Market Response 2020

Task Force ISR

Brussels/Paris, 27 April 2020

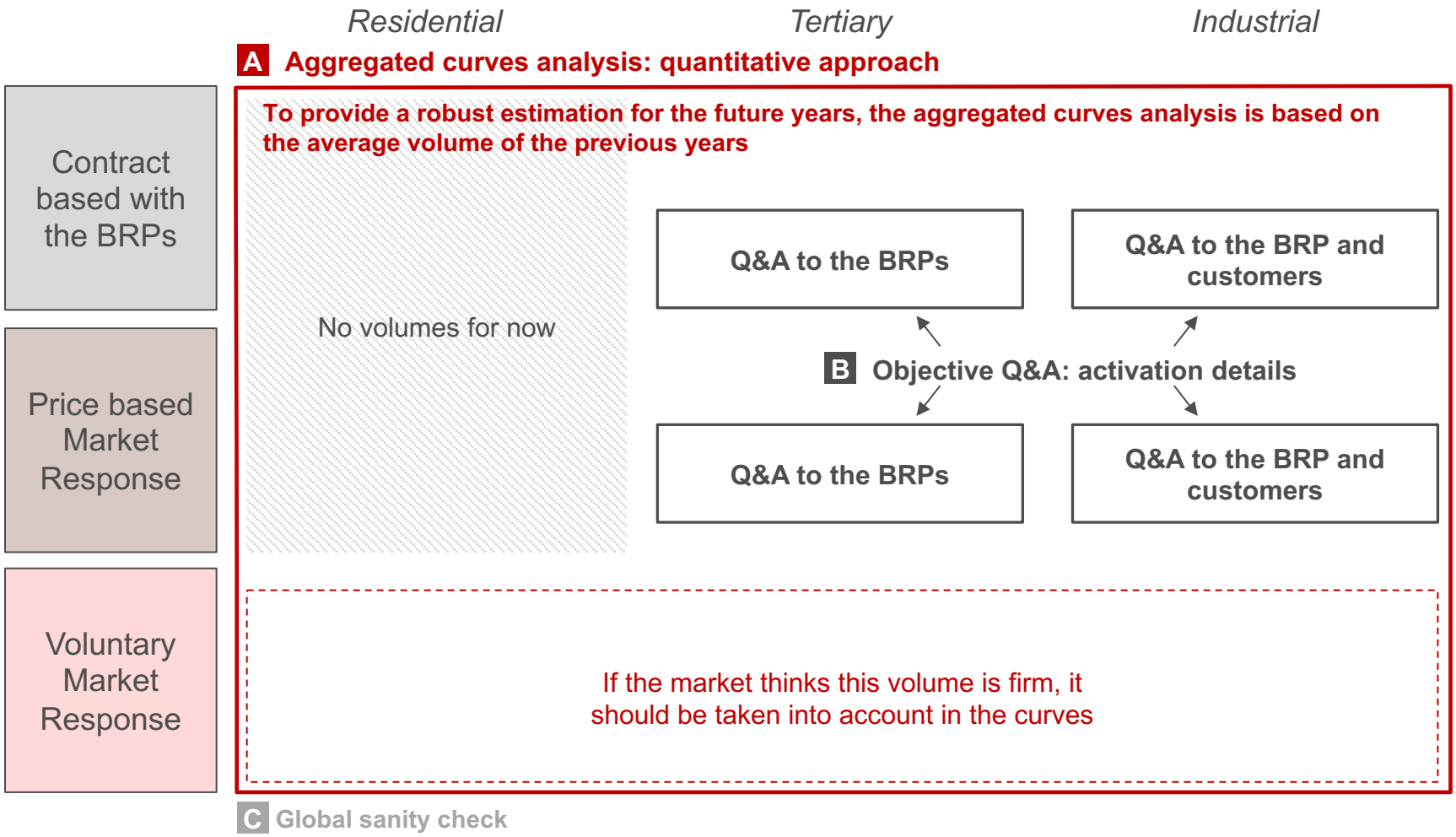
Objectives of this presentation

- In 2017, a robust & quantitative methodology was established to quantify the volume of Market Response in Belgium

- During the task force meetings in 2019 (July and September), it was discussed to adapt the methodology in view of stakeholder feedback on the fact that some volumes may not be fully captured. In particular:
  - Look into multi-NEMO compatibility (since Nord Pool has entered in the Belgian market), with the possibility to integrate more NEMOs ;
  - Re-assess the assumptions originally taken on block orders (simple and complex throughout this presentation).

