Nordic Webinar

mFRR Energy Activation Market

- Bid selection process
- Implementation guide

16.06.21

Visit nordicbalancingmodel.net

The purpose with the webinar

Nordic TSOs are implementing new processes and IT tools that will have an impact on BSPs participation in the mFRR energy activation market. The TSOs are continouosly developing the solutions.

Purpose of today:

- Update market participants about the comming changes;
- Explain the comming market/IT processes;
- Update on the necessary implementation on BSP part;
- Update on BSP implementation time plans in each market;
- Answer to questions and collect the inputs.

The webinar will be recorded

AGENDA

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- **Introduction** - *Roger Skoglund, Project Manager mFRR Energy Activation Market*
- **Overview of documentation in mFRR energy activation project** - *Erika Zvingilaite, Energinet*
- **Introduction to new mFRR energy activation market – product and process** – *Eivind Lindeberg, Statnett*
- **Bid selection process and Implementation Guide** - *Anders Naville Gisnås and Eivind Lindeberg, Statnett*
- **Pricing and settlement** – *Cecilie Seem, Statnett*
- **TSO implementation and testing plans for BSPs** – *Anders Naville Gisnås, Tage Søndergaard Larsen and Otso-Ville Rinne*
- **BSP readiness survey** - *Erika Zvingilaite, Energinet*

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Guideline for questions and comments

After each topic we will make time for answering your questions

Please, write your questions and comments in the chat

We will read a question out loud and will ask you to clarify or comment on whether an answer was clear

Introduction

Roger Skoglund, Project Manager mFRR Energy Activation Market

The Roadmap with key milestones

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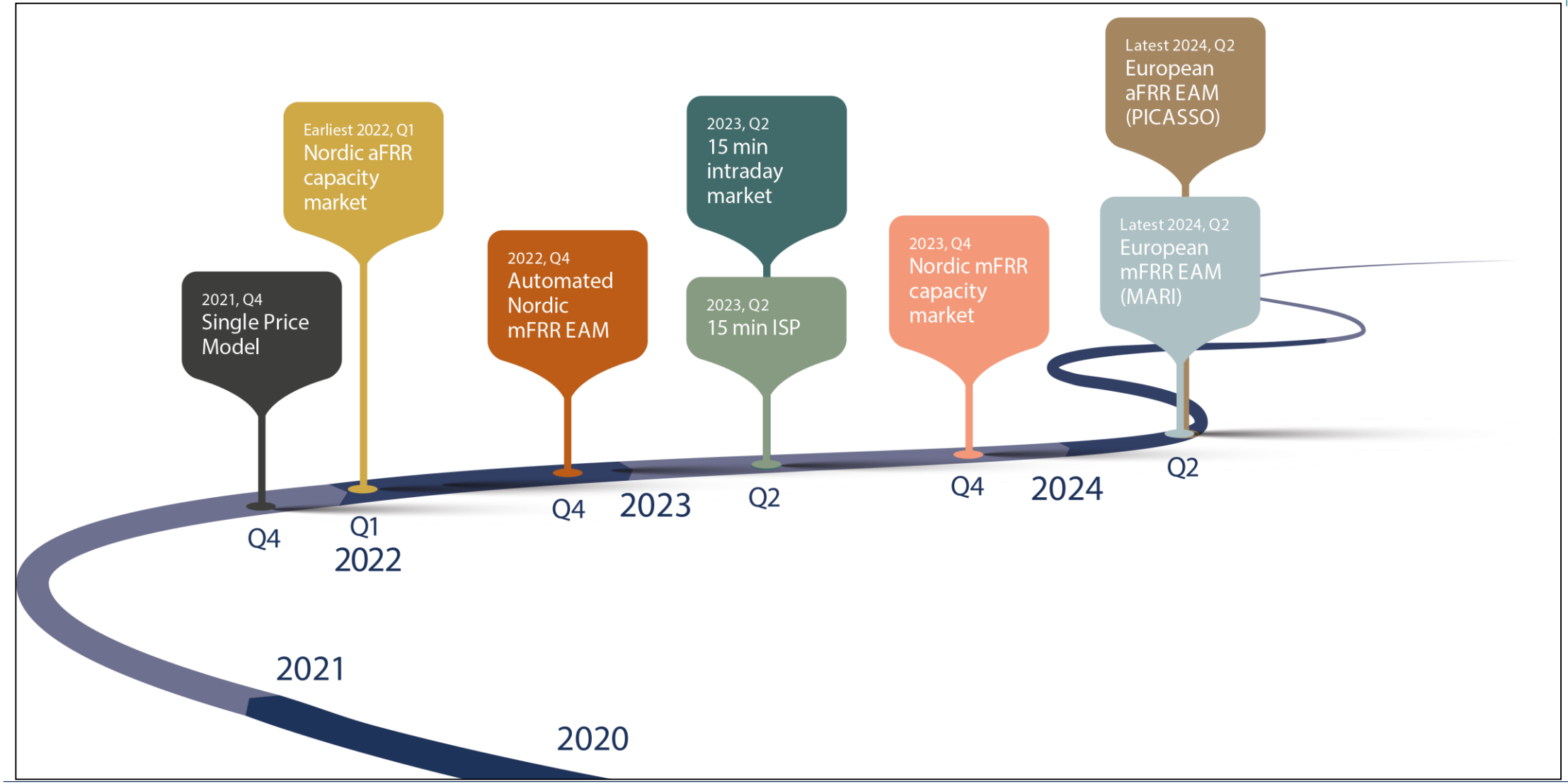

Three steps towards connection to the European mFRR energy activation platform MARI

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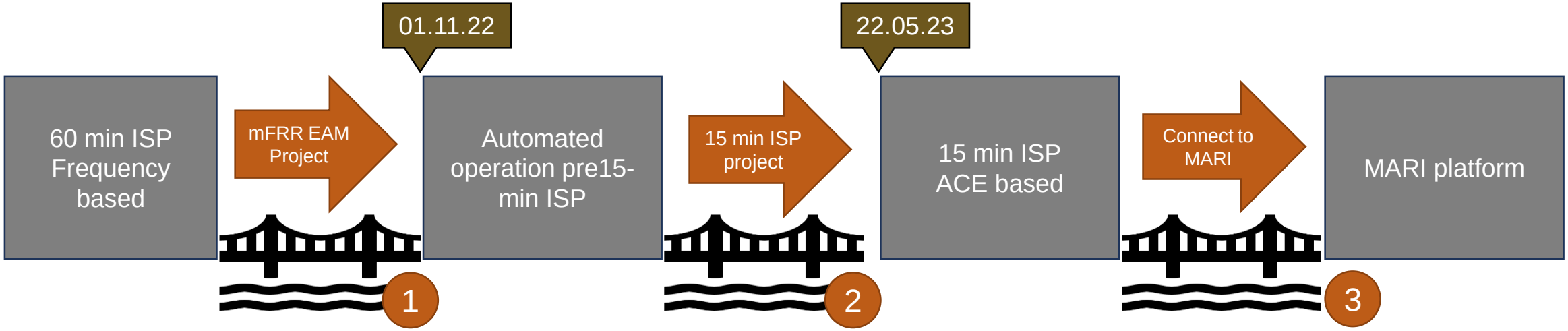

Shift from 60 min manual to 15 min automated balancing.

Changes in bidding and activation processes and product-requirements.

Shift from 60 to 15 min ID market and ISP.

Changes in pricing and settlement of mFRR energy and imbalances.

Nordic TSOs prepare for connection to the European mFRR energy activation market and platform MARI.

Automation of the mFRR EAM balancing process including a Nordic AOF is a necessary bridge to MARI for the Nordic synchronous area.

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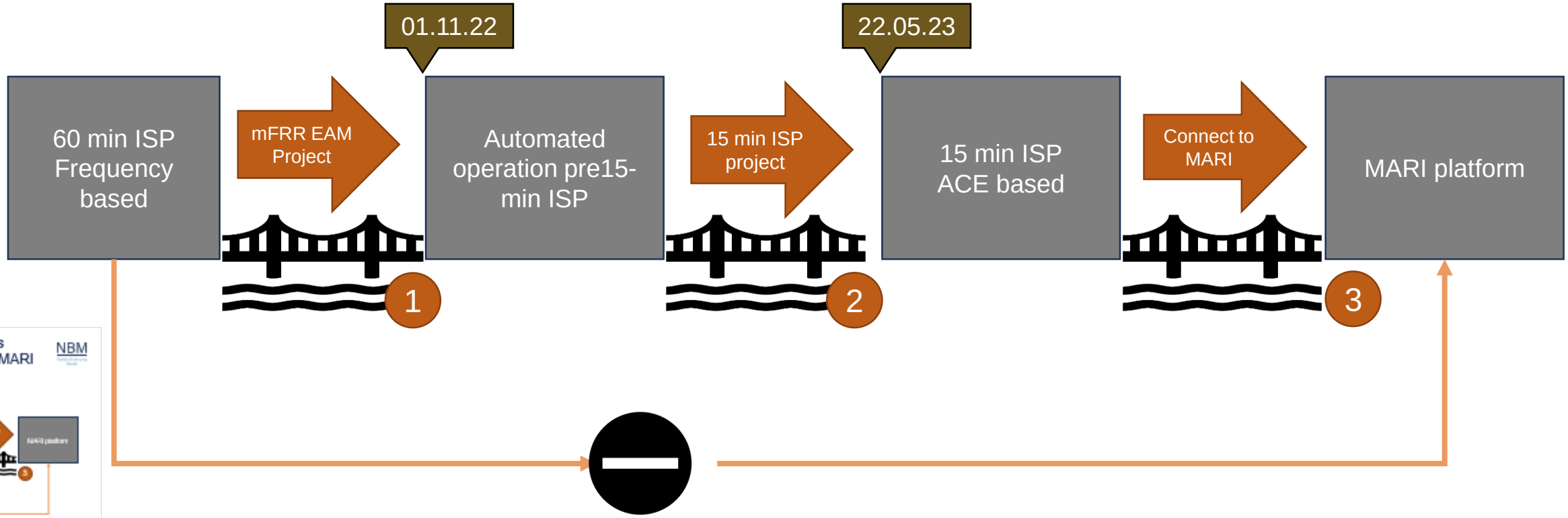

Key messages from our Nordic steering committee

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- We are fully committed to the **European legislation and its deadlines**. Following this, our commitment to succeed with NBM is strong, this is our highest priority in the Nordic TSO cooperation.
- NBM Program will deliver the tools to handle **complexity and need for automation** of the Nordic power system, providing benefits to the market at efficient and reasonable costs.
- The program is extremely complex. We are currently lagging some 4 months behind on important milestones for the Nordic manual FRR (frequency restoration reserve that is the main type of reserve currently used) market and the related changes in automation and integrations.
  - We will continuously assess how we can ensure optimal progress. All TSOs have onboarded significant amounts of extra resources to support the program.
  - We will communicate transparently if the risk of delay of key go-live milestones increases significantly.

It's for real - and it's happening now!

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- Testing with you will start in 3-4 months from today
- Transition in production start in 8 months from today
- We understand that your implementation will be complex and time consuming.
  - If you haven't started yet you should start now
  - We encourage you to participate in testing as soon as possible according to the TSO plans presented later today
  - The information you need should be available in the implementation guide that are made available for you.

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Documentation and Guides

Erika Zvingilaite, Energinet

mFRR Energy Activation Market – important documents

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- ***Memo - Process for activating products*** – describes the transition from Regulating power market today towards the European integrated mFRR energy activation market. The memo includes description of stepwise implementation of new market design features, standard product requirements, activation as well as pricing and settlement principles.
- ***National Terms and Conditions*** – will be updated and include market rules in each Nordic market, i.e. local market implementation of the market transition described in the memo above.
- ***Implementation guide*** – common Nordic guide that describes the market processes and technical interfaces to be implemented by participants in the market.
- ***ECP implementation guide*** – describes how a market participant can install a ECP endpoint for communication through the TSO's ECP network. ECP implementation guide is provided by each TSO.

Plan for **bid selection process and algorithm description** for mFRR EAM

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Nordic TSOs will follow the European regulation regarding publishing algorithm description:

- According to EBGL Article 12, publish description of algorithm at least one-month prior application;
- Nordic algorithm description will be aligned with the description of algorithm for MARI platform.

The description of Nordic platform algorithm will be developed in several steps:

1. Description of bid selection process by Nordic platform - slide deck, presented today;
2. A memo describing algorithm will be published during Q4 2021 and updated continuously;
3. Algorithm description will be finalized and published one-month before go-live of the Nordic mFRR Energy activation market platform.

