

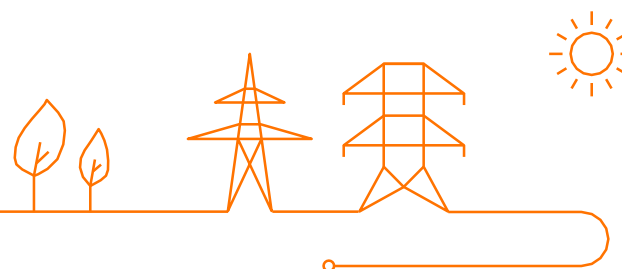
# TF Implementation Strategic Reserve

08/07/2020



# Agenda

1. Overview of the answers to the Public Consultation on methodology (including the volume of Market Response)
2. Assessment of the volume of Market Response for 2020 : E-CUBE





Overview of the answers to the Public Consultation  
on methodology (including the volume of Market  
Response)

## General

- The consultation period was set from Wednesday June 3<sup>rd</sup> to Wednesday July 1<sup>st</sup> 2020, 18h00.
- Elia received 2 non-confidential answers to the public consultation from
  - FEBEG
  - FEBELIEC
- A total of 24 questions/remarks were received, which were divided into 5 categories.

Category	# questions
Data and Assumptions	8
Publication of results	5
Market response	3
Flow based modelling	4
Total demand forecasting	4

- All questions and Elia's report detailing its responses will be published in the beginning of August.
- This presentation gives an overview of the answers received & some preliminary feedback.

## Data and assumptions (1/2)

### Climate years

- PECD database (1982-2016), why are more recent years not included ?
- How is the impact of climate change captured ? (+reference to VUB study)
  - Incorporating effects of 'climate change' is not straightforward and needs careful analysis as it is key to capture the different probabilities of occurrence without losing in representativeness and confidence of results
  - ENTSO-E is currently working on improving its climate database. This process will take a certain time as it is not straightforward and should include all European countries. This improved database will not be ready for the SR calibration report (due in November 2020).
  - Alignment with other TSO's and Member States to integrate the global and thus European effect of climate change on adequacy

## Data and assumptions (2/2)

- Clarification on outage of interconnectors
  - Only forced outages were meant, PO are deterministic for short term horizon. Only FOs are applied for the HVDC interconnectors (not for ALEGrO which is considered in the flow based domain calculation).
- Febeliec asks to have an in depth analysis of historical availability rate for thermal production with a CIPU contract.
  - FO are updated every year (based on historical data) while PO are extracted from REMIT and are deterministic for the short term.
- Request to use balancing reserves for extreme situations
  - National reserves are used to maintain the balancing of the grid and should not be taken into account when performing adequacy studies, which is also consistent with the latest European adequacy studies (given that the models assume perfect foresight).
- Why is there no reference to the ERAA methodology ?
  - Given that nor the methodology for the the European Resource Adequacy Assessment (ERAA) is yet approved by ACER, nor it was already used in an ERAA, the latest 'European adequacy assessment' corresponds to the 'ENTSO-E Mid-Term Adequacy forecast report (MAF)

## Publication of results (1/2)

- Request for an additional sensitivity taking into account the impact of Covid-19
  - This will be dealt with in the demand proposal that will be published within the input data public consultation by the end of August
- Why is France so important for the Belgian adequacy despite having a CRM?
  - Elia does not assess the effectiveness of measures of other countries CRM (France, GB) but takes the best estimate of generation & demand forecasts of those countries and take them into account in the calculations. Past studies have shown that France and Belgium are usually correlated in terms of adequacy.
- Request for a clarification of the “Hilo” parameters that will be applied
  - The “Hilo” approach was approved by the European Commission's DG Energy within the context of a state aid review of the strategic reserve mechanism.
  - The “Hilo” scenario will take into account the latest forecasts in terms of availability but also the historical observed unavailability during winter which resulted to be higher than it was expected for several past winters.
- Belgium has a double criterion 3h and 20h of LOLE for the P95. Is this P95 not sufficient to represent Hilo events ?
  - The SoS criteria defined in the law is a double criteria that is applied as such to the chosen scenario, hence the capacity need is calculated to comply with both criteria

## Publication of results (2/2)

- Request to use smaller steps than 100MW for the margin iteration
  - The block size of 100 MW was chosen to be as small as possible, while still ensuring statistically robust results for the determination of the volume. Especially when searching for the tail of the distribution (e.g. P95 criterion), this statistical robustness is a limiting factor. Choosing a smaller step size might lead to a calculation result that differs depending on the random seeding of the model
  - This analysis was already performed and presented in the TF of 09/07/2018 and it was demonstrated that 100 MW is as small as possible to ensure statistically robust results for the determination of the volume.
- Request to provide results compared with other adequacy studies covering same time horizon
  - This exercise was already performed in previous studies and will be presented to stakeholders when presenting the results of this study
- Request to show the limiting element when presenting the: energy vs interconnection capacity
  - It is not one or the other, it is more complex than that... but Elia will present an indication on simultaneous scarcity with Belgium as already published in previous studies. This gives an indication on when energy is also a limiting factor abroad.



## Market response

- Febeliec appreciates the effort made to improve the methodology but denies having agreed with the current methodology
  - Having applied alternative approaches in the past, in the 2017 Market response working group, this methodology was thoroughly discussed and finally retained as it takes into account observable price-driven market response. It was the preferred option of the 8 proposed in the E-cube workshops. Elia wishes to remind that in the past alternative methods (e.g. based on surveys) have been used, but they have been abandoned based on feedback received and a potential 'respondent bias' in the outcome. Elia is open to consider suggestions for improvement but it is not possible to abandon the current method without a better alternative being available.
- Modelling of Market response as very expensive unit is indeed too simplistic
  - It is indeed more complex than expensive generation units and is aimed at mimicking the behavior of true market technologies by modelling 7 different categories of MR.
  - Each of these categories is modelled as a “technology unit” in the model subject to a capacity constraint plus maximum duration constraints and maximum number of activations per week
  - This way of modelling is in-line with what is done at European level.

## Flow-based

- Febeliec asks for ALEGrO's impact on Belgium Adequacy and on the max import constraint
  - The SR study does not aim at assessing the impact of infrastructural investments, the added value of ALEGrO has been demonstrated within the SPAIC process. Concerning the impact on import constraints, this constraint should raise to 7500MW in 2022 due to addition of voltage control elements
- Febeliec and Febeg both ask how Elia plans to take into account the CEP ?
  - The FB domain and the RAM considered will be part of the input data consultation taking into account submitted action plans and derogations per country.
- What is the impact of the extension of the flow-based perimeter to CORE?
  - Assessing the impact of the extension of the flow-based perimeter to CORE is outside of the scope of this study.

## Total demand forecasting

- What is the impact of the COVID 19 and how would the total forecasting tool help to provide insights on the crisis on the short and mid-term ?
  - This will be dealt with in the demand proposal that will be published within the input data public consultation by the end of August taking into account the latest available economic projections
- Febeliec suggests to use the last report from the Federal Planning Bureau published on the 23/06/2020 into account
  - This is indeed a source that will be considered while assessing the impact of COVID 19
- The stakeholders still remain doubtful whether the tool will be able to provide relevant forecast with the indicators that are currently taken into account
- The bottom-up methodology does not convince FEBEG as this approach required many assumptions on a large number of underlying parameters

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# Market Response 2020

Task Force ISR presentation

Brussels, July 2020



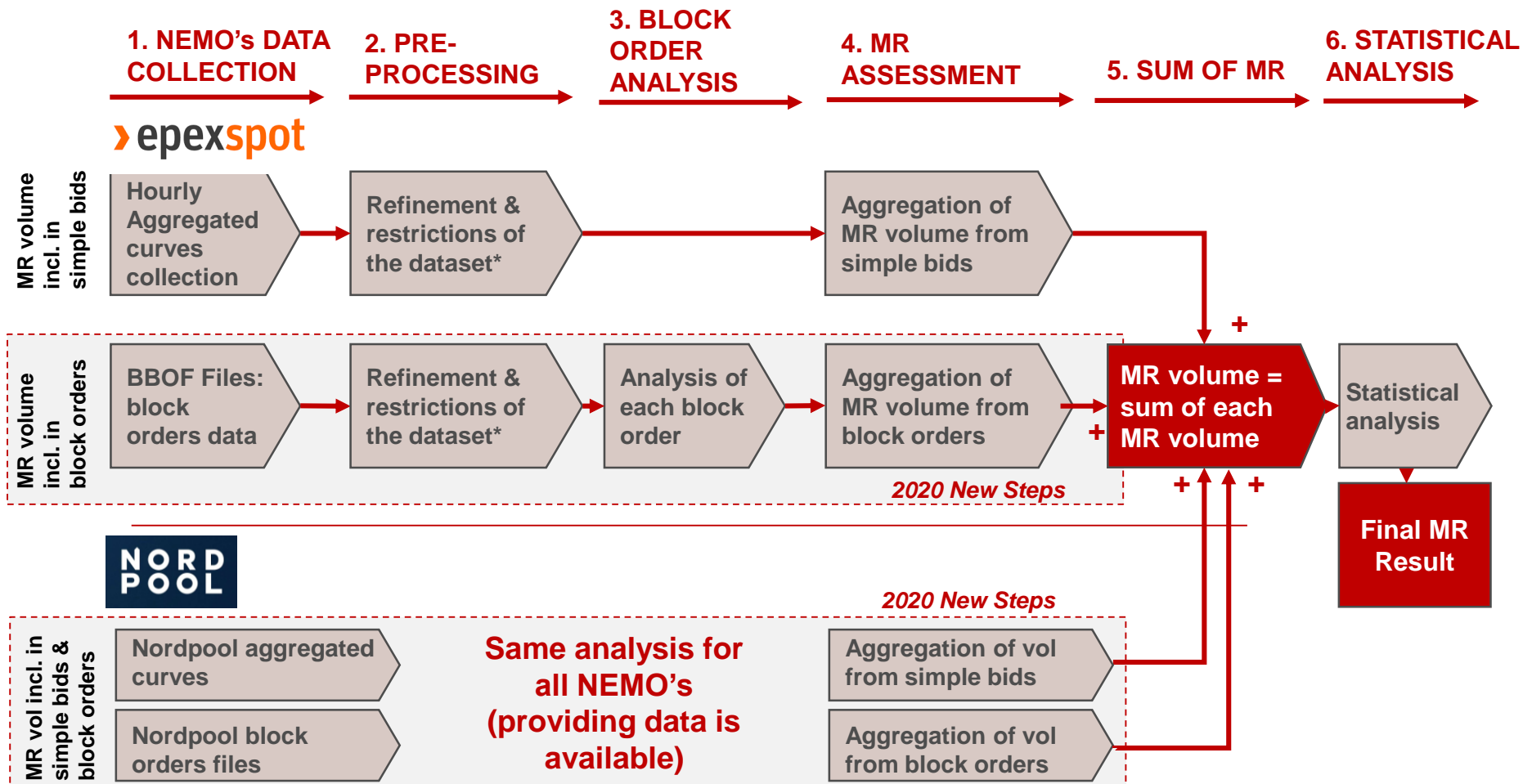
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# The 2020 updated methodology enables MR from block orders to be accounted for and allows the use of data from multiple NEMOs

## 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)

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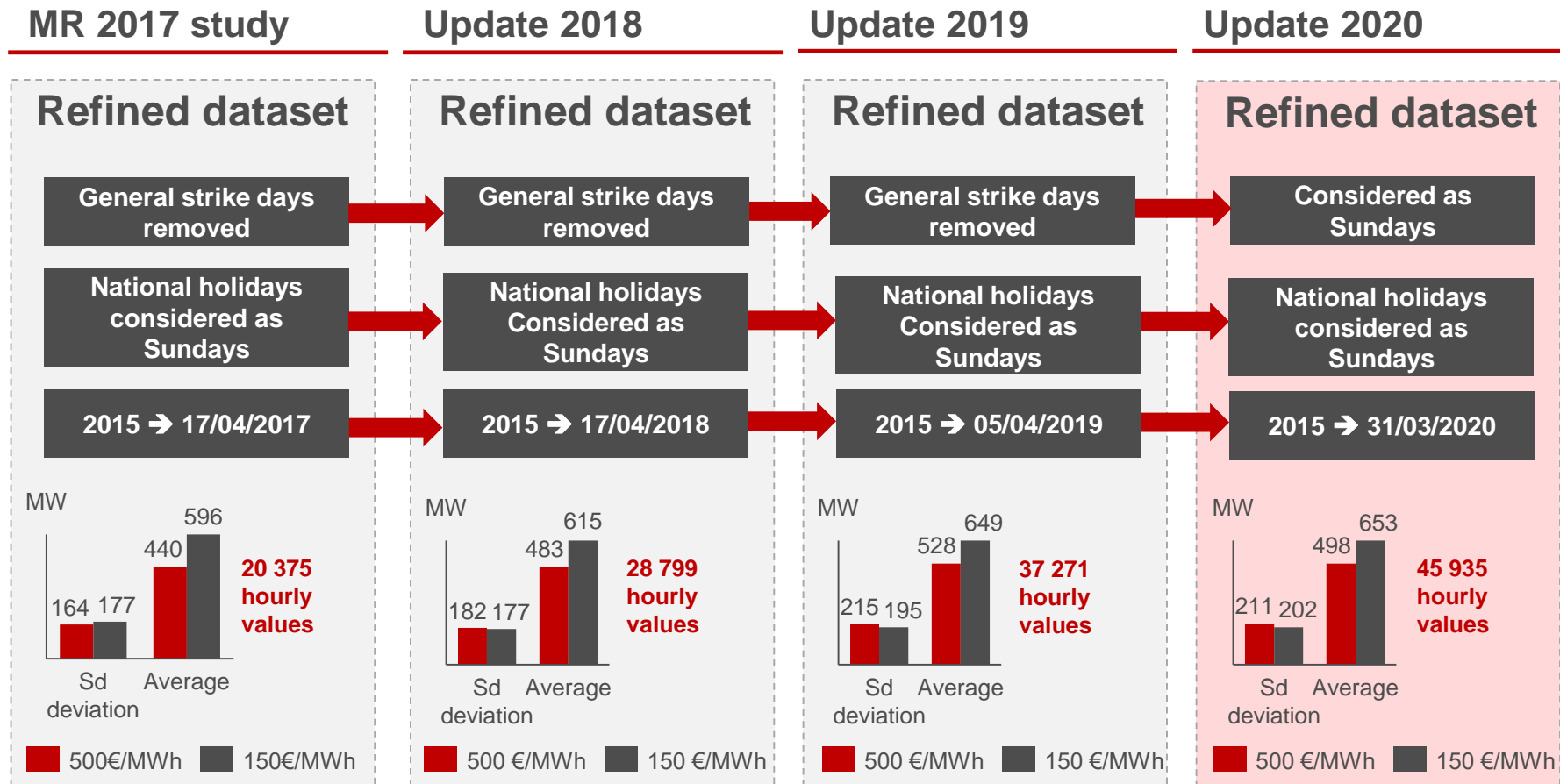
### **2** | Results of the EPEX aggregated curves analysis – 2020 update

