Description of balancing energy product characteristics

The objective of this appendix is to clarify the overview of bid activation process, basic functionalities of standard products, possible activation scenarios and bid submission process.

In this document, Q_i or QH0 stands for *quarter hour* and it represents a 15-minute market time unit (hereinafter - MTU). QH0 always starts at the 0^{th}, 15^{th}, 30^{th} or 45^{th} minute of an hour. T stands for *Time* and it represents the exact moment in time when Q_i MTU starts. i stands for index of a quarter hour.

1. Overview of MARI activation process

Decision on bids to be activated on MARI platform is made automatically by algorithm called Automatic Optimization Function (**AOF**). MARI TSOs submit Cross-Border Capacity Limits, Flow Constraints, demands for activation and all the standard product bids from its area to the platform as an input. Using this data, AOF decides which bids are to be activated. There are two distinctive AOF runs:

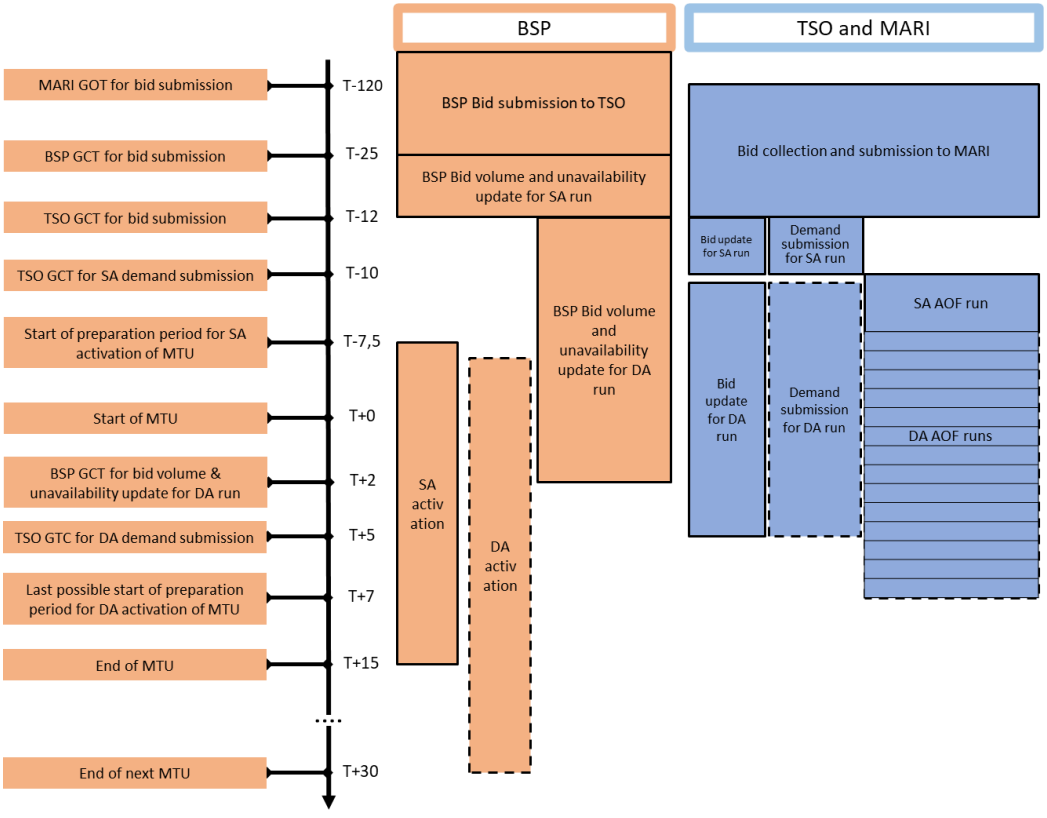
1. Scheduled activation (**SA**). Runs every 15 min, one run per MTU.
2. Direct activation (**DA**). Runs whenever triggered between two consecutive SA runs.

All bids eligible for scheduled activation only and bids eligible for both scheduled and direct activation submitted for Q_i participate in Q_i SA run.

