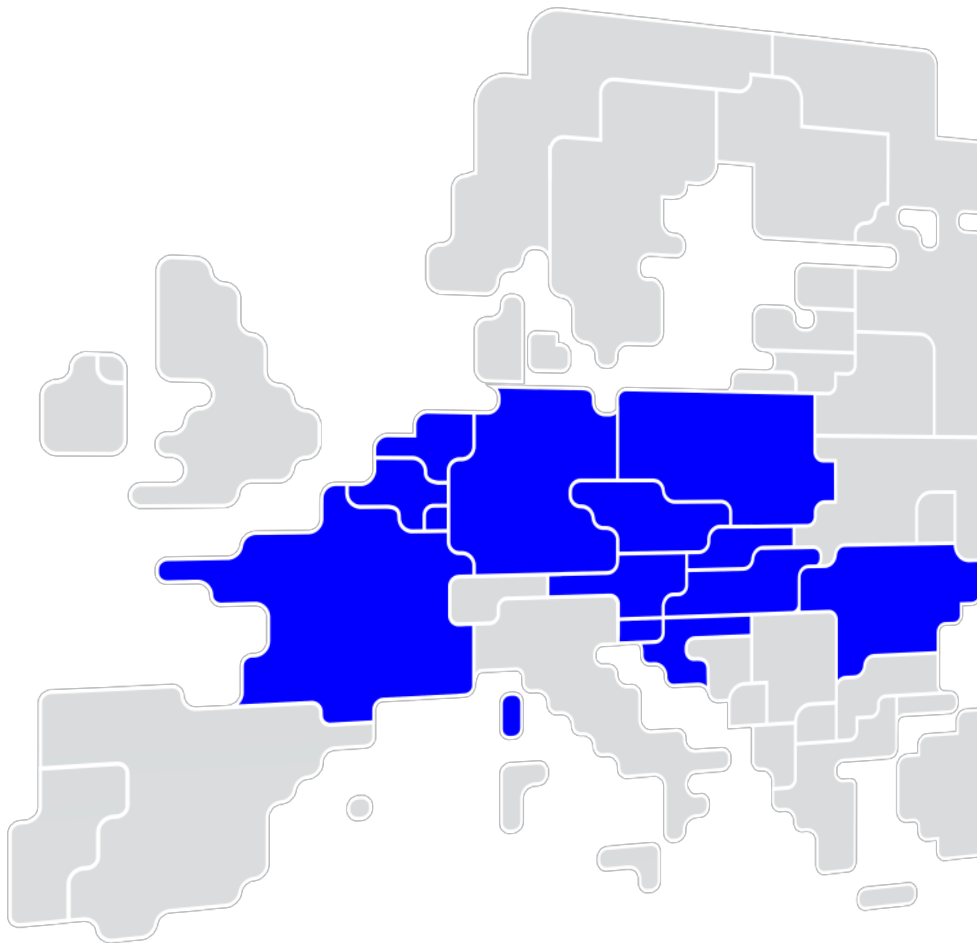
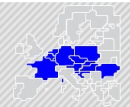


CORE



Accompanying Document for the Results of AHC SPAICC-like Run #2



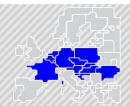


Version, date and status

Version	[1.0]
Date	11-12-2024
Status	<input type="checkbox"/> Draft <input checked="" type="checkbox"/> Final

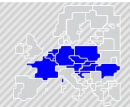
Document creation and distribution

Created by	Core FBE PT AHC TF
Submitted to	CORE SG
Type of document	<input type="checkbox"/> LG = legal document / proposal (for external submission) <input checked="" type="checkbox"/> ED = explanatory document (for external submission) <input type="checkbox"/> WD = working document (for project discussion only) •
File location	https://service.projectplace.com/#direct/document/415308073
Final target	<input checked="" type="checkbox"/> Document to be circulated to: NRAs <input checked="" type="checkbox"/> Market Parties <input type="checkbox"/> For internal usage only



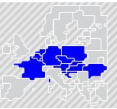
1. DOCUMENT HISTORY AND STATUS

Date	Summary of Changes	Version	By
22-11-2024	Initial draft for FBE PT	0.1	P. BAUMANNNS
02-12-2024	Draft for Core SG	0.2	P. BAUMANNNS
11-12-2024	Final version for publication	1.0	C. PAVON



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2. INTRODUCTION TO THE SPAICC-LIKE RUN CONCEPT

This document provides an overview of the Core TSO's results and observations from the so-called AHC SPAICC-like Run #2 which is part of the testing concept for the Advanced Hybrid Coupling (AHC) go-live in the Core CCR.

