

# AKTØRMØDE VEDR. MARKEDS- OG IT- ÆNDRINGER

Implementering af det nordiske mFRR  
energiaktiveringsmarked

*1. september 2020*

# Dagsorden

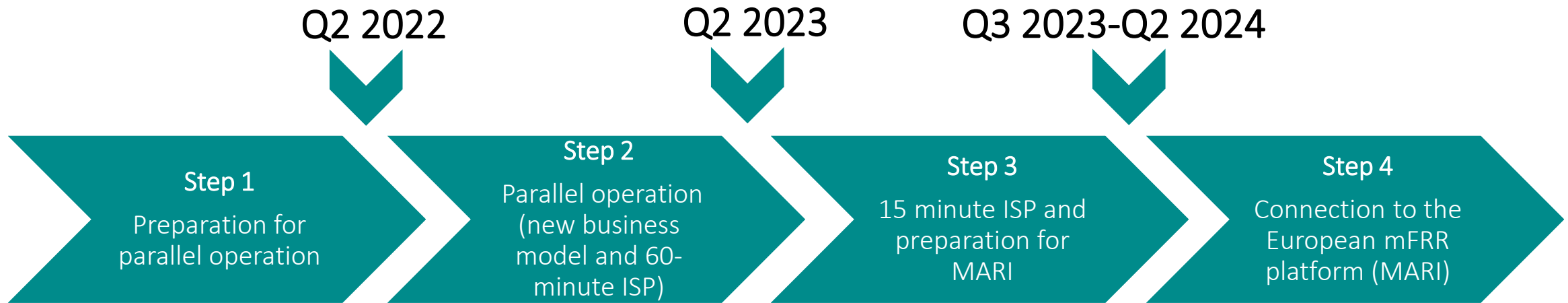


1. Velkomst og introduktion
2. Timeline for markeds- og IT-ændringer
3. Ændringer i budindmelding
4. Ændringer i budaktivering
5. Dialog fremadrettet

# MÅLET MED MØDET

- Dansk vinkel på det nordiske arbejde
- Følge op på nordiske møder og svare på spørgsmål
- Fortælle om 'work in progress'
- Dialog - drøfte og få inputs til mulige løsninger

# FOUR STEP PLAN...



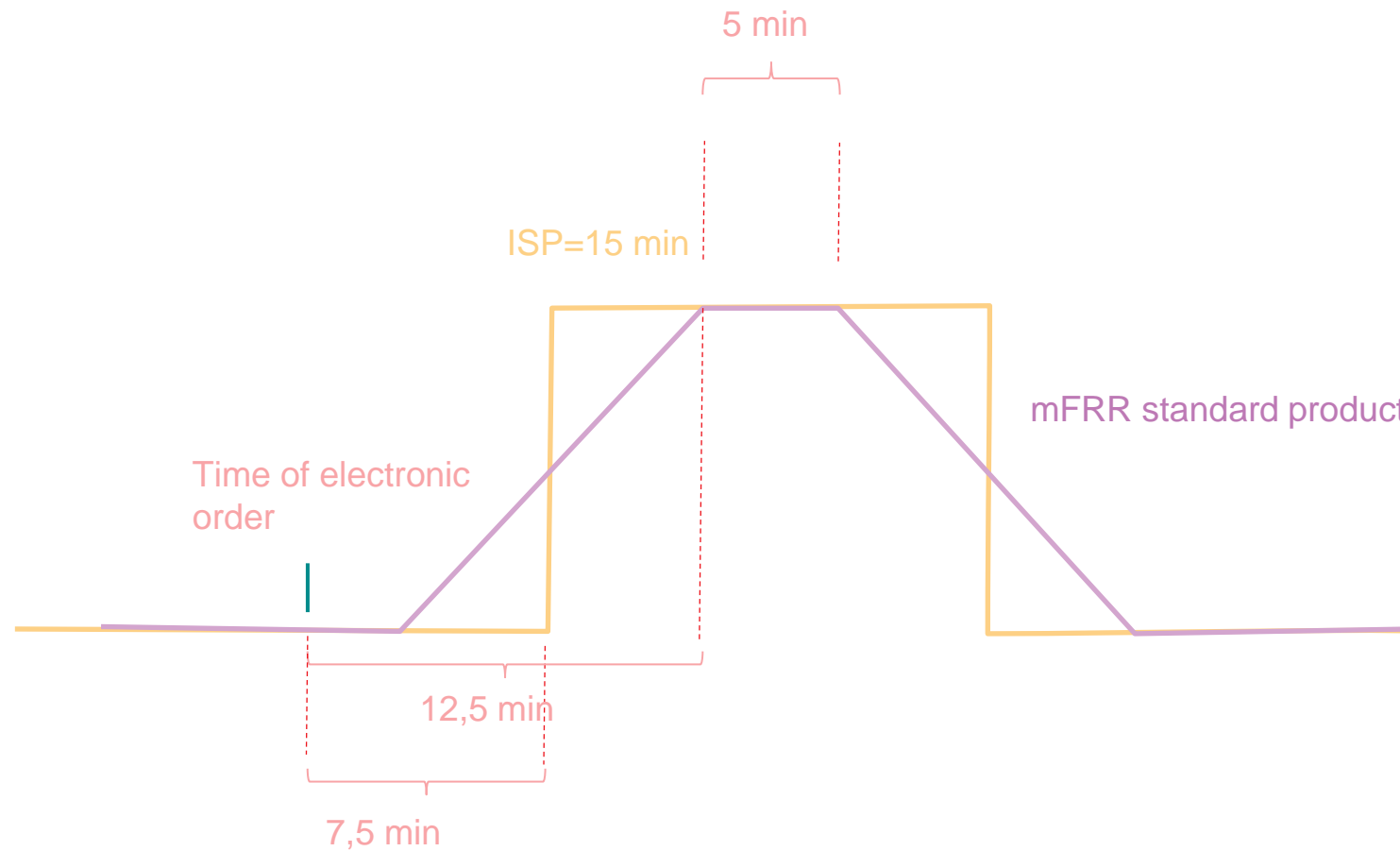
- Introduction of new bid format (CIM)
- Technical support for new bid attributes
- Maybe functional support for limited set of new bid attributes
- Maybe change ramping to comply with standard product