All remaining bids eligible for direct activation participate in all Q_i DA runs. DA AOF run is triggered if one of MARI TSOs submits a demand for activation after gate closure time for SA demand submission for Q_i.

Difference between SA and DA activations are described in Article 2.

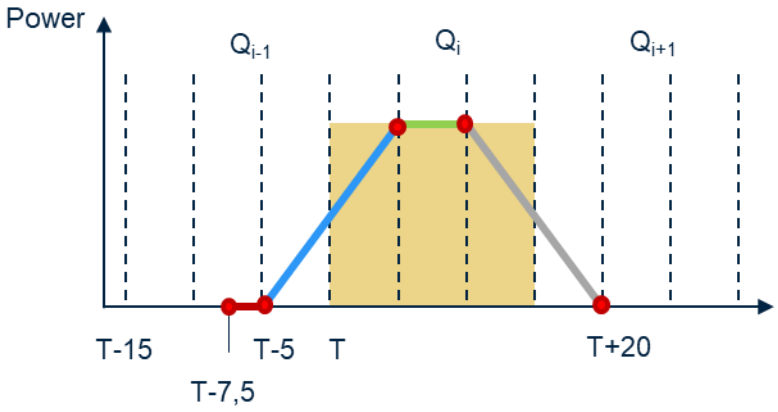
Process diagram covering processes between BSPs and TSOs are presented in the picture below:



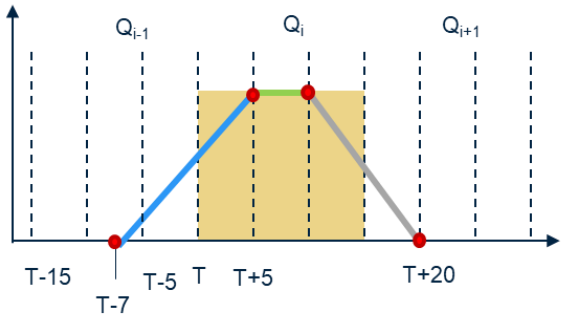
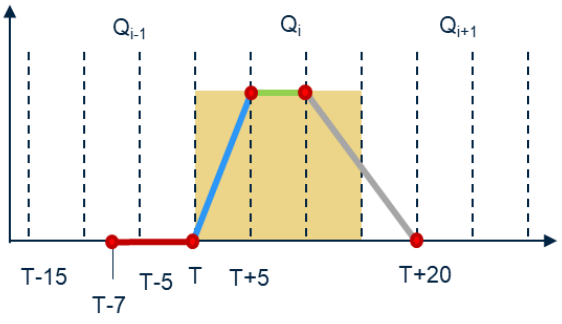
2. *Activation characteristics*

2.1. Scheduled bids

Activation of scheduled standard bids is as presented in the picture below:



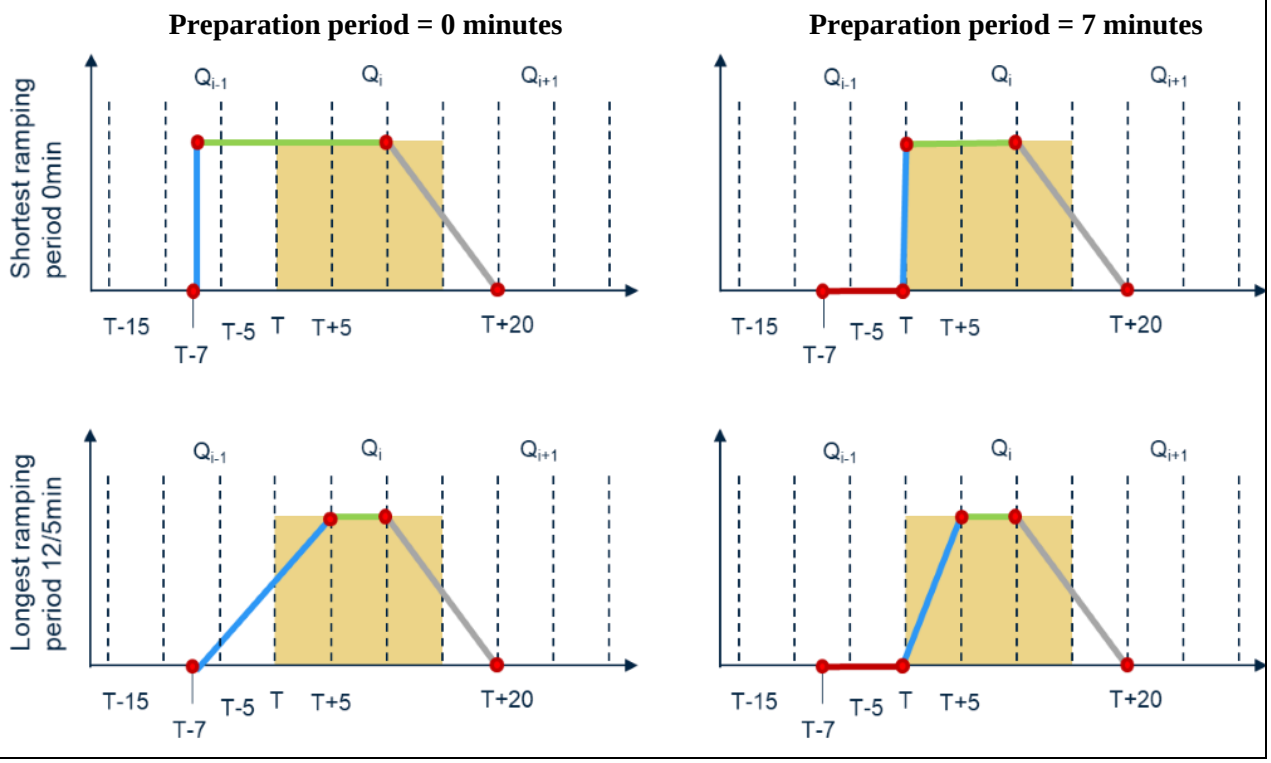
In this picture, Q_i stands for *quarter hour* and it represents a 15-minute market time unit. T stands for *Time* and it represents the exact time when MTU starts. The activation itself is characterized by 4 lines and they are defined in the tables below.

Characteristic	Definition in accordance to EBGL and mFRR IF	Limits set by Baltic TSOs
Preparation period (in red):	Preparation time is the time between start of preparation period and ramping period.	Preparation period no longer than 7 minutes (0 – 7 min.)
Extreme case: **Preparation period not higher than 7 minutes**. Extreme examples of preparation period which is allowed for BSP: **Preparation period = 0 minutes**  **Preparation period = 7 minutes**  		

Characteristic	Definition in accordance to EBGL and mFRR IF	Limits set by Baltic TSOs
Ramping period (in blue)	Ramping period is the time for BSP to change its resource unit's output from initial set-point to the desired power output.	Ramping period no longer than 12 minutes (0 – 12 min.)

Extreme case:

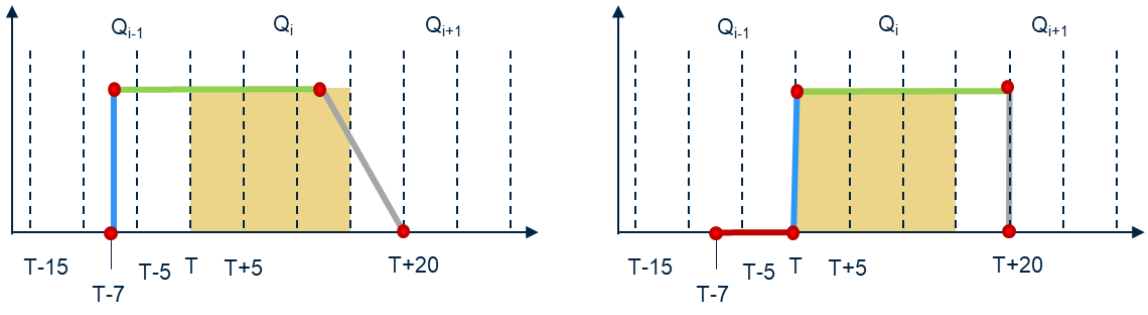
Ramping period not higher than 12 minutes. Ramping period together with preparation period should be less than 12 minutes. Extreme examples of ramping period in combination of different preparation period is provided below:



Characteristic	Definition in accordance to EBGL and mFRR IF	Limits set by Baltic TSOs
Delivery period (in green)	Delivery period is the time for BSP to deliver full power output for the proposed bid.	Delivery period is no shorter than 5 minutes and no longer than 20 minutes (5 – 20 min.). Limits are from T-7.5 to T+5.

Extreme case:

Maximum delivery period shall not be longer than 20 minutes. Extreme examples with maximum delivery period of 20 minutes are provided below:

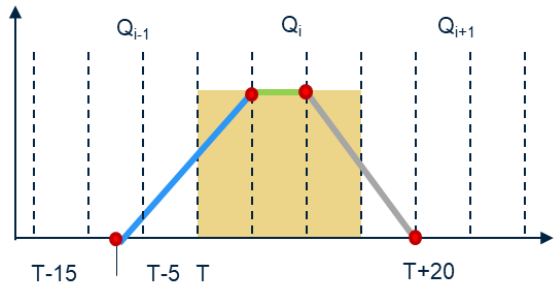


Characteristic	Definition in accordance to EBGL and mFRR IF	Limits set by Baltic TSOs
Deactivation period (in gray)	Deactivation period is the time for BSP to change its resource unit's output from desired power output to its initial scheduled power output.	Deactivation period is no longer than 10 minutes (0 – 10 min.). Limits are from T+10 to T+20.

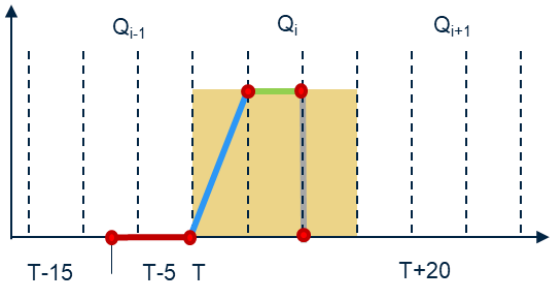
Extreme case:

Deactivation period shall not be longer than 10 minutes. Extreme examples of deactivation period are provided below:

Deactivation period = 10 minutes



Deactivation period = 0 minutes

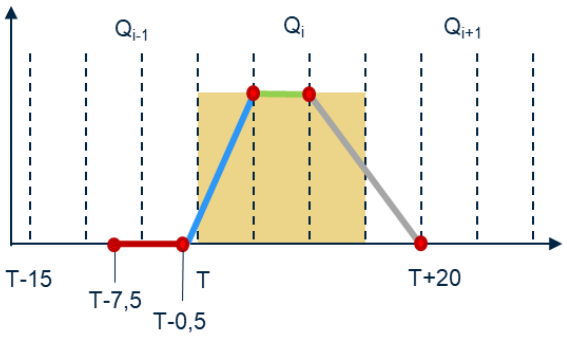


Characteristic	Definition in accordance to EBGL and mFRR IF	Limits set by Baltic TSOs
FAT (Full activation time)	FAT is preparation period + ramping period. Maximum of 12,5 minutes.	No additional limitation.

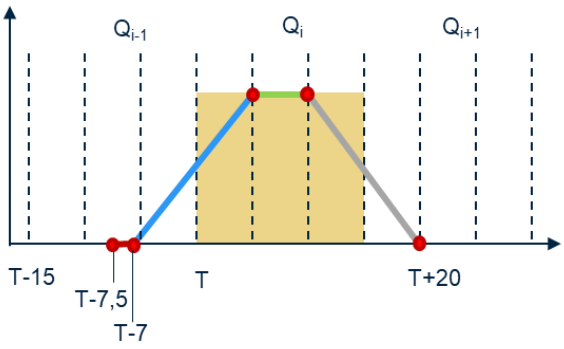
Extreme case:

FAT is no longer than 12,5 minutes. Extreme examples of FAT are provided below:

Preparation period = 7 minutes
Ramping period = 5,5 minutes



Preparation period = 0,5 minutes
Ramping period = 12 minutes

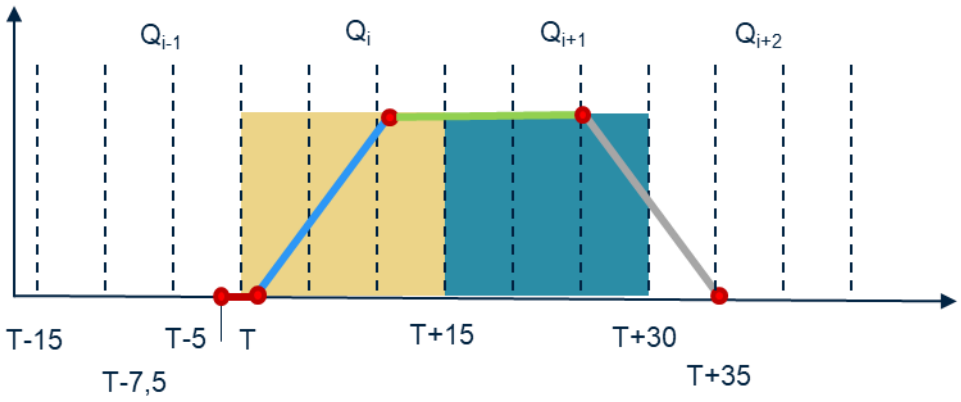


TSO will send an activation order to BSP with the information of start of preparation period in one minute resolution. For scheduled activations, the start of preparation period is always the same – T-7,5.

The end of the ramping period (gray in the pictures) is floating between T+10 and T+20.

2.2. Direct activation bids

Activation of direct standard bids is as follows in the picture below:



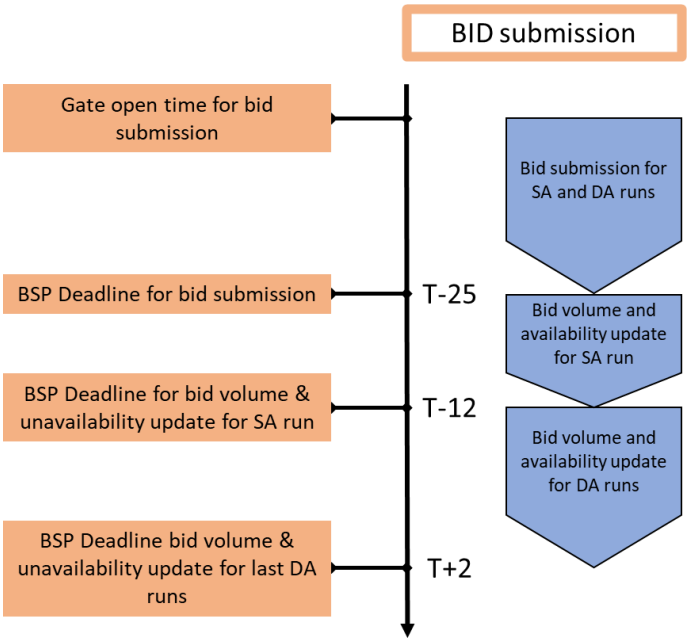
In this picture, Q_i stands for *quarter hour* and it represents a 15-minute market time unit. T stands for *Time* and it represents the exact time when Q_i MTU starts. The activation itself is defined in 4 lines and they are defined in the tables below.

For the following items, same rules apply as for SA:

- preparation period (red)
- ramping period (blue)
- deactivation period (gray)

The main differences between DA and SA activations are the start of preparation period and the duration of activation. For SA, the start of preparation period is always fixed at T-7,5. The starting of preparation period for DA activation is between T-7 and T+7 (a timeslot between two consecutive SA activations.). The end of the activation period will equal the end of the following MTU period.

