Reading Guide: Capacity Calculation & Market Coupling KPIs

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Related documents

Attachments

Contents

1 Introduction

According to Article 25 (7) of the First amendment of the Day-ahead Capacity Calculation Methodology (DA CCM) Core TSOs have the obligation to provide Core NRAs on a monthly basis the underlying capacity calculation and market coupling data related to the quarterly reports. Until a fully automated tool is available (so called Analytical & Reporting Tool), TSOs provide a subset of KPIs that were also reported on during the external parallel run. The developed set of Key Performance Indicators (KPIs) are published on a monthly basis on JAO.

The document at hand aims to introducing the reader solely to the calculated KPIs. It is not intendend to be a general introduction to Core flow-based market coupling. The two webinars held on 22nd of November 2021 (recording, presentations) and 23rd of March 2022 (recording) give an extensive overview on the process itself.

2 KPIs

2.1. Adjustment for minimum RAM inclusion

2.1.1. KPI 1 - Average maximum AMR per TSO

Short Name of KPI	KPI 1 - Average maximum AMR per TSO
Article DA CCM	Article 17. Adjustment for minimum RAM
Granularity	Per month / reporting period
Aggregation	Over all CNECs and all timestamps

KPI Description

KPI 1 analyses the AMR, i.e. the exclusive effect of the Ramr, per TSO. This KPI needs to be read in conjunction with Ramr of each TSO.

Meaning: The higher the KPI, the higher the amount of virtual capacity that is to be added to the natural level of RAM present in the CGM in order to reach the Ramr.

KPI 1 is calculated as the Average Maximum AMR value in MW per BD per TSO and is then averaged over the whole reporting period (usually one month). In this KPI only CNEs with AMR > 0 are taken into consideration but TS with AMR = 0 are included in the calculation. As CNEs have Contingencies associated with them, the values of the KPI are obtained by first calculating the maximum AMR per CNE and per TS. Then the CNEs are sorted by TSO and the average value across the 24 timestamps is calculated per TSO.

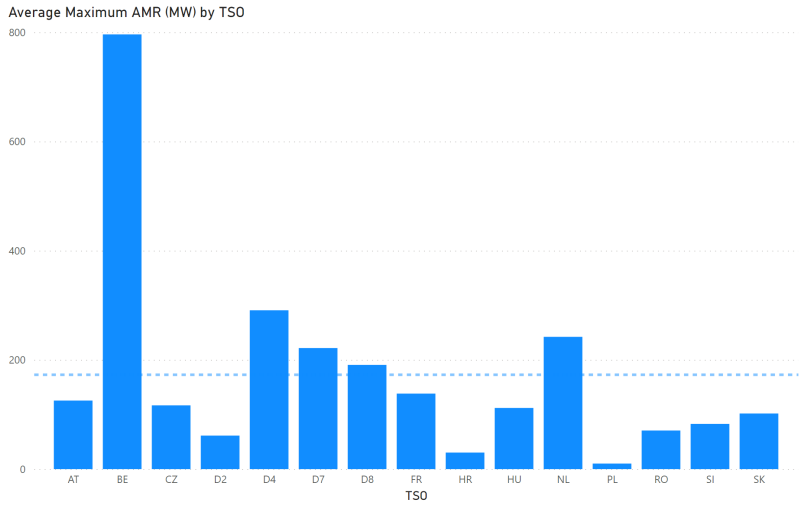
Steps performed:

- Find CNEs with AMR > 0 for at least one TS on the given BD;
- For each found CNE, take the maximum value per TS from all associated CNECs to this CNE;
-Classify the found CNEs per TSO;
- For each TSO, calculate the average across all 24 TS:

$$KPI1_{TSO,\mathrm{BDj}} = \frac{\sum_{n=1}^{24} \max(AMR)}{\frac{24}{y*24}}$$, where n is TS, and y the number of BDs in the reporting period.

Example Visualisation

TSO	Avg. AMR (MW)
AT	125.53
BE	796.06
CZ	116.75
D2	61.38
D4	290.85
D7	221.69
D8	190.83
FR	138.28
HR	30.30
HU	112.00
NL	242.21
PL	10.15
RO	70.68
SI	82.79
SK	101.84



2.1.2. KPI 2 – Occurrences of RAM < 20%

Short Name of KPI	KPI 2 – Occurrences of RAM < 20%
Article DA CCM	-
Granularity	Per bidding zone (BZ)
Aggregation	Over all CNECs and all timestamps

KPI Description

This KPI aims at monitoring for each bidding zone the number of CNEC that had a RAM lower than 20% of its FMax and the number of MTUs where at least one CNEC had a RAM lower than 20% of its FMax.

After computing the final FB domain, a RAM is attributed to each CNEC. The higher the RAM, the higher the capacity that is available for exchanges between bidding zones inside the Core region. If there is a high occurrence of RAM<20% of FMax, it means that this availability decrease.

It is also highlighted in this KPI when there is no RAM at all on CNECs.

Steps performed to compute the KPI for each CNEC:

Calculate the RAM :(RAM0_Core+AMR -CVA-IVA+3)/F_Max

Filtering on the CNEC that are presolved and where IVA is applied. The value of RAM0_Core comes from the pre-final domain before flow-based domain was shifted with the long-term nominations (LTN) and TSOs have agreed to add a margin 3 MW in the formula that represents the rounding that can occur during the process.