- Bid activations each quarter hour
- 15 min. and/or 60 min. bids supported
- Functional support for new attributes
- Ramping to comply with standard product
- Switch between automatic/fallback (manual) operation

- 15 min. ISP fully implemented

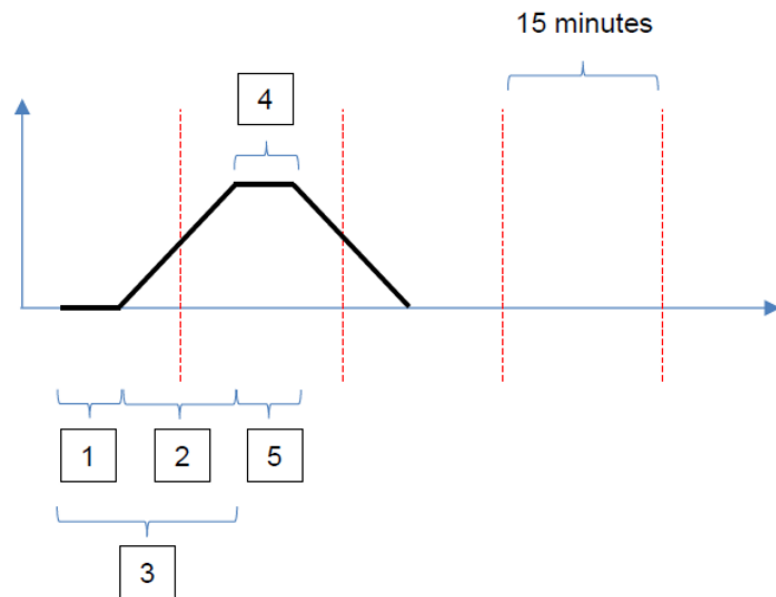
- Full support for standard mFRR energy activation market product

