

Imbalance pricing in Finland

The imbalance pricing was changed first on June 12, 2024, when the automatic Frequency Restoration Reserve (aFRR) energy market was implemented in Finnish balancing energy market. The imbalance price was changed to take into account both aFRR and manual Frequency Restoration Reserve (mFRR) components, in accordance with the energy balancing guidelines. The dominating direction will remain unchanged until the common Nordic connection to the European mFRR energy market place MARI.

As of 1 June 2026, the imbalance price will be calculated on a volume-weighted basis when activated mFRR in Finland is in the dominating direction. The imbalance price is calculated by using the 15-minute volume-weighted price of aFRR, the marginal price of mFRR, the satisfied demand of aFRR from the PICASSO platform, and the mFRR energy activated in Finland.

Dominating direction up

$$\frac{((VWA_{aFRR} price_{up} \text{ €/MWh} * aFRR_{satisfied demand}_{up} \text{ MWh}) + (mFRR_{price_{up} \text{ €/MWh}} * mFRR_{activated energy}_{up} \text{ MWh}))}{(aFRR_{satisfied demand}_{up} \text{ MWh} + mFRR_{activated energy}_{up} \text{ MWh})}$$

Dominating direction down

$$\frac{((VWA_{aFRR} price_{down} \text{ €/MWh} * aFRR_{satisfied demand}_{down} \text{ MWh}) + (mFRR_{price_{down} \text{ €/MWh}} * mFRR_{activated energy}_{down} \text{ MWh}))}{(aFRR_{satisfied demand}_{down} \text{ MWh} + mFRR_{activated energy}_{down} \text{ MWh})}$$

If the activated mFRR in Finland is in the opposite direction than the dominating direction, the imbalance price is determined by the maximum of mFRR marginal price and volume-weighted aFRR price (VWA_{aFRR}) when the dominating direction is upward. Similarly, the minimum of these components determines the imbalance price when the dominating direction is downward.

$$Max(VWA_{aFRR, up}, mFRR_{up})$$

$$Min(VWA_{aFRR, down}, mFRR_{down})$$

The result will be rounded to two decimal (0,01 EUR/MWh).

Dominating direction and value of avoided activation

The dominating direction is based only on mFRR activations in the uncongested area. If there is no dominating mFRR direction in the market time unit, the imbalance price will be based on the Day-ahead price, even if aFRR activations have been made during that time period.

If Finland's aFRR balancing demand has been fulfilled in PICASSO platform with netting and the aFRR price for requested direction will not be formed, the Day-ahead price -based value of avoided activation will be used for these 4s market time units. When calculating the volume-weighted average aFRR price, the Day-ahead price is taken as the reference price for these time periods, and the volume is Finland's aFRR balancing demand.

Volume weighted aFRR

The volume-weighted average of the aFRR energy marginal prices aims to decrease the impact of short term price spikes. In the volume weighting, each 4s aFRR marginal price in the dominating direction is weighted by the volume of the fulfilled balancing demand in this 4s market time unit.

The volume used in the calculation is the instantaneous aFRR activation need of the Finnish bidding zone, which can be fulfilled on the PICASSO platform, i.e. the satisfied balancing demand. Therefore, the aFRR volume activated from the Finnish bidding zone to the needs of other countries on the PICASSO trading platform is not included in the volume weighting, and the aFRR activated from other countries to the Finnish needs is included in the volume weighting.

$$VWA_{aFRR} = \frac{\sum(\text{marginal price}_{4s} \times \text{aFRR volume}_{4s})}{\sum(\text{aFRR volume}_{4s})}$$