**A** | Refinement of the dataset

**B** | Statistical analysis



The aggregated dataset refinement follows the same approach as in the previous years



The refined dataset was used in the following analysis

Note: see back-up for list of national holidays and general strike days

Source: E-CUBE Strategy Consultants

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### **2** | Results of the EPEX aggregated curves analysis – 2020 update

**A** | Refinement of the dataset

**B** | Statistical analysis

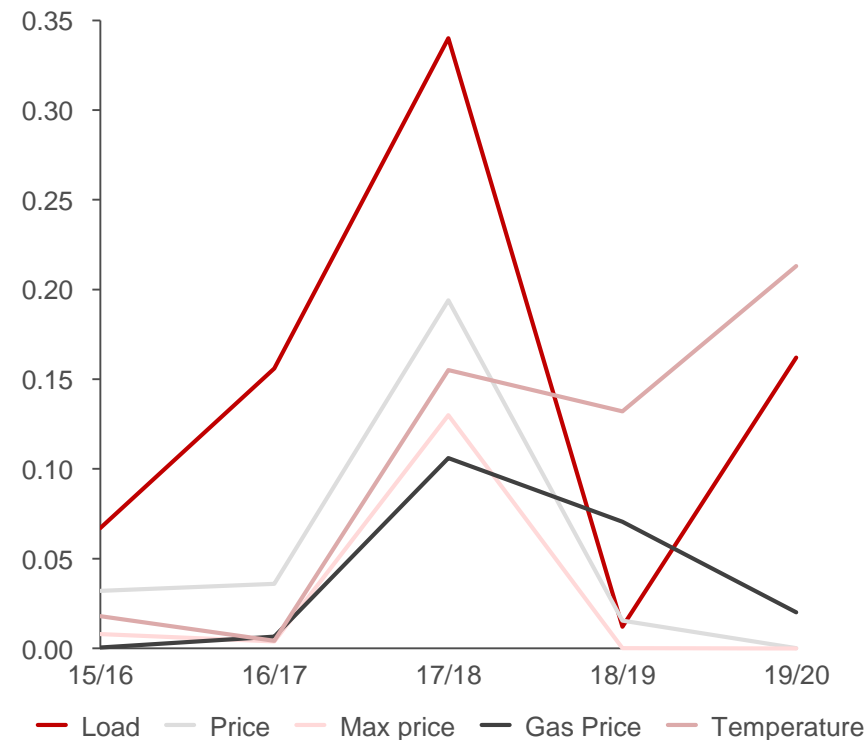
## Various correlations were conducted (temperature, price, normal temperature) without any satisfying results: $R^2$ remains very low (2/2)

### RESULTS OF REGRESSION BETWEEN 150 €/MWh MR VOLUMES AND STUDIED VARIABLES

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

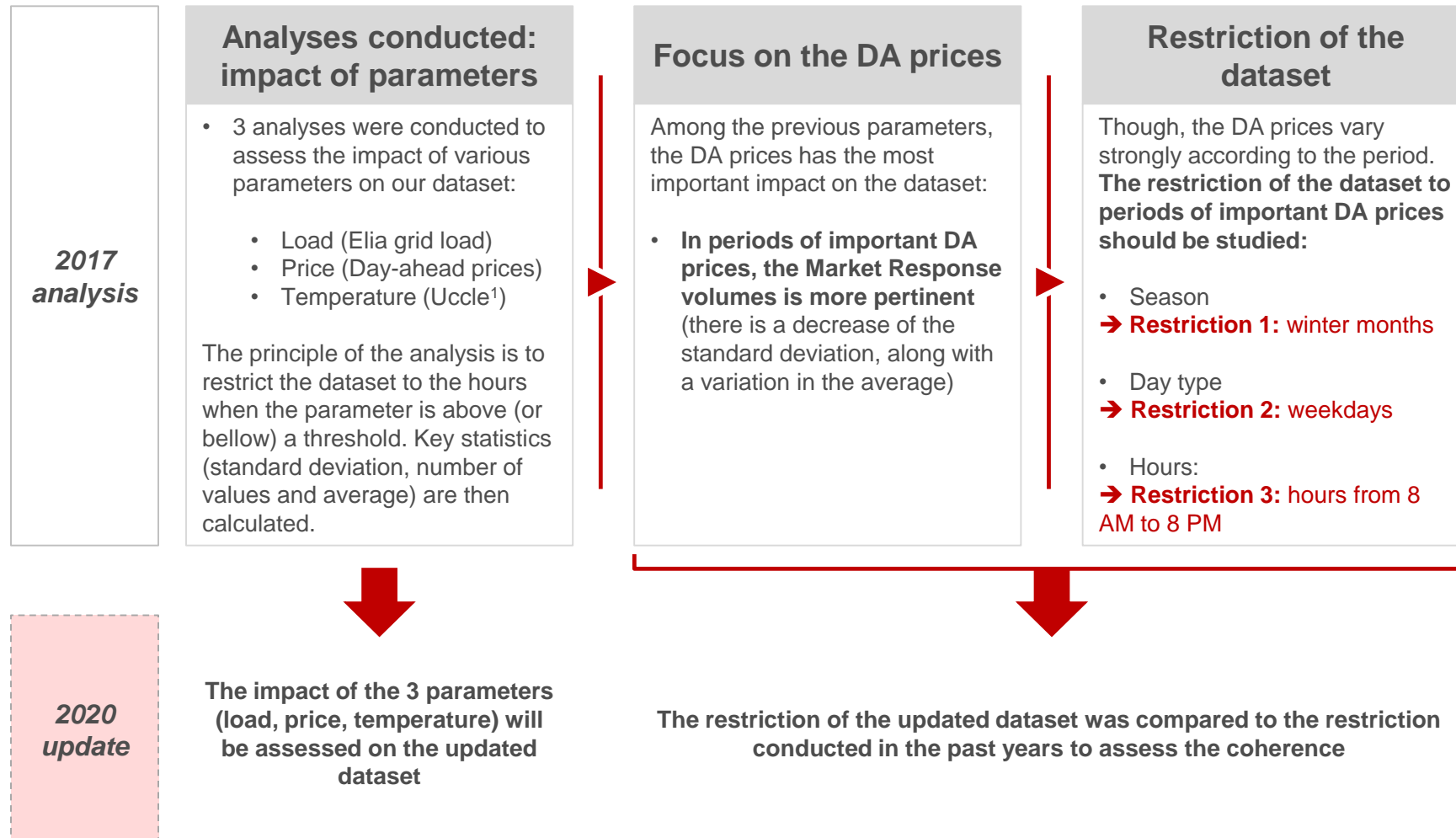
#### Principle

<b>Load</b>	The regression was computed between the daily volumes and the load of Elia
<b>Gas price</b>	A regression was conducted between the daily gas prices and the volumes of Market response
<b>Price</b>	A regression was conducted between the market response volumes and the spot price
<b>Temp.</b>	The regression is here conducted between the hourly temperature (Uccle & Zaventem reference) and the volumes of Market Response
<b>Daily maximum</b>	The regression was computed between the maximum price of the day and the volumes of Market Response



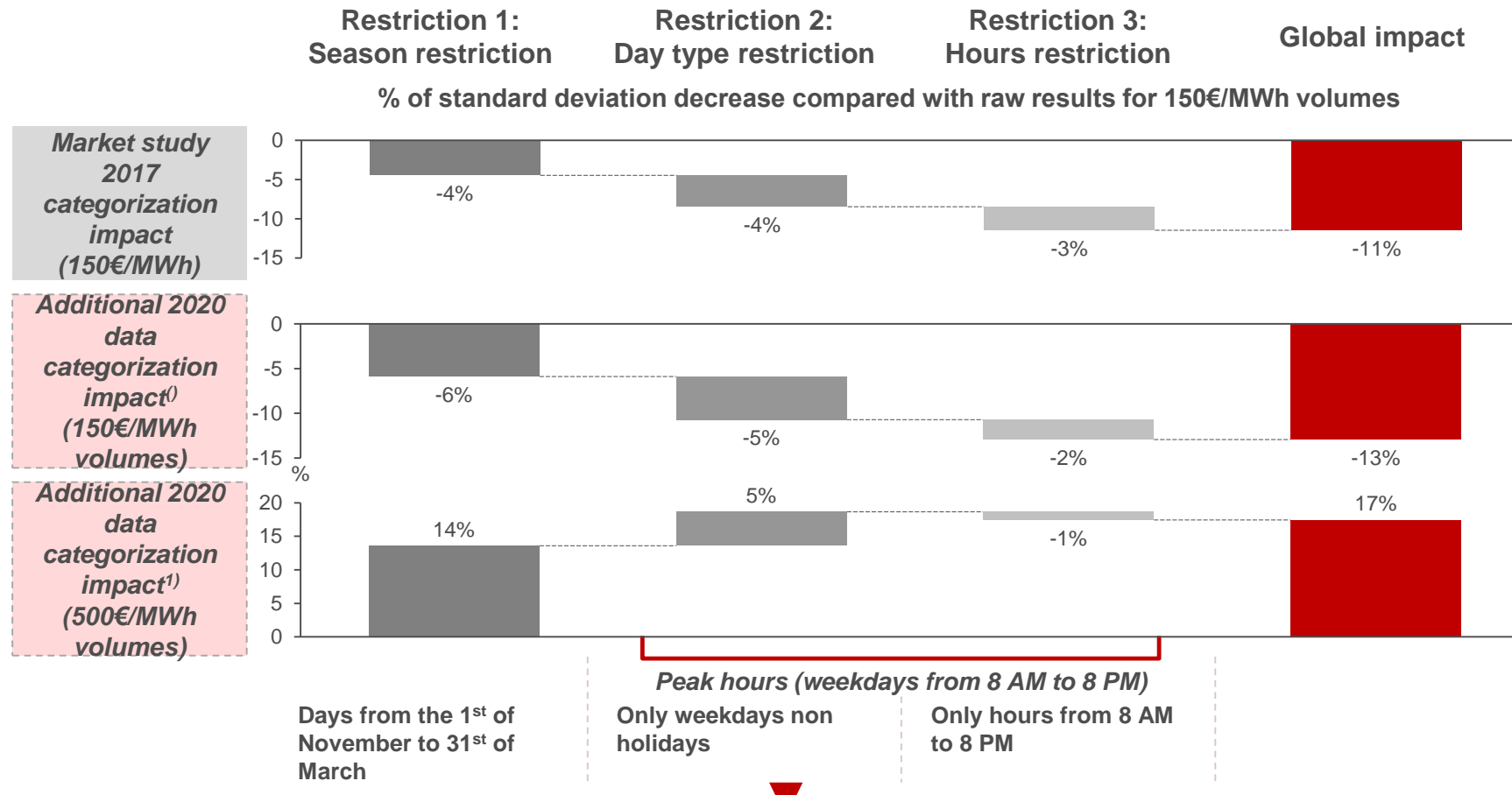
When computing regressions,  $R^2$ , the coefficient of determination, enables to assess the quality of the prediction of a linear regression. When variables are correlated, the  $R^2$  is close to 1. If this coefficient is equal to 0, there is no correlation between both variables. The P-value represents the probability to obtain the observed results if the 0 hypothesis is true. A P-value less than 0.05 indicates that the null hypothesis can be rejected.

