATASET

Comparison with the refined / restricted results
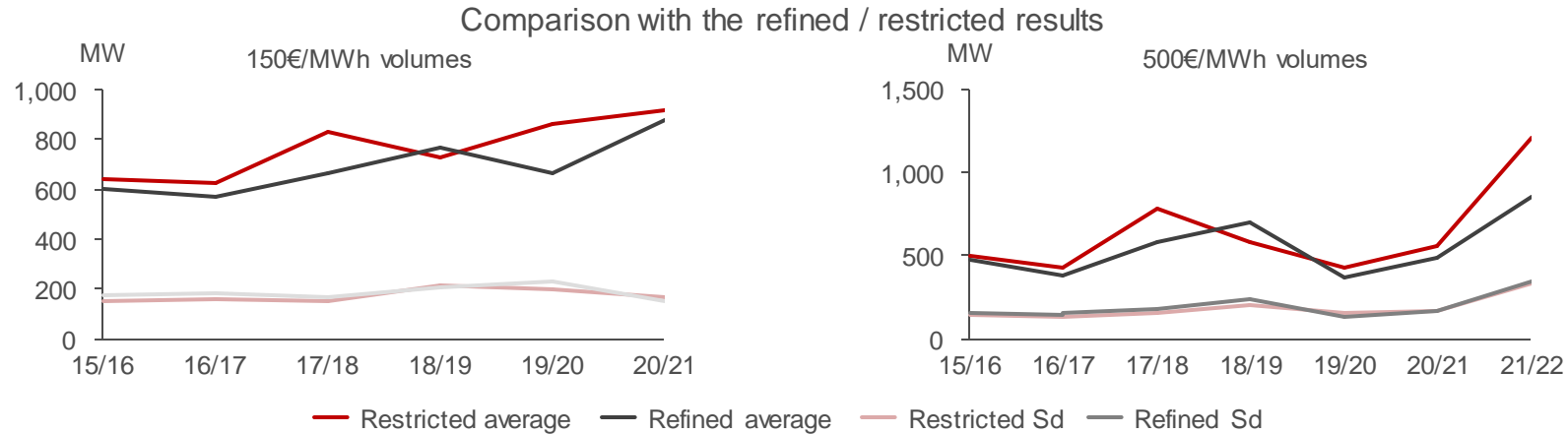


Note: refined dataset - yy/(yy+1) is from 01/04 of year yy to 31/03 of year (yy+1)
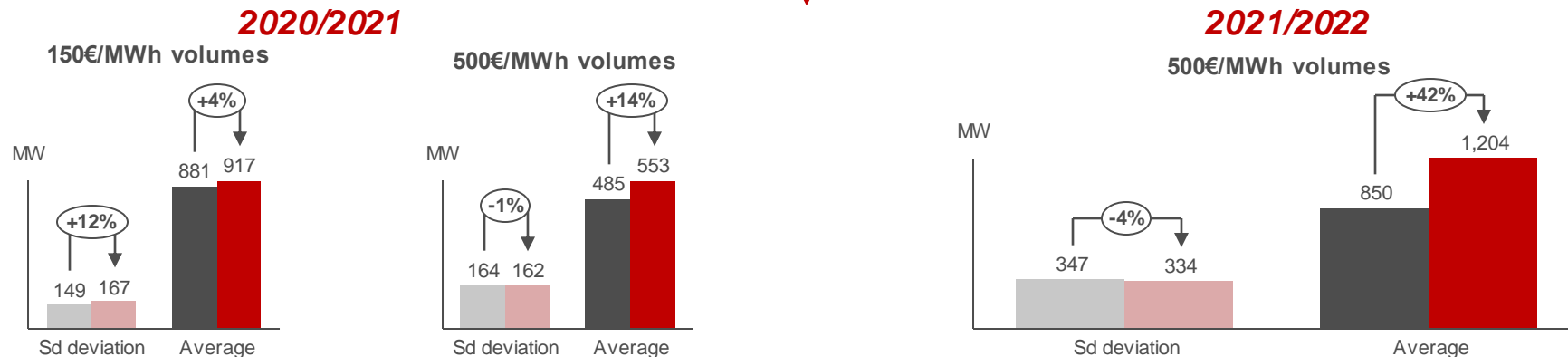
*2020/2021*



*2021/2022*



Source: E-CUBE Strategy Consultants, EPEX SPOT

26

# Winter 2021/2022 results in high market response volumes at the 500€/MWh threshold

MR PER WEEK FOR THE TWO THRESHOLDS AND PER YEAR FOR EPEX SPOT AGG CURVES

Offer + demand (MW)



| | Winter 15/16 | Winter 16/17 | Winter 17/18 | Winter 18/19 | Winter19/20 | Winter 20/21 | Winter 21/22 |
|---|---|---|---|---|---|---|---|
| | 150€/MWh | 150€/MWh | 150€/MWh | 150€/MWh | 150€/MWh | 150€/MWh | 500€/MWh |
| | 500€/MWh | 500€/MWh | 500€/MWh | 500€/MWh | 500€/MWh | 500€/MWh | |

Source: E-CUBE Strategy Consultants, EPEX SPOT
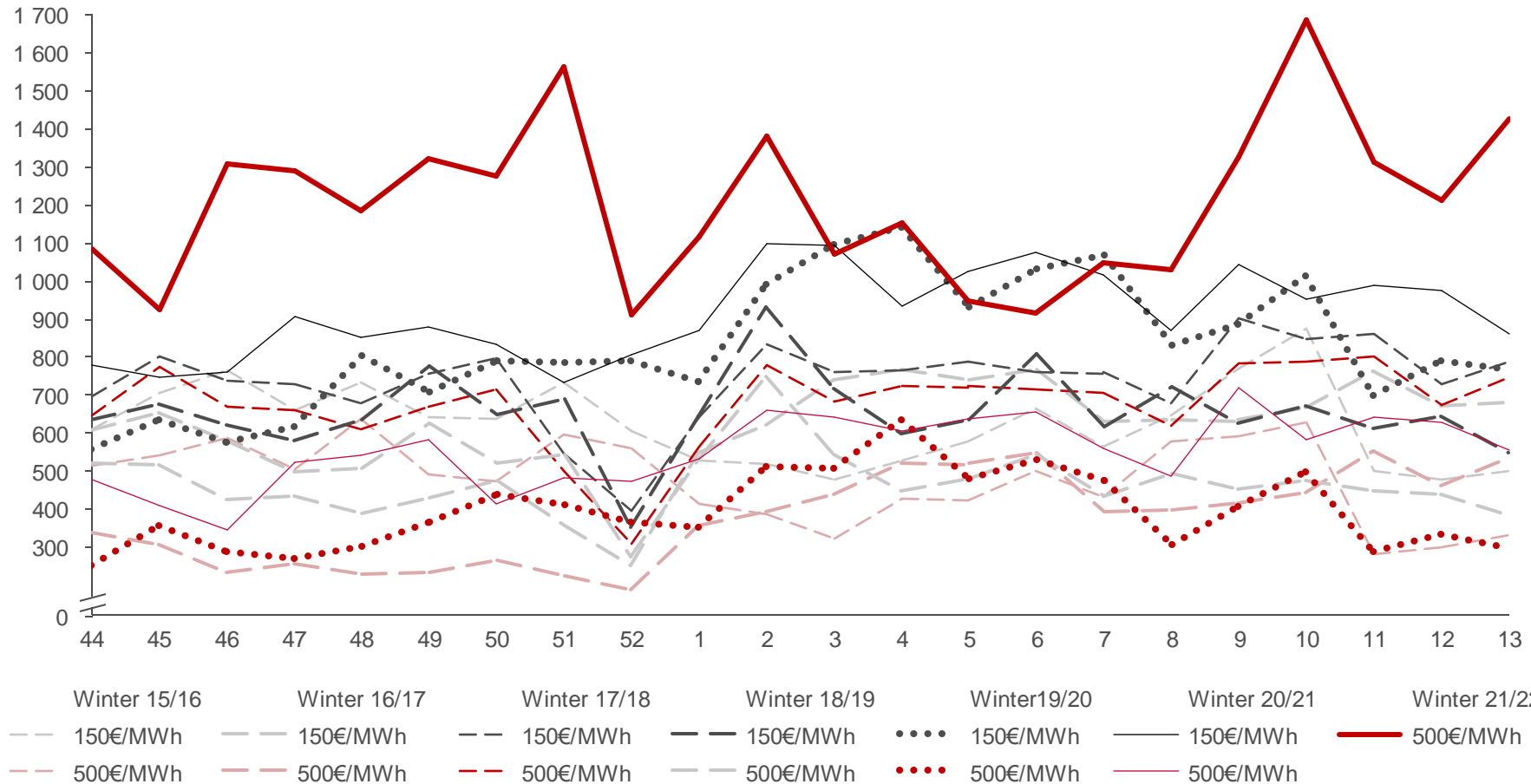
# Working with the 500€/MWh threshold has become more relevant for adequacy in times of high market prices

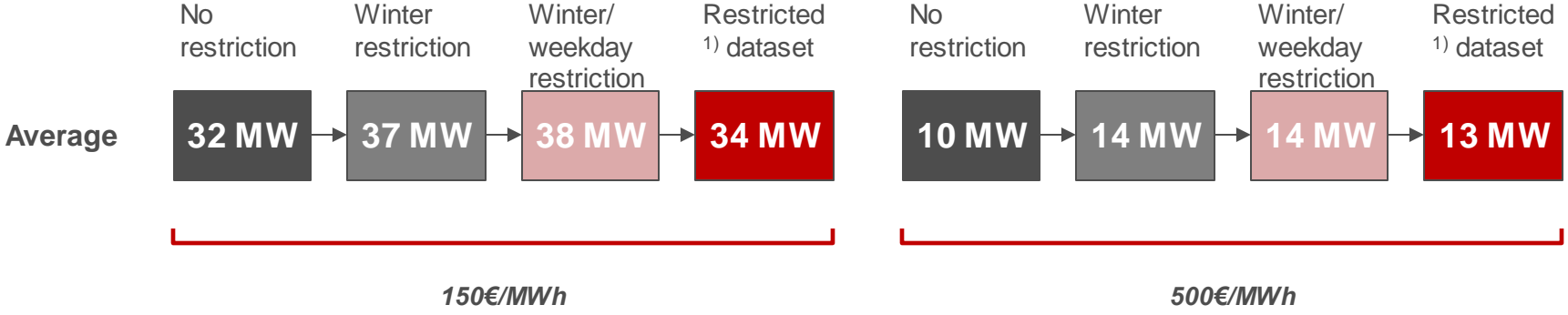MR PER WEEK FOR THE TWO THRESHOLDS AND PER YEAR FOR EPEX SPOT AGG CURVES

Offer + demand (MW)



— Sum Demand + Offer 150    — Sum Demand + Offer 500    -- Average 150    -- Average 500

