BSP implementation guide

Fifty Nordic MMS - FCR capacity market

Business process:	Balancing capacity market
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Revision history

Version	Release	Date	Changed by	Comments
1	Release	30.06.2023	Johan Tufvesson Bent Atle Bjørtomt Per Otto Garsjø	FCR Guide for BSPs
1	1	04.07.2023	Jan Owe	Correction according to review.
1	2	11.07.2023	Bent Atle Bjørtomt	According to feedback: Sequence diagram updated, acknowledge are only sent for Bids (offers and repurchase). In future domain will support bidding zone (noted some places in doc.). EDX Service name updated, the service is not ready at the moment. Repurchase is just Bids sent with negative quantity, some clarifications are done in doc. Removed code for first/second auction support in marketAgreement.type

1	3	13.02.2025	Petr Hendrych
			Johan Tufvesson
				Release notes:
				• New interface versions **Fel! Hittar inte referenskälla.**
				  ○ Definition of the ECP message type
				• FCR market timeline 2.1
				• Introduction of the negative bid 3.4
				• Introduction of the contracts 3.5 and 3.6.3
				• Publishing of reserve requirements 4.6
				  ○ explanatory text for Bid_TimeSeries
				  ○ businessType
				  ▪ new business type for elastic demand
				  ○ quantity_Measurement_Unit.name
				  ▪ implementation change required when using the new IEC CIM scheme
				  ○ standard_MarketProduct.marketProductType
				  ▪ product type for maximum regulation
				  ○ flowDirection.direction
				  ▪ new direction relevant for FCR
				  ○ quantity.quantity
				  ▪ new possible quantity (elastic demand)
				  ○ price.amount
				  ▪ price of the elastic demand
				• Bid updates to NMMS
				  ○ Delivery scenarios
				  ○ auction.mRID
				  ▪ new mRID for FCR auctions

				• Publishing bid acceptance results from NMMS 4.8 o Delivery scenarios o explanatory text for Bid_TimeSeries o bid_Original_MarketDocument.bid_**Bid**TimeSeries.mRID ▪ implementation change required when using the new IEC CIM scheme o auction.mRID ▪ new mRID for FCR auctions o businessType ▪ new business types for contracts o quantity_Measurement_Unit.name ▪ implementation change required when using the new IEC CIM scheme o price_Measurement_Unit.name ▪ implementation change required when using the new IEC CIM scheme o code ▪ implementation change required when using the new IEC CIM scheme o secondaryQuantity ▪ extended description because of the contracts o bid_Price.amount ▪ extended description because of the contracts • Publishing of the total market results from NMMS 4.9 o standard_MarketProduct.marketProductType o auction.mRID new mRID for FCR auctions
1	4	07.03.2025	Johan Tufvesson	Release notes: • Added information on how to reduce the number of bids in the bid submission process as a BSP in chapter 3.3.2 & 3.3.4 • Corrected the BSP name in the sequence diagram in chapter 3.1 • Corrected the result publication time in figure 4 to 06:00 for FCR SE/DK market timeline (first auction) in chapter 2.1.2
1	5	26.03.2025	Petr Hendrych	In case that there are no reserve requirements defined for an auction, the empty CIM xml messages with just a header is sent.
1	6	07.04.2025	Petr Hendrych	Release notes: The price of the Return is fixed at the time of its submission versus price fixing for un-deliveries, which takes place at a fixed time, see 3.6.3, the article: Non-auction contracts.

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1 Introduction

1.1 Background

Nordic MMS has been developed to facilitate common Nordic capacity markets, with purpose to ensure the availability of reserves in order to ensure operational security. Nordic MMS supports aFRR, mFRR and FCR reserve capacity markets.

This document, however, describes only FCR reserve capacity markets.

Frequency containment reserve (FCR) are types of Balancing Services that TSOs use for balancing of the Nordic synchronous area. In the Nordics, FCR balancing capacity is procured in two phases. The first procurement takes place before the day-ahead market and the second one takes place afterwards. Furthermore, both phases share a common reserve requirement.

1.2 Scope

This document covers the technical implementation details on the BSP side, when integrating with Nordic MMS (NMMS) by describing the processes required to interact with the FCR capacity markets. Both functional and technical aspects are covered. The intended audience of this document are the participating BSPs. In control areas where the BSP role has not been separated from the BRP role, the target audience for this document are the BRPs providing balancing services to the respective TSOs. Thus, the acronym BSP can be looked as synonymous to BRP in these cases.

The main processes described are:

- Reserve requirement publication process
- Bid submission process
- Market result publishing process

1.3 Terms and definitions

Acronym	Term	Definition
ACE	Area Control Error	
BSP	Balancing Services Provider	*A market participant with reserve-providing units or reserve-providing groups able to provide balancing services to TSOs*
BRP	Balance Responsible Party	*A market participant or its chosen representative responsible for its imbalances*
CIM	IEC Common Information Model	
CZC	Cross Zonal Capacity	*The cross-zonal transmission capacity between two bidding zones*
ECP	Energy Communication Platform	*Reference implementation of MADES standard*
FCR	Frequency Containment reserves	*The FCR that can be activated by an automatic control device designed to reduce the FRCE/ACE*
FCR-N	Frequency Containment Reserve for Normal operation	*FCR-N, in the range of 49.9 – 50.1 Hz*
FCR-D	Frequency Containment Reserve for Disturbances	*FCR-D Up, upwards, in the range of 49.9 – 49.5 Hz* *FCR-D Down, downwards, in the range of 50.1 – 50.5 Hz*
FRCE	Frequency Restoration Control Error	
MADES	Market Data Exchange Standard	*Communication IEC standard designed by ENTSO-E*
MOL	Merit Order List	*A list of Balancing Energy bids sorted in order of their bid prices, used for the activation of Balancing Energy bids within a Coordinated Balancing Area.*
MTU	Market Time Unit	*The period for which the market price is established or the shortest possible common time period for the two bidding zones, if their market time units are different.*
NOIS	Nordic Operational Information System	
RA	Reserve allocator	*System which procures balancing reserves*
TSO	Transmission System Operator	*A party that is responsible for a stable power system operation (including the organisation of physical balance) through a transmission grid in a geographical area. In the Nordic synchronous area, there are four TSOs: Svenska kraftnät, Fingrid, Energinet.dk and Statnett.*

1.4 References

Ref [1] Nordic Balancing Model - Publications (Implementation guides for BSP, etc.)

Ref [2] Energy Market Communications – Acknowledgement Business Process and Contextual Model for CIM European Market (IEC 62325-451-1)

Ref [3] ENTSO-E Reserve Bid document – UML model and schema v 7.1

Ref [4] ENTSO-E Reserve Bid document – UML model and schema v 7.4

Ref [5] ENTSO-E Balancing Document – UML model and schema v 4.5

Ref [6] ENTSO-E Reserve Allocation Result document – UML model and schema v 6.4

Ref [7] ENTSO-E Acknowledgement document

2 Business context

The Frequency activated reserves (FCR) are divided into Frequency Containment Reserves, for Disturbance (FCR-D Up and FCR-D Down) and Normal (FCR-N).

2.1 FCR markets timelines

The FCR capacity market involves several operational phases. The diagram below shows the timelines for the FCR capacity markets.

The market configuration supports the identification of two chained auctions, where one auction (the first auction) precedes another auction (the second auction) in time:

- **FCR NO *(first auction)* → FCR common *(second auction)***
- **FCR SE/DK *(first auction)* → FCR common *(second auction)***

Note: All bidding zones which are part of Nordic LFC block are part of FCR market. I. e. only bidding zone DK1 which is part of continental LFC block is excluded from FCR market. Virtual bidding zones (line sets) are also excluded.

2.1.1 FCR NO market timeline (first auction)

- involved: Macro area NO = all NOx bidding zones

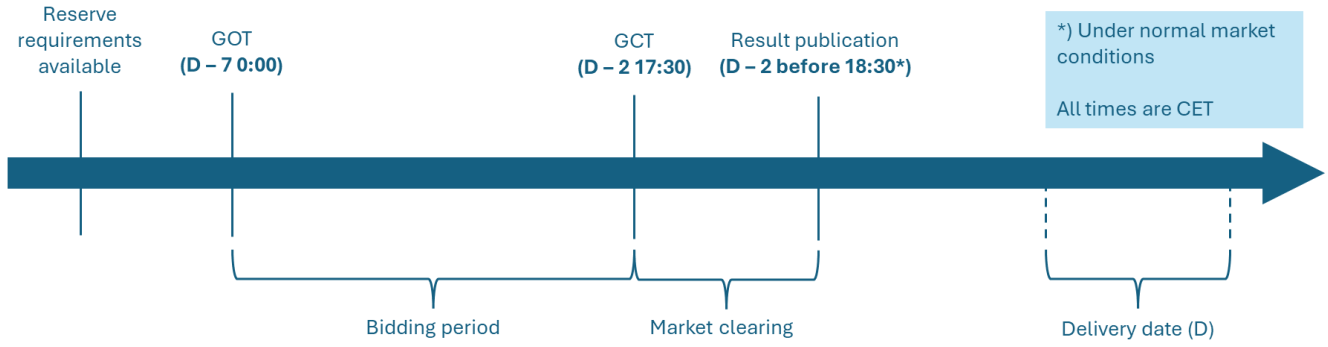


Figure 1: **FCR NO** market timeline

2.1.2 FCR SE/DK market timeline (first auction)

- involved: Macro area SE+DK (excluded DK1) = all SEx + DK2 bidding zones

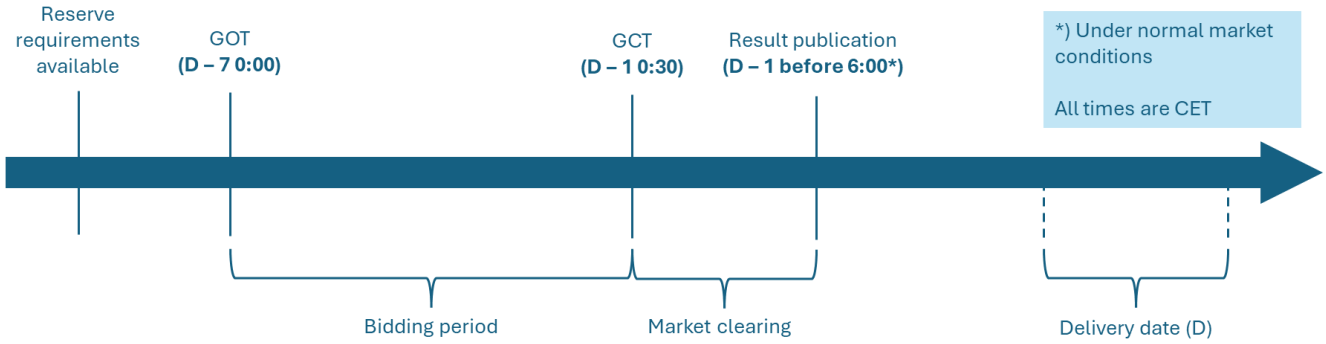


Figure 2: **FCR SE/DK** market timeline

2.1.3 FCR common market timeline (second auction)

- involved: Macro area NO, SE+DK (excluded DK1), FI = all bidding zones of Nordic LFC block except DK1

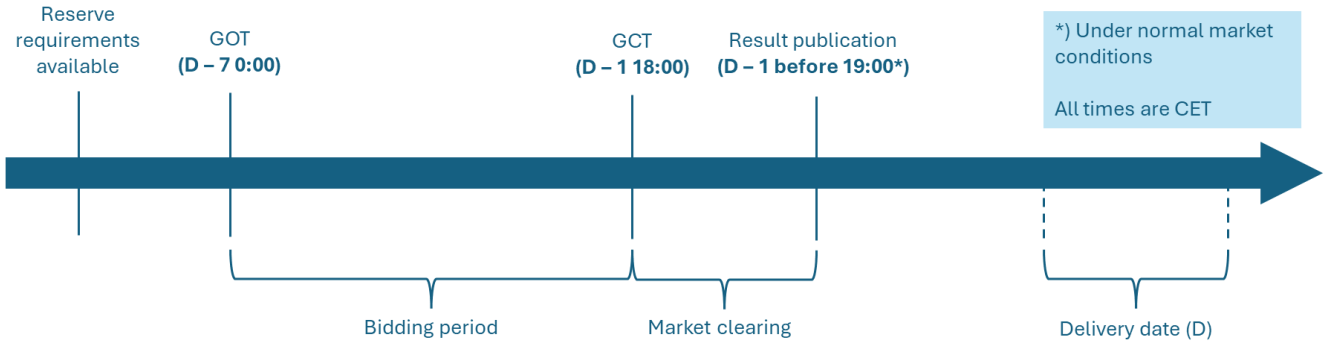


Figure 3: **FCR Common** market timeline

2.2 Timeline description

- Long-term reserve requirements are published in regular intervals on the TSOs websites and visible in Nordic MMS.
- FCR markets gate opening time: BSPs can submit their bids to all capacity markets from D-7 00:00 CET.
- Subsequently, when reserve requirements are updated, NMMS republishes them to BSPs and TSOs up until the gate closure time (GCT).
- Based on whether or not reserve requirements are updated after gate opening, the TSOs can choose to have NMMS publish reserve requirements through the described reserve requirement publishing process.
- Between the capacity market Gate Opening Time (GOT) and the capacity market Gate Closure Time (GCT), the BSPs can submit and update their bids (Bidding period).