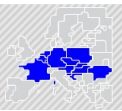
The Core TSOs will introduce AHC for nine non-Core borders in 2025. On the path to the implementation, Core TSOs must be ready with their local tooling for AHC by the end of the first quarter of 2025. The actual implementation of AHC in SDAC is planned for mid-2025, contingent on SDAC planning and the performance of EUPHEMIA with the additional virtual hubs required for Core AHC. Additionally, the introduction of AHC is scheduled with a deliberate temporal gap following the introduction of 15-minute MTU. Thus, any delay in the 15-minute MTU implementation will directly result in an equivalent delay in the AHC go-live for Core.

Given the tight timeline for the AHC implementation, a special testing concept was developed in close collaboration with market participants, Core national regulatory authorities, and ACER. This concept aims to avoid a full six-month external parallel run, aiming for a swift implementation for AHC. Instead, AHC will be tested offline in batches and a one-month external parallel run will be held shortly before go-live. The testing approach is named SPAICC-like runs, as its execution is based on the half-yearly SPAICC concept, which is used e.g., to assess the impact of changes in the grid due to grid expansion. SPAICC stands for Standard Procedure for Assessing the Impact of Changes in Core. In total, four such SPAICC-like runs are planned. For the time being, SPAICC-like runs #1 and #2 were successfully completed, still facing some specific objectives and limitations as described in the next paragraphs.

Against this background, the availability of results of SPAICC-like run #2 mark the first time AHC results are shared with the public. Both SPAICC-like run #1 and #2 runs covered the same seven BDs, while the upcoming runs #3 and #4 will analyse 20 BDs. Results from these later runs are expected in spring 2025.

The second SPAICC-like run was designed with the goal of sharing results with the public, especially with Market Participants allowing them to start their individual adaptations for the AHC go-live. Still, there are several important limitations to consider when interpreting these results. Core TSOs are working on improving all of these points for subsequent runs.

- No NRAO was performed during this run.
- Historic business day of 2023-08-21 which is part of SPAICC-like #2, had an IVA fallback for France (FR) and Belgium (BE)
- Individual validation processes were not conducted for ELIA and RTE
- Net Position Forecast (NPF) still relies on a prototype version of the AHC NPF tool which is currently under investigation. This might also impact the validation results of some TSOs.
- Resulting Romanian minimum and maximum Net Positions shows results that are still being investigated by Core TSOs as they seem counterintuitive
- The net position of the Baltic cable virtual hub was constrained due an inadvertent transformer outage. The results can thus not be deemed representative for this border.



These listed limitations, e.g., IVA fallback for the historic BD and no validation in SPAICC-like run #2, can lead to high differences in capacity that are not necessarily due to the introduction of AHC, which makes interpretation more difficult.

A general description of AHC including a list of the affected borders can be found in Chapter 3.

3. AHC AND THE FUTURE CORE AHC BORDERS

The term hybrid coupling refers to the integrated use of Flow-Based (FB) and Available Transmission Capacity (ATC) constraints within a single capacity allocation mechanism. There are two concepts of hybrid coupling: The Standard Hybrid Coupling (SHC) and the Advanced Hybrid Coupling. The key distinction between SHC and AHC lies in how power exchanges over interconnectors between bidding zones (BZs) within the Core CCR and those outside the Core CCR - both part of the Single Day-Ahead Coupling (SDAC) – are mapped into flows on Core CNECs. At the moment, only SHC is in use in the Core CCR.

In SHC, access to scarce CNEC capacity is ensured by ex-ante defining capacity on Core CNECs before the Core capacity calculation. Thus, SHC is based on forecasted exchanges on the relevant interconnectors and includes a security margin to account for deviations from the forecast. This means that, in the event of an incorrect forecast, either

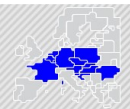
- (a) grid security is jeopardized because too much capacity is released, or
- (b) an efficient market outcome is not achieved because capacity remains unused

Conversely, in AHC, exchanges over the respective interconnectors compete for CNEC capacity alongside all other cross-zonal power exchanges within the Core CCR during market coupling in SDAC. By enabling such non-discriminatory competition for limited CNEC capacity, AHC is expected to both enhance socio-economic welfare while simultaneously improving operational grid security.

Core TSOs will introduce AHC for the following bidding-zone borders:

- DE-DK1 (AC border)
- DE-DK2 (Kontek + KF CGS)
- DE-SE4 (Baltic Cable)
- DE-NO2 (NordLink)
- NL-DK1 (COBRACable)
- NL-NO2 (NorNed)
- PL-LT (LitPol, AC border after synchronisation of the Baltic states)
- PL-SE4 (SwePol)
- RO-BG (AC border)

A Cost Benefit Analysis ('CBA') regarding the introduction of AHC is not foreseen, as the obligation to introduce AHC resulting from the CCM is independent of economic viability and, given the conceptual differences between SHC and AHC, improvements in terms of computational accuracy of the capacities are obvious.



