

# AKTØRMØDE VEDR. MARKEDS- OG IT-ÆNDRINGER

Implementering af det nordiske mFRR  
energiaktiveringsmarked

*21. januar 2021*

# MÅLET MED MØDET

- Følge op på det nordiske webinar den 14. januar
- Uddybe emner hvor der kan være usikkerhed
- Svare på spørsmål og samle-op på inputs og kommentarer
- Muliggøre diskussion
- Præsentere en mere detaljeret Energinets implementeringsplan for markedes aktører

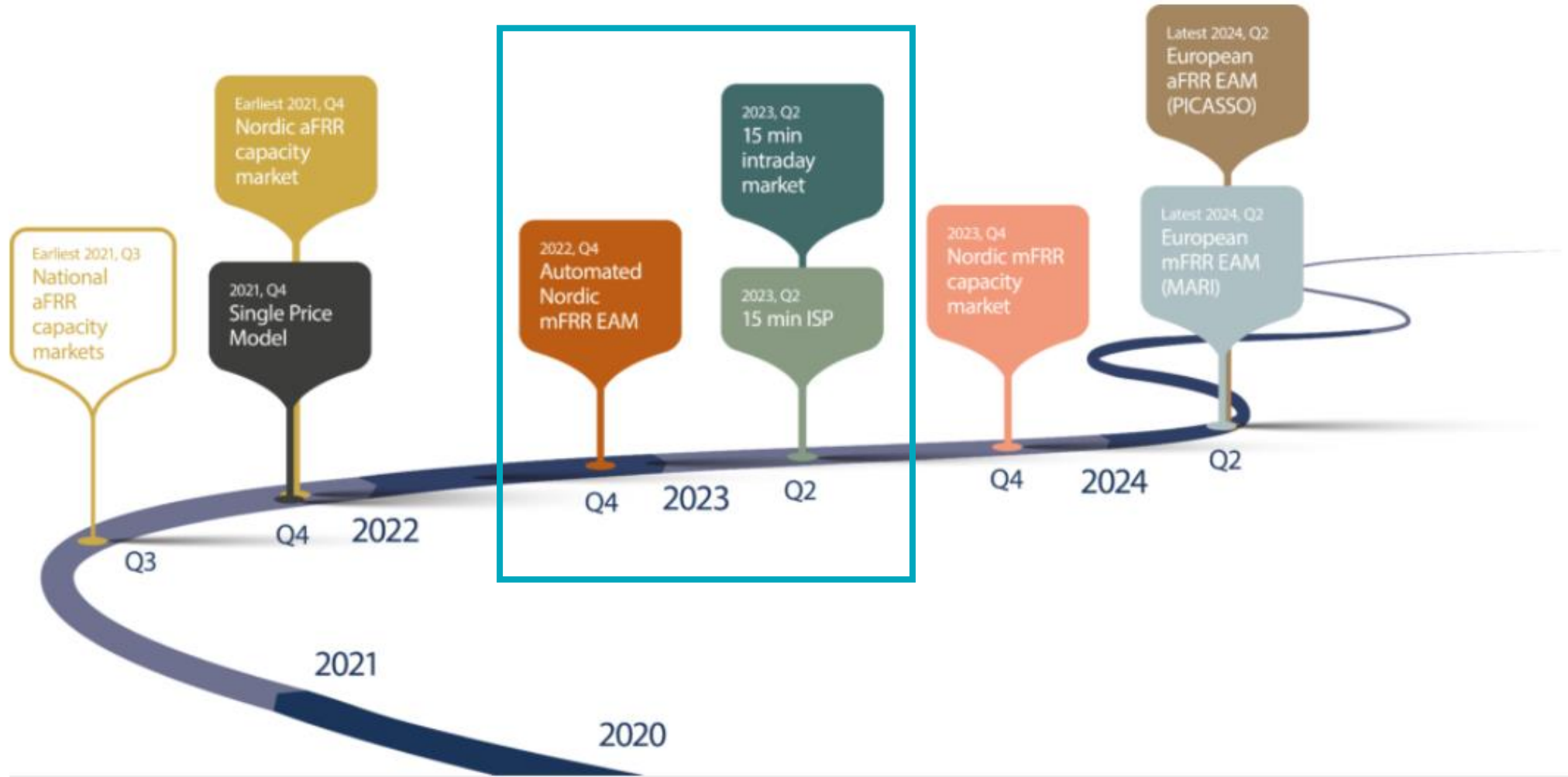
# Dagsorden



1. Målet med mødet
2. Opdateret NBM roadmap
3. Emner som vi vil uddybe
4. Energinets implementeringstidsplan for aktører
5. Spørsmål og diskussion
6. Tak for i dag