- This document aims at presenting the proposed adaptation to the quantitative methodology and to deal with block orders

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



Source: E-CUBE Strategy Consultants

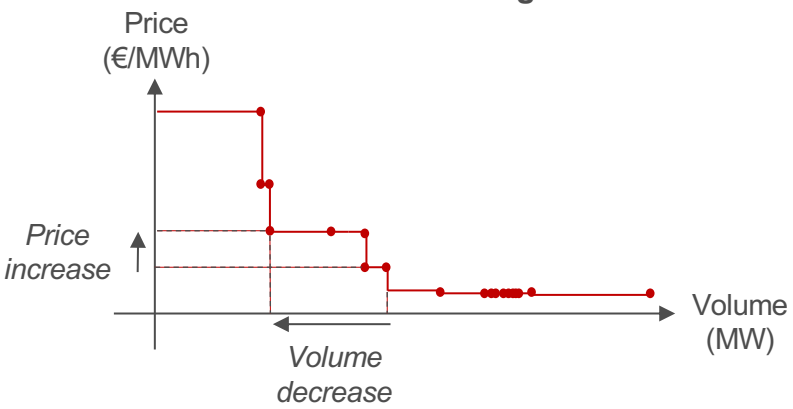
In the aggregated curves, Market Response volumes appear as a demand decrease or as an offer increase

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 the NEMO active in 2017.

Source: E-CUBE Strategy Consultants

In 2020, the methodology will be updated to consider the multiple NEMOs, and the block orders

1. Multiple NEMOs are operating in Belgium since July 2019

Therefore, the analysis will take into account the curves and bids realized in both NEMOs

NEMOs ACTIVE IN BELGIUM

› epexspot

NORD POOL

Note:

This adaptation of the aggregated curve methodology will allow the integration of additional NEMOs, as they start operations in the Belgian market. The quantitative methodology depends of course on data availability (aggregated demand / offer curves) from these active NEMOs.

This is providing that Nordpool data is available

2. The data used did not take the effect of block orders into account*

Therefore, the analysis will take into account the block orders (simple and complex) more thoroughly