- FCR capacity markets gate closing time:
    - BSPs can submit their bids to the FCR NO market until D-2, 17:30 CET.
    - BSPs can submit their bids to the FCR SE/DK market until D-1, 00:30 CET.
    - BSPs can submit their bids to the FCR common market until D-1, 18:00 CET.
- After gate closure, the market clearing runs. The Bid Selection Optimisation is executed, and the market results are published to BSPs and TSOs.
    - FCR NO result publication: no later than D-2, 18:30 CET
    - FCR SE/DK result publication: no later than D-1, 06:00 CET
    - FCR Common result publication: no later than D-1, 19:00 CET
- The TSOs have the possibility to extend the bidding period and/or reopen the bidding gate.

2.3 System context

This document provides detailed information about the message exchanges between Nordic MMS and the BSPs. The other exchanges are shown for contextual information purposes only and are outside the scope of this document.

The table below provides an overview of the flows between Nordic MMS and the BSPs. The table shows that IEC CIM is used as data exchange format and ECP/ EDX is used as communication platform. Please refer to chapter 5 for more details related to ECP/EDX.

Sender	Receiver	Data	Document	ECP message type
NMMS	BSP	Publish reserve requirements	iec62325-451-7-reservebiddocument.xsd – version 7.4	MO-MCC-RESERVE-REQUIREMENTS-V7-4
BSP	NMMS	Bids	iec62325-451-7-reservebiddocument.xsd – version 7.1	MO-MCC-BIDS
NMMS	BSP	Acknowledgement	iec62325-451-1-acknowledgementdocument.xsd – version 7.0 iec62325-451-1-acknowledgementdocument.xsd – version 8.0 iec62325-451-1-acknowledgementdocument.xsd – version 8.1	"original message code"-ACK Note: *Outgoing ACK: 8.0* *Incoming ACK: 7.0, 8.0, 8.1*
NMMS	BSP	Accepted contracts	iec62325-451-7-reserveallocationresult.xsd – version 6.4	MO-MCC-ACCEPTED-BIDS-BSP-V6-4
NMMS	TSO	Market result	iec62325-451-6-balancing.xsd – version 4.5	MO-MCC-MARKET-RESULTS-V4-5

Table 1 Flow between Nordic MMS and BSP

2.4 General rules

The capacity markets business process flows assume certain basic rules. These rules are described below.

2.4.1 Date and time

Date and time are expressed using the standard XML format for date and time: YYYY-MM-DDTHH:MM:ssZ, formatted using the universal time standard **UTC** by adding a 'Z' behind the time - like this: 2022-06-14T22:00:00Z

2.4.2 Document coverage

The beginning and ending date and time of the period covered by the document shall cover just one CET/CEST day.

2.4.3 Daylight saving time

- In **winter,** the period is from 23:00 UTC to 23:00 UTC
- In **summer,** the period is from 22:00 UTC to 22:00 UTC
- On the date of the change from winter to summer time, the period is from 23:00 UTC to 22:00 UTC. This change occurs on the last Sunday in March at 01:00 UTC
- On the date of the change from summer to winter time, the period is from 22:00 UTC to 23:00 UTC. This change occurs on the last Sunday in October at 01:00 UTC

2.4.4 Document identification and revision number

The document identification must be unique over time for the sender in question. Furthermore, the document identification itself should not have any significant meaning. The revision number is not used and shall always be equal to '1'.

2.4.5 Update/cancel principles

In general, a new received document will always completely replace a previously received document. **Update** of any time series is done by sending a new document honouring these rules

- A new document mRID (document identification)
- The same revision number (always equal to '1')
- A newer created date-time
- The same *period/day, domain, auction.mRID and subject market participant* (for bids) as for the data being updated

I.e. to **cancel** one or more time series, a new document is submitted honouring the above rules, omitting the bids that should be cancelled.

2.4.6 Cancel all bids

In order to cancel all bids by a given sender, day, and control area, a new document should be submitted with a dummy Bid_TimeSeries using element "status" and value A09 = cancelled. The time series must include the element auction.mRID, with the valid market code.

- The document period is specified as usual using the reserveBid_Period.timeInterval element.
- The document's scope (control area/bidding zone) is specified using the domain.mRID element, see details in o
- The dummy timeseries must include the status element and a reference to the market using element auction.mRID.
- The content of the other mandatory timeseries elements is ignored.

Working example:

```
<ReserveBid_MarketDocument>
…
  <Bid_TimeSeries>
      <mRID>8c520815945a43e88e1fb72e9ad05507</mRID>
      <auction.mRID>FCR_CAPACITY_MARKET_NO</auction.mRID>
      <businessType>B74</businessType>
      <acquiring_Domain.mRID codingScheme="A01">10Y1001A1001A91G</acquiring_Domain.mRID>
      <connecting_Domain.mRID codingScheme="A01">10YNO-3--------
J</connecting_Domain.mRID>
      <quantity_Measure_Unit.name>MAW</quantity_Measure_Unit.name>
      <currency_Unit.name>EUR</currency_Unit.name>
      <price_Measure_Unit.name>MAW</price_Measure_Unit.name>
```

```
      <divisible>A02</divisible>
      <blockBid>A02</blockBid>
      <status>
         <value>A09</value>
      </status>
      <flowDirection.direction>A01</flowDirection.direction>
      <marketAgreement.type>A01</marketAgreement.type>
      <Period>
         <timeInterval>
            <start>2000-01-01T00:00Z</start>
            <end>2000-01-01T00:00Z</end>
         </timeInterval>
         <resolution>PT60M</resolution>
         <Point>
            <position>1</position>
            <quantity.quantity>0</quantity.quantity>
            <price.amount>0</price.amount>
         </Point>
      </Period>
  </Bid_TimeSeries>
</ReserveBid_MarketDocument>
```

2.4.7 Acknowledgement

For the *Bid submission* process, an acknowledgement document, as defined in Ref [7] is generated as response, either completely accepting the received document or rejecting it completely. Partial acceptance of documents is not used. The codes and values used in this document are provided in chapter 4.10

The acknowledgement will always contain a document level `Reason`, with either code `A01` (Message fully accepted) or `A02` (Message fully rejected).

The acknowledgement may also contain further document level `Reason`(s), explaining document level errors.

The acknowledgement may also contain one or more `Rejected_Timeseries`, with one or more timeseries level `Reason`(s).

The acknowledgement may also contain one or more `InError_Period` within the `Rejected_Timeseries`, with one or more `Reason`(s) for a given time interval.

See example code snippet below:

```
<Acknowledgement_MarketDocument>
...

  <Rejected_TimeSeries>
      <mRID>4CDF6AAA-4C0D-98DB-94CDE58FB4B5</mRID>
      <InError_Period>
          <timeInterval>
              <start>2021-01-07T00:00Z</start>
              <end>2021-01-07T01:00Z</end>
          </timeInterval>
          <Reason>
              <code>A59</code>
              <text>All quantities of block bid must be equal.</text>
          </Reason>
      </InError_Period>
      <Reason>
        <code>A22</code>
        <text>Invalid BSP</text>
```

```
      </Reason>
  </Rejected_TimeSeries>
  <Reason>
    <code>A02</code>
    <text>Document fully rejected.</text>
  </Reason>
  <Reason>
    <code>A51</code>
    <text>The attribute createdDateTime cannot be in the future.</text>
  </Reason>
</Acknowledgement_MarketDocument>
```

2.4.8 Time series period

Within a time series period, the position must always begin with '1' and be incremented by '1' for each subsequent position, forming a series of contiguous numbers covering the complete range of the period. Furthermore, *gaps* in the time series are allowed. In this case, the time series will comprise of several periods to indicate the gaps.

See code snippet below:

```
<Bid_TimeSeries>
...

          <Period>
              <timeInterval>
                  <start>2018-09-17T03:00Z</start>
                  <end>2018-09-17T05:00Z</end>
              </timeInterval>
              <resolution>PT60M</resolution>
              <Point>
                  <position>1</position>
                  <quantity.quantity>100</quantity.quantity>
                  <minimum_Quantity.quantity>100</minimum_Quantity.quantity>
                  <price.amount>25.20</price.amount>
              </Point>
              <Point>
                  <position>2</position>
                  <quantity.quantity>100</quantity.quantity>
                  <minimum_Quantity.quantity>100</minimum_Quantity.quantity>
                  <price.amount>25.20</price.amount>
              </Point>
          </Period>
          <Period>
              <timeInterval>
                  <start>2018-09-17T15:00Z</start>
                  <end>2018-09-17T17:00Z</end>
              </timeInterval>
              <resolution>PT60M</resolution>
              <Point>
                  <position>1</position>
                  <quantity.quantity>100</quantity.quantity>
                  <minimum_Quantity.quantity>100</minimum_Quantity.quantity>
                  <price.amount>25.20</price.amount>
              </Point>
              <Point>
                  <position>2</position>
                  <quantity.quantity>100</quantity.quantity>
```

```
                <minimum_Quantity.quantity>100</minimum_Quantity.quantity>
                <price.amount>25.20</price.amount>
            </Point>
        </Period>
</Bid_TimeSeries>
```

3 Business process

This chapter provides information related to the business rules that apply.

3.1 Sequence diagram

The sequence diagram for the whole capacity market is depicted below. Note that the last two shown exchanges are provided for information only and are outside the scope of this document. Please refer to local user guides for further details.