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The implementation guide

Anders Naville Gisnås, Statnett

Overview of the implementation guide and updates

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Main part	Chapter
Process and context	Overall process, context
	Submit bid (C) (N)
	Activate bid (A)
	Report market results (D)
TSO specific information	EN/FI/SN/Svk
Messaging	General rules (G)
	Bid document (C) (N) (G)
	Activation document (N) (G)
	Bid availability document (D)
	Reserve allocation result document (D)
	Acknowledgement document (D)
	Examples

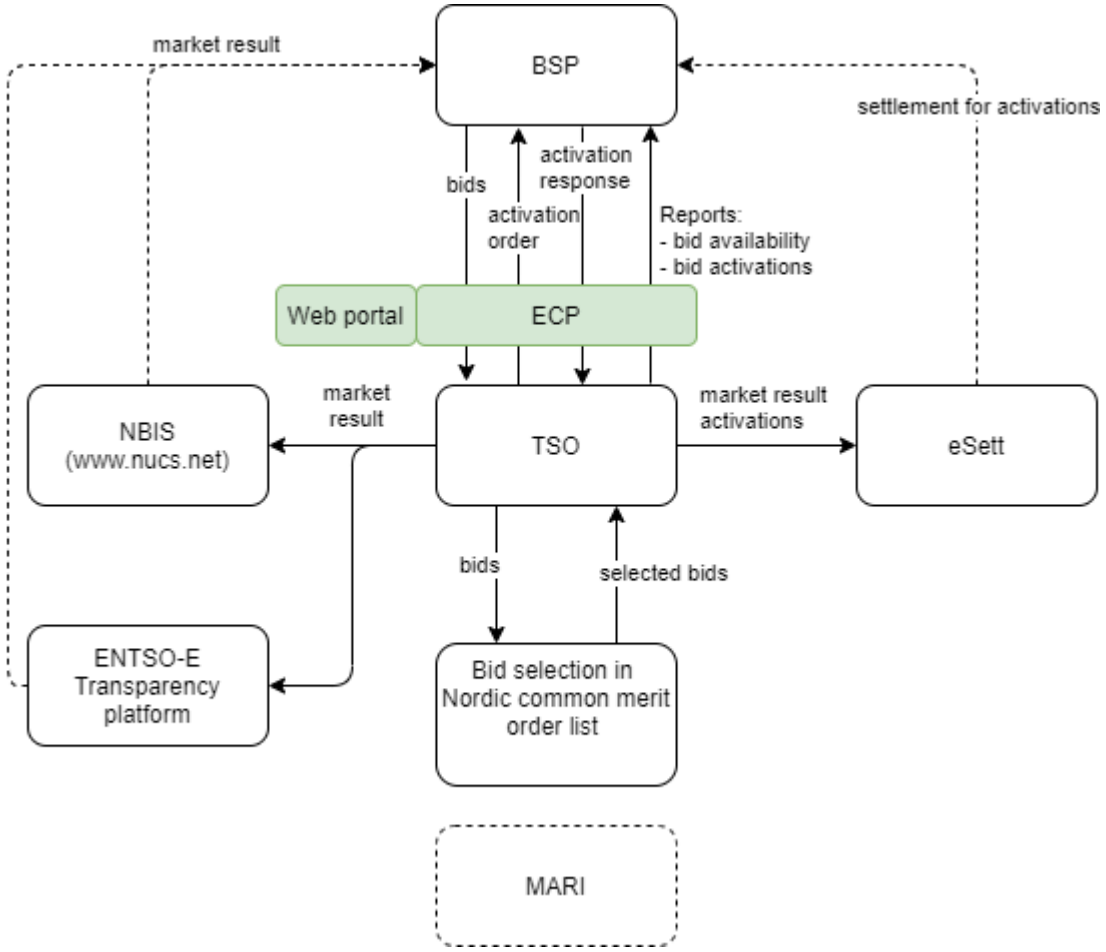
v1.1 updates:

- (C) Conditional linking update
- (N) National bid attributes specification
- (A) Activation heartbeat description
- (D) Document specifications
- (G) General messaging rules updates

The guide is complete and ready to be used for implementation.

A few detailed message codes will be specified in an updated version shortly after the summer.

System context diagram



- Communication channels
  - ECP
  - CIM messages
  - National web portal
- Additional integrations:
  - Country specific integrations: E.g. SCADA notification of orders

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Introduction to new mFRR energy activation market – product and process

Eivind Lindeberg, Statnett

Transition from today's processes to common European balancing processes

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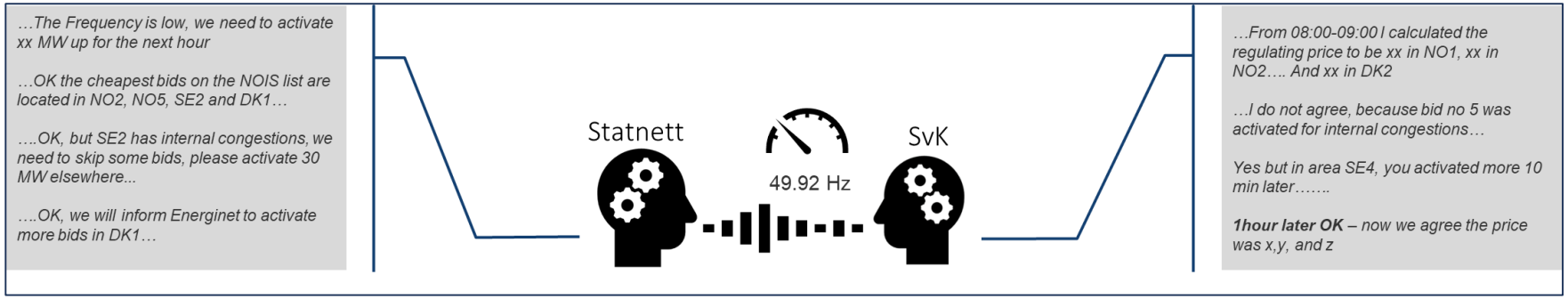
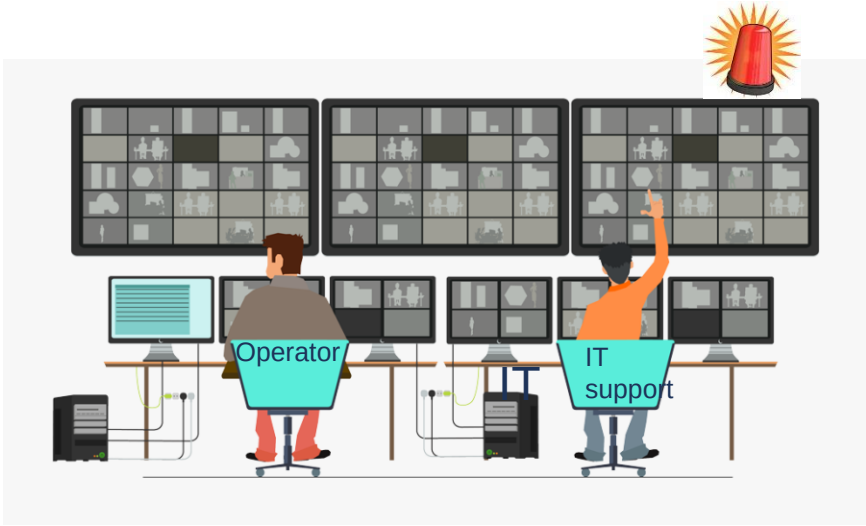
Today –

- Manual process
- 60 min (24 gate closures/day)
- Time to agree on actions on phone
- Call IT, when needed



Future –

- 15 min (96 gate closure/day)
- Smaller bid size
- Automated bid selection process
- Electronic ordering
- Observations
- Situational awareness
- Intervene only when needed
- IT support in control room



Standard mFRR energy product in the European and Nordic automated activation market

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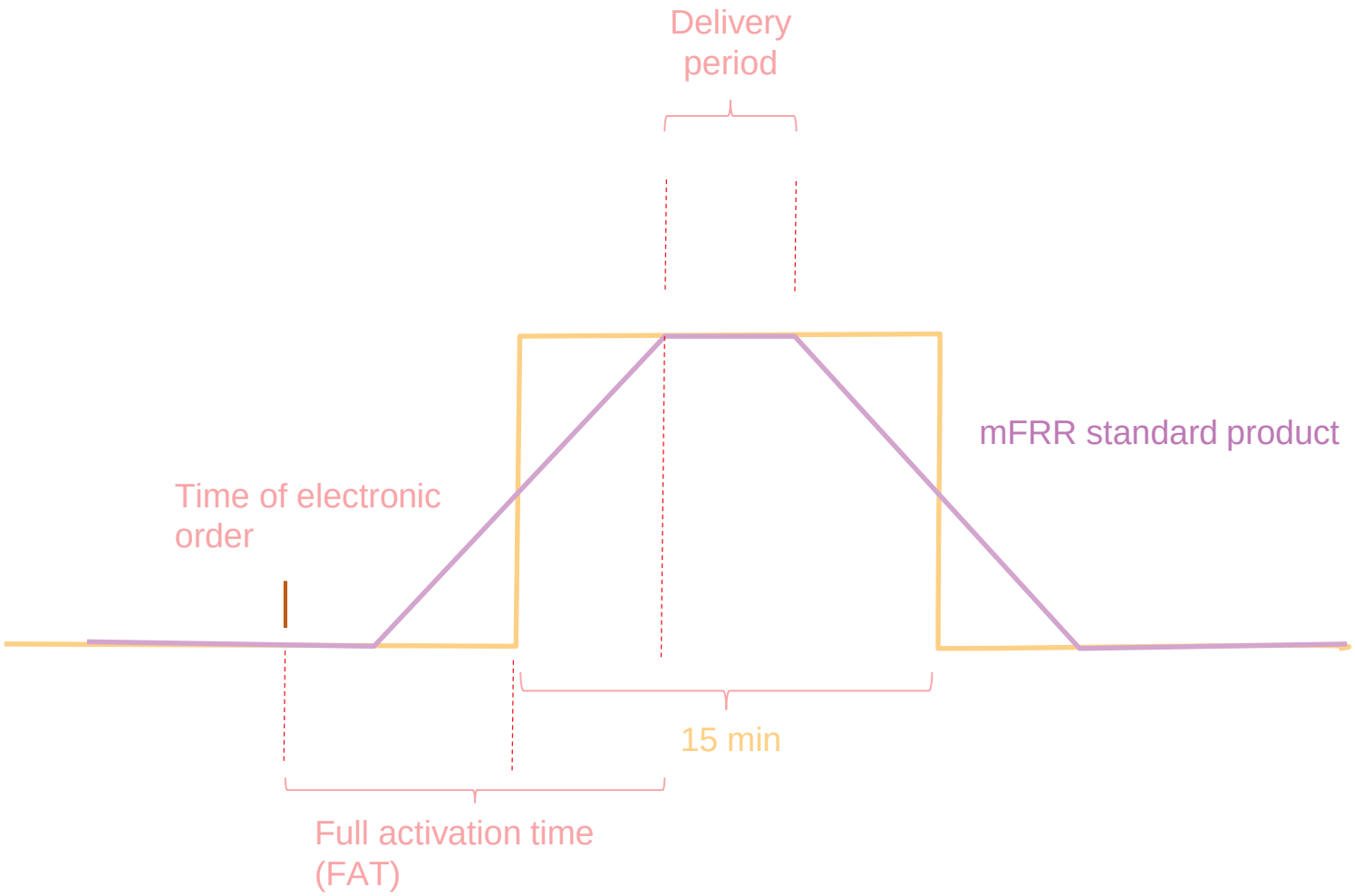

Standard product: scheduled- and direct- activation

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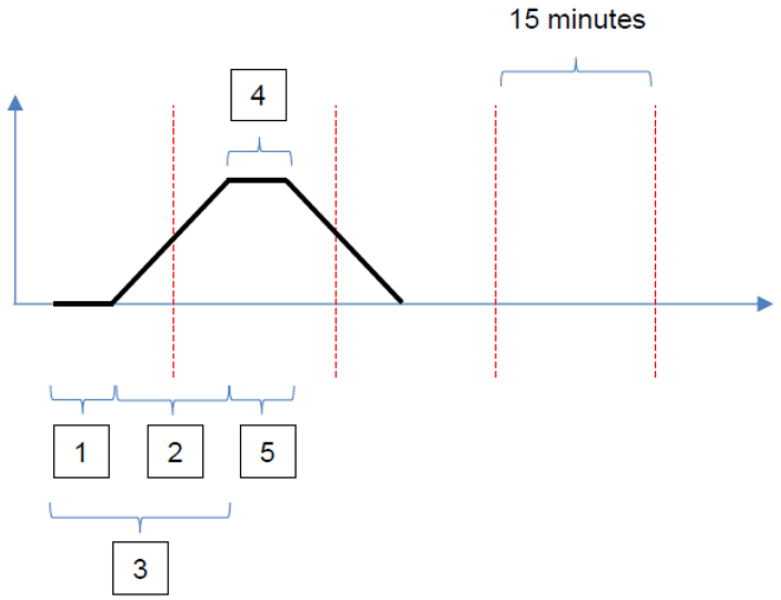
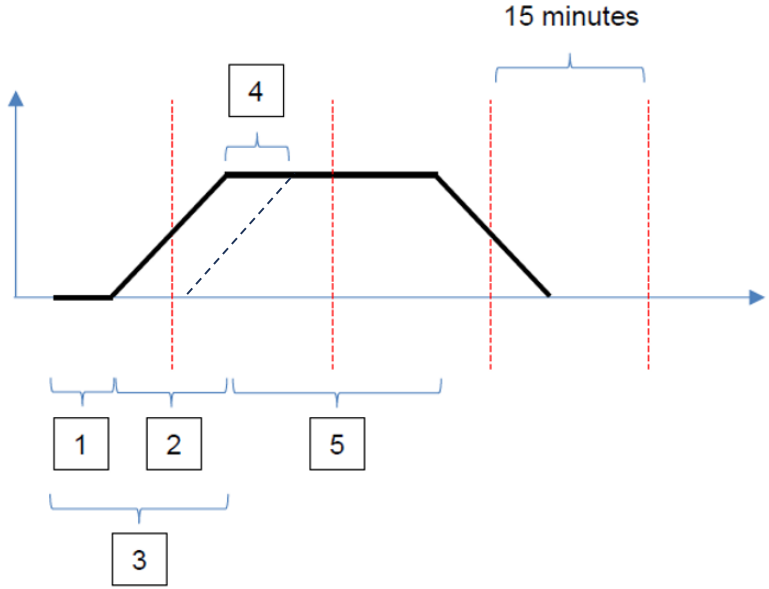
Scheduled activation