Example Visualisation

	CNECs minRAM<20% Fmax +3MW	Distinct MTUs (CNECs minRAM<20% Fmax +3MW)	CNECs with 0 RAM capacity: all observations	Distinct MTUs (CNECs with 0 RAM capacity)
AT - APG	62	29	1	1
BE - Elia	0	0	0	0

CZ - CEPS	0	0	0	0
D2 – TenneTGmbH	5	5	0	0
D4 – TransnetBW	22	9	0	0
D7 – Amprion	22	16	0	0
D8 - 50Hertz	5	4	0	0
FR - RTE	0	0	0	0
HR - HOPS	24	24	15	15
HU - MAVIR	0	0	0	0
NL - TenneTBV	3	3	0	0
PL - PSE	11	11	0	0
RO - Transelectrica	132	54	54	18
SI - ELES	0	0	0	0
SK - SEPS	0	0	0	0

2.2. TSOs' adjustment after validation

2.2.1. KPI 3 - Share of MTUs with intervention per TSO

Short Name of KPI	KPI 3 - Share of timestamps with intervention per TSO
Article in DA CCM	Article 20. Validation of flow-based parameters
Granularity	Per timestamp
Aggregation	Per TSO and over reporting period

KPI Description

During the validation process TSOs perform a security analysis upon the intermediate FB domain. In case the grid cannot be secured despited the use of remedial actions, the capacity (RAM) on a CNEC can be reduced. The amount of reduction of capacity (in MW) is the IVA.

This KPI is based on the IVA value in MW as reported in the final flow-based domain and hence satisfiying equation 21 of the DA CCM, which ensures that for each CNEC the RAM before adjustment for long-term nominations remains non-negative in all combinations of nominations from LTA.

$$CVA + IVA \leq F_{max} - FRM + AMR + LTA_{margin} - F_{LTA,max}$$

Equation 21

$Share\ of\ MTUs\ with\ IVA = \frac{Sum\ of\ \textbf{distinct}\ MTUs\ with\ IVA\ applied}{Total\ of\ MTUs}$, with total of MTUs equal to the number of business days labelled as technically representative within the reporting period * 24.

Practical examples with 10 BDs (240 MTUs):

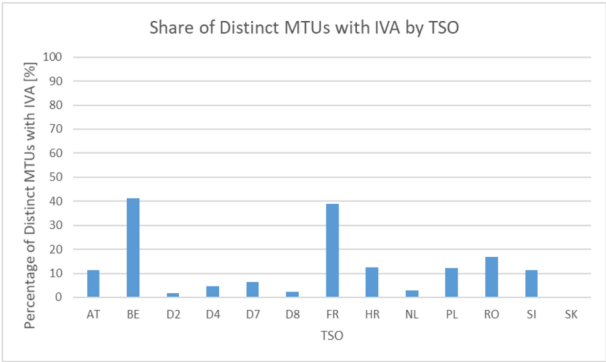
- TSO A has reduced the capacity for **1** CNE during all **240** MTUs.
    - $Share\ of\ MTUs\ with\ IVA = \frac{240}{240} = \mathbf{100}\%$

- TSO B has reduced the capacity for **100** CNEs during **1** MTU.
    - $Share\ of\ MTUs\ with\ IVA = \frac{1}{240} = \sim \mathbf{0,42}\%$

Example Visualisation

22	528	114	21,6%	414	78,4%
Totals BDs	Total MTUs	MTUs without IVA	Share of MTUs without IVA	Distinct MTUs with IVA	Share of MTUs with IVA

TSO	Distinct MTUs with IVA	Share of distinct MTUs with IVA
AT	59	11,17%
BE	217	41,10%
D2	9	1,70%
D4	24	4,55%
D7	33	6,25%
D8	12	2,27%
FR	206	39,02%
HR	66	12,50%
NL	15	2,84%
PL	65	12,31%
RO	89	16,86%
SI	60	11,36%
SK	2	0,38%
Total	**414**	**78,41%**



2.3 PSIA – Power System Impact Analysis

2.3.1 KPI 4 - Min and Max Net Positions per bidding zone

Short Name of KPI	KPI 4 – Min and Max Net Positions per bidding zone
Article in DA CCM	Article 25. Publication of data
Granularity	Per timestamp
Aggregation	No aggregation.