# MARI STANDARD PRODUCT

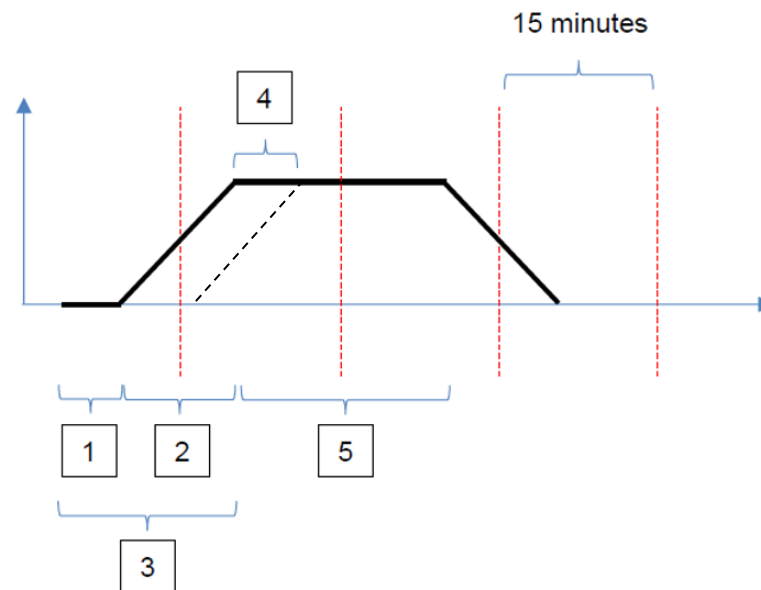


# STANDARD PRODUCT: SCHEDULED- AND DIRECT- ACTIVATION

## Scheduled activation

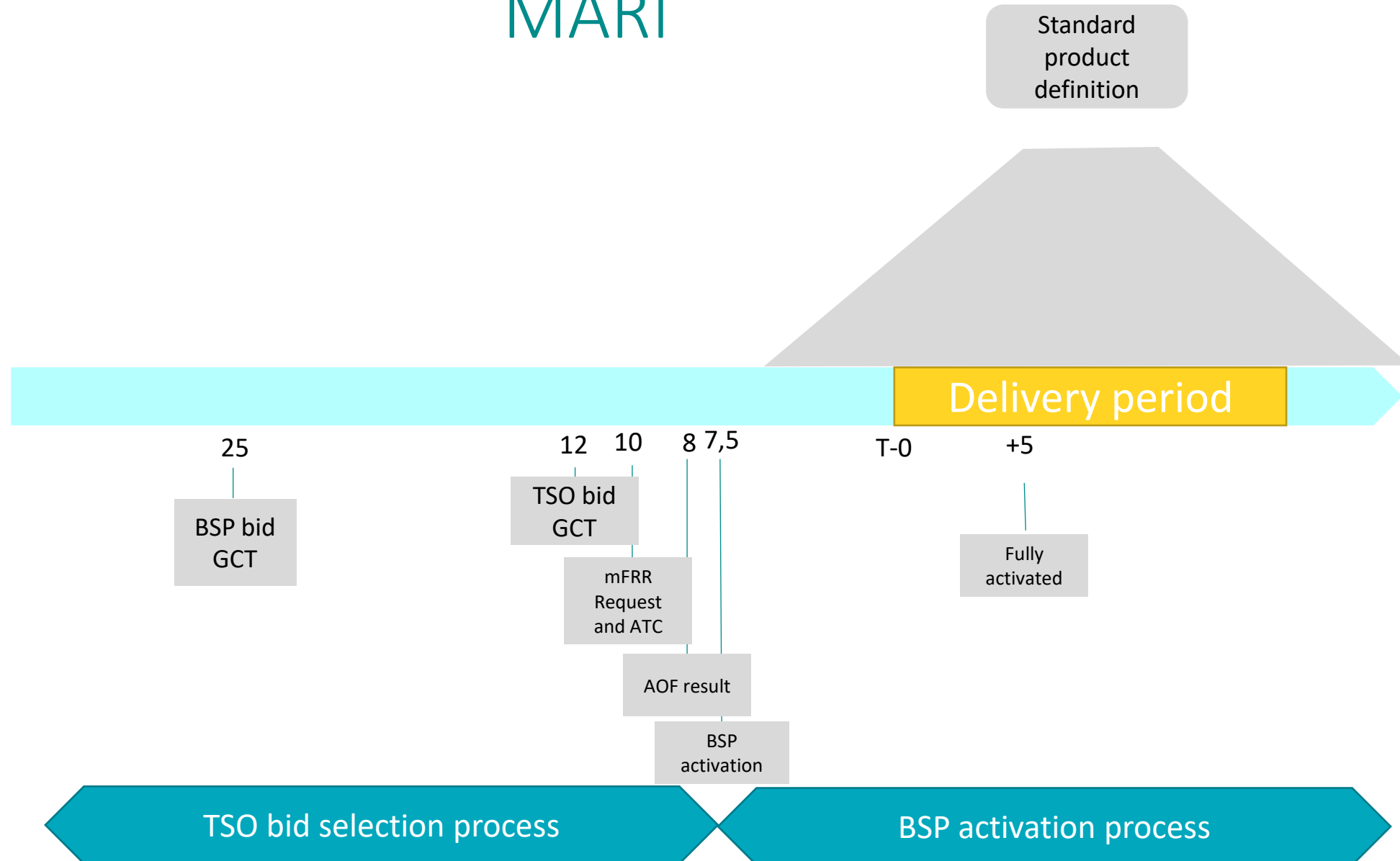


## Example of the longest direct activation



1. Preparation period
2. Ramping period
3. FAT – full activation time
4. Minimum duration of delivery period (5 min)
5. Maximum duration of delivery period:
  - a) 5 min in scheduled activation
  - b) 20 min in direct activation

# TIMELINE FOR BIDDING AND ACTIVATION IN MARI



## MARKET DESIGN

Under udarbejdelse

|   | Today                 | Parallel operation (Q2 2022-Q2 2023) | After 15 min ISP but before connection to MARI | When connecting to MARI |
|---|-----------------------|--------------------------------------|--|-------------------------|
| Full Activation Time, FAT (minutes)                     | 15                    | To be determined                     | To be determined                               | 12,5                    |
| Maximum/minimum price (EUR/MWh)                         | 5000/no minimum price | To be determined                     | To be determined                               | 99 999/-99 999          |
| Minimum bid size (MW)                                   | 5 or 10               | 1, 5 or 10                           | 1, 5 or 10                                     | 1                       |
| BSP bid time resolution for price and volume (minutes). | 60                    | 60 and 15                            | 15   | 15                      |
| Marginal price resolution (minutes)                     | 60                    | 60                                   | 15   | 15                      |
| Bid activation  | Electronic and manual | Electronic                           | Electronic                                     | Electronic              |
| Gate closure time                                       | H-45 min              | H-45 min                             | Q-45 (25) min                                  | Q-25 min                |
| MARI bid attributes for standard product                | -                     | introduced                           | introduced                                     | introduced              |



# PARALLEL OPERATION – WHAT WILL CHANGE? **ENERGINET**

1. **TSO process based on 15 minutes**
  - a) Fresh look at the expected imbalance every 15 minutes
  - b) Activations based on AOF results every 15 min
  - c) 60-minute bids are divided into 4x15 min bids
2. **Changes in bid submission:**
  - a) Support of 60- and/or 15-minute bids is being discussed
  - b) Support of standard product bid attributes
3. **BSP must be prepared for changes to activation:**
  - a) Scheduled activation (electronic ordering) will run each 15 min.
  - b) No guarantee that an activation lasts more than 15 minutes
  - c) Different activation pattern – ramping requirements
4. **Still one marginal price per hour**

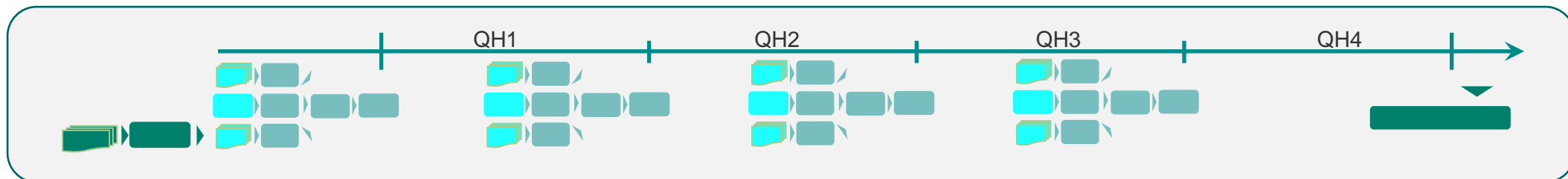
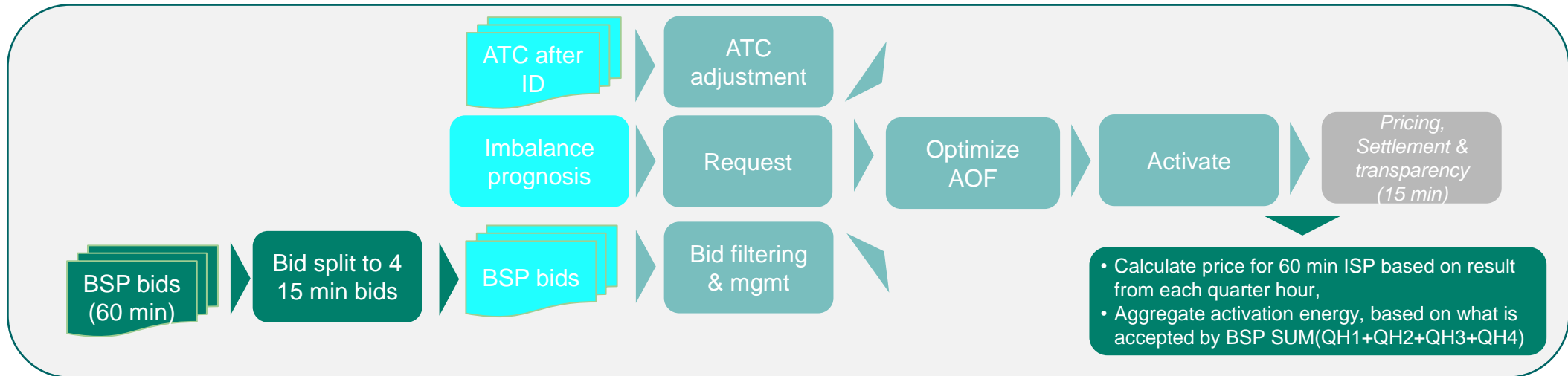
# BIDDING IN PARALLEL OPERATION

