

Imbalance pricing and settlement in the Nordics – follow-up on the option space and draft timeline for next steps

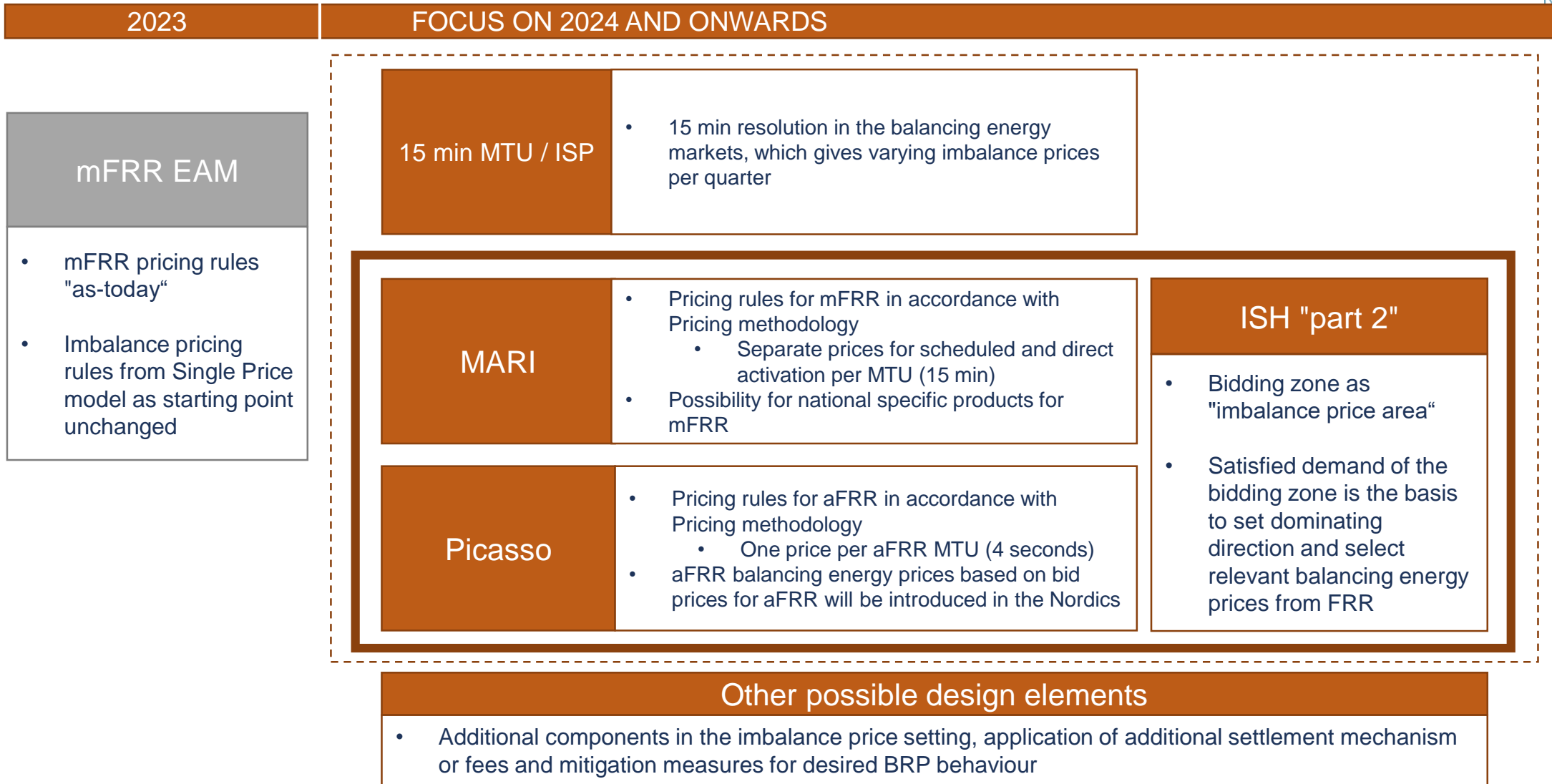
NBM Stakeholder meeting on 21 September 2022