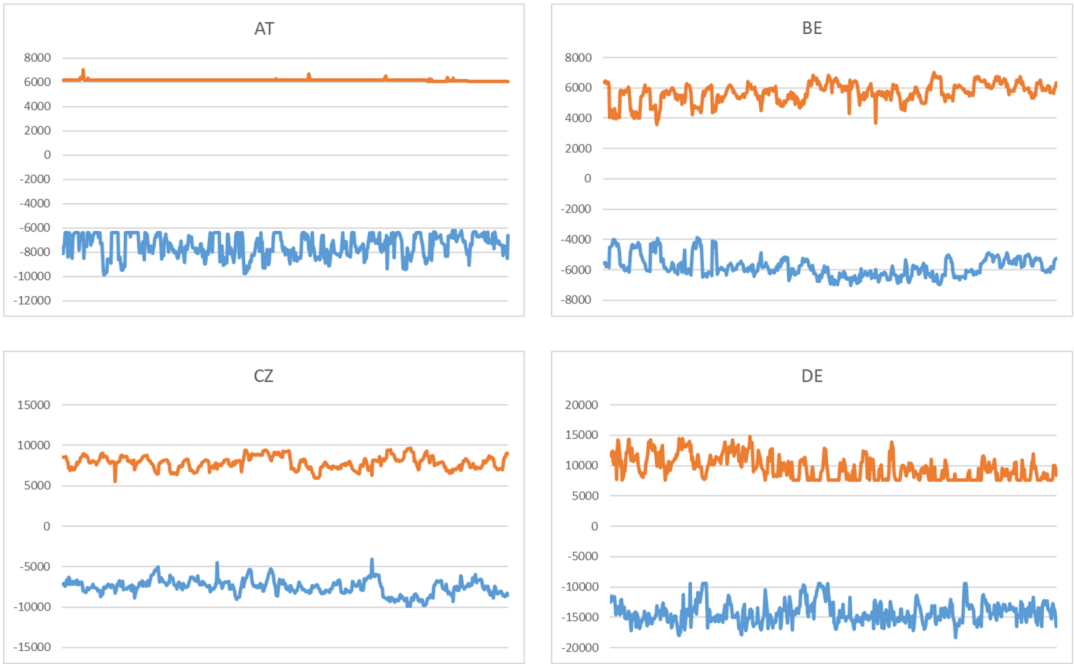
KPI Description

KPI 4 is meant to give an overview of the upper and lower bound of the capacities offered to the market.

Min and Max net positions are provided per bidding zone and per timestamp. This KPI is an output of the capacity calculation process and subject to publication as required by the CCM in article 25.2.d.i.

This KPI is a combination of specific net positions meaning that Min and Max net positions for different bidding zones are mostly exclusive and mostly theoritical.

Example Visualisation



2.4 Non-costly Remedial Action Optimization Analysis

2.4.1 KPI 5 – Relative Time Share of Applied RAs, by TSO, Type and Mode

Short Name of KPI	KPI 5 – Applied RAs
Article in DA CCM	-
Granularity	Per timestamp
Aggregation	Per TSO and over reporting period

KPI Description
This KPI gives an overview of the Remedial Actions that were applied per TSO, over the timestamps of the reporting period in which Non-costly Remedial Action Optimisation was performed and at least 1 remedial action was applied. Possible status of a timestamp from the reporting period: - Spanning was applied before or at Initial Flow-Based Computation *(short name: Spanning before and @initial)* - Default Flow-Based Parameters were applied before or at Initial Flow-Based Computation *(short name: DFP before and @initial)* - Non-costly Remedial Action Optimisation was not performed *(short name: NRAO did not run)* - Non-costly Remedial Action Optimisation was performed, but no Remedial Actions were applied *(short name: NRAO ran and did not apply RAs)*

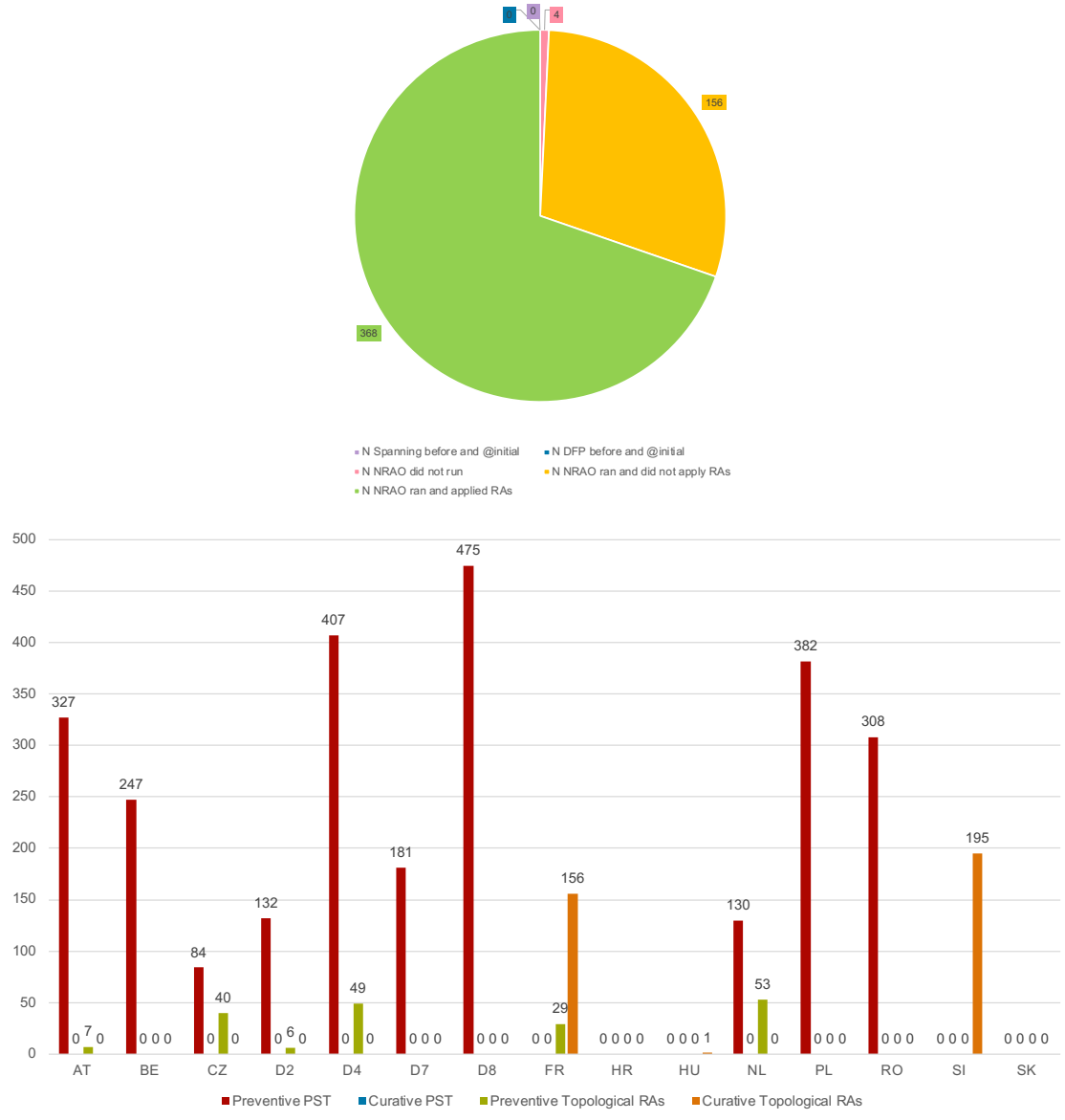
- Non-costly Remedial Action Optimisation was performed, and at least 1 remedial action was applied *(short name: NRAO ran and applied RAs)*