## The impact of various parameters was assessed on the new dataset to verify the coherence with the analyses conducted in the last years



**C STATISTICAL ANALYSIS – Restriction to pertinent periods**

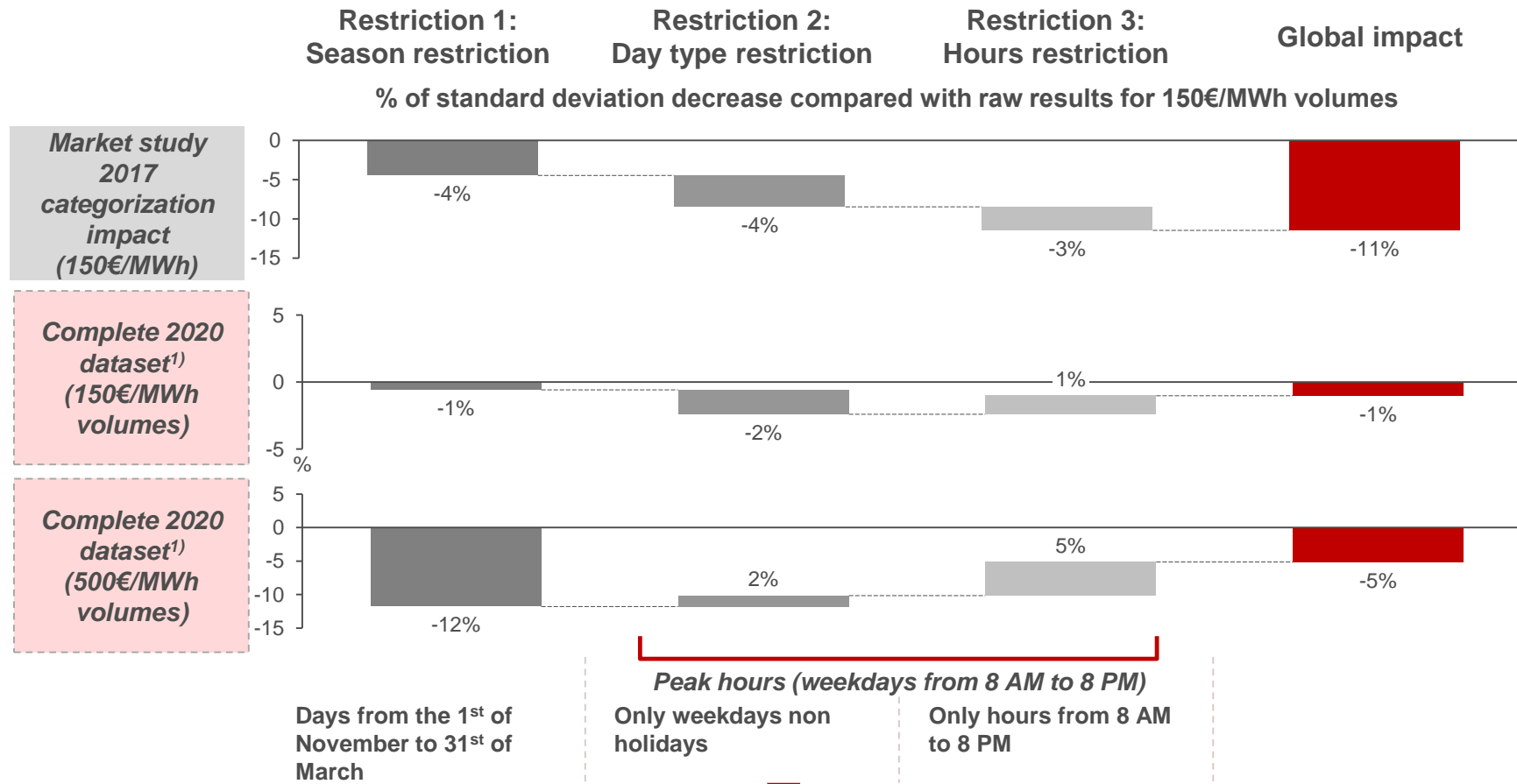
Like in 2017, restrictions to the additional dataset decrease volatility for the 150€/MWh volumes. On the contrary, the 500€/MWh volumes have increased volatility for the season and day type restrictions



**The focus on the most relevant hours in the context of the adequacy assessment (week days, peak hours of the winter period) is slightly more pertinent in the updated dataset compared to the previous years for 150€/MWh volumes**

1) The additional data goes from April 6<sup>th</sup>, 2019 to March 31<sup>st</sup>, 2020

Contrary to the 2017 study, the restriction to the hours increases volatility of the MR volumes, as does the restriction to weekdays for the 500€/MWh volumes



The focus on the most relevant hours in the context of the adequacy assessment (week days, peak hours of the winter period) is slightly less pertinent in the updated dataset compared to the previous years

1) The complete dataset goes from January 1<sup>st</sup>, 2015 to March 31<sup>st</sup>, 2020

The additional data for the 2020 dataset shows a 30% increase of average 150€/MWh MR volume when the data is restricted to winter peak hours. This increase is 16% for the 500€/MWh MR volumes

SUMMARY OF THE TWO CATEGORIES (REFINED AND RESTRICTED DATASET)

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

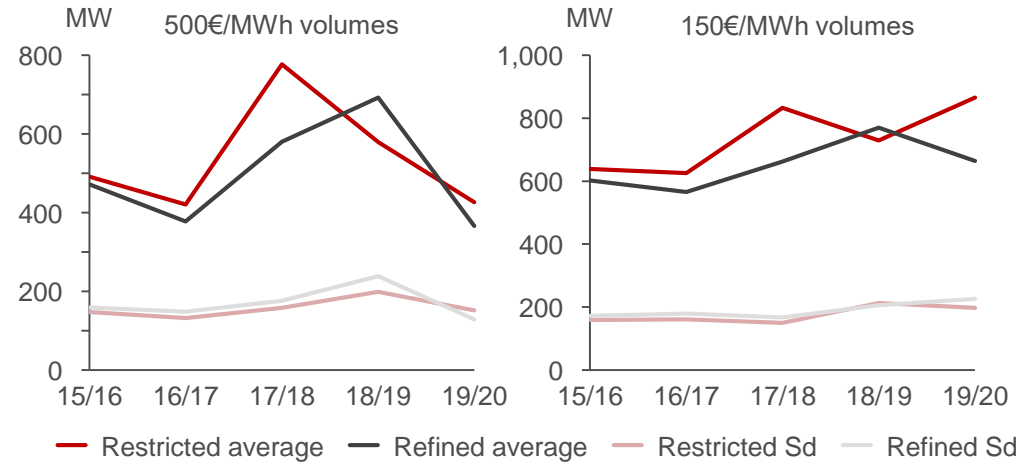
**Year by year evolution of MR and standard deviation**

During this study, the most important hours for Elia: the peak hours (8 AM to 8 PM during weekdays) in the winter are treated as a separate category.

The creation of this separate category generally leads to a decrease of the standard deviation. It is also apparent that the volume of MR is higher during the peak hours in the winter (except for 2018).

→ The volumes for the most important hours of Elia are higher than the overall average volumes and are marked by a decrease of standard deviation compared with refined results

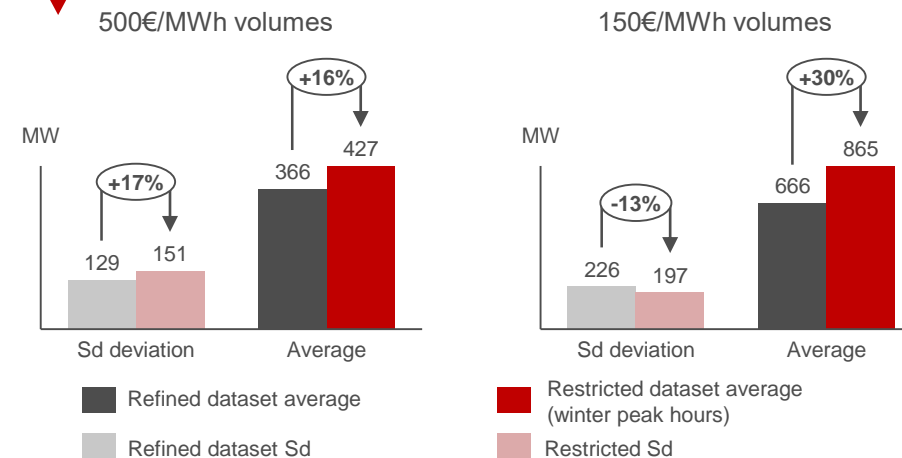
Comparison with the refined / restricted results



**Impact of the categorization on 2020 dataset**

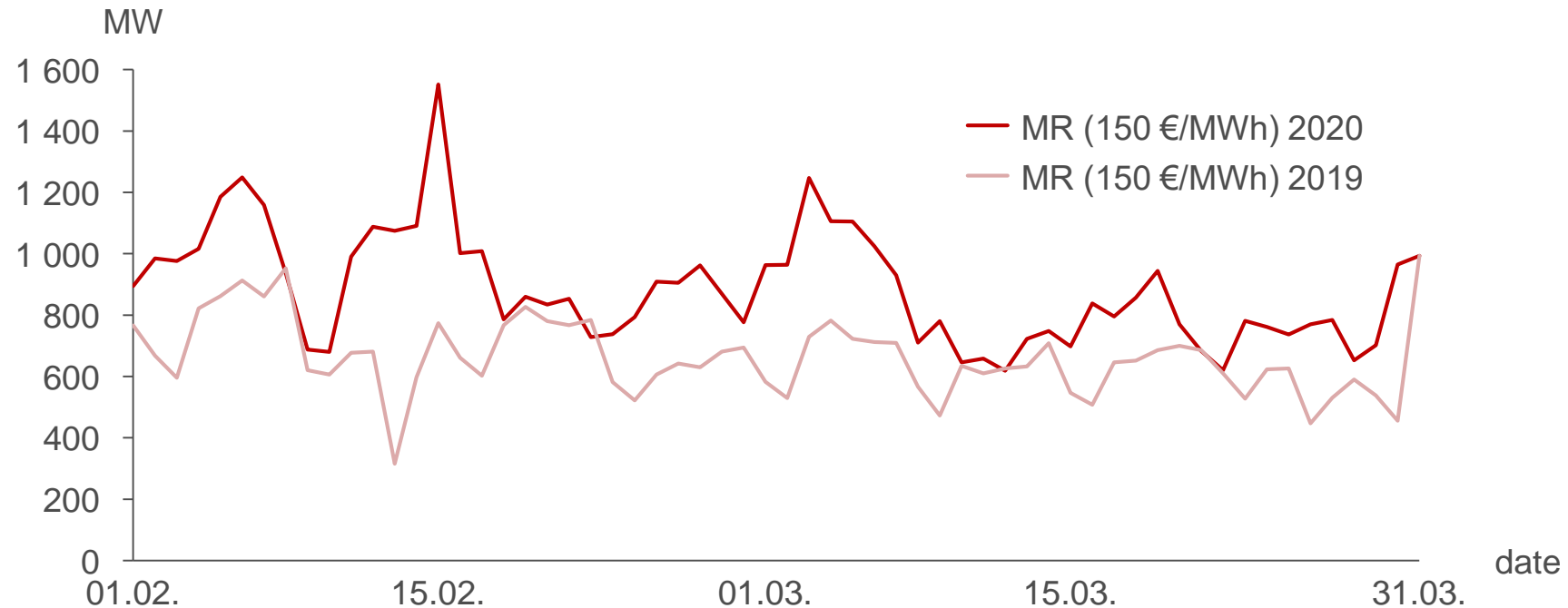
The 2020 dataset (01/04/2019–31/03/2020) is a good illustration of the previous remarks. The categorization of the winter peak hours leads to a higher average MR volume but can have varying effects on the standard deviation. Indeed, here we can see that the MR above €150 undergoes a decrease in standard deviation whereas the MR above €500 shows an increase.

→ The 2019 dataset is a good illustration of the increase of MR volumes during the winter peak hours, and the variable impact on standard deviation



## No unusual behaviour was noticed in the second half of March 2020 due to the sanitary crisis

DAILY MR AVERAGES FOR FEBRUARY AND MARCH OF 2019 AND 2020



There is a slight decrease in MR during the second half of March 2020. However this decrease is not significant when compared to the decrease during the same period in 2019. Indeed, this corresponds to normal 'end of winter' behaviour.

Note: the effects of a decrease in exchanged volumes (in situations such as the sanitary crisis for example) is not always intuitive and does not necessarily imply a decrease in MR. Indeed, the lower demand can give added flexibility to the market.



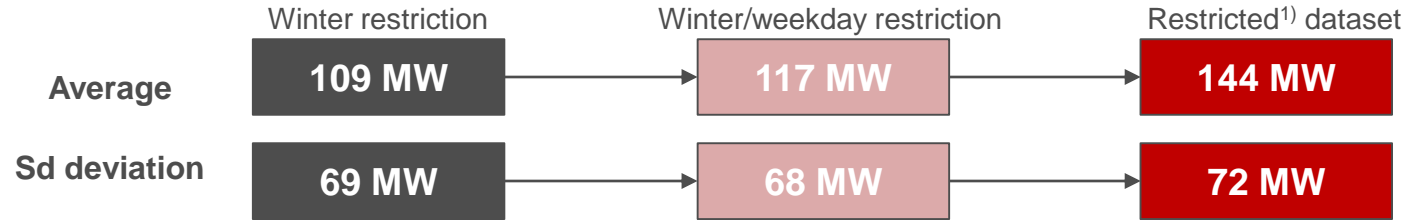
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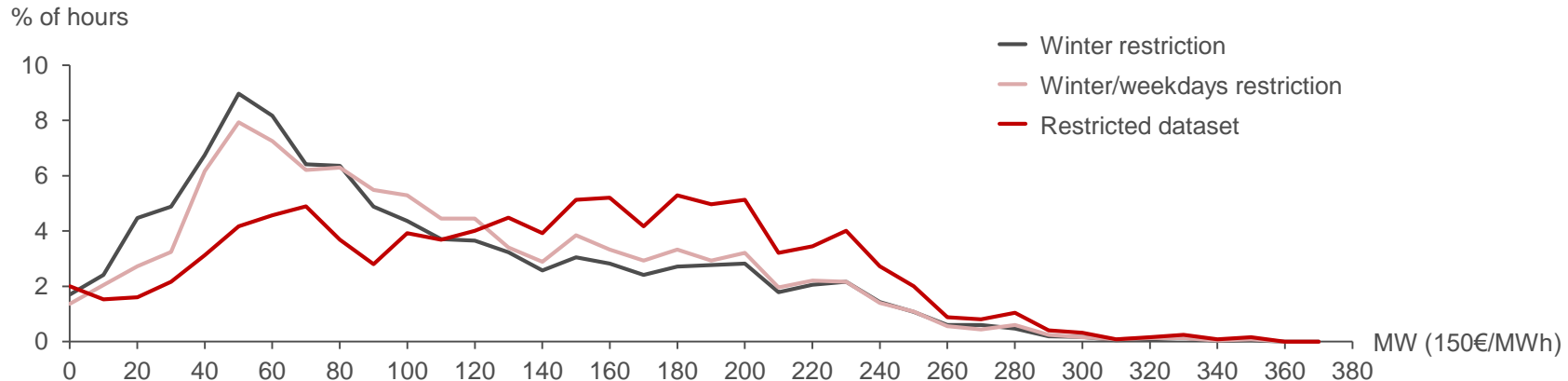
**150 €/MWh and 500 €/MWh MR volumes from the Nord Pool aggregated curves winter hours were 109 MW. This volume increases to 144 MW for the restricted<sup>1)</sup> data**

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



As expected, the volume of MR grows as we restrict the data to weekdays and to peak hours. The standard deviation is quite high compared to the MR volumes, this is visible in the distribution curves below which are relatively flat.