Time resolution and bid attributes for standard product

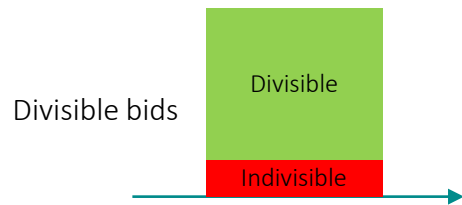
# STANDARD PRODUCT BID ATTRIBUTES

|  | Bid attribute                        | Description  |
|--|--------------------------------------|--|
| <b>SIMPLE BIDS:</b> <ul style="list-style-type: none"> <li>▪ One bid</li> <li>▪ One price</li> </ul> | <b>Indivisible Bids</b>              | Bids that must be activated in its entirety.   |
|  | <b>Minimum offered volume</b>        | This is in order to set a minimum volume to be activated even though the bid is divisible.   |
| <b>COMPLEX BIDS –</b><br>Combination of simple bids  | <b>Exclusive Bids</b>                | It will only be possible to activate one of the amounted volumes with its corresponding cost.  |
|  | <b>Multipart (Parent/child) bids</b> | Gives an opportunity to notify when the bid is subject to an increasing cost curve.  |
| <b>BIDS, LINKED IN TIME –</b><br>between consecutive quarter hours                                   | <b>Conditional Bids</b>              | Possibility to change the availability of one or multiple bids – if the bid is activated during the latest quarter, it is available/not available in the next. |
|  | <b>Technical Linked Bids</b>         | Technical linkage avoids the activation of the same balancing resource twice and takes ramping restrictions into account.                                      |
| <b>ACTIVATION TYPE</b>   | <b>Direct activation type</b>        | If bid is eligible for scheduled activation only or for both scheduled activation and direct activation.   |

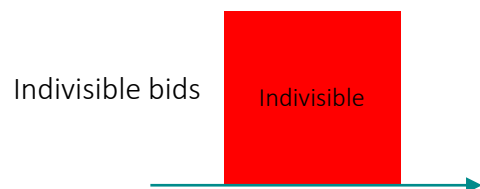
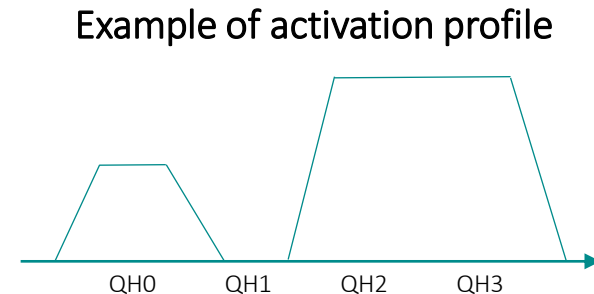
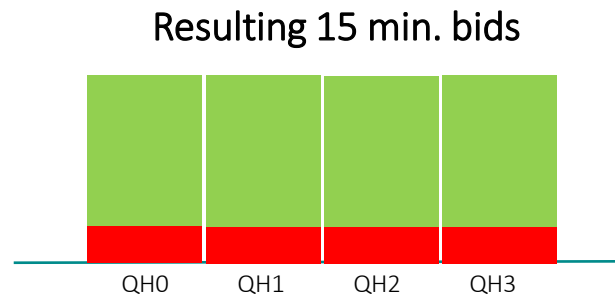
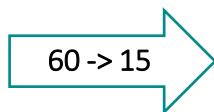
# PARALLEL OPERATION: 15 MIN ACTIVATION PROCESS ⇔ 60 MIN ISP



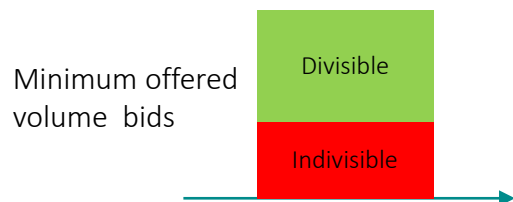
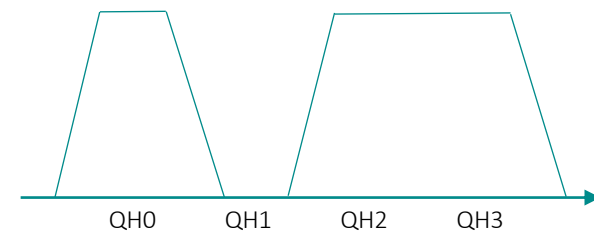
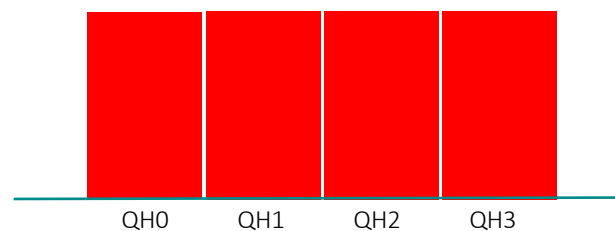
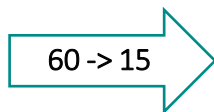
# SIMPLE BID TYPES



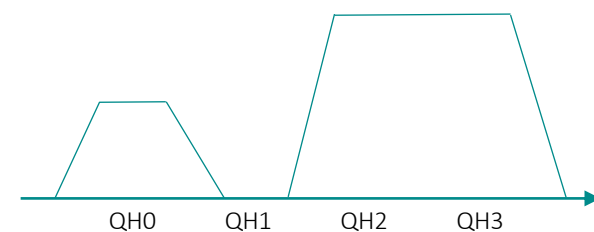
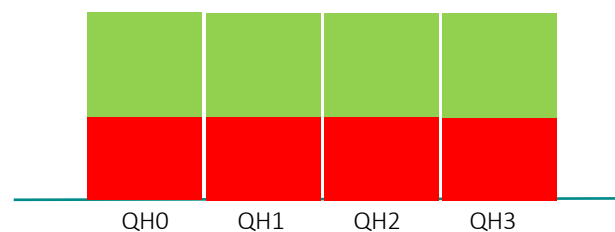
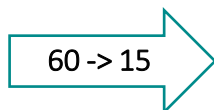
**Description**  
If activated the volume will be between max offered volume and min bid size



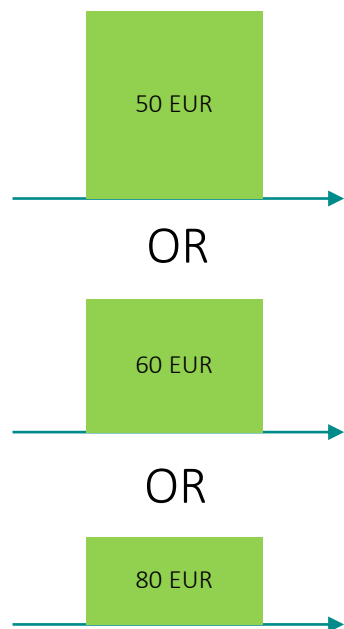
**Description**  
If activated the volume will be exactly max offered volume.