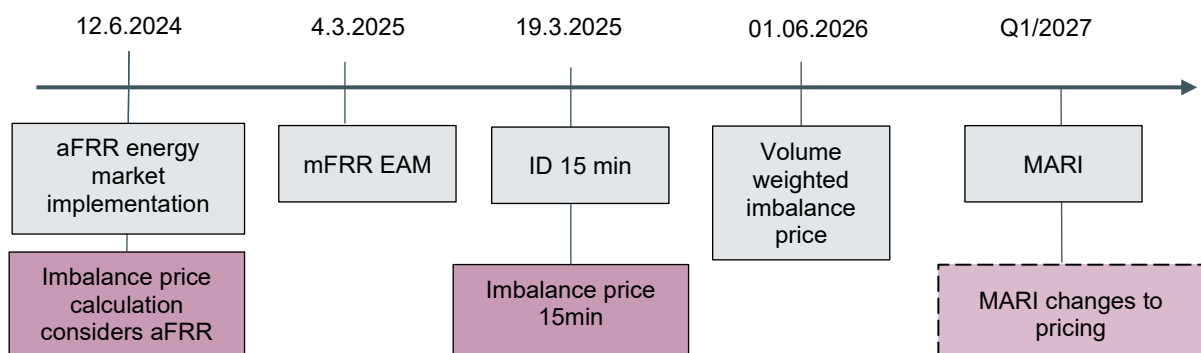
The volume-weighted average of the aFRR energy price is calculated for both up and down regulation. If there is no activation demand in that direction for the time period, the volume-weighted average does not consider these activation periods when calculating the imbalance price. The volume-weighted aFRR is taken into account in the imbalance price only in the dominant direction, the activation demand for the opposite direction is ignored.

Publication

The imbalance price is published with a small delay on Fingrid's website, Open Data portal and ENTSO-E's transparency platform.

Schedule

The calculation of the imbalance price will be reviewed once the common Nordic connection to the European mFRR energy marketplace (MARI) is implemented. In addition, the connection will introduce changes to the determination of the dominating direction, the use of the incentive component, and the calculation of the value of avoided activation. The pricing of mFRR products will also change, as separate prices will be introduced for direct and scheduled mFRR activations.



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Example

1. Dominating direction based on the mFRR activations in a uncongested area

Time EET/EEST	Finland mFRR up MWh	Finland mFRR down MWh	Uncongested area	Uncongested area up MWh	Uncongested area down MWh	Finland dominating direction
15:00	50	0	FI	50	0	Up
15:15	0	-30	FI, SE1, SE2, SE3, SE4, NO4, NO5	0	-100	Down
15:30	50	0	FI, SE1, SE2, SE3, SE4, NO4, NO5	50	-150	Down
15:45	0	0	FI, SE1, SE2, SE3, SE4, NO4, NO5	100	0	Up

2. Forming of imbalance price, aFRR satisfied demand included

Time EET/EEST	Finland aFRR up MWh	Finland aFRR down MWh	Finland mFRR up MWh	Finland mFRR down MWh	Uncongested area	Uncongested area up MWh	Uncongested area down MWh	Finland dominating direction
15:00	20	0	50	0	FI	50	0	Up
15:15	0	-20	0	-30	FI, SE1, SE2, SE3, SE4, NO4, NO5	0	-100	Down
15:30	0	30	50	0	FI, SE1, SE2, SE3, SE4, NO4, NO5	50	-150	Down
15:45	50	0	0	0	FI, SE1, SE2, SE3, SE4, NO4, NO5	100	0	Up

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3. Imbalance price based on aFRR and mFRR energy prices from the uncongested area, as well as on Finland's satisfied aFRR balancing demand and activated mFRR energy.

Time EET/EEST	aFRR up Eur/MWh	aFRR down Eur/MWh	mFRR up Eur/MWh	mFRR down Eur/MWh	Finland dominating direction	Imbalance price Eur/MWh	Calculation
15:00	100	-	50	-	Up	64,29	Volume weighted
15:15	-	20	40	40	Down	32	Volume weighted
15:30	-	40	30	30	Down	30	Marginal price
15:45	50	-	100	-	Up	100	Marginal price