Source: E-CUBE Strategy Consultants, EPEX SPOT
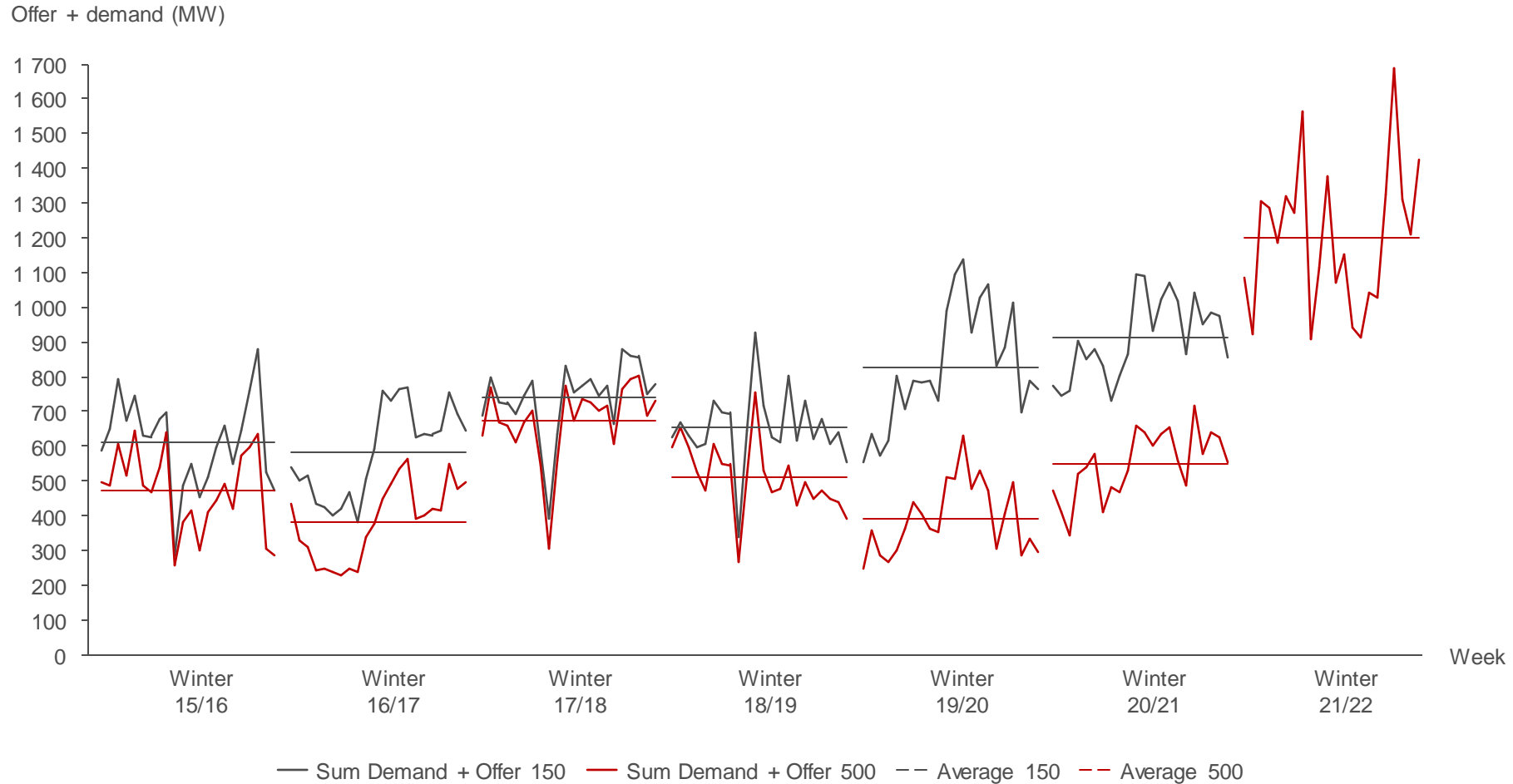
# The average of EPEX SPOT Block Orders has increased significantly between 20/21 and 21/22, following much higher prices and bigger volumes of traded blocks in 2021/2022

MR FOR EPEX SPOT BLOCK ORDERS FOLLOWING THE DIFFERENT DATA RESTRICTIONS

### *2020/2021*

| | No restriction | Winter restriction | Winter/ weekday restriction | Restricted [1] dataset | | No restriction | Winter restriction | Winter/ weekday restriction | Restricted [1] dataset |
|---|---|---|---|---|---|---|---|---|---|
| **Average** | 32 MW | 37 MW | 38 MW | 34 MW | | 10 MW | 14 MW | 14 MW | 13 MW |

*150€/MWh*                                    *500€/MWh*

### 2021/2022

| | No restriction | Winter restriction | Winter/ weekday restriction | Restricted [1] dataset |
|---|---|---|---|---|
| **Average** | 64 MW | 126 MW | 143 MW | 151 MW |

*500€/MWh*

Note : The nature of Block orders makes it that there are no Std deviation data
Source: E-CUBE Strategy Consultants, EPEX SPOT

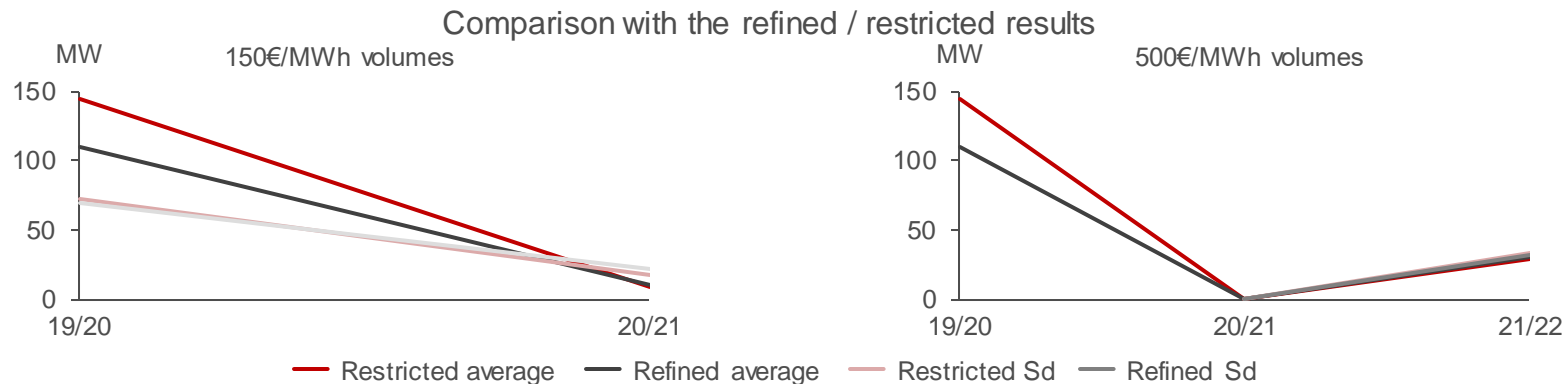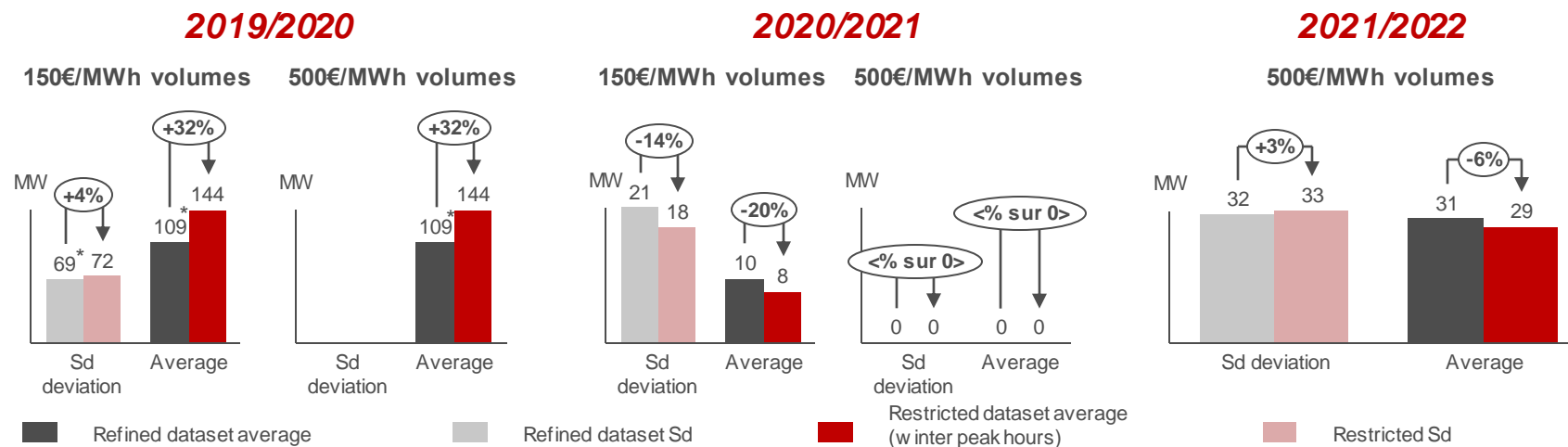1) Restricted data = winter, weekdays, peak hours

# Table of contents

# MR volumes from Nord Pool aggregates curves are still limited

SUMMARY OF THE TWO CATEGORIES (REFINED AND RESTRICTED DATASET) – NORD POOL DATASET

Comparison with the refined / restricted results



Note: yy/(yy+1) is from 01/04 of year yy to 31/03 of year (yy+1)

Legend: ── Restricted average ── Refined average ── Restricted Sd ── Refined Sd

### 2019/2020

**150€/MWh volumes**     **500€/MWh volumes**



### 2020/2021

**150€/MWh volumes**     **500€/MWh volumes**



### 2021/2022

**500€/MWh volumes**



Legend: 
■ Refined dataset average     ■ Refined dataset Sd     ■ Restricted dataset average (winter peak hours)     ■ Restricted Sd

*In 2019/2020 the refined data (Sd & Average) contains the winter restriction MR value

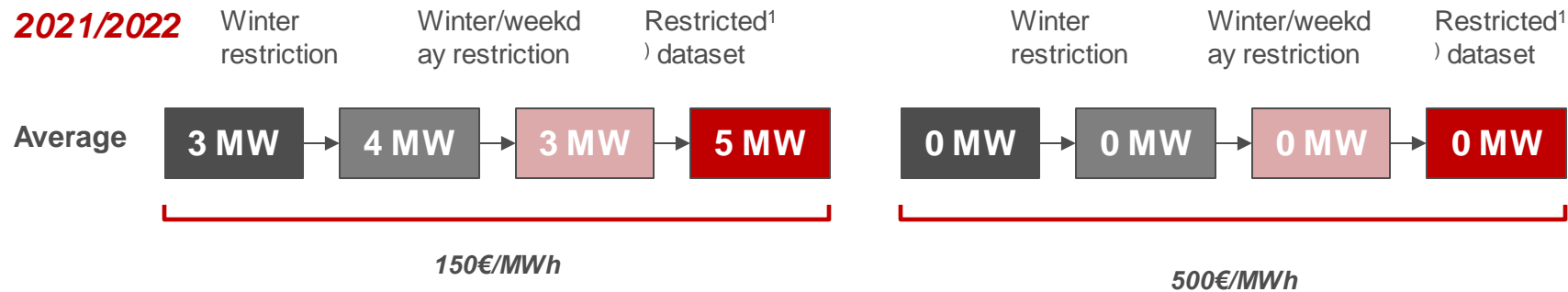Source: E-CUBE Strategy Consultants, Nord Pool

31

# MR for Block Orders from Nord Pool was only of 5MW in 21/22 and only for the 150€/MWh threshold

MR FOR NORD POOL BLOCK ORDERS FOLLOWING THE DIFFERENT DATA RESTRICTIONS
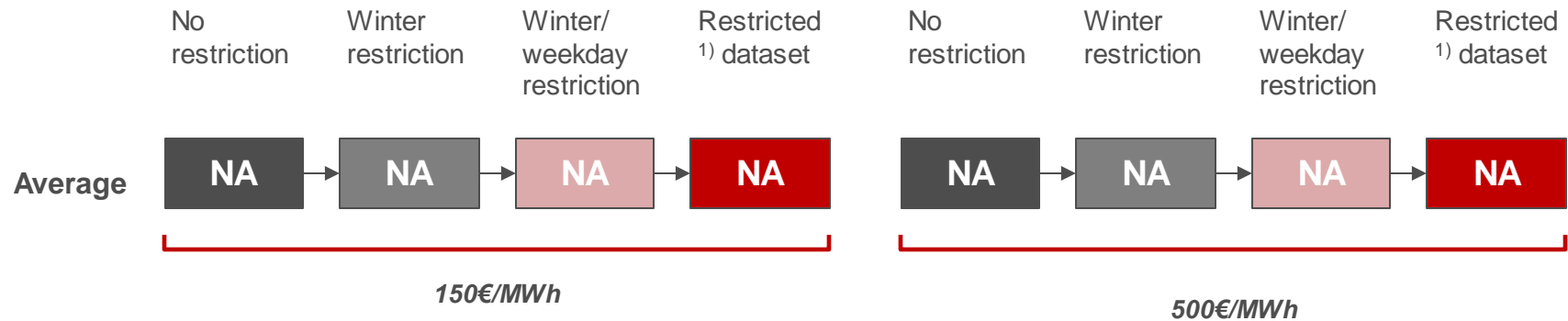
### *2020/2021*

|  | No restriction | Winter restriction | Winter/ weekday restriction | Restricted [1] dataset |  | No restriction | Winter restriction | Winter/ weekday restriction | Restricted [1] dataset |
|---|---|---|---|---|---|---|---|---|---|
| **Average** | **NA** | **NA** | **NA** | **NA** |  | **NA** | **NA** | **NA** | **NA** |