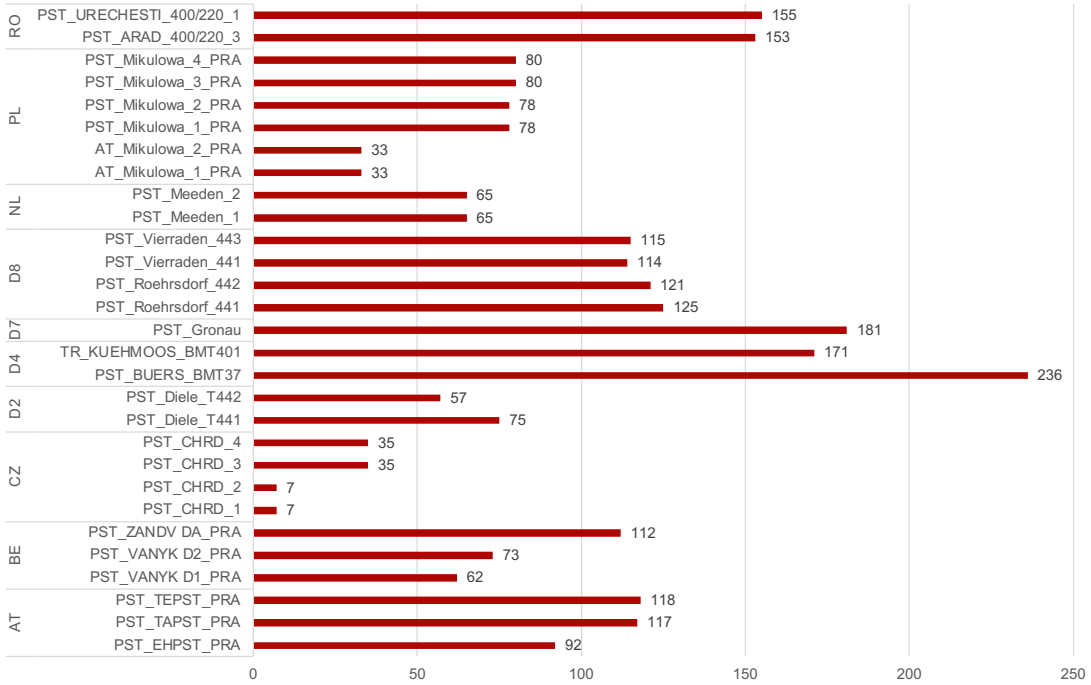
A remedial action can be defined as PST tap position change or as a Topological remedial action. Moreover, a remedial action can be defined as preventive or as curative (to be applied only in combination with a certain contingency or contingencies). Thus, 4 categories of remedial actions are possible:

- Preventive PST
- Curative PST
- Preventive Topological
- Curative Topological

Additionally, a detailed breakdown of the applied remedial actions, per TSO and per RA, is provided, separately for the 4 different categories mentioned above.

Example Visualisation





2.4.2 KPI 6 – Most limiting CNEC per TSO (NRAO)

Short Name of KPI	KPI 6 – Most limiting CNEC per TSO (NRAO)
Article in DA CCM	-
Granularity	Per timestamp
Aggregation	Per TSO and over reporting period

KPI Description

This KPI gives an overview on the number of CNECs which are limiting from NRAO perspective (have the lowest relative RAM value for the respective timestamp), before and after the Non-costly Remedial Action Optimisation step, per TSO.

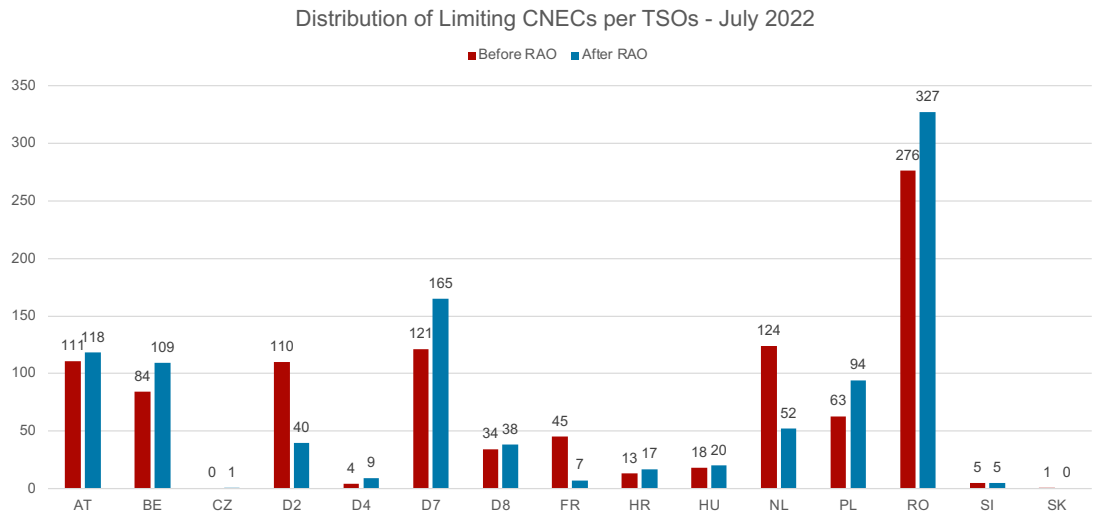
For computation of relative RAM, the following formula is used:

$$RAM_{rel} = \frac{RAM_{nrao}}{\sum_{(A,B) \in neighbouring\ Core\ bidding\ zones\ pairs} \left| PTDF_{A \to B,\, nrao} \right|} \; if\ RAM_{nrao} \geq 0$$

$$RAM_{rel} = RAM_{nrao}\ if\ RAM_{nrao} < 0$$

This KPI gives insight into how application of selected Remedial Actions is redistributing the most limiting CNECs. This is due to the fact that application of Remedial Actions does not eliminate flows, but instead re-routes them. As such, on some limiting CNECs the flow is reduced, while on other it increases.

Example Visualisation



2.4.3 KPI 7 – Average variation of relative RAM before and after NRAO

Short Name of KPI	KPI 7 – Average relative RAM before and after NRAO
Article in DA CCM	-
Granularity	Per timestamp
Aggregation	Per TSO and over reporting period

KPI Description

This KPI gives an overview on the average values of relative RAM before and after the Non-costly Remedial Action Optimisation step, on the most limiting CNECs from NRAO perspective (have the lowest relative RAM value for the respective timestamp), per TSO.

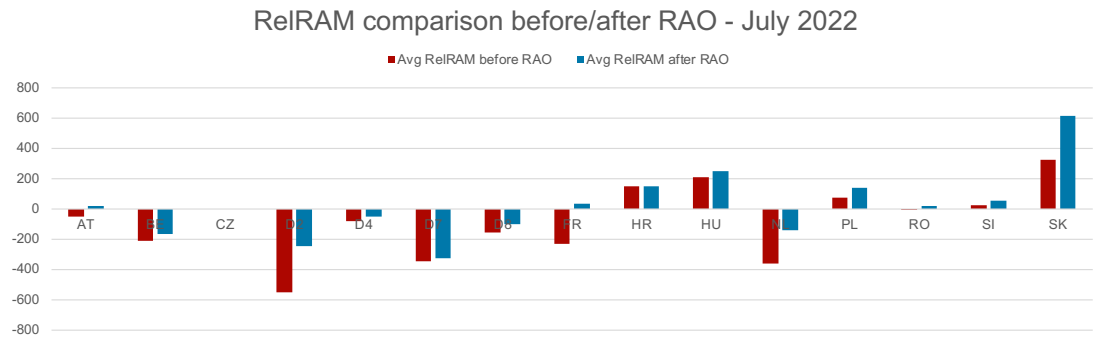
For computation of relative RAM, the following formula is used:

$$RAM_{rel} = \frac{RAM_{nrao}}{\sum_{(A,B) \in neighbouring\ Core\ bidding\ zones\ pairs} |PTDF_{A \to B,\, nrao}|} \quad if\ RAM_{nrao} \geq 0$$

$$RAM_{rel} = RAM_{nrao}\ if\ RAM_{nrao} < 0$$

This KPI gives insight into how application of selected Remedial Actions is increasing the relative RAM values, indicating that the optimisation increased capacity in certain areas.

Example Visualisation



2.5 Market Impact Assessment

2.5.1 KPI 8 - Most often presolved CNEs (Top 20)

Short Name of KPI	KPI 8 - Most often presolved CNEs (Top 20)
Article in DA CCM	-
Granularity	Per timestamp
Aggregation	Over all CNECs and over reporting period.

KPI Description

KPI 8 analyses which elements (CNEs) are the most often presolved ones. In other words, which elements are the most often provided in the FB Domain document for the SDAC.

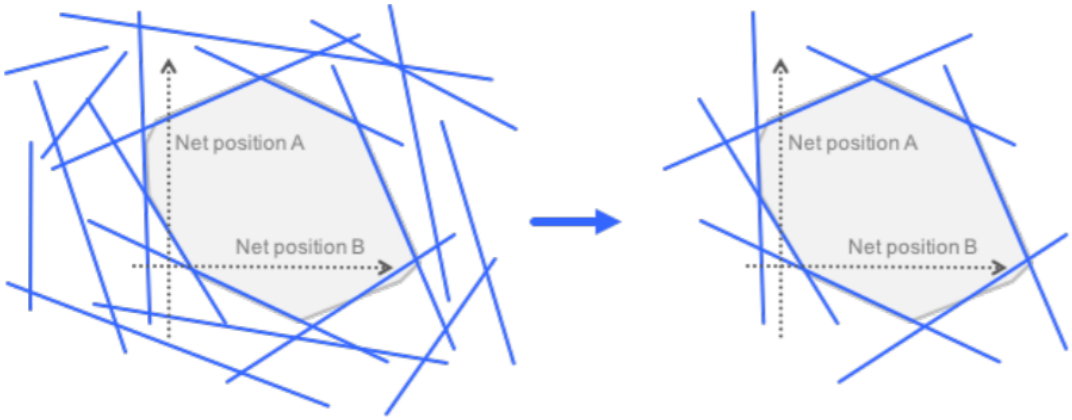
Meaning: The more often an element is identified as presolved, the more often it can potentially limit the MC results of the SDAC.

