



# Møte norsk NBM referansegruppe

11.05.2020

**Statnett**

# Agenda

- |                      |   |
|----------------------|---|
| <b>09:00 – 09:10</b> | <b>Velkommen, agenda, referat fra sist møte</b>   |
| 09:10 – 09:20        | Refleksjoner etter siste nordiske NBM referansegruppemøte, innledning ved Inger Kristin Holm, Norsk Hydro |
| 09:20 – 10:00        | Produktveikart for mFRR energiaktiveringsmarkedet ved Eivind Lindeberg                                    |
| 10:00 – 10:10        | Hvilke budattributter vil bli tatt i bruk først? Innspill fra Aslak Mæland og Geir Jevnaker               |
| 10:10 – 10:20        | Status ACERs høring av aFRR kapasitetsmarked  |
| 10:20 – 10:40        | Budfiltrering ved Gerard Doorman  |
| 10:40 – 11:00        | Produksjonsflytting ved Eivind Lindeberg  |

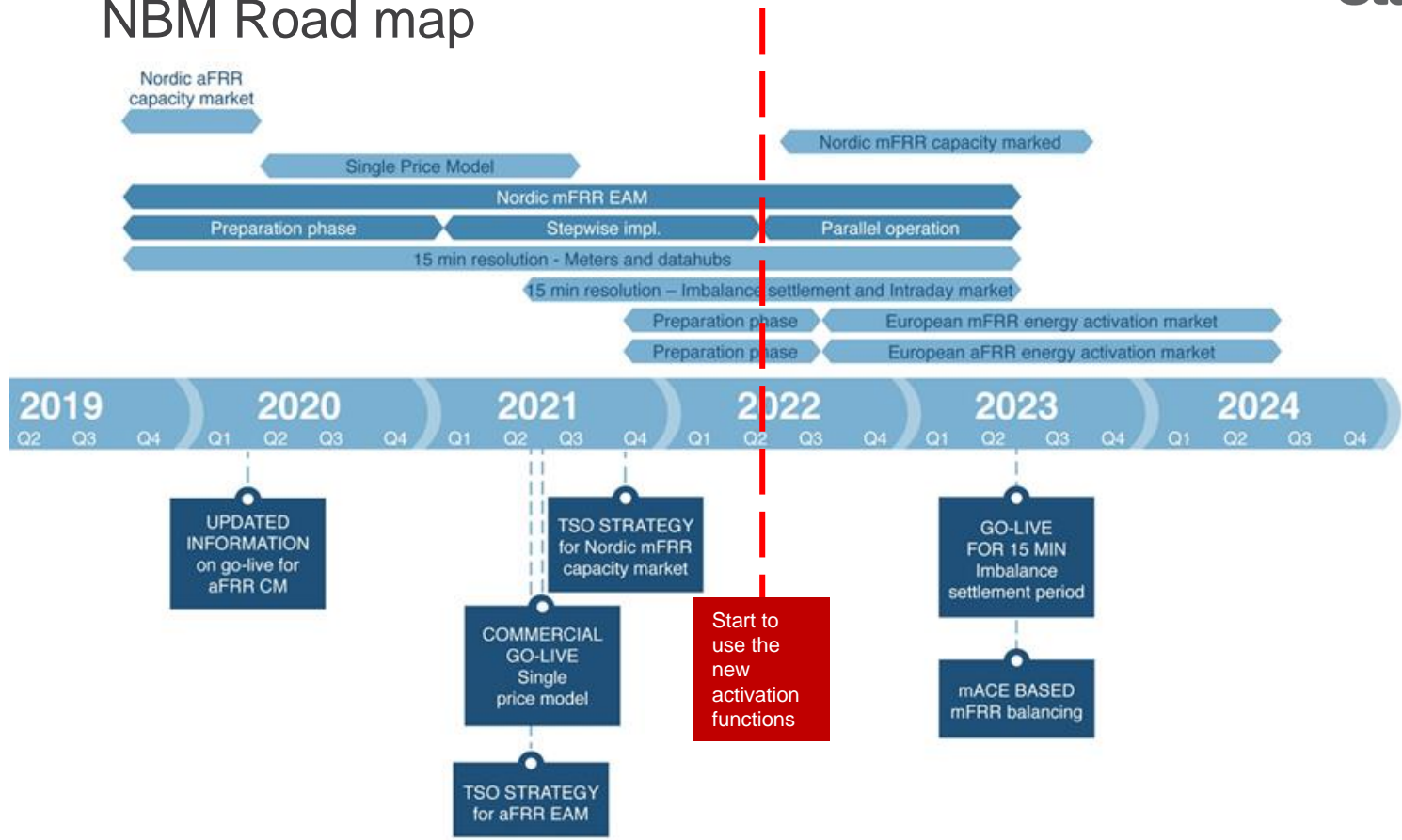
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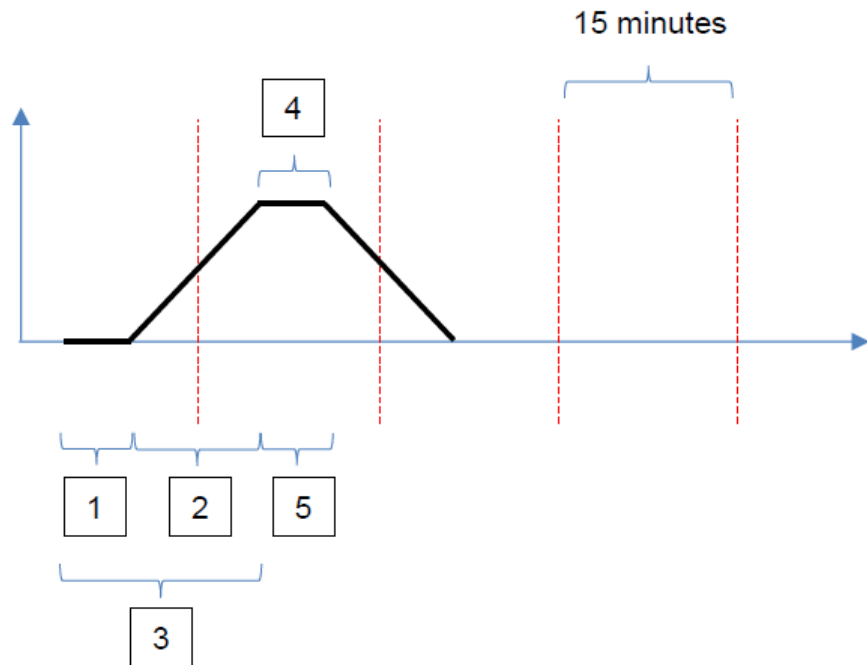
# NBM Road map



# Potential processes to handle imbalance and congestion

- Scheduled activation
  - Process running automatically each 15<sup>th</sup> minute
  - Includes netting of TSO demand
  - Scheduled activation can be used for both balancing and congestion management
- Direct activation
  - Manually initiated
  - Can be initiated any time except when scheduled activation process is running
  - Single TSO demand will be handled in each run
  - The TSOs will assess the need for faster activation of direct activation (FAT <12,5 min)
- Production adjustment
  - Process running automatically each 15<sup>th</sup> minute (in Norway and Sweden)
  - Advancing and/or postponing planned production changes 5 to 10 minutes
- Pre real time process
  - As part of NBM, Nordic TSOs will assess if there is a need for a pre real time process to handle congestion and maybe large expected imbalances
  - Process will probably run (manually or automatic) between 40 and 120 minutes before period shift