Core TSOs have detailed the method for AHC in the Second amendment of the Day-Ahead Capacity Calculation Methodology of the Core Capacity Calculation Region, specifying the framework for the technical AHC implementation:

- In the AHC, the CNECs of the Core Day-ahead capacity calculation region shall not only limit the net positions of Core bidding zones due to exchanges on bidding zone borders of the Core CCR but also the exchanges on bidding zone borders between the Core CCR and adjacent CCRs.
- For each AHC border, the Core TSOs shall introduce at least one virtual hub and the PTDFs of the virtual hubs shall be included in the flow-based parameters, meaning that the dimension of the Core flow-based domain is increased by adding more hubs ("columns")
- Cross-zonal network elements pursuant to Article 5 of the Core DA CCM shall additionally include those on AHC borders and the maximum zone-to-zone PTDF of a CNEC shall additionally consider the PTDFs of the virtual hubs, meaning that the dimension of the Core flow-based domain is increased by adding more CNECs ("rows")
- Core TSOs may impose a limit to the net position of the virtual hubs for AHC borders if it is based on the NTC computation of a neighbouring CCR.

4. EVALUTATION OF SPAICC-LIKE RUN #2 RESULTS

In the following paragraph, Core TSOs present their results of SPAICC-like run #2. Any results provided on the following pages focus on the differences in minimum and maximum Net Positions (NP) for hubs with AHC borders. In the case of the AHC scenario, the minimum and maximum NP values correspond to a "Core incl. AHC" NP, which is directly derived from the Cross-Zonal Capacity (CZC) domain as calculated in the Flow-Based Capacity Calculation (FB CC) process. For the non-AHC scenario, the minimum and maximum NP values are calculated differently. They are obtained by summing the Core Min/Max NPs, which are derived directly from the CZC domain of the FB CC process, and the Available Transfer Capacities (ATCs) for AHC borders. These ATCs are sourced from the ENTSO-E transparency platform¹.

It shall be noted that the delta plot shows the delta away from the zero. This is to make the comparison for both Min and Max NP consistent. A positive delta thus always means an improvement in capacity.

¹ Offered Day-ahead Transfer Capacity Implicit [11.1]

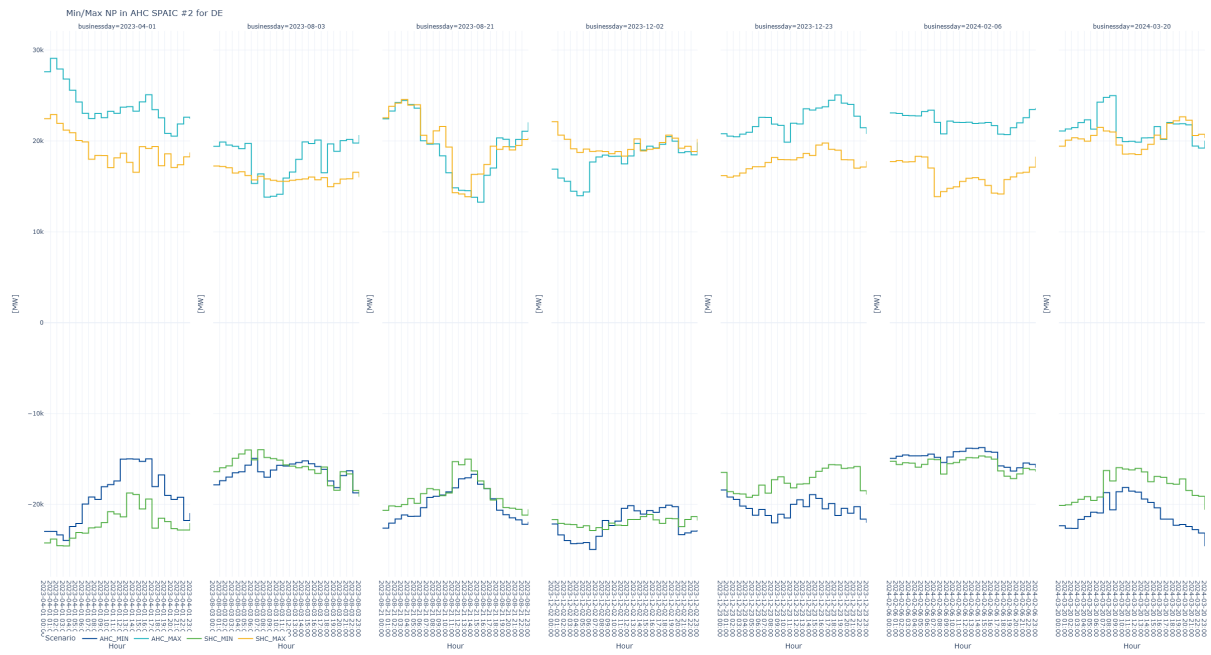
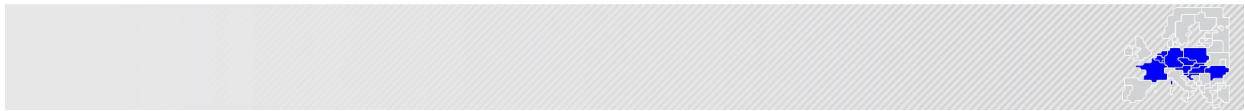