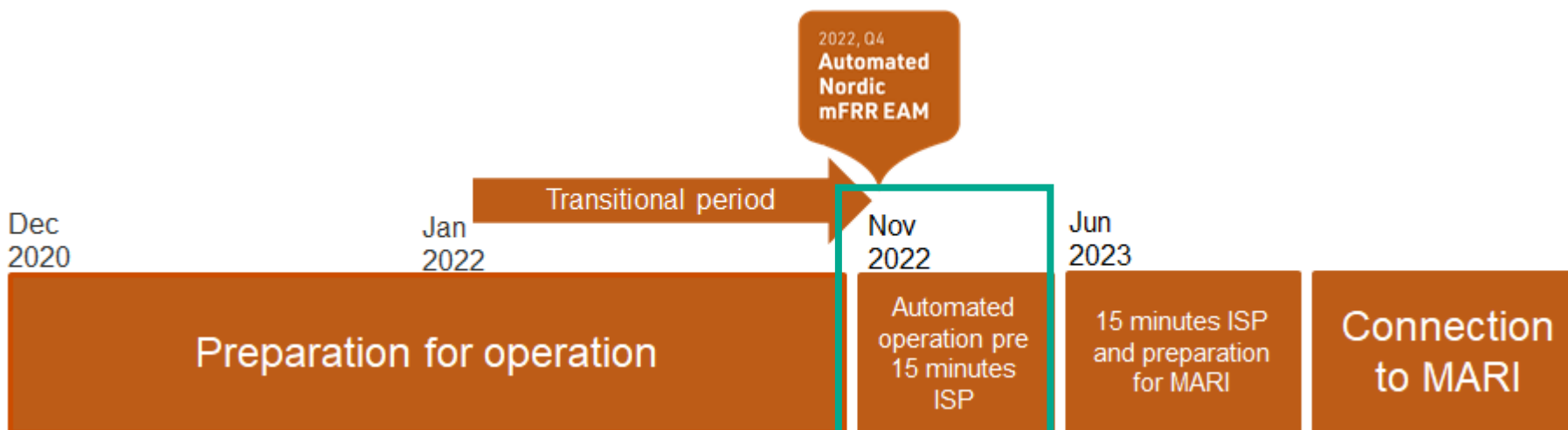
# UPDATED ROADMAP FOR NORDIC BALANCING MODEL PROGRAM

## Roadmap December 2020



# MFRR ENERGY ACTIVATION MARKET – TIMELINE

Parallel operation → Automated operation pre 15 minutes ISP



# EMNER TIL UDDYBNING

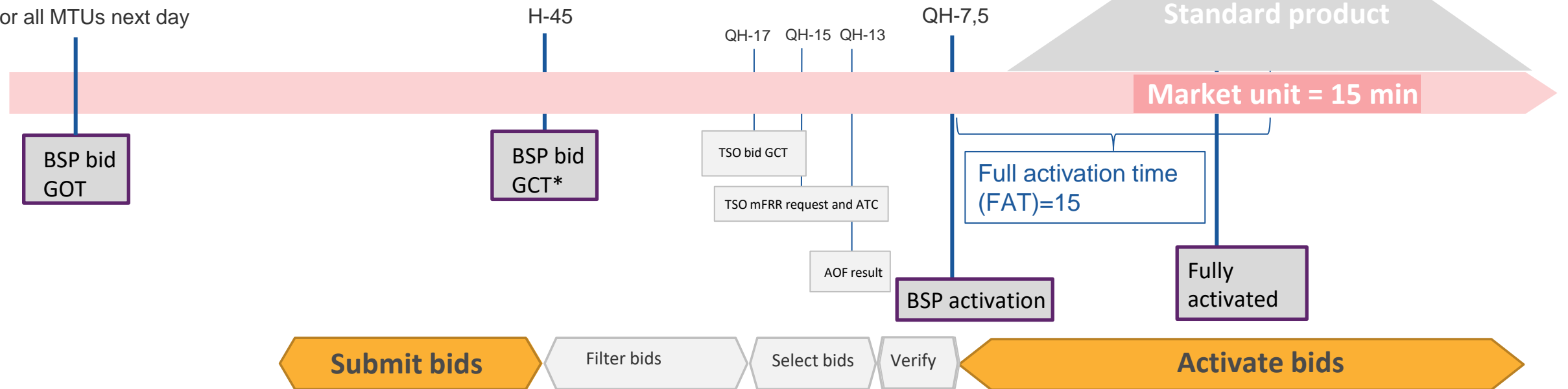
1. mFRR energiaktiverings markedsproces
2. Bud egenskaber - ændringer
3. Nuværende bud attributter - ændringer
4. Nationale bud-attributter
5. Bid linking
6. Aktiveringsrampe
7. Aktivering – tilgængelighed
8. Afregning
9. Energinets tilgang til prækvalifikation af anlæg

