Table of Contents

1. Introduction

The guidelines in this document contain specific information about how the information exchange with Fingrid on different reserve markets must be implemented.

The document contains information about bid submission to different reserve markets, receiving market results as well as instructions on how to implement real-time reporting among other things.

The main channels for information exchange between balancing service providers and Fingrid are:

1. ECP (Energy Communication Platform):
    - Bid submission, receiving market results, electronic activation for mFRR-bids
2. Vaksi - User Interface:
    - Bid submission, receiving market results, electronic activation for mFRR-bids
3. EDI Messages:
    - Receiving market results, delivering reserve plans for yearly market
4. FEN / KoVa FEN network (ELCOM, ICCP or IEC 60870-5-104 protocol):
    - Real-time reporting
5. Web-reporting:
    - Real-time reporting

2. Market platforms – Fifty NMMS & Vaksi

The following platforms are used between Fingrid and Balance Service Providers in reserve trading:

		Reserve product					
		FFR	**FCR-D**	**FCR-N**	**aFRR capacity**	**aFRR energy**	**mFRR capacity / energy**
Platform	**Vaksi**	x	x	x		x	x
	Fifty NMMS				x		

2.1 Nordic Market Management System (NMMS)

NMMS is a platform developed by Fifty that is used on the aFRR capacity market. Fifty operates as a service provider for Fingrid.

Finnish balance service providers submit their aFRR bids primarily to the NMMS platform, except for fallback situations described in section 2.1.3.

- In these fallback situations aFRR bids are submitted manually through Vaksi.

Instructions and information about the aFRR capacity market are also available in the Nordic implementation guide: https://nordicbalancingmodel.net/wp-content/uploads/2021/03/Implementation-Guide-aFRR-capacity-market-BSP_v2.6.pdf

Fingrid provides Fifty credentials to reserve market participants as part of the market joining process or upon request. Fingrid configures the reserve supplier's portfolio on the Fifty platform based on the information provided. The reserve supplier can also have a service provider configured on the platform.

2.1.1 aFRR capacity bids to the NMMS platform

Market design

- Daily auction D-1
- Bid submission possible from (GOT) D-7 at 00.00 (CET/CEST)
- Deadline for bid submission (GCT) D-1 at 7.30 (CET/CEST)
- Publication of market results in normal situation D-1 at 8.00 (CET/CEST)
- Publication of market results in fallback situation at the latest D-1 10.00 (CET/CEST)

Bid rules

- Bids are given per bidding zone, hour and direction.
- BSPs send bids to the NMMS-platform.
- A minimum volume for a bid is 1 MW. For an indivisible bid the bid's maximum volume is 50 MW or the tested maximum capacity of the portfolio, depending on which value is lower.
- BSPs may define a minimum acceptable purchase volume to their bid.
    - Example: bid 45 MW and minimum volume 20 MW.
- For block bids there is no limit on the number of hours. However, the volume must remain constant for all hours.
- Exclusive bids are bid combinations, where two bids are placed on the same hour and only one of them can be chosen. The bids may have different volume or price.

Bid submission to NMMS with electronic messages

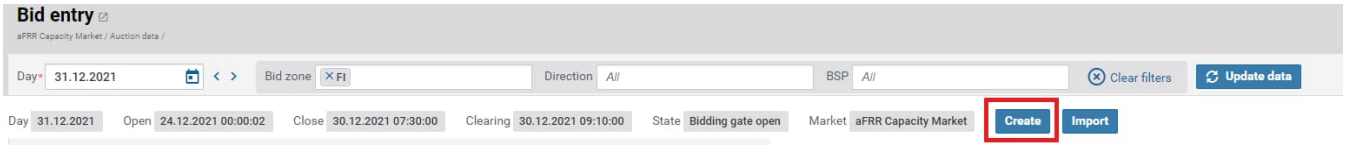
It is possible to submit bids to NMMS platform through electronic messages using EDX.

- Detailed instructions for the messages are available in the implementation guide: https://nordicbalancingmodel.net/wp-content/uploads/2021/03/Implementation-Guide-aFRR-capacity-market-BSP_v2.6.pdf
- More information about EDX from experts at Fingrid:
    - Antti Hyttinen, firstname.lastname@fingrid.fi, tel. +358 30 395 5353
    - Joonas Muikku, firstname.lastname@fingrid.fi, tel. +358 30 395 4324
    - Jussi Karttunen, firstname.lastname@fingrid.fi, tel. +358 30 395 4456

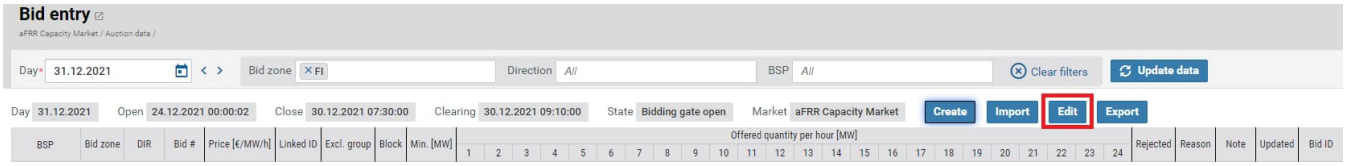
Bid submission to NMMS with user interface

It is also possible to submit bids on the NMMS platform manually through the user interface, or with Excel-import.

Manual bid submission is done under the main menu *aFRR Capacity Market → Bid Entry*. Select a date for which the bids are entered and click "Create".



Select correct BSP, Bidding Zone (FI) and direction (Up or Down) and after that click "OK".

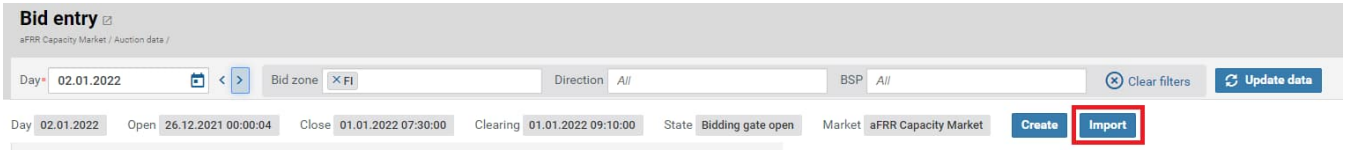


To edit the price and volume of the bid, click on "Edit".

Bid submission to NMMS with Excel-import

Importing bids from Excel can be done under the menu *aFRR Capacity Market → Bid Entry*. Select a date for which the bids are entered and click on “Import”, and then select the correct file and click “Open”.

The easiest way to create a ready template for bid submission is to create empty bid rows manually on the NMMS-platform and clicking “Export”. After this, the downloaded Excel-file can be edited and imported afterwards with “Import”.

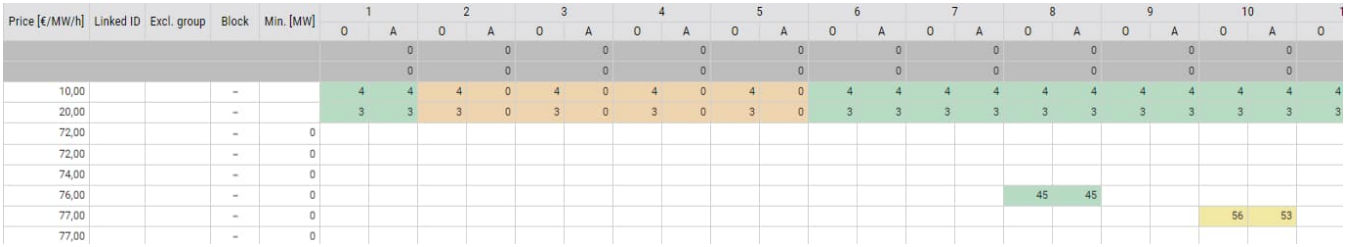


2.1.2 Results NMMS

The results of the aFRR-auction can be viewed in two different places in the NMMS user interface:

1. *aFRR Capacity Market → Bid results*

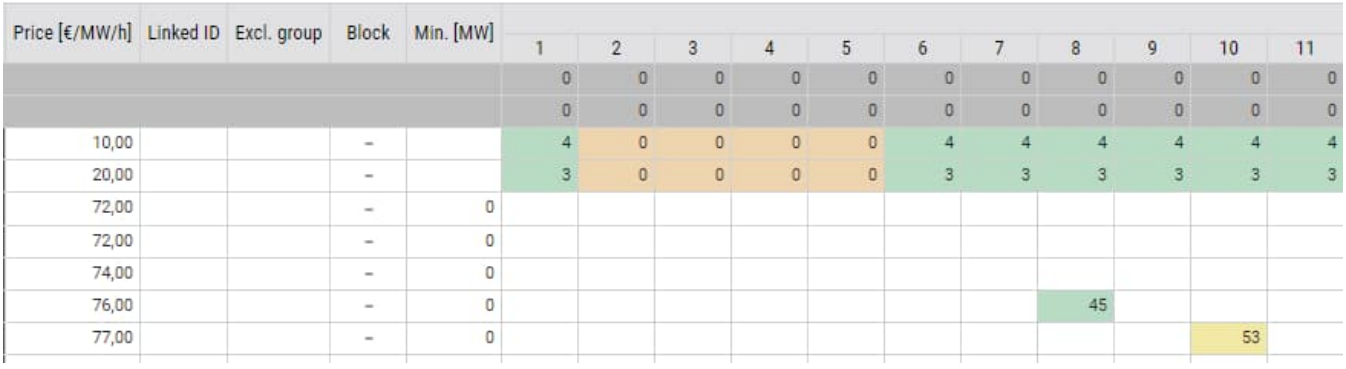
   On this screen, you can see the originally offered volume (O-column, O = Offered) and the accepted volume (A-column, A = Accepted). Bids that have been accepted completely have a green background color. Partially accepted bids are colored yellow and rejected bids are orange.



Price [€/MW/h]	Linked ID	Excl. group	Block	Min. [MW]	1		2		3		4		5		6		7		8		9		10		
					0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0	A	0
						0		0		0		0		0		0		0		0		0		0	
						0		0		0		0		0		0		0		0		0		0	
10,00			-		4	4	4	0	4	0	4	0	4	0	4	4	4	4	4	4	4	4	4	4	4
20,00			-		3	3	3	0	3	0	3	0	3	0	3	3	3	3	3	3	3	3	3	3	3
72,00			-	0																					
72,00			-	0																					
74,00			-	0																					
76,00			-	0															45	45					
77,00			-	0																			56	53	
77,00			-	0																					

2. *aFRR Capacity Market → Accepted bids*

   On this screen, you can only see the accepted volume. Bids that have been accepted completely have a green background color. Partially accepted bids are colored yellow and rejected bids are orange.



Price [€/MW/h]	Linked ID	Excl. group	Block	Min. [MW]	1	2	3	4	5	6	7	8	9	10	11
					0	0	0	0	0	0	0	0	0	0	0
					0	0	0	0	0	0	0	0	0	0	0
10,00			-		4	0	0	0	0	4	4	4	4	4	4
20,00			-		3	0	0	0	0	3	3	3	3	3	3
72,00			-	0											
72,00			-	0											
74,00			-	0											
76,00			-	0								45			
77,00			-	0										53	

Additionally, a general view of every auction can be viewed on the screen *aFRR Capacity Market → Market totals*:

- Accepted volumes per bidding zone
- Marginal prices per hour and bidding zone
- The overall cost of each auction

- Results are also published in NUCS and on the ENTSO-E Transparency platform.
- aFRR capacity procurement volumes and marginal prices are available from Fingrid's Open Data website.

2.1.3 Fallback situations Fifty NMMS

Fingrid's contact persons:

- Office hours Joonas Muikku, tel. +358 30 395 4324
    - On standby Antti Hyttinen, tel. +358 30 3955353
- Outside of office hours: Main grid control center, tel. +358 30 395 4210

Fingrid informs about upcoming outages and detected issues as the situation requires via email/phone.

A fallback means a situation, where the NMMS is not working correctly either completely or partially. In fallbacks 1 and 2 submitting bids is done through Vaksi. There are three main fallback scenarios that have been considered:

1. NMMS does not close the bidding gate correctly at 7.30 CET/CEST (Fallback 1)
2. NMMS is unable to calculate a result for the auction (Fallback 2)
3. NMMS is unable to publish the results of an auction (Fallback 3)

Fallback 1

In this scenario, NMMS fails to receive bids and/or close the bidding gate correctly at 7.30 (CET/CEST).

- Knowledge of the fallback is received by 7.35 (CET/CEST) at the latest.
- Fingrid's operator asks BSPs (by phone or other means) to submit their aFRR bids for the next day into the VAKSI system.
    - Submitting the bids into Vaksi is done manually through Vaksi. (see 2.2.3)
- Time for submitting bids is given at the operator's discretion
- The auction for the next day is ran in Vaksi and the results are distributed through EDI-message or Vaksi.

Fallback 2

In this scenario, NMMS fails to clear the market and calculate the accepted bids for the next day.

- Knowledge of the fallback is received by 8:45 (CET/CEST) at the latest.
- Fingrid's operator asks BSPs (by phone or other means) to submit their aFRR bids for the next day into the VAKSI system.

        - Submitting the bids into Vaksi is done manually through Vaksi. (see 2.2.3).
    - Time for submitting bids is given at the operator's discretion
    - The auction for the next day is ran in Vaksi and the results are distributed through EDI-message or Vaksi.

Fallback 3

In this scenario, NMMS cannot publish the market results for the next day

- Knowledge of the fallback is received by 9.00 (CET/CEST) at the latest.
- Fingrid's operator will distribute the auction results to BSPs via email. The email contains the following files:
    - Excel sheet with the information about the accepted bids. The format of the excel sheet is similar to the user interface of NMMS after the results are published
    - XML files that the BSP would have received via EDX in a normal situation.

The results are distributed to BSPs as soon as possible after the fallback has become apparent.

2.2 Vaksi

Vaksi is an internet-based application for the management of the commercial data of the power system.

Balancing service providers must submit their IP address or addresses, which will be used to access Vaksi, to Fingrid in advance. Both individual addresses and a joint address for the entire company configured with e.g. NAT are accepted. Access to Vaksi is only granted to the submitted addresses.

Fingrid provides the login IDs, usernames and passwords to access Vaksi.

- The login IDs are company-specific.
- The password must be changed in the Vaksi settings. The password is
- Users must change their password in the settings menu in Vaksi. The password is valid for one year at a time, but it is recommended to renew it every 6 months. The password can be renewed from Vaksi's settings or Fingrid's self service portal (https://itsepalvelu.fingrid.fi). No reminder message for updating the password will be sent.

One or more market parties can be assigned to a single user ID.

- Vaksi's reserve product specific displays are opened only for participants participating in those markets.
- One party can be configured for more than one user ID (such as service provider and owner), but the balancing bids orders are only delivered to one user.

2.2.1 Contact information and troubleshooting

Fingrid's Vaksi contact persons:

- Office hours Antti Hyttinen, etunimi.sukunimi@fingrid.fi, tel. +358 30 395 5353
    - On standby Juha Seppinen, etunimi.sukunimi@fingrid.fi, tel. +358 30 395 5172
- Outside of office hours Main grid control center, tel. +358 30 395 4210.

Fingrid informs about upcoming outages and detected issues on Vaksi's front page and by email/phone if necessary.

If Vaksi is down, balancing and reserve bids may be submitted by email/phone.

2.2.2 Logging in to Vaksi

https://balancing.fingrid.fi

Purpose

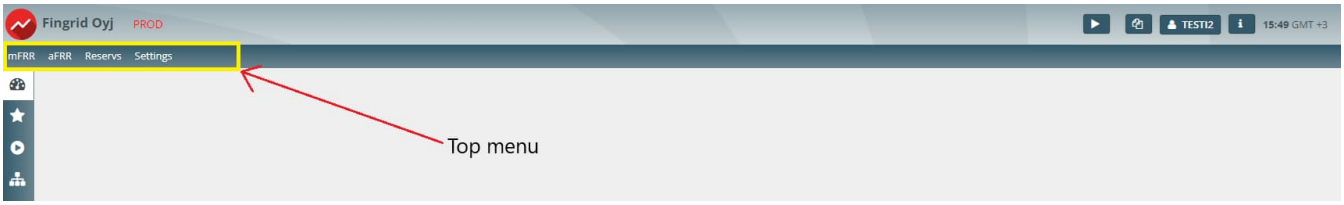
- User identification and system login.

Functions

- Username: Enter your username
- Password: Enter your password, this is case sensitive
- Login: Launches user authentication and login

Note! The Vaksi application is recommended to be used with the Chrome browser, or alternatively, with Firefox.

Vaksi front page and functions



Front page

- After logging in, you will be taken to Vaksi's front page.
- Fingrid announces news, such as downtimes and updates, on the front page.
- You can choose functions from the top menu.
- The mFRR menu is only visible to mFRR parties, aFRR menu for aFRR parties and the Reserves menu for FCR / FFR parties.

