

Serbia, Macedonia, Montenegro: Balancing market within the SMM block

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In the Serbian electricity market, all market participants are balancing parties and their relations are regulated by contracts.

According to the rules, the suppliers send daily estimates their needs for the next day and how they plan to balance them to the transmission system operator - Elektromreza Srbije and distribution system operators.

There is a certain degree of tolerance for the “flickering” of the difference, and if the difference is high, the operator must buy or sell energy surpluses or shortages within the system. Costs are settled by those who have caused this imbalance by their poor estimates.

EMS purchases the balancing reserve from Elektroprivreda Srbije, which is the only balancing reserve provider under a regulated price, which means that the balancing is not market-based.

When it comes to cross-border balancing, EMS, together with the Montenegrin CGES and the Macedonian MEPSO, works on establishing the Imbalance Netting (a single EU Imbalance Management Platform) within the SMM Block (Serbia, Montenegro and Macedonia).

In Macedonia, the transmission system operator, MEPSO, buys the balancing reserve from ELEM, which is in charge of secondary and tertiary regulation.

Balance responsible parties in the event of a negative imbalance take electricity from the system, and vice versa, in case of a positive imbalance, deliver energy to the system. In the first case, the balance responsible parties pay MEPSO for the energy off-take, while in the second case, MEPSO has no obligation to pay.

According to plans, MEPSO will in future rely on the balancing services providers in the secondary and tertiary regulation segments.

After establishing a market-based balancing mechanism, MEPSO will join in the regional balancing market at the level of the SMM control block, as well as in the Imbalance Netting Project together with the SMM and the WB6 project.

In accordance with the Market Code in Montenegro, the balancing market administrator is the electricity market operator (COTEE), tasked with system balancing, calculating the deviations of the balance responsible entities and related costs.

All market participants are entitled to sign bilateral electricity purchase and sale agreements

and access cross-border transmission capacities for electricity import and export. They are obliged to participate in the balancing mechanism and bear the associated costs.

All market participants have balancing and financial responsibility for the impact of their transactions on the Montenegrin power system operation.

The supplier who signed a contract with the end customer for electricity sale incl. full supply (open contract) is obliged to assume balancing responsibility for this customer.

The transmission system operator, CGES, acquires the necessary system services from the national electricity company EPCG.

Common to these three countries, Serbia, Montenegro and Macedonia, is that the market is regulated by energy agencies, and that transmission system operators purchase ancillary services from dominant state-owned electricity producers.

In addition to similarity, there are certain differences, primarily in the power system size, but also in the respective generation portfolios. Serbia is the largest power system inside the control block, with an annual generation of around 35 GWh and generation facilities of the total installed capacity of 7.326 MW.

As much as 8% of the net installed capacity in Serbia has to be leased in reserve, which is some 600 MW.

The European Union regulation prescribes a reserve to cover the potential outage of the largest generator in the system. In Serbia, this is TENT B, with an installed capacity of 600 MW.

EMS, as the transmission system operator, is responsible, *inter alia*, to purchase ancillary services. EMS acquires the necessary auxiliary services from EPS, as the only company with generating capabilities to provide such services.

Since EPS is a monopolist on the market, the terms and prices for the purchase of such services are regulated by the Energy Agency of the Republic of Serbia.

According to regulations, EMS and EPS enter into annual contracts. At present, EPS delivers balancing reserve, black start and voltage regulation services to EMS.

In terms of balancing reserves, the primary reserve is mandatory for all controllable generation units, and collectively, the primary reserve must be at least 36 MW. This service is free, similar to most European countries.

Reservation of the balance capacity for secondary (aFRR), tertiary (mFRR) and tertiary rapid (RR) regulation is not market-based. The amount for each reservation is defined by the Agreement on the provision of system services signed between the transmission system operator and the balancing service provider.

The reserve amount is determined on the basis of the ENTSO-E recommendation, while the Agency determines the price of the reserved capacity per MW for each type of reserve. System services agreement is negotiated for one calendar year. This is the minimum amount of reserve that the balancing service provider has to offer to the transmission system operator in real time.