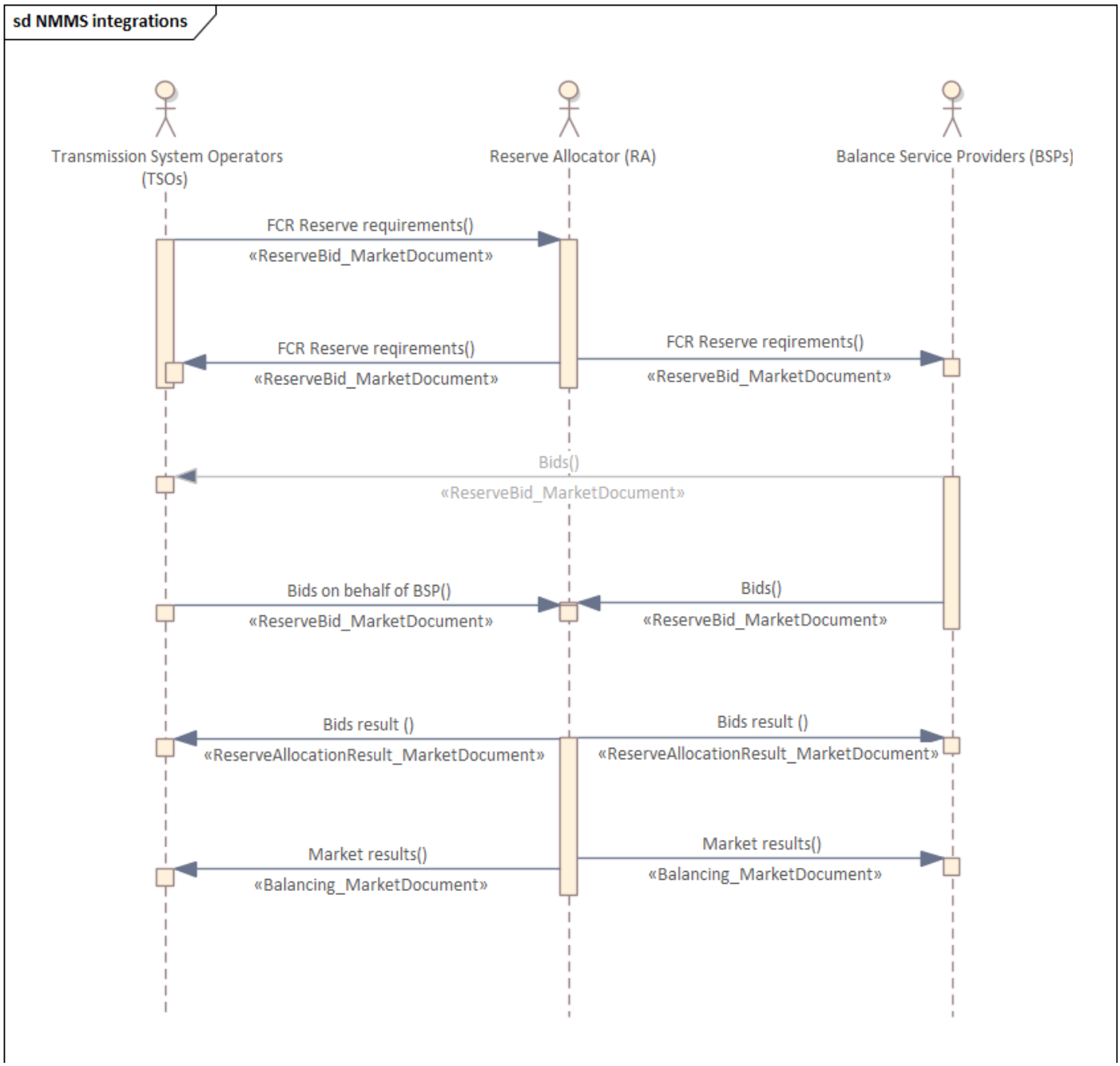


Figure 1 Sequence diagram for the capacity markets

3.2 Reserve requirements

NMMS publishes reserve requirements as CIM xml messages when the reserve requirements are submitted to the NMMS. TSOs can update daily reserve requirements before auction clearing, and NMMS will then publish the updated reserve requirements to all TSOs and BSPs. In case that the reserve requirements change after the latest publication, NMMS sends out updated information for that after a grace period to avoid frequent update messages.

In case that there are no reserve requirements defined for an auction, the empty CIM xml messages with just a header is sent.

In NMMS geographic areas that can carry reserve requirements for the FCR markets, the reserve requirements are defined only for macro areas.

Reserve requirements for the FCR are composed from the next items:

- **Demand (volume to be procured)**

The to be procured volume will always be communicated as **Demand** in the CIM messages published.

- **Elastic demand (volume to be procured only if the requested price is met)**

The volume to be procured at the current price conditions is always communicated as **Elastic Demand** in the published CIM reports.

- **Minimum regulation (volume to be procured locally)**

Macro areas are sets of one or more bidding zones. The minimum regulation that is defined as a part of the reserve requirements definition on a macro area, work as a demand. In this case, the bid selection will try to select bids to satisfy the minimum regulation volume from the bids in the set of bidding zones in the macro area.

- **Maximum regulation (maximum volume that can be procured in the given quality)**

The maximum volume that can be produced in a given type.

Note: The Frequency activated reserves (FCR) are divided into Frequency Containment Reserves, for Disturbance (FCR-D Up and FCR-D Down) and Normal (FCR-N), as has been written previously. The type of the provided FCR-D Frequency Containment Reserves must be specified.

Even if this may appear complex, the impact for the BSPs receiving reserve requirement messages as CIM xml is in fact very limited.

In CIM messages, minimum and maximum regulations that function as localization constraint in addition to the need, will appear in additional timeseries with their respective business types.

This process is used for the distribution of the reserve requirements (demand, minimum regulation and maximum regulation) of macro areas towards BSPs or TSOs. The provided data is considered public information and TSO and BSP parties receive the same document.

Markets in NMMS can be configured to send out reserve requirement changes if the requirements change frequently. The published reserve requirements are daily data in hourly resolution. They apply to a single auction and delivery day only.

The reserve requirements are sent out as result of being updated after they have been initially published, which allows TSOs to make and inform about changes even after the bidding gate has been opened.

3.3 Bid submission

During the bidding phase, the participating BSPs provide all information related to bids for FCR capacity markets. The *ReserveBid_MarketDocument* is used to provide this information. Alternatively, bids can be submitted via the Nordic MMS web user interface. The same business rules apply for both alternatives.

In order to be able to submit bids to NMMS, the BSP needs to have a valid **Portfolio** in the market and bidding zone to bid in. A portfolio represents that the BSP has prequalified resources to provide the required type of balancing services in a certain bidding zone and an agreement with the responsible TSO to participate in the market.

For a general description of the ReserveBid_MarketDocument schema, please refer to Ref [4]. The codes and values to be used in this document are provided in chapter o.

The following business rules apply to the bid submission process. It is up to the BSPs' responsible TSO to decide whether some the following market features are enabled or not as well as setting threshold values.

3.3.1 General rules

- A Reserve Bid Document contains a set of bids (a bid is represented by a time series)
- A Reserve Bid Document shall be for only one *subject party*
- The ECP endpoint used to send the data must be associated with the subject party either by:
  - The subject party being the same as the sender and being directly associated with endpoint used
  - The subject party having an active agent-principal (BSP) relationship with the agent identified in the sender market participant (logical sender) and by the sender ECP end point (physical sender)
- The delivery period for a bid must belong to the same tender period for all bids in a Reserve Bid Document
- Bids are given per bidding zone, that means as portfolio-bids, unless the TSO requires the BSPs to provide further location information on the bid using registered resource identifiers
- One Reserve Bid Document can be sent per control area, which includes all bids for all bidding zones the BSP has a portfolio in. It is also possible to send Reserve Bid Document per bidding zone. The document scope (control area or bidding zone) defines the set of bids replaced by the new document sent in. The number of bids submitted may not exceed the maximum number of bids set per portfolio

3.3.2 Bid quantity

- Bid quantity may vary for all hours in the time series
- Bid quantity time series does not have to be a continuous interval of values. Gaps, where the quantities are not specified, are allowed and there is no need to specify zero quantities instead of gaps. The only condition is that at least one quantity must be specified in the bid.
- Bid quantity (and minimum bid quantity) must be in the interval [Quantity -> Min, Max], given by the **Market parameters / Bid validation parameters** for the auction
- Bid quantity (and minimum bid quantity) must be a multiple of the [Quantity -> Factor], given by the **Market parameters / Bid validation parameters** for the auction
- Bid quantity may not exceed the [Maximum bid quality] per regulation direction and bidding zone, given by The BSP portfolios (**Market parameters / Portfolios**).

3.3.3 Bid type

- Bid type is set only for the FCR-D Up product and FCR-D Down product.
- Bid type is specified for whole time series
- Bid type for FCR-D can be set as Static (code Z03) or Dynamic (code Z02)
- If type is not specified for the FCR-D bid, then such a bid is rejected as well as the whole document containing this bid

3.3.4 Bid price

- Bid price must be present and have the same value for all positions in a time series, i. e. there is just one price for the whole bid. It is therefore not necessary to split the quantity time series into multiple bids if the price is the same for all time intervals. Fewer bids generally mean faster processing. However, If BSP needs to set different prices for different time intervals, multiple bids must be created.
- Bid price must be in the interval [Price -> Min, Max], given by the **Market parameters / Bid validation parameters** for the auction
- Bid price must be a multiple of the [Price -> Factor], given by the **Market parameters / Bid validation parameters** for the auction

3.3.5 Block bids

- All quantities of a block bid must be equal and represent a continuous interval of market time units (MTUs) - no gap is allowed in the sequence of MTUs
- All offered quantities of the block bid must be accepted or rejected.
- Exclusive bids can be combined with block bids if your TSO allows it.
- Number of the MTUs in the sequence of MTUs must not exceed [Maximum duration of block bid] given by **Market parameters / Bid validation parameters**

3.3.6 Bid divisibility

The divisible bid is the basic bid type. The bid can be accepted or rejected fully or partially, i. e. the accepted quantity is between offered quantity and zero. Divisible bid can be set for FCR service.

- In the case of the divisible bid:
  - The offered quantity must be divisible by [Quantity -> Factor].
  - The minimum quantity must be divisible by [Quantity -> Factor].
  - Minimum quantity must not exceed [Quantity -> Indivisible maximum] given by **Market parameters / Bid validation parameters**.

On the other hand, the indivisible bid must be accepted or rejected fully, i. e. the accepted quantity is equal to the offered quantity or zero. Indivisible bid can be set for FCR service.

- In the case of the indivisible bid:
  - Offered quantity of indivisible bid must not exceed [Quantity -> Indivisible maximum].

3.3.7 Maximum duration of block bids

The maximum allowed block bid length is configurable attribute of the Nordic MMS. It is set for each auction separately via **Market parameters / Bid validation parameters**. Due to this restriction, the BSP can submit a block bid for FCR with a maximum length of N consecutive MTUs.

*3.3.8 Linked Up/Down bids (inclusive group - **currently not allowed**)*

Joint linked up-and-down bids consist of two linked bids for different directions and the same hour(s). Both linked bids must be either accepted or rejected in the given hour; the offered quantity can be, however, different hour by hour. There are no links in time. The partial acceptance of the offered quantity is not allowed.

- *A block bid cannot be linked together with a non-block bid*
- *Both or none of the inclusive bids must be in the same exclusive group.*
- *Bids in the same inclusive bid group must be assigned to the same location.*
- *Only one up and one down bid in the same bidding zone can be linked into the inclusive bid group.*

3.3.9 Exclusive linked bids *(exclusive group - **currently not allowed**)*

Two or more bids can be linked into single exclusive group. For each MTU, only one bid which is part of the exclusive group can be accepted, all other bids must be rejected in that MTU.

NMMS also supports exclusive linking of bids between markets in the same market clearing group.

Markets in the same clearing group are initially cleared in a specific clearing order. (e.g. FCR SE/DK before FCR Common). Bids within in the same exclusive group across markets, that are selected in one market, will not be offered to the bid selection of the other market and can thus not be selected there in the same market time unit.

- Bids in the same exclusive group must belong to the same bidding zone (*connecting_Domain.mRID*)
- Bids in the same exclusive group must be of the same product (FCR-N, FCR-D up, FCR-D down)

- An exclusive group shall contain at least two bids
- Both or none of the inclusive bids must be in the same exclusive group.
- An exclusive group of the bids can be created for FCR service.
- A block bid can be part of an exclusive group in the case of the FCR services.
- A block bid cannot be combined with non-block bid in the same exclusive group in the case of the FCR services.

Evaluation of the exclusive linked groups:

- Block bids:
  - Block bids can be part of the exclusive group for FCRs markets
  - Block bid cannot be combined with the single hour bids
  - The block bid is evaluated as a monolith for the whole day, regardless of the presence of the offered quantity only for a certain MTU => Acceptance of one block bid automatically excludes the possibility of accepting any other block offer in the group

	Exclusive group	Block bid	1:00	2:00	3:00	4:00	Note
BID1	1	✓	1	1	1		Block bids only
BID2		✓	1				
BID3		✓			1		
BID4		✓				1	

- Single hour bids:
  - Single hour bids can be part of the exclusive group for FCRs markets
  - Block bid cannot be combined with the single hour bids
  - The single hour bid is evaluated separately for each MTU => multiple single hour bids can be accepted but accepted MTU will be always different

	Exclusive group	Block bid	1:00	2:00	3:00	4:00	
BID1	2	✗	1	1	1		Single hour bids only
BID2		✗	1		1		
	Exclusive group	Block bid	1:00	2:00	3:00	4:00	
BID1	3	✗	1	1	1	1	Single hour bids only
BID2		✗	1		1	1	

*3.3.10 Technical linking and quality limitations (technically linked group - **currently not allowed**)*

The feature allows the following bid quality constraints to be set:

- *Resting time*
- *Maximum activation duration*

Bid time series with common resting time and activation duration limitations need to be specified with a common technical linked group identification in the linkedBidsIdentification element. These bids are then chosen only in MTUs where the bids are available for activation.