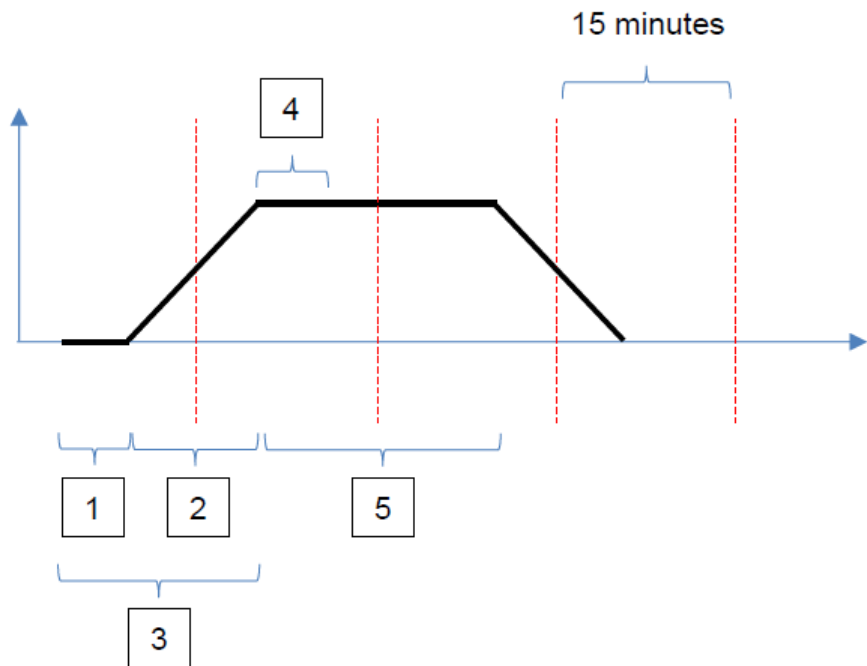
Scheduled activation



1. Preparation period
2. Ramping period
3. FAT – full activation time
4. Minimum duration of delivery period
5. Maximum duration of delivery period

Figure 6: Example of a Possible Shape of the mFRR Scheduled Product

## Direct activation



1. Preparation period
2. Ramping period
3. FAT – full activation time
4. Minimum duration of delivery period
5. Maximum duration of delivery period

Figure 7: Example of a Possible Shape of the Longest Direct Activation of mFRR

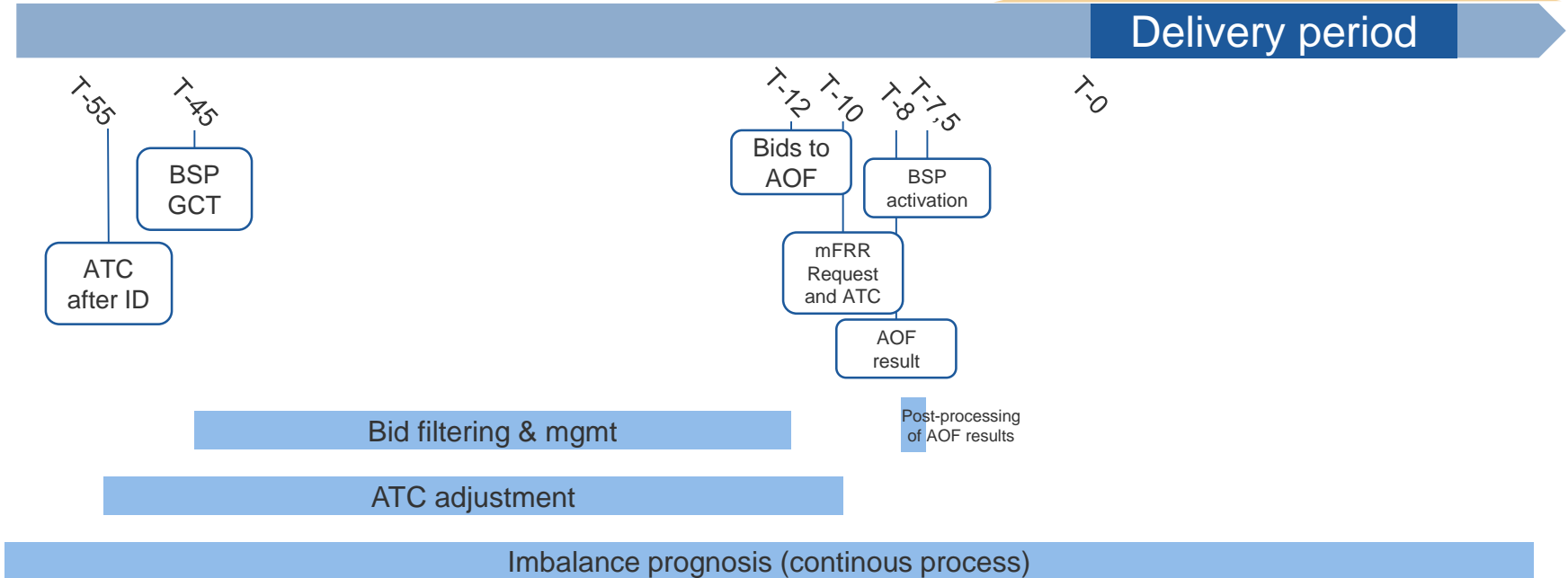


## TSO process for scheduled activation



# Timeline of the automatic process

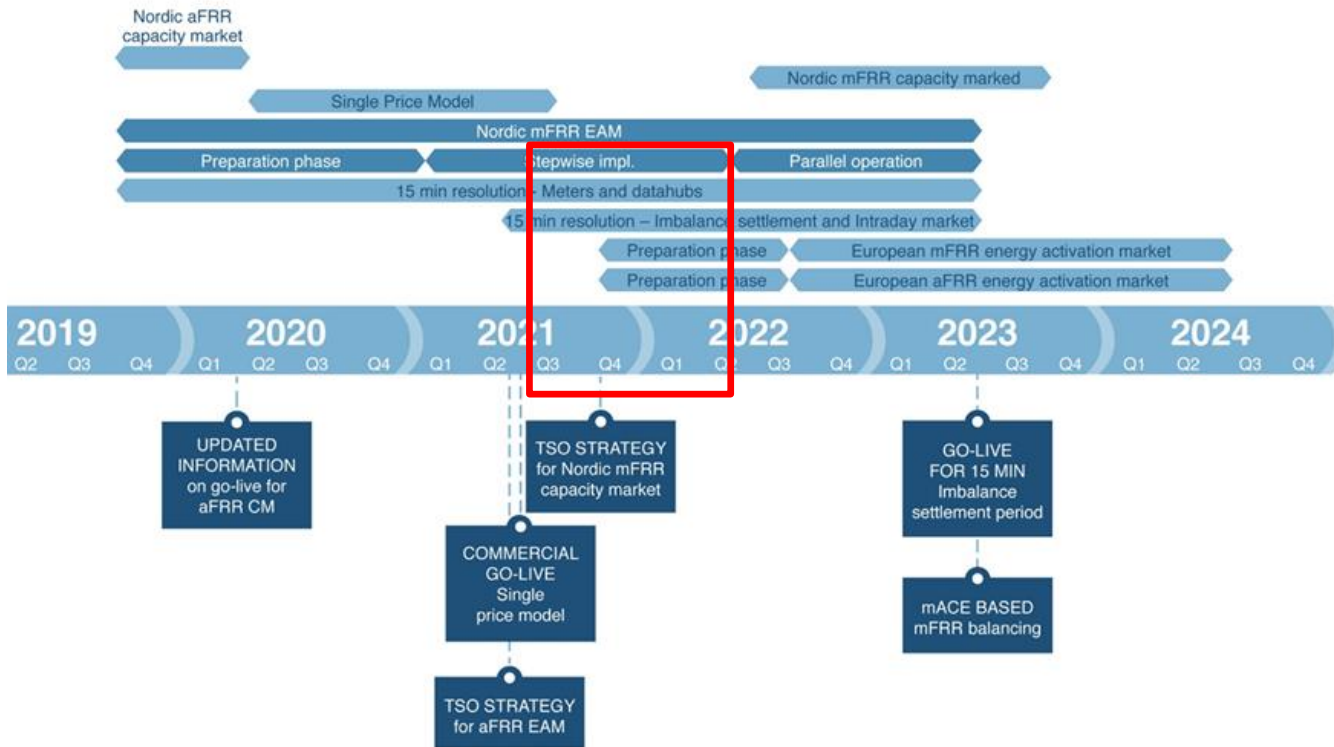
Standard  
product  
definition



# Automation requires new information in the bids

- Background
  - To ensure automatic activation of bids we see that market participants must be able to give information on minimum activation volume, if bid is "all or nothing", start-up cost, location, etc. The consequence is that it is a need to support more bid attributes than is used today. At least in Norway and Sweden, this also makes it necessary to change format and protocol for mFRR energy activations bids.
  - The bid attributes we will propose to support, are attributes that MARI will support, or that do not impact the use of MARI. Some attributes are not forwarded to MARI but processed by the TSO.
  - Details in which attributes to support and implementation plan, will be discussed with market participants in national reference groups before decided. When it is more clear which attributes that will be supported, TSOs will update the memo "Process for activating products".
  - In Finland, Norway and Sweden the support for new attributes implies a need to change format and protocol for bid interface between BSP and TSO. New format will be CIM-XML and protocol will be ECP.