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

Automated Nordic mFRR energy activation market process

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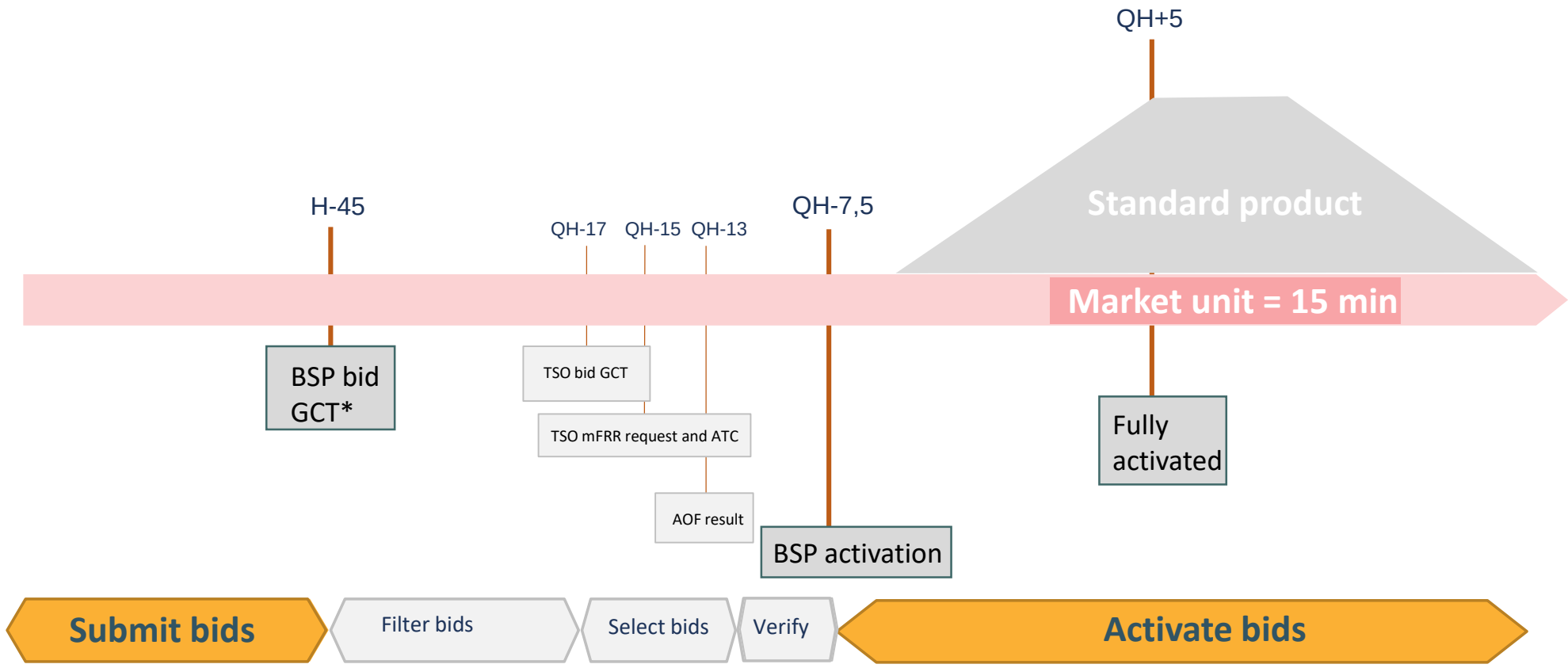
From go-live Automated Operation pre 15 minutes ISP



* For all four quarters in the next hour

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Bid selection process

Eivind Lindeberg, Statnett

Principles of Nordic mFRR energy activation platform

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- **Common Nordic platform:**
  - Nordic mFRR platform will support Scheduled activation with an algorithm similar to European platform MARI;
    - Information about MARI platform can be found here: MARI PICASSO workshop July 2020 and MARI workshop December 2020
  - There will also be exchange of energy for Direct activation between TSOs before connecting to MARI, this will be a rule-based bid selection;
- **TSO-TSO model:**
  - Exchange of balancing energy is between TSOs.
- **TSO-BSP model:**
  - BSPs have contact with local TSO and not with common Nordic platform.
- Each TSO will in addition have support for local bid activation, as a fall-back.
- **When connected to MARI:**
  - Scheduled- and Direct activation optimisation will be handled by MARI platform;
  - TSO local fall-back will be used also when connected to MARI;
  - Limited changes for TSOs;
  - No known changes for BSPs.

Bid selection process – overview

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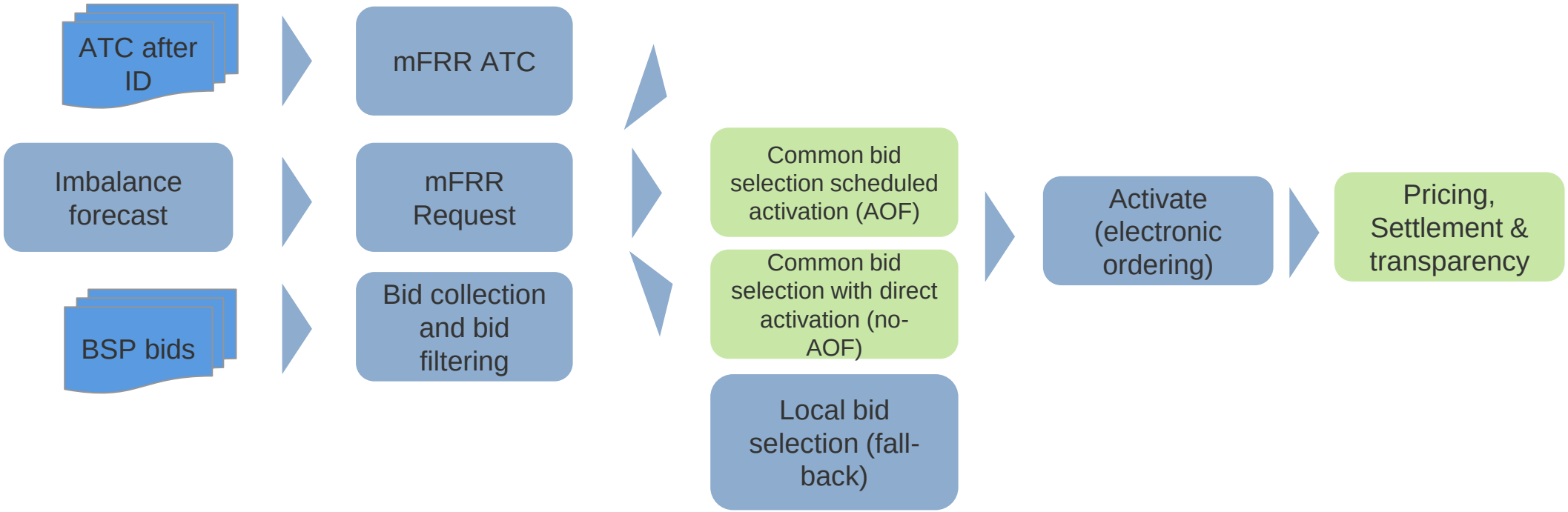

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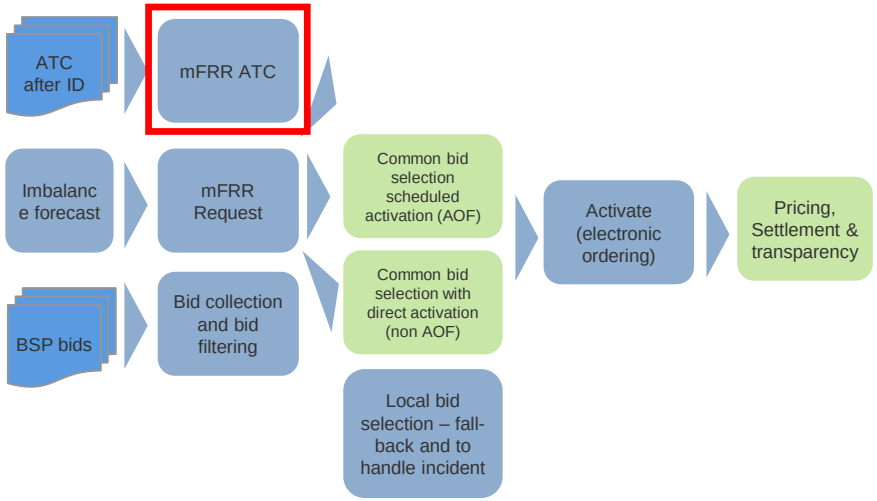
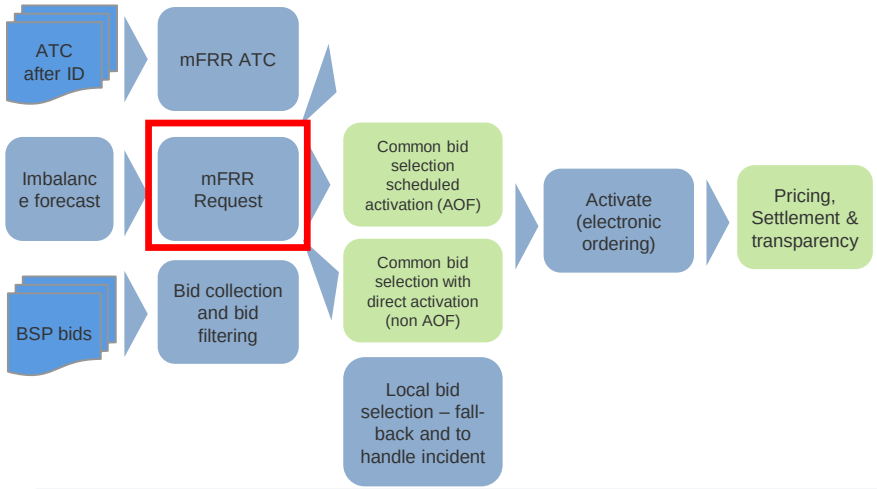
Bid selection process

- Inputs

Eivind Lindeberg, Statnett

Input



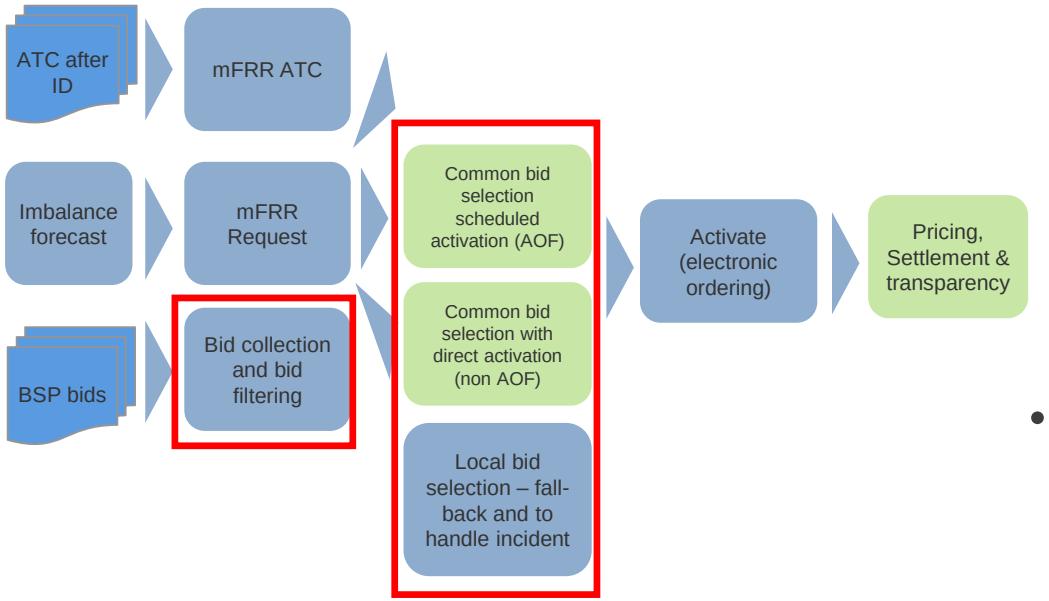


- **ATC – available transmission capacity***
  - Trade capacity (remaining capacity after ID) is used. Today it is manual assessment based on thermal capacity and physical flow that is used.
  - ATC can be adjusted by operators only due to system security reasons.
  - Will use all available trade capacity, not considering physical path.