The bid selection will not select such bids in market time units where they can be unavailable due to selections in other MTUs of the same or other time series with the same linkedBidsIdentification.

- *Bids in the same technically linked group must be situated in the same bidding zone.*
- *Bids in the same technically linked group must have the same duration and resting time values.*
- *The technically linked group must contain at least two bids.*
- *Block bid cannot be part of technically linked group.*

3.3.11 Registered resource ID (currently not used in the Nordic MMS)

NMMS allows specifying registered resource identifiers on the bids if the responsible TSO requires that information and has configured NMMS with the allowed resource data for its BSPs. Please refer to local market terms and conditions to see whether this information is required or not.

3.3.12 Allowed bid type combinations (Verify with your TSO which combinations they allow)

Bids can be either divisible ("D") or indivisible ("I") and be linked in time (Blockbids: "B"), regulation direction (linked up/down "L") or mutually exclusive (exclusive bids "E").

The table below describes each of these bid properties, and every allowed combination of these properties.

Case	Divisibility	Block (B)	Joint linked up-and-down (L)	Exclusive (E)	Description
I	Indivisible	No	No	No	single bid – Indivisible, non-block bid can span one or more hours (discontinuous interval is allowed). Each hour is cleared separately, i.e. the bid can be accepted or rejected separately hour by hour. The accepted quantity must either be equal to the offered quantity or zero. The result can be different in every hour of the bid.
D	Divisible	No	No	No	single bid – varying quantity – Divisible, non-block bid has the same rules as described in case **o** with the difference that it can be accepted in the range between minimum and offered quantity. The divisibility is expressed by the presence of the minimum quantity. The minimum quantity can be also zero. The result can be different for every hour of the bid.
IB	Indivisible	Yes	No	No	Indivisible block bid spans multiple consecutive hours (discontinuous interval is not allowed) with the same quantities per hour. In all hours, the bid must be either fully accepted or rejected.
DB	Divisible	Yes	No	No	Divisible block (between minimum and offered quantity) bid spans multiple consecutive hours (discontinuous interval is not allowed) with the same quantities per hour. In all hours, the bid must be either accepted (between minimum and offered quantity) or rejected. I.e. it is not possible to accept the bid in one hour and reject it in another hour.
IE	Indivisible	No	No	Yes	Exclusive bids in the same group (they have the same exclusive group id) are mutually exclusive for the same hour (block bids cannot be part of the exclusive bid group). The bid can be accepted in the given hour only if all other bids in the group are rejected. Bids can be exclusively linked across markets in the same market clearing group. Markets in the same market clearing group are cleared in a specific initial clearing order.
DE	Divisible	No	No	Yes	The same case as I**E** with the difference that the bid can be accepted also partially (between minimum and offered quantity). Please note that the exclusive group can contain both divisible and indivisible bids. Bids can be exclusively linked across markets in the same market clearing group. Markets in the same market clearing group are cleared in a specific initial clearing order. Bids selected in one market cannot be selected in the other market in the same market time unit.

IBE	Indivisible	Yes	No	Yes	Exclusive bids in the same group (they have the same exclusive group id) are mutually exclusive for the same hour. Block bid is indivisible block bid spans multiple consecutive MTUs (discontinuous interval is not allowed) with the same quantities per MTU. In all MTUs, the bid must be either fully accepted or rejected. The bid can be accepted in all MTUs only if all other bids in the group are for the same MTUs rejected.
DBE	Divisible	Yes	No	Yes	The same case as IB**E** with the difference that the bid can be accepted also partially (between minimum and offered quantity). Please note that the exclusive group can contain both divisible and indivisible bids.

3.3.13 Invalid bid type combinations

Bid type combinations currently disabled due to missing exemption from Article 32(3) of the EB Regulation.

Case	Divisibility	Block (B)	Joint linked up-and-down (L)	Exclusive (E)	Technical linking and Quality limitations	Description
IL	Indivisible	No	Yes	No	Technical linking available	Joint linked up-and-down bids consist of two linked bids for different directions with the same price and hour(s). Both linked bids must have the same price and both must be either accepted or rejected; the offered quantity can be, however, different hour by hour. There are no links in time. The partial acceptance of the bid is not allowed.
DL	Divisible	No	Yes	No	Technical linking available	The same as case **IL** with the exception that, for each hour, the bid can be accepted also partially – between minimum and offered quantity. If the minimum quantity of one of two linked bids is equal to zero, it is allowed to fully reject that bid and at the same time accept the other linked bid – this specific situation does not violate the rules for bids linking. Please note that it is possible to link together one divisible and one indivisible bid.
BL	Indivisible	Yes	Yes	No	Technical linking **not** available	The same as case **IL** with the exception that both bids must be either fully accepted in all hours or fully rejected in all hours. It is not allowed to link one block and one non-block bid.
DBL	Divisible	Yes	Yes	No	Technical linking **not** available	Combination of cases **DL** and **BL**: both bids must be either accepted in all hours or rejected in all hours, but the accepted quantity can be between minimum and offered quantity.
LE	Indivisible	No	Yes	Yes	Technical linking available	If joint linked up-and-down bid is part of the exclusive group (see case **E**), both corresponding linked bids must be part of the exclusive group and they both must either be accepted or rejected together, i.e. they are not considered as mutually exclusive. Both linked bids must have the same price. Bids can be exclusively linked across markets in the same market clearing group. Markets in the same market clearing group are cleared in a specific initial clearing order. Bids selected in one market cannot be selected in the other market in the same market time unit.

DLE	Divisible	No	Yes	Yes	Technical linking available	This is the combination of the cases **DE** and **LE**: if the bid is accepted, the second linked bid must be also accepted and all other bids in the exclusive group must be rejected. In contrast to the case LE, the bid can be accepted also partially (between minimum and offered quantity). Bids can be exclusively linked across markets in the same market clearing group. Markets in the same market clearing group are cleared in a specific initial clearing order. Bids selected in one market cannot be selected in the other market in the same market time unit.

3.4 Negative Bid submission

Each BSP can repurchase its obligations through negative bids. This means that BSPs can submit negative bids in such a way that they themselves can buy back their commitments (the quantity tendered) received in the first auction. This use case implies that negative bids can only be submitted for the second auction.

The submission of the negative bids is basically same as Bid submission with these exceptions:

- Negative bid can be submitted only to the FCR common market (second market)
- The bid offered quantity must be negative
- The bid offered price must be zero
- The BSP may submit a negative quantity up to a maximum of the quantity accepted on the first market (condition is evaluated per each bidding zone, hour, direction and quality of the accepted quantity).
- Negative bids cannot be combined with other bids.

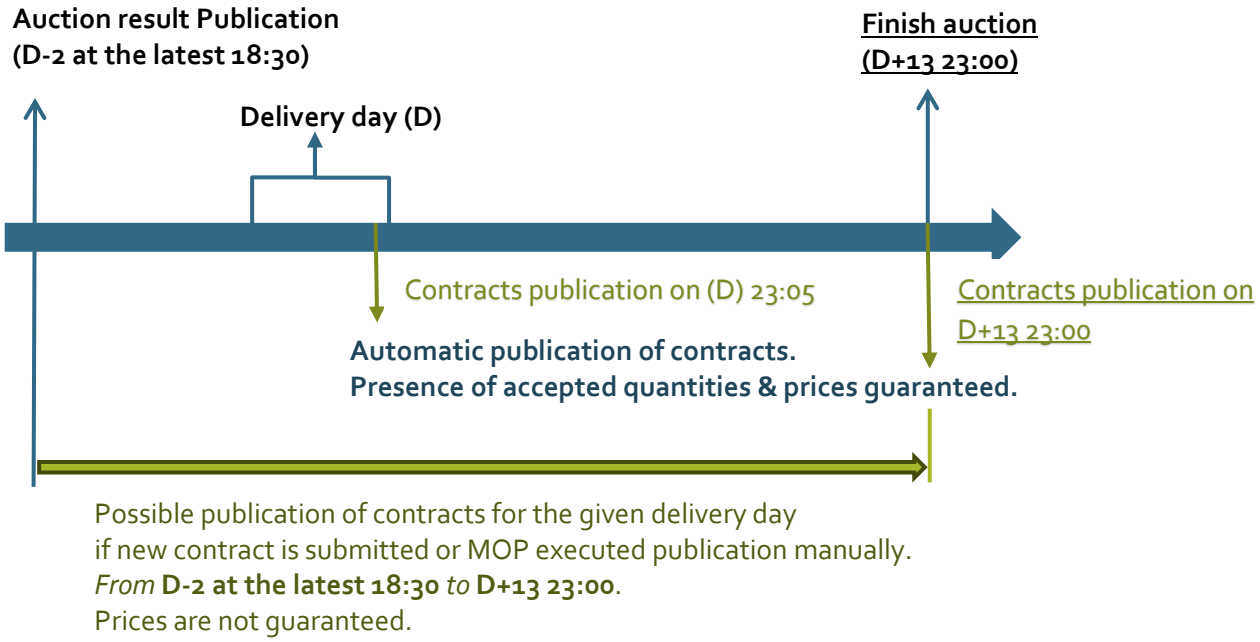
3.5 Contracts submission

The contract generally represents the capacity contract between BSP and TSO or between BSP and BSP. There are several types of contracts that cover different arrangements between market participants. The TSOs are able to submit Contracts on behalf of the BSPs to the Nordic MMS. The submission of the contracts is possible once the market auction has been cleared. The BSP is informed about their own contracts via corresponding data flow (see chapter 4.8). For more information about Contracts please visit the chapter 3.6.3

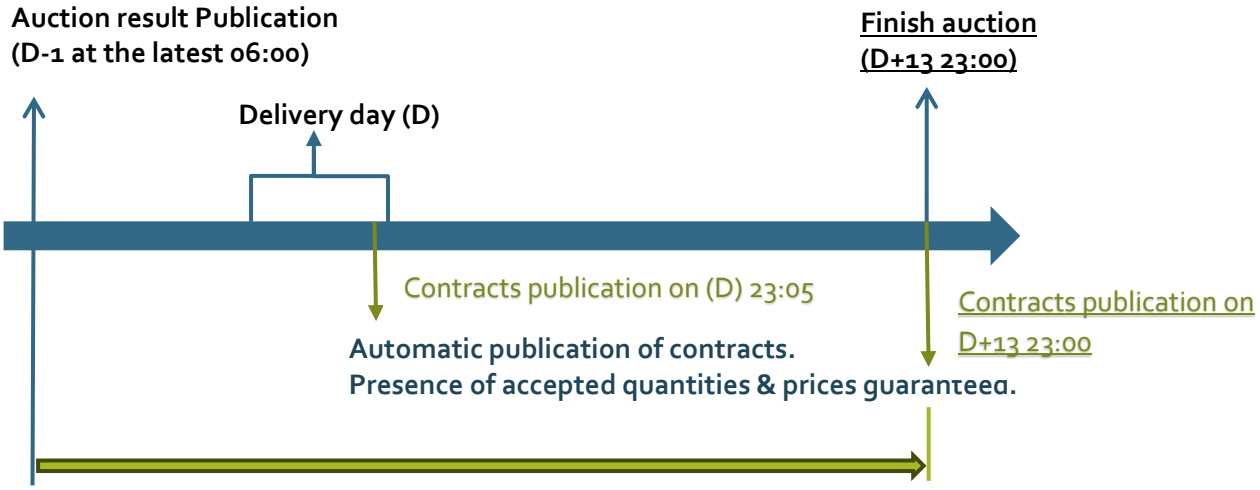
3.6 Market result publishing

3.6.1 FCR market results publishing timelines

- **FCR NO market timeline (first auction)**

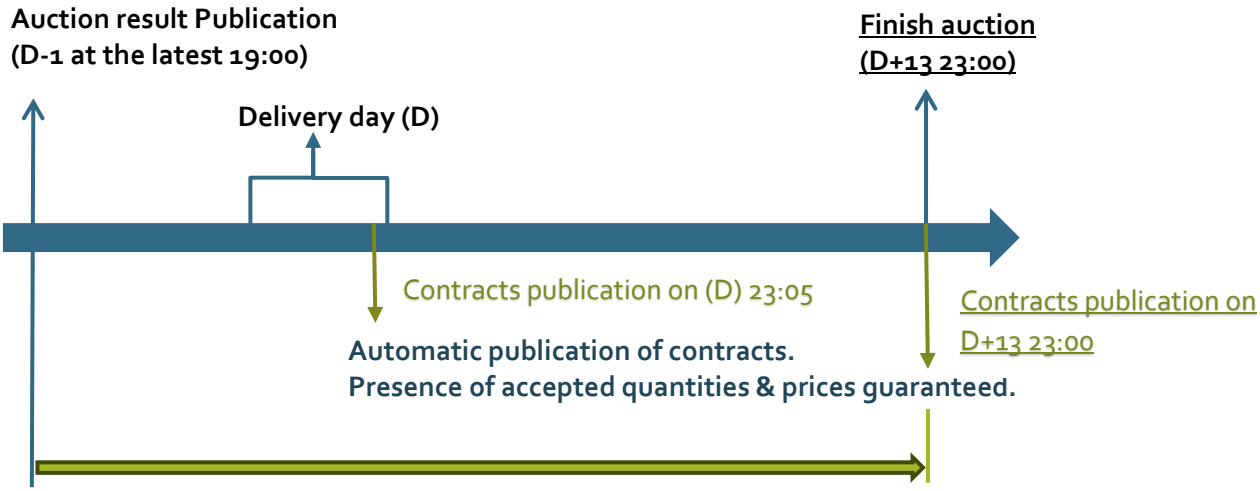


- **FCR SE/DE market timeline (first auction)**



Possible publication of contracts for the given delivery day
if new contract is submitted or MOP executed publication manually.
From **D-1 at the latest 06:00** *to* **D+13 23:00**.
Prices are not guaranteed.