**Description**  
If activated the volume will be between max offered volume and min offered volume



# EXCLUSIVE BID



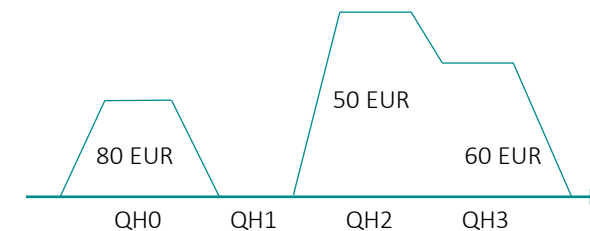
**Description**  
 Exclusive bids are mutually exclusive according to the principle “exactly one or none”. They may have different prices, directions and volumes. Exclusive bids must refer to the same MTU period.

60 -> 15

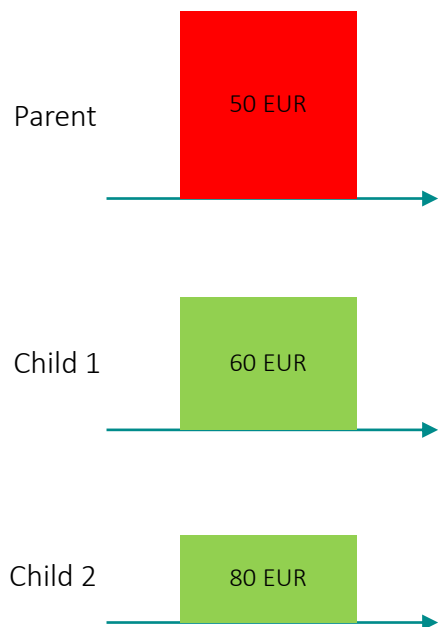
Resulting 15 min. bids



Example of activation profile



# MULTIPART BID



**Description**  
 Multipart bids must cover the same single MTU period and have the same direction.

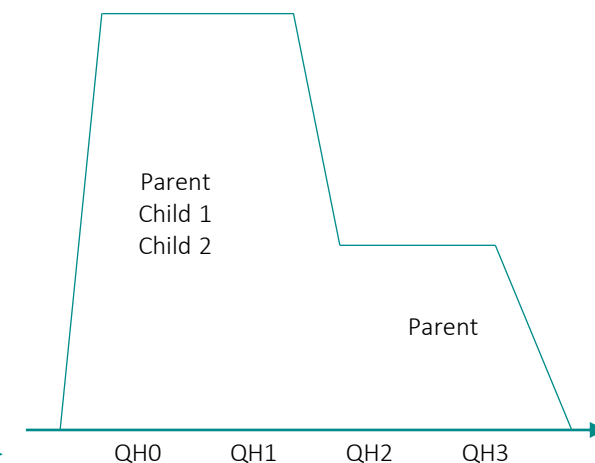
Bids with upward direction are assumed to have ascending prices while bids with downward direction are assumed to have descending prices.

60 -> 15

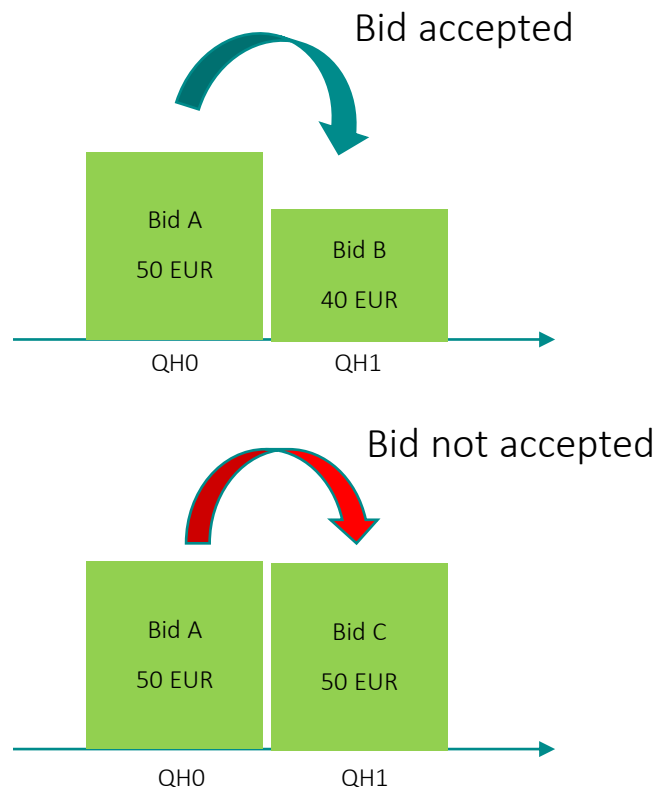
Resulting 15 min. bids



Example of activation profile



# CONDITIONAL BIDS (ECONOMICAL LINKING)



## Description

Conditional bids consist of bids in two or three consecutive MTU periods. Depending on whether the bid in QH0 was accepted or not, an associated bid in QH1 or QH2 will become either unavailable or available:

- Bid in QH0 accepted -> bid in QH1 available
- Bid in QH0 rejected -> bid in QH1 unavailable
- Bid in QH0 accepted -> bid in QH2 available
- Bid in QH0 rejected -> bid in QH2 unavailable

Within a group of conditionally linked bids, there has to be exactly one bid in QH0. In QH1 there may be zero, one or two bids with a link to the single bid in QH0. In QH2 there may be zero, one or two bids with a link to the single bid in QH0.

60 -> 15

**60 minute bids in parallel operation**

Conditional bids will not be allowed when sending bids in 60 minutes resolution.



# TECHNICAL LINKING

## Description

Links between bids in consecutive quarter hours, needed to avoid the underlying asset of a bid being activated twice or performing unfeasible activations.