*) MARI documentation use CBCL – cross border capacity limits, in stead of ATC

- **mFRR Request – based on imbalance prognosis**
  - Inelastic demand
    - All demand shall be covered as long as there are available bids (and ATC)
  - Elastic demand has a price limit
    - Algorithm supports elastic demand, but as of now we do not foresee to use it.

Use of bid attributes



- **All bid attributes are necessary because:**
  - Automated bid activation selection (optimization) every 15 min;
  - Algorithm can only use information provided on bids, no manual assessment or sanity check;
  - Bids are selected for each 15 min separately and there is no look-ahead, therefore need for bid linking in time - *technical linking* and *conditional linking*.

- **Bid attributes are used in two steps**
  - Step 1: Pre-process:
    - done by the TSOs - to determine which bids that shall be available for the bid selection on platform;
    - Based on bid attributes and other processes (e.g., congestion management)
  - Step 2: Algorithm run.
    - Optimize bid activation and satisfaction of balancing demands, given submitted bids (w/attributes) and ATCs.

Overview – common Nordic bid attributes

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	Bid attribute	Description
Simple bids One bid, one price	Minimum offered volume	Can be applied to set a minimum volume to be activated even though the bid is divisible.
	Indivisible Bids	Bid which cannot be activated partially.
Complex bids Combination of simple bids	Exclusive Group Order	Group of bids where solely one of the bids can be activated.
	Multipart (Parent/child)	Group of bids that must be activated in strict price order, from less expensive to more expensive.
Bids linked in time Between consecutive quarter hours	Technical linking	Linking of bids in subsequent quarter hours to indicate that two bids belong to the same underlying asset. This link can ensure that a bid in QH0 is not available for clearing if the bid in the previous quarter hour was activated in direct activation
	Conditional linking	Linking of bids in two or three subsequent quarter hours to consider the activation outcome in preceding quarter hours QH-1 and/or QH-2.
Activation type	Direct	Bid is available for direct activation.

Overview – National bid attributes

Bid attribute	Description	Supported by
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.	Statnett, Svenska Kraftnät, (Energinet)
Resting time	The BSP can add information on the required minimum duration between the end of deactivation and the following activation.	Statnett, Svenska Kraftnät, (Energinet)
Inclusive bids	If one bid is activated, another bid (e.g. a resource downstream) must also be activated.	Statnett, Svenska Kraftnät
Locational information	More detailed location on where the resources in the bid are situated, than bidding zone (e.g. on station level).	Statnett, Svenska Kraftnät, Energinet, Fingrid
Slower activation time	Indicate activation time that is longer than 15 min FAT. The attribute indicates that the product is non-standard and cannot be activated through Nordic activation optimization.	Svenska Kraftnät, Energinet
Faster activation time	Indicate a possible activation time that is shorter than 12,5 min. Faster activation will only be used for direct activation and only to handle grid problems. Bids with this attribute can also be selected for normal scheduled or direct activation.	Statnett
Period shift attribute	Indicate that the bid can be used for Period Shift. The bid can be selected for activation for only the start of or the end of the quarter hour. Bid selection for period shift be done after the AOF and will therefore not affect the bid selection in the AOF. Bids with this attribute can also be selected for normal scheduled or direct activation. Use of period shift will replace the use of the existing products "kvartersflytting" and "kvartsaffär".	Statnett, Svenska Kraftnät

Use of bid attributes

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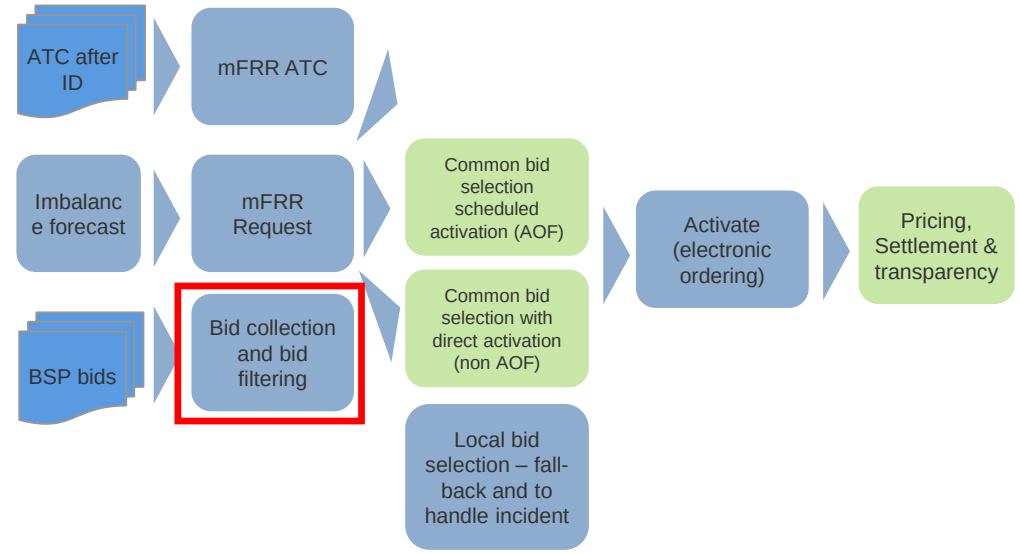

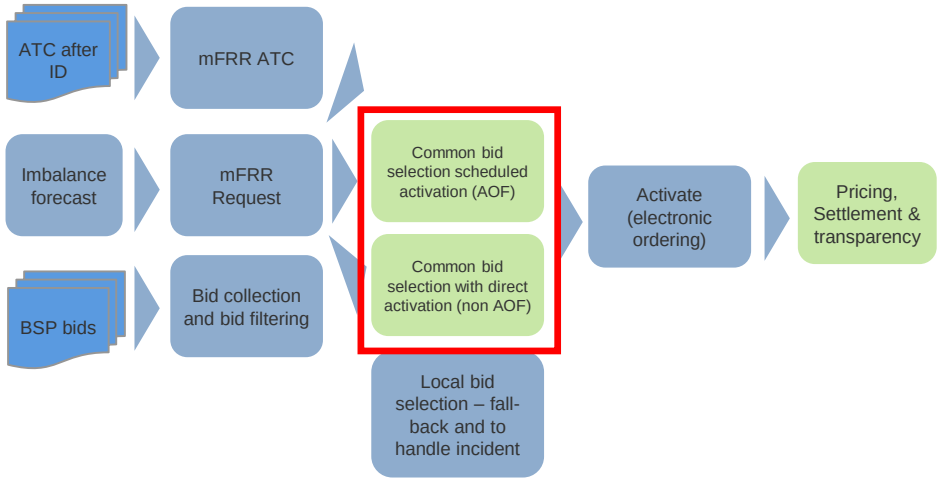

- **Step 1: Pre-process. Find out which bids that shall be available for the bid selection on platform:**
  - Use the following bid attributes, set by BSP
    - Activation type (DA or SA only)
    - Conditionally linked bids
    - Technically linked bids
    - Maximum duration – *national*
    - Resting time – *national*
    - Inclusive bid – *national*
    - Slower activation time – *national*
    - Locational information – *national*
  - Bid filtering - TSO can set bids unavailable due several reasons.

- **Step 2: Algorithm run. Optimize given bid (w/attributes), ATC and demands**
  - Use the following bid attributes set by BSP
    - Minimum offered volume
    - Indivisible attribute
    - Exclusive group bids
    - Multipart (Parent/child) bid

Bid filtering and marking unavailable for mFRR platform activation

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- Bid filtering due to internal congestions for operational security (bids marked unavailable for SA and DA selection):
  - Bids that cannot be activated due to internal congestions
  - Bids that are activated to solve internal congestions
- Non-standard products (e.g., bids with longer activation time)
- Guaranteed volume*
- BSP unavailability:
  - BSP electronic availability (based on response to heart-beat signal)
  - On request from BSPs after BSP GCT – due to technical reasons

*Extent of use of GV to be decided

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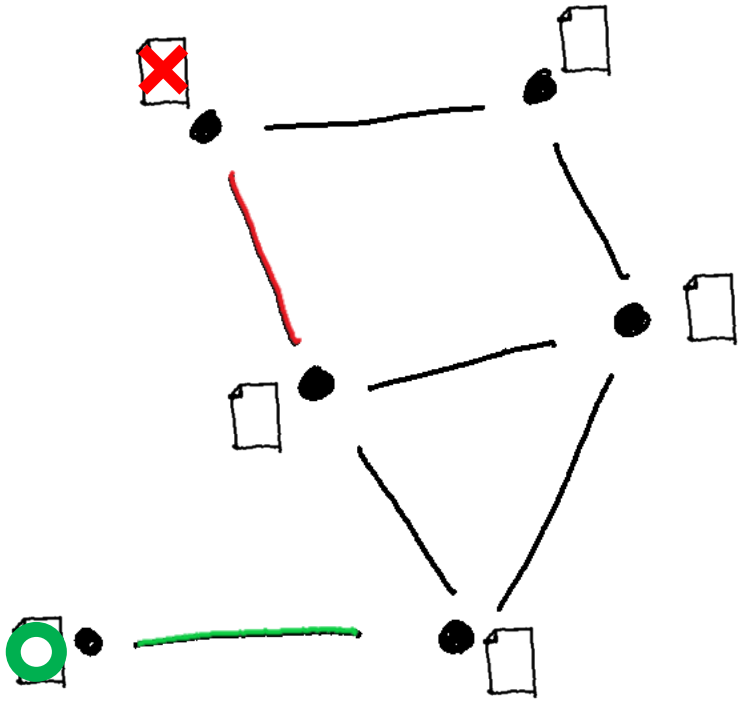
Congestion management

- Before sending bids to the Nordic Platform the TSOs must adress the operational security
  - If there are (predicted) congestions in the grid, some bids might be activated to resolve these
  - If some bids can cause a congestion if they are activated, they should be marked as unavailable for activation in the AOF
- This challenge varies significantly between the TSOs. Particularly important in Norway.
- Advanced grid analysis tools will be developed to perform this process. Decisions will be taken with some degree of uncertainty.



Non standard products

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- Fingrid and Svenska Kraftnät operate strategic reserves today;
- Energinet purchases slower reserves today;
- Nordic TSOs will continue using these reserves for balancing and in case of power system incidents – after go-live of the Nordic automated mFRR energy activation market;
- These non-standard products will not be made available for selection and activation by the Nordic platform algorithms for scheduled and direct activation:
  - they will be made visible in the common Nordic bid list and activated outside the common bid selection when standard products are not sufficient.

Bid attributes

Anders Naville Gisnås, Statnett

Overview – common Nordic bid attributes

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	Bid attribute	Description
Simple bids One bid, one price	Minimum offered volume	Can be applied to set a minimum volume to be activated even though the bid is divisible.
	Indivisible Bids	Bid which cannot be activated partially.
Complex bids Combination of simple bids	Exclusive Group Order	Group of bids where solely one of the bids can be activated.
	Multipart (Parent/child)	Group of bids that must be activated in strict price order, from less expensive to more expensive.
Bids linked in time Between consecutive quarter hours	Technical linking	Linking of bids in subsequent quarter hours to indicate that two bids belong to the same underlying asset. This link can ensure that a bid in QH0 is not available for clearing if the bid in the previous quarter hour was activated in direct activation
	Conditional linking	Linking of bids in two or three subsequent quarter hours to consider the activation outcome in preceding quarter hours QH-1 and/or QH-2.
Activation type	Direct	Bid is available for direct activation.

