Annual Monitoring Report

on activities related to cross-border transmission capacity in the Energy Community for the period of 2020

Reporting period: 2020 – publication date: December 2021

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1. Introduction

1.1. Background

The report provides an update on results of the Market Monitoring Project for South East Europe for the period 2020. The Market Monitoring Project originates from the 2006 Energy Community Annual Electricity Forum ('Athens Forum') that invited the United States Agency for International Development (USAID) to support the Energy Community regulators in developing common standards for monitoring the activities of electricity transmission system operators. This resulted in development of the so-called South East Europe Market Monitoring Guidelines (hereinafter 'the Guidelines')[1], prepared by the USAID-supported consultant Potomac Economics under the umbrella of the Electricity Working Group (EWG) of the Energy Community Regulatory Board (ECRB)[2]. The purpose of the Guidelines is to harmonize and coordinate the activities of National Regulatory Authorities (hereinafter 'regulators' or NRAs) in monitoring electricity transmission grid activities to ensure that network users are granted access to the maximum amount of transmission transfer capacity on a non-discriminatory basis. This also includes monitoring the control of transmission transfer capacity by individual participants in order to identify potential market power.

The Guidelines define the data required to implement market monitoring, specific monitoring indicators, thresholds to establish a reasonable range for the indicator values and actions for regulators for cases where an indicator is outside the threshold ranges:[3]

- Indicator 1 - The Base Case Exchange (BCE) Indicator: compares Base Case Exchange assumptions in the network model to cross-border schedules.
- Indicator 2 - The Already Allocated Capacity (AAC) Indicator: compares AAC to peak commercial schedules.
- Indicator 3 - Critical Facilities Indicator: compares estimated flows on critical facilities in the network model to actual flows on the facilities.
- Indicator 4 - Load Forecast Indicator: compares forecast load in the network model to actual load.
- Indicator 5 – Generation Forecast Indicator: compares forecast generation in the network model to actual generation.
- Indicator 6 – Transmission Reliability Margin (TRM) Indicator: compares actual TRM values to proxy TRM values calculated using control area balance data and net exchanges.
- Indicator 7 – Market Share Indicator: calculates market shares using auction data on cross-border interconnections.

In addition to the Guidelines, assessment of another provisional indicator was discussed at the ECRB Electricity Working Group with the aim to test where the Contracting Parties stand in terms of the level of

[1] https://www.energy-community.org/dam/jcr:6ff463f1-4c0f-4c3f-943b-f769f2c065f9/ECRB_market_monitoring.pdf. Approved by ECRB in April 2014.

[2] The Energy Community Regulatory Board (ECRB) operates based on the Energy Community Treaty. As an institution of the Energy Community. ECRB advises the Energy Community Ministerial Council and Permanent High Level Group on details of statutory, technical and regulatory rules and makes recommendations in the case of cross-border disputes between regulators. The Energy Community comprises the EU and Albania, Bosnia and Herzegovina, North Macedonia, Kosovo*, Moldova, Montenegro, Serbia and Ukraine. Armenia, Georgia, Turkey and Norway are Observer Countries. [Throughout this document the symbol * refers to the following statement: *This designation is without prejudice to positions on status, and is in line with UNSCR 1244 and the ICJ Advisory Opinion on the Kosovo declaration of independence*]. For more details on the Energy Community and ECRB see: www.energy-community.org.

[3] The individual data requirements referred to as part of the Guidelines are in line with the Energy Community *acquis communautaire*.

capacity offered to the market having in mind the 70% criteria[4] applicable in the EU. Following the practice from the previous report, a high level assessment is also presented in this report with the aim to improve analyses for future analyses.

2. Methodology

Along with the Guidelines, USAID supported development of the so-called South East Europe Automated Market Monitoring System (SEEAMMS). SEEAMMS allows transmission system operators (TSOs) to upload data to a web-based interface where the data is stored, processed, and reported to regulators. A dry run of SEEAMMS started in 2010. The ECRB approval of the Guidelines in April 2014 marked an important step supporting the cooperation among NRAs on market monitoring in accordance with Regulation (EC) 714/2009[5] and Directive 2009/72/EC[6]. It ratified the project's dry run which expanded the capacity of regulators to oversee and monitor key activities of TSOs. SEEAMMS operates on regional basis with regulators acting as the regional monitor center on a rotating basis.

