AUSTRIAN POWER GRID
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German-Austrian Market Split – Implementation and Impact from a TSO Perspective

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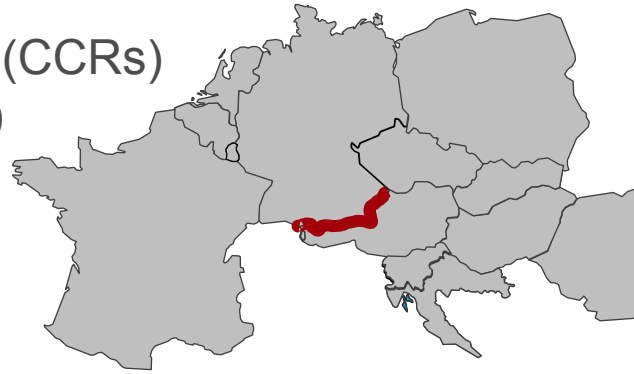
REGULATORY BACKGROUND

Regulatory Background

- Necessity for split of DE-AT Bidding Zone has been discussed over the last years.
- 2 main Processes:

  1) ACER Decision on Capacity Calculation Regions (CCRs) in accordance with CACM Regulation (November 2016) included Bidding Zone border between DE/AT.

  2) Regulatory Agreement between ECA/BNetzA to split the Bidding Zone (Mai 2017).



- Split of the DE-AT Bidding Zone was one of the largest changes for the Austrian market in the recent years, with significant impact for many stakeholders.
- Timeline to implement this significant change has been very ambitious from the beginning.

Regulatory Agreement

- Implementation of capacity allocation at the border DE-AT by 01/10/18.
  → Austria as an independent Bidding Zone
- **Minimum long-term capacity of 4,9 GW**
- **Implemented in CWE Flow-Based Day-Ahead Market Coupling**
- AT to provide redispatch for min. 1.0 GW and max 2.8 GW for DE.

AT in CWE

This agreement was the basis for the DE-AT Bidding Zone Border implementation project!

CWE … Central Western Europe (FR, BE, NL, LU, DE, AT)

TARGET MODELS & IMPLEMENTATION

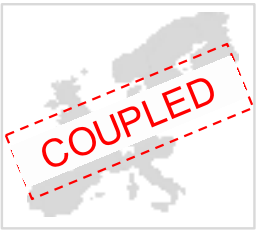
Capacity Allocation via existing solutions

Forward/ Long Term

- Explicit Auctions (Yearly & Monthly)
- European Harmonised Allocation Rules
- Financial Transmission Rights (FTRs)
- Joint Allocation Office (JAO)