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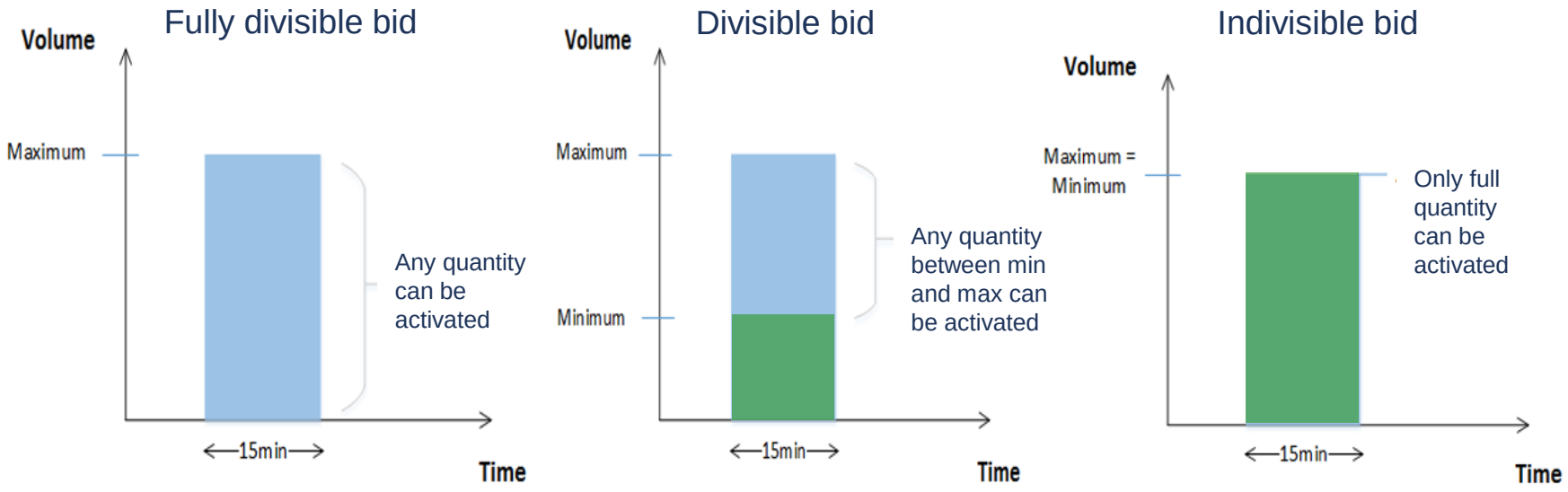
Simple bids

- Valid for one quarter hour
- One quantity and price
- Unique bid ID, use UUID (universally unique identifier)
- Divisibility:



Complex bids

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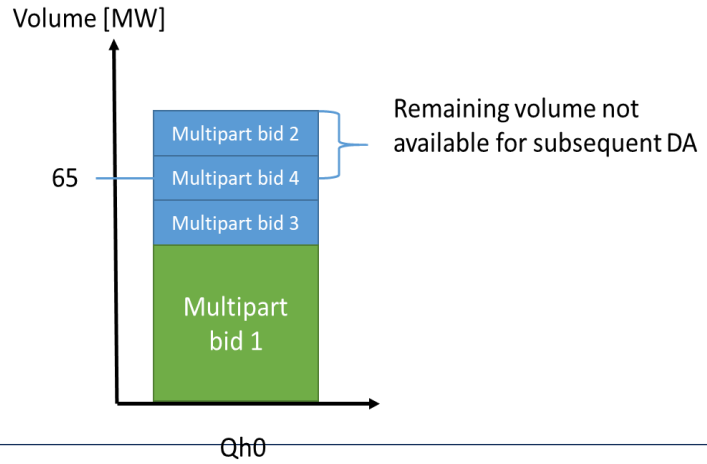
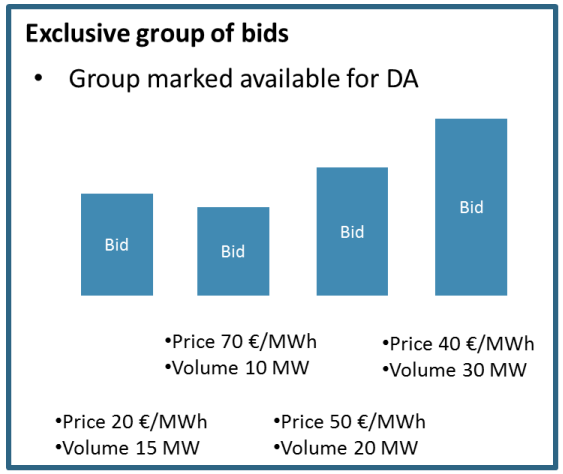
Multipart bid – activated in strict price order

- All bid components must have
  - Same *multipartBidsIdentification*
  - Same direction and activation type
  - Different prices
  - And belong to the same quarter hour



Exclusive group of bids – only one bid can be activated

- All bid components must have
  - Same *exclusiveBidsIdentification*
  - Same activation type
  - And belong to the same quarter hour



Example use-case: model start-up costs

Technical linking
- linking between market periods

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- Indicate that bids in consecutive quarter hours belong to the same underlying asset
- The bid selection algorithm will not activate a bid if it has technical link with a direct activated bid in the preceding quarter hour
- Allowed for both simple and complex bids
- A common *linkedBidsIdentification* is used to link the bids

Example of linking of two simple bids:

	QH-1	QH0
Bid ID	1	2
linkedBidsIdentification	**xx**	**xx**

Example of linking of three exclusive group bids (exclusive groups):

	QH-1	QH0	QH+1
Bid ID	1	3	5
exclusiveBidsIdentification	aa	bb	cc
linkedBidsIdentification	**xx**	**xx**	**xx**
Bid ID	2	4	6
exclusiveBidsIdentification	aa	bb	cc
linkedBidsIdentification	**xx**	**xx**	**xx**

Conditional linking

- linking between quarter hours with conditions

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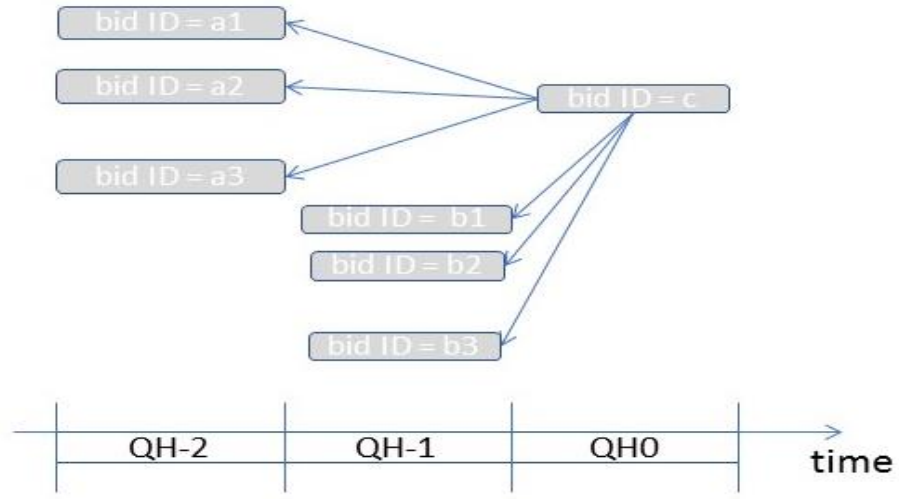
- A simple bid can be linked to up to six bids in the two previous quarter hours



Example use-cases for conditional linking:
- handle ramping constraints
- model start-up costs
- model changing hydro situations

For a *Conditionally available* bid each link may specify that the bid is:
- Not available if the linked bid was activated
- Not available if the linked bid was subject to SA
- Not available if the linked bid was subject to DA
- Not available if the linked bid was not activated
- Not available for DA if the linked bid was subject to SA
- Not available for DA if the linked bid was subject to SA

For a *Conditionally unavailable* bid each link may specify that the bid is
- Available if the linked bid was activated
- Available if the linked bid was subject to SA
- Available if the linked bid was subject to DA
- Available if the linked bid was not activated
- Available for DA if the linked bid was subject to SA
- Available for DA if the linked bid was subject to SA

Overview – National bid attributes

Bid attribute	Description	Supported by
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.	Statnett, Svenska Kraftnät, (Energinet)
Resting time	The BSP can add information on the required minimum duration between the end of deactivation and the following activation.	Statnett, Svenska Kraftnät, (Energinet)
Inclusive bids	If one bid is activated, another bid (e.g. a resource downstream) must also be activated.	Statnett, Svenska Kraftnät
Locational information	More detailed location on where the resources in the bid are situated, than bidding zone (e.g. on station level).	Statnett, Svenska Kraftnät, Energinet, Fingrid
Slower activation time	Indicate activation time that is longer than 15 min FAT. The attribute indicates that the product is non-standard and cannot be activated through Nordic activation optimization.	Svenska Kraftnät, Energinet
Faster activation time	Indicate a possible activation time that is shorter than 12,5 min. Faster activation will only be used for direct activation and only to handle grid problems. Bids with this attribute can also be selected for normal scheduled or direct activation.	Statnett
Period shift attribute	Indicate that the bid can be used for Period Shift. The bid can be selected for activation for only the start of or the end of the quarter hour. Bid selection for period shift be done after the AOF and will therefore not affect the bid selection in the AOF. Bids with this attribute can also be selected for normal scheduled or direct activation. Use of period shift will replace the use of the existing products "kvartersflytting" and "kvartsaffär".	Statnett, Svenska Kraftnät

Maximum duration

TBD

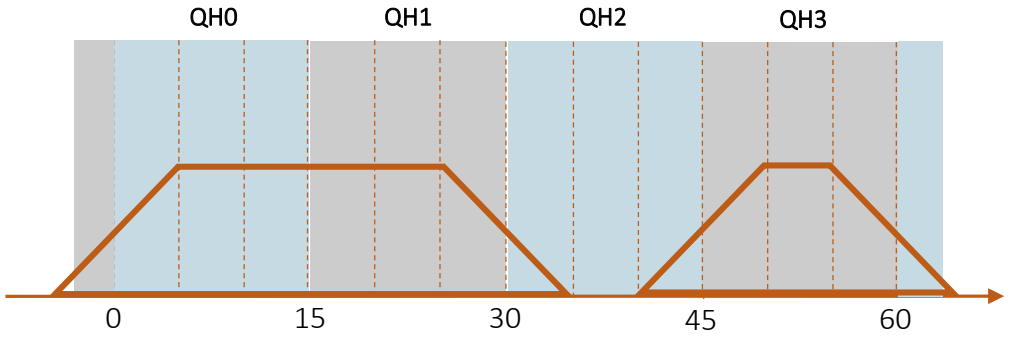
BSPs include information on the technical limitations regarding how long a bid can be activated. This attribute is necessary to allow BSP to send in bids in advance so that they do not need to update bid if they are activated.

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

Example

- All four bids are in the money in the particular MTU.
- Bids are ”technically linked”.
- **Maximum duration is 30 min** for all four bids.
- Resting time is 15 min for all four bids

Resulting activation



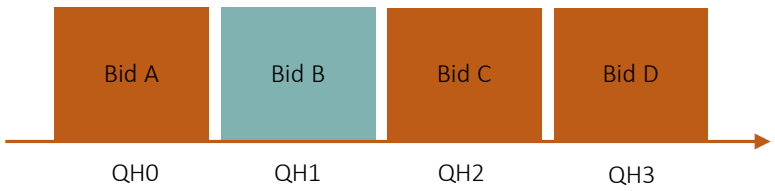
Resting time

TBD

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

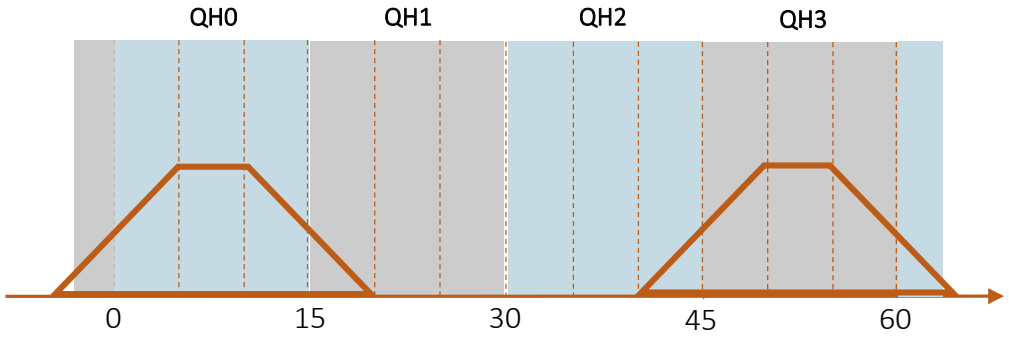
Technical linking of the bids must be in combination with this bid attribute. All the linked bids must have the same resting time.

Example



- Bids A, C and D are in the money in the particular MTU. **Bid B is not in the money and is not selected for activation**.
- Bids are ”technically linked”.
- **Resting time is set to 30 min** for all four bids.

Resulting activation



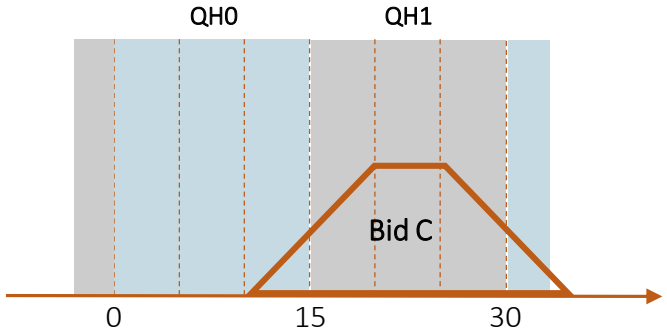
Inclusive bids

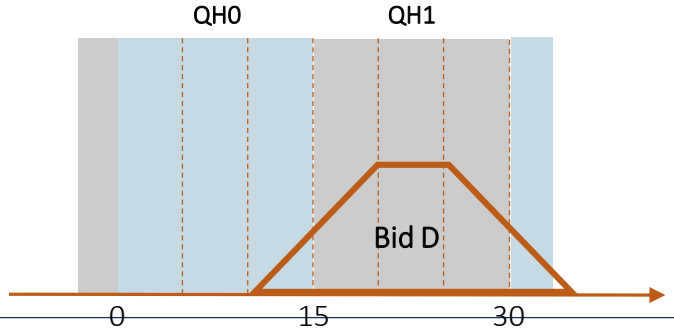
All or none of the components must be activated (example usecase: downstream resources).