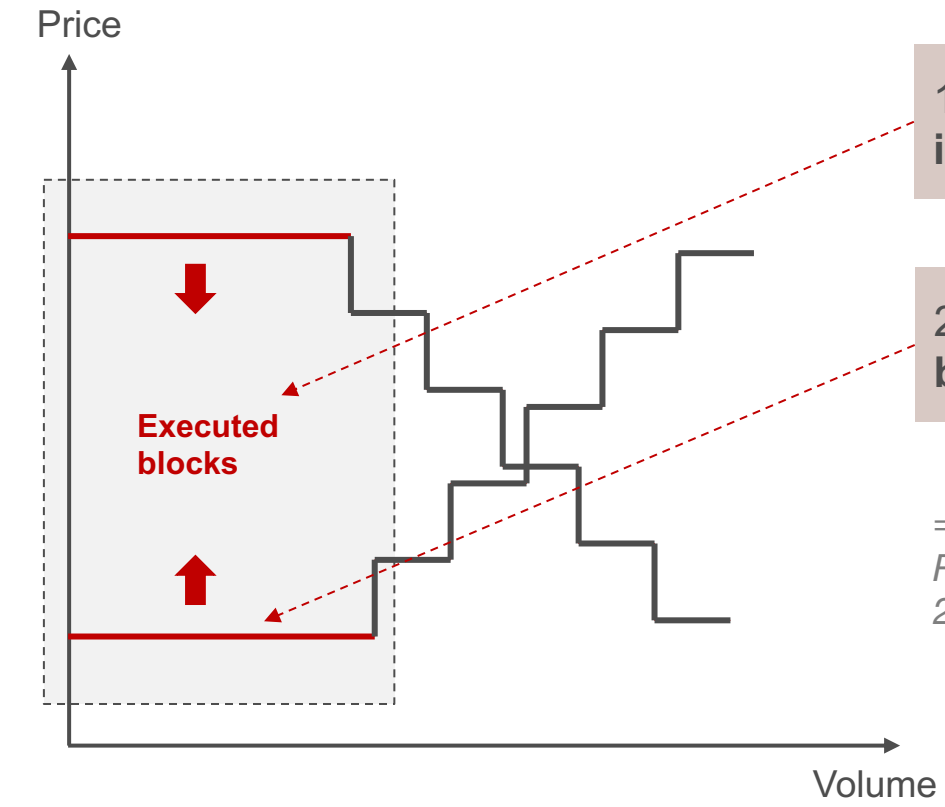
BELGIUM BLOCK ORDERS

› epexspot	NORD POOL
1 Simple blocks	1 Profiled / Block order
2 Curtailable blocks	2 Curtailable blocks
3 Exclusive blocks	3 Exclusive group
4 Loop Blocks	
5 Linked blocks	5 Linked blocks

* Note from 2017 methodology: The (block) orders are not taken into account in these (aggregated) curves. This reduces the total volume estimated. Though, according to EPEX, the volumes of Market Response (block) orders are very limited, most of it being from generation assets.

The block orders must be treated separately because the aggregated curves do not completely integrate them

ONLY EXECUTED BLOCKS ARE IN THE CURVES



1) **Only executed blocks are integrated within the curves**

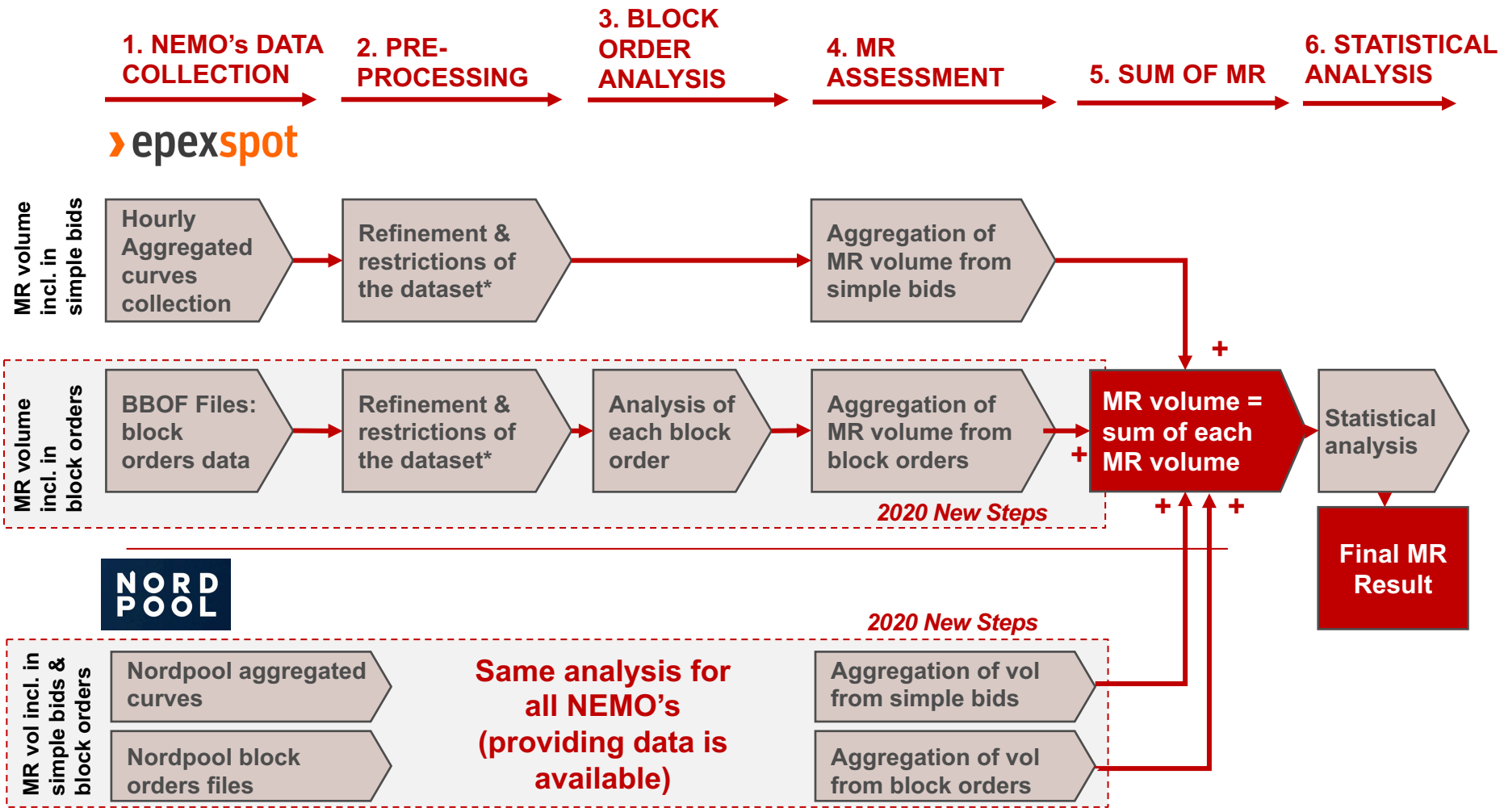
2) **They are not placed at their price but at "at all price"**