Figure 1:MinMax NP graphs for DE_LU

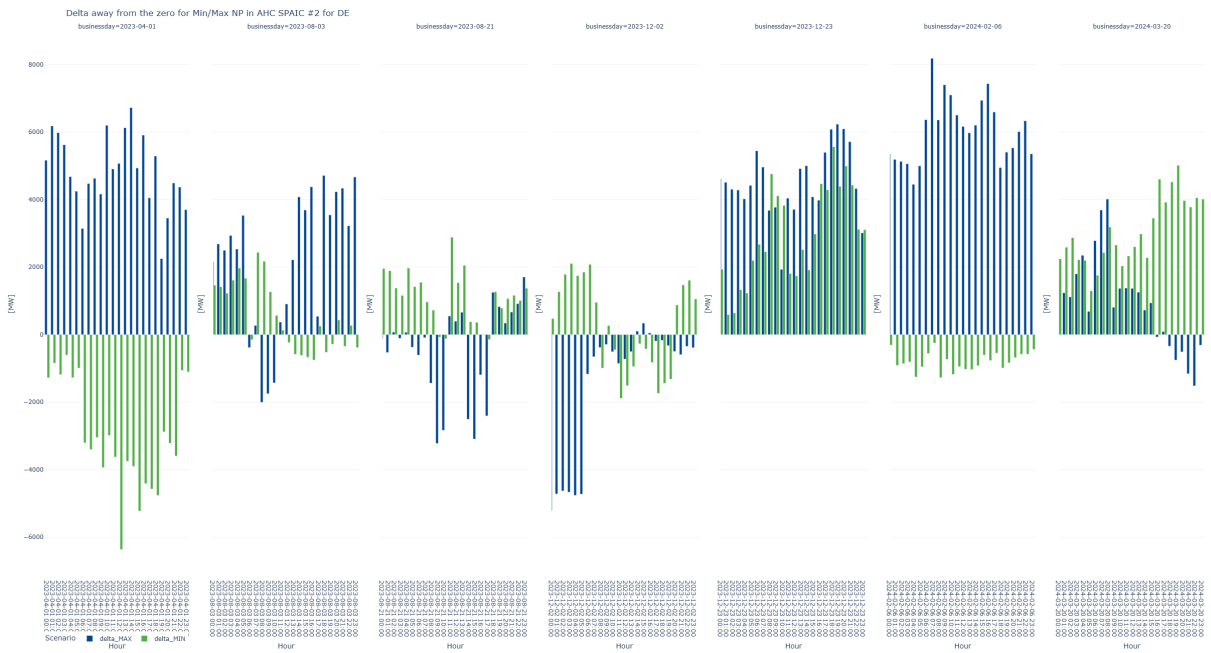


Figure 2:MinMax NP