DISTRIBUTION OF HOURS BY MR VOLUME CATEGORY



1) Restricted data = winter, weekdays, peak hours

Source: E-CUBE Strategy Consultants

2) The MR volumes were calculated on the data from 01/11/2019 to 31/03/2020 for Nord Pool. Therefore, the base value is not the refined value but that of the winter restriction.

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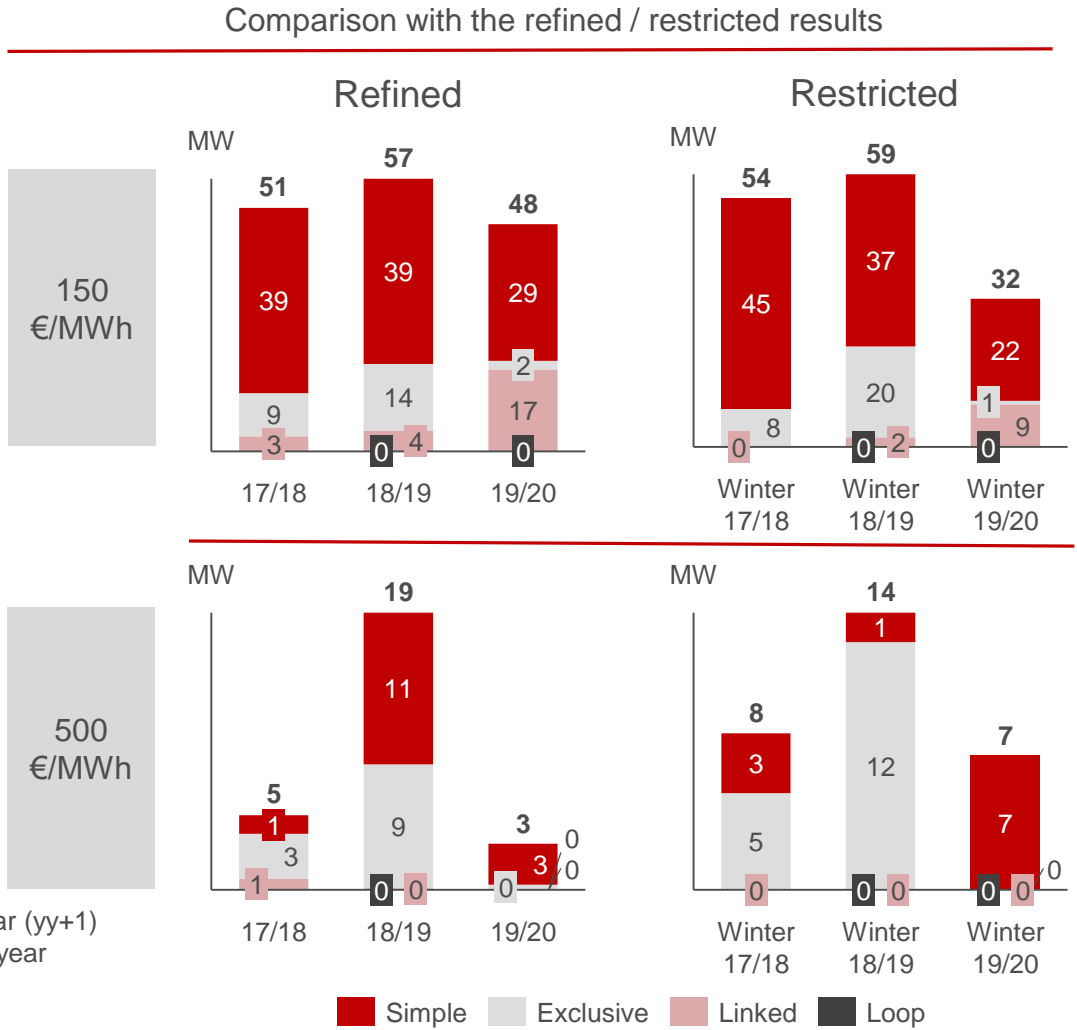
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# BLOCK ORDERS

**150 €/MWh MR volume from EPEX block orders during the restricted hours was 32 MW during the last winter. The MR volume from block orders does not consistently increase by restricting the data to winter peak hours.**

## SUMMARY OF THE TWO CATEGORIES (REFINED AND RESTRICTED DATASET)

- Simple blocks compose the majority of MR from block orders.
- In the analysed data, Loop blocks never contribute to MR volumes.
- The contribution to MR by linked blocks is increasing year by year.
- The MR volume from block orders decreased during the last winter. This decrease comes mainly from a decrease in MR from exclusive blocks.
- It is also worthy of note that the average MR volumes from block orders are not greater in the restricted dataset (winter peak hours) than in the refined dataset.



Notes: - yy/(yy+1) is from 01/04 of year yy to 31/03 of year (yy+1)  
 - winters are from 01/11 to 31/03 of the following year  
 - loop blocks only exist since 14/12/2018

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**There were no block orders from Nord Pool for the 2019/2020 winter period**

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There were no block orders from Nord Pool for the 2019/2020 winter period



**0 MW**

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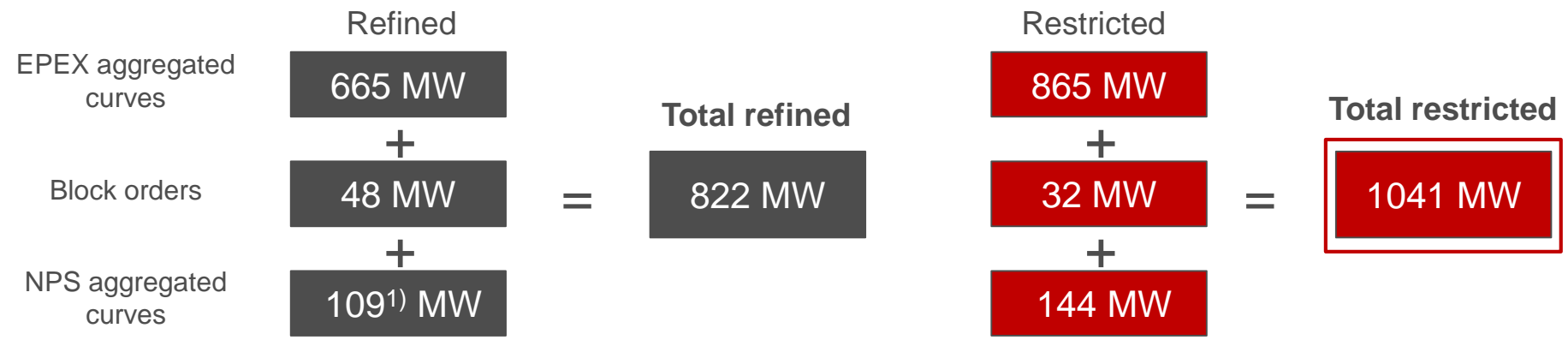
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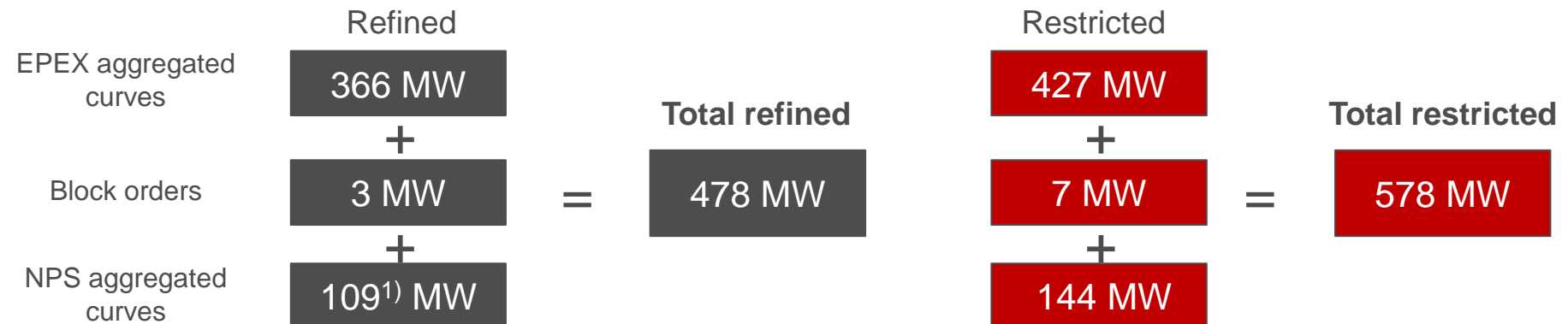
**Total Market Response for 2020 is 1041 MW for the 150€/MWh restricted hours. Market response from block orders is 3% of this total.**

TOTAL MR FOR 2019/2020 IS THE SUM OF MR FROM AGGREGATED CURVES AND BLOCK ORDERS

**150 €/MWh Market Response**



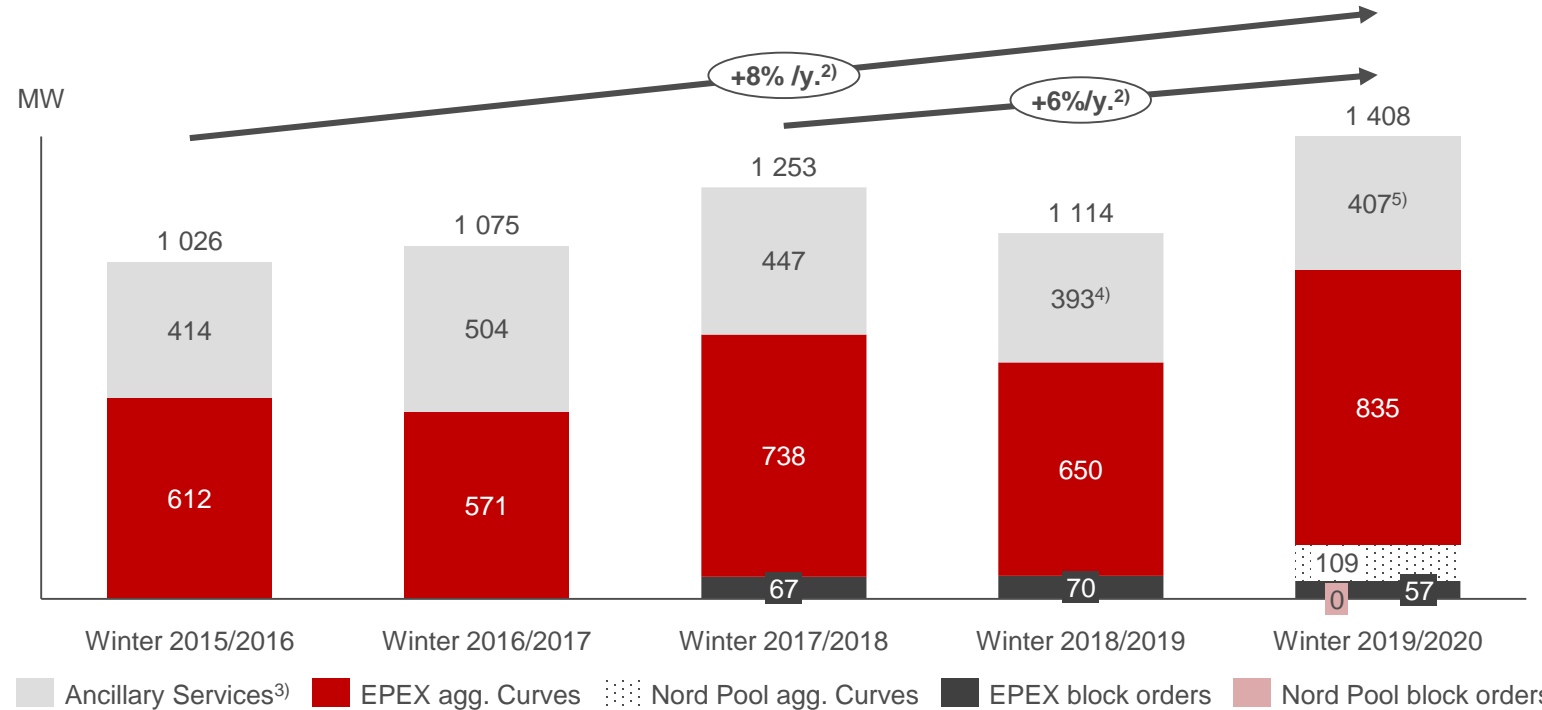
**500 €/MWh Market Response**





## Winter MR volumes have considerably increased during the last year, this is only partly due to the addition of Nord Pool

EVOLUTION OF THE VOLUMES OF MARKET RESPONSE - WINTER MONTHS<sup>1)</sup>



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

- 1) Winter months: from the 1st of November to the 31st of March, Volumes for **lower bound** (150€/MWh)
- 2) The rates are Compound Annual Growth Rate (CAGR) : the mean of the annual growth rate over the period
- 3) For the years 2016-2018 included, the volumes ICH, R3DP and R1Up. For 2019, the volumes are based on the observed share of non-CIPU in the contracted volume via the national auction. The volumes of Ancillary Services are contracted, depending on the product, for daily, weekly periods and are averaged for an entire year. Downward capacity is not relevant for the upward adequacy study
- 4) This value differs from the value presented last year due to an update of the Ancillary Services volume for 2017/2018
- 5) The 2020 AS value used for this was obtained by extrapolation from previous years

The update of the study leads to a 1041 MW Market Response volume and 3 extrapolation scenarios ranging from 1% to 8% total volume growth

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Output of the 2020 study

3 extrapolation scenarios

**1041 MW<sup>1)</sup>**  
Market Response Volume

**+1% total market growth**

**+6% total market growth**

**+8% total market growth**

We believe that the growth rate should be between +6% (growth of last 2 years) and +8% (average annual growth of MR volume since winter 2015/2016) . These are more likely as recent years have shown consistently high levels of growth.