=> The block orders are not in the Market Response as calculated according to the 2017 methodology

Source: E-CUBE Strategy Consultants

Our proposed updated methodology to assess the Market Response in Belgium combines simple bids and block orders for all 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)*

There are five types of block orders to consider at EPEX or NORDPOOL day-ahead markets

THE DIFFERENT TYPES OF BLOCK ORDERS IN BELGIAN NEMOS

COMPLEX BLOCK ORDERS

1 Simple blocks[1)]

NORD POOL › epexspot

Blocks of volumes (which may be different between hours) for several hours which can be either entirely executed or entirely rejected (All-or None).

- *Ex : SELL 100MWh EACH HOUR BETWEEN 17h AND 19h IF PRICE ABOVE 50€/MWh*

2 Curtailable blocks

NORD POOL › epexspot

Blocks which can be partially executed (%) above a minimum acceptance ratio (MAR) defined by traders. **All types of blocks (simple or complex) may be curtailable.**

- *Ex : SELL BETWEEN 50MWh AND 100MWh (MAR = 50%) AT 17h IF PRICE ABOVE 50€/MWh*

3 Exclusive blocks[2)]

NORD POOL › epexspot

Group of blocks : among them, only one can be executed; the block that is accepted is the one that maximizes the value of the market.

- *Ex : (Block 1) SELL 50MWh AT 17h IF PRICE ABOVE 50€/MWh OR (Block 2) SELL 50MWh AT 19h IF PRICE ABOVE 100€/MWh*

4 Loop Blocks

› epexspot

Group of two blocks which are executed or rejected together. They allow for instance to bundle buy and sell blocks - *only offered at EPEX.*

- *Ex : (Block 1) SELL 50MWh AT 17h IF PRICE ABOVE 50€/MWh AND (Block 2) BUY 50MWh AT 19h IF PRICE BELOW 100€/MWh*

5 Linked blocks

NORD POOL › epexspot

Set of blocks with a linked execution constraint. The execution of a child block depends on the execution of its father block.

- *Ex : (Parent block) SELL 50MWh AT 17h IF PRICE ABOVE 50€/MWh (Child block) SELL 50MWh AT 18h IF PRICE ABOVE 40€/MWh*

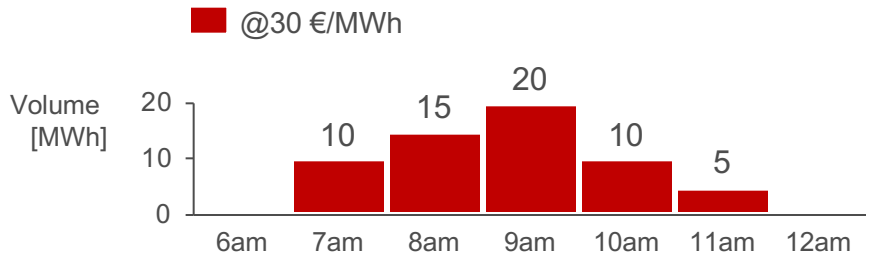
1) Which covers profiled and regular blocks at Nordpool, 2) Called Exclusive group at Nordpool
Source: E-CUBE Strategy Consultants - https://www.epexspot.com/en/tradingproducts