*150€/MWh*                     *500€/MWh*

### *2021/2022*

|  | Winter restriction | Winter/weekd ay restriction | Restricted[1] dataset |  | Winter restriction | Winter/weekd ay restriction | Restricted[1] dataset |
|---|---|---|---|---|---|---|---|
| **Average** | **3 MW** | **4 MW** | **3 MW** | **5 MW** | **0 MW** | **0 MW** | **0 MW** | **0 MW** |

*150€/MWh*                     *500€/MWh*

Note : The nature of Block orders makes it that there are no Std deviation data
Source: E-CUBE Strategy Consultants

1) Restricted data = winter, weekdays, peak hours
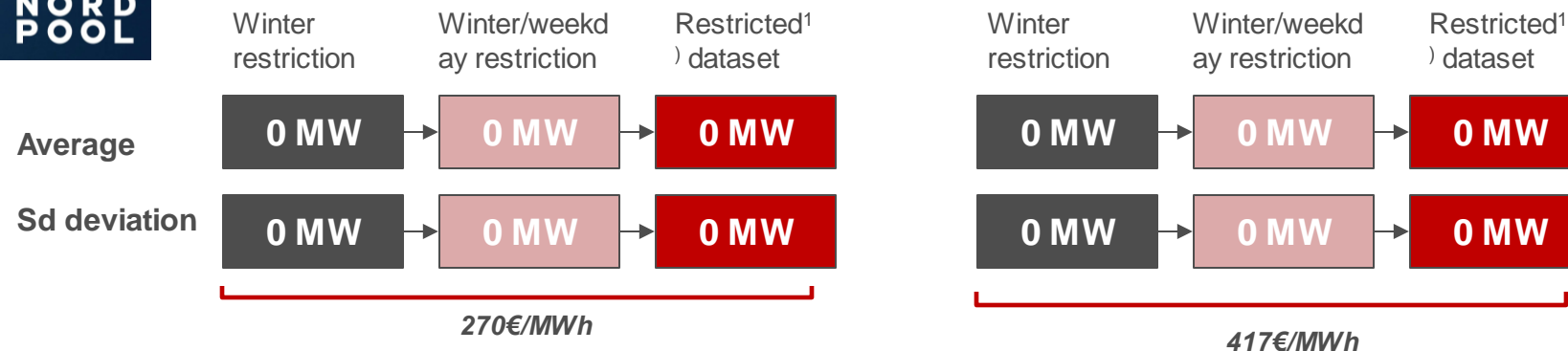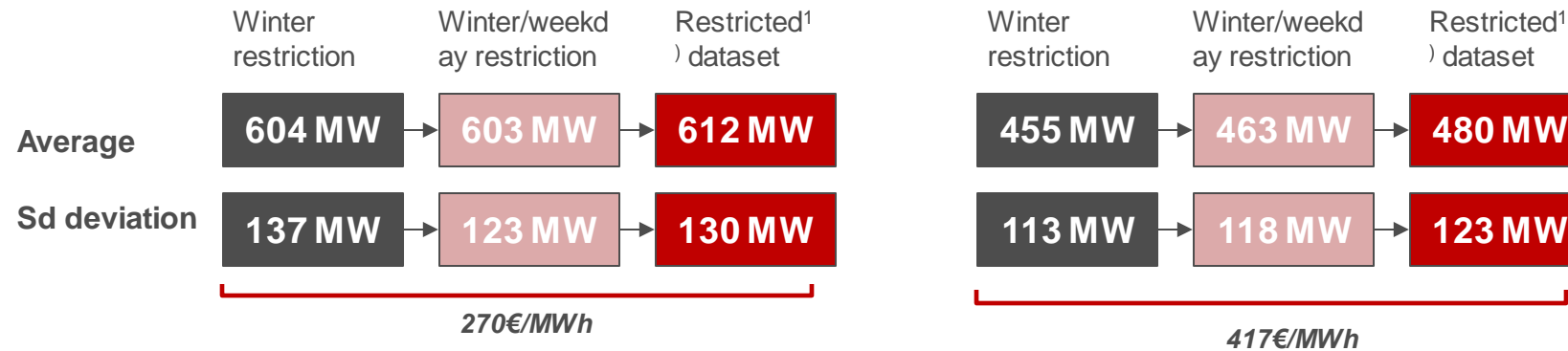
# Table of contents

# In 2020/2021, the average MR is respectively 612 MW & 480 MW for the 270€/MWh and 417€/MWh strike price thresholds

MR AND STD FOR EPEX SPOT & NORD POOL AGGREGATED CURVES FOR THE DIFFERENT DATA RESTRICTIONS

### *2020/2021*

#### › epexspot

|  | Winter restriction | Winter/weekday restriction | Restricted[1] dataset |  | Winter restriction | Winter/weekday restriction | Restricted[1] dataset |
|---|---|---|---|---|---|---|---|
| **Average** | 604 MW → | 603 MW → | 612 MW |  | 455 MW → | 463 MW → | 480 MW |
| **Sd deviation** | 137 MW → | 123 MW → | 130 MW |  | 113 MW → | 118 MW → | 123 MW |
|  |  | *270€/MWh* |  |  |  | *417€/MWh* |  |

#### NORD POOL

|  | Winter restriction | Winter/weekday restriction | Restricted[1] dataset |  | Winter restriction | Winter/weekday restriction | Restricted[1] dataset |
|---|---|---|---|---|---|---|---|
| **Average** | 0 MW → | 0 MW → | 0 MW |  | 0 MW → | 0 MW → | 0 MW |
| **Sd deviation** | 0 MW → | 0 MW → | 0 MW |  | 0 MW → | 0 MW → | 0 MW |
|  |  | *270€/MWh* |  |  |  | *417€/MWh* |  |

Source: E-CUBE Strategy Consultants, EPEX SPOT, Nord Pool
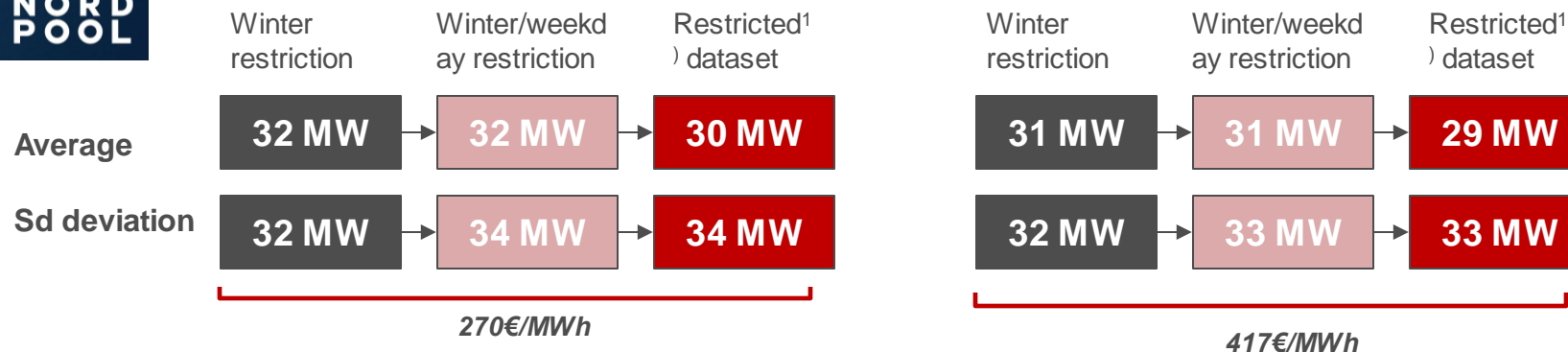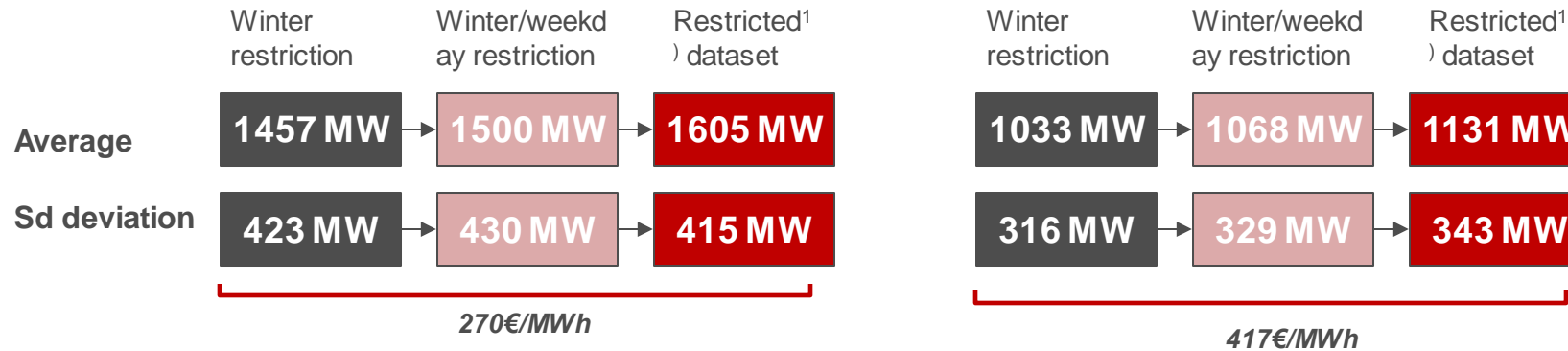
1) Restricted data = winter, weekdays, peak hours

# In 2021/2022, the average MR is respectively 1635 MW & 1160 MW for the 270€/MWh and 417€/MWh strike price thresholds

MR AND STD FOR EPEX SPOT & NORD POOL AGGREGATED CURVES FOR THE DIFFERENT DATA RESTRICTIONS

### *2021/2022*

› epex spot

| | Winter restriction | Winter/weekday restriction | Restricted[1] dataset | | Winter restriction | Winter/weekday restriction | Restricted[1] dataset |
|---|---|---|---|---|---|---|---|
| **Average** | 1457 MW | → 1500 MW | → 1605 MW | | 1033 MW | → 1068 MW | → 1131 MW |
| **Sd deviation** | 423 MW | → 430 MW | → 415 MW | | 316 MW | → 329 MW | → 343 MW |

*270€/MWh*      *417€/MWh*

NORD POOL

| | Winter restriction | Winter/weekday restriction | Restricted[1] dataset | | Winter restriction | Winter/weekday restriction | Restricted[1] dataset |
|---|---|---|---|---|---|---|---|
| **Average** | 32 MW | → 32 MW | → 30 MW | | 31 MW | → 31 MW | → 29 MW |
| **Sd deviation** | 32 MW | → 34 MW | → 34 MW | | 32 MW | → 33 MW | → 33 MW |

*270€/MWh*      *417€/MWh*

Source: E-CUBE Strategy Consultants, EPEX SPOT, Nord Pool

1) Restricted data = winter, weekdays, peak hours

# Ancillary services represent 350 MW in 2020/2021 and 360 MW in 2021/2022

CALCULATION OF ANCILLARY SERVICES

To calculate the volume of ancillary services we took the weighted (by demand response) sum of :

| | *2020/2021* | *2021/2022* |
|---|---|---|
| 1) FCR (Frequency Containment Reserves) | 25 MW | 45 MW |
| 2) aFRR (Automatic Frequency Restoration Reserves) | 6 MW | 24 MW |
| 3) mFRR (Manual Frequency Restoration Reserves) | 340 MW | 340 MW |
| **+** | | |
| | 371 MW | 409 MW |

