

Assessment of the Impact of Estonia Strategic Capacity Reserves on Neighbouring Countries

Key messages:

- Strategic reserve resources are kept outside of the electricity markets and are only activated when prices reach their limits. As a result, market prices appear as if strategic reserve resources do not exist.
- Strategic reserve may lead to resources that would otherwise be decommissioned becoming available on the market after the end of the strategic reserve period. However, this is scenario is unlikely, as it would require a significant improvement in the market situation for the specific resources.
- In conclusion, we anticipate that the Estonian strategic reserve will have either no or limited impact on neighbouring countries.

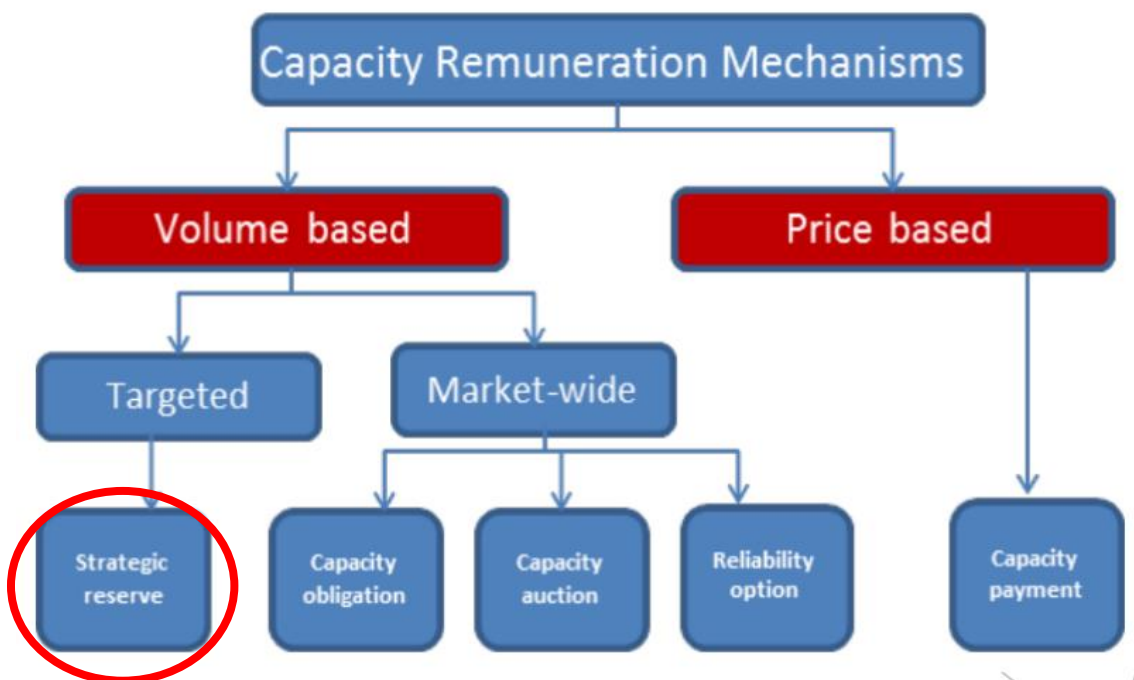
1. Introduction

Pursuant to Article 21(2) of Regulation (EU) No. 2019/943¹ of the European Parliament and of the Council, a member state must conduct an analysis to demonstrate the impact of the planned implementation of the Capacity Remuneration Mechanism (CRM) on neighbouring countries. The member state must consult at least those member states and the market participants of those member states with which they have a direct network connection. Estonian electricity network has direct connections to Finland and Latvia. As the Baltic states are one LFC (load-frequency control) block and de-synchronization from IPS/UPS frequency area will be conducted together at the same time, Lithuania and it`s market participants are included in this analysis and public consultation of the mechanism.

According to a study² ordered by Elering and conducted by AFRY the most suitable CRM for Estonia is the Strategic Reserve (SR) (drawing 1.1).

¹ <https://eur-lex.europa.eu/eli/reg/2019/943/oj>

² https://elering.ee/sites/default/files/2021-10/V%C3%B5imsusmehhanismi%20uuring_0.pdf



Drawing 1.1 – Capacity Remuneration Mechanisms

2. Causes

Possible resource inadequacy of the Estonian electricity system is caused mostly by decommissioning of old power plants. Even though production of electricity from renewable resources is growing, its reliability is limited as there might not be enough sunlight and wind available on the peak hours. According to the ENTSO-E ERAA 2022 potential power generation shortage in Estonia has been identified for the year 2027 with the Loss of Load Expectation (LoLE) exceeding the national standard (9 h/y). This concern is shared over the region which has led other neighbouring countries to also find a solution for adequacy concerns.

3. Impacts to neighbouring countries electricity markets

Given the capacities providing the SR for Estonia are required to not participate on electricity markets, the influence on neighbouring countries remains minimal. Nonetheless, in line with European Union regulation, it is essential to carry out an evaluation of the potential impact on neighbouring countries. To achieve this, it's necessary to take into account the characteristics of the Estonian SR.