The report includes the regional SEEAMMS results for the year of 2020. It summarizes recent results and explains the consequences of the various market monitoring indicators, including assessment of the level of the cross-border capacity offered to the market by the TSOs, which should be improved for future assessment of the 70% criterion.

2.1. Participation

The report covers jurisdictions for which Contracting Parties' (CPs) TSOs submitted data to SEEAMMS, namely: Albania[7], Bosnia and Herzegovina[8], North Macedonia[9], Georgia[10], Kosovo*[11], Montenegro[12] and Serbia[13].

[4] Article 16(8) of Regulation 2019/943 reads: "*Transmission system operators shall not limit the volume of interconnection capacity to be made available to market participants as a means of solving congestion inside their own bidding zone or as a means of managing flows resulting from transactions internal to bidding zones. […] this paragraph shall be considered to be complied with where the following minimum levels of available capacity for cross-zonal trade are reached: (a) for borders using a coordinated net transmission capacity approach, the minimum capacity shall be 70 % of the transmission capacity respecting operational security limits after deduction of contingencies, as determined in accordance with the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009; (b) for borders using a flow-based approach, the minimum capacity shall be a margin set in the capacity calculation process as available for flows induced by cross-zonal exchange. The margin shall be 70 % of the capacity respecting operational security limits of internal and cross-zonal critical network elements, taking into account contingencies, as determined in accordance with the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009. The total amount of 30 % can be used for the reliability margins, loop flows and internal flows on each critical network element*." The Agency for the Cooperation of European Regulators (ACER) in 2019 issued a recommendation for implementing the 70% minimum margin of capacity available for cross border trade in electricity, see: https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2001-2019.pdf.

[5] OJ L 211/15 of 14.08.2009. For Contracting Parties referring to the version adapted and adopted by Decision 2011/02 of the Ministerial Council of the Energy Community.

[6] OJ L 211/55 of 14.08.2009. For Contracting Parties referring to the version adapted and adopted by Decision 2011/02 of the Ministerial Council of the Energy Community.

[7] National electricity transmission system operator OST.

[8] Independent electricity transmission system operator NOSBiH.

[9] National electricity transmission system operator MEPSO.

[10] National electricity transmission system operator GSE.

[11] National electricity transmission system operator KOSTT.

[12] National electricity transmission system operator CGES.

[13] National electricity transmission system operator EMS.

2.2. Base Case Exchange (BCE) Indicator

The main metric established by the CPs' TSOs in the network model for cross-border capacity calculation is the Net Transfer Capacity (NTC). The BCE indicator monitors BCE assumptions in the network model. BCE assumptions are forecasts of commercial schedules in the network model. The purpose of the BCE indicator is to monitor the accuracy of the BCE assumptions in order to improve assumptions in modelling the NTC values. It is important that the BCE value represent a forecast of expected cross-border exchanges that is built on improved assumption. If not, the calculated NTC value may underestimate the cross-border transmission capacity, and thereby reduce opportunities for market activity.

The BCE indicator calculates a percentage of a forecast error between BCE values (the forecast) and the actual cross-border commercial schedules (deviation). The SEEAMMS software, according to the Guidelines, calculates a threshold above which deviation of forecasted values from factual values are deemed as violation. There is a lack of consistency throughout the region for the interpretation of the BCE value. The related conclusions of this report are based on review of ENTSO-E documents[14] as well as discussion between regulators and TSOs of the analyzed markets. It is recommended that the BCE value should reflect the best forecast of net commercial exchanges between two TSOs.