deltas for DE_LU

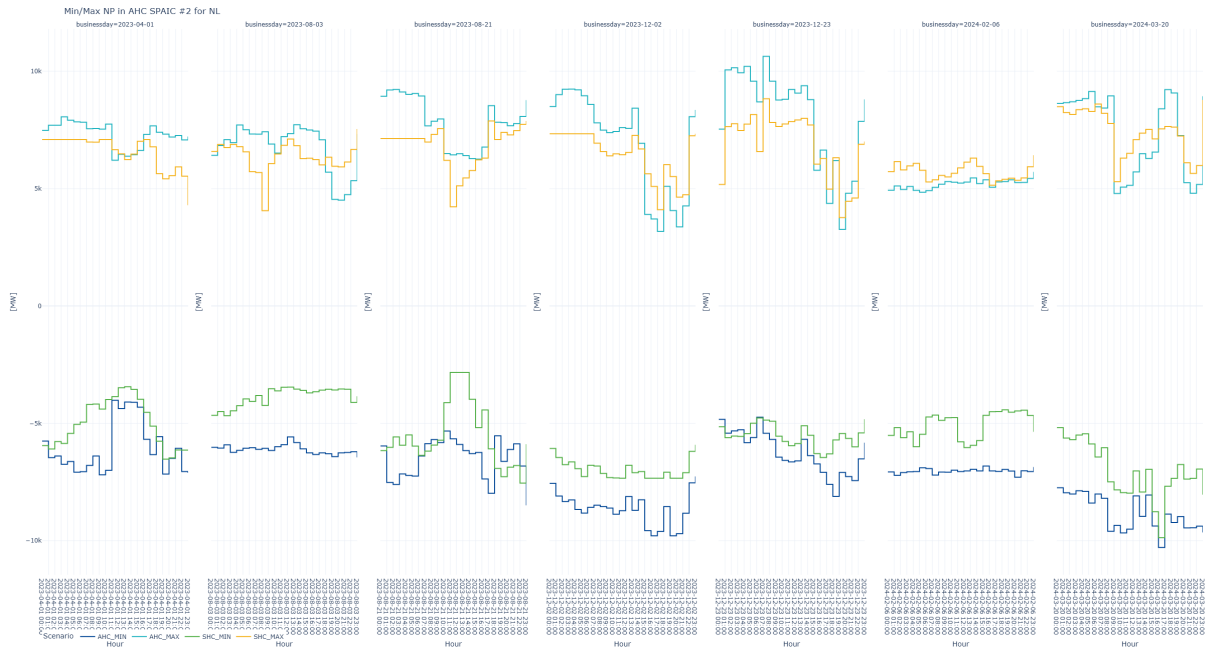
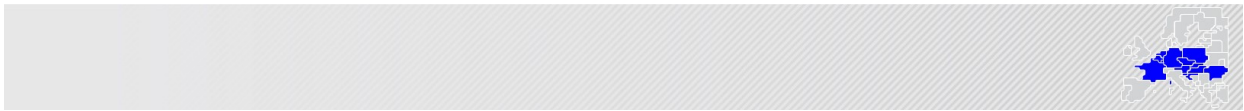