As stated in Regulation (EU) 2019/943 of the European Parliament and of the Council of 5 June 2019³ article 22(2) points (d) and (e) for those net producers engaged in the SR mechanism and physically present at the time of the reverse auction for the SR, should be permanently restricted on their participation in day-ahead, intraday, and reserve markets from the moment they become involved in the SR. This rule means that if there is existing capacity that, for any reason, does not take part in the electricity market and, the owner of the power generating unit chooses to engage in the SR instead, the owner must make a decision during the SR procurement process whether these units will be decommissioned or will participate in the SR mechanism prior to that. From the perspective of its impact to neighbouring countries, this implies that such a unit may not be able to sustain its operation and continue participating in the regular energy markets after the conclusion of this SR contract, except with additional state aid. It should be stressed that the exact terms and conditions of this SR measure will be established by the state-aid permit granted by the European Commission.

Moreover, as the resources taking part in the strategic reserve are not to receive remuneration from the wholesale electricity markets or from the balancing markets, and the resources in the strategic reserve are to be held outside the market for at least the duration of the contractual period, there is no content in modelling of the electricity market to analysis the impact of the capacity mechanism. The strategic reserve will only be launched in extreme circumstances when balancing market resources have run out. At the launching of the strategic reserve, the balancing energy is priced according to the rules of the balancing market, either at the maximum price of the balancing market (the current Baltic Balancing Market COBA solution) or at least at a price higher than the price of the energy not served or the maximum intraday electricity market price (possible solutions in the future once the Baltic States are connected to the pan-European reserve bidding solution (MARI platform)). The price on the day-ahead market is also likely to be already at its maximum in this case, if there is already a shortage of capacity on the day-ahead market.

All the neighbouring countries in question (see Table 1 below) operate under the same EU jurisdiction, which makes it easier to evaluate and moreover, minimizes the impact on the

³ <https://eur-lex.europa.eu/legal-content/EN/TXT/?uri=CELEX%3A32019R0943&qid=1697108945233>

market. Please see Table 2, which provides a comprehensive overview of the impact of the Estonian SR across all market timeframes.

Table 1 - The descriptions of possible impact for neighbouring country

Country	Connection	Impact	Explanation
Finland	350 + 650 MW of DC connections; different LFC	none	<ol style="list-style-type: none"> 1. Same legislative environment (market rules, technical and environmental requirements); 2. Only capacities located in Estonia can participate in the Estonian SR; 3. SR capacity is not allowed to participate in any energy markets at least for the time of the contract (see Table 2). 4. Existing capacity participating in the SR would be prohibited from entering the energy market after the conclusion of the SR period.
Latvia	Same LFC; ≈1500 MW, 3 x AC-line	none	
Lithuania	Same LFC; no direct lines	none	

Table 2 – The impact descriptions by market type

Market type	Impact by strategic reserve	Explanation
Future markets	rather positive	Long-term investment decisions would not be made without the capacity mechanism. Therefore the impact is considered to be positive.
Day-ahead market	none	The cause of implementing strategic reserve is the shortage of capacity on the market. Therefore power-only markets are not affected.
Intraday market	none	
Balancing markets		Due to needed short reaction time the balancing products are provided by already turning generators, strategic reserve is designed to be switched off for most of the time. The reserve is designed to be started as last in row (after the market bids have become exhausted).
mFRR	none	
aFRR	none	
FCR	none	

4. Impacts on long-term investment plans

As the SR is intended to be technology-neutral, it allows not only generating units but also energy storage units and demand response mechanisms to participate. Resource inadequacy is primarily caused by a shortage of generation units in the market. Therefore, implementing SR will not remove any units from the market but will temporarily prevent their decommissioning until new market-based capacities enter the market or encourage the entry of new units into the market. It's important to emphasize that the SR design requirements (as explained in clause three of Table 1), excludes the situation where already existing units use the mechanism to survive low-point of the market and, after the end of SR contract, re-enter the power-only market. This restriction applies only to existing units. New capacities built under the SR mechanism would still be eligible to participate after their contract period. This means that the mechanism encourages the construction of new units by providing a cash flow guarantee at the beginning of a unit's designed lifetime. These new units can then enter the market, thereby positively impacting the adequacy situation that existed before the implementation of the SR mechanism.

5. Estonia's specificities considered in the Estonia Strategic Reserve concept

It is recommended under Article 26 of the Regulation (EU) No. 2019/943 that a member state only has to allow participation of capacity located in another country if it is technically feasible. In the case of Estonia, it is the availability of transfer capacity (drawing 5.1) that is crucial for the electricity system at peak times. According to the analyses carried out by Elering, the most critical times in terms of the capacity of the Estonian electricity system are when the existing transfer capacity is at its maximum capacity and is then subject to outages. In such a case, there is a significant likelihood that the electricity generation capacity located on the territory of Finland will not be able to fully contribute to the security of supply of the electricity system of Estonia.



Drawing 5.1 – Baltic main grid with connections

Although ENTSO-E system capacity calculations show that at times when there is a shortage of electricity in Estonia, the electricity transfer capacity between Estonia and Latvia is not used, the electricity generation capacity in Latvia cannot be included in the Estonian strategic reserve mechanism. This is because in Latvia and Lithuania, the ENTSO-E analysis shows a similar situation of the system capacity than in Estonia. There is therefore a high risk of a simultaneous capacity problem of the system, and capacity in a neighbouring country cannot solve the capacity problem of the system in Estonia.

Therefore, in line with the circumstances described above, it is important that the electricity generation reserve to be procured is located on Estonian territory and is not dependent on the availability of transfer capacity. Therefore, it is foreseen that in the context of the strategic reserve to be implemented, cross-border participation will not be allowed, and in order to qualify for participation in the tender, the corresponding capacity-providing resource must be located in Estonia.