Source: historical numbers from Elia database

# Table of contents

# Market Response increases significantly in 2021/2022

TOTAL MR IS THE SUM OF MR FROM AGGREGATED CURVES AND BLOCK ORDERS

**150 €/MWh Market Response**

**500 €/MWh Market Response**

EPEX SPOT aggregated curves
EPEX SPOT Block orders

Nord Pool aggregated curves
Nord Pool Block Orders

Restricted · *2020/2021*

| 917 MW |
| + |
| 34 MW |
| + |
| 8 MW |
| + |
| − |

= **Total restricted** · **959 MW**

Restricted · *2020/2021*

| 553 MW |
| + |
| 13 MW |
| + |
| 0 MW |
| + |
| − |

= **Total restricted** · **566 MW**

EPEX SPOT aggregated curves
EPEX SPOT Block orders

Nord Pool aggregated curves
Nord Pool Block Orders

Restricted · *2021/2022*

| 1.204 MW |
| + |
| 151 MW |
| + |
| 29 MW |
| + |
| 0 MW |

= **Total restricted** · **1.384 MW**

Source: E-CUBE Strategy Consultants

# The update of the study leads to a 959 MW Market Response for 2020/2021 and 1.384 MW for 2021/2022

OUTPUT OF MR VOLUMES

*Output 2020/2021*

Market Response Volume **959 MW[1]**

*Output 2021/2022*

Market Response Volume **1.384 MW[2]**

1) 150 €/MWh winter peak hours taken as basis (restricted hours)
2) 500 €/MWh winter peak hours taken as basis (restricted hours)
Source: E-CUBE Strategy Consultants

# The historical long-term evolution of total Market Response is around 8%

EVOLUTION OF THE VOLUMES OF MARKET RESPONSE - WINTER MONTHS[1] & GROWTH SCENARIOS

**Evolution of the volumes of MR (historical CAGR[2])**

MW

8%/y

5% /y

| | Winter 2015/2016 | Winter 2016/2017 | Winter 2017/2018 | Winter 2018/2019 | Winter 2019/2020 | Winter 2020/2021 | Winter 2021/2022 |
|---|---|---|---|---|---|---|---|
| Total | 1 026 | 1 075 | 1 253 | 1 114 | 1 341 | 1 317 | 1 664 |
| Ancillary Services | 414 | 504 | 447 | 393 | 340 | 371 | 409 |
| EPEX agg. Curves | 612 | 571 | 738 | 650 | 835 | 899 | 1 098 |
| EPEX block orders | | | 67 | 70 | 109 | 37 | 126 |
| Nord Pool agg. Curves | | | | | 57 | 10 | 31 |
| Nord Pool block orders | | | | | 0 | 0 | 0 |

To stay coherent with AS volumes, the MR volumes studied here are obtained with the seasonal restriction only: all hours from winter months.

Legend:
- Ancillary Services
- Nord Pool agg. Curves
- Nord Pool block orders
- EPEX agg. Curves
- EPEX block orders

**Growth scenarios**

+1% total market growth

+5% total market growth

+8% total market growth

We believe that the growth rate can be split into three scenarios :
- **1%** as it is the lowest level, based on 2017 approach
- **5%** as 21/22 was a winter with unusual high prices, we therefor suggest in this scenario to consider the growth rate 2015/2016 to 20/21
- **Maximum 8%** as it is the average annual growth of MR volume since winter 2015/2016 and already seen in past years

Note :
1) Winter months: from the 1st of November to the 31st of March, Volumes for **lower bound** (150€/MWh) 15/16 to 20/21. 500€/MWh for the Winter 2021/2022
2) CAGR : Compound Annual Growth Rate

Source: E-CUBE Strategy Consultants, Elia

E-CUBE STRATEGY CONSULTANTS

# CRM: proposal for design evolutions
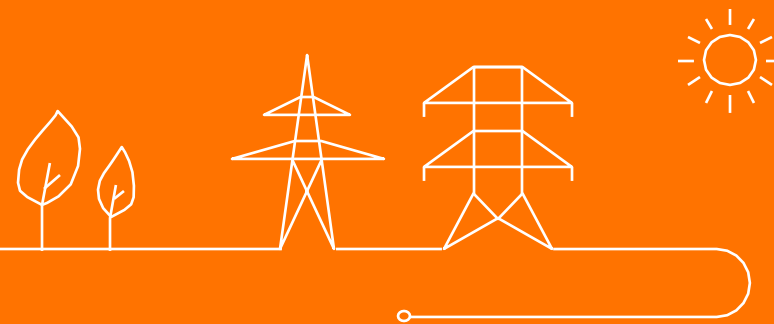
# Context and goal of the design evolutions

Following feedback during the public consultation of the FR v2 and as a result of additional stakeholder feedback, Elia initiated a design review of the CRM. There are some caveats:

- The proposals presented in this presentation form the starting point of a discussion for an evolution of the CRM design.

- The bilateral stakeholder discussion which Elia had do not serve as a public consultation, the proposals will be consulted upon as part of the functioning rules (where applicable) and after discussion in the working group.

- Elia aims to include as many of the proposals as possible in the FR v3 but acknowledges that certain design changes might require a change to the legal framework.

# CRM design elements

| | Evaluation |
|---|---|
| 1) Review of **payback obligation** modalities | ➢ Addressed |
| 2) Review **NRP** determination | ➢ Addressed |
| 3) CRM should be **"winter" product** | ➢ Addressed |
| 4) **Tests for demand response** are too strict (in line with SLA, e.g. testing full nominal capacity for 6 hours) | ➢ Addressed |
| 5) Facilitate participation of **low voltage flexibility** | ➢ (will be) addressed (together with DSOs) |
| 6) **Administrative simplification** (grid user declaration (DP ID), $CO_2$, renunciation of operating aid, …) | ➢ (will be) addressed |
| 7) **Battery degradation** could be better considered in CRM design | ➢ Addressed |
| 8) **Permit request** too strict for battery projects 4 years ahead of delivery period. There is still sufficient time for such projects to get the necessary permits after the auction. | ➢ Not addressed |
| 9) Impact of **derating factor improvement/reduction** | ➢ Addressed |

# CRM design evolutions

Prequalification Processes
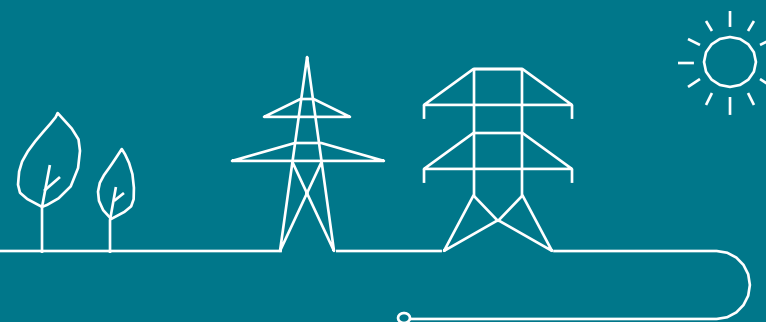
# NRP determination

## AS IS

**Historical method**

– Based on 12 months historical data

– Split into periods of 36 hours

  – For injection: max. variation over 36 hours

  – For offtake or injection/offtake: max. variation over 36 hours, but considering Unsheddable Margin

**PQ test** (in line with above principles)

## TO BE

**Historical method** ✅

– Based on 12 months historical data ✅

– No more 36-hour periods *new*

➤ For injection: max. injection methodology *new*

➤ For offtake or injection/offtake: (simplified) baseline methodology *new*

**PQ test** (in line with above principles) ✅

# NRP determination
## *based on Injection data*

**Historical method**

- Considering **quarter hourly values over a period of 12 months***,

  ending 5 WDs before the last day of the month preceding the PQ file submission date;

- The period is subdivided into time periods of **1 month**;

- For each month, the **lowest quarterly value** is determined

  (which is maximum injection, as injection values are negative);

- **NRP is determined as the <u>average</u> over the <u>lowest three</u> quarter hourly values**

**PQ test**

- **Test date** is defined;

- **NRP is determined as the lowest quarter hourly value observed during the test period, i.e. the 24 hours of the test date**



**NRP = 388,34 MW**

*For linked capacities, the sum of the quarter hourly values across all linked capacities will be considered to determine the NRP. However, to establish the NRP per individual DP/CMU, the same calculation will be done per DP/CMU and these results will be used to allocate the NRP over the individual DPs/CMUs.*
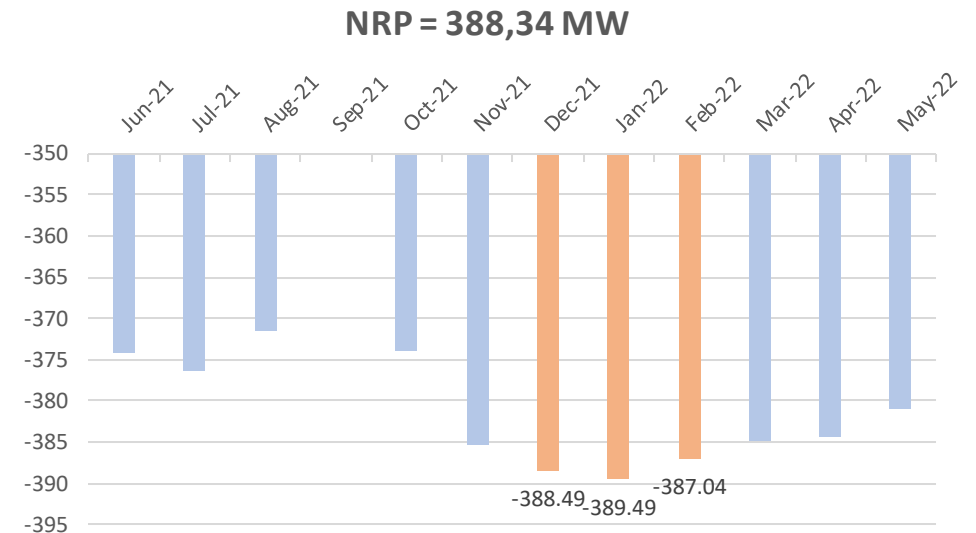
# NRP determination
*based on <u>Offtake or Offtake/injection data</u>*

### Historical method

- Considering **quarter hourly values over a period of 12 months**, ending 5 WDs before the last day of the month preceding the PQ file submission date;

- For each quarter hour part of a weekday or weekend, a **baseline** is established as follows:

  - For quarter hourly values part of a <u>**weekday**</u>, the **average of the <u>four</u> highest out of the <u>five</u> preceding** comparable quarter hourly values;

  - For quarter hourly values part of a <u>**weekend**</u>, the **average of the <u>two</u> highest out of the <u>three</u> preceding** comparable quarter hourly values;

- For each of the above quarter hours, the difference is calculated between on the one hand its baseline and on the other hand, the quarter hourly value or the specified Unsheddable Margin, whichever is highest;

- **NRP is determined as the <u>maximum</u> over all calculated values.**
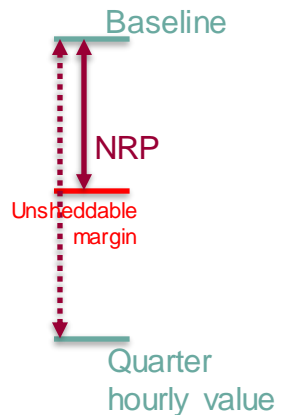
### PQ test

- **Test date** is defined;

- **NRP is determined as the difference between a baseline and the average quarter hourly value measured during the test period, e.g. 1 hour.**

Baseline

NRP

Unsheddable margin

Quarter hourly value

# Battery degradation

More and more (large) batteries are being connected to the grid and show interest to participate in the CRM. Therefore, it becomes relevant to introduce a specific **battery degradation parameter** to allow *batteries* that go for a *multi-year contract* to *maximize the capacity offered in the CRM, without them needing to resort to opt-out*.