According to SEEAMMS records there were **165 BCE violations during the reporting period (which is 30 less than last year)** on various interconnectors. The violations are distributed among TSOs in the following manner[15]:

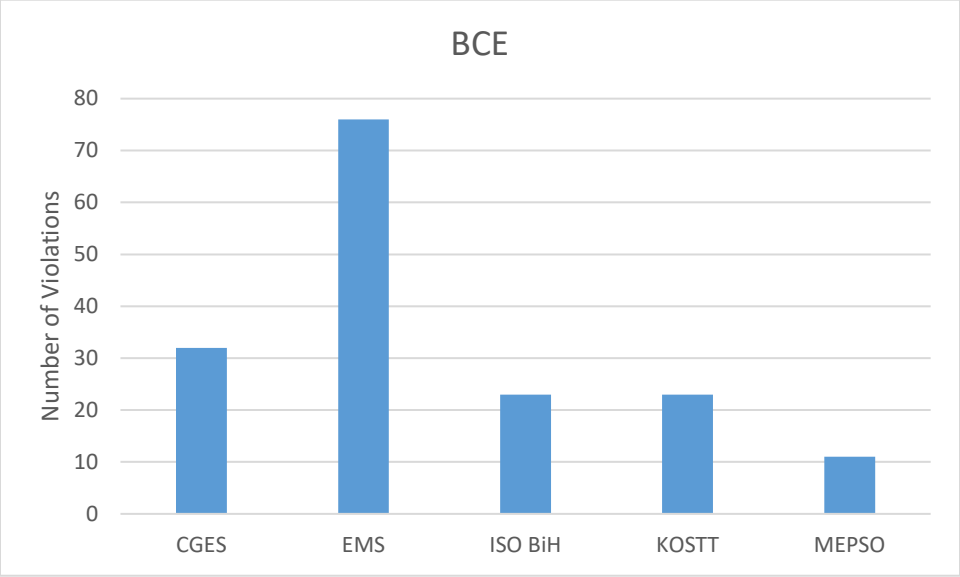


Figure 1 Distribution of BCE indicator violations among TSOs

[14] https://www.entsoe.eu/publications/market-reports/Documents/entsoe_proceduresCapacityAssessments.pdf
[15] There were missing data from Georgian TSO (GSE), therefore GSE violations were not included in the chart.

The network operator with the most violations is the Serbian TSO, EMS, in this reporting period - however the number of violations in 2020 compared to 2019 decreased. Explanations on the violations were provided by EMS AD as well as the neighboring Contracting Party operators NOS BiH AD (ISO-Bosnia Herzegovina) and MEPSO (North Macedonia) as follows:

- EMS: The forecasted values of exchanges are harmonized in the month M-2 for the month M for which the NTC is calculated. In the South East European region there is the practice that for each month, another TSO has the role of the coordinator, whose obligation is BCE harmonization and producing of the regional model which is further used for the calculations. Each TSO creates its forecasted exchanges, based on the totals which were received from its balance responsible partiesand these calculations are communicated to that month's coordinator, who is coordinating them afterwards. EMS AD proposes BCE values based on historical exchanges. Coordinator harmonizes BCE values, produces the regional model which is further used for the calculations and sends to TSO table with proposed BCE values for confirmation.
- MEPSO: Values for BCE are calculated, i.e., based on the best available forecasts from the individual grid modes (based on 3-th Wednesday of the Month which is pan-European and national adopted principle). It is expected that in some hours the net peak exchange and/or the maximal generator output to be larger from the BCE, especially when we have unexpected flows on the borders.
- NOSBiH: Net comercial schedule on ISO BiH- HOPS border in November 2019 was not -756 (according to data provided by ISO BiH);

Recommendation 1: NRAs should closely monitor BCE violations, an indicator that measures the accuracy of the BCE assumption used in the month-ahead network model and as a consequence the accuracy of the NTC calculation. In order to increase the accuracy, regulators shall require BCE values based on a forecast of net commercial schedules, using recent historical data, unless good reasons exists to use other methods. Further, NRAs should put more effort in collecting reasonable and substantiated explanations from their national TSOs for deviation from the BCE indicator thresholds.

2.3. Transmission Reliability Margin Indicator

The TRM is an amount of cross-border capacity set aside for TSOs to respond to potential frequency deviations and emergencies exchanges and other uncertainties. As it consumes a proportion of cross-border capacity, the higher the TRM value, the lower the NTC value is and thus the possibilities for cross-border trade. The purpose of the indicator is to monitor the accuracy of TRM assessment.