KPI is calculated using the information of whether elements in the Final FB Domain are presolved or not. This information is aggregated per CNE and shown in a pivot table. Top 20 CNEs based on the number of hours CNE was presolved in a given time period is shown. Additional information for the CNE is shown:

- Distinct Hours: Number of distinct hours the CNE was presolved. In contrast to the "Hours CNE was presolved" this field counts every hour maximum once, even if multiples CNECs for a given CNE were presolved within a given hour. This means that for one BD "Distinct Hours" can be at maximum 24.
- Average of RAM: Average value (over all presolved CNECs of given CNE) of relative RAM calculated as $RAM_{relative} = \frac{RAM}{F_{MAX}}$
- Max of RAM: Maximum value (over all presolved CNECs of given CNE) of relative RAM calculated as $RAM_{relative} = \frac{RAM}{F_{MAX}}$
- Min of RAM: Minimum value (over all presolved CNECs of given CNE) of relative RAM calculated as $RAM_{relative} = \frac{RAM}{F_{MAX}}$
- Max of max z2zPTDF: Maximum value (over all presolved CNECs of given CNE) of zone-to-zone PTDFs between neighboring Core Bidding Zones.
- Min of max z2z PTDF: Minium of the maxium value (over all presolved CNECs of given CNE) of zone-to-zone PTDFs between neighboring Core Bidding Zones.

Disclaimer: Allocation constraints are not part of this KPI. The reason is that the Allocation constraints are not checked for being presolved during the Capacity Calculation Calculation and they are provided for MC regardless of this information.

Determining the most constraining CNECs ("presolve")
Given the CNEs, CNECs and ECs that are specified by the TSOs in Core region, the flow-based parameters indicate what commercial exchanges or NPs can be facilitated under the day-ahead market coupling without endangering grid security. As such, the flow-based parameters act as constraints in the optimization that is performed by the Market Coupling mechanism: the net positions of the bidding zones in the Market Coupling are optimized as such that the day-ahead social welfare is maximized while respecting inter alia the constraints provided by the TSOs. Although from the TSO point of view, all flow-based parameters are relevant and do contain information, not all flow-based parameters are relevant for the Market Coupling mechanism. Indeed, only those constraints that are the most constraining the net positions need to be respected in the Market Coupling: the non-redundant constraints (or the "presolved" domain). As a matter of fact, by respecting this "presolved" domain, the commercial exchanges also respect all the other constraints. The redundant constraints are identified and removed by the CCC by means of the so called "presolve" process. This "presolve" step can be schematically illustrated in the two-dimensional example below:



CNEs, CNECs, and ECs before and after the "presolve" step

In the two-dimensional example shown above, each straight line in the graph reflects the mathematical representation of one constraint (CNE, CNEC, or EC). A line indicates the boundary between allowed and non-allowed net positions for a specific constraint, i.e. the net positions on one side of the line are allowed whereas the net positions on the other side would violate this constraint (e.g. overload of a CNEC) and endanger grid security. The non-redundant or "presolved" CNEs, CNECs, and ECs define the flow-based capacity domain that is indicated by the grey region in the two-dimensional figure. It is within this flow-based capacity domain that the commercial exchanges can be safely optimized by the Market Coupling mechanism. The intersection of multiple constraints, two in the two-dimensional in the figure above, defines the vertices of the flow-based capacity domain.

Example Visualisation

Row Labels	Hours CNE was pre-solved (distinct)	Hours CNE was presolved (summed across contingencies)	Average of RAM	Max of RAM	Min of RAM	Max of max z2zPTDF	Min of max z2zPTDF
[SI-HR] 220kV Cirkovce - Zerjavinc [OPP] [SI]	624	1856	104%	164%	86%	0,15865	0,0713
[SK-HU] Gabcikovo - Gyor [DIR] [HU]	624	2255	79%	109%	57%	0,58325	0,19874
[SI-AT] 220 kV Podlog - Obersielach [DIR] [SI]	623	931	172%	241%	99%	0,40981	0,04165
[AT-AT] Westtirol 1 - Westtirol 2 WTRHU41 [OPP]	623	3581	93%	125%	66%	0,1935	0,09369
[SI-HR] 220kV Cirkovce - Zerjavinc [DIR] [SI]	622	1796	85%	133%	62%	0,15865	0,02436
[AT-D2] St. Peter 2 - Pleinting 258 [OPP] [AT]	622	2453	94%	162%	66%	0,15778	0,03884
[AT-SI] Obersielach - Podlog 247 [DIR] [AT]	619	1220	99%	127%	80%	0,19315	0,14145
[PL-PL] Mikulowa AT1 [OPP]	616	1366	42%	68%	29%	0,19459	0,09094
[SK-SK] Bosaca - Varin [DIR]	615	1653	44%	74%	24%	0,15865	0,05029
[SK-HU] Gabcikovo - Gyor [OPP] [HU]	612	1501	105%	142%	68%	0,47241	0,09566
[HU-HU] Gyor - Oroszlany [DIR]	609	3702	58%	76%	47%	0,12146	0,07545
[AT-AT] Westtirol 1 - Westtirol 2 WTRHU41 [DIR]	607	1984	103%	156%	67%	0,18808	0,00912
[CZ-SK] Nosovice - Varin [DIR] [CZ]	606	1003	70%	94%	56%	0,49683	0,18652
[HU-UA] Kisvarda - Mukachevo [DIR] [HU]	605	713	83%	107%	45%	0,08761	0,00408
[SK-SK] V.Dur - Levice 2 [DIR]	602	602	40%	67%	26%	0,26981	0,16645
[HU-HU] Dunamenti - Oroszlany [DIR]	600	1911	100%	136%	77%	0,10181	0,01309
[BE-BE] PST Van Eyck 2 [DIR]	598	1190	96%	143%	59%	0,42756	0,04987
[AT-HU] Wien Suedost - Gyoer 245 [DIR] [AT]	593	863	63%	81%	50%	0,07499	0,05148
[HR-SI] 220kV Pehlin - Divaca [DIR] [HR]	592	996	110%	204%	72%	0,26404	0,08242
[HR-SI] 400kV Melina - Divaca [DIR] [HR]	590	1181	68%	88%	55%	0,38027	0,17334