**Prequalification process**
- Battery degradation parameter (in %)

**Capacity Contract**
- *Contracted Capacity* evolves over time with battery degradation parameter (linearly)
- SLA does not change

**Availability monitoring**
- Along with Contracted Capacity, also *Obligated Capacity* evolves over time
- Again, SLA does not change
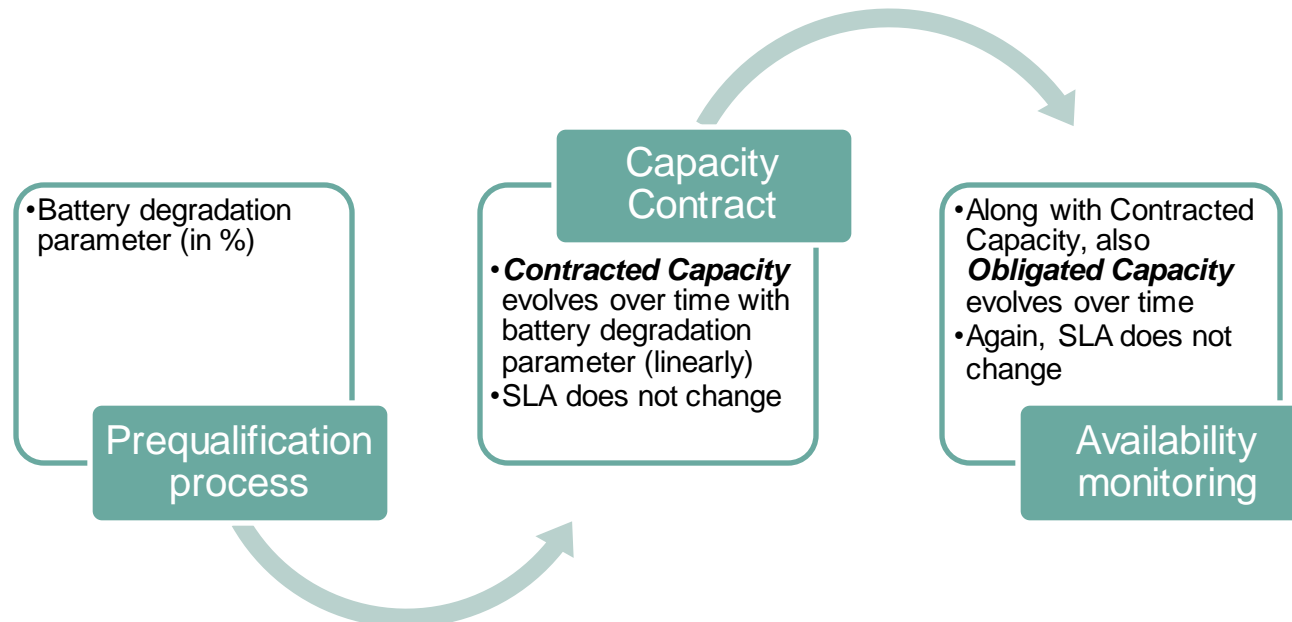
*Note that towards the next Auctions (for Delivery Period 2 and following), the battery degradation volume is reconsidered each time during the Prequalification Process:*

- *The Remaining Eligible Volume is each time calculated as: (NRP – opt-out) * Derating Factor **– Contracted Capacity**;*
- *Hence, the **volume related to the degradation will be part of the Remaining Eligible Volume** and so should be offered in the Auction or part of an upfront opt-out notification.*

49

# Evolution in time of a CMU

The rules regarding evolution in time of a CMU specify **what to do/what can be done with an already prequalified CMU by the CRM Actor or by ELIA** after being engaged in a Transaction or towards a new Transaction (auction or secondary market, already contracted or not, etc.).

The objective of reviewing the evolution in time rules, which become more relevant as more and more auctions are held (hence, work in progress), is to:

- Clarify the rules;

- Simplify the rules;

- Align with IT implementation (tools, data model,...).

## Low-voltage flex participation to CRM

- Strong link with the DSOs;

- Some blocking points have already been identified that currently obstruct the participation of low-voltage flexibility and which have resulted in the following specifications in the CRM Candidate – DSO agreement: **users > 1kV** and **AMR (Automatic Meter Reading)** requirement;

➢ Elia will further engage in discussions with the DSOs

## Participation threshold

- Will be investigated if this threshold needs to be reviewed downwards, also in light of facilitating the low-voltage flex participation;

- This revision should have no impact on the mandatory participation threshold though (to remain at 1MW after derating);

➢ Elia will take up this point with the FPS Economy

## Simplification & process

- Idea is to replace templates as much as possible with simple tick boxes, to give more flexibility to candidate in terms of timings to exchange info, etc.;

➢ Elia is currently working on this

# CRM design evolutions

Impact of Derating factor evolutions
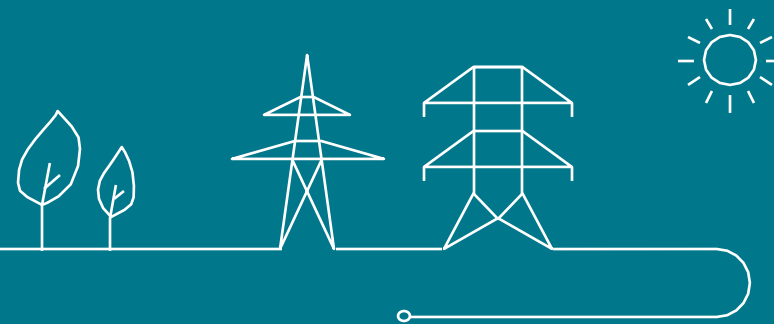
# In its approval of the Functioning Rules V2, CREG has requested Elia to investigate some changes on the derating factor evolution

- Scope of change request CREG entails the **energy-constrained CMUs**

  ➔ No changes apply for non energy-constrained CMUs.

- 

| General principle of CREG proposal for energy constrained CMUs : additional volumes can only be offered in case of an increased obligation | |
|---|---|
| **Additional volumes that can be offered in the auction** | **Additional volumes that are blocked from the auction** |
| Increase of **Nominal Reference Power** | **Increase of derating factor** following an update of the calibration: |
| Decrease of **Opt-out volumes** | ➔ Availability monitoring on Nominal Reference Power, so no additional obligation for the CMU. |
| Increase of derating factor resulting from **more strict SLA** selection ➔ CMU has to deliver a higher service level | ➔ Additional contribution to SoS is covered via a correction in the demand curve *("free additional MWs")*. |

**⇔ FR V2: additional contribution to SoS could be rewarded, even if availability obligation remains unchanged**

➡ **Calculation of eligible volume for the auction & secondary market should make use of the correct derating factors to reflect the principles above (⇔ FR V2: use DRF of most recent transaction).**

# Summary of impact for energy constrained CMUS of CREG proposal

| | DRF decrease | DRF increase |
|---|---|---|
| **Capacity remuneration** | ✓ On fixed contracted capacity (no impact of DRF decrease) | ✓ On fixed contracted capacity (no impact of DRF increase) |
| **Availability Monitoring** | ✓ In function of Nominal Reference Power ➔ no impact in case of decrease derating factor. | ✓ In function of Nominal Reference Power ➔ no impact in case of increase derating factor. |
| **Participation to Auction** | Not applicable (no additional volumes to contract) | ✓ Additional derated capacity can be offered in the auction. ✓ If selected, ✓ Increase of contracted capacity & remuneration. ✓ No increase in availability obligation, but higher SoS. |
| **Participation to Secondary Market** | Not applicable (no additional volumes to contract) | ✓ Additional derated capacity can be offered in secondary market (cf. most recent published derating factor). ✓ If selected, ✓ Increase of contracted capacity and remuneration. ✓ No increase in av. obligation, but higher SoS. |
| **Dummy bid** | **Increase** volume to procure in demand curve in function of **decreased** derating factor. | **Decrease** volume to procure in demand curve in function of **increased** derating factor. |

# CRM design evolutions

Pre-delivery Monitoring
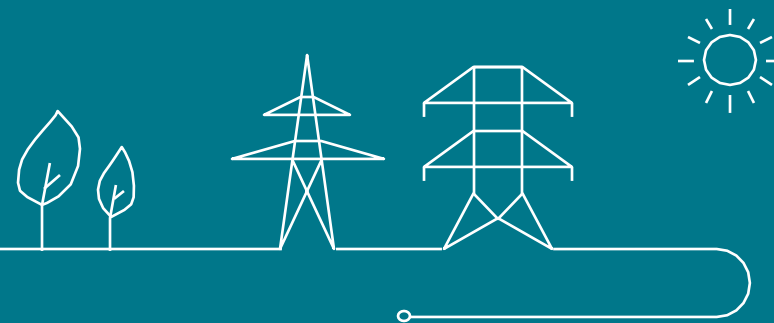
# On August 31 2023, the first $t_{control\ 1}$ will take place

| Prequalification | Pre-delivery | Delivery |
|---|---|---|

**August 31 Y-2**

**Y-1 Auction**

**October 31 Y**

| Pre-delivery monitoring **phase 1** *25 months* | Pre-delivery monitoring **phase 2** *23 months* |
|---|---|
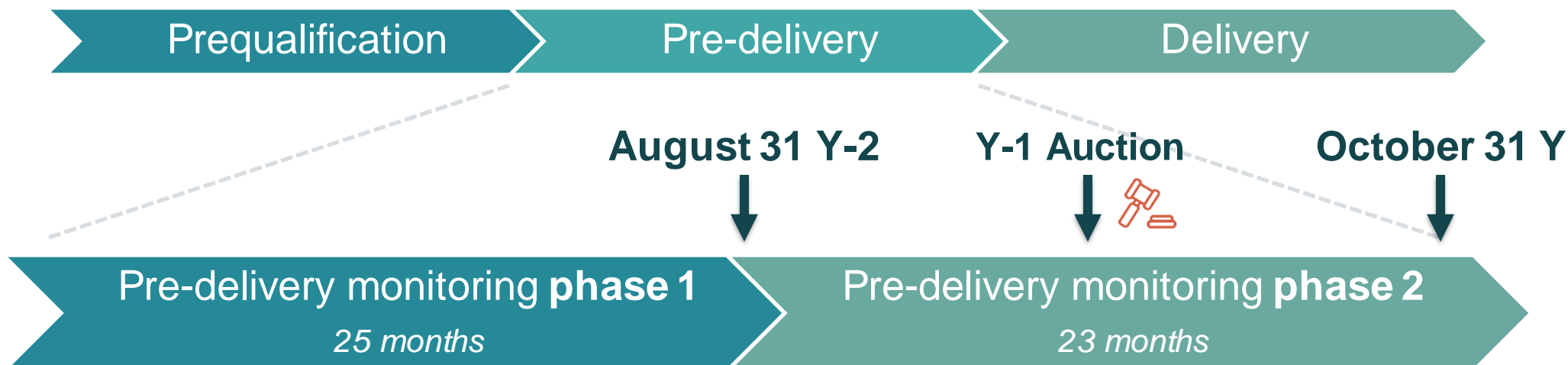
- Determination of Missing Volume through measurements
  - Historical data
  - Requested pre-delivery test
- For CMUs linked to DSOs, data would need to be provided to Elia
- Elia has 20 WD to complete the pre-delivery activity report
- Elia proposes that the DSOs have **10 WD** to provide the data
  - With data that is at that point available and validated

# Proposal: strengthen link between PQ and Pre-delivery

1. **Completely align the volumes determination for Prequalification and Pre-delivery**

    - Both for determination based on historical data and pre-delivery test
    - Main difference: historic data over a 12-month rather than a 15-month period

2. **A new volume determination for an <u>Existing</u> CMU is not necessary if <u>over the last year</u> a determination also happened in the framework of**
    - PQ for other Delivery Periods
    - Parallel Pre-delivery Periods
    - NRP determination for changing from Additional to Existing CMU

    - ➢ Avoids unnecessary work, both for Elia and the Capacity Provider
    - ➢ The CMU can request an updated volumes determination when he does not want to make use of past results

# CRM design evolutions

Availability Obligation
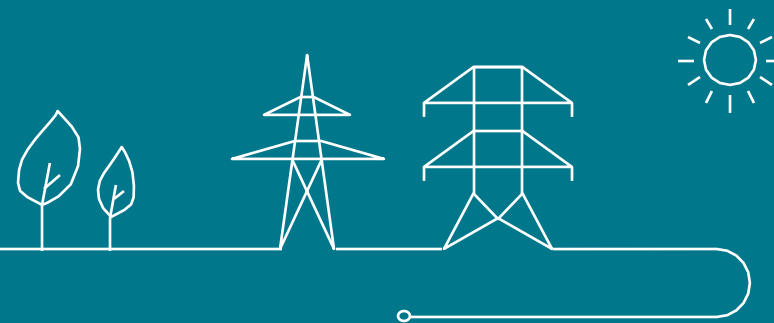
# Market parties have at multiple occasions expressed their concerns about the availability tests

- Availability Tests are aimed at CMUs with high occurrences of Unproven Capacity or failed instances of Availability Monitoring

    - In practice, these will mainly target DSR

- Market parties have drawn the attention to two main concerns

    - The timing of tests: testing could occur when DSR-units are not available, such as during Summer

    - The costs of tests: testing for full SLAs at moments with relatively low prices would result in major losses

- The existing principles of Availability Testing are solid, but could be refined in the upcoming update of the Functioning Rules

# Proposal: restrict the potential moments and duration of an Availability Test

- As is:

    - No clear-cut restrictions in FR, but Elia has committed in slides that it will "avoid days with particularly low risk on adequacy"

    - A CMU can immediately be tested for its full SLA

- To be:

    - Elia will analyze the monthly scarcity situations based on the best available information. This can result in the absence of Availability Tests during the summer.