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**X** | Back-up

**A** | Methodology reminder

**B** | Extraction of the Market Response volumes

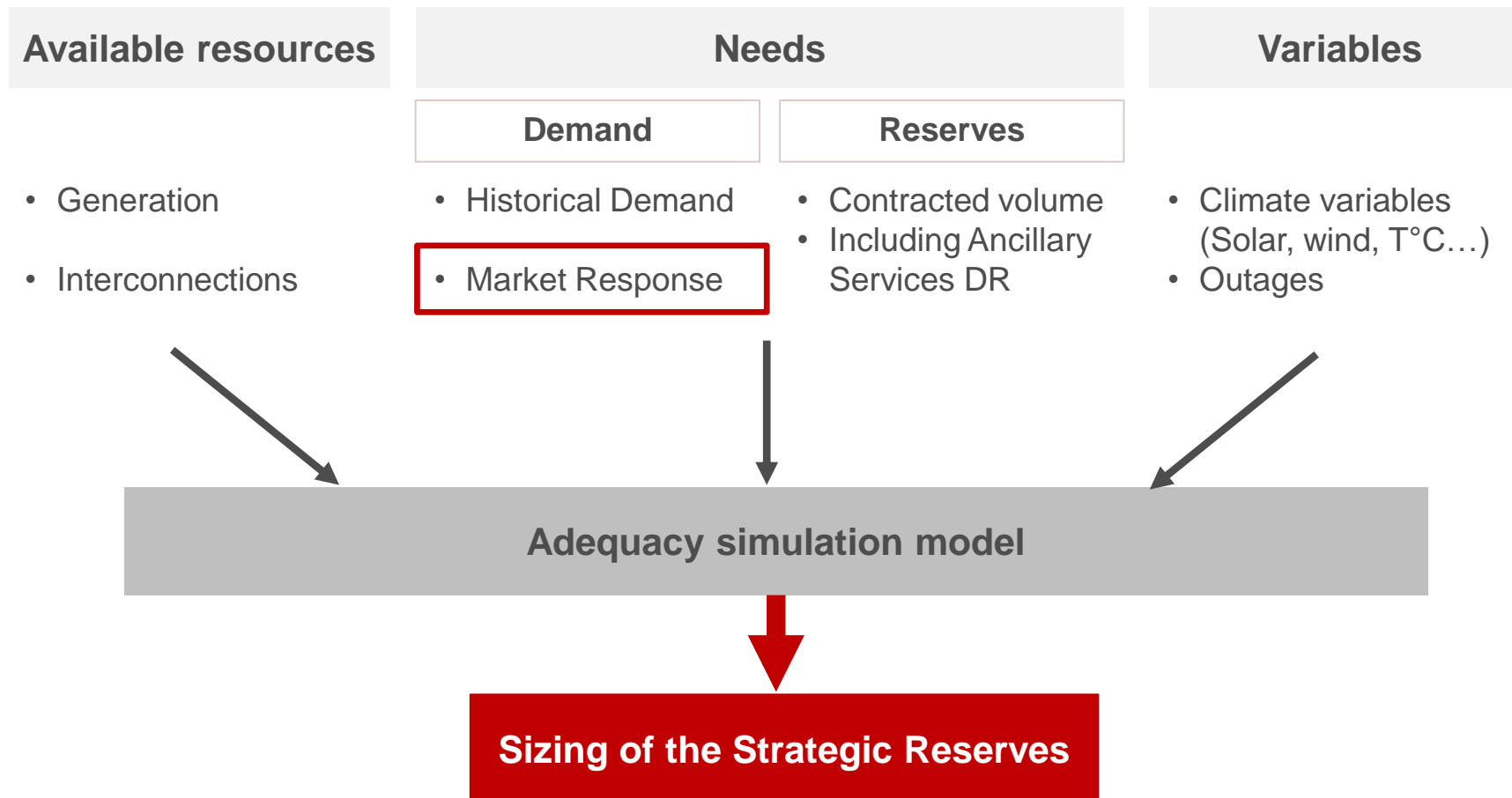
**C** | Refinement of the dataset

**D** | Statistical analysis

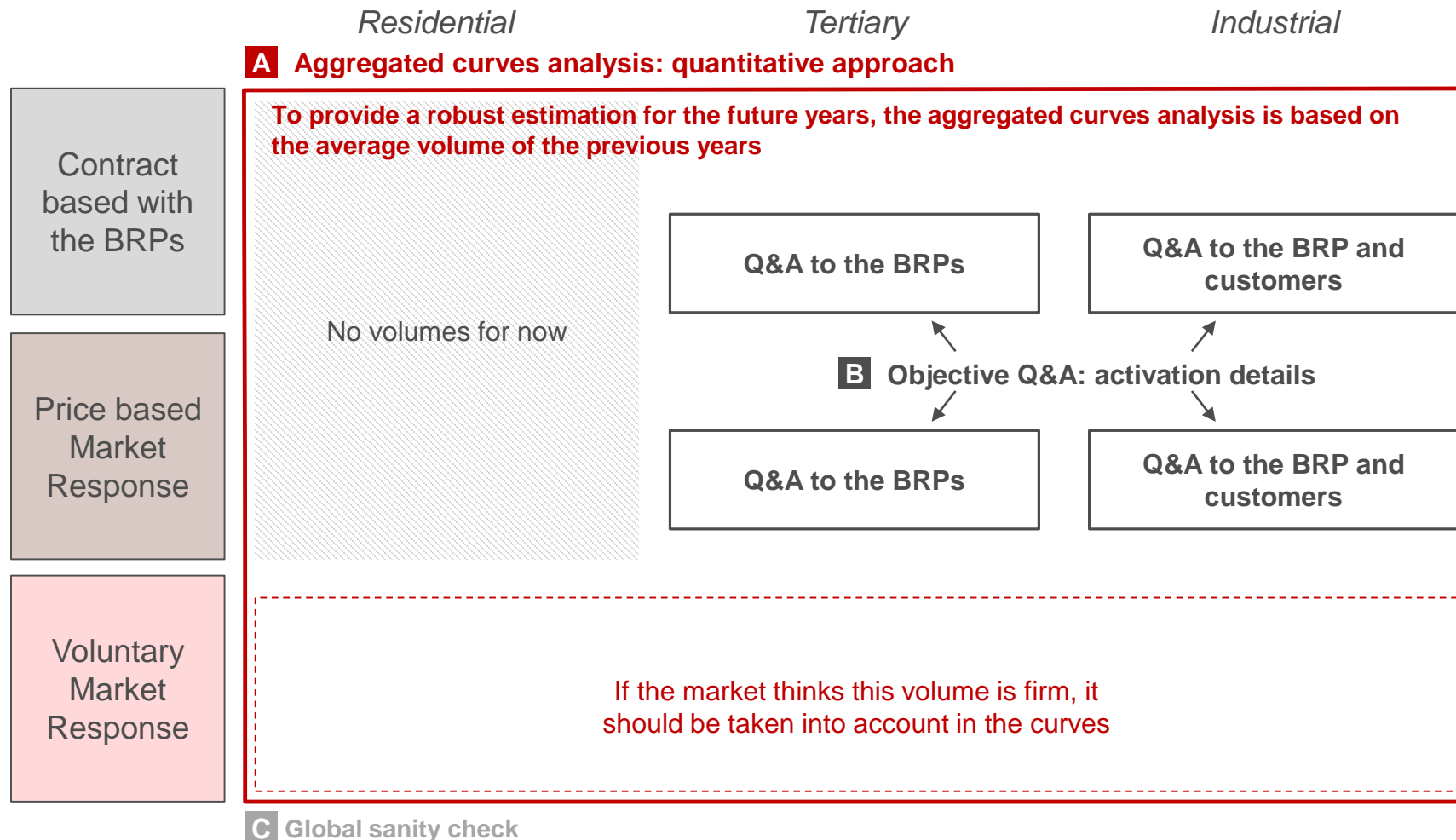
**E** | Implementation

## Market Response volume determination is essential to size the volumes of Strategic Reserves

Market Response corresponds to the response of electricity consumers in periods of tension and high prices in the electricity grid



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



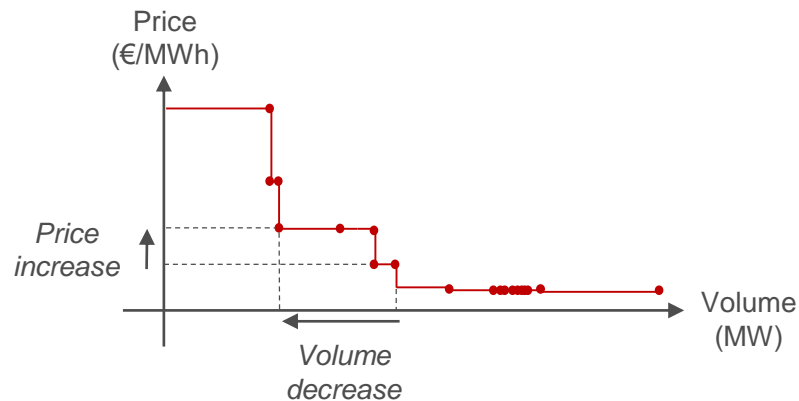
## In the aggregated curves of EPEX DAM Belgium, Market Response volumes appear as a demand decrease or as an offer increase

### 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

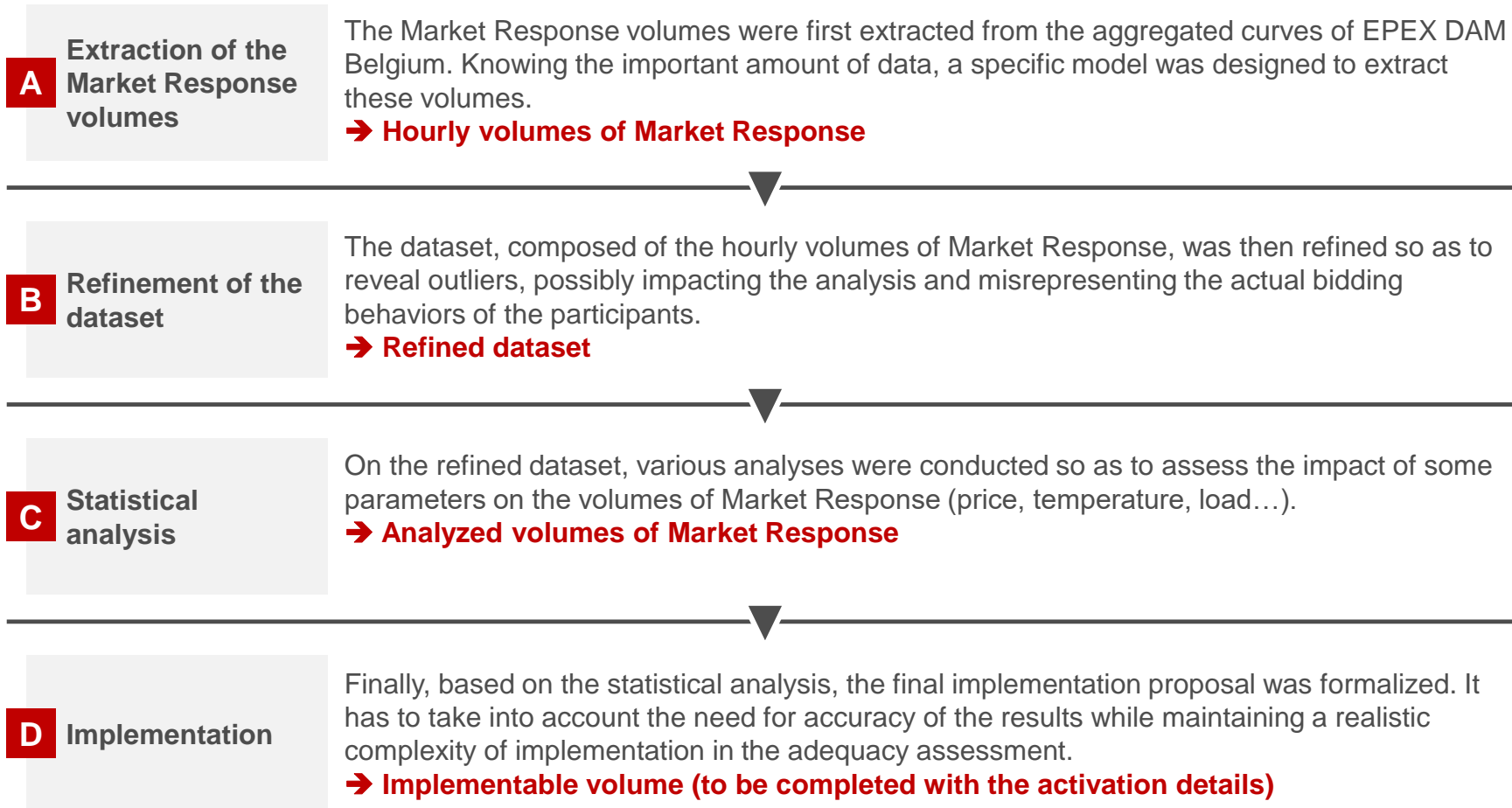
- Instead of a demand decrease, suppliers can value Market Response as new offer in the market: this part would appear in the supply curve
- Due to the possible presence of generation bids in the offer curve, two price thresholds have been set up:
  - Volumes above 150€/MWh, which correspond to the base case of Market Response volumes
  - Volumes above 500€/MWh, which enable to exclude all possible generation bids

#### 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

# The update of the Market Response Study is based on the exact same methodology as the one performed in 2017, 2018, and 2019 for the aggregated curves

The process followed four key steps to come to a pertinent volume of Market Response:





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**X** | Back-up

**A** | Methodology reminder

**B** | Extraction of the Market Response volumes

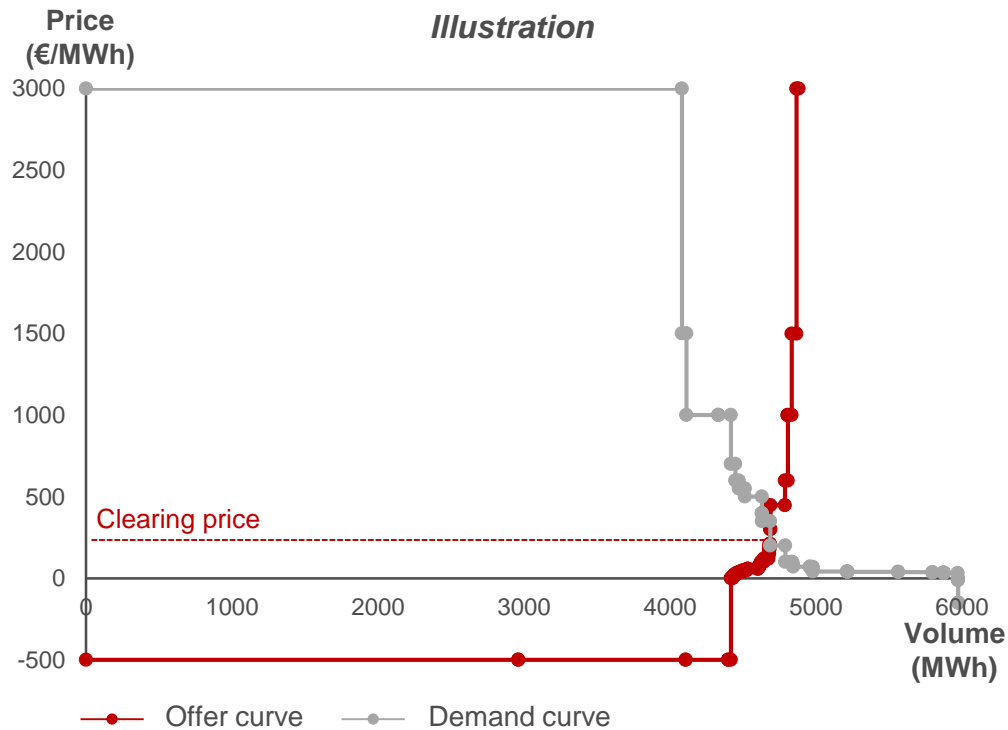
**C** | Refinement of the dataset

**D** | Statistical analysis

**E** | Implementation

# EPEX DAM Belgium and Nord Pool provide hourly aggregated curves of the purchase and sale orders

EPEX DAM Belgium aggregated curve



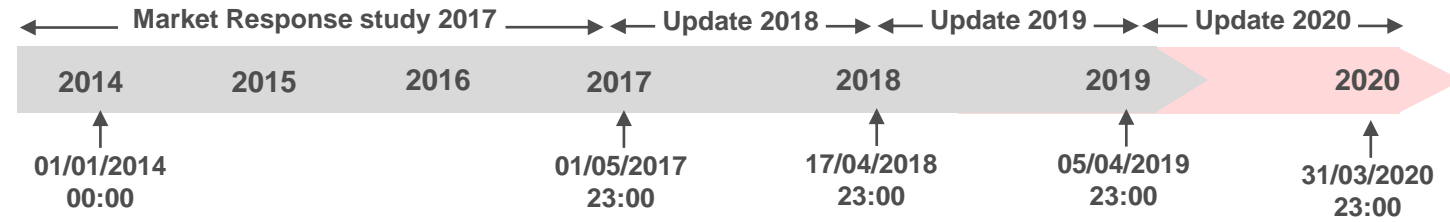
- **The curves determine the clearing price:** at the intersection of the demand and supply curve.
- From the curves, we can deduce the load variation corresponding to a given price increase
- This load variation **corresponds to the perimeter of Market Response** with contract based and price based MR but also voluntary DR. Indeed, if there are some volumes in the voluntary DR category, BRPs will anticipate voluntary DR events: it will impact their bidding behaviours and hence be reflected in the aggregated curves

**Disclaimer:**

The details on the activation cannot be estimated with the aggregated curve methodology, it is not possible to extract it from the curves

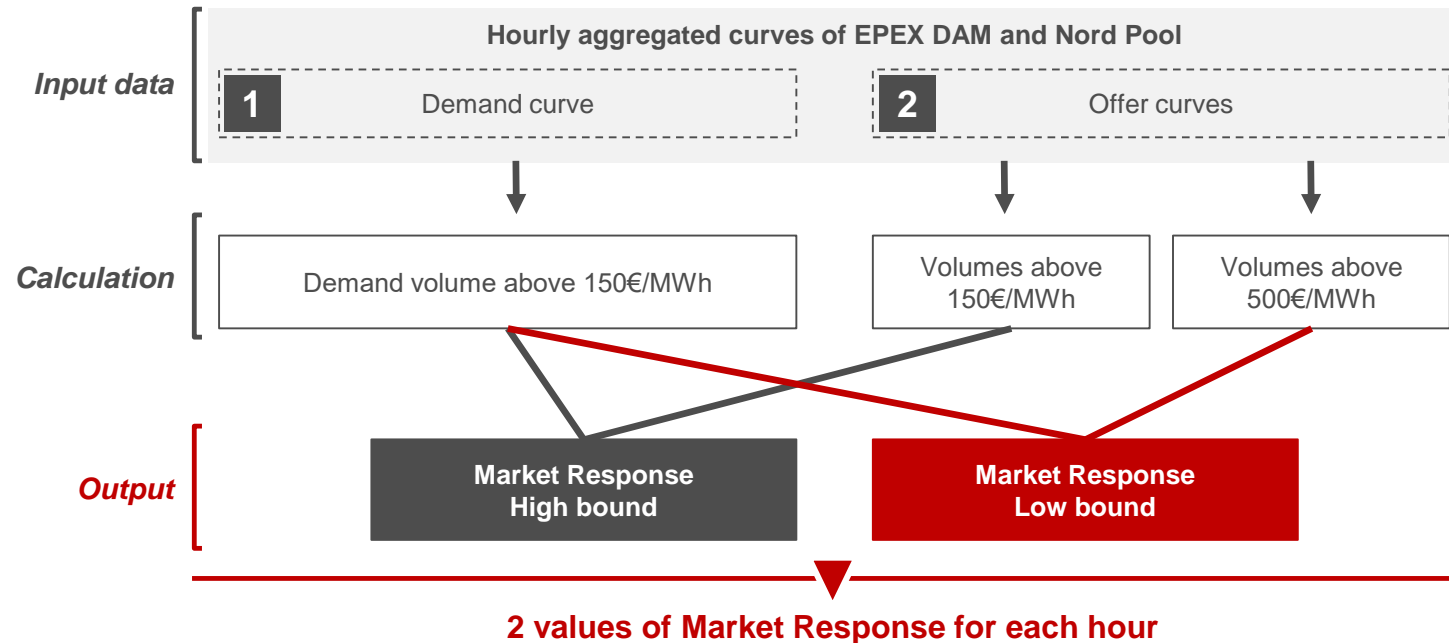
The Market Response volumes were extracted from the EPEX aggregated curves. The 2020 update added 8664 hours to the dataset

Timeframe of the dataset



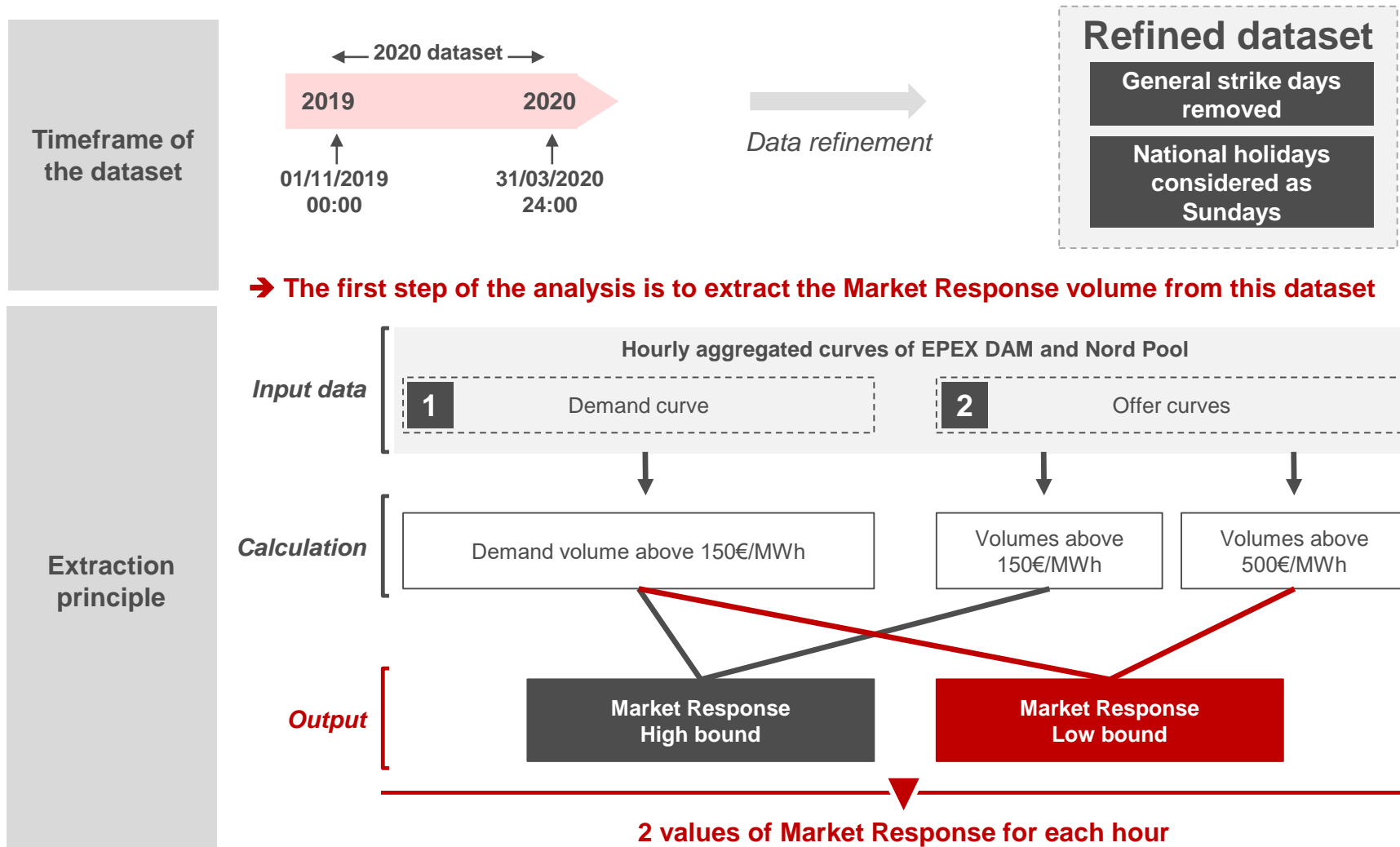
→ The first step of the analysis is to extract the Market Response volume from this dataset

Extraction principle



# BACKUP – VOLUME EXTRACTION

The Market Response volumes were extracted from the Nord Pool aggregated curves. The dataset was refined following the same approach as the EPEX dataset

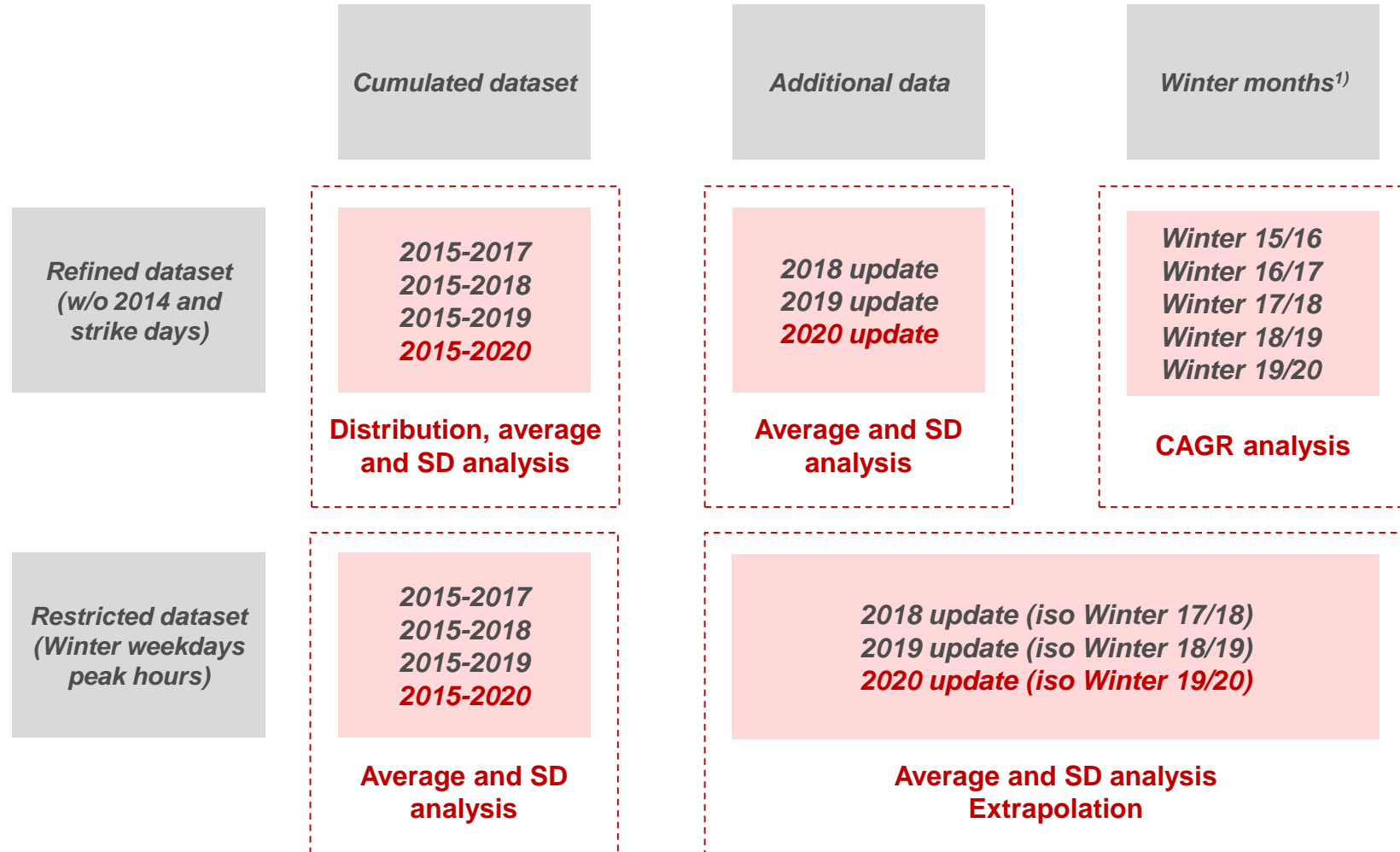


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<b>D</b>	Statistical analysis
<b>E</b>	Implementation