The TRM indicator calculates a metric that is intended to track the previously defined ENTSO-E TRM formula[16], which is also approved via the Guidelines. This metric is compared to the actual TRM used by the TSO and identifies any significant variances.

[16] https://eepublicdownloads.entsoe.eu/clean-documents/pre2015/ntc/entsoe_proceduresCapacityAssessments.pdf

The TRM value is agreed bilaterally between TSOs as a fixed value, however it does not seem to be updated in order to reflect the up-to-date operating statics. The lack of coordination at a wider geographic scope undermines the calculation process.

According to SEEAMMS records in the reporting period there were 30[17] TRM violations that were assigned to EMS (22) and MEPSO (8). According to the explanations given by EMS, in the South East European region there is the practice that the values for Transmission Reliability Margin are defined in the Agreement on Network and System Operation Management on yearly basis. It has to be noted that TRM violations dropped in 2020 compared to 2019 by 27 items and by 47 compared to 2018[18].

Recommendation 2: The NRAs should oblige the respective TSOs to adopt the ENTSO-E TRM formula based on ECRB Recommendation on Harmonizing Cross-Border Transmission Capacity Calculations in Electricity. This would increase the level of transmission capacity made available to the market, therefore the regulators should enforce the requirement of the TSOs to enable the maximum level of cross-border capacity for the market.

2.4. Already Allocated Capacity Indicator

Already Allocated Capacity (AAC) is the cross-border capacity that is booked by market participants. The AAC indicator compares the booked values with the values that are actually scheduled in the operating period. The purpose of the indicator is to detect whether market participants are withholding capacity from the market by buying capacity but not using it. Capacity that is reserved but that is not scheduled on a sustained basis withholds transmission capacity from other participants or at least requires them to wait to for short-notice[19] release of this capacity. Monitoring capacity usage will deter participants from capacity hoarding and will open the market to wider competition.

The approach for this indicator involves identifying the hour with the greatest volume of commercial schedules (monthly peak schedules).[20] This hour should be matched and compared with the corresponding reservations, i.e. the AAC, for that day.

The indicator confirms that **cross-border capacity hoarding is not problematic in the region.** The following figure shows the number of violations of 2019 year. In 2020 total number of violations decreased by 23. It should be noted that a more detailed monitoring of intraday capacity allocated and its use is needed to ensure that no capacity hoarding occurs on intraday, where in practice the potential for capacity hoarding exists due free allocation under the first-come-first-served basis.

[17] ISO BH and CGES didn't submit complete data and SEEAMMS couldn't calculate ranges, so as violations are not included in the number.
[18] CGES and ISO BiH didn't provide data for TRM.
[19] Near in time to the operating horizon.
[20] Data doesn't include day ahead and intraday allocations.