Day Ahead

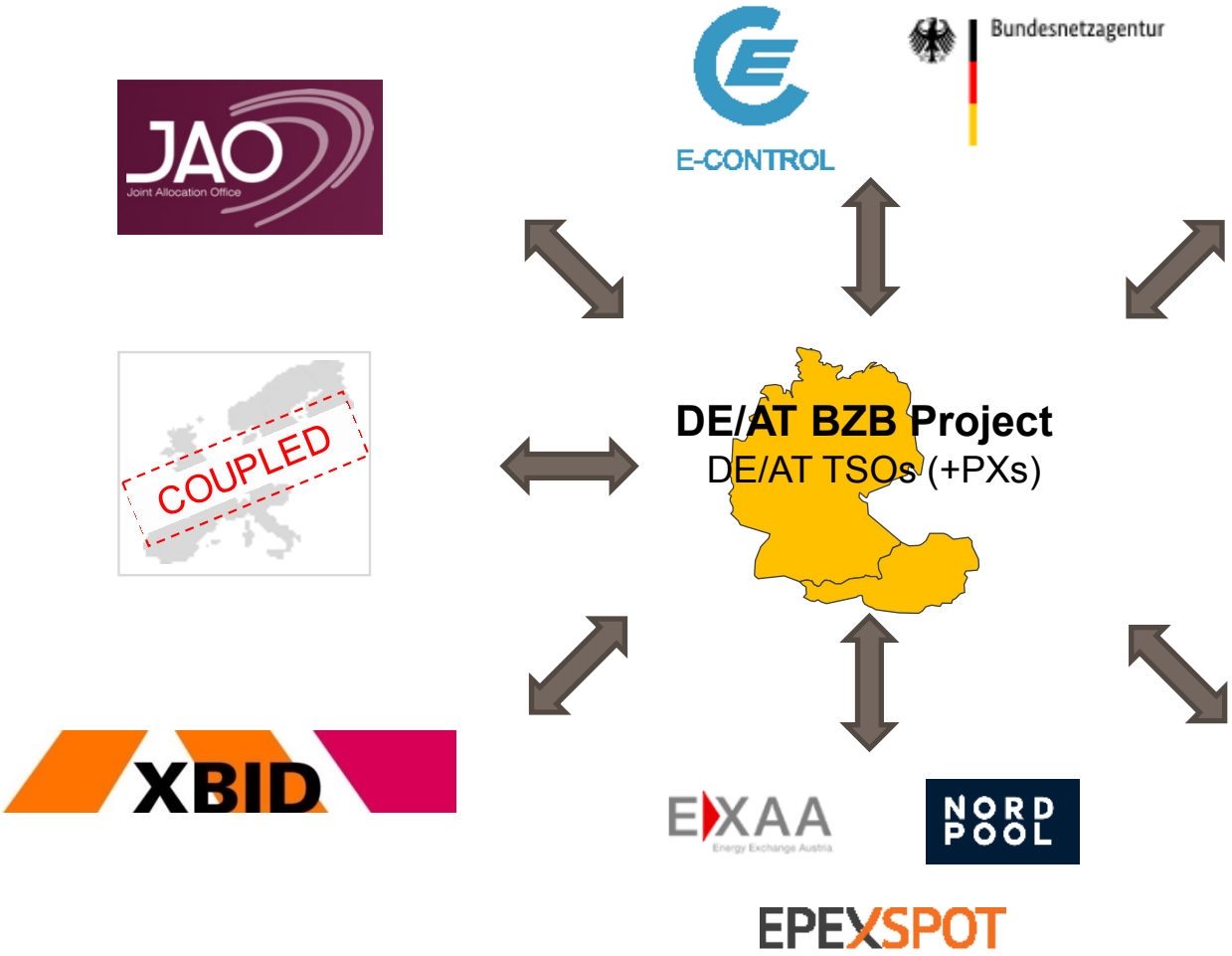
- Integration into the European Single Price Coupling – Multi Regional Coupling (MRC)
- Flow-based Market Coupling in CWE region



Intraday

- Implicit continuous trading
- Integration into the XBID Solution

Project Environment



CWE Region

- CWE TSOs (+PXs)
- Flow Based processes already in place an active.
- APG was already CWE member.
- DE/AT BZB needed to be integrated in all CWE systems and processes.

CORE Region

- CORE TSOs (+PXs)
- Region relevant implementing CACM & FCA obligations

Stakeholders

Project with high complexity

- Capacity Calculation and Allocation follows European processes and target models defined by European regulations.
  - Flow-based capacity calculation
  - Flow-based allocation
- Processes are highly regulated and changes required regulatory approval on a regional level (CWE).

→Alignment with many different stakeholders was necessary!

→Technical processes and systems are complex!

→Timeframe for implementation was fixed and did not allow for any delay!