# MFRR ENERGY ACTIVATION MARKET PROCESS

Automated Operation pre 15 minutes ISP

	pre 15 minutes ISP	after 15 minutes ISP
BSP GCT	H-45	QH-25
FAT	15 min	12,5 min

No later than 12:00 for all MTUs next day



\* For all four quarters in the next hour

# BUD EGENSKABER

	Today	Automated operation, pre 15 min ISP	After 15 min ISP but before connection to MARI	When connecting to MARI
<b>Currency</b>	EUR and DKK	EUR	EUR	EUR
<b>Maximum/minimum price (EUR/MWh)</b>	5000/no minimum price	5000/no minimum price	5000/no minimum price	99 999/-99 999
<b>Minimum bid size (MW)</b>	5	1	1	1
<b>Maximum bid size (MW)</b>	50	9 999 (technical limit)	9 999 (technical limit)	9 999 (technical limit)
<b>Bid granularity (MW)</b>	1	1	1	1
<b>Activation granularity (MW)</b>	1	1 or 0.1	1	1
<b>BSP bid time resolution for price and volume (minutes).</b>	60	15	15	15
<b>Marginal price resolution (minutes)</b>	60	60	15	15



# ÆNDRINGER I NUVÆRENDE BUD ATTRIBUTTER

Budattribut	I dag	Automated activation pre 15 min ISP (Q4 2022-Q2 2023)
Start gradient	Ja	Bortfalder – symmetrisk ramping omkring kvartersskiftet
Stop gradient	Ja	Bortfalder – symmetrisk ramping omkring kvartersskiftet
Dødtid (preparation time)	Ja	Bortfalder – symmetrisk ramping omkring kvartersskiftet
Valuta	DKK el. EUR	EUR
Angivelse af prod. /forbrugsressource	Obligatorisk	Bortfalder – ikke relevant efter single price model
Kontrakt ID	Obligatorisk	Bortfalder – informationen er obsolete

# NATIONAL BID ATTRIBUTES

1. In the Nordics we are considering the following national bid attributes:
  1. Maximum duration
  2. Resting time
  3. Inclusive bids
  4. Locational information on bids
2. National bid attributes will not be forwarded to the AOF. They can be used for bid filtering by TSO before the bids are sent to the AOF.
3. Location information will be implemented to enable the use of it at a later stage
4. Energinet has not yet decided whether to implement the rest of attributes and inputs from market participants are welcome.
5. If market participants do not indicate the need for these bid attributes, they will most likely not be implemented for the Danish market.

# NATIONALE BUD ATTRIBUTTER (1 AF 3)

## Maximum duration

BSPs include information on the technical limitations regarding how long a bid can be activated. This attribute is necessary to allow BSP to send in bids in advance so that they do not need to update bid if they are activated.

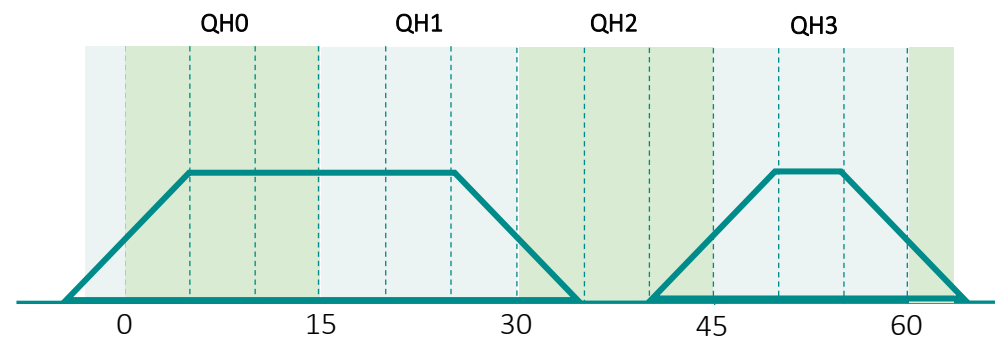
Technical linking of the bids must be in combination with this bid attribute. All the linked bids must have the same maximum duration.