Example

- Bids A og B are inclusive bids.
- Bids C og D are inclusive bids.
- All four bids are in the money in the respective MTUs.
- Bid B is unavailable for activation due to e.g. an internal congestion.

Resulting activation





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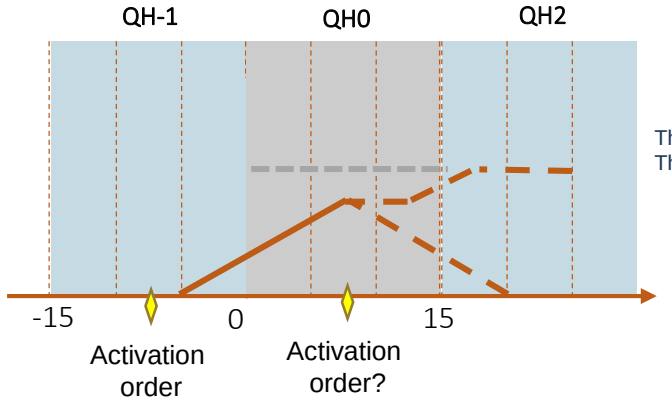
Slower activation time

Slower reserves are the resources that have a longer activation time than the allowed Full Activation Time. These resources cannot be used in the scheduled or direct activation clearing processes and are thus non-standard product.
Non-standard product bids can be used for operational security and might be needed in scarcity situations or in case of incident.

Example

- Activation time (FAT) is 20 minutes for the bid
- The bid cannot be used for scheduled or direct activation clearing

Resulting activation



The gray line indicates the bid volume.
The full volume is not delivered during QH0.

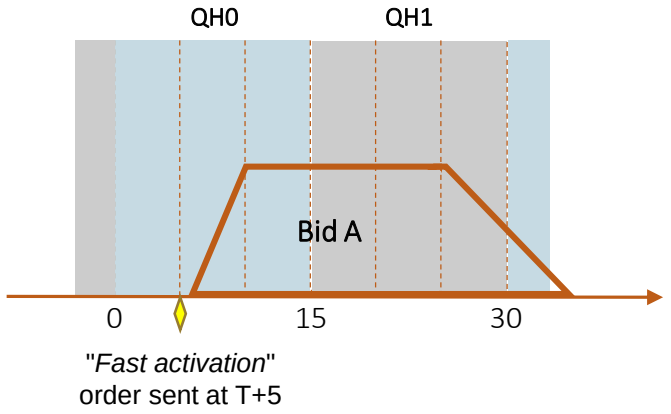
Faster activation

- A bid can be given with an activation time that is faster than the standard FAT.
- Faster activation will only be used for direct activation and only to handle grid problems.
- Bids with this attribute can also be selected for normal scheduled or direct activation.

Example

- Bid A supports faster activation with full activation time of 5 minutes
- The bid A is not selected for scheduled or normal direct activation
- The TSO orders faster activation of bid A at T+5 (5 minutes into QH0) to be fully activated at T+10

Resulting activation



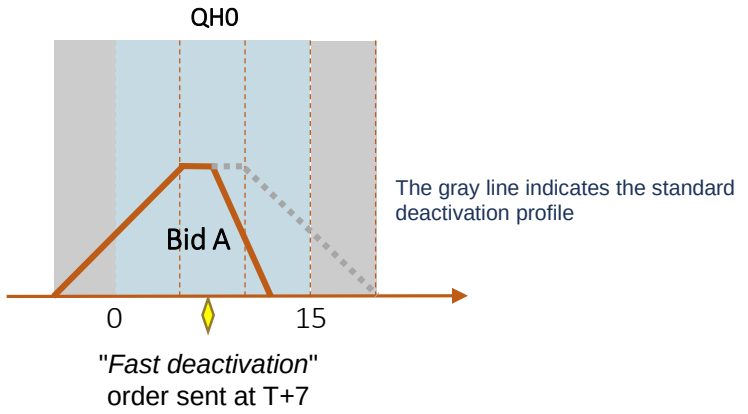
Faster deactivation

- Any standard product bid for scheduled and/or direct activation can be ordered deactived faster than the standard profile when it is necessary for operational security
- 1 minute preparation time and 4 minutes ramping down will be assumed for faster deactivation

Example

- Bid A is a normal bid (may support scheduled and/or direct activation, and may or may not support faster activation)
- The bid A is activated for scheduled activation
- The TSO orders faster deactivation of bid A at T+7 to have the bid fully deactivated at T+12

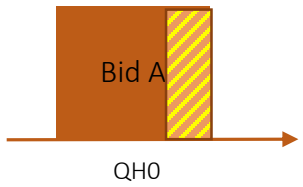
Resulting activation



Period shift attribute

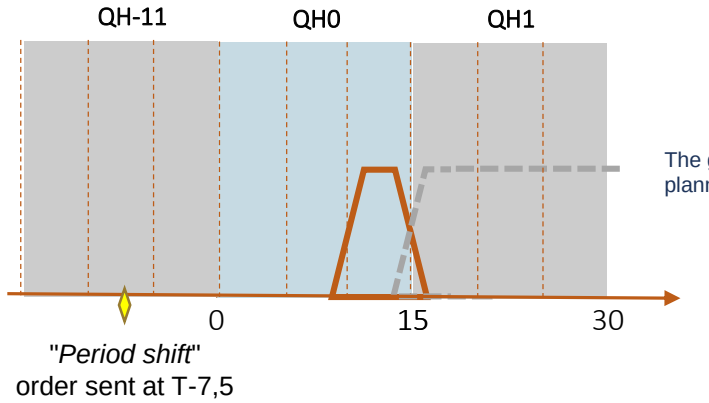
- A period shift activation is a short activation in the beginning or end of the quarter hour.
- Bid selection for period shift will be done after the AOF and will therefore not affect the bid selection for scheduled activation.
- Use of period shift will replace the use of the existing products "kvartersflytting" and "kvartsaffär".

Example



- Bid A supports period shift activation in the end of the bid period
- The bid is not selected for scheduled activation
- The TSO orders period shift activation of bid A

Resulting activation

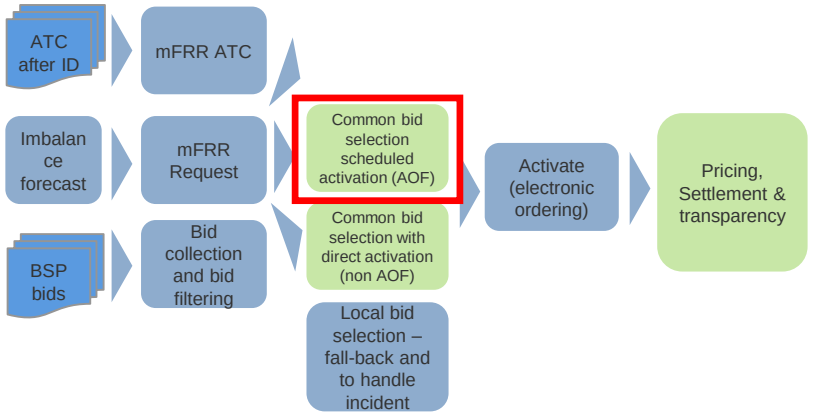


The gray line indicates an example of planned ramping of production

Bid selection

Eivind Lindeberg, Statnett

Bid selection – scheduled activation



- **Common Nordic bid selection for scheduled activation (SA)**
  - Algorithm follows the same principles as MARI
  - Exchange between areas only when it gives positive socio-economic result.
    - Normally this will include netting of demand, but it can also imply activation of bids in opposite direction in different areas (counter activation).
    - Counter activation – in one uncongested area select up regulation bids and down regulation bids which are in the money.

  - Algorithm will first find a solution that satisfy mandatory conditions.
  - Then search for other solutions that better satisfy the goal function, within a specified amount of time.

  - Mandatory conditions
    - Prevent unforeseeable accepted bids (UABs)
    - Prevent adverse flow (on borders with no desired flow range)
    - Enforce price convergence (on borders with no desired flow range)
      - From an economic point of view, enforcing price convergence for interconnectors is similar to preventing unforeseeable rejected bids (URBs) for bids and needs.
    - Prioritize bids
      - Fully divisible bids and elastic needs have priority over other bids.
      - Elastic needs have priority over fully divisible bids.

Bid selection – scheduled activation

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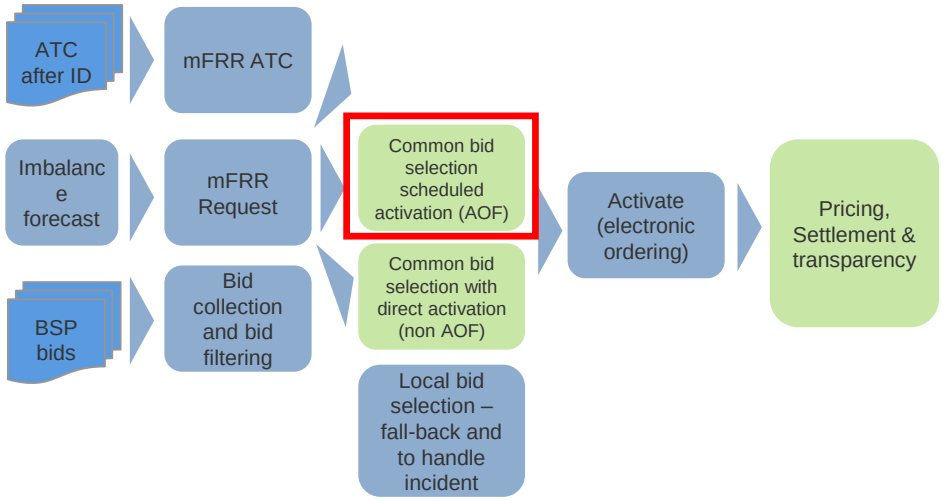
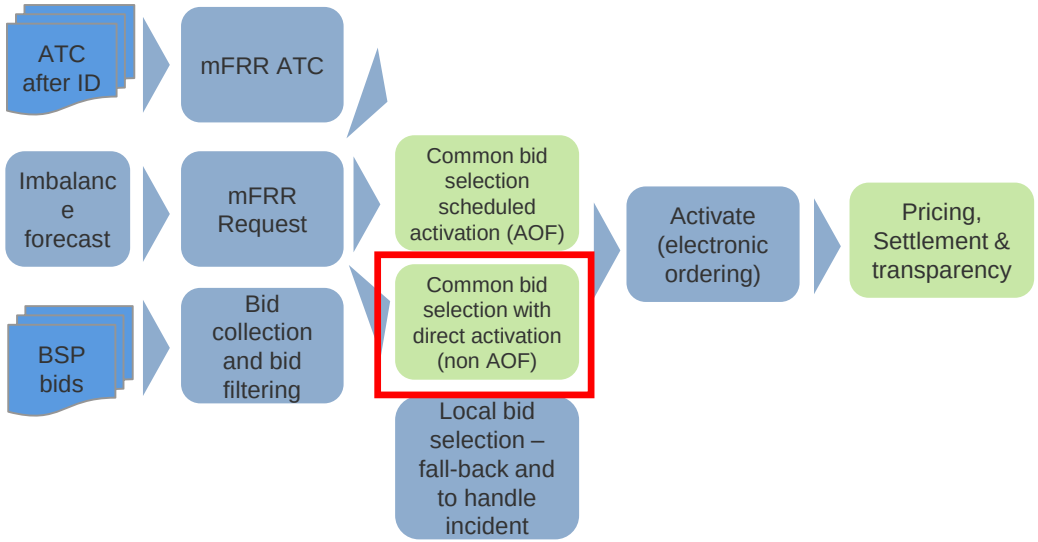


- **Goal function for scheduled activation optimisation**
  - Maximize satisfaction of inelastic demand.
  - Maximize social welfare.
  - Minimize cross border flow.
  - Maximize traded volumes (bids and needs)
    - Traded volume = accepted quantities.
  - Penalize unforeseeable rejected fully divisible bids (URdB).

Bid selection for direct activation (DA)

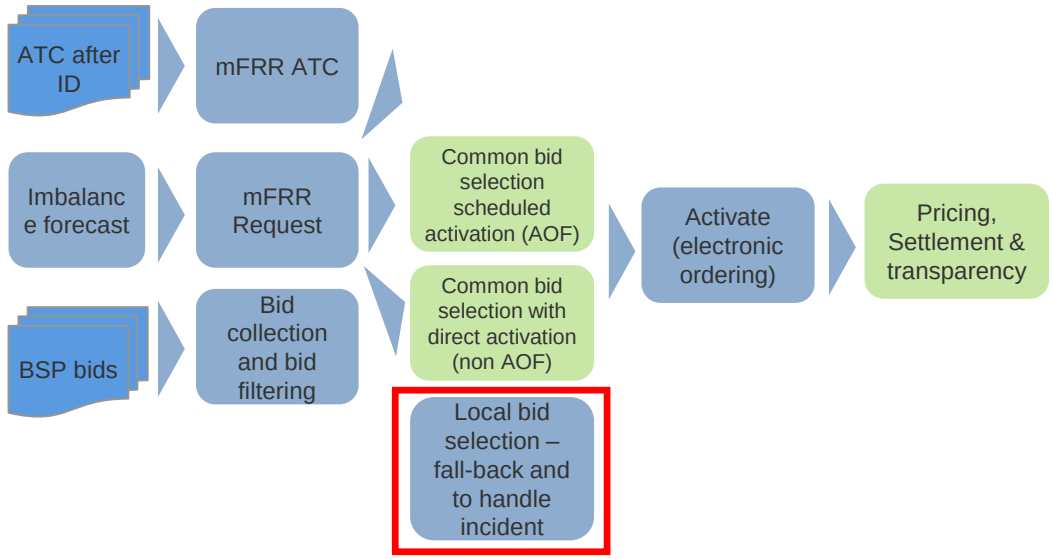


- **Common bid selection for direct activation will be done with a separate solution than for the scheduled activation.**
  - In MARI this is done in the same solution.