All block types, simple or complex, may be curtailable

LEGEND **non executed**: block order not cleared **executed**: block order cleared MAR : Minimum Acceptance Ratio

1 Simple blocks

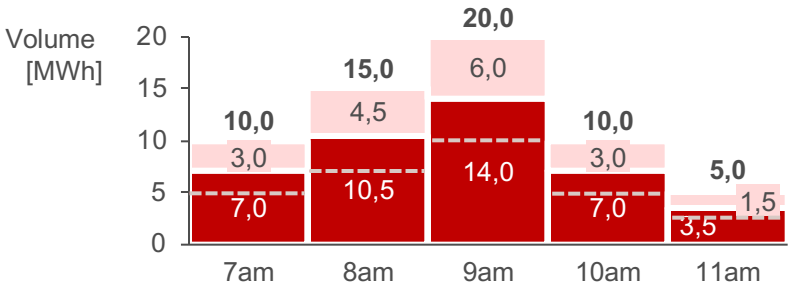
Blocks of volumes (which may be different between hours) over one or several hours which can be either entirely executed or entirely rejected (All-or None). ***It corresponds to a curtailable block with a Minimum Acceptance Ratio of 1***



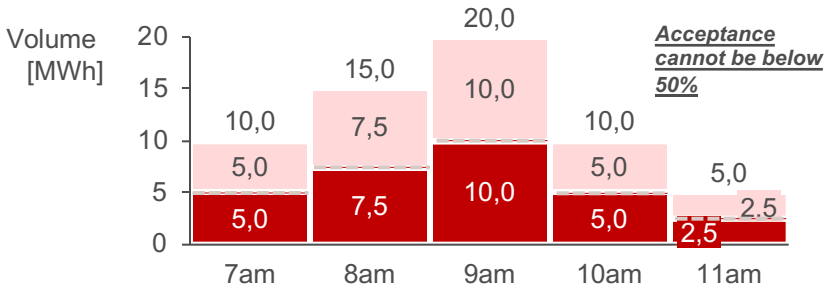
2 Curtailable blocks

Blocks which can be partially executed (%) above a minimum acceptance ratio (MAR) defined by traders, per hour. ***There is one MAR per block, valid for all hours.***

EXAMPLES WITH A MAR OF 50% AND AN ACCEPTANCE OF 70%



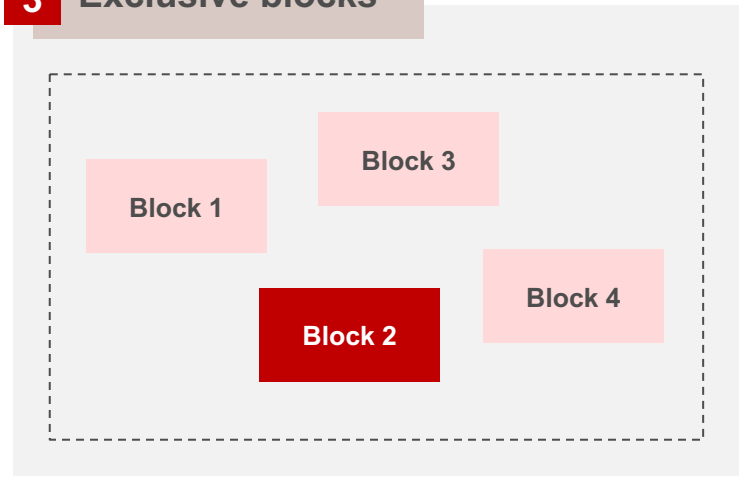
EXAMPLES WITH A MAR OF 50% AND AN ACCEPTANCE OF 50%



Source: E-CUBE Strategy Consultants

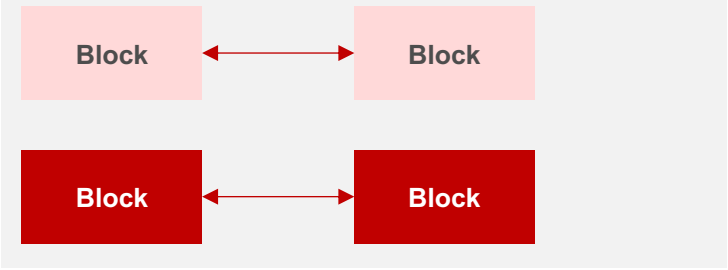
There are three types of complex block orders

