

# Methodology of parameters calculation for Lithuanian Capacity Mechanism

## Part 4: Methodology for the Allocation of Congestion Rent

### **TITLE 1: General Provisions**

#### *Article 1: Subject matter and scope*

1. The objective of this document is to develop detailed methodologies for calculation of parameters in the Lithuanian capacity remuneration mechanism (CRM) that will be used by LitGrid to calculate parameters necessary for the implementation of Lithuanian CRM, as laid out in Article 4. Amendment of Article 9 of the Law on Electricity of The Republic of Lithuania:
  - 24) approve the methodology for calculating de-rated capacity;
  - 25) approve the methodology for calculating the Maximum Entry capacity of interconnectors (Item 25);
  - 26) approve the methodology for the allocation of congestion rent; and
  - 27) approve the methodology for the calculation of allocated capacity.
2. The methodologies are split this into four Parts presented in separate documents:
  - Part 1 presents the methodologies for de-rating capacity calculation for national generation capacity and foreign capacity participating in Lithuanian CRM;
  - Part 2 presents on the methodology for Maximum Entry Capacity;
  - Part 3 presents the methodology to calculate the Auction Target Capacity; and
  - Part 4 presents the methodology for allocation of the Congestion Rent.
3. The present document addresses Part 4 and focuses on the allocation of Congestion Rent.

*Article 2: Definitions and interpretation*

4. For the purposes of the present methodology, the terms used in this document shall have the meaning of the definitions included in Article 2 of Regulation (EU) 2019/943 and Article 1. Amendment of Article 2 of the Law on Electricity of The Republic of Lithuania.
5. In addition, in this methodology, the following definitions and their interpretations shall be used:
  - **Auction Clearing Price** is the Price in the Capacity Auction determined by the Price Setting Bid
  - **Capacity Mechanism** is defined in accordance with Article 2(22) of Regulation (EU) 2019/943.
  - **Capacity Mechanism Contract** means the contract between the CM operator and the capacity provider enabling the capacity provider to get a remuneration for its availability during the Reference period.
  - **Cross-border Physical Unit** is a Generating Physical Unit or DSR located in a Member State of the European Union, the electricity system of which is interconnected directly with the electricity system of Lithuania
  - **Entry Capacity** means the capacity, expressed in MW, that can be allocated to eligible foreign capacity for participation in a capacity mechanism. Its total amount can never exceed the Maximum Entry Capacity.
  - **Foreign Capacity** means a capacity located in a Member State different from the Member State applying the capacity mechanism.
  - **Maximum Entry Capacity** means the maximum allowed foreign capacity (expressed in MW) considered between two Member States that can participate in a capacity mechanism during a certain Delivery Period.t.
  - **Energy Not Served (ENS)** means the amount of energy demand – measured in MWh – which is not supplied in a given zone and in a given time period due to insufficient resources to meet demand.
  - **Scarcity**, also named 'system stress' refers to a situation during which ENS is strictly greater than zero in a given system and in a given time period because national production, demand reduction measures and total possible imports are insufficient to meet demand.
  - **Scarcity hours** for a given bidding zone are defined as hours during which the corresponding bidding zone has an importing position after market clearing coupling and for which the value of the hourly Energy Not Served (ENS) is strictly greater than 0 MWh/hour, after considering the effect of curtailment sharing within the market coupling algorithm. This is based on perfect foresight model as defined in ERAA.
  - **Scarce asset** means either the transmission capacity or the electricity resources of neighbouring systems that are operating at their maximum capacity and hence limiting the management by the market of a scarcity situation.
  - **Net Transfer Capacity (NTC)** model means a capacity calculation method based on the principle of assessing and defining ex-ante a maximum energy exchange between adjacent bidding zones as referred to in Article 2 of Commission Regulation (EU)

2015/1222 of 24 July 2015 establishing a guideline on capacity allocation and congestion management.