- **Rule-based bid selection**
  - Rule-based bid selection is somewhat simpler than direct activation in MARI, but the goal is that bid selection result to a large extent will be the same.

  - Direct activation:
    - In price order evaluate if bid can be used to cover direct activation demand given ATC;
    - With direct activation demand is satisfied for one bidding area and one direction at the time.

Bid selection fall-back – for scheduled activation



- **Common bid selection will be possible even if the primary solution for scheduled activation is unavailable.**

- **Rule-based bid selection**
  - Rule-based bid selection is somewhat simpler than the primary Nordic solution for scheduled activation:
    - The goal is that bid selection result to a large extent will be the same.
  - Fall-back scheduled activation
    - In price order evaluate if bid can be used to cover demand given ATC.
      - Evaluate for one-by-one bidding areas in sequence, until bid volume is fully used to cover demand, or until all bidding areas evaluated.

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Bid activation and ramping requirements

Eivind Lindeberg, Statnett

Activation response and ramping requirements

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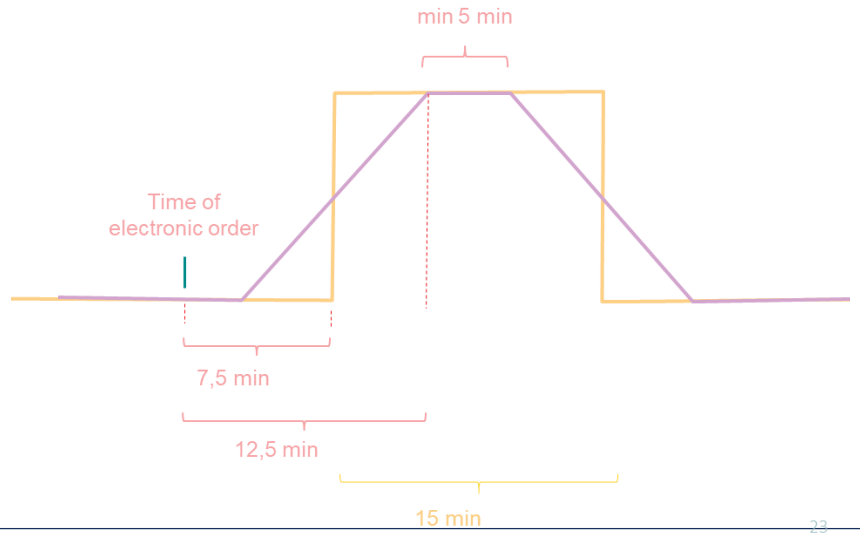
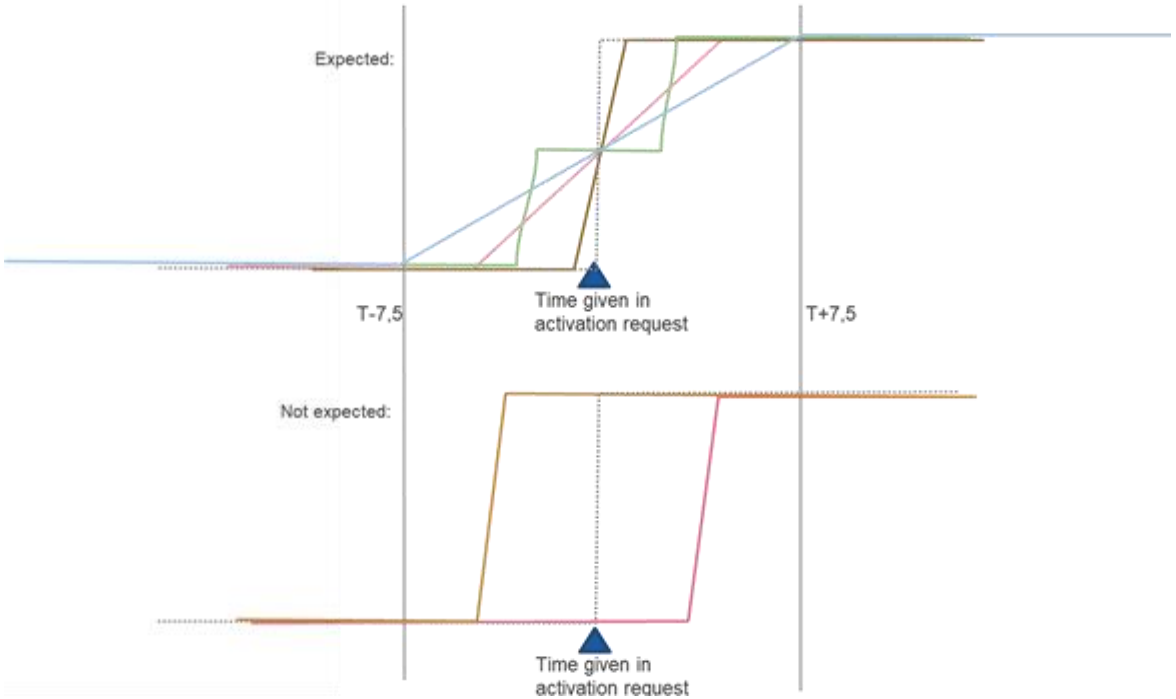
- Desired response is the european standard profile
- Deviating responses should be symmetrical around the mid-point
- Same expectations for activation and deactivation



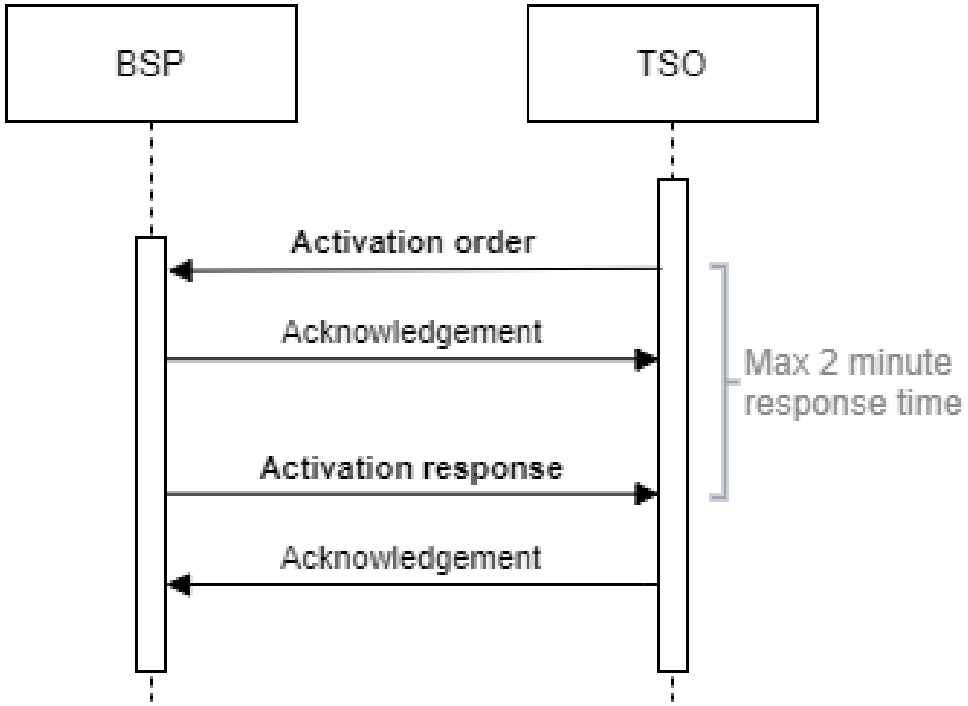


SVENSKA KRAFTNÄT ENERGINET FINGRID Statnett

Activation messages and heartbeat signal

Anders Naville Gisnås, Statnett

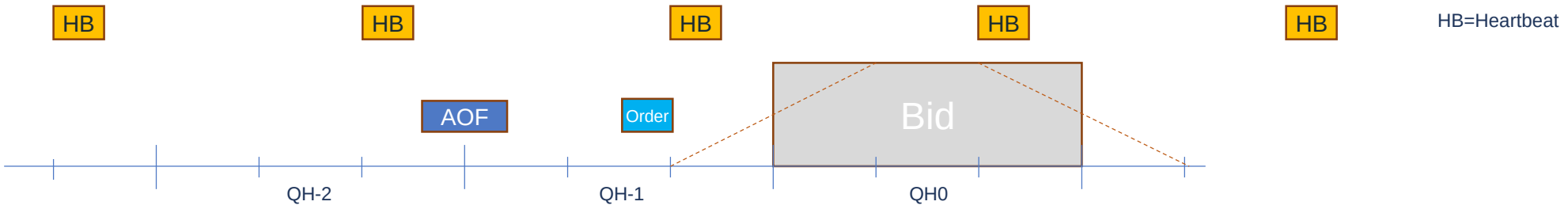
Activation ordering process



- For SA and DA activation orders are sent 7,5 minutes before the start of the period of the activation (midpoint of the ramp)
- The response time requirement for BSP to send the activation response is 2 minutes
- When TSO sends acknowledgement for the activation response, the activation is agreed
- **It is very important to implement a reliable and quick process for activations in order avoid failed activation and to comply with availability requirements**

Activation heartbeat

- Empty activation order every 15 minutes. BSP should answer the heartbeat the same way as real activation orders
- The purpose of the heartbeat is monitoring of availability of communication and activation process
- Missing or failed heartbeat should trigger alarm to operator



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Reporting results, and general messaging principles

Anders Naville Gisnås, Statnett

Bid availability report

BidAvailability_MarketDocument

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- A report with detailed status of bids that were made unavailable for bid selection will be sent to BSP after the bid selection process has completed
- The report will include information of the reason why bids have been made unavailable for bid selection by the TSO
- A corresponding bid availability report without BSP-specific information will be published at the European transparency platform

Activation report

ReserveAllocationResult_MarketDocument

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- A report with summary of agreed activations will be sent to the BSP after each ISP
- The report will include information such as bid, period, activation type and reason for each activation

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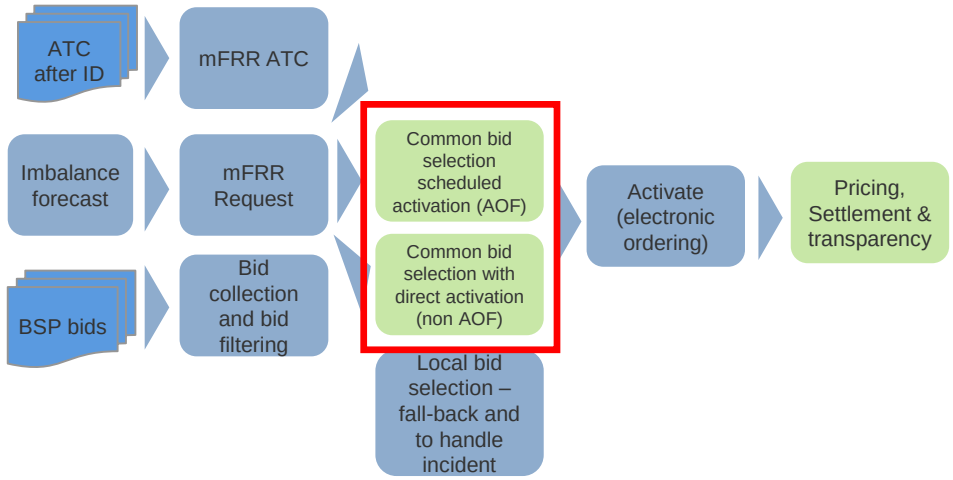
Messaging principles for update and cancellation

- **For bids and activations**
  - Updates can be done by sending only affected time series
  - Cancellation is done by sending time series with quantity=0
- **For reports** (bid availability and reserve allocation result)
  - A new document for the same period replaces previously sent document for that period
  - Cancellation is done by resending the document while omitting the time series to be cancelled

Pricing and settlement

Cecilie Seem, Statnett

Pricing determination – bid selection for SA and DA

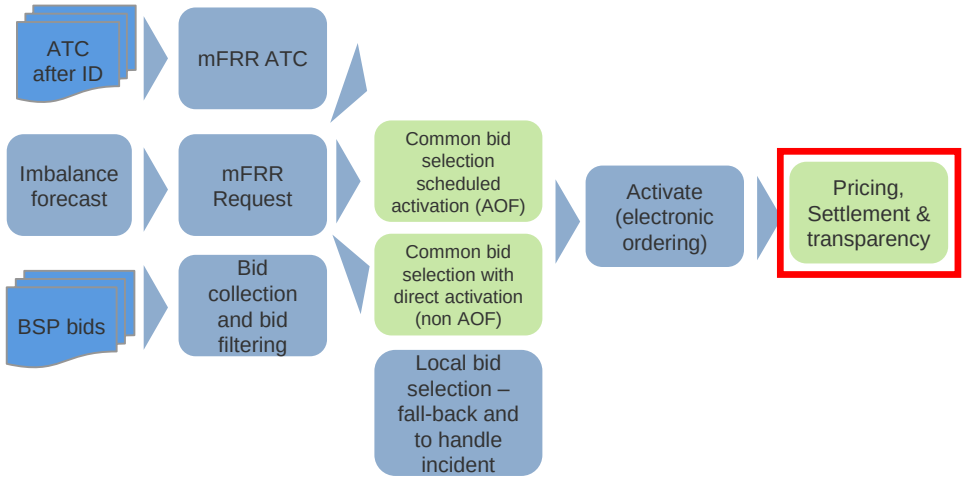


- **Price determination for scheduled activation (one run per 15 min):**
  - Cross border marginal price – same price in all bidding areas within an uncongested area;
    - In some given situations algorithm can give price indeterminacy and calculation of price is complex.
  - If there are several bids on the margin, all (divisible) bids are selected with pro-rata activation of each bid to fulfill demand.