3. *Bid submission*



BSP must mark if a bid is for SA or SA+DA run.

Each BSP must submit bids for QH0 25 minutes until the start of relevant MTU (deadline at T-25). SA and SA+DA bids unavailability for SA run must be submitted 12 minutes before relevant MTU (deadline at T-12). For DA run, updates and/or unavailability of submitted bids for relevant MTU must be submitted up until 2 minutes after the start of relevant MTU. (deadline at T+2).

4. *Bid features*

4.1. Simple bids

Simple bids are most basic bids which can be submitted to MARI platform. All necessary requirements for a simple bid can be found in Baltic balancing market rules Table 1. *Common Baltic mFRR standard product characteristics*. Bid shall contain information of minimum quantity and maximum quantity in accordance with technical implementation guidelines.

Divisibility of bids. Bids may be either:

1. Fully divisible.
2. Fully indivisible.
3. Partially divisible.

Indivisible bid or indivisible part of bid shall not be higher the largest technical minimum production or consumption of the pre-qualified generation or load unit of the BSP. Details on bid divisibility parameters are provided below in the table:

	Minimum quantity	Maximum quantity	Comment
Fully divisible bid	1 MW	Defined based on prequalification results of units of BSP	Can be activated from 1MW up to maximum quantity in 1 MW increments
Fully indivisible bid	Equal to maximum quantity based on prequalification results of units of BSP		Must be activated in full amount
Partially divisible bid	Defined based on prequalification results of units of BSP		Can be activated from minimum quantity up to maximum quantity in 1 MW increments

4.2. Complex bids

4.2.1. Multipart (parent-child) bids

The multipart bid is referred to as parent-child bid in the mFRR IF. Multipart bid consists of two or more simple bids within the same MTU. Within one SA or DA run, Multipart bids let activate one or more *child* bids only if *parent* bid is activated. Multipart bids must follow these conditions:

- Multipart bids can only be linked and activated within same MTU
- All bids must be in the same direction
- If a parent bid is activated, all related bids will not participate in following DA runs for this MTU.

4.2.2. Exclusive group order

An Exclusive group is a set of balancing energy bids that satisfy the following condition: only one of the bids of the group can be activated; hence, the activation of a bid belonging to an exclusive group excludes the activation of the other bids belonging to the same group.

Exclusive group bids must follow the following conditions:

- All exclusive bids must be indivisible bids.
- Exclusive bids can have different volumes and prices.
- Exclusive bids must be linked within the same MTU and the same direction.
- Exclusive bids can be activated in SA and DA runs.