- **FCR Common market timeline (second auction)**



Possible publication of contracts for the given delivery day
if new contract is submitted or MOP executed publication manually.
From **D-1 at the latest 19:00** *to* **D+13 23:00**.
Prices are not guaranteed.

3.6.2 FCR market results overview

After the bid selection optimization process is completed, and the result from the auction is ready, the following information is published from the Nordic MMS system:

Document		Information	Timing
Accepted bids (auction contracts) *ReserveAllocationResult_MarketDocument*		Only own bids Both procured and offered prices and quantities	• When bid selection optimization process is completed and the auction results have been published.
Market result *Balancing_MarketDocument*	Volumes	Market volumes	
	Prices	Market prices	
Contracts (contracts of all types) *ReserveAllocationResult_MarketDocument*		Only own contracts	• Each time a new contract is registered or contract publication is manually executed by MOP (contract can be reported without accepted price). • End of the delivery day (accepted price included). • End of the auction time life = delivery day + 13 days (accepted price included).

Settlement of accepted bids from either the FCR NO (first auction), FCR SE/DK (first auction) or FCR Common (second) uses the pay-as-cleared methodology, meaning that the market result includes clearing prices per bidding zone, market time unit and regulation direction with the price being included both in the balancing market document and the reserve allocation result market document.

3.6.3 Contracts

The *ReserveAllocationResult_MarketDocument* as defined in 4.8 is used to provide information about BSPs contracts. Firstly, a status of the bids (Auction contracts) that submitted to the auction is provided after auction clearing. One of the following reasons is used to indicate the status of the Auction contract (bids):

- bid is accepted (**A73**)
- bid is not accepted (**B09**)
- bid has been divided to permit acceptance (**A72**)
- Tender unavailable in MOL list (the bid is rejected by TSO) (**B16**)

Nordic NMS can contain also another type of Contracts which may be placed to the system by TSOs after publication of the auction results.

The other types of contracts are:

- Auction (default for the standard bids created for the auction: FCR NO, FCR SE/DK, FCR common)
- Procurement outside market (direct trade outside the auctions)
- Return (buy-back of the BSP's obligation to the TSO by the BSP)
- Announced non-delivery (non-delivery of the contract announced ex-post by BSP)
- Unannounced non-delivery (non-delivery of the contract not announced by BSP but found out by TSOs)
- Transferor swap (contract passed to another BSP)
- Transferee swap (contract received from another BSP)

Note: the difference between Negative bid and Return is in the time of the usage. Negative bid can be placed directly into the second auction before GCT. Return can be placed into the Nordic MMS by the TSO after the auction clearing. There is also a difference in setting the accepted price for a given accepted quantity (see below).

Main features of the contracts:

- Auction contracts (standard bids created for the auction)
  - Has offered quantity
    - Can be positive or negative.
    - Negative offered quantity can only be submitted to the FCR common market.
  - Has accepted quantity (zero in case of non-accepted bid) when offered quantity exists
    - Can be positive or negative in special case of the negative bids.
  - Has offered price
  - Has accepted price when non-zero accepted quantity exists
    - Accepted price (standard activation when pay as clear method is applied):
      - Can be different from hour to hour
      - Can be different from offered price
      - Is equal to the clearing price in case of the positive accepted quantity
      - Is equal to the maximum clearing price of all markets (first and second) for the given product in case of the negative accepted quantity
    - Accepted price (bottleneck activation **or** pay as bid method): (Bottleneck activation is currently not used)
      - Is constant for an all hours and is equal to the offered price
      - Can be different from offered price
- Non-auction contracts:
  - Has no offered quantity
  - May have accepted quantity
    - Positive in case of the *Procurement outside market, Transferee swap* contracts
    - Negative in case of the *Return*, *Announced non-delivery*, *Unannounced non-delivery*, *Transferor swap* contracts
  - Have no offered price
  - Must have accepted price (**except swaps**) when non-zero accepted quantity exists
    - Accepted price can be differed from hour to hour
    - *Procurement outside market* has price confirmed outside of the market
    - *Return* has price equal to Maximum product price at the moment of the Return submission
    - *Announced non-delivery* has price equal to Maximum product price * Penalty for announced non-delivery fixed each hour at the specified time *(visible at Auction timeline, attribute Close procurements)*
    - *Unannounced non-delivery has price equal to* Maximum product price * Penalty for unannounced non-delivery fixed each hour at the specified time *(visible at Auction timeline, attribute Close procurements)*

Note: Maximum product price is calculated as maximum clearing price of all markets for the given product and all prices of the bids accepted of the type of *Procurement outside market* for all markets of the given product.

The BSPs receive information about their *own* contracts. Nordic MMS distributes one *ReserveAllocationResult_MarketDocument* per BSP**,** control area (TSO) and market result publication run.
Agents receive accepted contracts in separate messages per principal BSP.

Order of result publication runs:

- All **auction** contracts after auction clearing
- All contracts (**volumes but without price for all types**) after contract registration by TSO

- All contracts **(volumes and prices for all types**) at the end of each day (D-1,23:35 CET)
- All contracts (**volumes and prices for all types**) 13 days after the auction (D+13, 23:00 CET)

3.6.4 Market results – volumes and prices

The *Balancing_MarketDocument* as defined in 4.9 is used to provide information about the market prices and the total volume per hour and direction. The codes and values to be used in this document are provided in chapter 4.9. Nordic MMS distributes one *Balancing_MarketDocument* message per BSP and market result publication run. BSPs which did not enter bids into an auction do not by default receive market result messages. A BSP can however be flagged in Nordic MMS to receive the market results messages even if the BSP does not enter bids into an auction. To enable this the BSP should contact their local TSO

3.6.5 Republishing of market results

Nordic MMS can republish the market results multiple times due to different reasons:

- If the auction result is valid but cannot be processed by recipients due to inconsistencies in party identifiers. In this case, master data in the local MMS or in Nordic MMS requires to be updated before the market result is republished.
- Republishing can also be initiated when communication with some or all recipient endpoints has previously failed.

To support the update/cancel principle described in 2.4.5 and ensuring that the new market result replaces any earlier received market results, all documents that are sent will have new document mRID and updated createdDateTime.

3.6.6 Withdrawal of market results

Nordic MMS can withdraw the market result because of an invalid clearing result. As part of a withdrawal process, Nordic MMS will send out new market result messages with the following changes:

- Any previously accepted or partially accepted bids are changed to not accepted, which means the reason code is set to **B09 –** Bid not accepted
- All accepted volumes in the total market results are set to 0
- The price element is not included

Nordic MMS allows auction results to be published and withdrawn multiple times for one auction run.

3.6.7 Finish with non-purchase

Finish with non-purchase is a special market result, where

- All reason codes in the accepted bids message are set to **B09 –** Bid not accepted
- All accepted volumes in the total market results are set to 0

There are three possible scenarios for such zero results to be distributed:

- There are no reserve requirements
- No auction result has been published within the final publication deadline
- The auction has been cancelled because of extraordinary market conditions or a permanent failure during market clearing

Non-purchase market results completely replace and invalidate earlier published results.

4 Data flow descriptions

This chapter provides the dependencies for the documents used to support the FCR capacity markets

4.1 Classification

The dependency matrices describe the classification of the attributes. The following are classifications are used:

- M – The information is mandatory, i.e. the element is mandatory in the XSD schema
- R – The information is required, i.e. the element is not mandatory in the XSD schema but is required by the business process
- D – The information is dependent, i.e. the presence depends on certain condition(s)
- O – The information is optional.

4.2 Coding schemes

When communication with Nordic MMS, the coding scheme to identify senders and receivers can vary by TSO. The local TSO defines which coding scheme and party code to use for the market participants it is responsible for.
Some sender / receiver systems like NMMS use fixed codes and coding scheme A01.

Code	Coding Scheme	Description and reference
A01	EIC	Energy Identification Codes: https://www.entsoe.eu/data/energy-identification-codes-eic/
A10	GS1/ GLN	Global Location Number, provided by GS1: https://gepir.gs1.org/index.php/search-by-gln
NSE	Swedish national	
NFI	Finnish national	
NDK	Danish national	
NNO	Norwegian national	

4.3 Bidding zones

The FCR capacity markets consists of the following bidding zones:

Name	TSO	mRID	Coding scheme
DK2	Energinet	10YDK-2--------M	EIC
FI	Fingrid	10YFI-1--------U	EIC
NO1	Statnett	10YNO-1--------2	EIC
NO2	Statnett	10YNO-2--------T	EIC
NO3	Statnett	10YNO-3--------J	EIC
NO4	Statnett	10YNO-4--------9	EIC
NO5	Statnett	10Y1001A1001A48H	EIC
SE1	Svenska kraftnät	10Y1001A1001A44P	EIC
SE2	Svenska kraftnät	10Y1001A1001A45N	EIC
SE3	Svenska kraftnät	10Y1001A1001A46L	EIC
SE4	Svenska kraftnät	10Y1001A1001A47J	EIC

4.4 Control areas

- Denmark (DK): **10Y1001A1001A796**
- Finland: **10YFI-1--------U**
- Norway: **10YNO-0--------C**
- Sweden: **10YSE-1--------K**

4.5 Macro areas

- Norway: **10YNO-0--------C**
- South Norway: (In order to use this macro area a EIC code has to be requested from ENTSO-E and configured in NMMS)
- South of cut 2: (In order to use this macro area a EIC code has to be requested from ENTSO-E and configured in NMMS)
- Sweden: **10YSE-1--------K**
- Finland: **10YFI-1--------U**

4.6 Publishing of reserve requirements from Nordic MMS

The data flow is used for distribution of the reserve requirements (demand, minimum regulation and maximum regulation) of bidding zones and macro areas towards BSPs.

The publishing of reserve requirements using the ReserveBid_MarketDocument in version 7.4.

For a general description of the ReserveBid_MarketDocument schema in version 7.4, please refer to Ref [4].

Document scope:

Each received document shall always contain data for one day and:

- all macro areas assigned to the market (FCR market does not specify reserve requirement for bidding zones).