# NBM Road map



- Timeline for the introduction of new bid attributes.
- TSO will support bids with new attributes in parallel with existing bids for a given period.
- Red rectangle indicates potential period with support for new and existing bid formats (but not necessarily using new attributes)

## Assumption on bid attributes to be supported (1 of 4)

- Support for minimum activation volume
  - attribute: Minimum offered volume
- Support for bids where volume is "all or nothing"
  - attribute: Indivisible Bids
- Support for start-up costs
  - attribute: Exclusive Bids

## Assumption on bid attributes to be supported (2 of 4)

- Where an activation in one quarter hour determines if bid are available in next quarter hour
  - attribute: Conditional Bids
  - Necessary to handle limited activation resources (empty reservoir) and other cases where an activation in one quarter hour determines if bid are available in next quarter hour.
  - Needed to automatically adjust bids in QH1 and/or QH2 as a result of the outcome of the clearing during QH0, since balancing energy gate closure time (BE GCT) for QH1 or QH2 already have passed.
- Multipart (Parent/child)
  - Child bids must be more expensive than parent bid
    - This requirement reduces the use of this. Still discussions.
  - Supported in MARI

## Assumption on bid attributes to be supported (3 of 4)

- Min. duration
  - If bids are only used for standard scheduled and direct activation, this attribute is not necessary. But if there will be manual activation where it is possible that a deactivation can be made a "short" time after activation, this attribute is needed.
  - Minimum duration longer than 15 minutes cannot be supported in the scheduled process
- Max. duration
  - 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.
- Resting time
  - 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.

## Assumption on bid attributes to be supported (4 of 4)

- Activation type
  - If bid is eligible for scheduled activation only or for both scheduled activation and direct activation
- Inclusive
  - To handle bids from resource objects that also impacts other resource objects ("water way")
  - *If this bid is activated this bid must be activated too*
- Location/resource object
  - Information about where the activation will be injected in the grid



# Other potential attributes

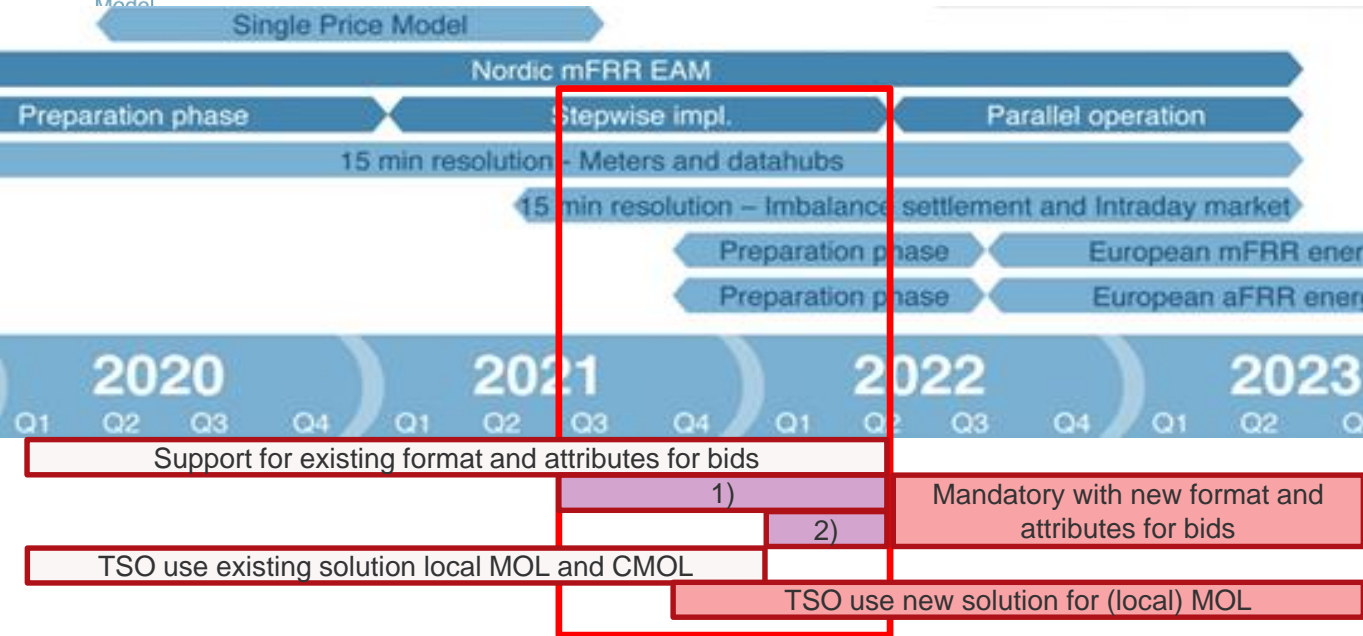
- Available for faster activation / fastest possible full activation time
  - To be used if we decide that faster activation is necessary
- Not standard FAT
  - For slower resources that cannot fulfil the standard product requirements, but still can be useful for the TSO in scarcity situations or in case of local grid constraints
- Not electronic ordering
  - For resources that cannot be electronically activated, but still can be useful for the TSO in scarcity situations or in case of local grid constraints
- Available for production shift
  - For a possible new production shift product

# Process changes

- Separate GCT for each quarter
  - Introduced together with 15 min ISP
- Electronic ordering a pre-requisite
- BSPs cannot reject electronic orders
  - As long as TSOs respect the restrictions given in the bid, the BSPs cannot reject the activation.
  - Bids are firm.
- New prequalification requirements (for some TSOs)

## Standard product attributes that will be introduced before joining MARI but after 15 min ISP

- It is not decided when the following attributes will be introduced. They are part of the EU Standard Product and will be introduced before joining MARI, but probably after 15 min ISP
  - FAT 12.5 minutes
  - GCT 25 minutes
  - 1 MW minimum bid size and 1 MW bid granularity



1) Technical support for new format and attributes for bids  
 2) Functional support for new attributes for bids

- In a period before "Functional support ...", the operators at the NCCs will be presented recommendation on bid activation from new solutions ("shadow operation"). If BSPs include new attributes in their bids in this phase, it will be used in the "shadow operation", and increase the value of the shadow operation.
- In the period with "Functional support ..." before "Parallel operation", there will potentially be more UAB (unforeseeable/paradoxically accepted bids) and URB (unforeseeable/paradoxically rejected bids), than in parallel operation phase. Since it will be difficult to exactly determine a target marginal price, when each of the TSOs manually activates bids based on expected marginal price in the mutually regulated bidding areas. (With new bid attributes the CMOL will be less readable to a human. This is not a problem with the AOF in use.)

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# ACER decision making process

Apr-May

- Regular interactions (webconferences) with RAs and TSOs
- **Public consultation 3 weeks (consultation from 30 April until 20 May)**
- Assessment of public consultation comments
- TSOs hearing: end May – Early June

Jun

- End of RA and TSOs interactions by 5 June
- Documents to ACER EWG by 16 June
- EWG advice on 23 June