2.5.2 KPI 9a - Most limiting CNEs (Top 20)

Short Name of KPI	KPI 9a - Most limiting CNEs (Top 20)
Article in DA CCM	-
Granularity	Per timestamp
Aggregation	Over all CNECs and over reporting period.

KPI Description
KPI 9a analyses which elements (CNEs) are most often limiting the SDAC.

Meaning: The more often an element is identified as a limiting one, the more often it effectively limited the simulated Market Coupling. *A constraint limiting the Market Coupling is often referred to as an 'active constraint'.*

The KPI is calculated using the Shadow Price value coming from simulating the Market Coupling. Shadow Price of an element in the Market Coupling optimization can be interpreted as "value of a potential increase of welfare in a case an extra 1 MW of exchange would be possible (RAM would be bigger by 1MW) on the given CNEC." CNECs with non-zero shadow prices are those, which are effectively limiting the cross-zonal exchanges.
CNECs with non-zero shadow prices are aggregated per CNE and shown in a pivot table. Top 20 CNEs based on the number of hours CNE is limiting in a given time period is shown. Additional information for the CNE is shown:

- Distinct Hours: Number of distinct hours the CNE was limiting. In contrast to the "Hours CNE has ShadowPrice" this field counts every hour maximum once, even if multiples CNECs for a given CNE were limiting within a given hour. This means that for one BD "Distinct Hours" can be a maximum 24.
- Average of RAM: Average value (over all limiting CNECs of given CNE) of relative RAM calculated as $RAM_{relative} = \frac{RAM}{F_{MAX}}$
- Max of RAM: Maximum value (over all limiting CNECs of given CNE) of relative RAM calculated as $RAM_{relative} = \frac{RAM}{F_{MAX}}$
- Min of RAM: Maximum value (over all limiting CNECs of given CNE) of relative RAM calculated as $RAM_{relative} = \frac{RAM}{F_{MAX}}$
- Max of z2zPTDF: Maximum value (over all limiting CNECs of given CNE) of zone-to-zone PTDFs between neighboring Core Bidding Zones.
- Min of max of z2z PTDF: Minium of the maxium value (over all presolved CNECs of given CNE) of zone-to-zone PTDFs between neighboring Core Bidding Zones.

Example Visualisation

Row Labels	Hours CNE was limiting (distinct)	Hours CNE was limiting (summed across contingencies)	Average of RAM	Max of RAM	Min of RAM	Max of max z2zPTDF	Min of max z2zPTDF
[PL-PL] Mikulowa AT1 [OPP]	326	326	46%	62%	29%	0,18494	0,09155
DE_AL_import	126	126	81%	100%	0%	0	0
PL_import / BASECASE	115	115	52%	100%	0%	1	1
[SK-SK] V.Dur - Levice 2 [DIR]	96	96	34%	43%	26%	0,25208	0,16645
[D2-NL] Diele - Meeden SCHWARZ [DIR] [D2]	55	56	36%	80%	20%	0,23507	0,07783
PL_import	45	45	67%	100%	0%	1	1
BE_AL_import	42	42	43%	100%	0%	0	0
[FR-D7] Vigy - Ensdorf VIGY2 S [DIR] [D7]	25	25	44%	64%	32%	0,22066	0,0318
[D2-D7] Grosskrotzenburg - Urberach UMAIN N2 [DIR] [D7]	24	24	25%	41%	21%	0,09822	0,07328
[D8-PL] Vierraden - Krajnik 1 [OPP] [PL]	18	18	30%	37%	20%	0,18426	0,13541
[NL-NL] Diemen - Lelystad DIM-LLS380 W [OPP]	17	17	26%	32%	23%	0,25535	0,06865
[FR-D7] Vigy - Ensdorf VIGY1 N [DIR] [D7]	17	17	39%	42%	31%	0,21203	0,03071
[SK-PL] Lemesany - Krosno Iskrz 2 [DIR] [PL]	12	12	42%	48%	39%	0,10768	0,09778
[NL-BE] Rilland - Zandvliet RLL-ZVL380 W [DIR] [NL]	12	12	49%	60%	40%	0,36418	0,32121
[SK-HU] Levice - God [DIR] [SK]	11	11	55%	63%	52%	0,39776	0,35612
[AT-D2] St. Peter 2 - Pleinting 258 [OPP] [AT]	11	11	87%	96%	82%	0,05162	0,04558
[BE-FR] Achene - Lonny 19 [DIR] [FR]	9	9	72%	82%	61%	0,44259	0,43502
[SK-SK] V.Dur - Levice 1 [DIR]	9	9	29%	35%	27%	0,21843	0,19329
[D7-D7] Ensdorf - Uchtelfangen TAUBNT N [DIR]	8	8	36%	37%	35%	0,0848	0,0789
[SK-UA] V.Kapusany - Mukachevo (WPS) [DIR] [SK]	8	8	47%	50%	44%	0,24428	0,17889

2.5.3 KPI 9b – Allocation Constraints

Short Name of KPI	KPI 9B – Allocation Constraints
Article in DA CCM	-
Granularity	Per timestamp
Aggregation	

KPI Description

KPI 9b analyses if Allocation Constraints (provided separately in export or import direction), currently applied by Belgium (ELIA) and Poland (PSE), were limiting the SDAC.