### Eksempel



- Alle fire bud er indenfor marginal prisen i den pågældende MTU.
- Der er "technical linking" mellem de fire bud.
- **Maximum duration er angivet til 30 minutter** for alle fire bud.

### Resulterende aktivering



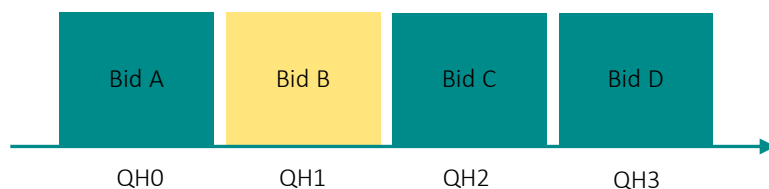
# NATIONALE BUD ATTRIBUTTER (2 AF 3)

## Resting time

The BSP can add information on the required minimum duration between the end of deactivation and the following activation.

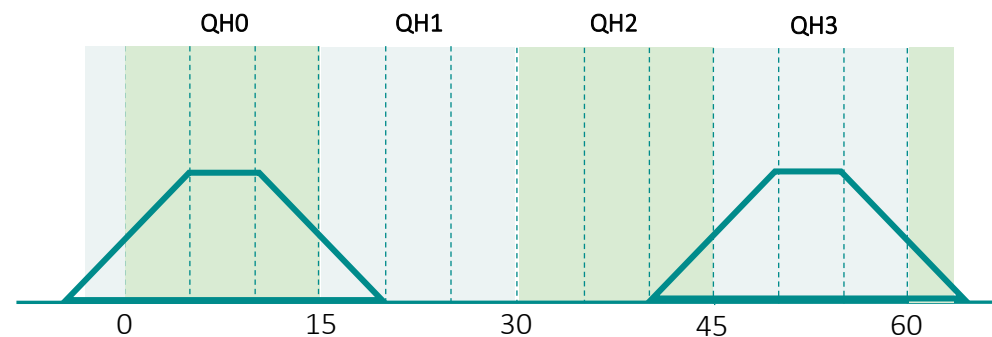
Technical linking of the bids must be in combination with this bid attribute. All the linked bids must have the same resting time.

### Eksempel



- Bid A, C og D er indenfor marginal prisen i den pågældende MTU. **Bid B er udenfor.**
- Der er "technical linking" mellem de fire bud.
- **Resting time er angivet til 30 minutter** for alle fire bud.

### Resulterende aktivering

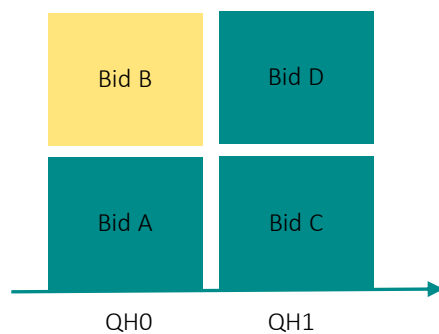


# NATIONALE BUD ATTRIBUTTER (3 AF 3)

## Inclusive bids

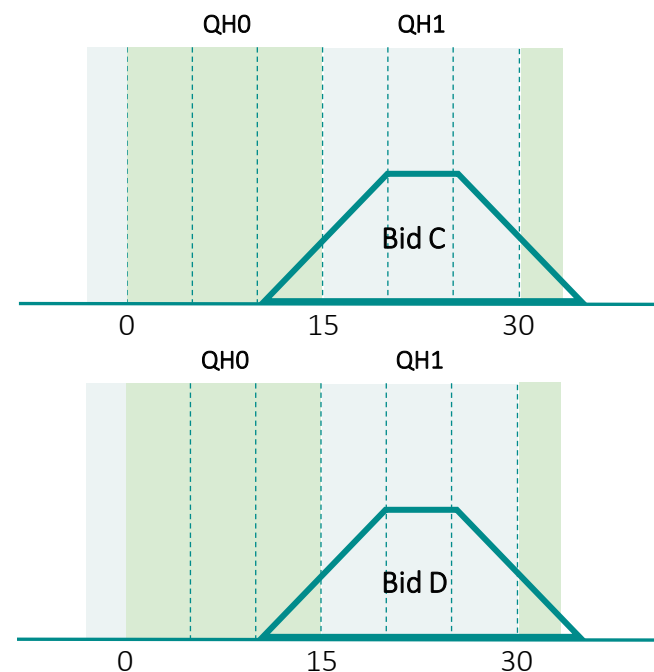
If one bid is activated, another bid (e.g. a resource downstream) must also be activated.