- The content of the submenu that opens from the Reserve bids menu depends on pre-determined specifications made to the reserve party.
- To exit VAKSI, click your username in the top right corner and Logout.

Windows and views

- Screens open either in a new tab or to the same window depending on how the action was launched and on the menu parameters.
- When a screen opens in a new tab, the Vaksi front page will remain open on the background, allowing you to open other screens from it.
- When the screen opens in the same window, the new screen replaces the contents of the previous page. However, the top menu will still be available.
- **Note!** Avoid using your browser's Back button.

Favourite and home screens

- user specific favourite and home screens can be accessed quickly from the top-left corner of the front page of Vaksi.
- To add a screen to your favourites, click the star icon on the top-right corner of the screen in question  . To set a screen as your home screen, click the triangle icon on the top-right corner of the screen  . To undo your selection, click the icon again.

2.2.3 Submitting aFRR, FCR and FFR bids

aFRR, FCR and FFR markets bid submission

Submitting aFRR capacity bids to Vaksi is only enabled in case of fallbacks 1 and 2 of NMMS platform. In these cases, bids are entered using the: *aFRR reserve bid input* screen.

aFRR energy market bidding in VAKSI:

1. XML message via ECP network
2. Vaksi user intefrace via the aFRR menu:
    - aFRR energy market 15Min → aFRR energy market bidding

There are two ways to submit FCR and FFR bids into the Vaksi database and delete

or adjust already submitted bids:

1. XML message via ECP network
2. Vaksi user interface via the Reserve menu:
    - Reserve products and their corresponding screens from Reserve bid menus:
        - FCR: Reserves → FCR order → Reserve bid input
        - FFR: Reserves → FFR → FFR reserve bid input

Message-based delivery of bids and trades

The transfer of bids and trades as XML messages between Vaksi and balancing service providers is done via the ECP network based on the MADES communication standard.

- MADES (MArket Data Exchange Standard) is the communication standard of ENTSO-E. It ensures that messages can only be read by the intended recipient.
- ECP (Energy Communication Platform) is an implementation of the MADES standard.
    - Balancing service providers must set up an ECP endpoint on their servers and register in Fingrid's ECP network.
    - The enterprise application of balancing service providers communicates with its own ECP endpoint using the MADES API.
    - The ECP endpoint transfers files to Fingrid's endpoint via Fingrid's ECP broker.

For more information about ECP, please visit https://ediel.org/nordic-ecp-edx-group-nex/market-actor-onboarding/

XML messages are based on the ENTSO-E's ERRP or CIM message standards.

- https://www.entsoe.eu/publications/electronic-data-interchange-edi-library/

More detailed implementation instructions are available:

- https://www.fingrid.fi/en/electricity-market/reserves_and_balancing/reserve-trading-and-information-exchange/
- https://www.fingrid.fi/en/electricity-market/reserves_and_balancing/reserve-trading-and-information-exchange/ecp-messaging2/

ECP installation support from Fingrid:

- ecp.support@fingrid.fi

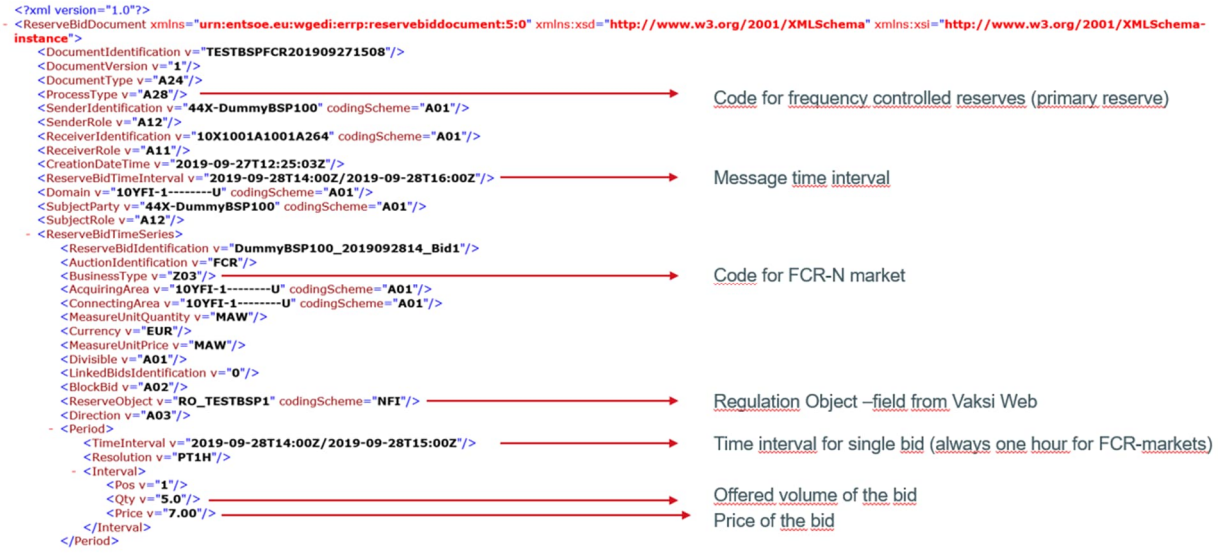
Bid submission through ECP

When using ECP, Vaksi user interface still works as a back-up system. Reserve party is obligated to check the status of bids in Vaksi if:

- Reserve party does not receive acknowledgement message after submitting bid via ECP.
- The market results received via ECP do not match the submitted bids in reserve party's system.

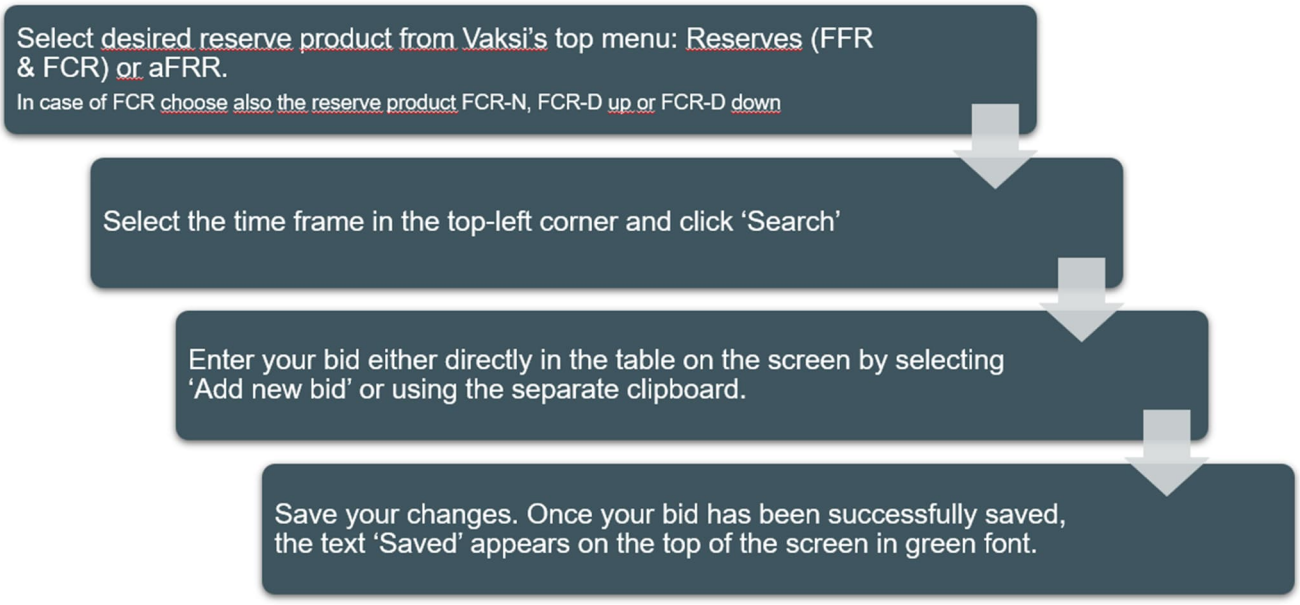
In addition to submitting bids, ECP can be used for:

- Reporting FFR, FCR-N, FCR-D up and FCR-D down trades as product-specific hourly sums for the reserve party and bid specific trades to the balance service provider.
- mFRR trades i.e. electronic activation of mFRR.