There are multiple ways of looking at the data, depending on the focus of the analysis



**There are 12 national holidays in Belgium. They are counted as Sundays in the analysis. There were 3 days counted as general strikes in the analysed period**

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### National holidays in Belgium:

- “Jour de l’An” (1<sup>st</sup> January)
- “Pâques” (variable)
- “Lundi de Pâques” (variable)
- “Fête du Travail” (1<sup>st</sup> May)
- “Ascension” (variable)
- “Pentecôte” (variable)
- “Lundi de la Pentecôte” (variable)
- “Fête nationale” (21<sup>st</sup> July)
- “Assomption” (15<sup>th</sup> August)
- “Toussaint” (1<sup>st</sup> November)
- “Armistice de 1918” (11<sup>th</sup> November)
- “Noël” (25<sup>th</sup> December)

### General strike days:

- 2015/10/07
- 2016/06/24
- 2016/10/07

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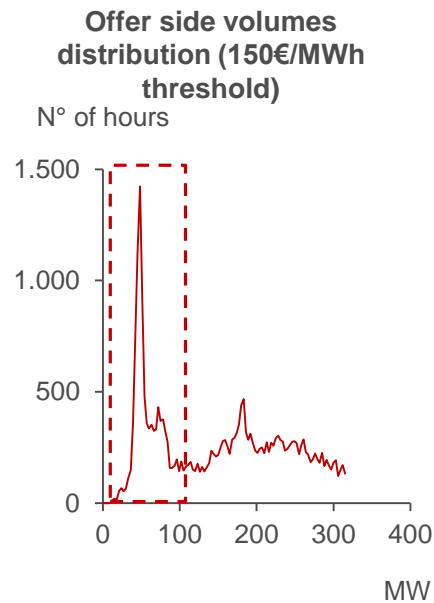
<b>X</b>	Back-up
<b>A</b>	Methodology reminder
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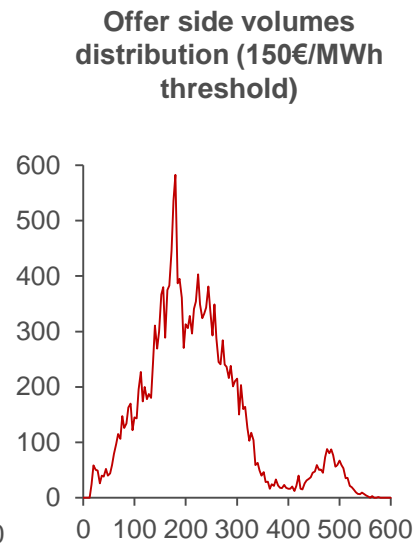
The additional volumes of the 2020 EPEX update do not present a specific behaviour of the customers and are coherent with the dataset of the Market Response study 2017 as well as 2018 & 2019 updates

DISTRIBUTION FOR THE OFFER SIDE ONLY, CUMULATED DATASET

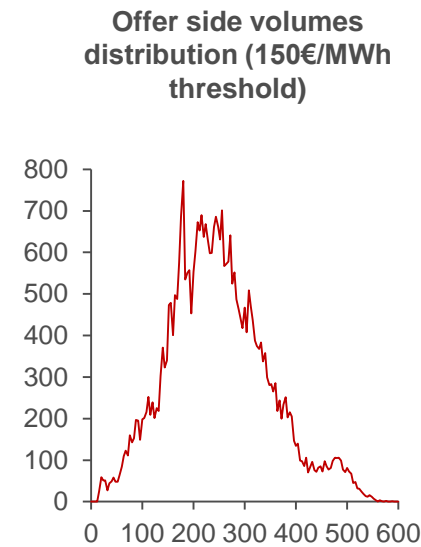
Raw dataset – 2017 Study



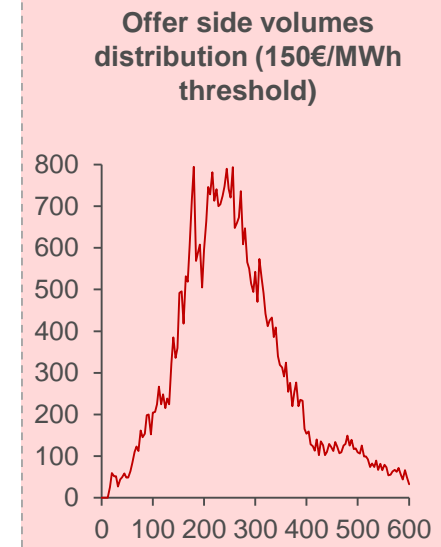
Dataset w.o. y. 2014 – 2017 study



Dataset w.o 2014 - 2019 update

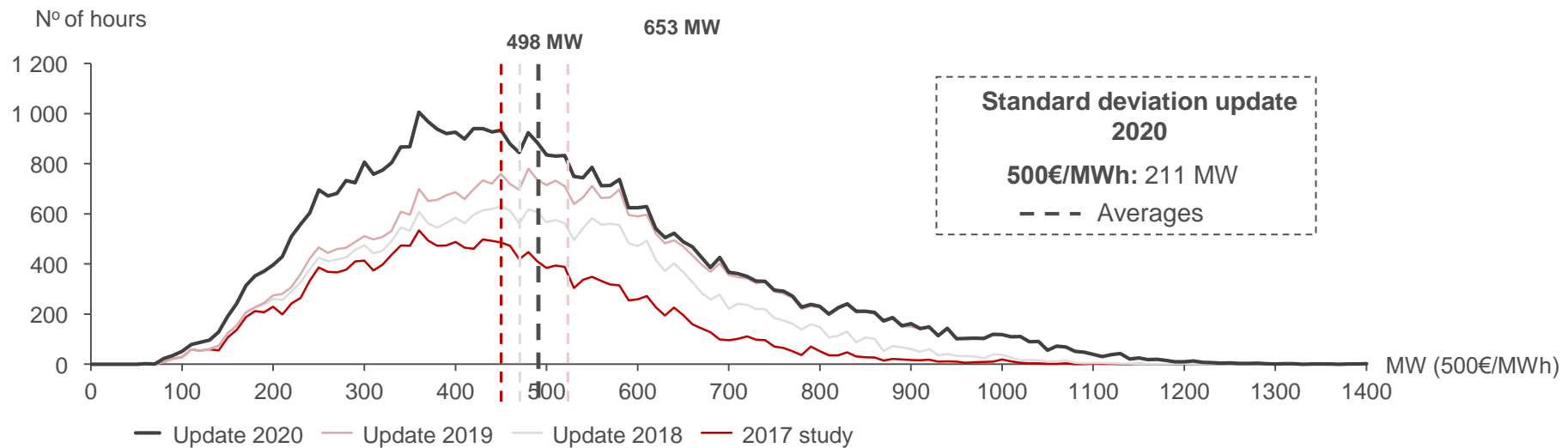
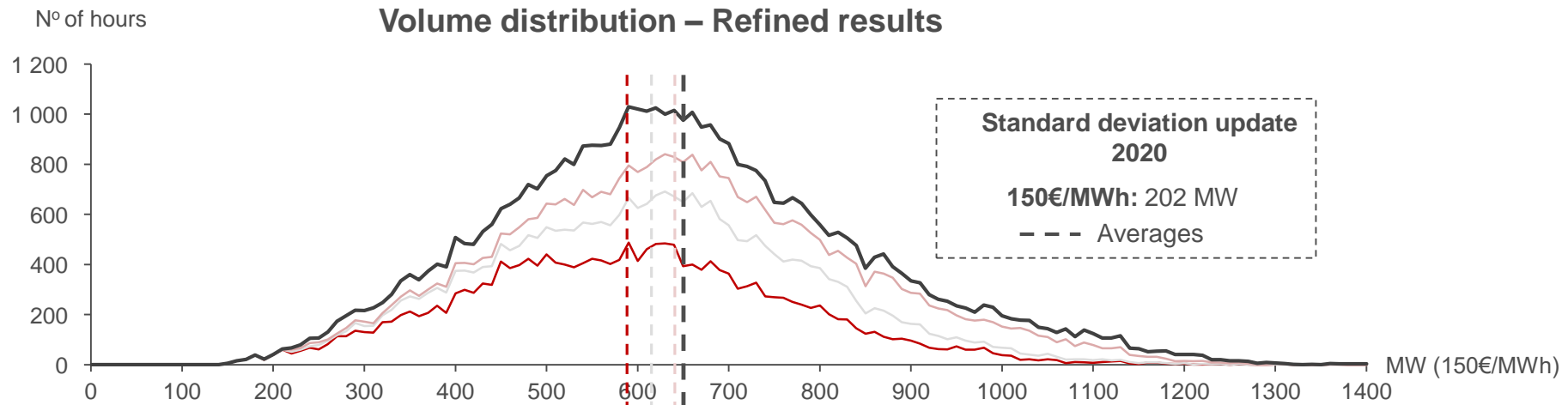


Dataset w.o 2014 - 2020 update



In the Market Response volumes of 2014, we noticed a specific behaviour of the customers not present in the volumes of 2015, 2016 and 2017 → **The year 2014 was excluded of the dataset**  
 This type of behaviour doesn't appear in the 2015-2020 updated dataset → **the volumes are coherent with the dataset of the Market Response study 2017**

The distribution of the updated EPEX dataset (cumulated values since 2015) presents similar characteristics as the volume distribution of the 2017 study

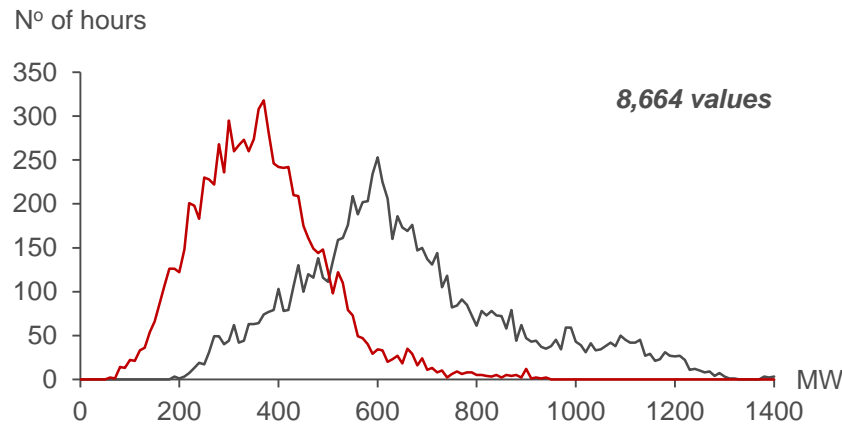


**Standard deviation:** indicates the dispersion of the values of the dataset: whether the values are spread over a wide range of values

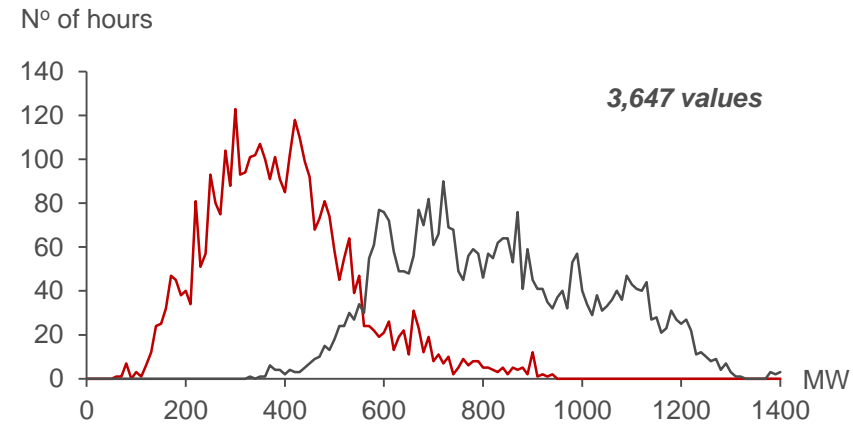
# The restrictions increase the average EPEX MR values. They decrease standard deviation for 150€/MWh volumes