### Eksempel



- Bid A og B er inclusive bids.
- Bid C og D er inclusive bids.
- Bid A, C og D er indenfor marginal prisen i den pågældende MTU. Bid B er udenfor.

### Resulterende aktivering



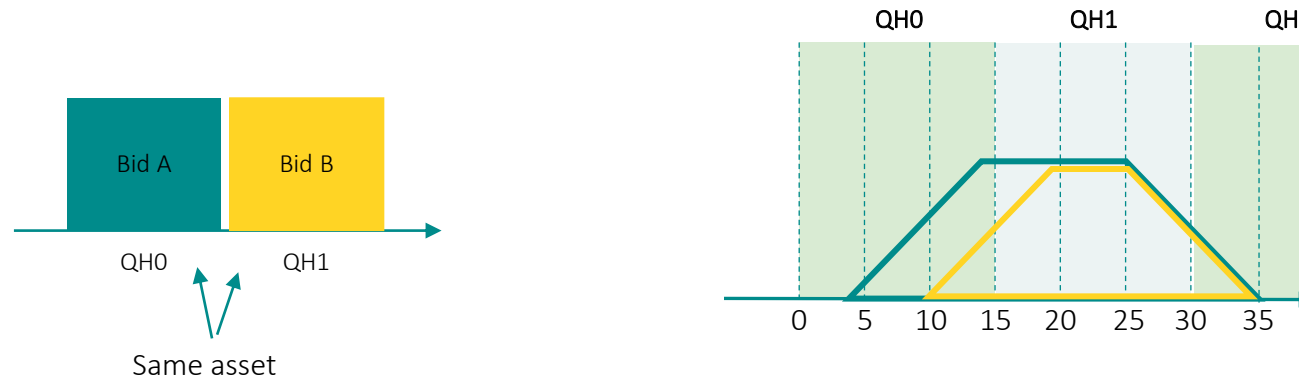
# NEED FOR LINKING OF BIDS IN TIME

- **Technical linking**  
Avoid direct activated bids from being double activated in the following quarter.
- **Conditional linking**  
Availability of a bid is determined by conditions on bids in previous quarters. Examples of use cases are ramping constraints and start up cost.

# TECHNICAL LINKING

Direct activations last until the end of the next quarter hour.

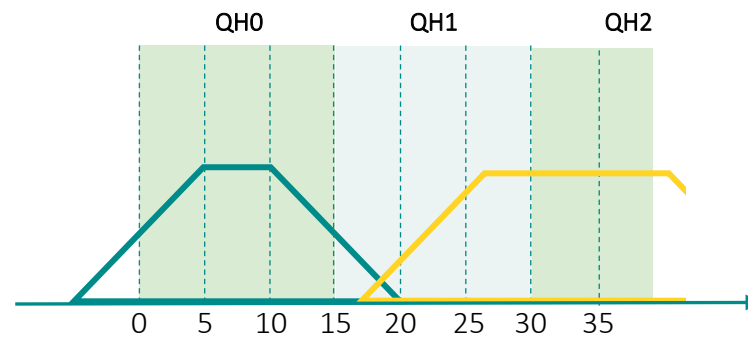
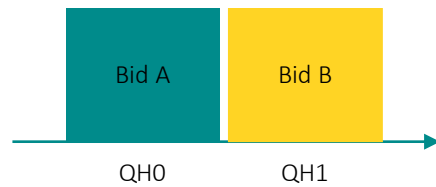
To avoid double activation it is necessary to link bids for which the underlying asset is the same.



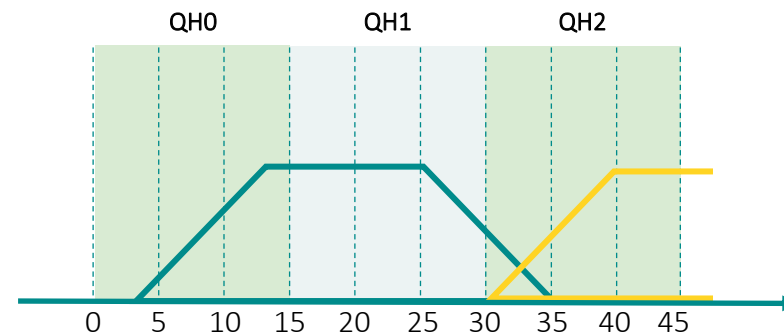
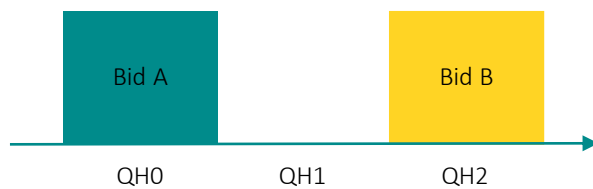
Bid A is direct activated in QH0 and will extend into QH1. Consequently bid B will not be available.