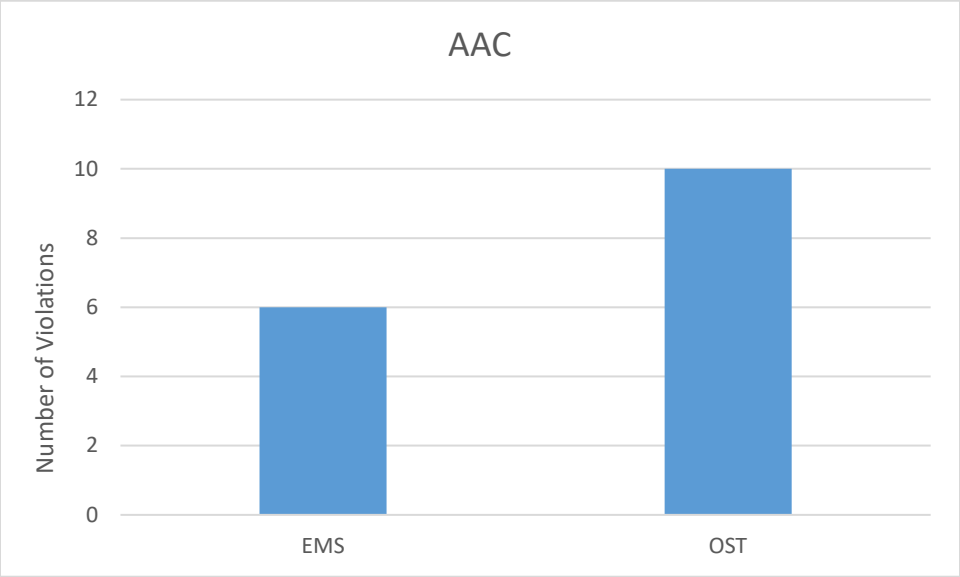


Figure 2. Summary of AAC indicator violations

2.5. Critical Facilities Indicator

Critical facilities are electrical facilities, usually transmission facilities that are of security relevance when transferring power between TSOs. The Critical Facilities (CF) Indicator monitors simulated power flows on key transmission elements in the network model to determine whether these key elements are the limiting elements in actual system operations. The purpose of the indicator is to detect whether transmission constraints in the network model that limit NTC values are constraints that actually occur in real-time operations. The monitoring intends to provide more information on modelling assumption with the aim to improve the NTC calculation.

The Critical Facilities Indicator has produced results that support the hypothesis that **internal congestion is overestimated in many cases**. The TSOs introduced lower values in the network model which resulted in limitations, while the actual flows were higher. The TSOs are not fully utilizing full transfer capacities of critical facilities in the network model that is resulting in lower NTCs. 94% of values show a 10% and greater error value while 44% of CF values have a more than 100% error variance. In a significant number of cases (24 records), actual flows are 10 times higher than the estimated flows. In these extreme cases, the model assumptions will likely lead to overestimating internal congestion and underestimating NTC values. Table 1 demonstrates the distribution of Critical Facilities Indicator values for the year of 2020. It is obvious that Critical facility indicator remains critical in the region, however improvements in violation percentages are obvious in 2020 compared to 2019.

PERCENTILE	ERROR VALUE
94%	10%
85%	30%
70%	50%
44%	100%
14%	400%
5%	1000% and more

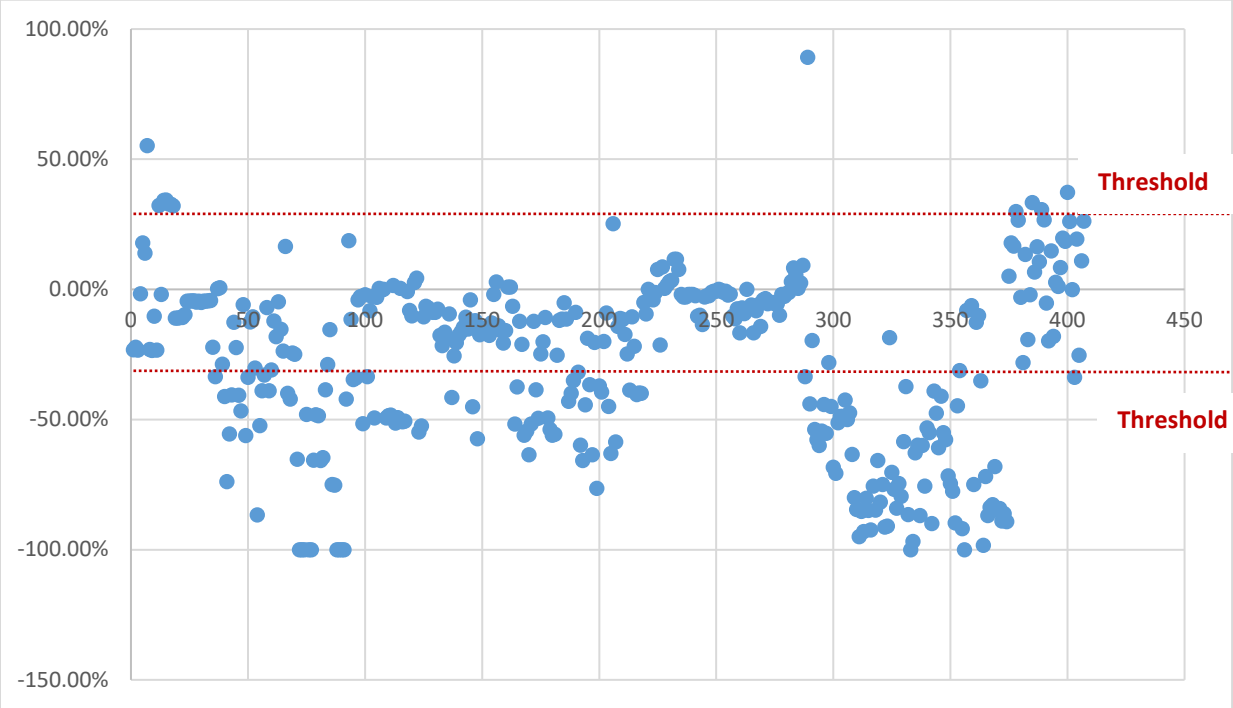
Table 1: Distribution of Critical Facilities Indicator Values