Rules for technical linking between two consecutive quarter hours:

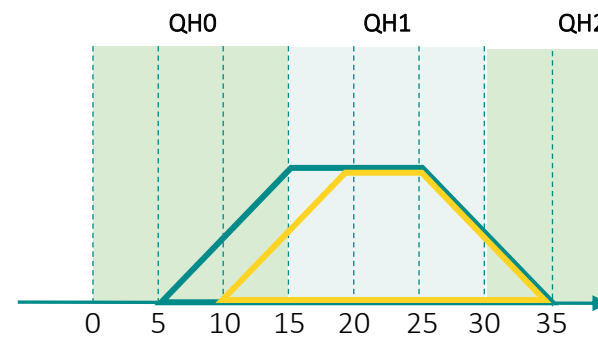
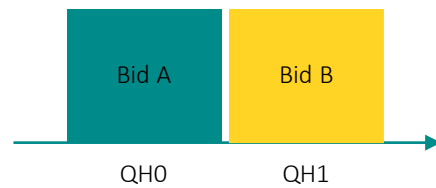
1. A bid direct activated in QH0 is not available in QH1 for direct activation;
2. A bid direct activated in QH0 is not available in QH1 for scheduled activation;
3. A bid scheduled activated in QH0 is not available in QH1 for direct activation, unless the asset can perform ramping up during ramping down of a scheduled bid activated in QH0

Rule for technical linking between consecutive quarter hours i.e. more than two quarter hours:

1. A bid direct activated in QH0 is not available for direct activation in QH2, unless the asset can perform ramping up during ramping down of a direct activated bid in QH0

# REASONS FOR TECHNICAL LINKING (1 OF 3)

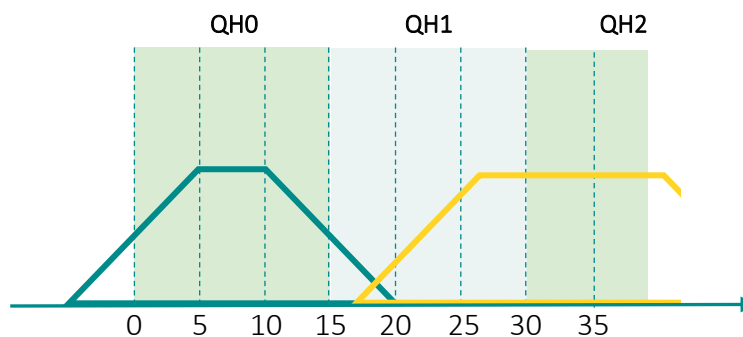
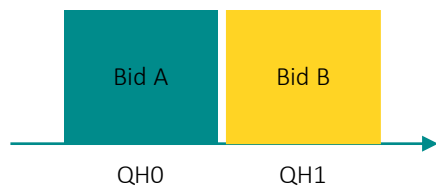
Direct activation in previous quarter



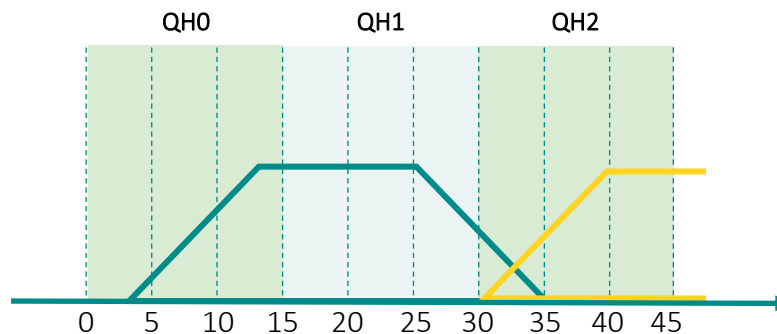
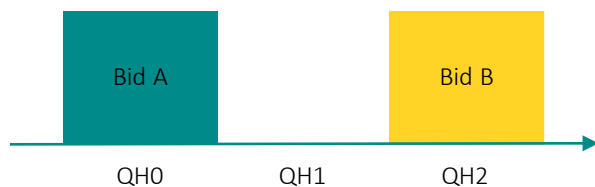
Bid A is direct activated in QH0 and will extend into QH1. Consequently bid B will not be available.

# REASONS FOR TECHNICAL LINKING (2 OF 3)

Direct activation in next quarter



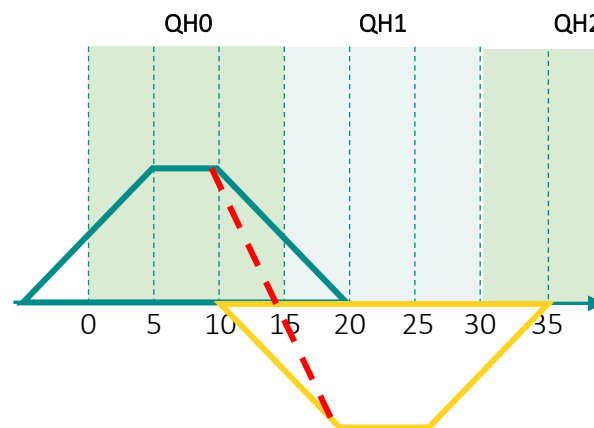
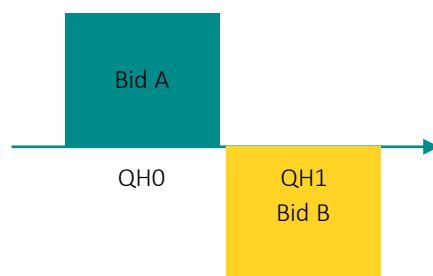
Bid A is scheduled activated in QH0 and will extend into QH1. Direct activation of Bid B will require the underlying asset to ramp up while ramping down.



Bid A is direct activated in QH0 and will extend into QH2. Direct activation of Bid B will require the underlying asset to ramp up while ramping down.