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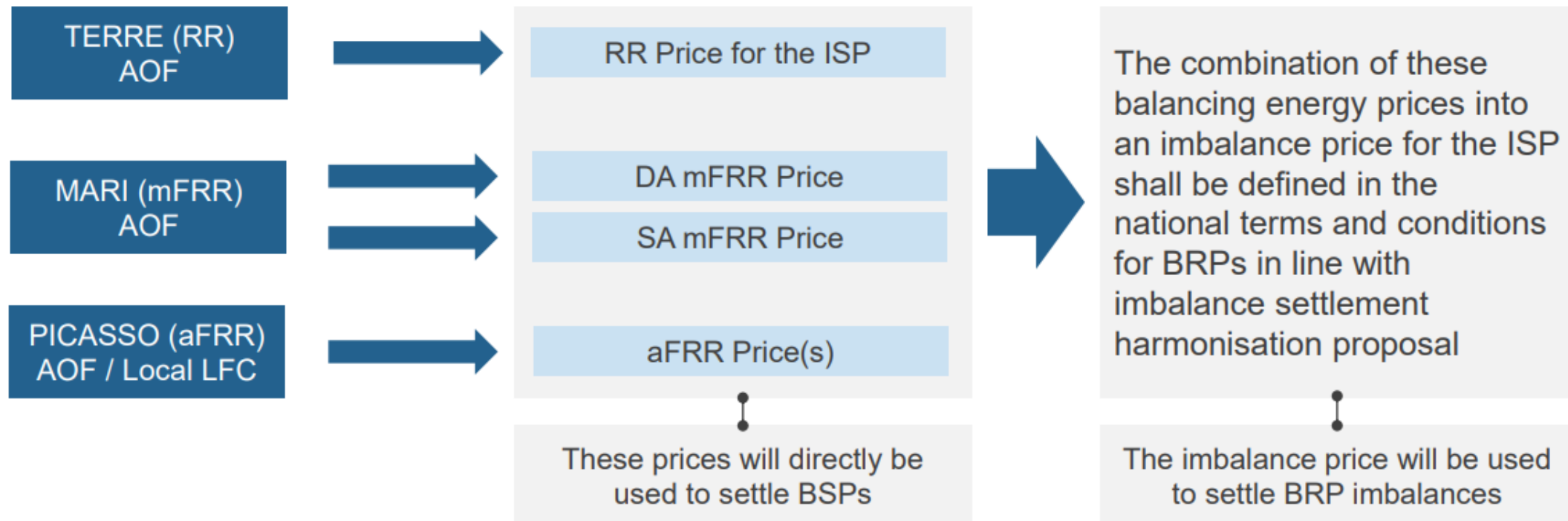
Content and purpose of today's presentation

- In the previous NBM Stakeholder group meeting on 2 June 2022, we gave a high level introduction to the topic of imbalance pricing options going forward
- The presentation was followed up with more extensive material on the option space for future imbalance pricing and settlement, which was published on 5 July 2022 on the NBM webpage (updated in August):
 - [Imbalance pricing and settlement in the Nordics going forward – introduction to the steps ahead \(updated\) – nordicbalancingmodel](#)
- Today we would like to go through some of the material published on 5 July, in addition to address the draft timeline for work the next half year
 - We want to in particular spend some time on the examples provided

Reminder: Drivers for changes to imbalance pricing



Principles of pricing when we get to the platforms



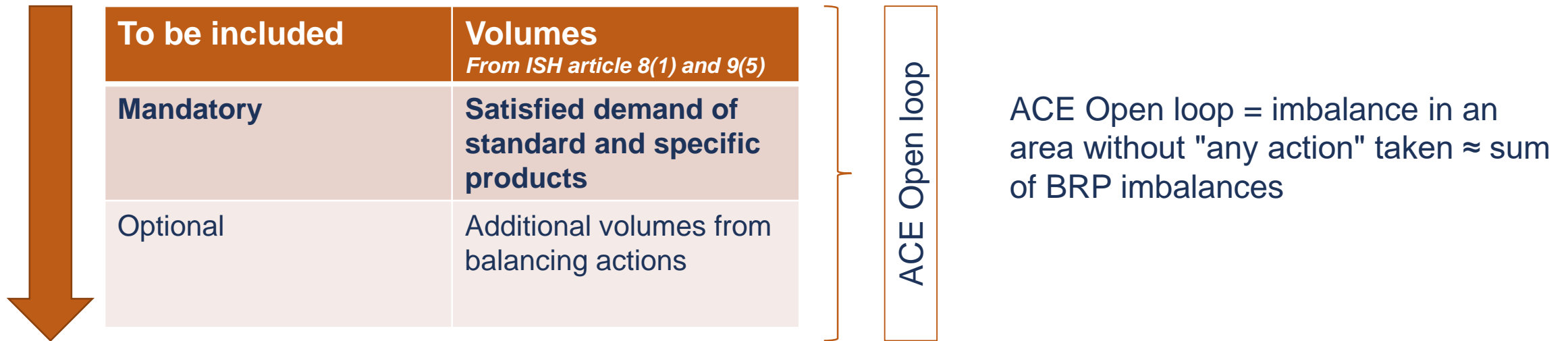
Main areas which for certain will undergo design changes in the near future