    - Note that this does not remove the Availability Obligation:

        ➢ Availability Monitoring remains active

    - In first instance, only testing for a quarter hour

        ➢ Only if a previous test failed, tests for full SLA are possible

        ➢ A CMU can always request a test on its own that will always be a quarter hour to avoid a future full SLA test

[FIGURE 5-22] — DISTRIBUTION OF THE SCARCITY HOURS OVER THE WINTER MONTHS FOR BELGIUM ('EU-BASE' SCENARIO)
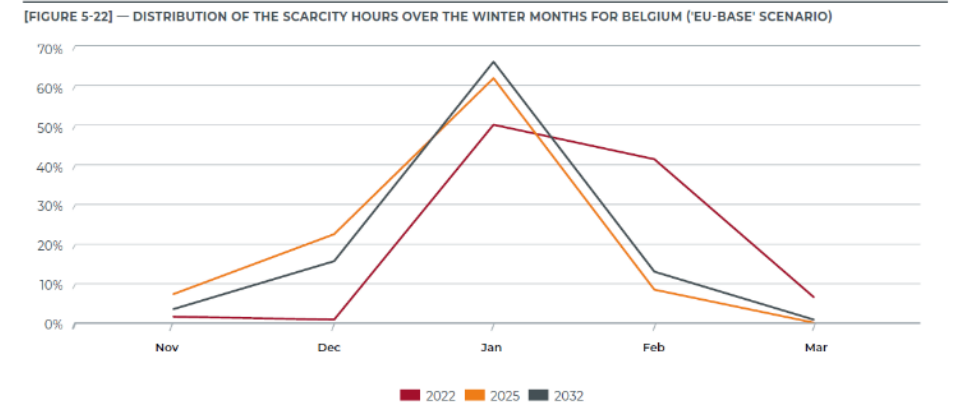
# CRM design evolutions

Payback obligation
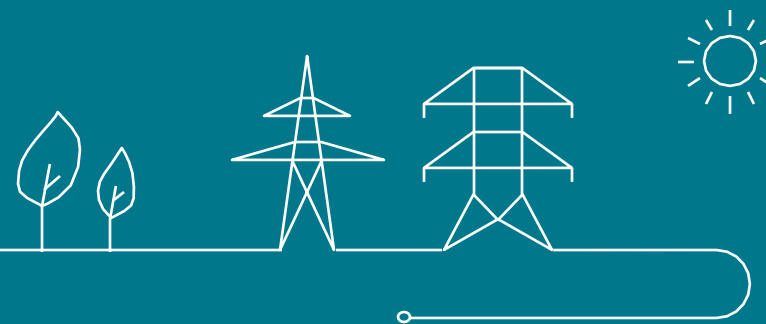
# Payback Obligation: reminder of the design choices from the past
## Reliability option has always been a compromise

- The first CRM design proposals regarding the Payback Obligation aimed at keeping the CRM as a **technology neutral** mechanism with **limited overall costs** and **avoiding windfall profits** :

  - After lengthy discussions, the idea of a **single** strike price was retained :

    - It ensured a certain level playing field between CRM participants.

    - It avoided the complexity of multiple strike prices.

  - It was also decided not to consider any payback exemptions linked to e.g. hedging as such behavior eventually boiled down to an **individual** market actor's choice.

  - However, the concept of a single strike price was complemented with its possible substitution by a **Declared Market Price (DMP)** for units without a daily schedule **:**

    - The underlying idea behind such DMP was to avoid that such units would not have to payback at the level of the calibrated strike price if it did not cover their high activation costs.
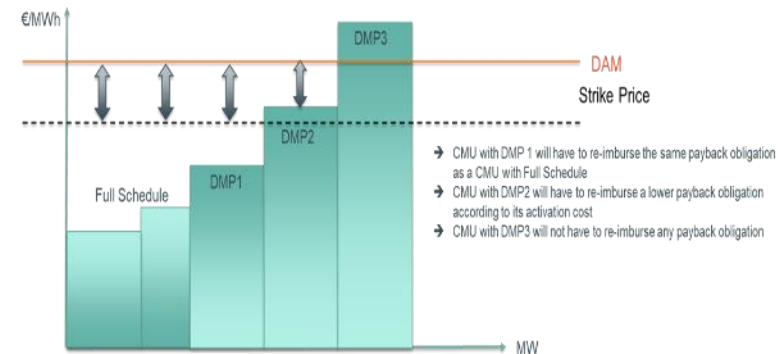


  - An indexation mechanism looking at the evolution of DA prices between the auction and the second delivery period was also foreseen for multi-year contracts according to the Royal Decree Methodology.

- ➤ Following a **repeated feedback** from market parties on the Payback Obligation given the current market prices and following Haulogy's recommendations on the matter, Elia understands the need to reconsider some design aspects of the Payback Obligation.

## Payback Obligation: reminder of the main design objectives
### The design of the Payback Obligation should find a balance between capturing windfall profits and technology neutrality/openness

- The design of the Payback Obligation mechanism should respect certain principles highlighted in European Commission decision on the Belgian CRM (306) :

  *"There should be a realistic chance of being exposed to the strike price in the event of peak prices to **avoid windfall profits**"*
  *"Capacities should not be excluded from the CRM in case they only activate a market price higher than the strike price level" // **technology neutrality/openness***

- This is confirmed by the Royal Decree Methodology as well :

  - *"27§ 1. De methodologie voor de kalibratie van de uitoefenprijs bestaat erin om een actualisering van het niveau van de uitoefenprijs te bepalen binnen een vooraf bepaald spectrum, waarbij ervoor wordt gezorgd dat in de eenvormige day-aheadkoppeling een **redelijk capaciteitsvolume wordt aangeboden en in de eenvormige day-aheadkoppeling wordt gekozen vooraleer de uitoefenprijs bereikt is**."*

➔ From the above and following unexpected recent events in the energy market, the current design of the Payback Obligation does not seem to fit anymore with the above-mentioned principles :

  ➔ The current strike price kept 'as is' would potentially lead to **persistent payback obligation events** for certain technologies (exceeding the realistic aspect of it) and could **prevent their participation** to the CRM.

  ➔ Moreover, Elia has been repeatedly informed by several market parties that the current Payback Obligation design is perceived as a **barrier of entry to the CRM**.

- Finally, taking into account feedback from market parties to improve and modify the payback obligation design was crucial for the European Commission to approve the payback obligation modalities:

  *"The Commission also notes that the mechanism of the payback obligation in the Belgian CRM has been significantly modified and improved following public consultations. (514) The Commission therefore considers that the mechanism of the payback obligation strikes the appropriate balance between the two competing goals referred to in recital (512)."*

# Current issue: given current prices and repeated feedback from several market parties, a redesign of the payback obligation might be needed
**new design proposals seem inevitable**

- Current design

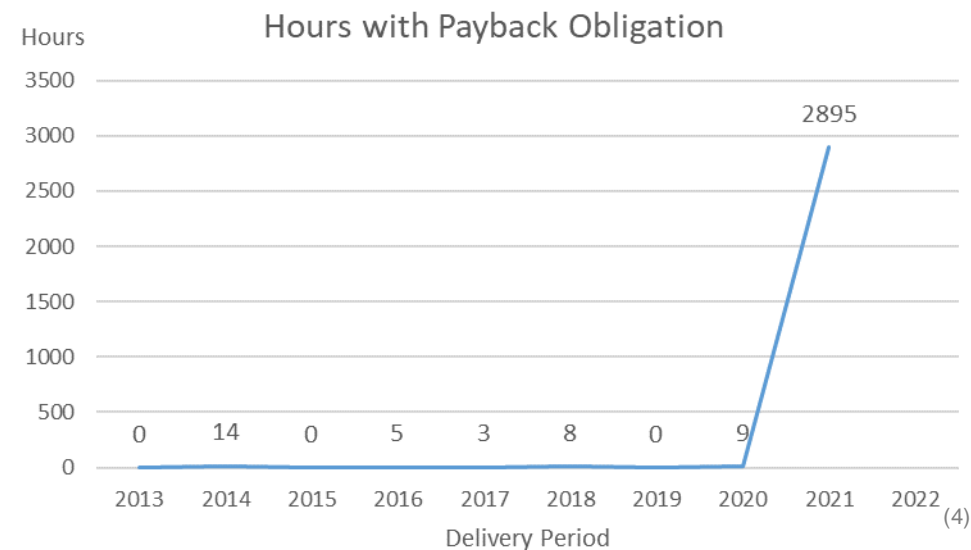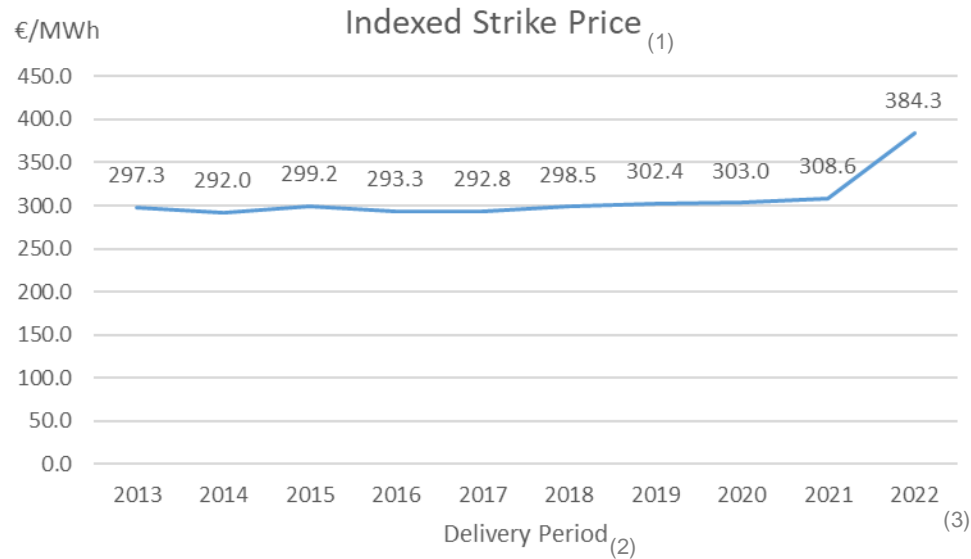| | **Daily Schedule** | **Non-Daily Schedule** |
|---|---|---|
| Energy Constrained | Single strike price | Declared Market Price |
| Non-Energy Constrained | Single strike price | Declared Market Price |

- Possible design solution

| | **Daily Schedule** | **Non-Daily Schedule** |
|---|---|---|
| Demand response | N/A | Payback obligation exemption |
| Other | Redesign of calibration of uniform strike price. | Declared Market Price (no change) |

**Retroactive application of the design changes has to be investigated**

# The current design does not seem to prove adequate for the current sharp increases in price

## Indexed Strike Price (1)

€/MWh



| Year | Value |
|------|-------|
| 2013 | 297.3 |
| 2014 | 292.0 |
| 2015 | 299.2 |
| 2016 | 293.3 |
| 2017 | 292.8 |
| 2018 | 298.5 |
| 2019 | 302.4 |
| 2020 | 303.0 |
| 2021 | 308.6 |
| 2022 | 384.3 (3) |

Delivery Period (2)

## Hours with Payback Obligation

Hours

| Year | Value |
|------|-------|
| 2013 | 0 |
| 2014 | 14 |
| 2015 | 0 |
| 2016 | 5 |
| 2017 | 3 |
| 2018 | 8 |
| 2019 | 0 |
| 2020 | 9 |
| 2021 | 2895 |
| 2022 | (4) |

Delivery Period

- Applying the current Payback Obligation design on historical prices shows that the indexed Strike Price would result in a persistent amount of payback occurrences pre-2021.

- The current indexation method proves inadequate to deal with soaring energy prices, resulting in persistent Payback Obligation events.