Recommendation 3: Given these results, it is recommended that the NRAs engage directly with TSOs to better understand the source of these errors and consider follow-up activities at the ECRB EWG that can be agreed and included in the next work program.

2.6. Generator Forecast Indicator

The Generator Forecast Indicator measures the accuracy of the generation forecast used in the network models. Accuracy of these forecasts helps to ensure better network modelling and, consequently, more realistic NTC values. This indicator calculate a percentage of the forecast error between the forecasted load and the actual load. Generation forecast accuracy has increased since the last reporting period but TSOs still tend to forecast peak generation with lower values compared to realize peak output. Approximately 44% of data is out of range in relation to the established threshold of error (27%)[21]

[21] GSE and KOSTT Didn't provide complete data and therefore not participating in the figure presented.



Recommendation 4: TSO should ensure that the generation data, which is necessary to create the network model, is checked and validated by TSO before use for the network model and to the extent possible make corrections to the potential errors, including the data provided by power producers. In case deviation continue several months in a row, TSOs must investigate the reason together with the data owners (generation companies).

2.7. Load Forecast Indicator

The Load Forecast Indicator measures the accuracy of the load forecast used in the network model. Accuracy of these forecasts improves network modelling and, consequently, more realistic NTC values. This Indicator calculates a percentage of the forecast error between the forecasted load and the actual load.

Results show that in most cases **load forecasts used in the network model are very accurate**, with small variation from the actual values. However, in this reporting period increased number of forecast errors (deviations) beyond normal threshold[22] are obvious, in certain cases exceeding 40% (especially in case of EMS and GSE). Variances of this indicator are presented in the table below

[22] Threshold is calculated by the SEEAMMS according to the Guidelines.

Data Provider	Month	Actual Peak Load	Forecast Load	%Error	Threshold
CGES	2020-04	476	560	17.60%	9.90%
	2020-10	431	375	-13.00%	10.20%
	2020-11	500	402	-19.60%	10.40%
	2020-12	522	457	-12.50%	10.40%
EMS	2020-01	6,612	5,911	-10.60%	9.90%
	2020-02	6,211	5,499	-11.50%	9.90%
	2020-03	5,907	4,966	-15.90%	9.90%
	2020-04	5,577	4,303	-22.80%	9.90%
	2020-05	4,758	4,235	-11.00%	9.90%
	2020-06	4,828	4,259	-11.80%	9.90%
	2020-07	4,865	4,246	-12.70%	9.90%
	2020-08	4,793	4,145	-13.50%	9.90%
	2020-09	4,945	4,099	-17.10%	10.00%
	2020-10	5,687	4,575	-19.60%	10.20%
	2020-11	6,457	4,947	-23.40%	10.40%
	2020-12	6,571	5,720	-13.00%	10.40%
GSE	2020-01	2,063	1,278.30	-38.00%	9.90%
	2020-02	2,111	1,143	-45.90%	9.90%
	2020-03	1,896	1,240.20	-34.60%	9.90%
	2020-04	1,694	1,105.20	-34.80%	9.90%
	2020-05	1,563	982	-37.20%	9.90%
	2020-06	1,715	1,060.80	-38.10%	9.90%
	2020-07	1,787	1,103.50	-38.20%	9.90%
	2020-08	1,690	1,029.10	-39.10%	9.90%
	2020-09	1,692	967.3	-42.80%	10.00%
	2020-10	1,677	985	-41.30%	10.20%
	2020-11	1,933	1,071.20	-44.60%	10.40%
	2020-12	2,098	1,202.90	-42.70%	10.40%
	2021-01	2,019	1,215	-39.80%	10.40%
ISO BH	2020-05	1,313	1,520	15.80%	9.90%
KOSTT	2020-07	689	783	13.60%	9.90%
	2020-08	651	802	23.20%	9.90%
MEPSO	2020-09	904	1,246	37.80%	10.00%
	2020-12	1,401	1,246	-11.10%	10.40%
OST	2020-02	1,341	1,180	-12.00%	9.90%
	2020-10	1,071	1,300	21.40%	10.20%