Jul

- Documents to Board of Regulators (BoR) by 2 July
- BoR FO on 16 July

23

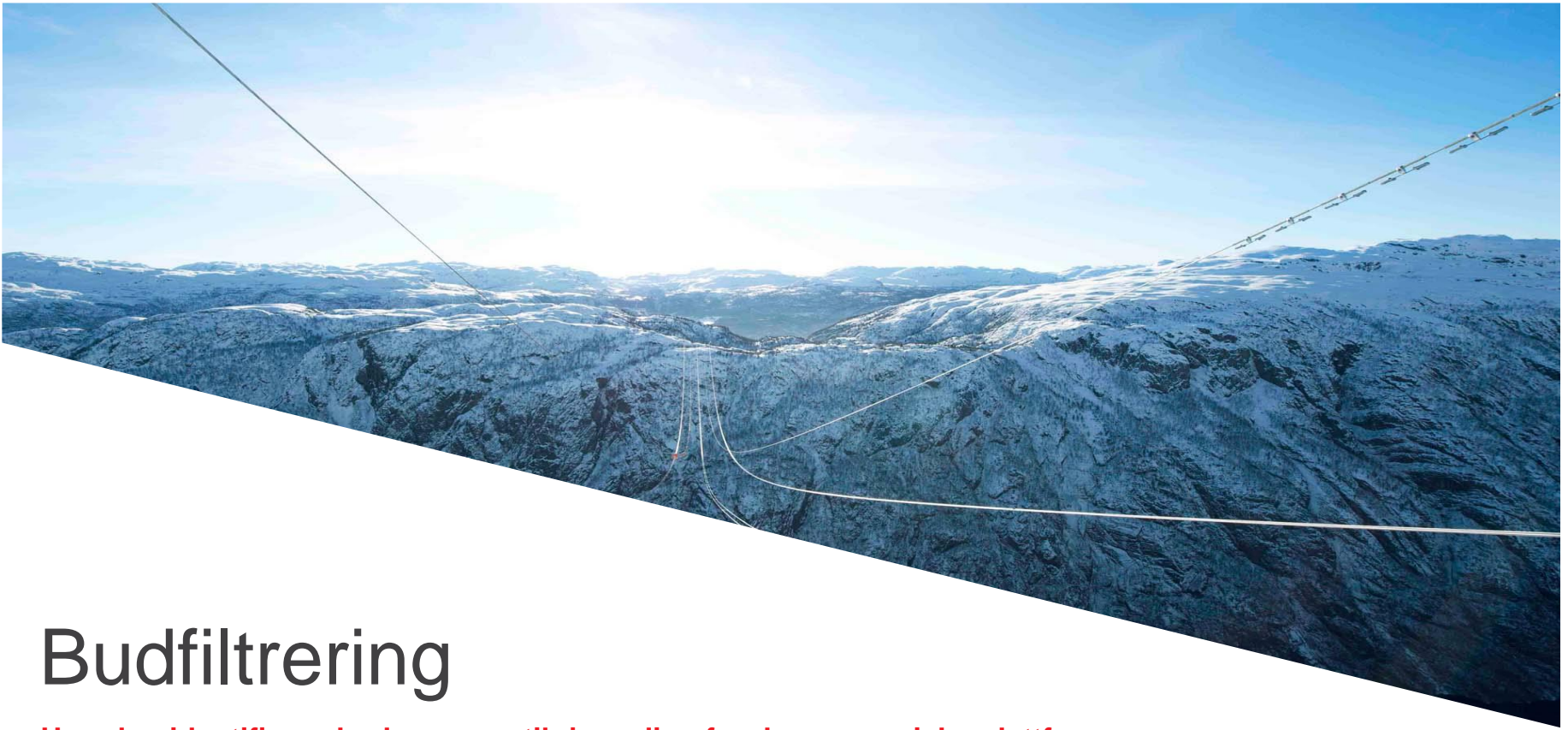
Sted, dato

**Stakeholder workshop on 12 May 2020 from 10 CET to 13 CET**

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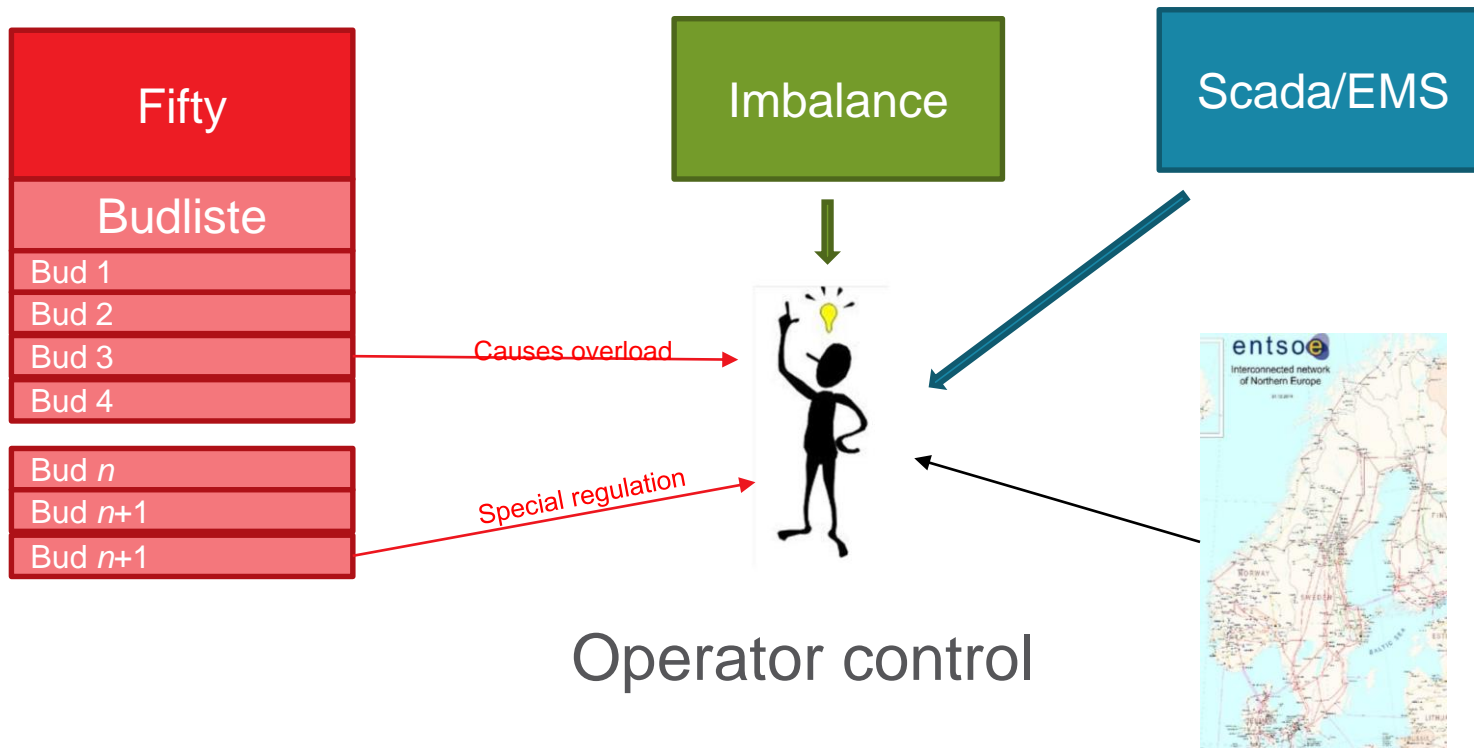
# Budfiltrering

Hvordan identifisere bud som er utilgjengelige for den europeiske plattformen

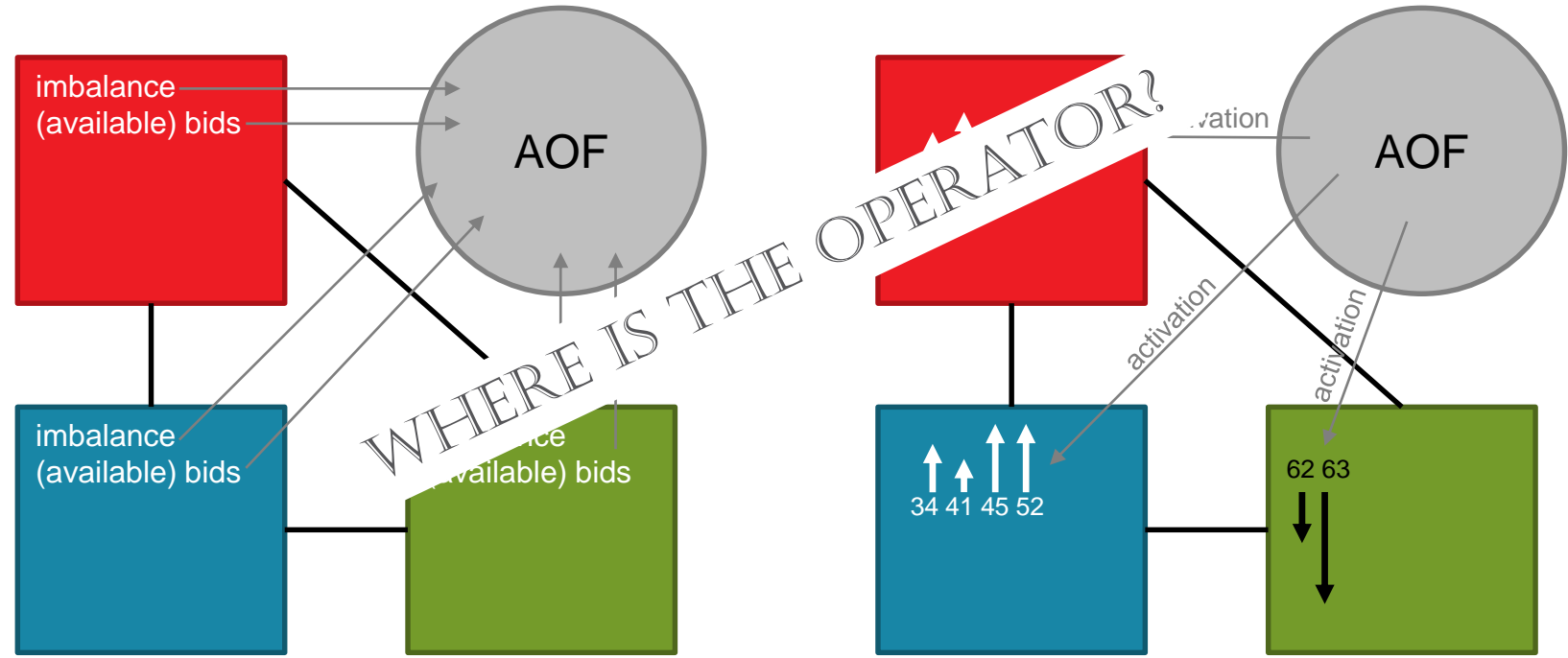
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# Present procedure