Example of an XML message (FCR-N bid)

Submitting reserve bids with user interface



Submitting aFRR, FCR and FFR bids

	Deadline for submitting, editing and deleting bids (GCT)	The earliest possible entry time for new bids (GOT)
aFRR capacity	08:30 (EET/EEST) for the next CET/CEST day	7 days from the entry time
aFRR energy	25 minutes before the time of use	7 days from the entry time
FCR	18:30 (EET/EEST) for the next CET/CEST day	31 days from the entry time
FFR	18:00 (EET/EEST) for the next CET/CEST day	31 days from the entry time

Deadlines for aFRR, FCR ja FFR bids

Bid details for aFRR, FCR and FFR in VAKSI

FCR hourly market bids

Required information:

- Time: date and hour (hour start time, EET/EEST)
- Volume (MW): volume of the bid to the nearest 100 kW
    - Minimum bid capacities: FCR-N 100 kW, FCR-D 1 MW
    - Maximum capacities for single bid: FCR-N 5 MW, FCR-D 10 MW
- Price (€/MW,h): the offered sum in EUR
- For FCR-D bids regulation method (Dynamic, Static)

Optional information:

- For FCR-D up bid, type (consumption, production, aggregated)
- Regulating object for FCR-N bids: the predefined regulating objects allowed for a reserve party will show in the drop-down menu when selecting ‘Add new bid’. If there is anything missing from the regulating object -list menu, please contact Fingrid. The plant name contains information about the balance responsible party and balance of the resource. Multiple resources can be aggregated into a single bid.

FCR yearly market plans

Binding plans must be submitted no later than 18:00 (EET/EEST) for the next day.

The yearly market plans must be sent to Fingrid electronically using the identifier FI_party_FCRN/FCRD/FCRD_ALAS_SUUN.

- FCRD = frequency containment reserve for disturbances up (FCR-D up).
- FCRN = frequency containment reserve for normal operation. (FCR-N)
- FCRD_ALAS = frequency containment reserve for disturbances down (FCR-D down).
- party = party ID, such as Fingrid = FG.

EDI message, DELFOR messaging.

The hourly volumes are submitted for the hours of a day in the CET/CEST time zone in MW. One series per party, a sum of all reserve objects. The volume is at most the current reserve contract yearly market appendix 4 agreement volume.

FFR bids

Required information:

- Time: date and hour (hour start time, EET/EEST)
- Volume (MW): volume of the bid to the nearest 100 kW, minimum bid capacity is 1 MW. Maximum capacity 10 MW per bid
- Price (€/MW,h): The price of the FFR bid in EUR
- Type: Aggregated, Consumption, Production

Optional details which are only added to combination bids:

- Combination bid: empty, FCR-D up hourly market, FCR-D up annual plan, FCR-N hourly market, FCR-N annual plan
- Way of regulation: Dynamic, Static. Regulation method of an FCR-D up bid
- Price of the combination bid: FCR-D up & FCR-N hourly market combination bid price in EUR. If left empty, the price is the same as the FFR price.

FFR combination bids

FCR-D up and FCR-N hourly market combination bids can be viewed in the FCR bids and trades reporting screen after the FFR procurement has been made and the deadline for submitting FCR bids has expired. Fingrid must be notified before leaving the first combination bid.

- The FFR trades of a combination bid are reported in the FFR bids and trades search screen
    - Also includes the FCR-D and FCR-N annual plan component of a combination bid
- FCR-D and FCR-N hourly market trades of a combination bid are reported in the FCR bids and trades screen

The FCR component of a combination bid cannot be adjusted after the deadline for submitting FFR bids has expired.

Tyyppi	Osapuoli	Alkaa	Päättyy	Teho	Hinta	Tyyppi	Yhdistelmätarjous	Yhdistelmätarjouksen säätötapa	Yhdistelmätarjouksen hinta (€/MW)	Tarjoustunnus
FFR tarjous	TESTI2	21.05.2024 01:00	02:00	5,0	10,00	Kulutus	FCR-D ylös tuntimarkkina	Staattinen	15,00	
FFR tarjous	TESTI2	21.05.2024 02:00	03:00	5,0	10,00	Kulutus	FCR-D ylös tuntimarkkina	Dynaaminen	15,00	
FFR tarjous	TESTI2	21.05.2024 03:00	04:00	5,0	11,00	Kulutus	FCR-D ylös vuosisuunnitelma		15,00	
FFR tarjous	TESTI2	21.05.2024 04:00	05:00	5,0	11,00	Aggregoitu	FCR-N tuntimarkkina		15,00	
FFR tarjous	TESTI2	21.05.2024 05:00	06:00	5,0	12,00	Aggregoitu	FCR-N vuosimarkkina			

aFRR energy bids

All approved aFRR capacity bids in Fifty NMMS platform obligate to submit a corresponding number of aFRR energy offers in Vaksi.

Required information:

- Time: date and hour (hour start time, EET/EEST)
- Volume (MW): volume of the bid to the nearest 1 MW
    - Positive value for aFRR up bids
    - Negative value for aFRR down bids

Transfer of aFRR obligation

Before transferring an aFRR obligation to another BSP, a BSP must determine an obligation transfer pair to themselves and inform Fingrid. The obligation can only be transferred to another BSP if:

- the obligation transfer pair has been predetermined and approved by Fingrid,
- the aFRR procurement has occurred,
- there is at least one hour before the corresponding Market time unit.

After both BSP-parties have approved the transfer of the reserve obligation from one BSP to another, they must notify Fingrid and correct their reserve obligations in Vaksi's ”aFRR Velvoitteen siirto” –screen.

After all the requirements are fulfilled, and the BSPs' reserve obligations correction columns match, the assignment of an aFRR reserve obligation to another BSP will be approved.

aFRR capacity market bids (backup solution)

Required information:

- Time: date and hour (hour start time, EET/EEST)
- Volume (MW): volume of the bid to the nearest 1 MW
    - Minimum bid volume: 1 MW
    - Maximum bid volume: 50 MW
- Price (€/MW,h): The price of the bid in EUR
- Production type: Heat (Lämpö) or Hydro (Vesi)

The bids submitted to Vaksi are fully divisible.

Block bids and exclusive bids are not possible.

2.2.4 mFRR energy and capacity bids

Submitting mFRR energy bids

There are two ways to submit mFRR energy bids into the Vaksi database and delete or edit already submitted bids:

1. XML messages via the ECP network
2. Via Vaksi interface. Under mFRR section, “mFRR bid input” screen.
   - ”Add new bid”: a table opens to the top of the screen that can be used to submit individual bids or the same bid for longer time. Similarly, as with FCR and FFR bids (see section 2.2.3 *Bid submission through ECP*).

Deadlines for submitting bids

- Offers must be submitted, and they can be edited/deleted no later than 45 minutes before the beginning of the hour in question. If there is a failure in the resource after this deadline, the BSP must contact Fingrid control center in order to delete the bid.
- Bids may be submitted for a maximum of 31 days from the time of submitting the bid.

Submitting mFRR energy bids with Vaksi interface

1. Select the time frame in the top-left corner and click ‘Search’
2. Enter your bid either directly in the table on the screen by selecting ‘Add new bid’ or using the separate clipboard.
   - ”Add new bid’: A table opens at the top of the screen where you can submit individual bids or the same bid but for a longer period of time
   - Clipboard: We recommend using the clipboard to submit more complex bids because the necessary data can be copied to the clipboard for example from an Excel spreadsheet. The clipboard requires standard bid information, but the data in the reserve and aggregation fields is given in numbers. The data must be tab delimited, but you can also use a semicolon or comma. After adding your bids to the clipboard, export your data to the table by selecting ‘Export to table’.
3. Save your changes. Once your bid has been successfully saved, the text ‘Saved’ appears on the top of the screen in green font. Saved bids are in black font if the bid in question is not a reserve bid, which are highlighted in red font.

Details of mFRR energy bid

Required information:

- *Time*: date and hour (hour start time, EET/EEST)
- *Volume (MW)*: volume of the bid in full megawatts; in downward balancing bids, the volume is negative.
- Price (EUR): the price of the bid in EUR. Maximum price of a regulation bid is 10 000 €/MWh and minimum -10 000 €/MWh.
- Power station: To see the pre-defined power stations determined for a BSP in the ‘Power station’ drop-down menu, select ‘Add new bid’. If there are deficiencies or changes needed in the list, contact Fingrid. The power station name contains information about the balance responsible party of the resource.

- Other information required for bids includes location and balance (consumption/production). These are defined in the power station list and are not needed to be added to the bid separately. The location and balance are displayed as part of the bid on the mFRR energy bids and trades screen and the bids and trades reporting screen.
- BSPs can submit maximum of 5 under 5 MW bids for up- and down-regulation per hour (total of 10 under 5 MW bids per hour).