Figure 3: MinMax NP graphs for NL

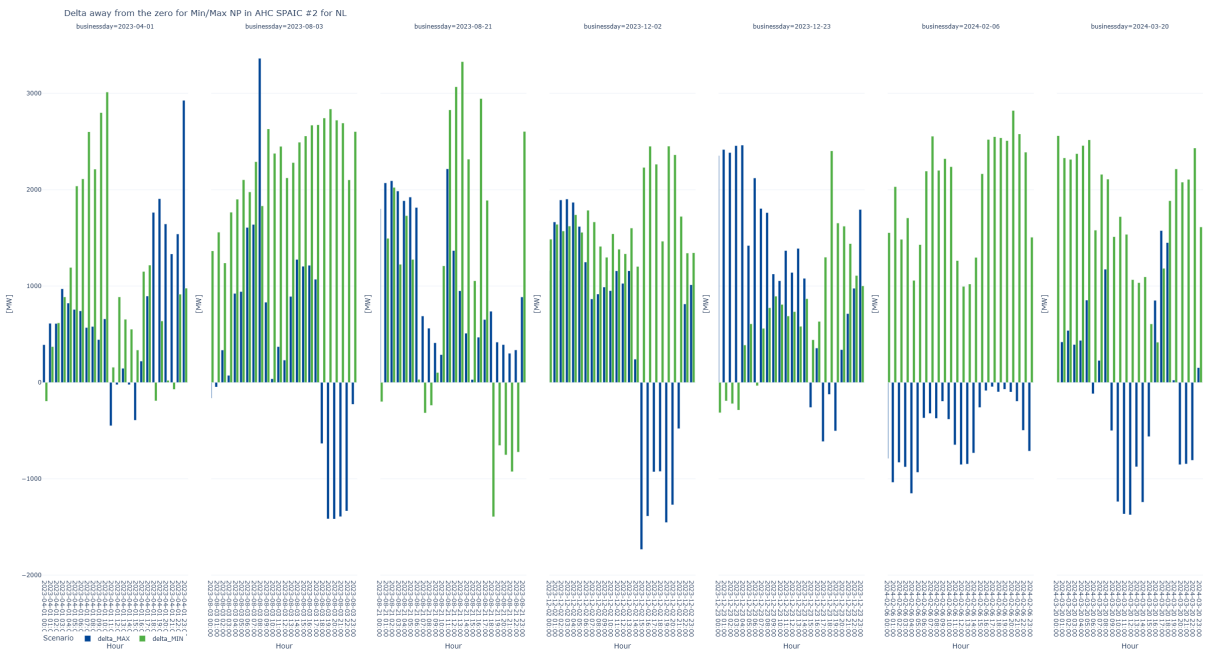


Figure 4: MinMax NP deltas for NL

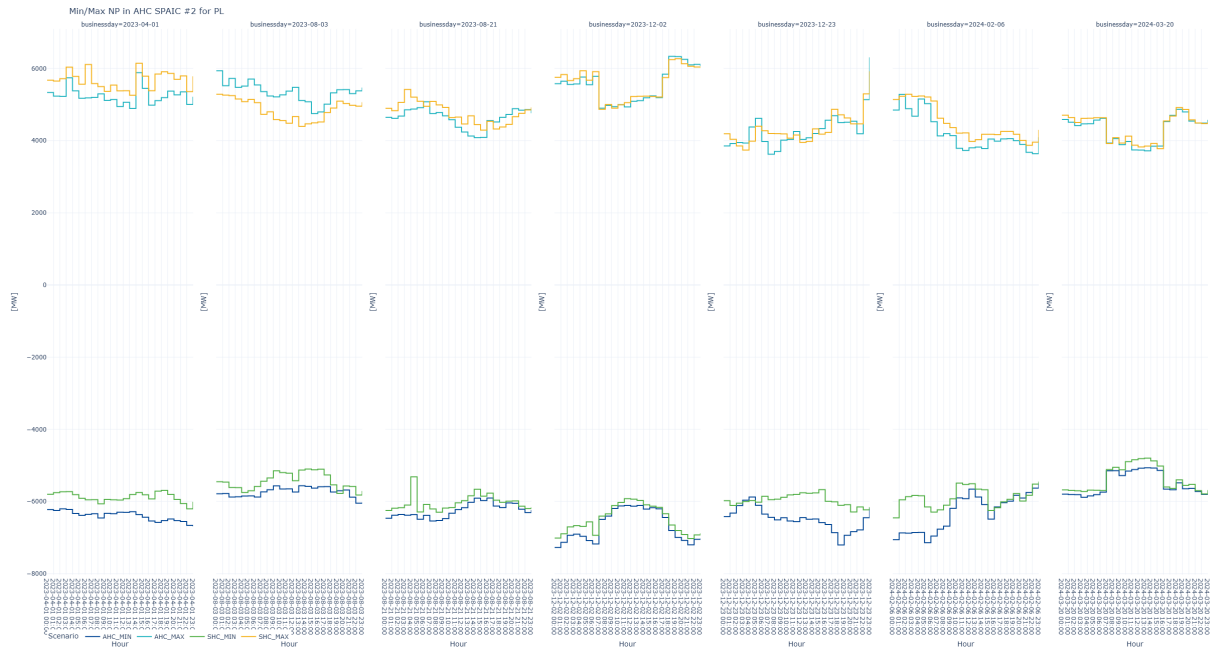
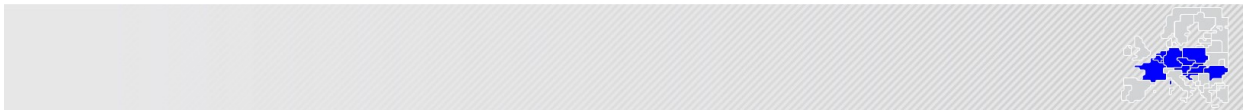