3 Exclusive blocks



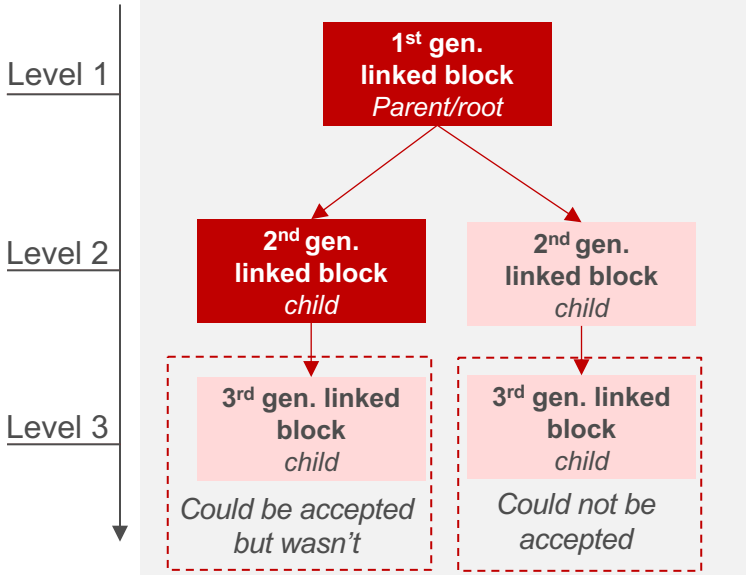
Group of blocks: among them, only one can be executed

4 Loop Blocks



Group of two blocks which are executed or rejected together

5 Linked blocks



Set of blocks with a linked execution constraint. The execution of a child block depends on the execution of its father block.

LEGEND

***non executed**: block bid authorized but not cleared*

***executed**: block bid authorized and cleared*

Source: E-CUBE Strategy Consultants

There are three principles to be considered whether the block orders should be integrated in the Market Response volume calculation

PRINCIPLES OF THE INTEGRATION OF THE BLOCKS

A — Coherence with the market response definition

The market response volume is the total (net) volume that reacts when prices rise from 150/500 €/MWh (high/low thresholds*) until 3000 €/MWh (not included), either by a generation increase (offer curve) or a consumption decrease (demand curve).

→ Only bids above this 150/500 €/MWh Market Response Threshold (MRT) will be considered

B — Multi-hour activation of block orders

Observation: compared to simple bids, block orders actually span over multiple hours. This means that their activation in fact does not only depend on a price increase in one hour, but over multiple hours at the same time

Principle: high prices triggering market response activations (i.e. above 150/500 €/MWh) are considered to occur simultaneously over several hours of a day : this is a Market Response event

→ We consider that hours around a Market Response event are correlated and that the prices rise equally

C — Avoidance of double counting

→ Only what is contractually possible in the bids is accepted – e.g :

- **No double counting for blocks into MR** *: e.g: only one exclusive block from an exclusive group of blocks can only counted, either in the market response, or excluded from it*
- **All bids above the MRT are integrated into MR if they are deemed available (i.e. are contractually possible) during a MR event**

* In line with the quantitative methodology defined in 2017

Source: E-CUBE Strategy Consultants

These principles derive into a methodology of integration for each block order

ORDER BLOCKS	RULES OF INTEGRATION
1 Simple blocks[1)] (NORD POOL, epexspot)	If the block price is above the MR Threshold[1)], then it is considered as MR
2 Curtailable blocks (NORD POOL, epexspot)	If the curtailable block price is above the MR Threshold[1)], then it is considered as 100% MR, whatever the minimum acceptance ratio
3 Exclusive blocks[2)] (NORD POOL, epexspot)	1. The block that would contribute most to the loss of load avoidance – the one with the highest volume – is "selected" 2. If this block is above the MR Threshold, then it is considered as MR
4 Loop Blocks (epexspot)	Only the blocks above the MR Threshold are considered as MR.
5 Linked blocks (NORD POOL, epexspot)	All the submitted linked blocks above the MRT will be considered as MR

1) Excluding Block at -500€/MWh and blocks at 3000 €/MWh; 2) Called Exclusive group at Nordpool
Source: E-CUBE Strategy Consultants