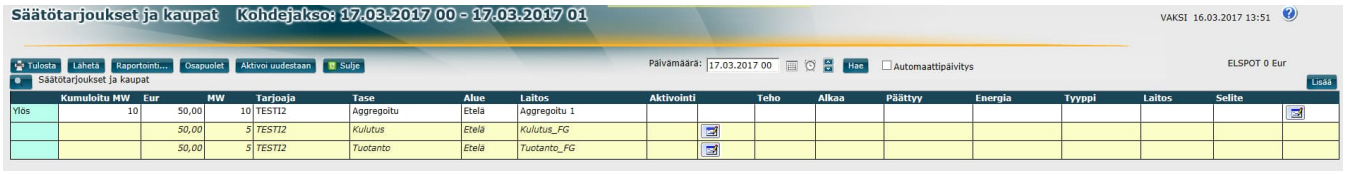
Optional details, with further instructions below:

- *Aggregation*
- *Reserve*

Aggregated regulation bids

The bids must be entered separately for each power station name, and they must be given the same combination number in the aggregation field. The numbers are intended to separate bids with different prices, and they are used sequentially. On the clipboard, the numbers 1-10 correspond to the aggregation combinations.

- The aggregated bids are displayed on the 'Bids and trades' page as upper level sum bids, and partial bids can be viewed by clicking an upper level bid.



- If Fingrid orders only a part of an aggregated bid, the trades are concluded for all partial bids in proportion to their bid sizes. A residual bid is identified by adding the letter A at the end of the name.

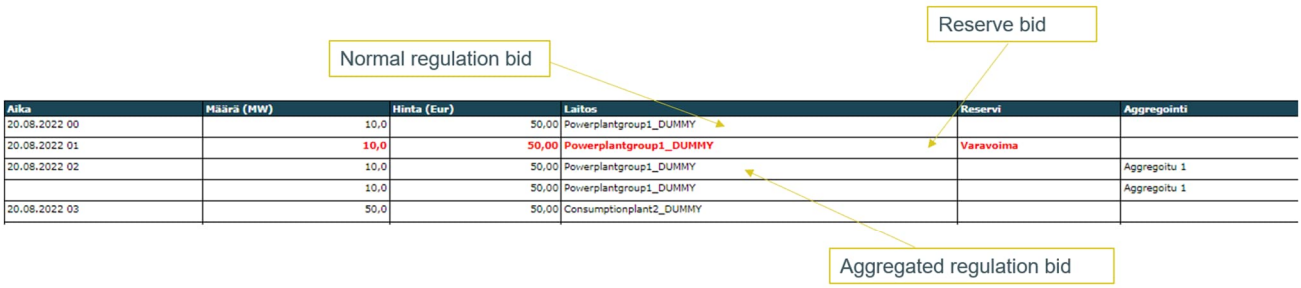
Seperation of reserve bids

Reserve power plant bids must be separated into reserve bids when submitting a bid. These bids are used after the voluntary mFRR energy bids and mFRR energy bids resulting from the capacity market. They are highlighted in red font.

Reserve field of the table is selected to Reserve power plant or number 2 is entered to the clipboard.

If you are submitting a standard mFRR energy bid or mFRR energy bids resulting from the capacity market, leave the Reserve field empty or enter 0.

Example of submitting a mFRR energy bid



Aika	Määrä (MW)	Hinta (Eur)	Laitos	Reservi	Aggregointi
20.08.2022 00	10,0	50,00	Powerplantgroup1_DUMMY		
20.08.2022 01	10,0	50,00	Powerplantgroup1_DUMMY	Varavoima	
20.08.2022 02	10,0	50,00	Powerplantgroup1_DUMMY		Aggregoitu 1
	10,0	50,00	Powerplantgroup1_DUMMY		Aggregoitu 1
20.08.2022 03	50,0	50,00	Consumptionplant2_DUMMY		

Same view on the clipboard:

```
PP.KK.VVVV TT<tab>Määrä (MW)<tab>Hinta (Eur)<tab>Laitos<tab>Reservi<tab>Aggregointi
20.08.2022 00  10  50  Powerplantgroup1_DUMMY 0  0
20.08.2022 01  10  50  Powerplantgroup1_DUMMY 2  0
20.08.2022 02  10  50  Powerplantgroup1_DUMMY 0  1
20.08.2022 02  10  50  Powerplantgroup1_DUMMY 0  1
20.08.2022 03  50  50  Consumptionplant2_DUMMY  0  0
```

Deleting an mFRR energy bid

To delete an individual bid, click the recycle bin icon in the data entry table: 

- The bid is then shown with strikethrough in the table.
- Save your changes.

If you need to delete more than one bid, we recommend using the clipboard:

- Select the time frame from which you want to delete bids.
- Select clipboard.
- Clear the clipboard but leave date and hour. If the date and time are not left, no changes will be made to the bid even after saving.
- Select ‘Export to table’ and save.

mFRR capacity market

Submitting mFRR capacity bid

BSPs can enter, edit and delete bids manually in Vaksi under the menu:

- *mFRR → Hourly markets → mFRR capacity bid input*

Time limits for bid submission

- Bids must be submitted before 9.30 (EET/EEST) for the next CET/CEST day.
- Bids may be submitted for a maximum of 31 days from the time of submitting the bid.

Details of mFRR capacity bid

- Direction (up/down)
- Regulation area (North/Central/South)
- Hour
- Price (€/MW,h), between 0,01 – 10 000 €
- Volume (MW), 1 MW resolution
    - Minimum bid size is 1 MW and maximum bid size is 50 MW

- More information about the details of capacity bids can be found from the mFRR capacity market implementation guide: https://www.fingrid.fi/globalassets/dokumentit/fi/sahkomarkkinat/reservit/implementation-guide-mfrr-capacity-market.pdf

3. Activation

Activation

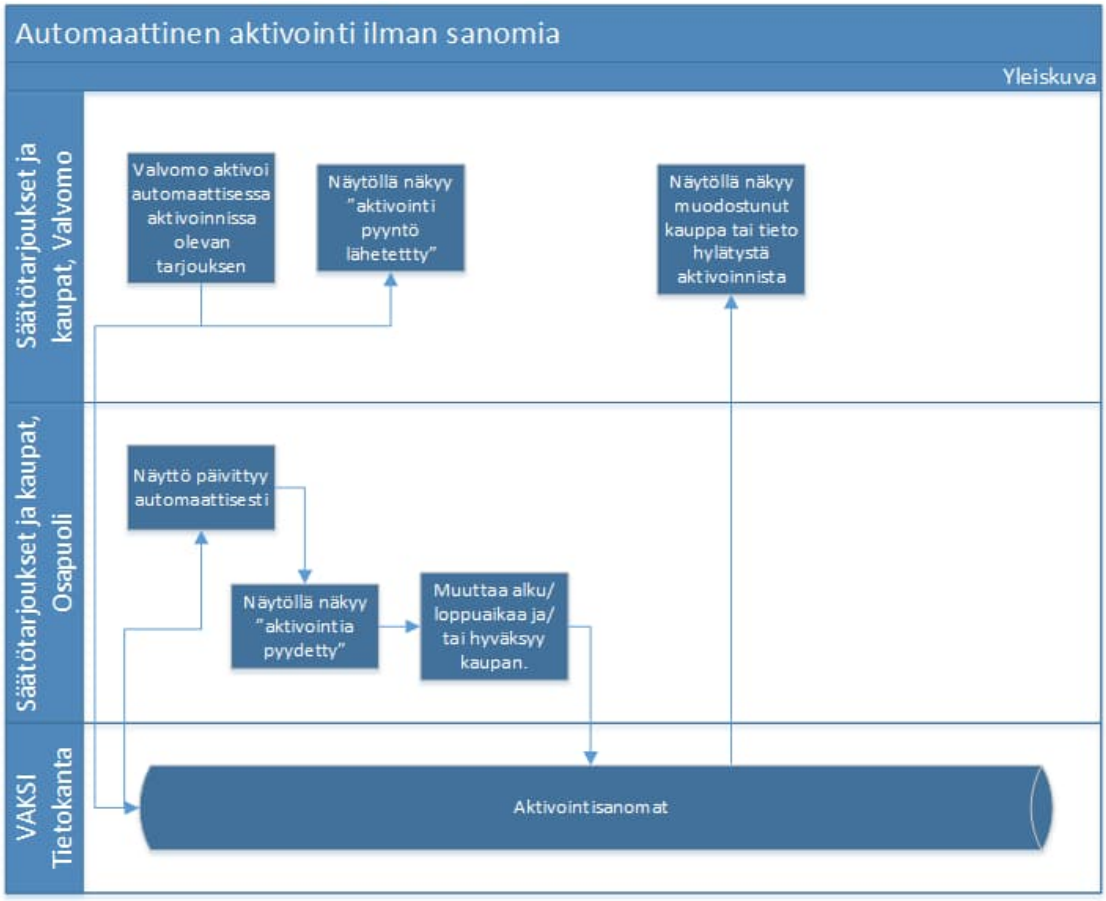
For frequency containment reserve for normal operation (FCR-N), frequency containment reserve for disturbances (FCR-D up & FCR-D down) and fast frequency reserve (FFR), the regulation is autonomous and based on the local frequency measurement.