# CONDITIONAL LINKING RAMPING CONSTRAINTS

Direct activation in next quarter hour may conflict with ramping constraints



Bid A is scheduled activated in QH0. The ramp down extends into QH1. Direct activation of Bid B requires the underlying asset to ramp up while ramping down.

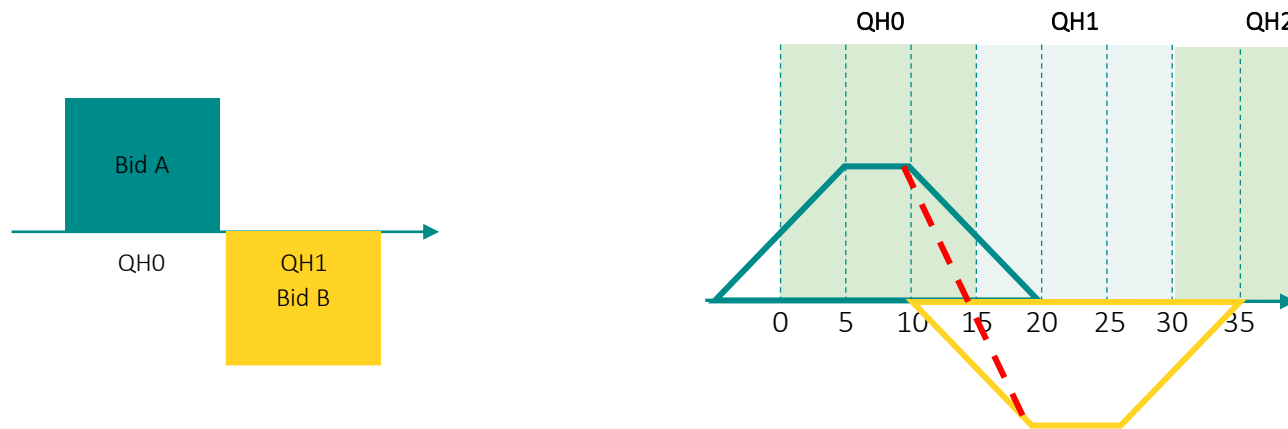


Bid A is direct activated in QH0. The ramp down extends into QH2. Direct activation of Bid B requires the underlying asset to ramp up while ramping down.