- 1. Determine how to establish the direction of the total system imbalances**
"dominating direction" in current Nordic terminology
 - a) Legal starting point: Satisfied demand of balancing energy per bidding zone

- 2. Determine how to establish the imbalance price**
 - a. Select the relevant balancing energy prices to be used to set the imbalance price (*we will have several prices in the future*)
 - b. Set an imbalance price which must at least respect the boundary condition of volume-weighted average of relevant balancing energy prices
 - c. Determine how to set value of avoided activation (VoAA) in case of no demand for or no activation of balancing energy
 - d. Determine possible need for and use of additional components

Establish the direction of the total system imbalances*

- Current: **Activated mFRR** balancing energy in **uncongested area** (= sets of imbalance price areas)
- Future: (At least) **Satisfied demand** of FRR balancing energy in **bidding zone** (= imbalance price area)



Balancing energy products and prices with the platforms

- Current: mFRR price in up and down direction
- Future: mFRR and aFRR prices from standard and specific products

Product type	Activation type	Price setting and activation direction
Standard product mFRR – MARI	Scheduled activation (SA)	<ul style="list-style-type: none"> • One price per 15 min MTU • Activation direction: Up, Down, Up and down (both) or None
	Direct activation (DA)	<ul style="list-style-type: none"> • Up to four prices per 15 min MTU (two prices possible per direction as a DA activation will last for two quarter hours) • Activation direction: Up or Down
Standard product aFRR – PICASSO		<ul style="list-style-type: none"> • One price per MTU = control cycle \approx 4 sec = 225 prices per 15 min ISP • Activation direction: Up, Down or None
<p>Specific products are national only, and a local TSO responsibility to develop if needed. At least some of the Nordic TSOs are expected to develop specific products for mFRR.</p>		

Which of the balancing energy prices are relevant and how to take them into account?

- To select the relevant prices to establish the imbalance price for an ISP, we need to know:
 - The **direction** of the total system imbalance (dominating direction), so we know whether to set an imbalance price for negative or positive imbalance (with a single price model)
 - For which balancing energy products the imbalance price area = bidding zone has a **satisfied demand**, where a demand of zero can also be seen as a satisfied demand
- How to take these prices into account:
 - The imbalance price cannot be lower (negative imbalance) or higher (positive imbalance) than the volume-weighted average of the relevant prices
 - Else there is a span, where the maximum (negative imbalance) or minimum (positive imbalance) is the "most expensive" approach on how to use the balancing energy prices (combinations are possible)

Value of Avoided Activation (VoAA)

- VoAA is relevant:
 - a) In case of **no demand** for mFRR or aFRR in the bidding zone (not very likely case)
 - b) The demand of the bidding zone is fully netted – **no balancing energy activation** for that bidding zone (more likely case)
 - c) The volume of demand is **equal** in both directions, so no clear dominating direction (corner case)
- VoAA shall be set based on bid price or prices available to this TSO for this ISP