Fingrid issues the aFRR activation signal through the ELCOM or ICCP protocol, which requires access to the FEN/KoVa FEN network.

In the mFRR energy market, Fingrid orders bids electronically or by phone call.

- An electronic order is placed through an XML message via ECP path using the MADES data exchange standard (MADES = MArket Data Exchange Standard) or on the Elcom or ICCP signal sent by Fingrid. The reserve provider must generate an alert in their systems for this.
- For electronic orders, the minimum bid volume is 1 MW. For other orders, the minimum volume is 5 MW.
- An electronic order is required for mFRR energy bids acquired through the mFRR capacity market.

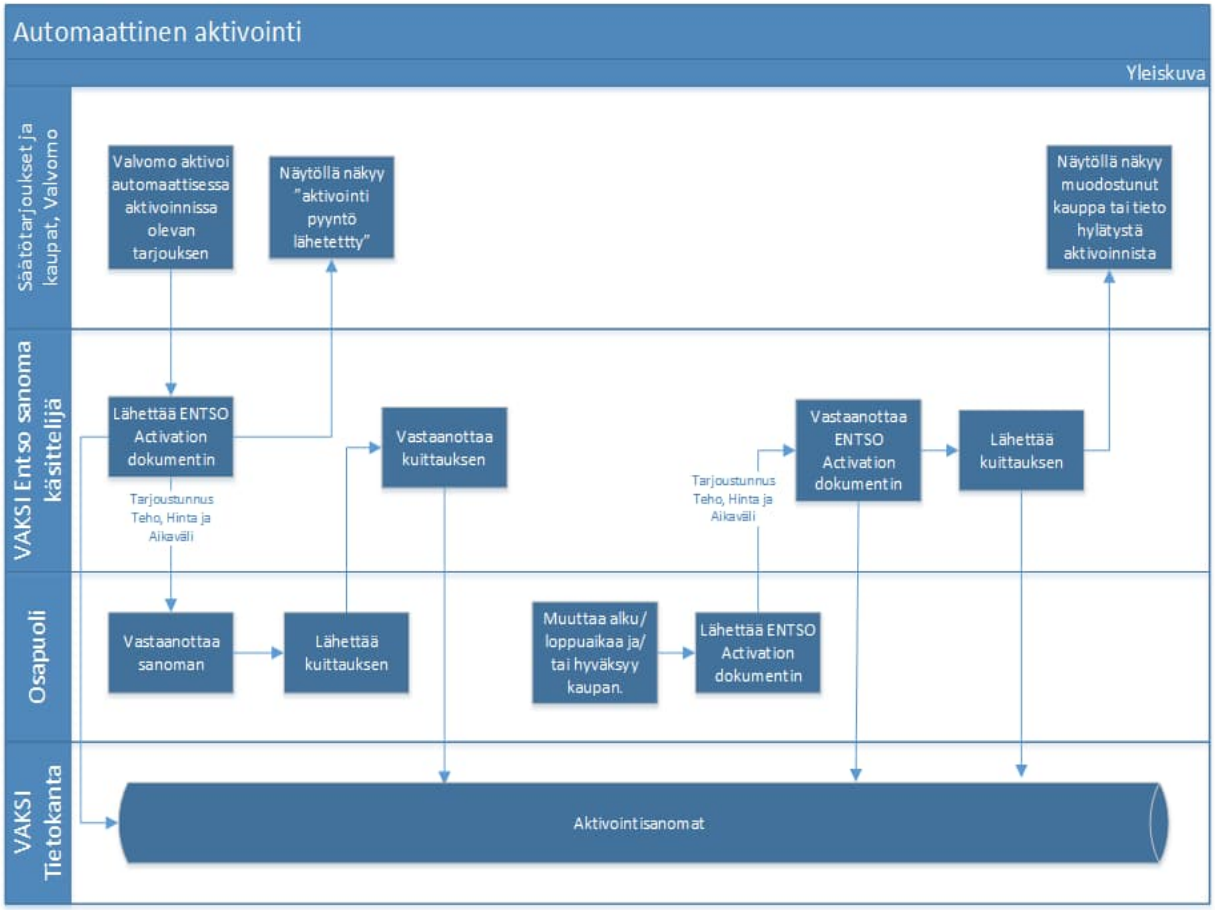
Electronic ordering of mFRR energy bids using Elcom- or ICCP-signal



- A party can see an order in the regulation energy market in Vaksi.
- The order is accepted in Vaksi.

- It is not possible to create an alert for an order in Vaksi.
- Alerts can be issued to parties using Elcom or ICCP signal for e.g. in the operational control system or operational support system.

Electronic ordering of mFRR energy bids using messages



- An order in the mFRR energy market is sent to a party as a message (ENTSO-E ERRP activation document).
- The party's system sends an acknowledgement message of receiving the order.
- The party sends a message acknowledging an accepted order.

Document	Attribute	Code and description
ERRP Activation Document		***Activation Document***
	Document Identification	Unique identification of the document
	Document Version	Fixed 1
	Document Type	**A36** Deactivation document **A39** SATCR activation **A40** DATCR activation (normal activations based on MOL) **Z15** DATCR activation, move (change) of planned production **A41** Activation response Code ***A39*** *SATCR activation* is only used in Denmark.
	Process Type	**A29** Secondary reserve process, i.e. FRR-A market **A30** Tertiary reserve process, i.e. Balance regulation market
	Sender Identification	Identification of the party who is sending the document
	Sender Role	**A04** System operator **A27** Resource Provider
	Receiver Identification	Identification of the party who is receiving the schedules
	Receiver Role	**A04** System operator (for the response) **A27** Resource Provider
	Creation Date Time	Date and time for creation of the document
	Activation Time Interval	The beginning and ending date and time of the period covered by the document
	Domain	National area
	Order Identification	Unique identification of the activation order. "Activation ID". The same *Activation id* is used in the request and the response.
	Order Identification Version	The version of the activation order. Incremented with one for each transmission of the document from the System Operator. The same version is used in the request and the response.
		Activation Time Series
	Allocation Identification	Reference to relevant bid or an "Move of planned production ID". *The "Move of planned production ID" is only used for Document Type* ***Z15*** *(DATCR activation, move (change) of planned production)*
	Resource Provider	The identification of the Resource Provider related to the contract identification
	Business Type	**A01** Production **A04** Consumption **A12** Secondary control (A time series concerning secondary reserve) (**FRR-A**, earlier **LFC**) **A96** Automatic frequency restoration reserve **A97** Manual frequency restoration reserve
	Acquiring Area	Market Balance Area
	Connecting Area	Market Balance Area (repeated from Acquiring Area)
	Measure Unit	**MAW** MW
	Direction	**A01** Up **A02** Down
	Status	*Only in the request:* **A10** Ordered (The quantities in the time series are to be activated) *Only in the response:* **A07** Activated (*The quantities in the time series have been activated*), i.e. confirmation
		A09 Cancelled (*The tender indicated in the time series has been completely cancelled. In this case the resources are no longer available to all Acquiring System Operators*), i.e. rejection.
	Resource Object	Identification of the resource that is used to supply energy capabilities to the System Operator
		Period
	Time Interval	The start and end date and time of the time interval of the period in question
	Resolution	The time resolution is always the difference between the Time Interval End and the Time Interval Start.
		Interval
	Pos	The position of the observation in a time series – Always 1
	Qty	The quantity for the interval in question
		Reason (Interval Level)
	Reason Code	**Z20** Frequency regulation **Z21** System regulation

Example of an activation bid in mFRR energy market.