## **TITLE 2: Congestion Rent allocation principles**

### *Article 3: Congestion Rent in Lithuanian Capacity Mechanism*

6. According to Article 26 of Regulation (EU) 2019/943 capacity mechanisms shall be open to direct cross-border participation providers located in another Member State, subject to the conditions laid down in that Article. Direct participation of cross-border capacity in CRM is the EC's target solution of cross-border participation and refers to the foreign capacity's ability to directly and explicitly participate in the national CM.
7. To explicitly enable the cross-border capacity participation in the Lithuania CRM a two-step process is envisaged. First, the Maximum Entry Capacity per border (Sweden, Poland, Latvia) is allocated through pre-auction which sets the Foreign Capacity clearing price based on the last contracted Cross-border Physical Unit. The cleared Foreign Capacity obtains the right to qualify and participate in the main Lithuanian auction with the same bid price as was submitted in the pre-auction. The clearing price obtained by the Foreign Capacity in the main Lithuanian auction is set by the minimum of the Auction Clearing Price and the Pre-Auction Clearing Price.
8. The Congestion Rent collected by the operator of the Lithuanian Capacity Mechanism on each border is represented by the price difference between the Pre-auction Clearing Price and the Auction Clearing Price as referred to in Market rules article 34 multiplied by the Maximum Entry Capacity.

### *Article 4: Application of the Congestion Rent allocation by border*

9. According to Article 26 of Regulation (EU) 2019/943, the principles allocation of the Congestion Rent can be different for each border depending on whether the interconnected Member State allows for direct cross-border participation in the presence of capacity mechanism:
  - Member State neighbouring with Lithuania does not apply a Capacity Mechanism or applies a Capacity Mechanism which is not open to direct cross-border participation; and
  - Lithuania and its Member State both have Capacity Mechanisms which allow for direct cross-border participation by foreign capacity over the same delivery period.
10. The total Congestion Rent adjusted as presented in TITLE 3 below shall be allocated between the TSOs for the interconnector, where both Member States have Capacity Mechanisms which allow for direct cross-border participation by foreign capacity over the same delivery period based on the following rules:
  - The TSOs on both sides of the border shall receive their share of the Adjusted Congestion Rent based on a 50%-50% sharing key.
  - In case specific interconnectors are owned by entities other than TSOs or entities other than TSOs have a share in the investment costs of the interconnector, the reference to TSOs in the paragraph above shall be understood as referring to those entities.
11. Where the neighbouring Member State does not apply a Capacity Mechanism or applies a Capacity Mechanism which is not open to direct cross-border participation, the Adjusted

Congestion Rent shall be shared between the TSOs for the interconnector based on the following rules:

- The foreign TSO shall receive a X% share of the total revenue considered for sharing and the national TSO shall receive the remaining (100%-X%).
- The parameter X% is equal to 0% unless is agreed otherwise between the TSOs as part of the TSO-TSO agreements related to the implementation of the Lithuanian Capacity Mechanism.
- In case specific interconnectors are owned by entities other than TSOs or entities other than TSOs have a share in the investment costs of the interconnector, the reference to TSOs in the paragraph above shall be understood as referring to those entities.

### **TITLE 3: Adjustments of Congestion Rent for allocation purposes**

*Article 5: Principle of Congestion Rent allocation to provide incentives for transmission capacity development*

12. According to Article 19 of Regulation (EU) 2019/943, the allocation of the Congestion Rent should provide incentives for the development of transmission capacity and it should be spent on a) guaranteeing the actual availability of the allocated capacity or b) on maintaining or increasing of interconnection capacity through co-ordinated remedial actions or network investments.
13. According to the ENTSO-E draft methodology (3 July 2020), when transmission capacity is deemed the scarce resource limiting the foreign capacity participation, the allocation of Congestion Rent shall result in a proportionate incentive to further develop transmission capacity on the considered border.

*Article 6: Addressing the situations when the Maximum Entry Capacity is not fully allocated*

14. According to the ENTSO-E draft methodology (3 July 2020), in case the Maximum Entry Capacity has not been fully allocated to eligible Foreign Capacity, the transmission capacity is not deemed the scarce resource and no incentive for further development of the transmission capacity on the considered border shall be provided.
15. Two options are proposed for dealing with situations when the Maximum Entry Capacity has not been fully allocated to the eligible foreign capacity:
  - **Option 1:** When the Maximum Entry Capacity has not been fully allocated to the eligible foreign capacity on a given interconnector, the transmission capacity is not deemed the scarce resource and no congestion rent will be shared with the concerned neighbouring Member State.
  - **Option 2:** When the Maximum Entry Capacity has not been fully allocated to the eligible foreign capacity on a given interconnector but at least one eligible foreign unit on the concerned border has been accepted in the main auction, congestion rent will be shared with the concerned neighbouring Member State.