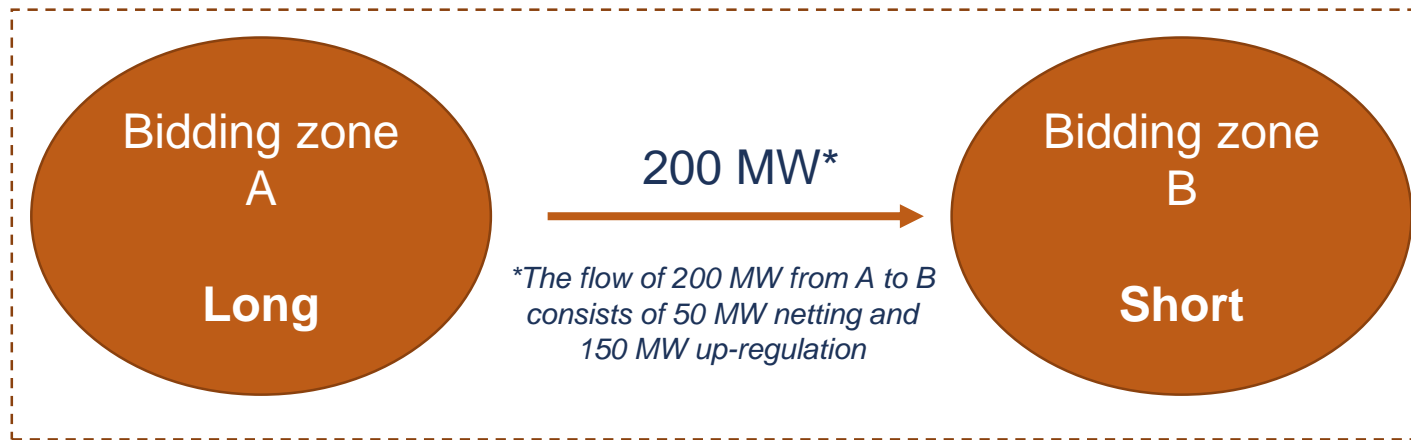
- Currently, VoAA is only calculated in case of no activation of balancing energy in the uncongested area, which does not take into account the demand of the bidding zone, but the net demand of the uncongested area

Example 1) Establish the direction of the total system imbalances

- From uncongested area and activation volumes to bidding zone and satisfied demand
- For simplicity – we imagine two bidding zones with demand for scheduled activated mFRR only

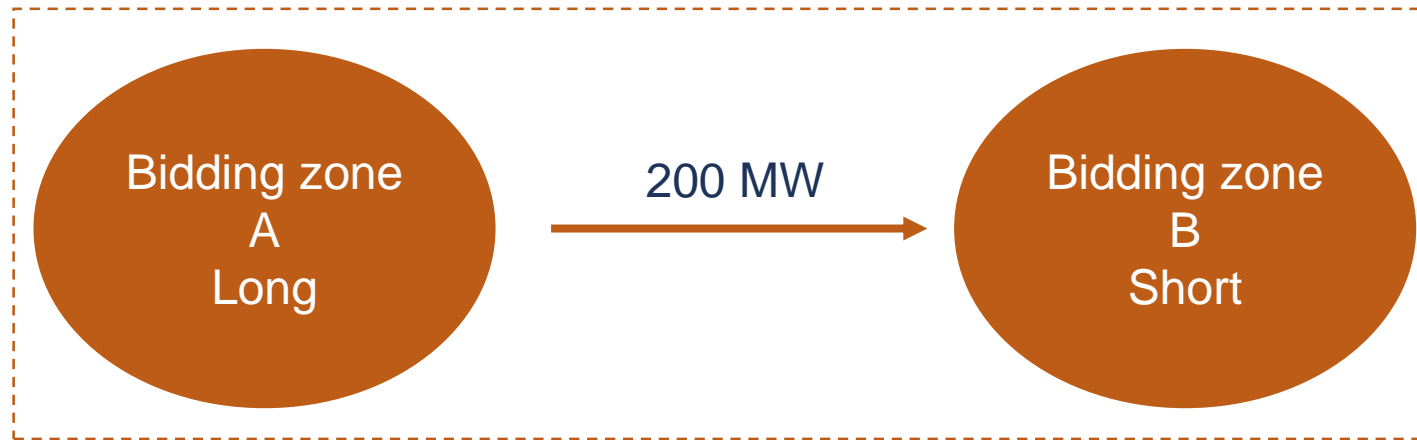
Today:
Uncongested area is short

Future:
A is long, B is short



Area A		Area B	
Demand	50 MW down	Demand	200 MW up
Satisfied demand	50 MW down	Satisfied demand	200 MW up
Activation volumes	150 MW up	Activation volumes	0 MW