# CONDITIONAL LINKING RAMPING CONSTRAINTS

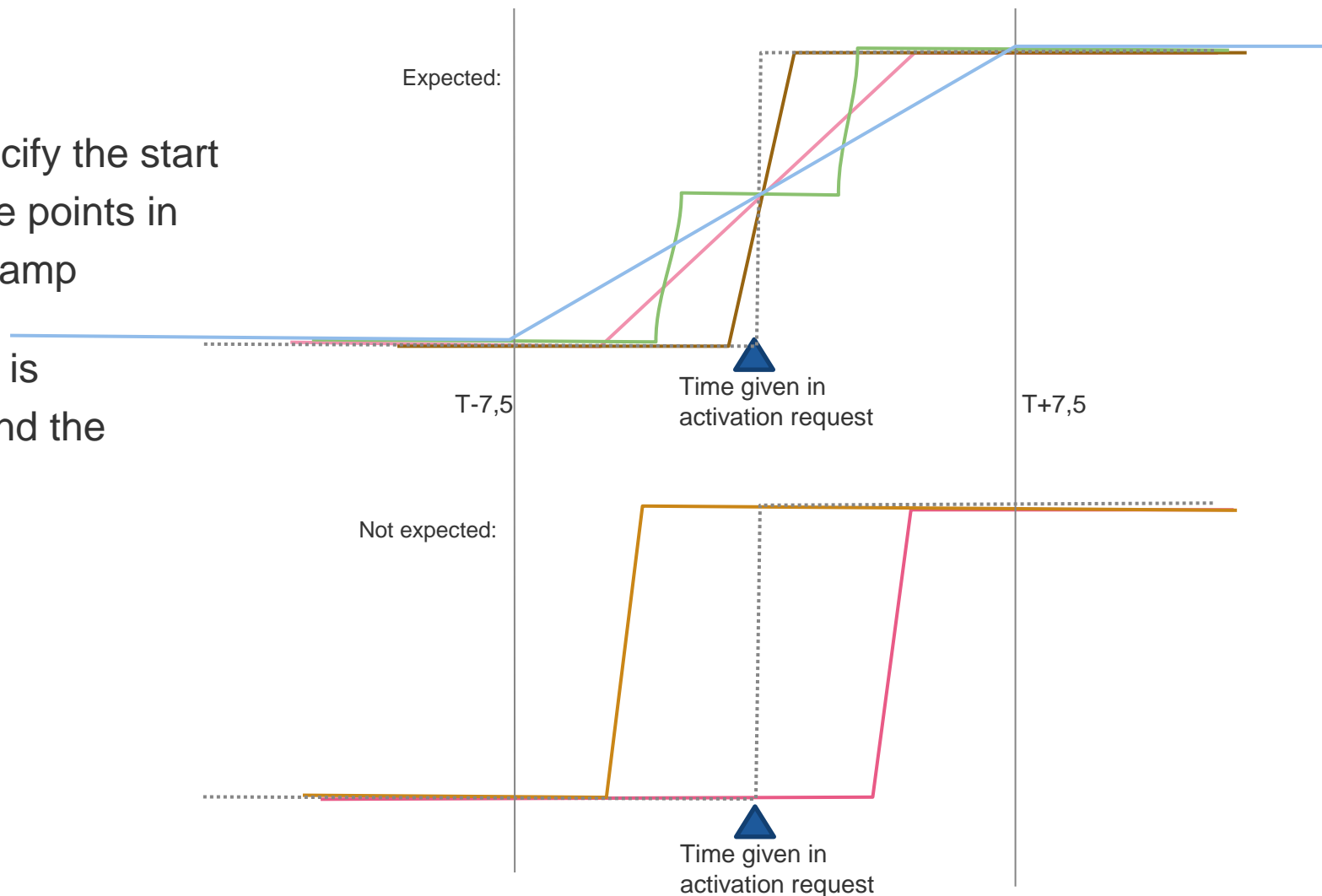
Activation in opposite direction in next quarter hour



The ramp from upward X MW to down ward  $-X$  MW requires twice the ramping speed as required for Bid A and Bid B. If the underlying asset is not able to fullfill the faster ramping curve, conditional linking should be used.

# AKTIVERINGSRAMPE

- The activation order will specify the start and stop for activation as the points in the middle of the expected ramp
- The expected delivery ramp is "symmetrical" ramping around the ordered start and stop time



# ACTIVATION AVAILABILITY MONITORING

## Heart-beat signal

- In the automated process every 15 min there is **little time for manual handling of activations** in case of failure of electronic activations.
- TSOs **require high activation availability from BSPs** and wish to monitor it.
- **The heart-beat signal enables to monitor and measure availability** of the activation process and connection, both **by the TSO and the BSP**.
- The heartbeat is an "empty" activation order that will be sent at least once every 15-minute period to BSPs who have placed bids
- The empty order will refer to a fixed dummy bid id and dummy resource and quantity will be 0.
- The heartbeat orders should be processed the same way as real orders to detect issues in any of the parts of the activation process.
- **TSOs are currently considering the possible actions in case of failed response** to heart-beat signal, e.g., to notify BSPs so that corrective actions can be taken, or an alternative communication channel can be used.