4. Reporting and invoicing

4.1 Reporting

4.1.1 Real-time reporting

The balance servive provider obligated to supply real-time data to Fingrid. The data exchange must meet the requirements of the most recent prequalification tests of the reserve object. The delivery methods for status information of reserve objects include FEN or KoVa-FEN network (using ELCOM, ICCP, or IEC 60870-5-104 protocols) and web data transfer. For aFRR, the only possible delivery method is the ICCP protocol. In Finland, FEN/KoVa-FEN network connection is provided by Erillisverkot Oy. The BSP can create a real-time data transfer connection independently or use a service provider. If a service provider is chosen for real-time communication, the provider must first arrange real-time data transfer to the service provider, after which all necessary real-time communication testing is handled by the service provider and Fingrid

Setting up a real-time data exchange connection between the BSP and Fingrid involves the following steps:

1. Ensure the implementation of data exchange in your own systems.
2. Select the protocol for real-time data exchange.
3. Notify Fingrid about the establishment of the data transfer connection.
4. Arrange the testing of the real-time connection with Fingrid.

FEN / KoVa FEN:

1. Notify Erillisverkot Oy of your interest in establishing a FEN / KoVa FEN network connection.
2. Create the necessary protocol partner with the help of your real-time system provider.
3. Inform Fingrid of the need for a real-time connection, after which you will receive the AIEF document containing the necessary information for establishing the connection with Fingrid's real-time system.

Web data transfer:

1. Notify Fingrid of the system's IP address for firewall whitelisting.
2. Fingrid will handle the integration of data exchange between the reserve provider and Fingrid.

The BSP must must note that the aFRR real-time data transfer connection must be established separately, and it requires a separate ELCOM/ICCP data transfer connection.

The BSP must provide Fingrid with a description of the implementation of the real-time data calculation along with the prequalification test report.

The required real-time signals for reserve targets and their requirements are comprehensively available in the Reserve infromation exchange -signal list.

In addition to real-time data for reserves, other requirements have been defined for electrical equipment and power plants connected to the Finnish power system. The real-time data exchange for these must comply with the currently valid Real-Time information exchange –guide. The same

information (for example, active power measurement) does not need to be provided twice if it is already supplied for other reasons and meets the required accuracy.

FCR

The update interval must be 60 seconds at most, unless otherwise specified.

Required information from each reserve unit:

- Volume of maintained reserve capacity (MW), separately for FCR-N, FCR-D up and FCR-D down
- Momentary active power (MW)

Volume of maintained reserve describes the current actual volume of the maintained capacity. Activation of the reserve must not reduce the volume of the maintained capacity.

The accuracy for reporting active power and maintained reserve capacity must be within ± 5 % for targets under 1,5 MW, ± 1 % for targets between 1,5-10 MW, and ± 0,5 % for targets over 10 MW. The resolution should be 0,01 MW

For weather dependent reserves also:

- Available active power, Pavailable (MW), update interval 10 seconds

Additionally, for Limited Energy Reservoir's (LER):

- Remaining activation capability (min), separately for FCR-N, FCR-D up and FCR-D down
- Normal state energy management (NEM) power (MW), separately for FCR-N, FCR-D up and FCR-D down
- Alert state energy management (AEM) status (on = 1, off = 0), separately for FCR-N, FCR-D up and FCR-D down

The remaining activation capability of a reserve expresses how long the reserve could be fully and continuously activated with the energy currently available.

- The reported activation capability of FCR-N is the minimum of the upwards and downwards endurance.

If the information on LER is reported from an aggregated resources, the data is delivered as follows:

- AEM status = 1, if even one sub-target has activated reserve level management.
- The remaining activation capacity is reported as the minimum value of the individual objects in the portfolio.

More information and the calculation formulas: Technical Requirements for Frequency Containment Reserve Provision in the Nordic Synchronous Area

FFR

The update interval must be 60 seconds at most, unless otherwise specified.

Required information from each reserve unit:

- Volume of maintained reserve capacity (MW)
- Momentary active power (MW)

Volume of maintained reserve describes the current actual volume of the FFR maintained. Activation of the reserve must not reduce the volume of the reserve maintained.

The accuracy for reporting active power and maintained reserve capacity must be within ± 5 % for targets under 1,5 MW, ± 1 % for targets between 1,5-10 MW, and ± 0,5 % for targets over 10 MW. The resolution should be 0,01 MW

For weather dependent reserves also:

- Available active power, Pavailable (MW), update interval 10 seconds

More information and the calculation formulas: The technical requirements and the prequalification process of Fast Frequency Reserve (FFR)

aFRR

The update interval must be 10 seconds at most, unless otherwise specified.

Required information from each reserve unit:

- Volume of maintained reserve capacity, separately for up and down regulation (MW)
- Momentary active power (MW)
- Amount of activated reserve (MW)
- Retransmission of the activation signal sent by Fingrid.
- Retransmission of the watchdog signal, update interval 4 seconds.

For weather dependent reserves also:

- Available active power, Pavailable (MW)

Volume of maintained reserve capacity describes the current actual volume of the maintained aFRR. Activation of the reserve must not reduce the volume of the reserve maintained.

The volume of maintained reserve, momentary active power and the amount of activated reserve are reported to the nearest 0,1 MW.

mFRR

The update interval must be 60 seconds at most, unless otherwise specified.

Required information from each reserve unit:

- Active power measurement (MW) or other real-time data that enables Fingrid to verify the activation of the reserve

The active power is reported to the nearest 0,1 MW.

4.1.2 Reporting of FCR hourly market trades

The FCR hourly market trades can be seen in Vaksi in the Reserve bids menu under ‘Search for hourly market bids and trades.

BSPs may also receive the trades reports from Fingrid in XML format, see section 2.2.3.

4.1.3 Reporting of FFR trades

The FFR trades can be seen under ‘Search FFR bids and trades in the Reserves/FFR menu in Vaksi.

BSPs may also receive the trades reports from Fingrid in XML format, see section 2.2.3.

4.1.4 Reporting and invoicing data of aFRR trades

The aFFR capacity market trades can be seen on NMMS platform and under ”Search aFRR reserve bids and trades” in the aFRR menu on Vaksi.

The aFFR energy market trades can be seen in VAKSI

- *aFRR → aFRR energy market 15Min → Reporting of aFRR energy bids and trades*

BSPs may also receive the trade reports from Fingrid in XML format, see section 2.2.3.

4.1.5 Reporting of mFRR energy bids and trades

The page ‘mFRR bid input’ screen shows the bids entered for a specific time period.

Trades and bids can be viewed on the ‘Reporting of mFRR bids and trades’ page using different search criteria.

The tree menu on the home page also contains an Excel report, in which trades and bids are shown as hourly time series divided into production and consumption.

4.1.6 Reporting of mFRR capacity market results

The results of the mFRR capacity market will be reported in Vaksi:

- *mFRR → Hourly markets → mFRR capacity sale report*

It is also possible to report the result using a message

- Messages are sent daily after the procurement has been made.
- In the message, it is reported for each bid whether the bid was accepted in the auction completely, partially, or not at all."
- The total procurement volume and the marginal price of the hour are also published on Fingrid's website, Open Data platform and on the ENTSO-E transparency platform

4.1.7 Reporting of balancing energy

The balancing energies are reported along with the Imbalance Settlement performed by eSett Oy.

4.1.8 FFR and FCR history data

Balancing Service Provider shall store history data for at least 14 days.

Fingrid requests history data via email, and providers can appoint several contact persons for history data requests.

The data must be delivered as reserve unit specific .csv files in a format specified by Fingrid after five workdays from the request at the latest

The file to be sent should be named in the format:
[Date]_[Area]_[Resource]_[Interval]_[Timezone].csv, where

[Date] is date at which the data is written to the file, format YYYYMMDD, e.g. 20180916
[Area] is the area, where the reserve object is located, in Finland FI
[Resource] is the name of the reserve object as it is written in the Restore-system
[Interval] is the time period from which the history data is being delivered,
format YYYYMMDDThhmm-YYYYMMDDThhmm, e.g. 20180914T0935-20180914T0935 (according to standard ISO 8601)
[Timezone] is the time zone of the data,e.g. CET or UTC

Format of the file to be delivered:

- The file must contain a title line and the corresponding value lines.
- The character encoding standard to be used is ASCII, fields must be separated by a semicolon (;), the decimal separator is comma (,) and the line break is ASCII/CRLF
- Date and time must be presented in the format YYYYMMDDThhmmss.nnn in accordance with the ISO 8601 standard, where 'nnn' represents fractions of second

The numerical values must be presented to three decimal places without units.

Status information (on/off) must be reported as binary (0 = off, 1 = on).

The data save interval for FCR must be at least 1 second and for FFR at least 0,1 seconds.

Sign rule for instantaneous active power: net consumption negative (-), net generation positive (+).