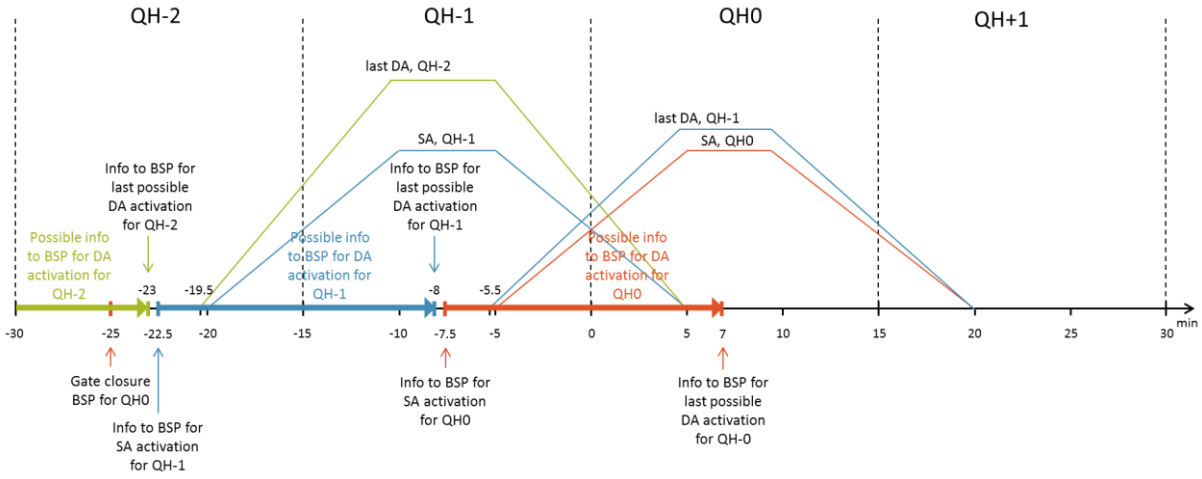
4.3. Technical Linking

Technical linking is bid liking between different MTUs to prevent the double activation of the same production unit.

The linkage of bids between consecutive quarter hours is needed, because at the gate closure time T-25 for BSPs for QH0 (*current quarter hour*), BSP do not have the knowledge, if their bid was activated in (*previous quarter hour*) either SA for QH-1, DA for QH-1 or DA for QH-2.

Since, after receiving information about the activation, BSPs cannot update their bids for QH0, technical linkage between QH-2, QH-1 and QH0 is used.

Figure below depicts the information state for BSPs.



Technical linking can be done in two ways:

- One to one linking. This means, that bid for QH0 is linked only to activation in QH-1.
- One to two linking. This means, that bid for QH0 is linked to activation in QH-1 and QH-2.

Rule for CMOL function:

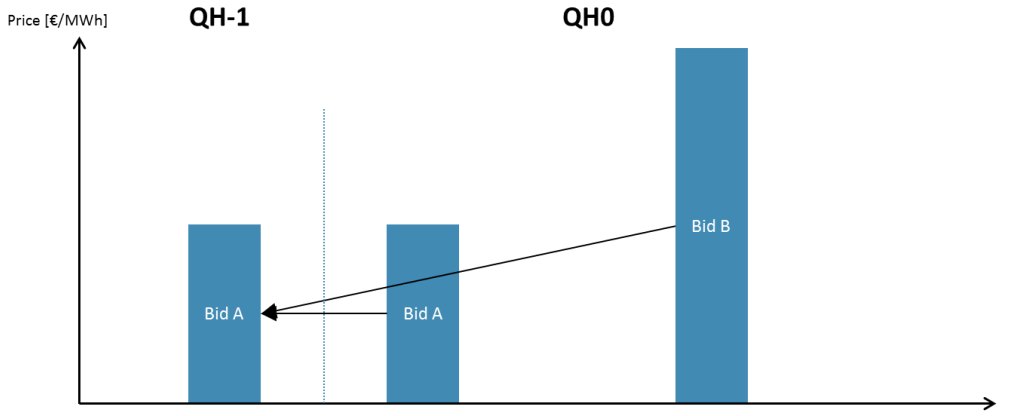
1. If the bid of QH0 is linked to a bid in QH-1 and bid of QH-1 is activated in DA QH-1, bid of QH0 must not be available for SA and DA in QH0.
2. If the bid of QH0 is linked to a bid in QH-1 and bid of QH-1 is activated either in SA or not at all, bid of QH0 must be fully available for SA and DA, if marked available in DA in QH0.

4.4. Conditional linking

Conditional linking is bid linking between different MTUs because of economical reasons. From technical point of view, conditional linking is similar to technical linking. The main difference is that conditional linking may link the bids containing different resource units.

Example of conditional linking:

The figure below shows that depending on whether bid A in QH-1 is activated, one of the bids (A or B) in QH0 will be available. If bid A for 10 €/MWh is activated in QH-1 then bid B for 20 €/MWh will be available in QH0. If bid A for 10 €/MWh was not activated in QH-1, then bid A for 10 €/MWh will be available in QH0.



Divisible bid in QH-1 marked available for DA
- Price 10 €/MWh
- Volume 100 MW

Divisible bid in QH0 marked available for DA
- Price 10 €/MWh
- Volume 100 MW
- Linked to bid A in QH-1

Divisible bid in QH0 marked available for DA
- Price 20 €/MWh
- Volume 100 MW
- Linked to bid A in QH-1