Examples of simple, curtailable and exclusive blocks

METHODOLOGY TO INTEGRATE ORDER BLOCKS IN MR

MRT = Market Response Threshold 150-500 €/MWh

1 Simple blocks

Simple block

*If price > MRT => **MR***
*If price < MRT => **Not MR***

2 Curtailable blocks

Curtailed block

Example : with MAR =50%

*If price > MRT => **100% MR***
*If price < MRT => **Not MR***

If the curtailable block is considered part of the MR, then it is 100% MR, whatever the minimum acceptance ratio

3 Exclusive blocks

1. ***The block that would contribute most to loss of load avoidance – the one with the highest volume is "selected"***
2. ***If the block is above the MR Threshold, then it is considered as MR***

LEGEND
NOT MR
MR

***Case #1** : a block is priced **above** MRT*

Exclusive block	Exclusive block	Exclusive block (Selected block)
sell **10MWh** at **90 €/MWh**	sell **10MWh** at **200 €/MWh**	sell **15MWh** at **30 €/MWh**

→ ***Not MR***

***Case #2** : all blocks are priced above MRT*

Exclusive block	Exclusive block	Exclusive block
sell **20MWh** at **180 €/MWh**	sell **15MWh** at **175 €/MWh**	sell **15MWh** at **200 €/MWh**

→ ***MR***

***Case #3** : all blocks are priced below MRT*

Exclusive block	Exclusive block	Exclusive block
sell **10MWh** at **30 €/MWh**	sell **10MWh** at **80 €/MWh**	sell **10MWh** at **30 €/MWh**

→ ***NOT MR***

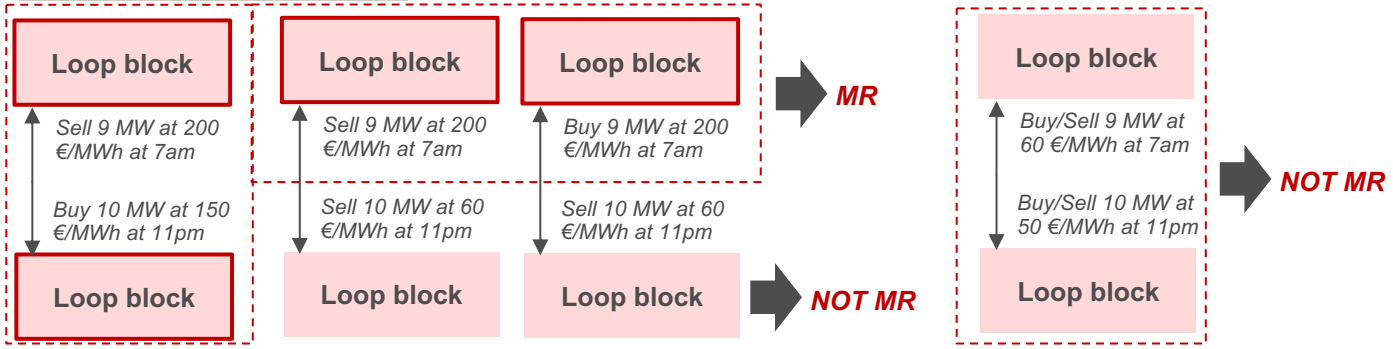
Examples of look blocks and linked blocks

METHODOLOGY TO INTEGRATE ORDER BLOCKS IN MR

MRT = Market Response Threshold 150/500 €/MWh

4 Loop blocks

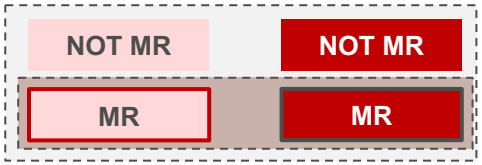
Only the blocks above the MRT are considered as MR. If both blocks are below the threshold, then it is not.