# The future: Activation Optimization Function zonal approach (present platforms)

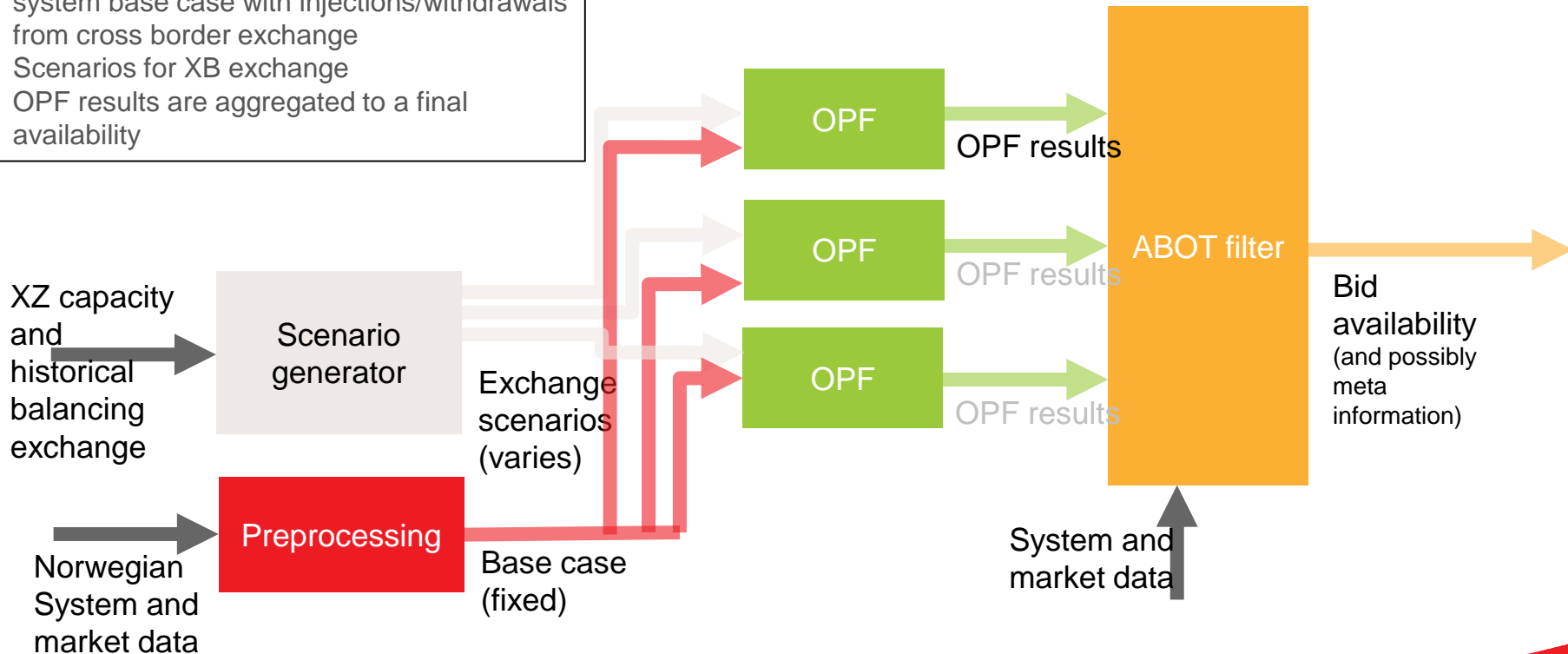


# Guideline on Electricity Balancing

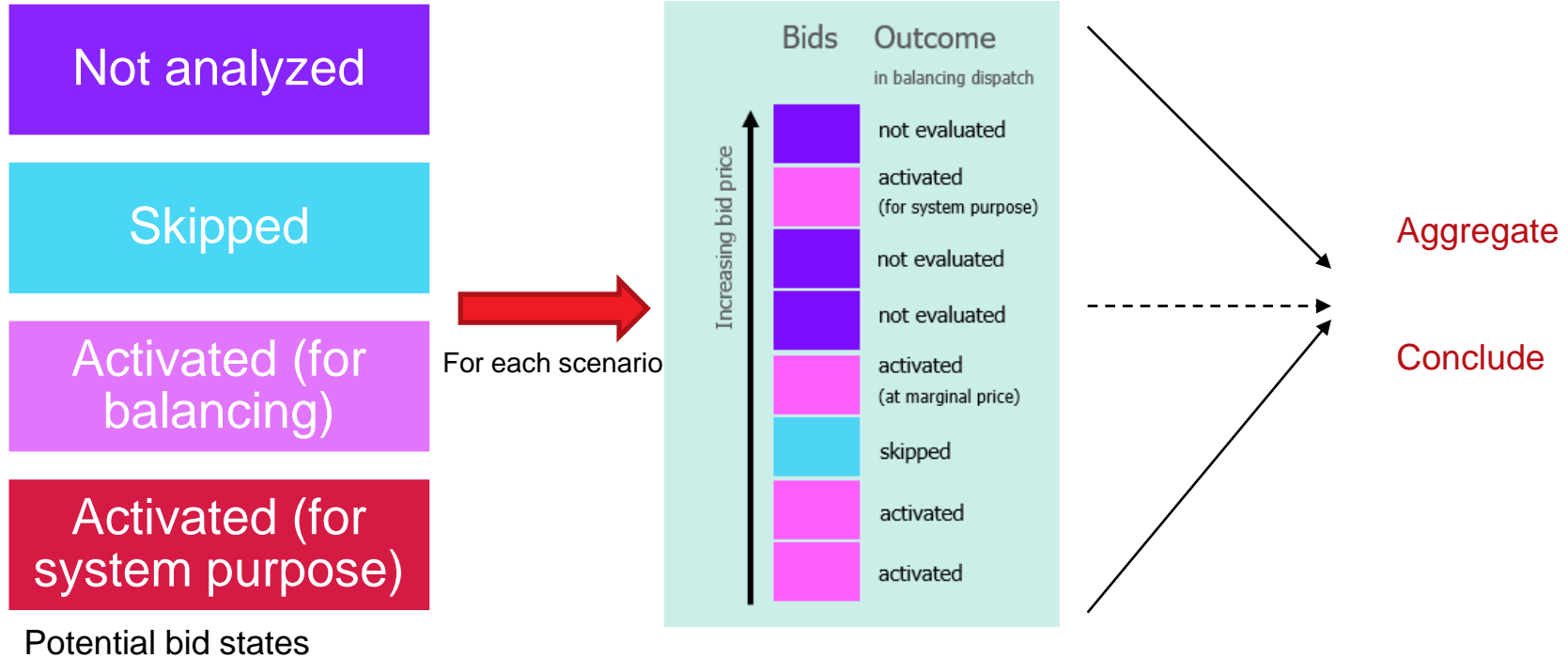
- *Article 29.14:*
  - *Each TSO may declare the balancing energy bids submitted to the activation optimisation function unavailable for the activation by other TSOs because they are restricted due to internal congestion or due to operational security constraints within the connecting TSO scheduling area.*