ReserveBid_MarketDocument		451-7-reservebiddocument.xsd – version 7.4
mRID	M	Unique identification of the document.
revisionNumber	M	Constant value of **1**
Type	M	**B21** = Reserve need document
process.processType	M	**A52** = Frequency containment reserve (FCR)
sender_MarketParticipant.mRID	M	**10V1001C--000284** (Nordic MMS) **A01** = EIC coding scheme
sender_MarketParticipant.marketRole.type	M	**A34** = Reserve Allocator
receiver_MarketParticipant.mRID	M	Identification of the party receiving the document Identification is supported by several coding schemes. See Chapter 4.2: "Coding schemes"
receiver_MarketParticipant.marketRole.type	M	**A46** = Balancing Service Provider (BSP)

createdDateTime	M	Date and time of document creation (in ISO 8601 UTC format) YYYY-MM-DDTHH:MM:SSZ
reserveBid_Period.timeInterval	M	The period covered by the document (in ISO 8601 UTC format) Start: YYYY-MM-DDTHH:MMZ End: YYYY-MM-DDTHH:MMZ
domain.mRID	M	EIC identification of the market area: **10Y1001A1001A91G** = Nordic Area **A01** - EIC coding scheme

BidTimeSeries **Send macro area requirements** The following time series are created for each macro area in the market and each direction: • demand o value represents one in-elastic demand, • all elastic demands separately, • minimum regulation, • maximum regulation o in case of the FCR-D products traded within FCR market the value represents the maximum possible part of the demand that can be covered by **static** bids.		
mRID	M	Unique identification of the need timeseries.
auction.mRID	M	Constant value: **FCR_CAPACITY_MARKET_NO** **FCR_CAPACITY_MARKET_SE_DK** **FCR_CAPACITY_MARKET_CMN**
businessType	M	**For reserve requirements:** Relevant for a macro area in the acquiring domain. **B75** (Need) = The requirement that should ideally be covered in the specified amount. **B90** (FlexibleNeed) = The requirement that should be covered in the specified amount only for specified demanded price. **For minimum regulation:** **A60** (Minimum possible) = A localization constraint for the procurement of balancing capacity, forcing the market to procure the given minimum of reserves in the specified geographic area. **A61** (Maximum available) = A quality constraints for the procurement of balancing capacity. It is possible to procure balancing capacity on the market in static quality up to the Maximum regulation, no more. If the value is set to zero, then it is not allowed to purchase balancing capacity in static quality at all. Conversely, if the Maximum regulation value is not set, then there is no constrains on the procurement of static balancing capacity. Relevant for macro areas in the acquiring domain.

		Note: A60 and A61 does not have to be present if any relevant value is not specified. *A macro area is a set of bidding zones
acquiring_Domain.mRID	M	The identification of the area with the reserve requirement or localization constraint. This can be a macro area identification. **A01** - EIC coding scheme
connecting_Domain.mRID	M	EIC identification of the market area: **10Y1001A1001A91G** (Nordic Market Area) **A01** - EIC coding scheme
quantity_Measurement_Unit.name	M	**MAW** = megawatt
Divisible	M	**A01** = Yes
flowDirection.direction	M	**A01** = Up (used for product FCR-D) **A02** = Down (used for product FCR-D) **A03** = Symmetric (used for product FCR-N)
standard_MarketProduct.marketProductType	O	Quality type of the maximum reserve requirement **Z03** = static quality Populated only if flowDirection.direction ≠ A03 and businessType = A61 (maximum regulation) otherwise not populated. *Note: Used only for maximum regulation of the FCR-D product (not used for FCR-N products).*

Period		
timeInterval	M	Period covered (in ISO 8601 UTC format). Start: YYYY-MM-DDTHH:MMZ End: YYYY-MM-DDTHH:MMZ
Resolution	M	**PT60M** – the time resolution. Must equal the duration of the timeInterval.

Point		
Position	M	Sequential value beginning with 1.
quantity.quantity	M	Quantity of: **For business type B75:** In-elastic demand per bidding zone or per macro area **For business type B90:** Elastic demand per macro area **For business type A60:** Minimum reserve regulation per macro area **For business type A61:** Maximum reserve regulation per macro area

		Exception for macro area time series if the market feature "Use macro area minimum regulation in bid selection" is enabled for the given market: • *Reserve requirements are not present* • *Minimum reserve regulation is present as B75*
price.amount	D	Price for elastic demand.

4.7 Bid updates to NMMS

The data flow is used by BSPs to submit the bids to the capacity market.

There are two message delivery scenarios. In the first scenario "BSP-as-BSP", the BSP sends the message to Nordic MMS by own name. In the second scenario "Agent-as-BSP", the Agent creates/updates bids behalf of the other BSP (principal).

Explanatory table:

Physical sender	Logical sender (sender_MarketParticipant)	subject_MarketParticipant	Submission scenarios
BSP	BSP	BSP	BSP-as-BSP (bids placed directly by BSP to NMMS)
BSP (agent)	BSP (agent)	BSP (principal)	Agent-as-BSP (bids placed by Agent behalf of the BSP)

The ReserveBid_MarketDocument in version 7.1 is used for Bids updates.

For a general description of the ReserveBid_MarketDocument schema in version 7.1, please refer to Ref [3].

Document scope

Each received document shall always contain data for one day, one BSP and one control area/bidding zone. The scope is therefore defined by combination of the elements:

- reserveBid_Period.timeInterval,
- domain.mRID (= control area/bidding zone),
- subject_MarketParticipant.mRID (= subject BSP),
- auction.mRID of first time series in the document (= market).

The bids within the scope which are already stored in the Nordic MMS are deleted and replaced by new bids in the incoming XML file. In other words, each new XML document always completely replaces all existing bids in the scope (day, control area or bidding zone, subject BSP, market).

Consequently, the submission of the empty XML document would lead to the removal of all existing bids in the scope. However, the empty document does not allow to identify the market in question because the element auction.mRID is on time series level. In that case, the sender must send one "dummy" time series with element status and value A09 = cancelled. The only purpose of this time series is to identify the market. The content of the time series is ignored. The completely empty document will be rejected with the reason code A69 and reason text: *„At least one time series must be present*".

ReserveBid_MarketDocument		451-7-reservebiddocument.xsd – version 7.1
mRID	M	Unique identification of the document
revisionNumber	M	Constant value of "**1**"

Type	M	**B40** = Complete Reserve Bid Document
process.processType	M	**A52** = Frequency containment reserve (FCR)
sender_MarketParticipant.mRID	M	Identification of the party sending the document = valid BSP Identification is supported by several coding schemes. See chapter 4.2: "Coding schemes"
sender_MarketParticipant.marketRole.type	M	**A46** = Balancing Service Provider (BSP) **A39** = Data Provider (Agent) Agents sending on behalf of BSPs must use market role A39 when submitting bids. See chapter 6: "Agents and data providers acting on behalf of BSPs"
receiver_MarketParticipant.mRID	M	**10V1001C--000284** (Nordic MMS) **A01** = EIC coding scheme
receiver_MarketParticipant.marketRole.type	M	**A34** = Reserve Allocator
createdDateTime	M	Date and time of document creation (in ISO 8601 UTC format) YYYY-MM-DDTHH:MM:SSZ Used for the general validation that a newer document (i. e. with a more recent createdDateTime) in the same scope has not already been processed.
reserveBid_Period.timeInterval	M	The period covered by the document (in ISO 8601 UTC format) Start: YYYY-MM-DDTHH:MMZ End: YYYY-MM-DDTHH:MMZ Start and end interval must define an entire CET Day
domain.mRID	M	Code of control area or bidding zone. Must be under the TSO responsibility *See list of allowed Bidding zones* *See list of allowed Control areas* *Note: If BSP is active in more control areas, it must send more documents – one for each control area.)* **A01** - EIC coding scheme
subject_MarketParticipant.mRID	M	Identification of the party responsible for the bid subject_MarketParticipant must be:

		• the same as the BSP as the sender_MarketParticipant. • or the subject_MarketParticipant must be the principal BSP for the agent BSP which is the sender_MarketParticipant. The relation between principal and agent must be valid and active for the given business day (reserveBid_Period.timeInterval).
		Identification is supported by several coding schemes. See chapter 4.2: "Coding schemes"
subject_MarketParticipant.marketRole.type	M	**A46** = Balancing Service Provider (BSP)

Bid_TimeSeries		
mRID	M	Unique identification of the time series
auction.mRID	M	Constant value: **FCR_CAPACITY_MARKET_NO** **FCR_CAPACITY_MARKET_SE_DK** **FCR_CAPACITY_MARKET_CMN** *Note: All elements auction.mRID in the document must have the same value. It is not allowed to submit the bids for multiple markets in single file.*
businessType	M	**B74** = The time series provides an offer to provide reserves.
acquiring_Domain.mRID	M	**10Y1001A1001A91G** (Nordic Market Area) **A01** - EIC coding scheme
connecting_Domain.mRID	M	The EIC identification of the bidding zone where the bids are placed. See chapter: 4.3: "Bidding zones". *Note: this bidding zone must correspond with domain.* If domain is set as control area this bidding zone must below to this control area. If domain is set as bidding zone this biding zone must be the same. This bidding zone must be in the BSP (subject_MarketParticipant.mRID) portfolio. **A01** - EIC coding scheme
quantity_Measure_Unit.name	M	**MAW** = megawatt
currency_Unit.name	R	**EUR** = euro
price_Measure_Unit.name	R	**MAW** = megawatt
divisible	M	**A01** = Divisible

		Quantity may be reduced stepwise down to the minimum quantity **A02** = Indivisible *No reduction possible on the quantity*
linkedBidsIdentification	*D*	*Used for technical linking of bids by providing a technical linked group identification.* *Currently not allowed for the FCR auctions -see also 3.3.10* *Bid timeseries with common resting-time (resting_ConstraintDuration.duration) and activation duration limitations (maximum_ConstraintDuration.duration) need to be specified with a common technical linked group identification in the linkedBidsIdentification element such that these bids are chosen in market time units where the bids are available for activation.* *The bid selection will not select such bids in market time units where they can be unavailable due to selections in other market time units of the same or other timeseries with the same linkedBidsIdentification.* *Not used if the bid is not linked or does not have quality limitations.* *Quality limitations and thus technical linking, cannot be combined with block bids.*
exclusiveBidsIdentification	D	The identification used to associate bids that are to be linked together. If one bid is selected then all others with the same exclusiveBidsID cannot be selected. Apart from exclusive bid groups within a market and bidding zone, it allows the exclusive cross-linking of bids between markets, to be able to offer a resources flexibility in two markets with simultaneous gate closure without risking double acceptances. Not used if the bid is not part of an exclusive group
blockBid	O	**A01** – Yes – all quantities within the time interval must be selected **A02** – No Indicator of the block bid. In all MTUs, the block bid must be either accepted (between minimum and offered quantity or fully - depending on the divisible flag) or rejected. I. e. it is not possible to accept the bid in one MTU and reject it in another MTU.

		If the element is not present, the bid is considered as non-block.
status	O	The information about the status of the bid. The element is optional. If the element is present, it must contain the value **A09** (Cancelled) and is used for being able to cancel all bids for a given delivery date and market. In that case, the content of the time series is ignored. If a time series with such a status is part of the document, it must be the only time series in the document. The time series is present only for the purpose of the identification of the market (which is part of the document scope). As a result of uses of the status element, all bids provided by given BSP (subject_MarketParticipant.mRID) will be deleted from the system. Set of the deleted bids is affected by element domain. • domain.mRID is filled by the control area => bids for given control area are deleted • domain.mRID is filled by the bidding zone => bids for given control area are deleted
registeredResource.mRID	O	*Location of the bid. Currently not relevant for FCR* *In other contexts this is also called "Resouce identifier", "Location id" and "Stasjonsgruppe id"* *The element may be either mandatory, optional or disabled for the given market and control area, depending on the configuration of the market.* *If the element is present it must contain the valid location (master data entity Location) assigned to the same BSP and bidding zone as the bid itself.* *If the element is not present and the attribute is set as optional, the empty value is written to the corresponding bid attribute.* *If the element is not present and the attribute is set as mandatory, it is considered as an error.*
		Coding scheme: • *"NNO" : Norwegian national* • *"NSE" : Sweden national*
flowDirection.direction	M	**A01** = Up (available for FCR-D) **A02** = Down (available for FCR-D) **A03** = Symmetric (available only for FCR-N products)
marketAgreement.type	O	**A01** – daily
resting_ConstraintDuration.duration	*O*	*The delay to be respected between the end of activation and the start of the next activation.*

		Currently not allowed for the FCR auctions -see also 3.3.10 *The standard ISO 8601 is used for duration. The allowed form in this context is PTnH, where n is the number of hours. Leading zeros are allowed.* *The element is optional. If the element is not present, the empty value is written to the corresponding bid attribute.*
maximum_ConstraintDuration.duration	*O*	*The maximum duration that a regulation has to be up once the bid is activated.* *Currently not allowed for the FCR auctions -see also 3.3.10* *The standard ISO 8601 is used for duration. The allowed form in this context is PTnH, where n is the number of hours. Leading zeros are allowed.* *The element is optional. If the element is not present, the empty value is written to the corresponding bid attribute.* *Note: can be used only for the MFRR_CAPACITY_MARKET auction*
standard_MarketProduct.marketProductType	D	The value shall be one of the supported bid qualities: • Z02 = dynamic • Z03 = static The element can be present only for directions A01 = Up or A02 = Down otherwise must not be present.
inclusiveBidsIdentification	*O*	*The unique identification used to identify associated bids with each other in the joint linked up-and-down way.* *Currently not allowed for the FCR auctions -see also 3.3.8* *Joint linked up-and-down bids consist of two linked bids for different directions and the same hour(s). Both linked bids must be either accepted or rejected in the given hour; the offered quantity can be, however, different hour by hour. There are no links in time. The partial acceptance of the offered quantity is not allowed.*

Period		
timeInterval	M	Period covered (in ISO 8601 UTC format) Time interval must be a subset of reserveBid_Period.timeInterval and must not overlap with any other time interval of the same time series. Start: YYYY-MM-DDTHH:MMZ End: YYYY-MM-DDTHH:MMZ

		Note: in case of the block bid must not overlap Maximum duration of block bid see also 3.3.5
resolution	M	Constant value PT1H or PT60M The precision of the interval that the different points within the time series cover is *one hour*

Point		
position	M	Position within the time interval. Sequential value beginning with **1**
quantity.quantity	M	Offered quantity
minimum_Quantity.quantity	D	The minimum quantity of energy that can be activated at a given time position. The minimum quantity must be present if bid is marked as divisible (A01) and must not be present when the bid is market as indivisible (A02). Must be specified as the same value across all points across all periods of the bid.
price.amount	M	The price of the product offered Must be specified as the same value across all points across all periods of the bid.