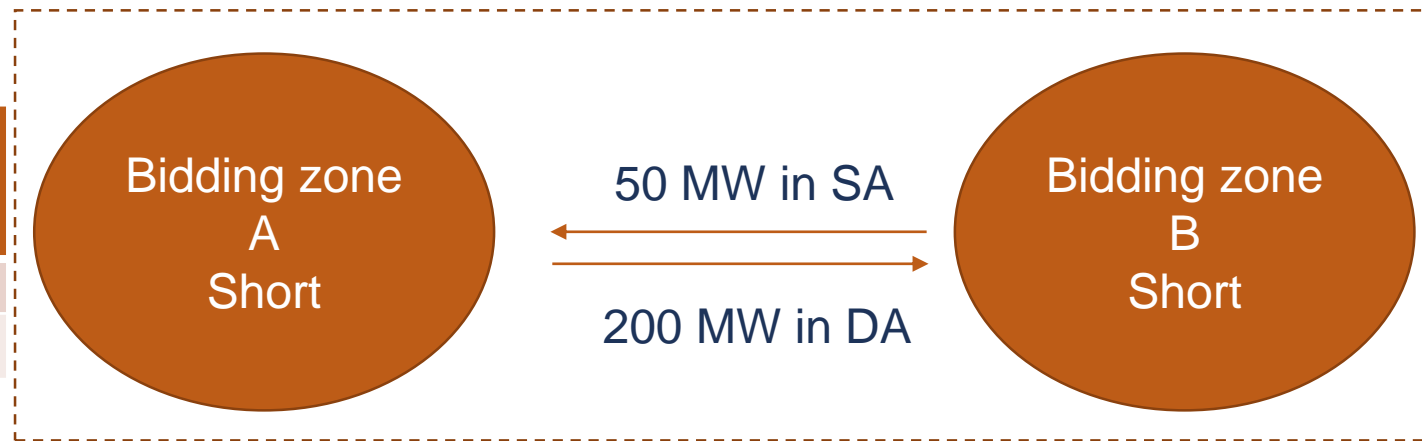
Example 2) Value of avoided activation – building on example 1



- Demand in the ISP covered by scheduled activated (SA) mFRR only
- Activation direction of SA is upwards only
- SA price in uncongested area of A and B = 50 EUR/MWh

- Imbalance price Area B = 50 EUR/MWh
 - No change from today in this example
- Imbalance price Area A = Value of Avoided Activation (VoAA)
 - Area A is netted (no balancing energy activations for that bidding zone) and VoAA applies
 - It is possible to set the VoAA to 50 EUR/MWh (the SA price itself is set based on a bid price or bid prices), but also to another value, like the average of first upward and downward bid in the bidding zone
 - Note that BSPs are activated in Area A for Area B at the SA price of 50 EUR/MWh

Example 3) Activation prices for which you have a satisfied demand



Area A	Satisfied demand	Activated with BSPs
SA	+200	+150
DA up	0	+200

Area B	Satisfied demand	Activated with BSPs
SA	+100	+150
DA up	+200	0

A and B uncongested both in SA and DA

- SA price 40 EUR/MWh
- DA price 60 EUR/MWh

Imbalance price

- Area B = 60 EUR/MWh (maximum) or 53,3 EUR/MWh (volume-weighted average*)
- Area A = 60 EUR/MWh (maximum**) or 40 EUR/MWh (volume-weighted average***)
- Today, with the current Nordic pricing regime, the imbalance price would be 60 EUR/MWh in both A and B
 - This is because there is only one mFRR price per direction and the uncongested area is short

*The volume-weighted average for Area B is calculated as follows:

(100 MW*40 EUR/MWh + 200 MW*60 EUR/MWh) / 300 MW = 53,3 EUR/MWh

** If taking into account also the balancing energy price with a satisfied demand of zero

*** The volume-weighted average for Area A is calculated as follows:

(200 MW*40 EUR/MWh + 0 MW*60 EUR/MWh) / 200 MW = 40 EUR/MWh

Draft timeline for work the next 6 months