Figure 5: MinMax NP graphs for PL

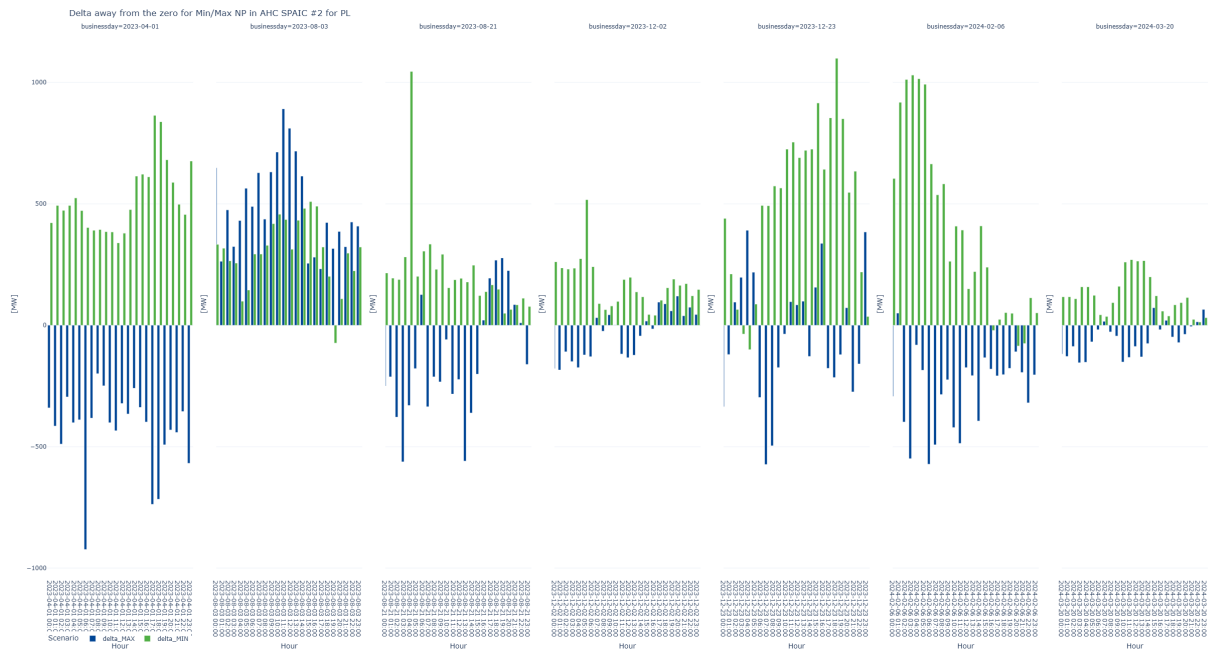


Figure 6: MinMax NP deltas for PL

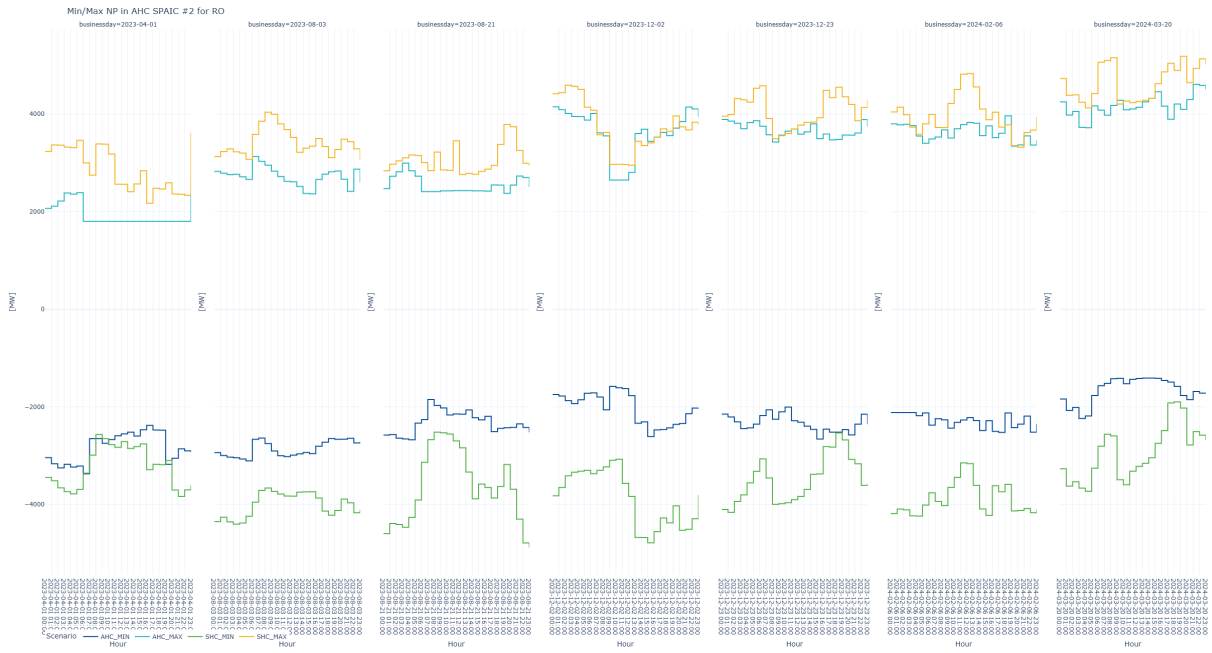
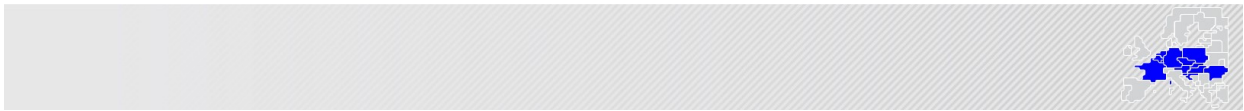