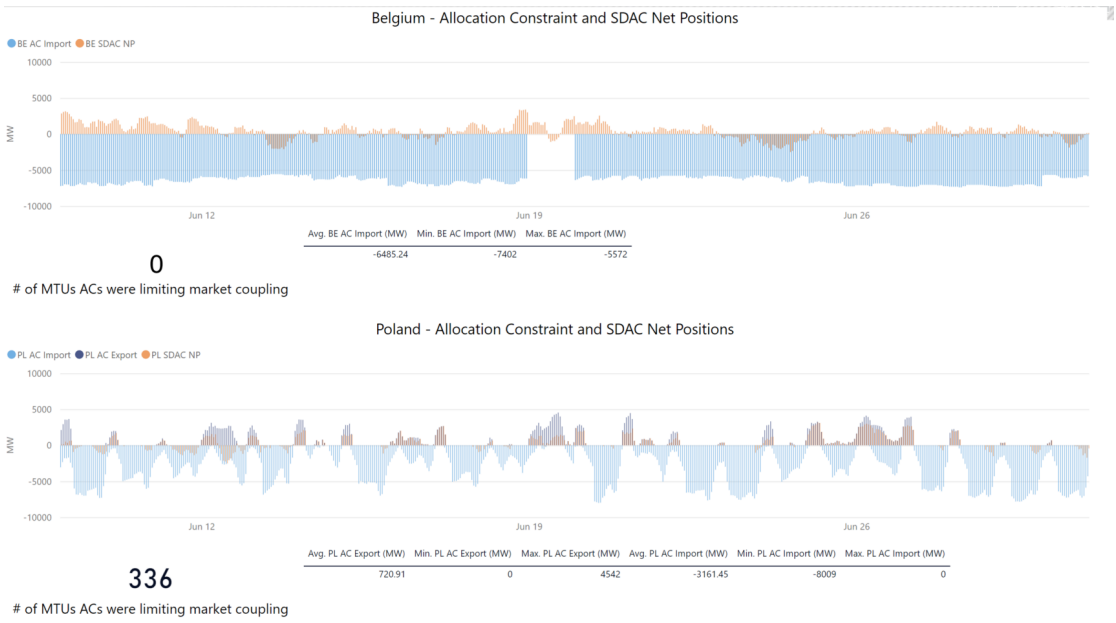
Meaning: The more often an element is identified as a limiting one, the more often it effectively limited the Market Coupling. *A constraint limiting the Market Coupling is often referred to as an 'active constraint'.*

The KPI is calculated using the Shadow Price value coming from the Market Coupling (EUPHEMIA). Shadow Price of an element in the Market Coupling optimization can be interpreted as "value of a potential increase of welfare in case this constraint was increased by an additional 1 MW (i.e. the constraint value of RAM or Allocation Constraint would be 1MW higher)." Allocation Constraints with non-zero shadow prices are therefore those which are effectively limiting the cross-zonal exchanges.

The time series graphs show the values of different Allocation Constraints per MTU as well as the final SDAC net position (after a request made in Core Consultative Group to add this information). If no Allocation Constraint value is reported but there is a positive or negative SDAC net position, then no Allocation Constraints were provided to the market coupling (see for example for Belgium on the 20th of June). However, if there is no value for the Allocation Constraints and the SDAC NP is visible, then the allocation constraint was most likely limiting the overall net position of the BZ (see Poland below).

Further, the number of MTUs when respective Allocation Constraints were limiting the market coupling are reported as well as the average, maximum and minimum values across the reporting period.

Example Visualisation



2.5.4 KPI 10 - Clearing prices, price spread and price convergence

Short Name of KPI	KPI 10 - Clearing prices, price spread and price convergence
Article in DA CCM	-
Granularity	Per month (reporting period)
Aggregation	Per bidding zone/bidding zone border

KPI Description

KPI 10 analyses trends in clearing prices in Core bidding zones.

Meaning: An efficient market coupling should lead to an efficient allocation of cross-zonal capacity. In other words, lower average clearing prices across the Core region and more frequent price convergence.

This set of KPIs is calculated using the Market Clearing Prices as available from the Market Coupling simulation. Maximum, minimum, and average value from the given bidding zone is calculated and shown in the first graph per BD.

For the second graph, price differences between electrically neighbouring Core bidding zones are calculated for every hour. Obtained price differences (PD) are then aggregated into groups: PD = 0 EUR, 0 < PD < 1, ..., 50 < PD). The number of occurrences/hours price difference belonged to a particular group is shown in the second graph. The value is expressed in percentage per day.

For the value presented for CCR Core the day-ahead price spread between the maximum and minimum price across all Bidding Zones is taken (not necessarily electrical neighbours).

Example Visualisation