# Bid availability: High-level view

- Optimal Power Flow (OPF) is run on a system base case with injections/withdrawals from cross border exchange
- Scenarios for XB exchange
- OPF results are aggregated to a final availability



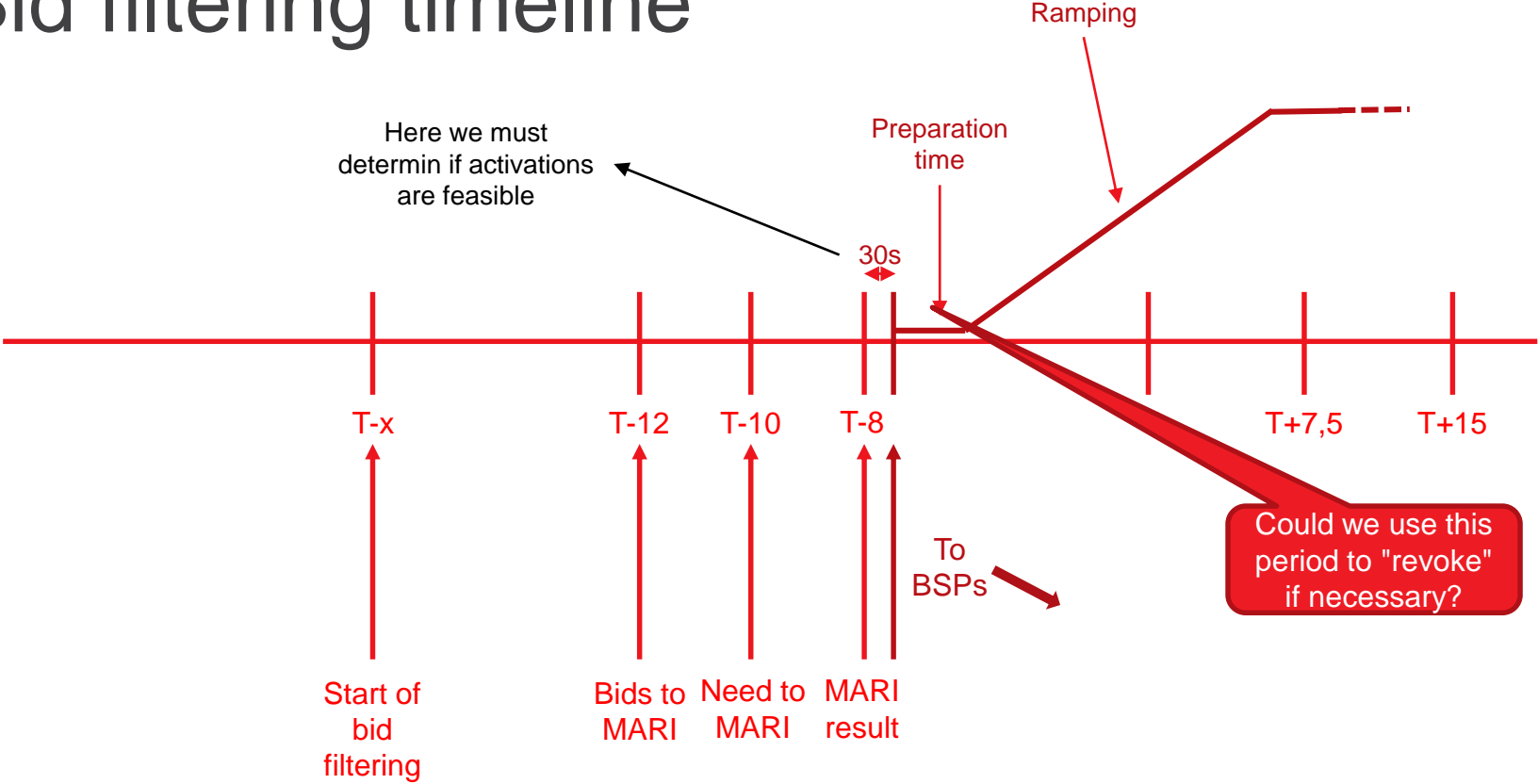
# Information from OPF results



# Status

- Prototype developed and tested
- Results look promising
- We will most probably develop concept for use in NBM
  - No clear alternative
  - Unless major overhaul of platform interaction
- Major remaining issue: post MARI check of feasibility
  - Uncertainty → no perfect forecast

# Bid filtering timeline



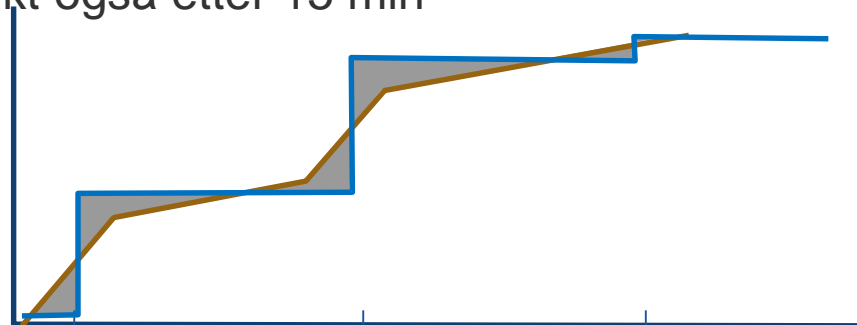


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## Introduksjon

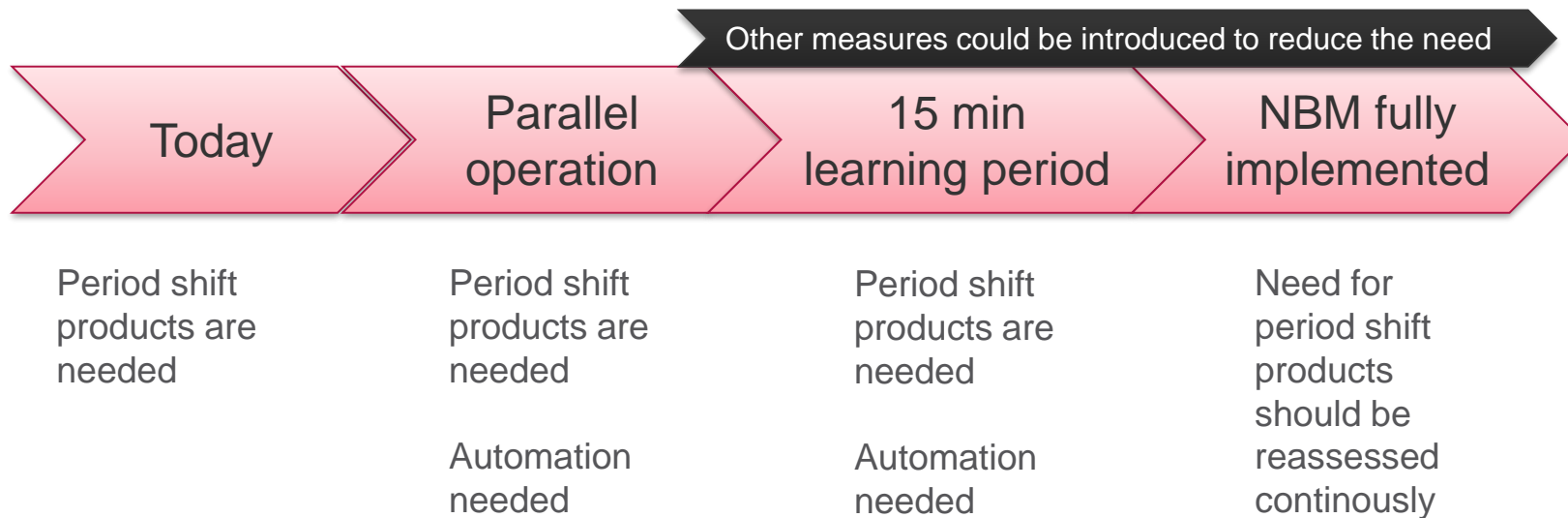
- Strukturelle ubalanser gir store frekvensavvik og lar seg ikke håndtere med normal balansering
  - Se analyse i vedlagte slides
- Dagens produksjonsflytting passer dårlig med NBM-prosessen
- Forventer behov for periodeskift-produkt også etter 15 min
  - NBM-prosessen tas i bruk før behovet eventuelt går ned
  - Parallel operation trengs noe annet enn dagens flytting