Example of contents for FFR:

DateTime,Cap_Ffr,InsAcPow,GridFreq,ContSetP,ContMode,ContOutSig,inLimFfr
20180914T093502.000,10.000,10.000,50.000,10.000,FFR1,0.000,0
20180914T093503.000,10.100,10.100,49.990,10.100,FFR1,0.000,0

Required FCR history data:

Name	Description	Unit
InsAcPow	Instantaneous active power	MW
GridFreq	Grid frequency	Hz
Baseline	Power setting, calculated baseline	MW
Cap_Fcrn Cap_FcrdUp Cap_FcrdDo	Reserve capacity maintained	MW
Pmax	Maximum power of the Reserve Unit	MW
Pmin	Minimum power of the Reserve Unit	MW
ContStatus_Fcrn ContStatus_FcrdUp ContStatus_FcrdDo	Controller status	on/off
RegStr_Fcrn RegStr_FcrdUp RegStr_FcrdDo	Balancing power	MW/Hz
Endurance_Fcrn Endurance_FcrdUp Endurance_FcrdDo	Activation endurance*	min
NEM	Normal state energy management (NEM) power*	MW
AEM	Alert State Energy Management (AEM) status*	on/off
Act_Fcrn Act_FcrdUp Act_FcrdDo	Activated reserve (calculated)	MW

** For Limited Energy Reservoirs (LER) only*

In addition, Fingrid recommends recording the variables that affect the available active power for weather-dependent production (wind speed, solar radiation, etc.).

Required FFR history data:

Name	Description	Unit
InsAcPow	Instantaneous active power	MW
GridFreq	Grid frequency	Hz
Cap_Ffr	Reserve capacity maintained	MW
ContSetP	Controller set value	MW
ContOutSig	Controller output (optional)	MW
ContMode	Controller mode	String
inLimFfr	Indicator of potential activation limitations (optional)	on/off

In addition, Fingrid recommends recording the variables that affect the available active power for weather-dependent production (wind speed, solar radiation, etc.).

4.1.9 aFRR history data

Balancing Service Provider shall store aFRR history data for at least 1 month.

Fingrid requests history data via email, and providers can appoint several contact persons for history data requests.

The data must be delivered as reserve unit specific .csv files in a format specified by Fingrid after five workdays from the request at the latest.

The file to be sent should be named in the format:
[Date]_[BSP]_[Interval]_[Timezone].csv, where

Date] is date at which the data is written to the file, format YYYYMMDD, e.g. 20180916
[BSP] is the name of the BSP
[Interval] is the time period from which the history data is being delivered,
format YYYYMMDDThhmm-YYYYMMDDThhmm, e.g. 20180914T0935-20180914T0935 (according to standard ISO 8601)
[Timezone] is the time zone of the data,e.g. CET or UTC

Format of the file to be delivered:

- The file must contain a title line and the corresponding value lines.
- The character encoding standard to be used is ASCII, fields must be separated by a semicolon (;), the decimal separator is comma (,) and the line break is ASCII/CRLF
- Date and time must be presented in the format YYYYMMDDThhmm

The numerical values must be presented to three decimal places without units.

The data recording interval for aFRR is 1 minute, and the records use a 1-minute average calculated from real-time.

Required aFRR history data:

Name	Description	Unit
aFRR_cap_up	Maintained aFRR capacity up	MW
aFRR_cap_down	Maintained aFRR capacity down	MW
aFRR_activated	Activated aFRR energy	MW
aFRR_signal	aFRR control signal received from Fingrid.	MW

4.2 Invoicing

4.2.1 Invoicing guide

The energy fees are billed at the same time as imbalance power billing. The balance service provider invoices Fingrid for the sold reserve capacity. If the sanctions determined for the billing period exceed the capacity compensation, the BSP is also obliged to send an invoice (negative value) in these situations. The invoice must include the following information:

- Invoices primarily as e-invoices, billing information available: https://www.fingrid.fi/en/pages/contacts/billing-addresses/,
- Invoice reference Fingrid's contact person, Reserves: Kim Nyyssönen,
- Information on separate lines about the service or goods sold (reserve products), quantity (including undelivered separately), unit price, price excluding VAT, amount of VAT and price including VAT per line,
- Billing period,
- Information of the invoicing company: Official name, business ID, VAT number, and payment information,
- Contact person and contact details for clarification

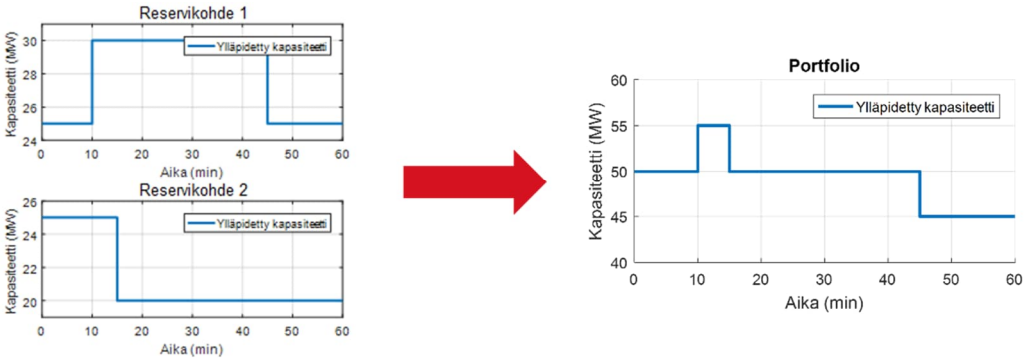
The BSP sends Fingrid an invoice for the maintained reserves of the previous month on the tenth day of each month or the next business day.

4.2.2 Reserve invoicing based on real-time data

The input data is unit-specific real-time data of a balancing service provider's maintained volume of FCR-N, FCR-D up, FCR-D down, FFR, aFRR up and aFRR down capacity. Maintained volumes of FCR-N, FCR-D up and down, FFR and aFRR up and down are calculated separately according to the same principle.

- 1-min averages are calculated using real-time data, on which later calculations are based.
- 1-min averages of reserve units in the same portfolio are summed → this yields the maintained portfolio-specific reserve capacity.
- The comparison of the maintained reserve to reserve trades must be done with 1 min accuracy without temporal netting.

Maintained reserve capacity may vary over time depending the operation of the unit!



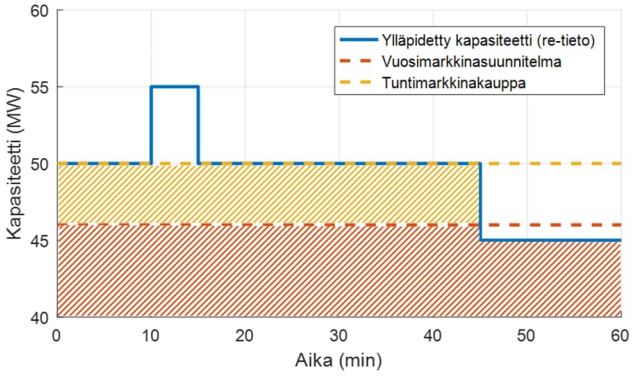
Calculation principle of yearly and hourly market capacity to be used in invoicing:

- Trading period-specific reserve capacity to be used in invoicing:
  Yearly market capacity:
  Red area / 60 min

  Hourly market capacity:
  Yellow area / 60 min

- Billing reviews are based on minute data, which is used to determine the hourly sum

- Sanctions are calculated on the basis of undelivered reserve capacity



4.3 Undelivered reserve

The reserve supplier can only participate in the reserve market with available reserve capacity, i.e. in the event of a failure, submitted offers must be edited/deleted.

If a restriction appears for the reserve supplier at the time of use or for future market time periods (in which the party has binding offers or approved trades), the planned maintenance of the reserve must be carried out at the party's other approved reserve sites.

If fault limits or completely interrupts the maintenance of the reserve, the Reserve supplier must notify Fingrid without delay in writing to the address reservit@fingrid.fi and Fingrid reserve responsible (information available at Fingrid www-site). The notification must contain information about the party, the reserve object, a description of the reasons for the failure and the estimated start and end of the obstacle.

In addition, BSP-specific shortfalls in reserve capacity of more than 10 MW or unfeasible mFRR energy offers must be reported to Fingrid's central network center at tasehallinta@fingrid.fi or by phone.

If the reported disruption in maintenance is determined by Fingrid to be a force majeure (see definition in contract appendix 1), no sanctions will accrue to the Reserve supplier. The reserve supplier must mention separately if some of the sanctions are not on the invoice.