The required secondary reserve depends on the month of the year, and it amounts to a minimum of 160 MW. It is provided by HPP Djerdap 1, Bajina Basta, Bistrica and PSHPP Bajina Basta, and most recently TENT A.

HPP Djerdap 1 (65%) and HPP Bajina Basta (20%) have the dominant share in the secondary reserve. The current secondary reserve price is around 10 euros per MW.

Tertiary reserve consists of all plants that are not in operation, and are reported as available, and plants that are in operation but do not operate at maximum capacity. Tertiary reserve is 300 MW for positive and 150 MW for negative reserve.

Pumped-storage hydropower plants have the largest share in the tertiary reserve, which are used at peak consumption intervals when prices are high. Therefore, during low prices and low demand periods, they are kept in reserve. The current tertiary reserve price, according to AERS data, is around 3 euros per MW.

Regionally, there is no cross-border reserve capacity provision, except in the form of imported energy from neighbouring systems, which is treated as exchange/purchase (or sale) of balancing energy.

The Macedonian power system is, in proportion to the size of the country, smaller than the Serbian one. The total installed capacity of all power plants is about 1,400 MW, with the annual generation of some 6 TWh. The largest generation unit, used to dimension the required balancing, is Bitola, with 3 233 MW units.

Secondary and tertiary reserves are purchased by MEPSO from the state-owned company ELEM, which is the dominant electricity producer.

The prices are regulated, but they are not calculated according to the MW of reserve provided. Instead, the regulatory agency recognizes the annual total cost of MEPSO for the supply of ancillary services. In 2017, these costs amounted to approximately EUR 16.3 million, for the purchase of 40 MW secondary and 100 MW tertiary balancing reserves.

The total balancing reserves in Macedonia is lower than the recommended reserves, i.e. 233 MW, which is the capacity of the largest generation unit in the system.

The Montenegrin power system is the smallest in the SMM block. Installed capacity of all power plants is some 1,000 MW, with the annual generation of some 3 TWh. The largest unit of the system is TPP Pljevlja, which has 2 210 MW units.

CGES purchases the necessary system services from EPCG, which is also the national power

company. The market is also monopolistic and regulated by the Energy Agency of Montenegro.

The total required amount of the balancing reserve is prescribed, which throughout the year is some 100 MW on average (about half of the TPP Pljevlja capacity). Of this, about 25 MW is average secondary reserve, except in the months when it is not available due to the HPP Perucica overhaul (April, June, July and August).

In these months, only 100 MW of tertiary reserve is purchased. The sum of tertiary and secondary reserves purchased by CGES from EPCG should be 50 MW, 25 MW secondary and 25 MW tertiary reserves. The remaining 50 MW of tertiary reserve are provided by consumers who are willing to offer such a service.

The cost of the producer providing tertiary reserve in 2019 estimated by the regulator was EUR 468,884.

In addition to the quantity, the balancing reserve price is also regulated. The secondary reserve price is adjusted to inflation and the secondary regulation capacity availability. Consequently, in 2019, it amounted to 83,233.99 EUR/MW year or 6,936.17 EUR/MW/month.

For the tertiary reserve availability from domestic sources, provided by the electricity producers in Montenegro, the price of 1,387.23 EUR/MW/month was approved. For tertiary reserve availability from domestic sources, provided by end customers, the price is 462,41 EUR/MW/month.

According to the regulatory agency data, in 2019, the total costs for the provision of ancillary services and balancing services, (transposed to tariffs) approved for the Montenegrin electricity transmission system were at the level of EUR 1,247 million.

In accordance with the current situation, the total balancing reserve in the SMM block is around 850 MW - Serbia 610 MW, Macedonia 140 MW and Montenegro 100 MW. The total annual cost of securing balancing reserve at the block level is some EUR 38 million.

Regional cooperation aims to reduce the cost of the balancing reserve, which is especially important given that these costs are passed on to end consumers. One way to achieve this objective is to jointly dimension the balancing reserve at the SMM block level.