# Alternativer

Alternativ	Foreløpig vurdering	Kommentar
Ingen periodeskift-håndtering	■	Stor risiko for uakseptable frekvensavvik
Mer aFRR	■	Dyrt. Lite egnet
Mer FCR	■	Dyrt. Lite målrettet
Bruke standardprodukt for direkteaktivering	■	Lite egnet. Varighet >15min
5 minutters "produksjonsjustering"	■	Inngripende. Lite målrettet.
Insentiver til saktere ramping av produksjon/ 10 min ramping av BRP posisjon	■	Fjerner problemet i stedet for å løse symptomene.
Specific mFRR product for period shift	■	En forbedring av dagens flytting

# Need for period shift product should be reassessed

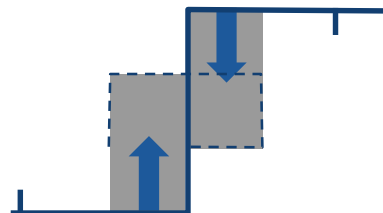


# Alternative new solution: Specific mFRR product for period shift

From:  
moving a production  
change back or  
forward



To:  
Activating bids before or  
after for parts of the  
period

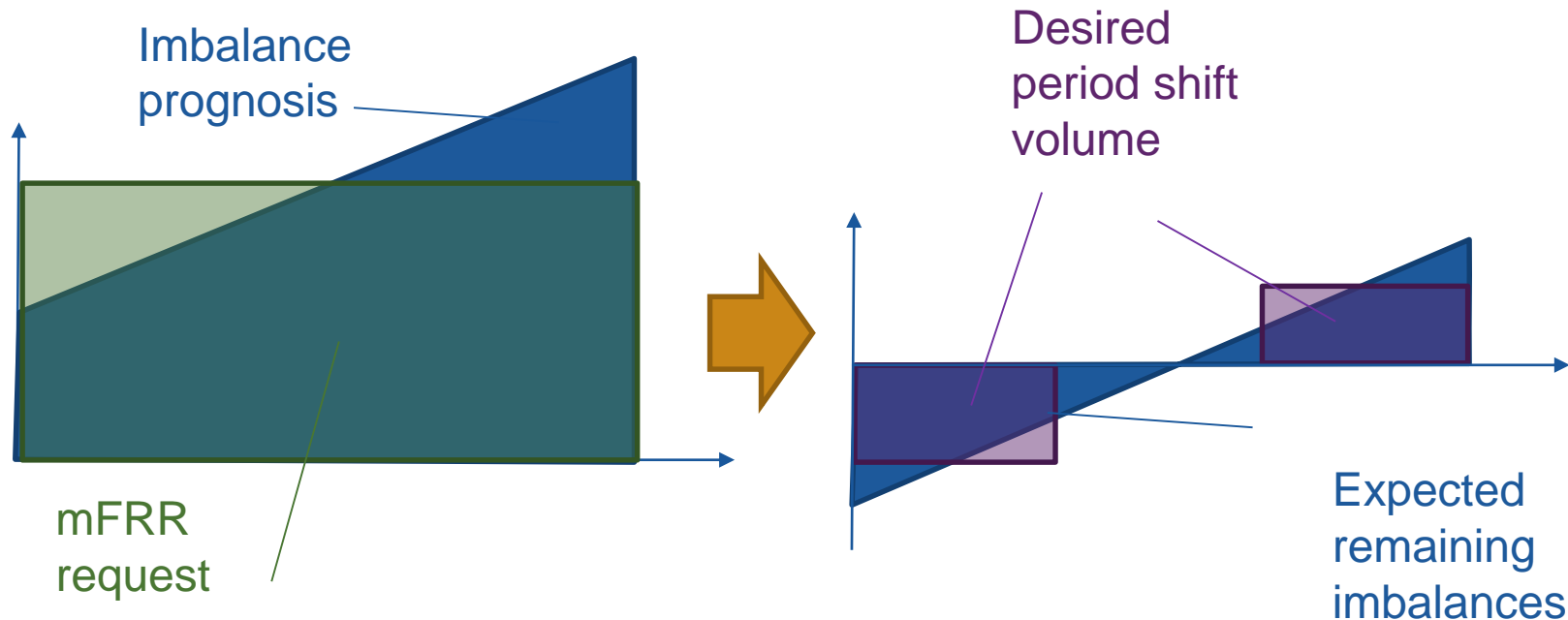


## New specific product

- A proposed solution is to make the production adjustment a part of the mFRR bids.
  - Each TSO **can** add new bid attributes to the mFRR bids that allows the TSO to activate these bids for only a part of the period.
  - Depending if the planned production change is in the beginning of the market period or at the end, the bid can be activated in the start of the period or in the end. (activation from xx:00-xx:05 or from xx:10-xx:15)
  - New attributes only visible in the local TSO – not the Nordic or European AOF
- Benefits
  - This will address the issue with the link to mFRR
  - It will allow the BSP to "opt in" to this. This has been a desire from norwegian BSPs
  - It will allow us to prioritize mFRR. The AOF can choose bids first, and period shift can choose from the remaining bids.
- Unclear if this requires a specific product in the EBGL sense

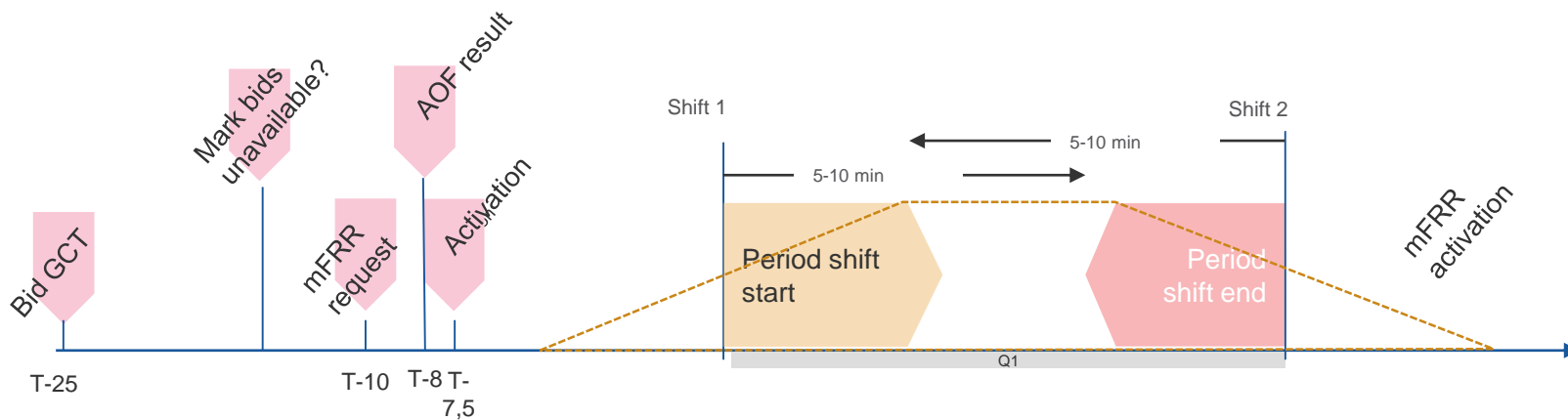
Bid	Volume	mFRR price	...	Period shift product start	Period shift product end
Station	+40	300		No	Yes

## Period shift volume based on *expected* remaining imbalances after mFRR



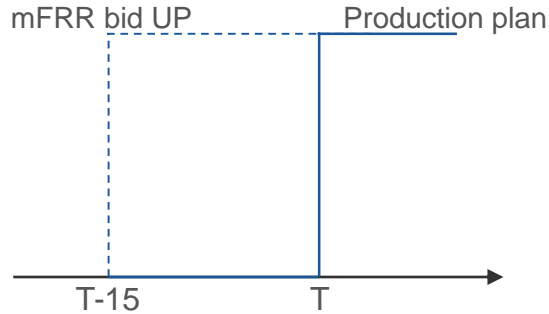
# Activation

- Main idea: Activated together with the mFRR bids. T-7,5



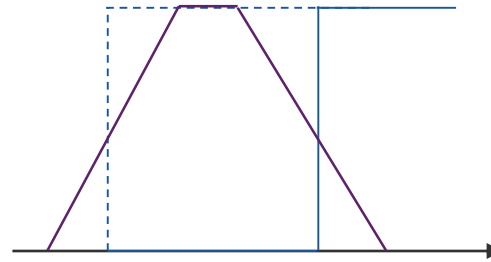


# Example – production plan, mFRR and period shift



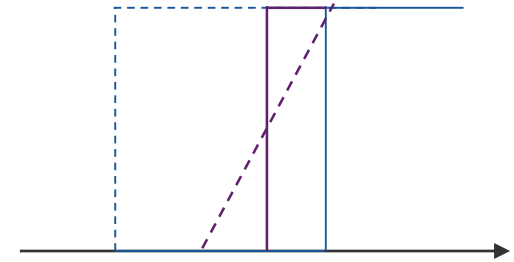
*In these figures the plan changes are instantaneous while the activations are using the standard product ramp.*