# AFREGNING FOR LEVERET ENERGI- OG UBALANCEAFREGNING

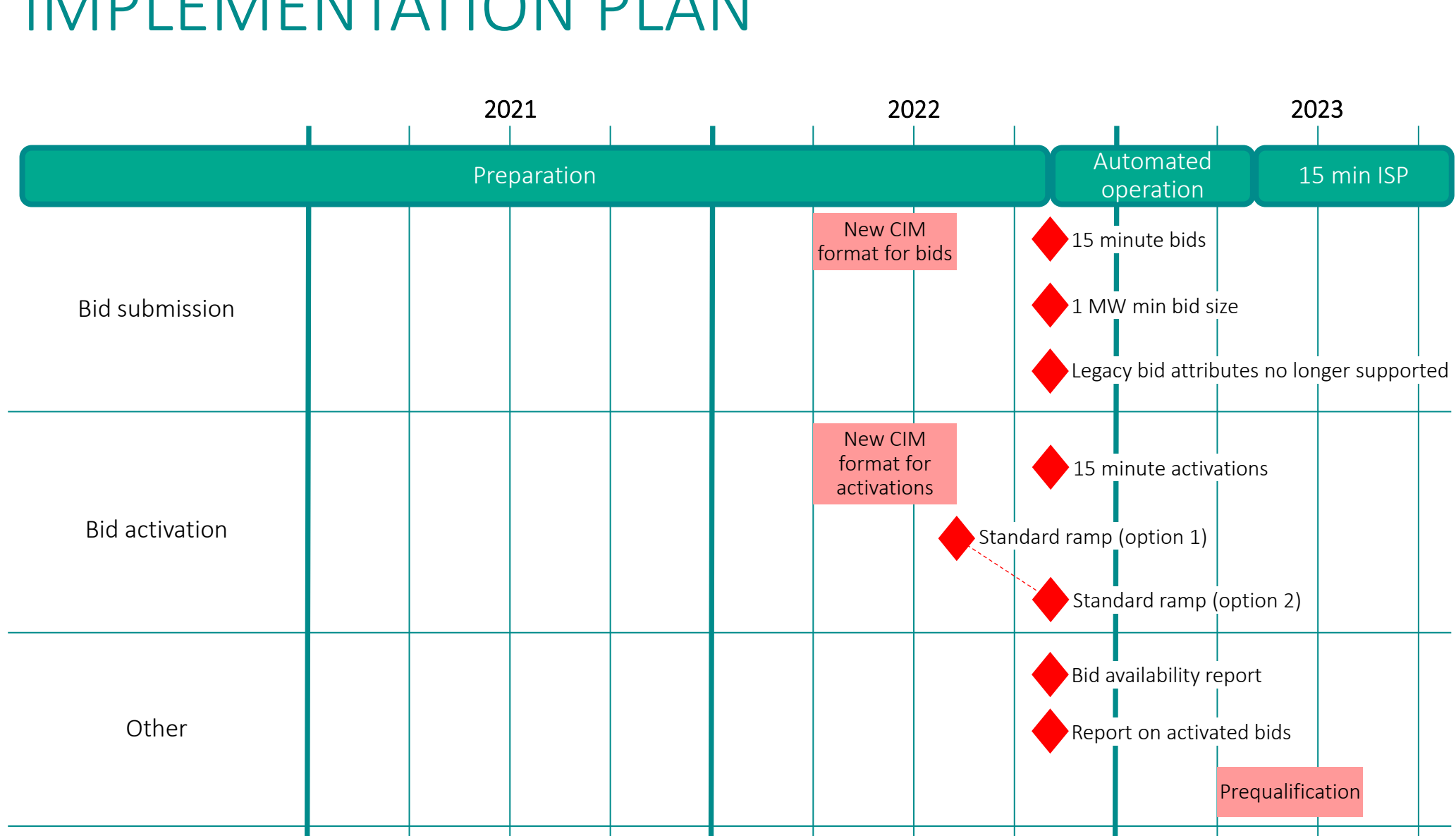
- The volume or scheduled activation that the BSPs will be paid for equals the block energy volume within the 15 minutes period.
- For direct activation the BSP energy volume is defined as a block volume starting at the midpoint of the ramp.
- The volume will be paid for with the mFRR price for that period.
  - There will be an hourly price until 15 min ISP.
- The imbalance position of the BRP will be adjusted with the activated volumes.
  - Until 15 min ISP this will be calculated with the block volumes without taking the ramps into account.
  - From 15 min ISP the BRP imbalance adjustment volume is calculated using the ramped profile. The BRP should not get any imbalances if it follows the standard product ramp.

# PRÆKVALIFIKATION

## Automated Operation pre 15 minutes ISP

- I den første periode tillader vi en aktiveringstid FAT=15 min
- Det forventes, at de fleste anlæg kan levere
- På nuværende tidspunkt ser vi ikke behov for en ny prækvalifikation i den første periode
- Der vil være behov for prækvalifikation fra 15 min ISP, hvor FAT=12,5 min. Eventuelt en overgangsfase, hvor alle skal være prækvalificeret ved tilslutning til MARI.
- Fremadrettet kan der, som følge af SOGL, være behov for at gentage prækvalifikation efter 5 år

# IMPLEMENTATION PLAN





TAK FOR I DAG!

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