- A redesign of such mechanism should ideally be able to deal with unexpected sustained price increases.

Remarks:
(1) Based on a Strike Price of 300 €/MWh indexed on historical prices based on the formula 'as is'.
(2) Delivery Period is defined as 01/11/Y – 31/10/Y+1
(3) Only prices until 08/09/2022 are used
(4) prices for DY 2022 are not available

# Several market parties proposed repeatedly an exemption on the payback obligation for demand response capacities.

**DSR example* :**

**Situation:**
Added value of production = 500 €/MWh
Elia strike Price = 300 €/MWh
Day-ahead (DA) price = 700 €/MWh

### (DMP* = 2000€/MWh) No CRM activation

| | | |
|---|---|---|
| Cost of buying electricity | €/MWh | -700 |
| Added value of production | €/MWh | 500 |
| Pay-back obligation | €/MWh | / |
| **Net position** | **€/MWh** | **-200** |

### (DMP* = 500 €/MWh) With CRM activation

| | | |
|---|---|---|
| Cost of buying electricity | €/MWh | 0 |
| Added value of production | €/MWh | 0 |
| Pay-back obligation | €/MWh | -200 |
| **Net position** | **€/MWh** | **-200** |

A demand response asset that participates in CRM will incur a financial loss when high DA are above its added value both when they price the DMP at or way above the added value of production
**A payback obligation cannot be justified for consumption assets,**

➜ By nature, DSR does not generate inframarginal rents during moments of extremely high prices as they do not consume, whereas these capacities are subject to a payback obligation as soon as DMP is exceeded.

➜ DSR capacities cannot declare extremely high DMP (cf. example to the left) as this would imply that they need to continue consuming energy (➜ producing at a loss) as long as their DMP is not exceeded to avoid availability penalties.

* Example taken from the public consultation response on the FRv2

# Summary of different choices for the strike price indexation

## 1) When to apply the indexation of the calibrated strike price?

| Ex-ante | | Ex-post |
|---|---|---|
| Between Auction & 2nd Delivery Period | Between Auction & 1st Delivery Period | During the delivery period |
| ✓ Current design<br>✓ Only for multi-year contracts.<br>✓ Does not solve lag between current and past prices. | ✓ Cf. Haulogy's recommendation.<br>✓ Use improved indexation formula.<br>✓ Does not solve lag between current and past prices. | ✓ Monthly indexation based on the evolution of pre-defined parameter(s).<br>✓ Strike price follows market trends and ensures windfall profits are still captured. |

## 2) How to calculate the ex-post monthly indexed strike price?

**Increasingly tailor-made** →

| DAM evolution | CO2 & gas price driven | Unit specific DMP |
|---|---|---|
| ✓ Current design is DAM-driven.<br>✓ Technology-neutral | ✓ Less technology-neutral.<br>✓ Linked to marginal costs of most units in this category.<br>✓ EC precedents (Italy, Ireland). | ✓ Not considered as it could open the door for gaming ➔ payback obligation risks to become an empty box. |

# This leads to different options for the uniform strike price redesign

**This overview of proposed solutions aims at summarizing considered options**

| | Option A: As Is | Option B: Haulogy proposal | Option C: Ex-post indexation DA | Option D: Ex-post indexation based on fuel and $CO_2$ prices | Option E: Combination of max (B & D) | Option F: A or B + more granular stop-loss |
|---|---|---|---|---|---|---|
| **What** | - Only ex-ante indexation from 2nd Delivery Period<br>- No ex-ante indexation for 1s Delivery Period<br>- DAM driven | - Ex-ante indexation from 1st Delivery Period (cf. Haulogy)<br>- DAM driven<br>- Complemented with finetuned indexation formula | - DAM driven.<br>- On a monthly basis | - Gas prices and $CO_2$ prices driven<br>- On a monthly basis | - Ex ante indexation with a back-stop mechanism in case of price shocks in fuel markets | - Monthly or weekly stop-loss |
| **+** | - Simple<br>- Fixed strike price, lower uncertainty for the delivery period | - Simple<br>- Relieves some concerns on LT market trends | - Takes into account ST evolution.<br>- Technology neutral.<br>- Captures windfall profits | - Takes into account ST evolution of underlying price drivers. | - Addresses current concerns of high prices<br>- Impact of fuel prices in extreme situations covered | - Simple<br>- Further decreases risk in case of temporary market trends. |
| **-** | - Does not solve lag between historical and current prices.<br>- Does not address concerns raised by stakeholders | - Unable to capture ST changes.<br>- Indexation based on DAM might not consider evolution of specific drivers such as changes in merit order. | - Indexation based on DAM might not consider evolution of specific drivers such as changes in merit order. | - Complex determination of indexation formula<br>- Selected fuel sources might not determine DAM in the long term. | - Decrease of market prices lags (hence longer time with high strike price) | - Not a solution when prices remain above strike price structurally.<br>- Risk of reducing the efficiency of the Payback Obligation |

# Formulas of proposed solutions regarding the strike price indexation (1/3)

**Option B : Haulogy proposal with adapted indexation concept**

- Indexation as of the 1st Delivery Period and proposed fine-tuning of the indexation formula to better cope with structural market evolutions between the calibration of the strike price and the start of the delivery period.

$$Indexed\ Calibrated\ Strike\ Price\ (CMU_{id}, Transaction_{id}, t)$$
$$= \textbf{Factor}\ (\textbf{t}, \textbf{Auction\ year}, \textbf{Auction\ type}) * Calibrated\ Strike\ Price\ (CMU_{id}, Transaction_{id}, t)$$

- Indexation factor 'as is' : as proposed by Haulogy in their study

$$Factor\ (t, Auction\ year, Auction\ type)$$
$$= 1 + \frac{Average\ DAM\ (DPe_t - 3\ to\ DPe_t - 1) -\ Average\ DAM\ (Auction\ year - 3\ to\ Auction\ year)}{Calibrated\ Strike\ Price\ (Auction\ year)}$$

- Proposed indexation factor 'to be' : as proposed by Elia

**Question : is there a need to consider a floor/cap for the indexed strike price ?**

$$Ex-ante\ indexation\ factor\ (t, Auction\ year, Auction\ type)$$
$$= 1 + \frac{Average\ DAM\ (DPe_t - 3\ to\ DPe_t - 1) -\ Average\ DAM\ (Auction\ year - 3\ to\ Auction\ year)}{Average\ DAM\ (Auction\ year - 3\ to\ Auction\ year)}$$

**This indexation formula is a preliminary example for illustrative purposes.**

# Formulas of proposed solutions regarding the strike price indexation (2/3)

## Option C : ex-post indexation DA

- Ex-post indexation occurring on a monthly basis based on DA prices in order to take into account short term price evolution

$$Ex-post\ indexed\ Calibrated\ Strike\ Price\ (CMU_{id}, Transaction_{id}, t, m)$$
$$= \boldsymbol{Ex-post\ indexation\ Factor}\ (m, DPe_t, DAM_m) * Calibrated\ Strike\ Price\ (CMU_{id}, Transaction_{id}, t)$$

- With as ex-post indexation factor :

$$Ex-post\ indexation\ factor\ (m, DPe_t, DAM_m) = \frac{Average\ DAM_m(last\ year\ that\ ends\ at\ start\ month\ m)}{Average\ DAM\ (Auction\ year - 3\ to\ Auction\ year)}$$

**Questions/aspects to be clarified :**
- **What is the look back horizon for the DAM?**
- **Is there a need to consider a floor/cap for the indexed strike price ?**

$$Ex-post\ indexed\ Calibrated\ Strike\ Price\ (CMU_{id}, Transaction_{id}, t, m)$$
$$= \frac{Average\ DAM_m(last\ year\ that\ ends\ at\ start\ month\ m)}{Average\ DAM\ (Auction\ year - 3\ to\ Auction\ year)} * Calibrated\ Strike\ Price\ (CMU_{id}, Transaction_{id}, t)$$

**This indexation formula is a preliminary example for illustrative purposes.**

# Formulas of proposed solutions regarding the strike price indexation (3/3)

**Option D : ex-post indexation based on fuel and CO2 prices**

- Ex-post indexation occurring on a monthly basis based on fuel & CO2 prices in order to take into account short term market evolution impacting potentially the merit order on DA market.

  - Since the formula would have to be based on parameters to be discussed, here's a potential example coming from the Irish CRM :

$$PSTR_m = Max\left(\frac{1}{FTHEORYPU_y} \times Max\left(PFUELNG_m + (PCARBON_m \times FCARBONING_y), PFUELO_m + (PCARBON_m \times FCARBONIO_y)\right), PTHEORYDSU_y\right)$$

where:

- $FTHEORYPU_y$ is the Peaking Unit Theoretical Efficiency for Capacity Year, y;
- $PFUELNG_m$ is the Natural Gas Fuel Price for Month, m;
- $FCARBONING_y$ is the Natural Gas Carbon Intensity Factor for Capacity Year, y;
- $PFUELO_m$ is the Oil Fuel Price for Month, m;
- $FCARBONIO_y$ is the Oil Carbon Intensity Factor for Capacity Year, y;
- $PCARBON_m$ is the Carbon Price for Month, m; and
- $PTHEORYDSU_y$ is the Demand Side Unit Theoretical Price for Capacity Year, y, d.

| Strike Price Component | Value | Unit |
|---|---|---|
| $PCARBON_m$ | $PCARBON_m$ Index | €/tCO₂e |
| $PFUELNG_m$ | [$PFUELNG_m$ Index (p/therm) x 0.01 (£/p) + $PFUELNG_m$ Transport (£/therm)] x Exchange Rate (€/£) x 9.48 (therm/GJ) x 3.6 (GJ/MWh) | €/MWh |
| $PFUELO_m$ | [$PFUELO_m$ Index ($/t) x Exchange Rate (€/$) + $PFUELO_m$ Transport (€/t)] x 0.025 (t/GJ) x 3.6 (GJ/MWh) | €/MWh |
| $PCARBON_m$ Index | ICE ECX EUA Futures – EUA - (monthly)[14] | €/tCO2e |
| $PFUELNG_m$ Index | ICE UK Natural Gas Index (monthly) | p/therm |
| $PFUELNG_m$ Transport | 0.0424[15] | £/therm |
| $PFUELO_m$ Index | Platt's Forward Curve (monthly) for monthly swap transactions for 1% sulphur free on board (FOB) fuel oil cargoes in North West Europe (NWE) for the relevant month (AAEGR00) | $/t |
| $PFUELO_m$ Transport | 50[16] | €/t |
| $FTHEORYPU_y$ | 15 | % |
| $FCARBONING_y$ | 0.202 | tCO2e/MWh |
| $FCARBONINO_y$ | 0.277 | tCO2e/MWh |
| $PTHEORYDSU_y$ | 500 | €/MWh |
| Exchange Rate (€/£) | The Trading Day Exchange Rate as defined in the Trading and Settlement Code | €/£ |
| Exchange Rate (€/$) | The rate set at 17:00 the day before the Trading Day, from the same source as used for the Trading Day Exchange Rate | €/$ |
| therm per GJ | 9.48[17] | therm/GJ |
| LSFO calorific value | 0.025[18] | t/GJ |

**This indexation formula is a preliminary example for illustrative purposes.**

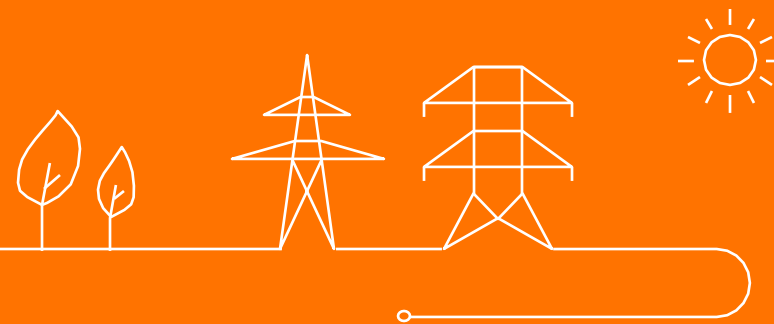# Summary and evaluation of the different options proposed