*Plan changes might actually have a ramp, and mFRR changes might be faster, but this is the profiles that are used for settlement*



Activation of mFRR bid.  
Period shift activation not possible

*Resulting profile is a little bit strange. The mFRR product and the plan changes does not fully harmonize*



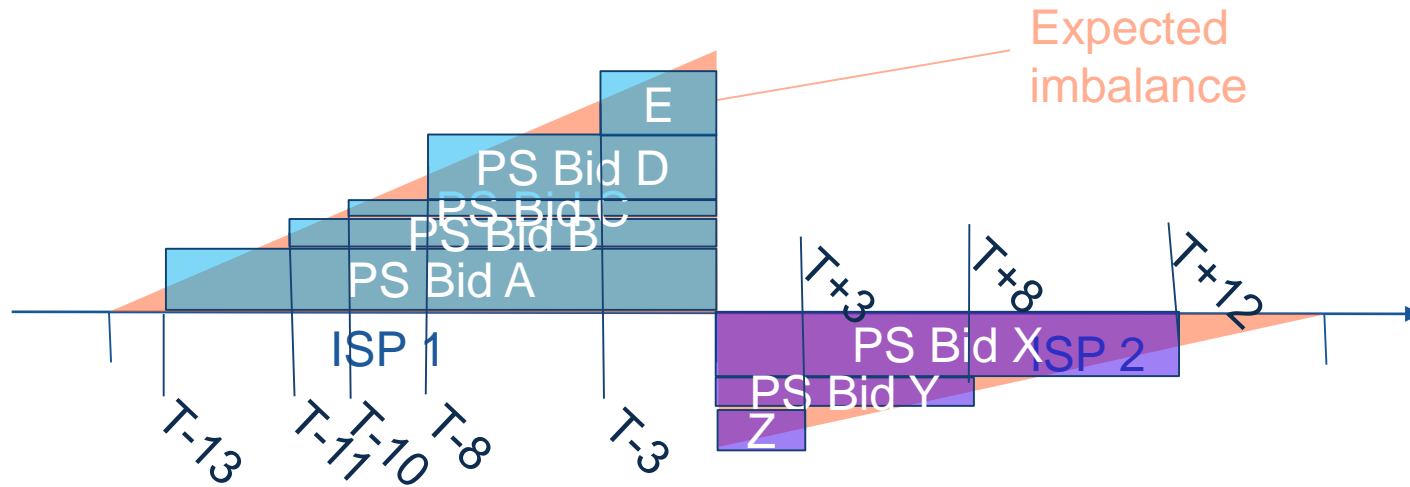
Activation of period shift product

10 minute ramp like mFRR or no ramp like the plan change?

The full delivery is within the same ISP, so it has no practical consequence

# +/- 5 minutes or any length?

Could a period shift bid be activated for 12 or 4 minutes as well, or should it be restricted to 5 minutes?

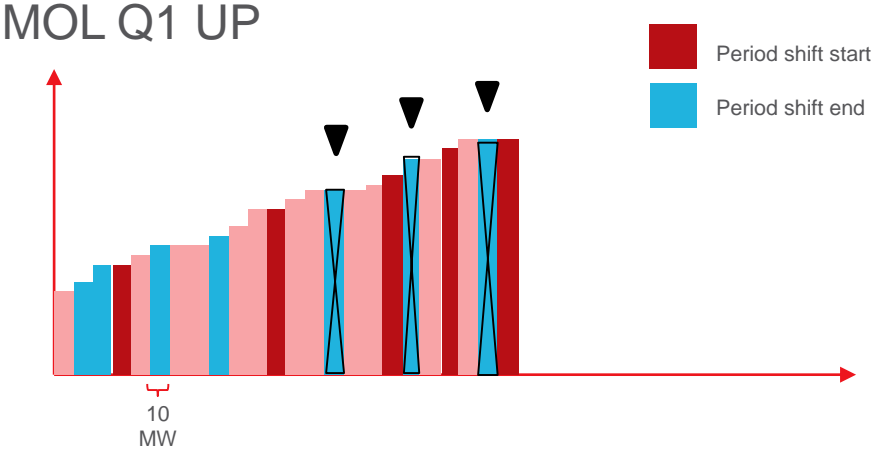


## Mark bids unavailable to ensure sufficient volume (1/3)

- Because the AOF selects bids first, there could be no available period shift bids available, if all are activated for mFRR
- If period shift activation is deemed as critical, we must ensure that we have sufficient period shift volume by holding some bids back from the AOF
- The most expensive bids are reserved. The cheapest remaining bids after AOF are activated
- Removing bids from AOF could result in lost income for a BSP so it should be used restrictively.

# Mark bids unavailable to ensure sufficient volume (2/3)

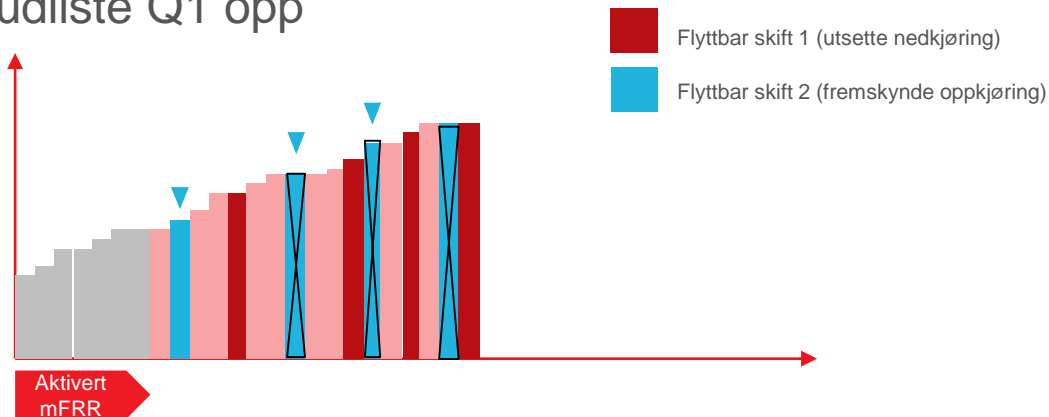
- Most expensive bids are marked as unavailable
  - Period shift need start= 0
  - Period shift need end = 30
  - 30MW most expensive "end" bids (blue) are reserved



# Mark bids unavailable to ensure sufficient volume (3/3)

- Cheapest remaining bids are activated
- Bids made unavailable for AOF are guaranteed to be available
- Depending on AOF result other, cheaper bids could also be available
- This bid selection operation must be done very fast (<30s) but it should be a simple look-up operation so it could be possible.

Budliste Q1 opp



# Pricing

- Ambition
  - Should not distort the mFRR pricing
  - Should provide sufficient incentive for the BSP to participate with sufficient volume
- Market liquidity could be low
  - Only producers that are changing their production can participate\*
  - > A separate market price for period shift could lead to gaming opportunities
    - Both a "Period shift marginal price" or separate bid prices for the period shift product could lead to this
- Pay-as-bid gives little margin for BSPs
  - We want the BSPs to bid cost-based in the mFRR market
  - > Maybe a (reasonable) premium could be added to the bid price to give incentive to participate and avoid distortion to the mFRR price.

## Diskusjon

- Generelt inntrykk
- Hvordan vil volumene utvikle seg sammenlignet med dagens flytting
- Håndterbart å bruke alle de nye attributene?
- Innspill til prising
- Innspill til reservasjonsløsning

# Forslag til neste møter

- Kan se ut til at det blir mulig med fysiske møter til høsten. Gitt at de fleste likevel er i Oslo, skal vi prøve å legge opp til fysiske møter?
- Foreslår å fortsette å ha de norske møtene like i etterkant av de nordiske.

Nordis referansegruppemøte	Norsk referansegruppemøte
27.08	08.09?
26.11	03.12?