Figure 7: MinMax NP graphs for RO

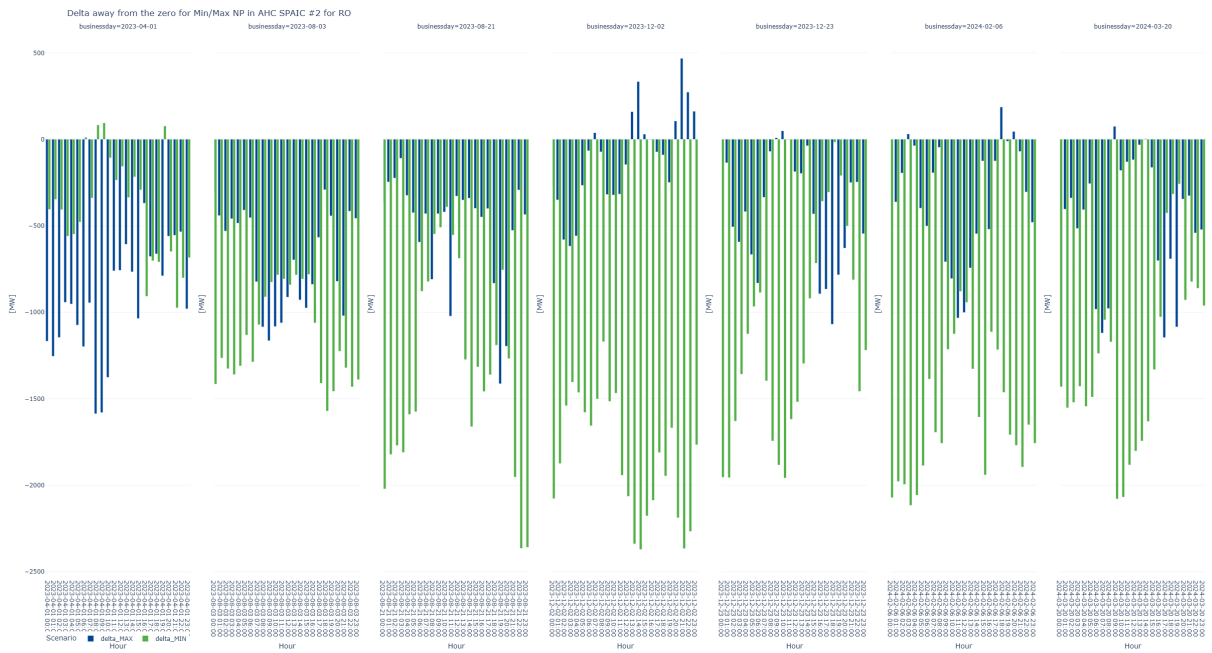
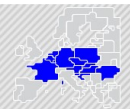


Figure 8: MinMax NP deltas for RO



5. EXPLANATION OF DATA PROVIDED WITH THIS DOCUMENT

Core TSOs provide two zip-files per BD. One contains the final domain results, as it would normally be published on the JAO publication tool. The other one contains the plots as shown in the previous section for all hubs in html format.

As mentioned above there are some disclaimers to the results of this run. Most importantly for the data:

- No NRAO was performed during this SPAICC-like run.
- Historic business day of 2023-08-21 which is part of SPAICC-like #2, had an IVA fallback for France (FR) and Belgium (BE).
- Individual validation processes were not conducted for ELIA and RTE.
- The net position of the Baltic cable virtual hub was constrained due an inadvertent transformer outage. The results can thus not be deemed representative for this border.
- The Romanian Max NP for the business day 2023-04-01 was limited by a “historically used” CNEC which is no longer in use. This will be removed for SPAICC-like run #3.
- In general, the results for the Romanian hub are under active investigation by TSO’s.
- Net Position Forecast (NPF) still relies on a prototype version of the AHC NPF tool which is currently under investigation. This might also impact the validation results of some TSOs.

Any of the listed limitations, e.g., IVA fallback for the historic BD and no validation in SPAICC-like run #2, can lead to high differences in capacity that are not necessarily due to the introduction of AHC, which makes interpretation more difficult.

6. NEXT STEPS

Preparations for SPAICC-like run #3 are already in progress. The corresponding simulations will begin in December 2024. Due to the fact that the 20 BDs need to be analyzed in 3 batches, and considering the Christmas period, results are expected no earlier than February 2025.