- Possible design solution

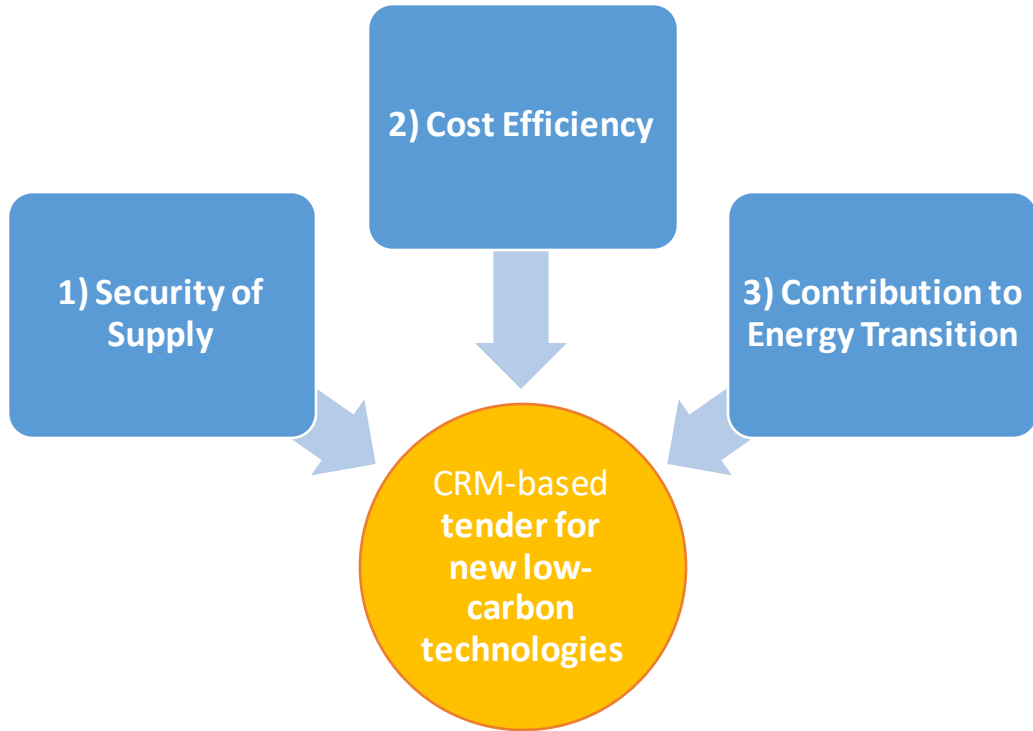| | Daily Schedule | Non-Daily Schedule |
|---|---|---|
| Demand response | N/A | Payback obligation exemption |
| Other | Redesign of calibration of uniform strike price. | Declared Market Price (no change) |

**For new contracts**, a monthly indexation of the strike price based on the DAM prices (option C) seems to be a promising way forward.

**For existing contracts**, an ex-ante indexation based on the Haulogy proposal (option B). It is still to be investigated whether this can be applied retroactively.

# Low carbon tender for '24 – '25

**Reminder: The proposed solution for W24-25 aims to ensure security of supply at the lowest cost while contributing to the energy transition towards a carbon neutral society at the same time.**

```
                    ┌──────────────────┐
                    │ 2) Cost Efficiency│
                    └──────────────────┘
┌──────────────┐              │           ┌──────────────────┐
│ 1) Security of│             ▼           │ 3) Contribution to│
│    Supply     │                         │ Energy Transition │
└──────────────┘                         └──────────────────┘
          ╲            ⬤                      ╱
           ▼      CRM-based                ▼
                  tender for
                  new low-
                  carbon
                  technologies
```

**1**
- Attract **new in-the-market capacities** to cover the need for new MWs in W24-25 to meet the legal reliability standard of LOLE = 3h.
- Design to respect the European guidelines for **capacity mechanisms.**

**2**
- Build further on the **CRM design** to limit additional costs for :
    - The design and implementation of the mechanism.
    - Knowledge building for market parties.
- **Only** reward **new capacities** : tender should be proportionate in view of the less significant gap in W24-25 compared to after '25.
- Avoid double remuneration with CRM.

**3**
- Eligibility criteria will include **strict $CO_2$ emission limits** to ensure that the selected capacities contribute to the Belgian and European targets on carbon neutrality (cf. Fit for 55, Repower EU).

---

- **Goal of the presentation today is to present the high-level design principles for the tender.**
- **Elia will launch a public consultation on the design note mid-October.**

# Core design principles

- ✓ Only acquire **new capacities** that are not/will **not be contributing to SoS** in '24-'25 (alignment with Elia's assumptions in Adequacy & Flexibility Study '23)

- ✓ **Alignment** with **CRM** modalities and processes to **reduce barriers of entry and improve interoperability**

- ✓ **No double remuneration** (CRM & LCT or others)

# Contract Duration & Eligibility

## A) Contract duration

New capacities without a contract through the CRM are
**allowed to bid in for Multi-Year contracts**

→ Through a combination of an LCT and a CRM contract

| LCT contract | CRM contract |
|:---:|:---:|
| | |

**Y1**
**'25**

**Yn**

→ *Delivery period modalities kept identical between LCT and CRM*
→ *Subject to investment file to CREG (in line with CRM)*
→ *1,3,8 and 15 year capacity contract durations (in line with CRM).*

## B) Eligibility criteria

1) All existing capacities that are already contributing to SoS in '24-'25, are excluded
   → Taking into account the exact definition of contributing to SoS *(see further)*

2) A strict $CO_2$ requirement applies to only allow the participation of low carbon technologies.

# Eligibility – Definition of "new" capacities

**General**

Only **Additional "New Build" allowed**, according to definition CRM
- To make sure that only new capacities, not yet contributing to SoS, are procured
- Demand response requires specific definition

**DSR**

Specifically for demand response, **Additional other & Existing** *also allowed*, according to definition CRM
- But only when these are *"non-contributing to SoS"/"new"*

*"Non-contributing to SoS"*

→ No explicit Demand-Response offered (Ancillary Services)
→ No implicit Demand-Response offered (DA/ID market)

*In the last X years before the Auction of the LCT*

Example of possible rule similar to **Strategic Reserves** :
**IF** DAM price on a Belgian NEMO ≥ xxx €/MWh
**OR IF** positive imbalance price ≥ xxx €/MWh
→ Availability percentage of the offered capacity should be higher than xx %

*To be aligned with assumptions in the Adequacy & Flexibility '23 gap determination.*

**The exact definition of eligible demand response capacities to be further developed in the coming weeks.**

# Overview of remaining main design principles

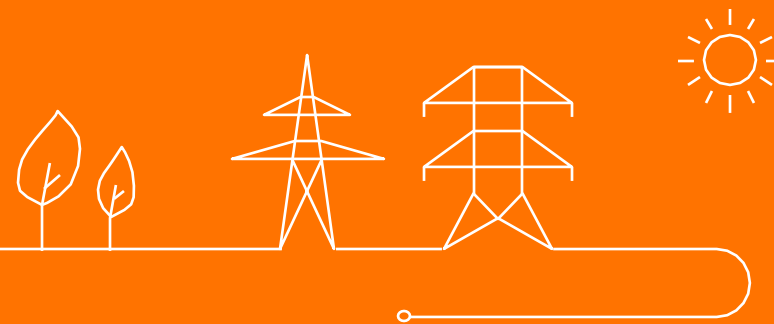| Topic | Proposal | Compatible with current CRM design |
|---|---|---|
| **Link with CRM process** | ✓ LCT clearing before Y-4 CRM auction.<br>✓ LCT prequalified capacities cannot participate in Y-4 CRM auction ('27-'28) | Yes |
| **Prequalification** | ✓ No Virtual CMUs.<br>✓ No Fast Track. | Yes |
| **Pre-delivery/Financial Securities** | ✓ No pre-delivery control for existing CMUs to avoid double testing.<br>✓ No financial security after contract signature for existing CMUs. | Simplification, but requiring update of CRM FR V3. |
| **Availability monitoring & Payback** | ✓ No deviation from CRM design possible. | Yes |
| **Secondary Market** | ✓ Opening of secondary market as of delivery period '24 – '25. | Yes |

# Next meetings
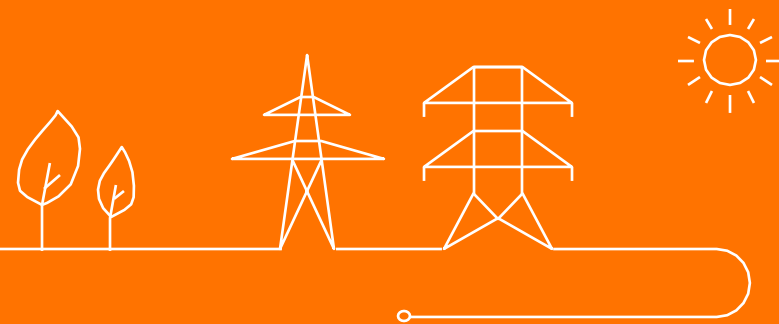
# Foreseen timeslots for next meetings

- Thursday 13th October 2022 **am**

- Friday 28th October 2022 **pm**

- UPDATE Thursday 17th November 2022 **pm**
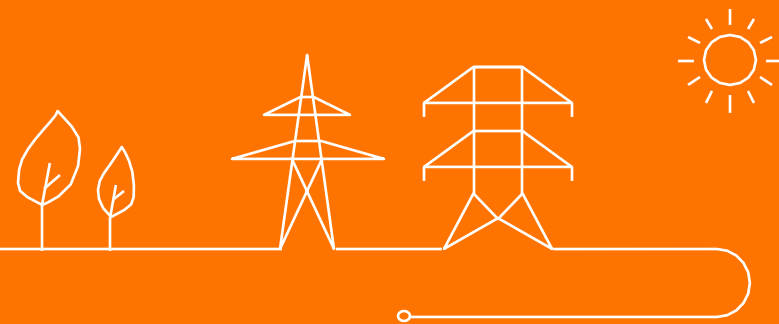
- Friday 16th December 2022 **pm**

- - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - - -

- Thursday 29th September pm Flexibility Workshop

Thank you !

# Back-up slides

# Battery degradation
*Example*

1. The **Battery degradation parameter** (in %) submitted as part of PQ file submission = 5%; NRP = 100 MW; SLA 4 hours; Derating Factor = 50%; Investment File = 8 years;

2. CMU selected in the Auction (50MW, 8-year contract), so **Contracted Capacity** in Capacity Contract evolves as follows:
   - Delivery Period 1 → Contracted Capacity = Volume of Bid selected in the Auction = 50 MW;
   - Delivery Period 2 → Contracted Capacity = (1 – Battery degradation) * Volume of Bid selected in the Auction = (1-5%) * 50 = 47,5 MW;
   - Delivery Period 3 → Contracted Capacity = (1 – 2*Battery degradation) * Volume of Bid selected in the Auction = (1-2*5%) * 50 = 45 MW;
   - …

3. Also the **Obligated Capacity** evolves over time
   - Delivery Period 1 → Obligated Capacity = Contracted Capacity / DF = 50/50% = 100 MW for 4 hours;
   - Delivery Period 2 → Obligated Capacity = Contracted Capacity / DF = 47,5/50% = 95 MW for 4 hours;
   - …

4. Towards the next Auctions, the **Remaining Eligible Volume** equals:
   - Auction for Delivery Period 2 → Remaining Eligible Volume = (NRP – opt-out)*DF – Contracted Capacity = (100 – 0)*50% - 47,5 MW = 2,5 MW;
   - Auction for Delivery Period 3 → Remaining Eligible Volume = (NRP – opt-out)*DF – Contracted Capacity = (100 – 0)*50% - 45 MW = 5 MW;
   - …



Bar chart — legend: Contracted Capacity, Obligated Capacity, Remaining Eligible Volume. Y-axis: Volume [MW].

| Delivery Period | Contracted Capacity | Obligated Capacity | Remaining Eligible Volume |
|---|---|---|---|
| Delivery Period 1 | 50 | 100 | 0 |
| Delivery Period 2 | 47.5 | 95 | 2.5 |
| Delivery Period 3 | 45 | 90 | 5 |
| Delivery Period 4 | 42.5 | 85 | 7.5 |
| Delivery Period 5 | 40 | 80 | 10 |
| Delivery Period 6 | 37.5 | 75 | 12.5 |
| Delivery Period 7 | 35 | 70 | 15 |
| Delivery Period 8 | 32.5 | 65 | 17.5 |