4.8 Publishing contracts results from Nordic MMS

The data flow is used for distribution of detailed results (accepted and not accepted bids = Auction contracts) towards BSPs after auction clearing. The data flow is also used for distribution of detailed results of all other contracts towards BSPs (see also chapter 3.6.3).

There are two message delivery scenarios. In the baseline scenario, the BSP receives the message as expected. In the alternative scenario, an agent acting on behalf of the BSP receives the message instead of the affected BSP (principal).

Explanatory table:

Logical receiver	Physical receiver	Party in time series	Receiver scenarios
BSP	BSP	BSP	Baseline scenario: BSP-as-BSP
BSP (agent)	BSP (agent)	BSP (principal)	Alternative scenario: Agent-as-BSP

Receiver scenarios:

- Baseline = the logical receiver is BSP: Results are distributed directly to BSP which is the input of the dataflow.
- Alternative = the logical receiver is BSP (agent): Results are distributed to the agents – the data of their principals are sent.

Only the BSP who submitted at least one bid in the given market and control area receives the document. Message is not sent to BSPs without relevant bids.

Description of the document:

The publishing of detailed results (accepted and not accepted bids) using the ReserveAllocationResult_MarketDocument in version 6.4.

For a general description of the ReserveAllocationResult_MarketDocument schema in version 6.4, please refer to Ref [6]

ReserveAllocationResult_MarketDocument		iec62325-451-7-reserveallocationresult.xsd – version 6.4
mRID	M	Unique identification of the document
revisionNumber	M	Constant value of "**1**"
type	M	**A38** = Reserve allocation result document
process.processType	M	**A52** = Frequency containment reserve (FCR)
sender_MarketParticipant.mRID	M	**10V1001C—000284** (Nordic MMS) **A01** = EIC coding scheme
sender_MarketParticipant.marketRole.type	M	**A34** = Reserve Allocator
receiver_MarketParticipant.mRID	M	Identification of the party receiving the document Identification is supported by several coding schemes. See chapter 4.2: "Coding schemes"
receiver_MarketParticipant.marketRole.type	M	**A46 =** Balancing Service Provider (BSP) **A39 =** Data Provider, see chapter 6: "Agents and data providers acting on behalf of BSPs"
createdDateTime	M	Date and time of document creation (in ISO 8601 UTC format) YYYY-MM-DDTHH:MM:SSZ
reserveBid_Period.timeInterval	M	Period covered (in ISO 8601 UTC format) YYYY-MM-DDTHH:MMZ
domain.mRID	M	**10Y1001A1001A91G** (Nordic Market Area) **A01** - EIC coding scheme

TimeSeries

Note for time series:

Each time series represent one contract. If the logical receiver of the data flow is BSP, all existing contracts of this BSP in the given control area are included.

If the bid (Auction contract) is at least partially forcibly accepted (forcibly accepted quantity > 0 in any hour) because of the bottleneck in a control area, the bid is presented twice – one as standard time series (containing standard accepted quantities) and one as bottleneck time series (containing the forcibly accepted quantities). In this case, both time series (standard and bottleneck) can contain the different timeInterval. Please see description of this element. ***– bottleneck is currently not relevant for the FCR***

mRID	M	An identification that uniquely identified the time series
bid_Original_MarketDocument.mRID	M	Constant value of "**NA**"
bid_Original_MarketDocument.revisionNumber	M	Constant value of "**1**"
bid_Original_MarketDocument.bid_**Bid**TimeSeries.mRID	M	The identification of the time series that was used in the original tender - the reference to the bid
bid_Original_MarketDocument.tendering_MarketParticipant.mRID	M	The ID of the tendering party Identification is supported by several coding schemes. See chapter 4.2: "Coding schemes"
auction.mRID	M	Possible values: **FCR_CAPACITY_MARKET_NO** **FCR_CAPACITY_MARKET_SE_DK** **FCR_CAPACITY_MARKET_CMN**
businessType	M	**B95** = Procured capacity (used for Auction contracts) **A02** = Internal trade (used for Procurement outside market contract) **C11** = Production reduction (used for Capacity return contract) **A53** = Planned maintenance (used for Announced non-delivery contract) **A54** = Unplanned outage (used for Unannounced non-delivery) **A32** = Capacity transfer notification (used for Transferor swap and Transferee swap contract) *Note: A32 with negative quantities represents Transferor swap, A32 with positive quantities represents Transferee swap.*
acquiring_Domain.mRID	M	**10Y1001A1001A91G** (Nordic Market Area) **A01** - EIC coding scheme
connecting_Domain.mRID	M	The EIC identification of the bidding zone where the bids were placed. See chapter: 4.3: "Bidding zones". **A01** = EIC coding scheme
marketAgreement.type	M	**A01** = daily
marketAgreement.mRID	M	Constant value of "**NA**"
quantity_Measurement_Unit.name	M	**MAW** = megawatt
currency_Unit.name	R	**EUR** = Euro
price_Measurement_Unit.name	M	**MAW** = megawatt
registeredResource.mRID	O	The identification of a location (used for bottleneck) associated with a bid.

		If location is not used, the element is omitted.
flowDirection.direction	M	**A01** = Up (used FCR => FCR-D) **A02** = Down (used FCR => FCR-D) **A03** = Symmetric (used only for product FCR => FCR-N)
resting_ConstraintDuration.duration	*O*	*The delay to be respected between the end of activation and the start of the next activation.* ***Currently not allowed for the FCR auctions -see also 3.3.10*** *The standard ISO 8601 is used. The number of hours stored in the time series is converted to the format PTnH, where n is the number of hours.* *If the value of the time series is empty, the element is omitted.*
maximum_ConstraintDuration.duration	*O*	*The maximum duration that a regulation has to be up once the bid is activated.* ***Currently not allowed for the FCR auctions -see also 3.3.10*** *The standard ISO 8601 is used. The number of hours stored in the time series is converted to the format PTnH, where n is the number of hours.* *If the value of the time series is empty, the element is omitted.*
Reason (within Time Series)		
code	M	Information whether the bid has been accepted in standard way or due to the bottleneck (forcibly accepted bid). Note: This element is relevant only for the new publishing. **B49** = contract has not been accepted due to bottleneck ***B42*** *= bid (Auction contract) has been accepted due to the bottleneck (forcibly accepted)* ***– currently not relevant for FCR*** *Note: acceptation due to bottleneck is not currently possible in the FCR markets*
code	M	**Information whether the bid (Auction contract) has been accepted or not.** • **If businessType = B95 and code = B49** **A73 =** Bid in question has been accepted (full acceptance of the bid in all hours of the day)

		A72 = The original bid quantity has been divided to enable it to be accepted (partial acceptance of the bid, at least in one hour). **B09 =** Bid not accepted **B16 =** Tender unavailable in MOL list (the bid is rejected by TSO) • **If businessType ≠ B95 not populated** *Note: relevant only for bids (Auction contract)*
text	D	A reason for rejection described by in the words. A reason for rejection can be specified by the TSO and will be included here. Only present if reason code = B16

Period		
timeInterval	M	Period covered (in ISO 8601 UTC format) `YYYY-MM-DDTHH:MMZ` Each time interval represents one continuous interval of hours where accepted quantity is **available**. 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | Etc. V | V | V | V | | | V | V | | Etc. "V" represents any filled-in accepted quantity. Note: Bids (Auction contracts, businessType = B95) • In a standard auction, the accepted quantity is **available** for each hour for which there is a bid quantity. The accepted quantity is always filled with at least zero (in case of non-accepted quantity). • For forcibly acceptation is accepted quantity **available** only for hours where forcibly acceptation is greater than zero. Non auction contracts (businessType ≠ B95) • For non-auction contracts, the accepted quantity is available only for hours where acceptation is greater than zero. In this case, the following intervals are built: 1–4 (i. e. 00:00–4:00) 7–8 (i. e. 6:00–8:00)
resolution	M	**`PT60M`** – the precision of the interval that the different points within the time series cover is *one hour*

Point		
position	M	Position within the time interval. Sequential value beginning with **1**

quantity	M	**The accepted quantity of the contract** identified for a point *Description of the relationship between the quantity and other elements:* ***Reason.code = B49 and businessType = B95*** *quantity of the bid (auction contract) accepted in standard auction and:* • *ReasonCode = A73 => (quantity must be higher than 0) and (quantity must be equal to secondaryQuantity) for all points of the TS (the bid is accepted as a whole)* • *ReasonCode = A72 => quantity must be ≥ 0 and at the same time quantity must be < secondaryQuantity in at least one point of the TS* • *ReasonCode = B09 or B16: quantity is = 0 (for all points of the TS)* ***Reason.code = B42 and businessType = B95*** *quantity of the bid (auction contract) accepted due to the bottleneck and:* • *ReasonCode = A73 => (quantity is > 0) and (quantity = secondaryQuantity for all points of the TS (the bid is accepted as a whole - time intervals are identical to B49)* • *ReasonCode = A72 => quantity is > 0* *ReasonCode = B09 and B16 => quantity is = 0 (for all points of the TS)* *Note: reason code is not populated for Non-auction contracts*
price.amount	D	**The accepted price of the contract** identified for a point *Note: Price.amount is present if quantity > 0* *The accepted price can be different from the original offered price and can be different hour by hour in the case that market operates within the Pay as clear method or non-auction contract is presented.* *The accepted price is constant for all points in the time series and at the same time is equal to the offered price in the case that market operates within the Pay as bid method or Reason.code = B42 (bottleneck time series).*
secondaryQuantity	R	**The offered quantity** identified for a point *For all supported ReasonCodes: secondaryQuantity is present* *secondaryQuantity is not present of non-auction contracts (businessType ≠ B95)*
bid_Price.amount	R	**The offered price** identified for a point *For all supported ReasonCodes: bid_Price.amount is present* *bid_Price.amount is not present of non-auction contracts (businessType ≠ B95)*

4.9 Publishing total market results from Nordic MMS

The data flow is used to distribute overall auction results (area volumes and prices) towards BSPs. The document is sent to all BSPs who submitted at least one bid (in any bidding zone). The document contains the data of all bidding zones in the given market.

The **new** publishing of reserve requirements using the Balancing_MarketDocument in version 4.5.

For a general description of the Balancing_MarketDocument schema in version 4.5, please refer to Ref [5].