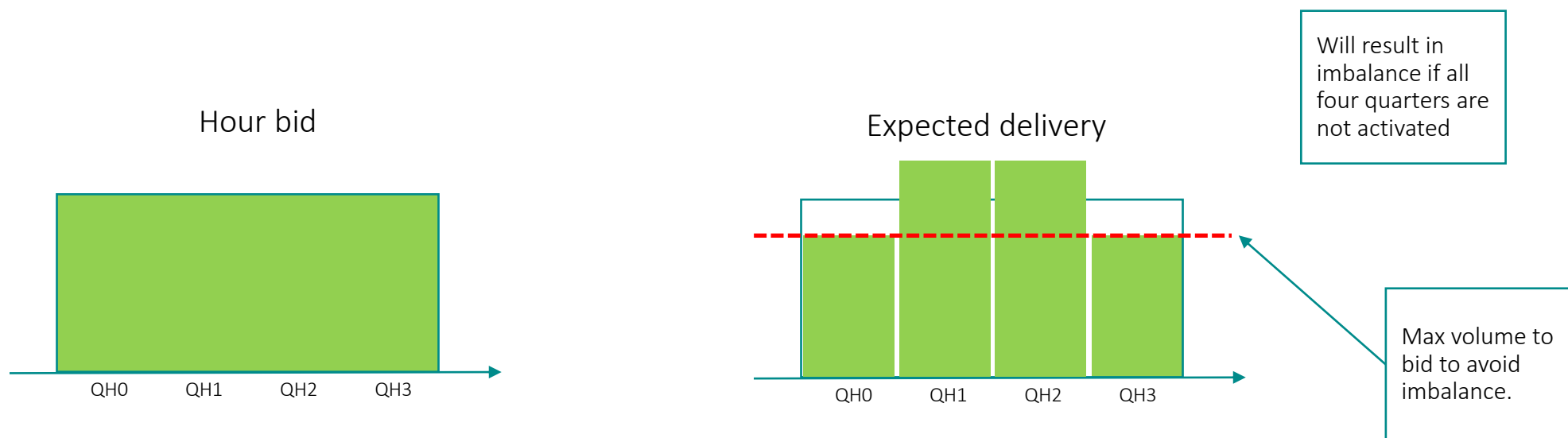
# REASONS FOR TECHNICAL LINKING (3 OF 3)

## Ramping restrictions



The ramp from upward X MW to down ward  $-X$  MW will require twice the ramping speed as required for Bid A and Bid B. If the underlying asset will not be able to fulfill the faster ramping curve, then there is a technical link.

# POTENTIAL IMBALANCE IF DELIVERY DIFFERS OVER THE HOUR



# STANDARD PRODUCT BID ATTRIBUTES - SUMMARY

| Bid attributes           | Preparation                                   | Parallel Operation                    |                    | 15 min. ISP        | MARI               |
|--------------------------|---|---------------------------------------|--------------------|--------------------|--------------------|
|                          |   | 60 min bids                           | 15 min bids        |                    |                    |
| Minimum offered volume   | Technical support<br>Maybe functional support | Functional support (simple splitting) | Functional support | Functional support | Functional support |
| Indivisible Bids         | Technical support<br>Maybe functional support | Functional support (simple splitting) | Functional support | Functional support | Functional support |
| Exclusive Bids           | Technical support                             | Functional support (simple splitting) | Functional support | Functional support | Functional support |
| Multipart (Parent/child) | Technical support                             | Functional support (simple splitting) | Functional support | Functional support | Functional support |
| Conditional Bids         | Technical support                             | Technical support                     | Functional support | Functional support | Functional support |
| Technical Linked Bids    | Technical support                             | Technical support                     | Functional support | Functional support | Functional support |
| Activation type          | Technical support                             | Functional support (simple splitting) | Functional support | Functional support | Functional support |

**Technical support:**  
The attribute will be allowed in the CIM document but will be ignored.

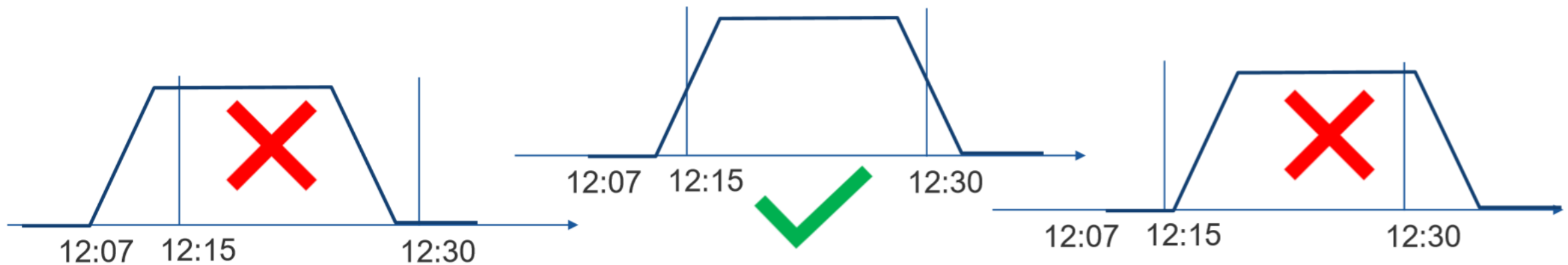
**Functional support:**  
The attribute will be fully functional.

# CHANGES IN BID ACTIVATION

## Scheduled activation

### Typical activation

- 12:07:30: Activation order sent for delivery in the quarter 12:15-12:30
- Timestamp of the activation will be 12:15
- The desired response is similar to the standard product
  - Don't finish ramping before 12:15. Don't start ramping after 12:15