Table 2: Load Forecast Indicator variances

Recommendation 5: NRAs should examine the reasons of increased values of load forecasting errors and to which extent the COVID-19 pandemic could have influenced load forecast errors in the reporting period.

2.8. Assessment of the level of cross-border capacity offered to the market

In 2019 the EU adopted a revision of the legislative framework, among which the rules for allocation of cross-border electricity transmission capacity. Article 16 of Regulation (EU) 2019/943, which currently is not applicable in the Contracting Parties, introduced new requirement for the TSOs to make at least 70 % of cross-border transmission capacity on interconnectors available to the market.[23] This Regulation also allows for transitory measures, such as derogations pursuant to Article 16(9) or action plans pursuant to Article 15 based on which TSOs will gradually to reach this threshold by the end of 2025, latest. On 8 October 2019, ACER issued a Recommendation to national regulatory authorities in implementing consistent approach when monitoring this requirement.[24]

The coordinated capacity calculation under the CACM Regulation implies the use of new taxonomy. In the process of capacity calculation, the TSOs identify the critical network elements on their areas and after the consideration of the flows from other areas, assess the power flow capabilities of the critical network element associated with contingency, and calculate margin available for cross-zonal trade on such critical network element.

According to ACER's Recommendation, the capacity calculation within a coordination area needs to take into account the impact that bidding-zone borders outside such a coordination area have on the physical flows on the critical network elements used within such coordination area (Capacity Calculation Region – CCR). As the CCRs currently include only the EU Member States, the consideration of flows from third countries is possible in case an agreement has been concluded by all TSOs of a CCR with the TSO of the third country.

In the absence of coordinated capacity calculation in line with the CACM Regulation and in order to make a high-level and rough assessment for the Contracting Parties, the ECRB EWG agreed to use available SEEAMMS data and existing taxonomy to assess the state of play in relation to the level of capacity made available to the market. It should be noted that, contrary to EU calculations, which is based on hourly estimation of the 70% criteria, in case Contracting Parties, the estimations are based on average annual

[23] Article 16 (8): Transmission system operators shall not limit the volume of interconnection capacity to be made available to market participants as a means of solving congestion inside their own bidding zone or as a means of managing flows resulting from transactions internal to bidding zones. Without prejudice to the application of the derogations under paragraphs 3 and 9 of this Article and to the application of Article 15(2), this paragraph shall be considered to be complied with where the following minimum levels of available capacity for cross-zonal trade are reached:
(a) for borders using a coordinated net transmission capacity approach, the minimum capacity shall be 70 % of the transmission capacity respecting operational security limits after deduction of contingencies, as determined in accordance with the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009;
(b) for borders using a flow-based approach, the minimum capacity shall be a margin set in the capacity calculation process as available for flows induced by cross-zonal exchange. The margin shall be 70 % of the capacity respecting operational security limits of internal and cross-zonal critical network elements, taking into account contingencies, as determined in accordance with the capacity allocation and congestion management guideline adopted on the basis of Article 18(5) of Regulation (EC) No 714/2009.
The total amount of 30 % can be used for the reliability margins, loop flows and internal flows on each critical network element.

[24] https://www.acer.europa.eu/Official_documents/Acts_of_the_Agency/Recommendations/ACER%20Recommendation%2001-2019.pdf

values calculated from the monthly data given there is no short term calculation of capacity for the market. Considering the above, the regulators from Contracting Parties for the time being are not able to assess the compliance with 70% criteria as per ACER's recommendation, however a rough estimation is made using total transfer capacity (TTC), which represents the thermal capacity of the interconnection (or group of interconnections) represented as a fixed value not taking into account critical elements in networks, already allocated capacity (AAC) and available transmission capacity (ATC). The sum of ATC and AAC is used as an indicative measure the capacity available for commercial use of market participants. Table 3 summarizes average daily data of those indicators which are used in the calculation of table 4[25].