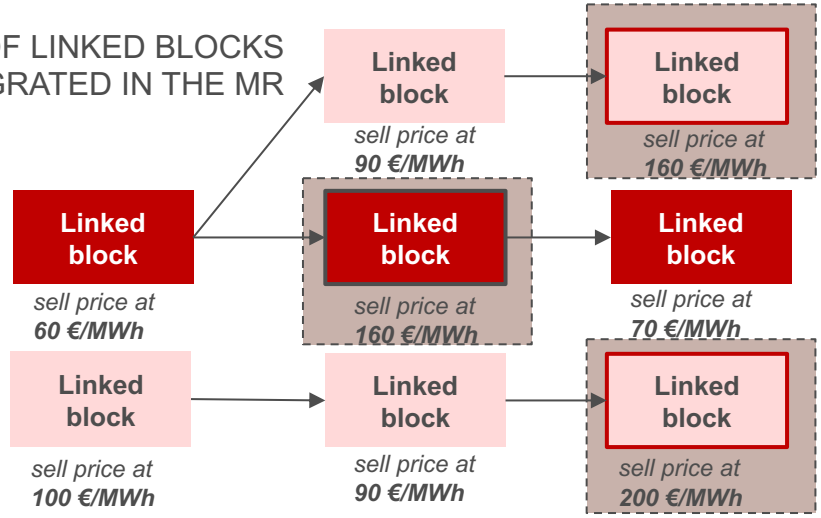
5 Linked blocks

All the submitted linked blocks above the MRT will be considered as MR

LEGEND



EXAMPLES OF LINKED BLOCKS INTEGRATED IN THE MR



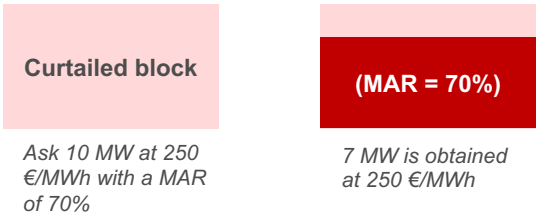
Block orders which integrate conditional execution will require a specific analysis in the MR assessment

LEGEND

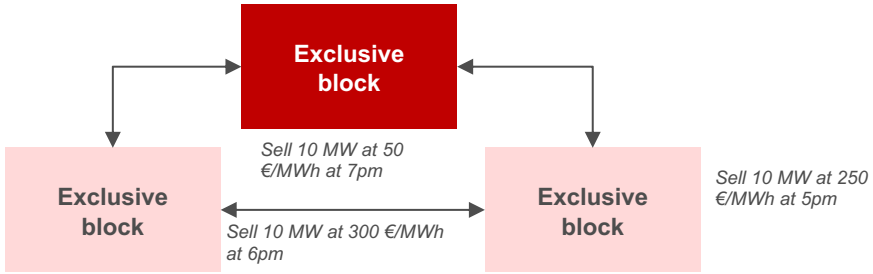
non executed: *block bid authorized but not cleared*

executed: *block bid authorized and cleared*

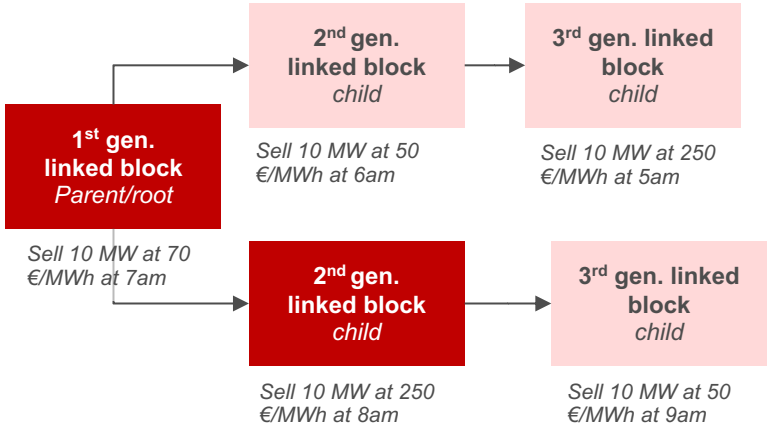
2 CURTAILED BLOCKS CAN BE EITHER REJECTED OR EXECUTED ABOVE THE MAR



3 AT MOST ONE EXCLUSIVE BLOCK FROM THE SAME GROUP CAN BE ACCEPTED



4 THE EXECUTION OF A GENERATION LINKED BLOCK CONDITIONS THE AUTHORIZATION OF NEXT ONE



5 LOOP BLOCKS ARE EXECUTED OR REJECTED AS A WHOLE