*Article 7: Adjustment of Congestion Rent for the likelihood of simultaneous scarcity*

16. To determine to what extent the transmission capacity between two Member States is deemed the scarce resource limiting the participation of foreign eligible capacity in the capacity mechanism, the expected level of concurring system stress events between the two Member States in question shall be considered.
17. Therefore, it is essential to identify whether it is the scarcity of transmission capacity between Lithuania and the neighbouring Member State that limits the participation of eligible foreign capacity in Lithuanian capacity market. The scarcity of transmission capacity is determined by the expected level of coincidence system stress events between the Lithuania and the neighbouring Member State.
18. According to the ENTSO-E draft methodology (3 July 2020), the expected level of concurring system stress events is defined ex-ante by the ratio between the number of hours that both considered countries are at the same moment observing Expected Energy Not Served (EENS) divided by the total number of hours that the country organising the capacity mechanism is observing energy not served. The values used in the ratio are based on the central scenario of the latest approved version of the European resource adequacy assessment as meant by Article 23 of Regulation (EU) 2019/943.
19. The Congestion Rent to be allocated between TSOs is then adjusted by the likelihood of the concurrent system stress. the Adjusted Congestion Rent considered for allocation, in accordance with ENTSO-E draft methodology (3 July 2020), is:
  - (i) Equal to 100 % when (one minus the likelihood of coincident system stress between the considered neighbouring countries) exceeds 80%
  - (ii) Equal to 0% when (one minus the likelihood of coincident system stress between the considered neighbouring countries) is below 20%
  - (iii) Between the benchmarks mentioned in (i) and (ii), a linear interpolation between 0% and 100% is applied.

## Appendix

### Methodology for calculation of the Adjusted Congestion Rent for the 2025 delivery auction

The current Adequacy Assessment model employed by LitGrid does not consider a regional perspective that would derive EENS values ex-ante for other Member States. As a result, a direct application of the approach proposed by in the ENTSO-E draft methodology described in 18 above is not possible and therefore an alternative measure of coincidence stress events is proposed.

Specifically, the alternative coincidence stress measure is consistent with the Maximum Entry Capacity calculation, fully explained in Part 2 of this work. In brief, for the Latvian and Swedish interconnectors a share of peak hours in the period 2016-2019 with non-negative price difference and positive import flow to Lithuania. For the Polish interconnector, a share of peak hours in the period 2016-2019 with non-negative price difference is estimated. The peak hours are defined as the highest 50% of Lithuanian peak demand periods during the winter quarter (7:00 to 19:00, business days, December to February). The calculated shares of hours are used as indicators of the availability of Foreign Capacity to be exported to Lithuania during the Lithuanian stress event, hence, an absence of a coincidence stress. The likelihood of a coincident stress can be calculated as 100% minus the calculated shares.

Below, we provide an example of congestion rent sharing key for the Polish-Lithuanian interconnector. Based on the methodology of likelihood of coincidence system stress defined in Part 2 and using 2016-2019 data, there is a 49% likelihood of coincident system stress between Poland and Lithuania. Calculating 1 minus 49% provides 51%, which falls between the benchmarks mentioned in (i) and (ii) of paragraph 19 above. Using linear interpolation, the total Adjusted Congestion Rent considered for sharing between the Lithuanian and Polish TSOs is equal to 52%.<sup>1</sup> Further, according to 10 above, the Adjusted Congestion Rent is split based on a 50%-50% sharing key between each TSO. The remaining 48% of the Congestion Rent on this interconnector is directly retained only by the Lithuanian TSO.

---

1 For every 1% change in the one minus the likelihood of coincident system stress between the considered neighbouring countries there is approximately 1.667% change in the total revenue considered for sharing.