	ATC		AAC		TRM	TTC
	import	export	import	export		
EMS	154	180	4242	3676	712[26]	10400
CGES	2035	1989	2035	1989	300	5410
ISO BH	370	310	1469	1440	350	4400
MEPSO	912	725	911	644	300	5425
OST	0	0	714	704	250	3442
GSE	0	439	0	49	0	700

Table 3. Summary of annual data (MW)

As outlined in the 4 below, the level of capacity made available compared to the TTC of the interconnection, is very low despite a conservative transmission reliability margin (TRM). It should be noted that the ATC allocated on long-term and sort-term timeframe is a result of the long term capacity calculation process, therefore a lot of welfare loss results due to lack of short term coordinated calculation of capacities. The data collected do not include the outcome of weekly capacity calculation process that is applicable in some borders in the Western Balkans. Cross border capacity usage criteria in table 4 are calculated for two direction – import and export.

As the existing calculation process and the taxonomy are not consistent with the processes used in the EU, also the assessment of the available capacity for the market is not consistent with ACER's methodologies. This outlines the need for significant improvements in the capacity calculation processes.

indicator	EMS		CGES		ISO BH		MEPSO		OST		GSE[27]	
	imp	exp	imp	exp	imp	exp	imp	exp	imp	exp	imp	export
TRM/(TRM+AAC+ATC)	14%	16%	7%	7%	16%	17%	14%	18%	26%	26%		
(AAC+ATC)/TTC	42%	37%	74%	72%	42%	40%	34%	25%	21%	20%	0%	70%

Table 4. Summary of the estimated the level of cross-border capacity offered to the market

Data used for this assessment are aggregated per bidding zones and border-per-border representation is the objective in the future reports. In addition, the capacity made available on intraday timeframe is not considered in this assessment therefore the result is slightly undermined.

[25] According to the Guidelines, daily values are uploaded by TSOs in the SEEAMMS and are assumed to be highest hourly values of that particular day.
[26] Average annual value TRM as EMS have different monthly TRMs.
[27] In case of GSE, only Turkish border are included in the calculation with export direction (as capacity allocation for import did not take place in 2020). Due to the fact that interconnector is direct current line, there is no TRM defined.

Recommendation 5: This assessment shall be performed in the future reports as a provisional indicator, with potential improvements of SEEAMMS software too, until coordinated capacity calculation, including also for short term timeframe, is implemented.

3. Conclusions

Monitoring of TSO activities on cross-border capacity revealed that the cross border capacity calculation methodologies are still not harmonized among TSOs of the region, mostly concerning calculation of the Base case Exchange indicator.

The Transmission Reliability Margin calculation is not done according to the ENTSO-E rules and ECRB Recommendations; instead, the practice of bilateral arrangements between TSOs determining the TRM value in advance is still in place.

The Critical Facilities Indicator has shown a very high degree of forecast errors in the estimates of internal congestion. This is one of the most difficult problems to monitor as regulators and market participants have very little insight into how internal congestion affects cross-border capacity. NRAs should aim to understand this indicator as a potential area affecting cross-border capacity calculations.

The report shows variances in generation forecast and that TSOs tend to include pessimistic values (lower than expected and actual) in the model, a fact that deserves increased attention of TSOs and NRAs.

ECRB recommends that NRAs report to ECRB on steps and measures undertaken in monitoring and implementing the recommendations from this report and include them in the following assessment report. It is reported that the UIOSI principle will be applied at the interconnection Serbia-Montenegro and Serbia-Bosnia and Herzegovina for 2022 cross-border capacity rights. ECRB invites NRAs to push for application of such principle where it is not applied yet.

In addition, ECRB recommends that NRAs keep monitoring the capacity calculation process of the TSOs and work towards coordinated capacity calculation, including also short term calculation, as quickly as possible.