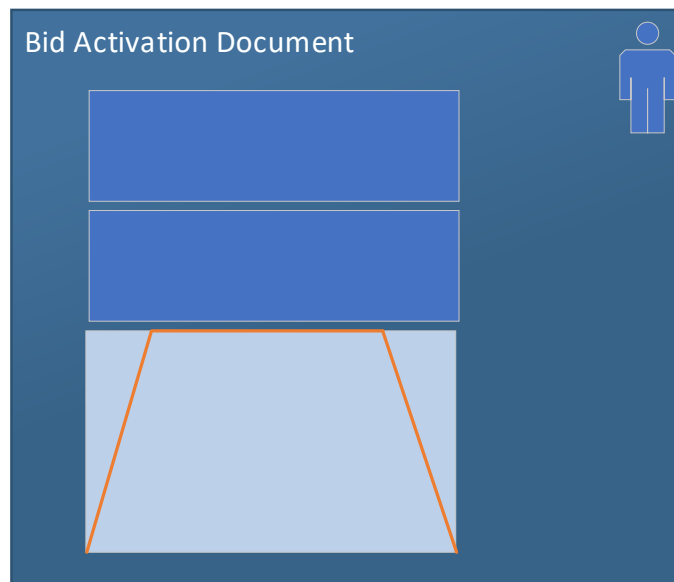


# CHANGES IN BID ACTIVATION

Interactive discussion

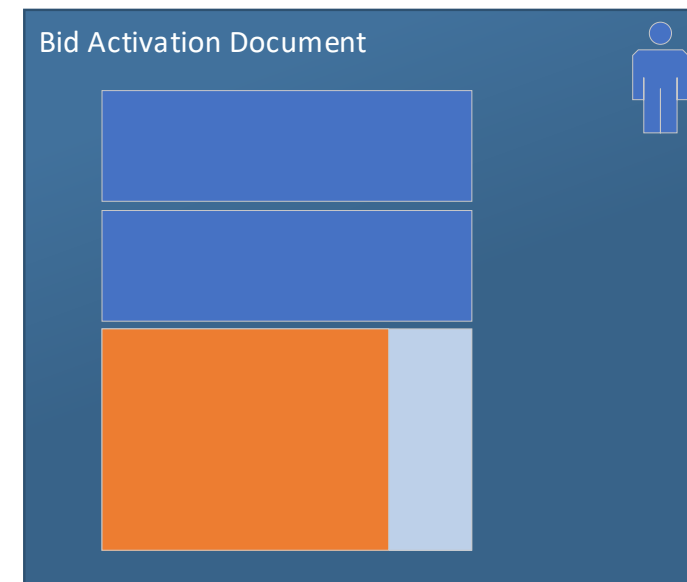
## Activation Model

- Ramping vs block activation
- Update of period
- Information model: CIM
- Activation signal
  - Scheduled vs direct



Now

Timing: variable



Preperation

Timing: fixed – direct activation ad-hoc

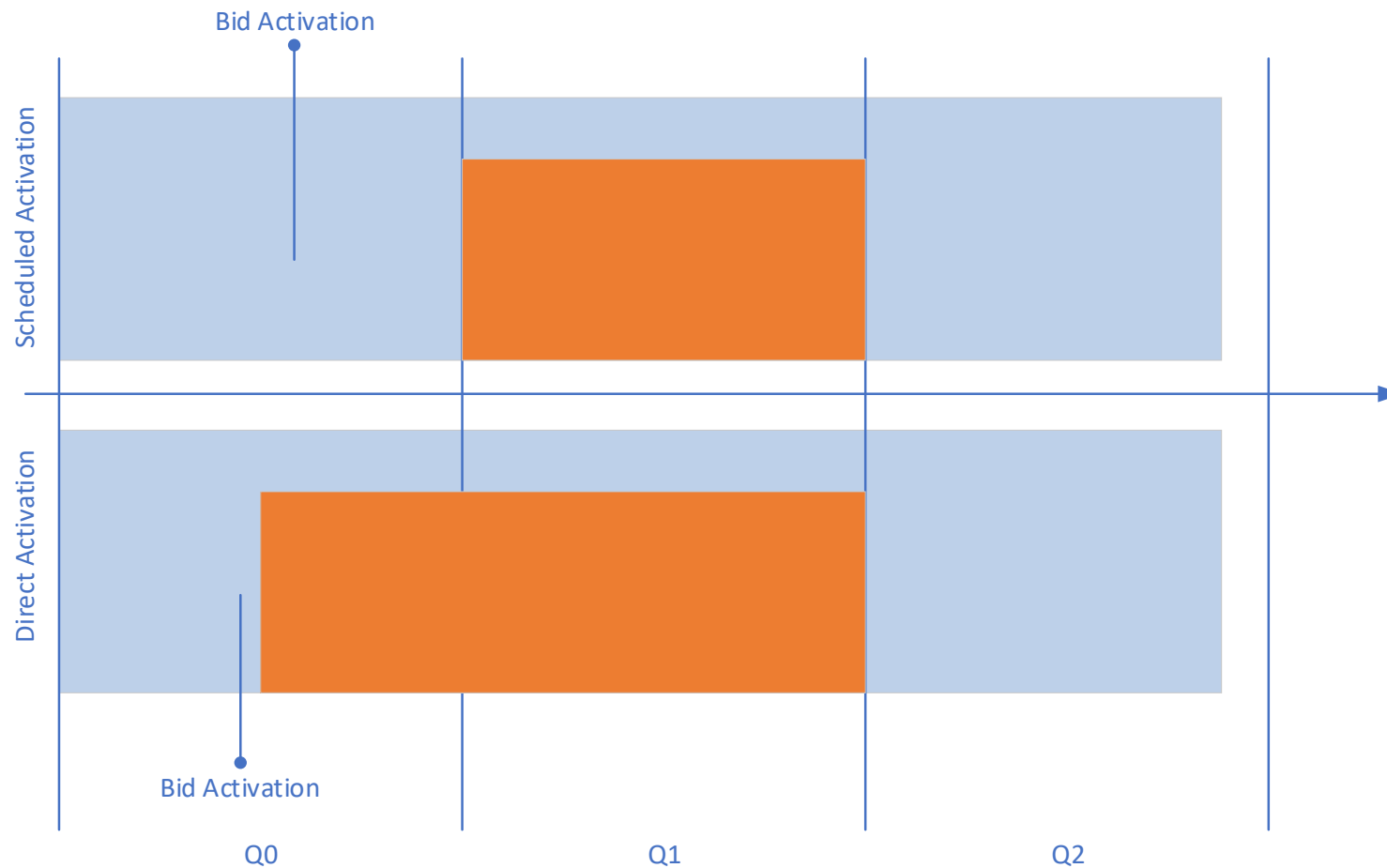


# CHANGES IN BID ACTIVATION

Interactive discussion

Scheduled and direct activation

Impact of activation  
with direct activation



# DIALOG FREMADRETTET

## Fælles drøftelse

1. Markeds og IT løsninger i de forskellige skridt frem til tilslutning til MARI drøftes og besluttes løbende i norden og hos Energinet;
2. Derfor er der har vi behov for og ønske om en løbende information/dialog – både om løsninger men også implementering;
3. Vi vil gerne høre jer om muligheder og behov for (mere fleksibel) kommunikation:
  - a) Tilbagevendende 'spørgetime' hver 14. dag;
  - b) Online kommunikation/forum;
  - c) andet



TAK FOR I DAG!

For yderligere spørgsmål, kontakt [ezv@energinet.dk](mailto:ezv@energinet.dk)