Balancing_MarketDocument		iec62325-451-6-balancing.xsd – version 4.5
mRID	M	Unique identification of the document
revisionNumber	M	Constant value of "**1**"
type	M	**B34 =** Market result document
process.processType	M	**A52** = Frequency containment reserve (FCR)
sender_MarketParticipant.mRID	M	**10V1001C—000284** (Nordic MMS) **A01** = EIC coding scheme
sender _MarketParticipant.marketRole.type	M	**A34** = Reserve Allocator
receiver_MarketParticipant.mRID	M	Identification of the BSP receiving the document Identification is supported by several coding schemes. See chapter 4.2: "Coding schemes"
receiver_MarketParticipant.marketRole.type	M	**A46 =** Balancing Service Provider (BSP) **A39 =** Data Provider, see chapter 6: "Agents and data providers acting on behalf of BSPs"
createdDateTime	M	Date and time of document creation (in ISO 8601 UTC format) YYYY-MM-DDTHH:MM:SSZ
area_Domain.mRID	M	**10Y1001A1001A91G (**Nordic Market Area**)** **A01** – EIC coding scheme
period.timeInterval	M	The period covered by the document (in ISO 8601 UTC format) YYYY-MM-DDTHH:MMZ

TimeSeries		
mRID	M	An identification that uniquely identifies the time series
businessType	M	**C17** = Market price and volume
acquiring_Domain.mRID	M	**10Y1001A1001A91G** (Nordic Market Area) **A01** - EIC coding scheme

connecting_Domain.mRID	M	The EIC identification of the bidding zone. See chapter: 4.3: "Bidding zones". **A01** - EIC coding scheme
type_MarketAgreement.type	M	**A01** = daily
standard_MarketProduct.marketProductType	D	Type of the product • **Z02** = dynamic • **Z03** = static Element is present if flowDirection.direction = A01 or A02 Note: Reported in the case of the results for FCR-D product on the Bidding zones level.
flowDirection.direction	M	**A01** = Up (used for FCR => FCR-D) **A02** = Down (used for FCR => FCR-D) **A03** = Symmetric (used only for product FCR => FCR-N)
currency_Unit.name	R	**EUR** = Euro
quantity_Measurement_Unit.name	R	**MAW** = megawatt
price_Measurement_Unit.name	R	**MAW** = megawatt
auction.mRID	R	Possible values: **FCR_CAPACITY_MARKET_NO** **FCR_CAPACITY_MARKET_SE_DK** **FCR_CAPACITY_MARKET_CMN**

Period		
timeInterval	M	Period covered (in ISO 8601 UTC format) `YYYY-MM-DDTHH:MMZ`
Resolution	M	**`PT60M`** = the precision of the interval that the different points within the time series cover is one hour

Point		
Position	M	Position within the time interval. Sequential value beginning with **1**
Quantity	M	Total volume procured
procurement_Price.amount	M	Market price

4.10 Acknowledgement document returned by Nordic MMS

Acknowledgement_MarketDocument	iec62325-451-1-acknowledgement.xsd – v 8.0	
mRID	M	Unique identification of the document

createdDateTime	M	Date and time of document creation (in ISO 8601 UTC format) YYYY-MM-DDTHH:MM:SSZ
sender_MarketParticipant.mRID	M	**10V1001C--000284** **A01** = EIC coding scheme
sender _MarketParticipant.marketRole.type	M	**A34** = Reserve Allocator
receiver_MarketParticipant.mRID	M	Identification of the BSP receiving the ACK Identification is supported by several coding schemes. See chapter 4.2: "Coding schemes"
receiver_MarketParticipant.marketRole.type	M	**A46 =** Balancing Service Provider (BSP) **A39 =** Data Provider, see chapter 6: "Agents and data providers acting on behalf of BSPs"
received_MarketDocument.mRID	M	Information extracted from the bid document
received_MarketDocument.revisionNumber	M	Information extracted from the bid document
received_MarketDocument.createdDateTime	M	Information extracted from the bid document

Rejected_TimeSeries		
mRID	D	Identification of the rejected time series
Reason	D	One or more of the reasons described below
code	M	**A01** = Message fully accepted **A02** = Message fully rejected **A05** = Sender without valid contract. Used if the BSP is not eligible for the given product in the current bid area **A57** = Deadline limit exceeded/Gate not open **A59** = Not compliant to local market rules Other reason codes may also be used.
text	M	A specific reason for the rejection can be specified and included here. E.g. `«Time series ID»: The exclusive group must contain at least two bids`

5 ECP

ECP is the integration channel that is supported for communication with the NMMS market platform. It is used for all data exchanges between NMMS and BSPs.

5.1 How it works

ECP delivers messages from the sender to a recipient within single ECP network. Messages transported through the ECP network can be any text or binary data. IEC CIM is used as data exchange format. Alongside with the message, ECP transfers also message metadata. These are (among others) information about sender and recipient. The former is used by platform to authenticate the message sender. ECP consists of three main components: *endpoint*, *component directory* and *broker*. See figure below:

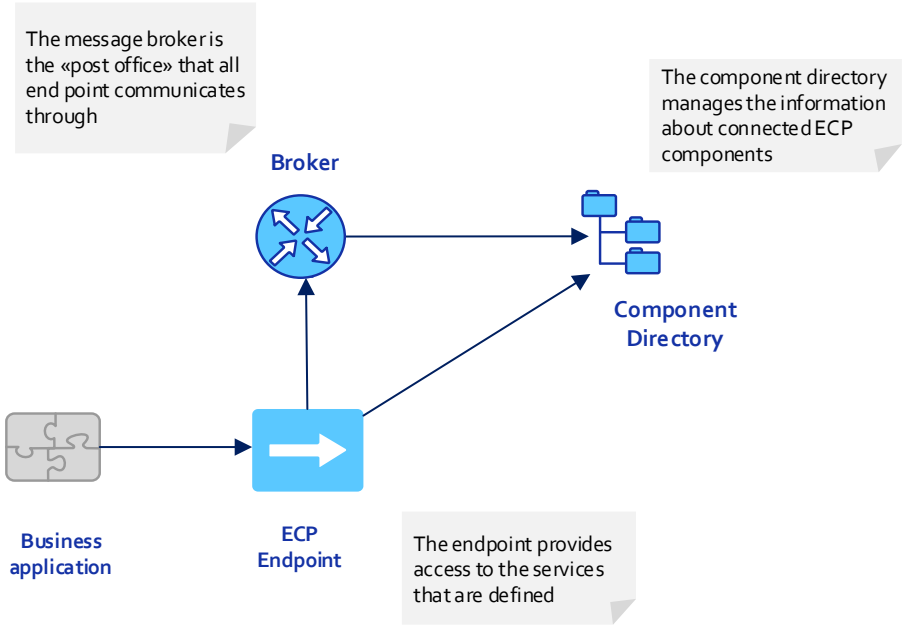
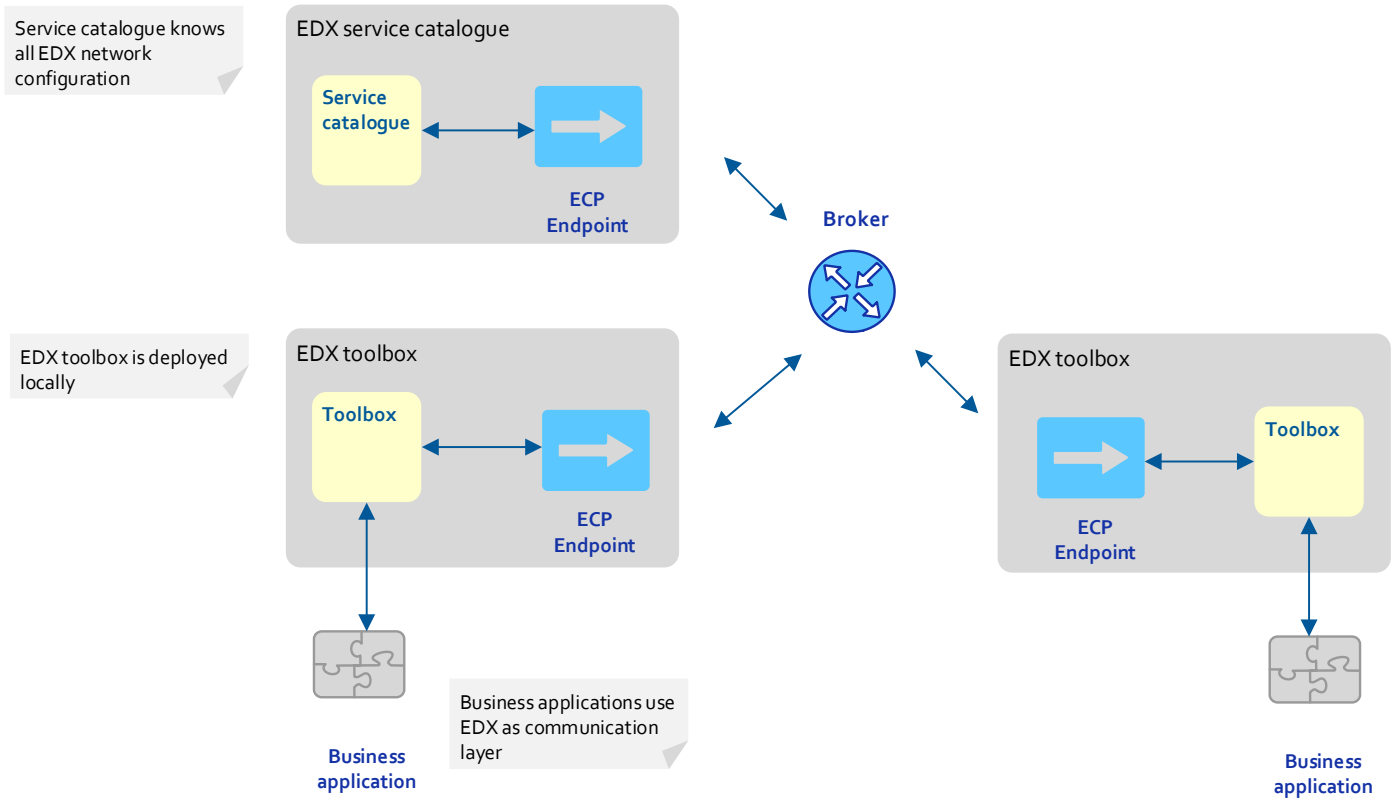


Figure 2 ECP Main Components

5.2 EDX

EDX is an extension to ECP, and is used to define the network configuration, and introduces the concept of services, service providers and consumers. The two central parts of the EDX network is the service catalogue and the toolbox. An EDX network consists of multiple toolboxes and a single service catalogue. These components

communicates via ECP and is responsible for distribution of the network configuration. Messaging occurs directly between the toolboxes. Se figure below for EDX network overview:



5.3 How to connect

Please refer to the installation package and documentation provided by your local TSO.

5.4 ECP/EDX for capacity market

5.4.1 Which message types to use

To see list of the ECP message types used for Nordic MMS please visit chapter 2.3.

5.4.2 Which service to use

The addressing convention used for communicating in the ECP network is *SERVICE-service.code*.

Note: Nordic MMS does not validate ECP service name but it is recommended to use values described in the following table.

Market	Market code	ECP Service name
FCR capacity market Norway	FCRCAP_NO	SERVICE-FCRCAP-NO
FCR capacity market Sweden/Denmark	FCRCAP_SE_DK	SERVICE-FCRCAP-SE-DK
FCR capacity market Common	FCRCAP_CMN	SERVICE-FCRCAP-CMN

6 Agents and data providers acting on behalf of BSPs

Nordic MMS supports authorizing third parties (agents) and their users to bid and receive market results on behalf of one or more principal BSPs (the party delegating the right to bid and receive market results).

The authorized parties can, but do not have to have own portfolios in Nordic MMS.

The authorization scheme allows the agent's ECP endpoint to be used to send bids and receive market results for one or more subject party (principal BSP).

For this purpose, the endpoint must belong to and identify the agent acting as a data provider on behalf of the principal BSPs. The agent's party code has to be set as the sender_MarketParticipant.mRID in the message and its sender_MarketParticipant.marketRole.type needs to be set to A39 – data provider.

In order to authorize an agent, the principal BSP needs to request an authorization for the agent party from its responsible TSO. Its BSP needs to provide both the agent's party code and ECP endpoint. An agent can only be authorized for all or none of the principal BSPs bidding zones.

Once the association between the agent and the principal BSP is defined, the agent's users will have access to the bids and market results of the principal BSP. The agent's ECP endpoint will be allowed to submit bids and receive market results on behalf of the principal BSP.