- **Price determination for direct activation (several runs per 15 min possible)**
  - Cross border marginal price for the bidding areas, participating in the bid selection.

Balancing energy pricing and imbalance pricing and settlement

from go-live automatic operation (60 min ISP) until go-live 15 min ISP



- **Balancing energy pricing and settlement**
  - Same principles for balancing energy pricing and settlement as today:
    - Hourly marginal price, based on output from SA and DA activation algorithms and calculated in common Nordic pricing module.
    - Marginal prices from each run of scheduled and direct activation are inputs to the price calculation.
    - One price per direction – no separate SA and DA settlement prices.
    - Day-ahead price as a cap and floor for mFRR balancing energy price and for hours without activation.

- **Imbalance pricing and settlement**
  - Same principles as from go-live single price:
    - Single-Price_Common-Market-Design.pdf (nordicbalancingmodel.net)

Implementation plans – by country

Otso-Ville, Rinne Tage Søndergaard Larsen and Anders Naville Gisnås

Energinet – implementation plan

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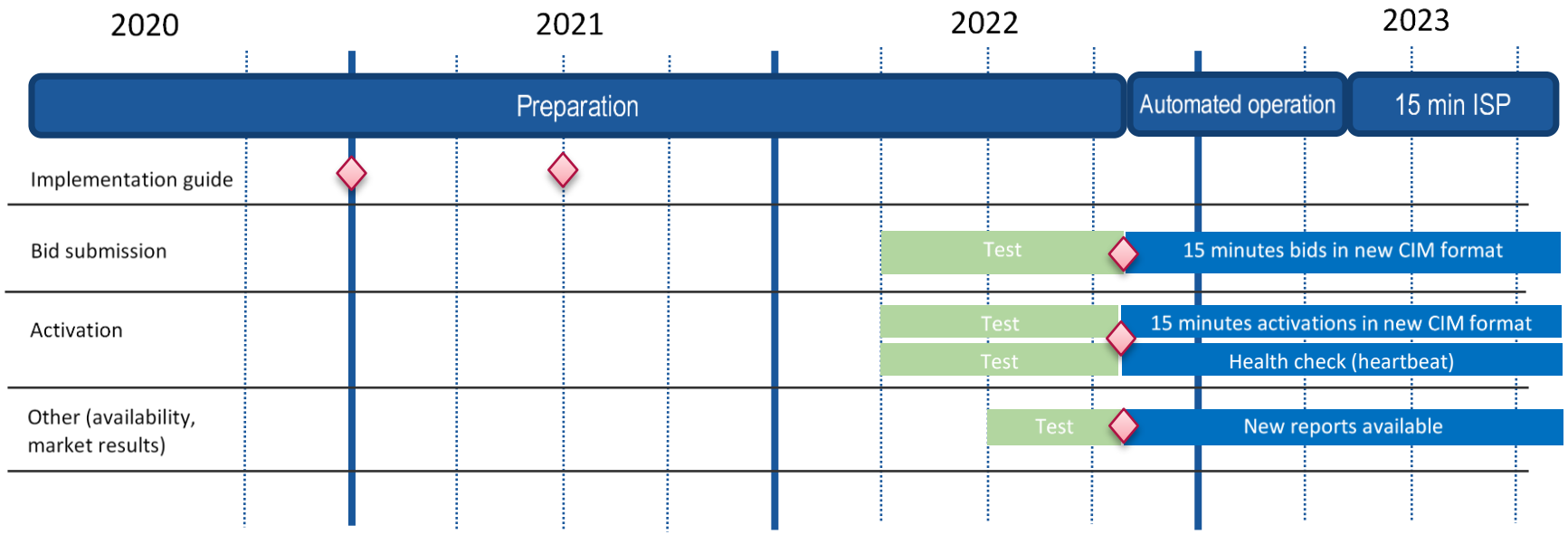

- Go-live in November 2022.
- No transition phase – 60 minutes bids in old format prior to go-live; 15 minutes bids in new format after go-live.
- Changing delivery shape (symetric ramps) will also be aligned with go-live.
- Testing will start primo Q2 2022.

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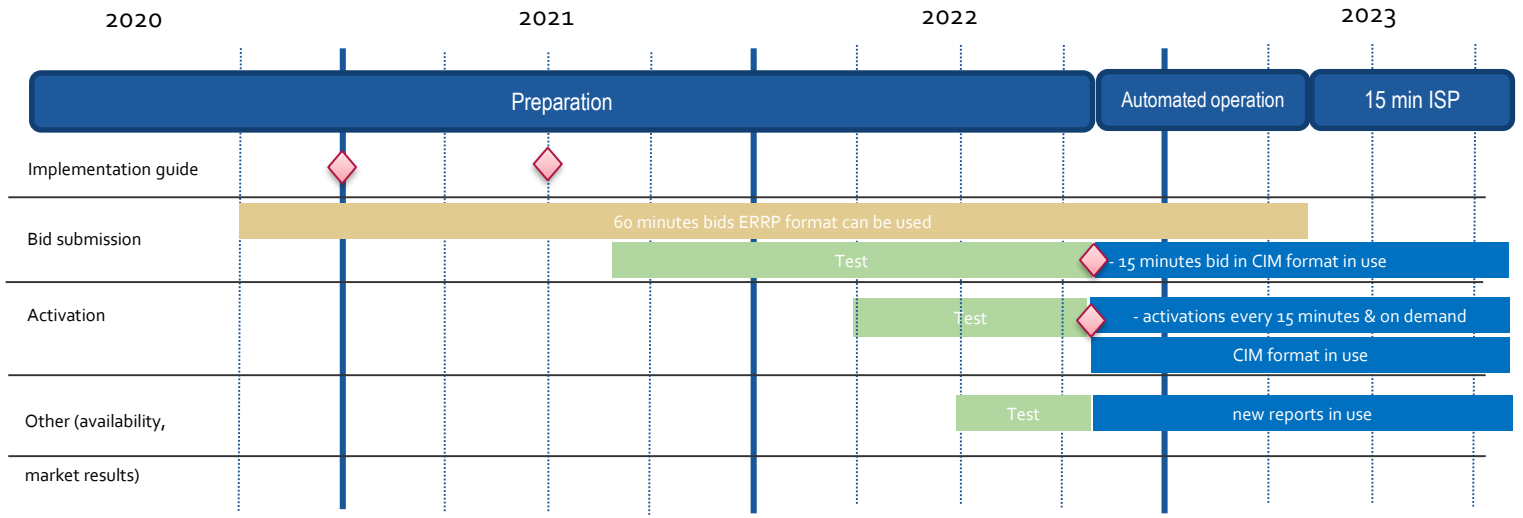
Fingrid – implementation plan



- Testing starts after summer with parties that have indicated readiness
- Submitting 15 min bids is recommended during Automated operation phase (60 min possible)
- Bid activation will be done in 15 min cycles in either case

Statnett and Svenska kraftnät – implementation plan

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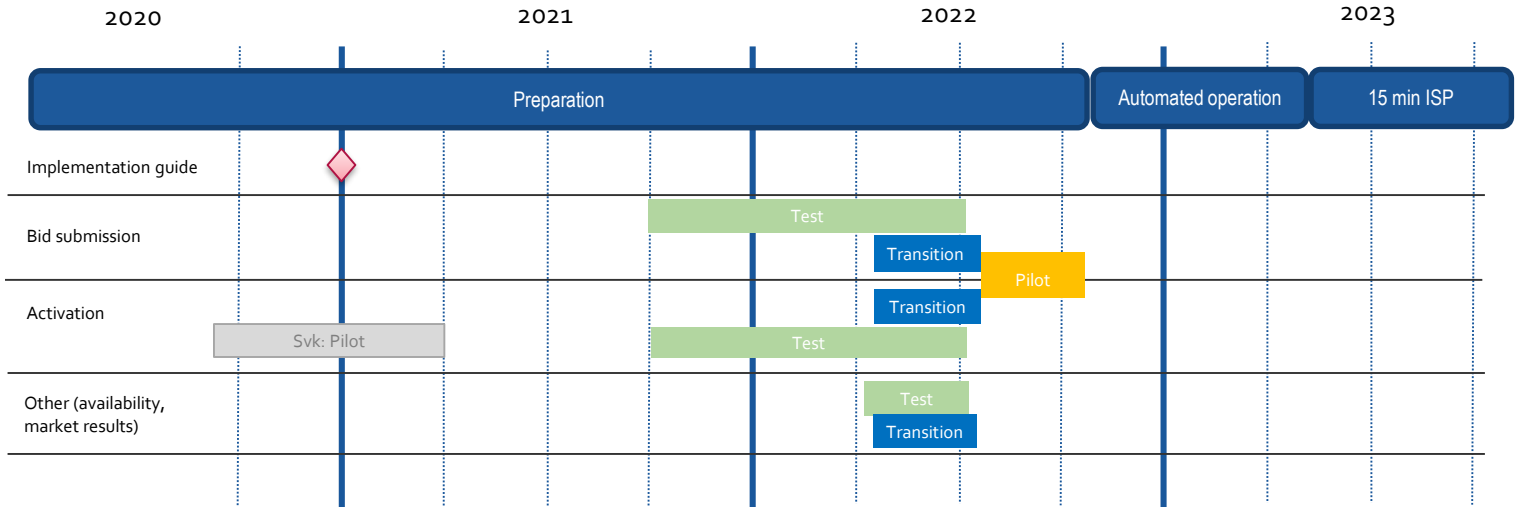

- Testing starts October 2021. The TSOs will provide a self-service testing environment.
- During the transition BSPs must start using new formats while today's process remains. Most of the new bid attributes will not be effective in this period.
- SN and Svk are considering a pilot before automated operation, where new bid attributes will be effective. Further discussions with BSPs and evaluation of operational consequences are needed before deciding on the plan for overall transition to automated operation.

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BSP readiness survey

Erika Zvingilaite, Energinet

Important input for TSO work on supporting BSPs in timely implementation

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- This spring Statnett, Svenska kraftnät and Fingrid have all sent out questionnaires to market participants to map their readiness for the new mFRR Energy Activation Market.
  - *Energinet will send out a questionnaire to the Danish market participants this week.*
- Thank you for all replies – this is important for targeting and improving information to and dialogue with market participants.
- TSO's concerns:
  - whether market participants will be ready on time;
  - that increased complexity and new mFRR standard product requirements as well as late implementation may reduce liquidity.

The general picture - progress

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1. Market participants to a large extent are familiar with the Implementation Guide:
   - However a considerable share of participants are still not familiar with the guide.
   - **Implementation guide holds the information about necessary changes in processes and interfaces between BSPs and TSOs and technical implementation information.**
2. The scale of changes needed is clear for may, but not all BSPs:
   - **Important to scope and plan timely implementation to be ready for go-live**
3. The majority of market participants have not started implementation of the needed changes
   - **Expectations on readiness for testing of the solutions are different among market participants.**

The general picture – information from TSOs

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1. Market participants indicate different changes and topics that are still not entirely clear:
   - From bid submission and attributes to bid activation;
   - The roadmap and implementation time plan.
2. More information is asked for by the market participants:
   - TSO-contact information can be found in implementation guide and on homepage Automated Nordic mFRR energy activation market – nordicbalancingmodel – *do not hesitate to contact with questions!*
   - Based on survey results TSOs will adjust the information and dialog with market participants.

Contact

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mfrr@svk.se

Energinet
electricitymarket@energinet.dk

Fingrid
Reservit@fingrid.fi

Statnett
BSP@statnett.no

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On the NBM programs homepage you will find:

- Webinar slides
- Answers to all the questions from today
- Webinar recording

www.nordicbalancingmodel.net

Thank you for your attention!

June 2021