EVOLUTION OF THE DISTRIBUTION WITH THE RESTRICTION ON THE ADDITIONAL 2020 DATA

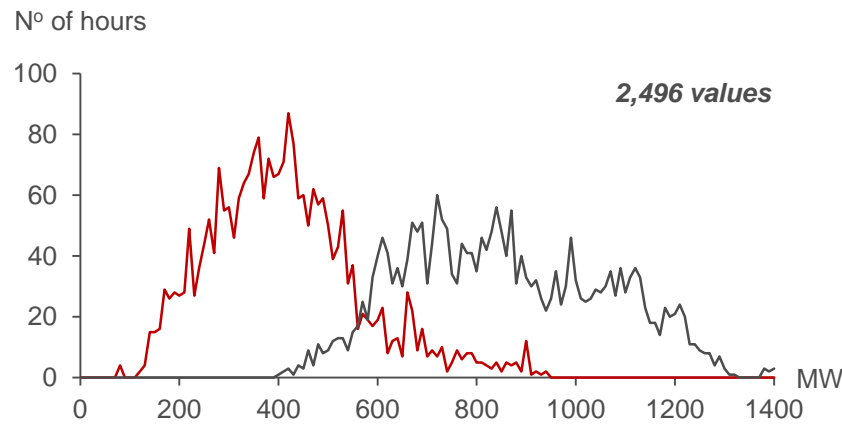
**Refined dataset distribution**



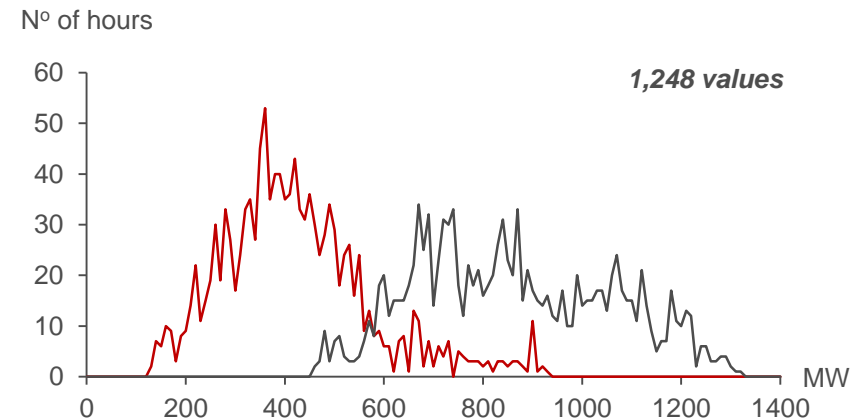
**Restriction 1 : season**



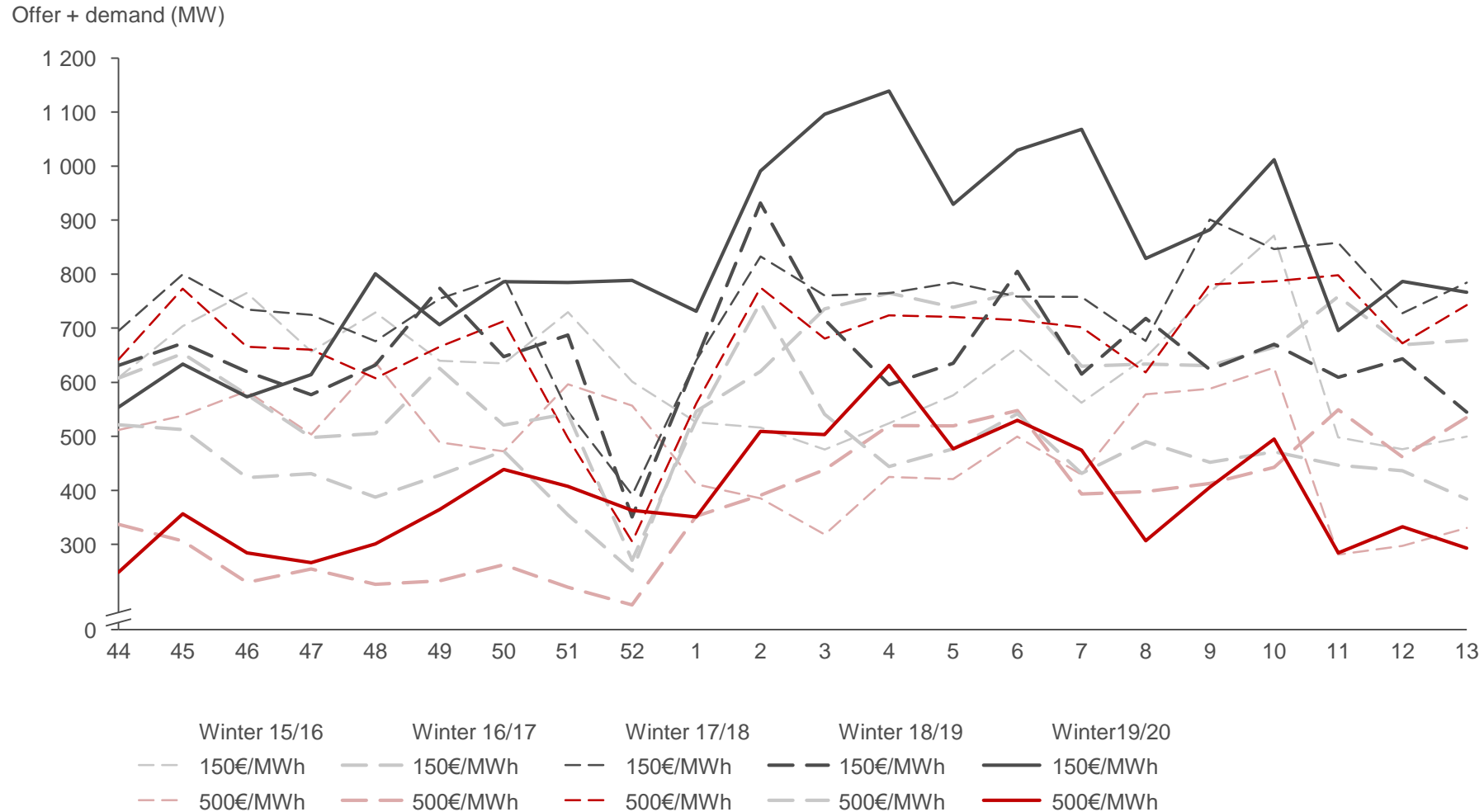
**Restriction 2 : day type**



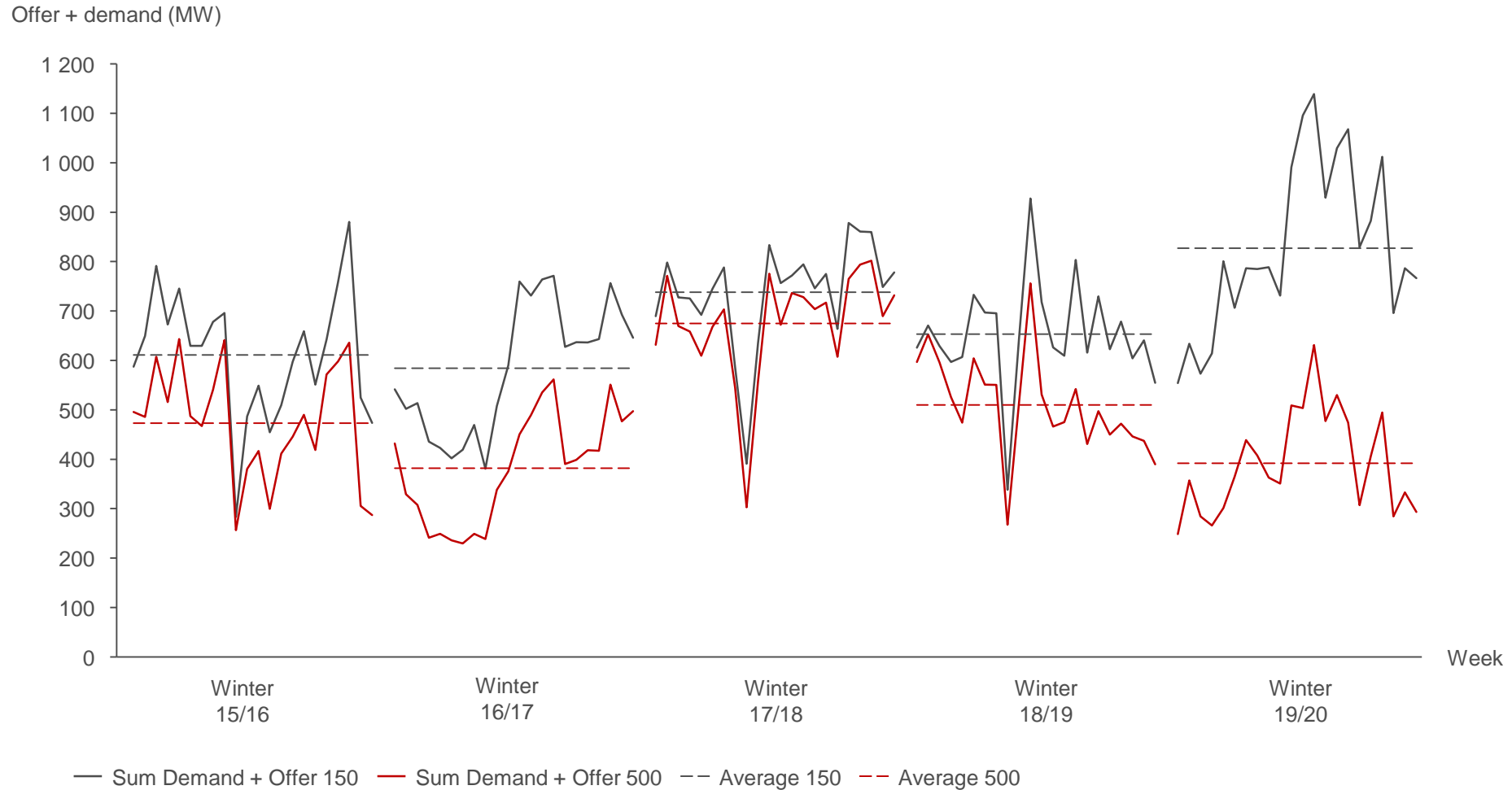
**Restriction 3 : hours**



The 2019/2020 winter has higher MR volumes in the refined EPEX dataset than previous years for the 150€/MWh threshold, but not for the 500€/MWh threshold, this reflects the yearly averages



The weekly averages for the high bound refined EPEX MR are above those of previous winter periods, this is not the case for the low bound. The gap between the low and high bounds greatly increased in the last winter



## Numerous analyses were conducted on the EPEX data to explain the volume patterns, yet without any strong correlations

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Various analyses were conducted :

- Simple correlations and multivariate regressions:
  - Day-ahead prices
  - Temperatures
  - Daily maximum price
  - Load
  - Gas prices

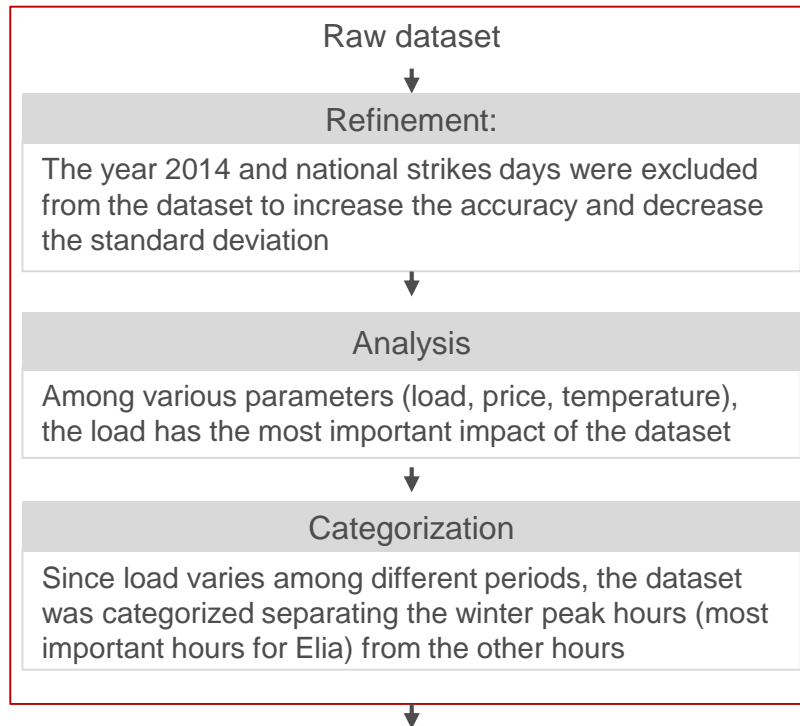
**As in the 2017, 2018, and 2019 studies, no satisfying results were found from these analyses, so the impact of the three main parameters (load, price and temperature) was assessed differently: by restricting the dataset to periods of important load, price, temperature etc.**

This documentation will be put on the Task Force ISR website

According to the methodology designed in 2017, the quantitative part (aggregated curve analysis) was updated with recent data

2017 Market response study

Aggregated curves analysis



- Volumes of Market Response above 150€/MWh
- Extrapolation of these results

2020 Study update

Aggregated curves + block orders analysis

- Verification of the coherence of the additional data  
→ **Coherent data addition**
- The analyses conducted in the 2017 study have a slightly different impact on the updated dataset  
→ **DA prices have the biggest impact, although load remains fairly important**
- The restriction analysis shows that the winter months categorization is the most pertinent  
→ **The CAGR analysis was conducted on the winter months, as the previous year**
- Updated Market Response volume above 150€/MWh
- New extrapolation of the results

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# Ancillary services projections provided for the 2020 update of the Market Response study

	FRR need	R1 Total	R1 DR Avg Min-max	% DR	R2 Total	R2 DR	R3+ Total	R3+DR Avg Min-max	% DR	Sum - DR
2018	1039 <sup>1a</sup>	81 <sup>1a</sup>	10 <sup>1b</sup> 0-23	12%	139 <sup>1a</sup>	0	900 <sup>1a</sup>	375 <sup>1b</sup> 260-494	42%	<b>385</b>
2019	1039 <sup>1a</sup>	80 <sup>1a</sup>	35 <sup>1c</sup>	44%	145 <sup>1a</sup>	0	894 <sup>1a</sup>	364 <sup>1c</sup>	41%	<b>399</b>
2020	Given that the Delivery Period 2020 is incomplete, no figures are provided. The numbers provided for the years 2022-2024 are based on an extrapolation from the year 2019									<b>413<sup>1)</sup></b>
2021	Dimensioning of Reserves 2021									<i>Projections</i>
2022	1039 <sup>2</sup>	88 <sup>2</sup>	35	40%	160 <sup>2</sup>	10%	879 <sup>2</sup>	404	46%	<b>439</b>
2023	1039 <sup>2</sup>	88 <sup>2</sup>	35	40%	160 <sup>2</sup>	20%	879 <sup>2</sup>	431	49%	<b>466</b>
2024	1039 <sup>2</sup>	88 <sup>2</sup>	35	40%	160 <sup>2</sup>	30%	879 <sup>2</sup>	457	52%	<b>492</b>

Scope ↑  
↓

<sup>1a</sup>Historic values FRR need, R1, R2, R3 (Dossier Volumes, LFC BOA), <sup>1b</sup>R1up, ICH, R3DP and R3flex (website); <sup>1c</sup> Based on the observed share of non-CIPU in the contracted volume via the national auction; <sup>2</sup>Elia best estimate;

- Weekly (R1) and daily (R3) contracts: yearly averaged volumes (and weekly/daily minimum and maximum); downward capacity is not relevant for the upward adequacy study
- Assumption concerning calculations (cells in yellow)
  - R1, MR covers all locally procured capacity (as from 2019)
  - R2, gradual increasing MR volumes as from go live new design (Q3 2020)
  - R3, slight MR share growth

The figures shown are an estimation and do not represent any targets or ambitions.

The final share of DR is determined by the market as products (R1, R2, R3) will be open for the offers of different technologies.