CWE IMPACT ASSESSMENT

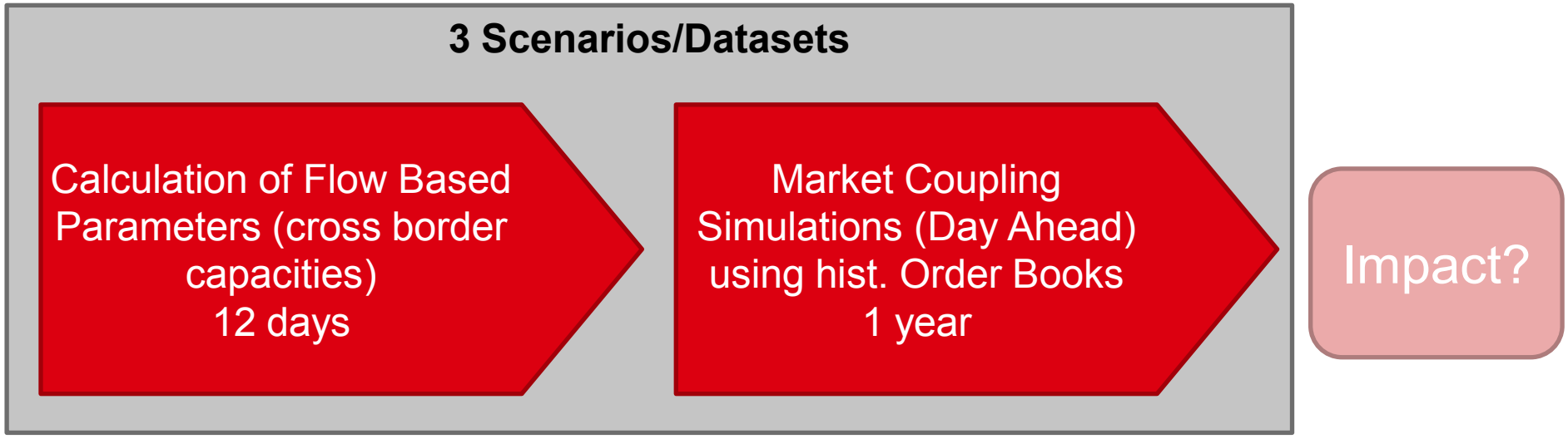
Overview SPAIC Process

- In order to analyse the impact of changes on the flow based capacity calculation in CWE region, CWE partners have defined a *Standard Procedure for Assessing the Impact of Changes* = **SPAIC**

- This SPAIC approach has also been applied for the introduction of the border DE/AT into the CWE Flow Based Calculation

- Providing SPAIC results has been requested by Regulatory Authorities of the CWE region in order to approve the integration of DE/AT border into the Flow Based solution

Overview SPAIC Process



Conclusions DE/AT SPAIC

- DE-AT BZ split would on average have a positive impact on the import and export possibilities in CWE
- For DE-AT border it could be expected that maximum import capabilities from DE to AT would be above 4900 MW in several hours
- For assessing the impact on market results the available data, i.e. historical order books, imposed several challenges for the simulation
- Consequently market coupling results could only be simulated with a number of limitations. Therefore, no substantiated results could be provided

RESULTS SINCE 01/10/2018

Results Flow Based Market Coupling

- Q4 2018

Relevant Indicators for DE/AT Border	*min*	***Ø***	*max*	
Possible Maximum Exchange DE>AT (Min NP AT)	*4900**	***5240***	*9054*	[MW]
Import(-)/Export(+) AT<>DE Day Ahead	*-6383*	***-3484***	*1868*	[MW]
Price Difference AT > DE	*-2,15*	***7,33***	*74,21*	[€]
Price Convergence (Share of hours)		***23 %***		

- Q1 2019

Relevant Indicators for DE/AT Border	*min*	***Ø***	*max*	
Possible Maximum Exchange DE>AT (Min NP AT)	*4900**	***5359***	*7897*	[MW]
Import(-)/Export(+) AT<>DE Day Ahead	*-6195*	***-3080***	*1750*	[MW]
Price Difference AT > DE	*-1,91*	***4,13***	*53,90*	[€]
Price Convergence (Share of hours)		***35 %***		

*The value of long term capacity (usually 4,900 MW) reflects the minimum capacity for FB calculation (via LTA inclusion).

Results Flow Based Market Coupling

- Q2 2019 (until 25.06.2019)

Relevant Indicators for DE/AT Border	*min*	***Ø***	*max*	
Possible Maximum Exchange DE>AT (Min NP AT)	*4900**	***5133***	*7572*	[MW]
Import(-)/Export(+) AT<>DE Day Ahead	*-5253*	***-1292***	*4435*	[MW]
Price Difference AT > DE	*-9,26*	***0,21***	*27,49*	[€]
Price Convergence (Share of hours)		***54 %***		

- Since Split (until 25.06.2019)

Relevant Indicators for DE/AT Border	*min*	***Ø***	*max*	
Possible Maximum Exchange DE>AT (Min NP AT)	*4900**	***5245***	*9054*	[MW]
Import(-)/Export(+) AT<>DE Day Ahead	*-6383*	***-2650***	*4435*	[MW]
Price Difference AT > DE	*-9,26*	***3,98***	*74,21*	[€]
Price Convergence (Share of hours)		***37 %***		

*The value of long term capacity (usually 4,900 MW) reflects the minimum capacity for FB calculation (via LTA inclusion).

Development of Day Ahead Price Spreads Differences & Prices of Long Term Rights

Price Differences DE-AT									
Month	**Oct.18**	**Nov.18**	**Dec.18**	**Jan.19**	**Feb.19**	**Mar.19**	**Apr.19**	**May.19**	**Jun.19***
Quarter	**Q4/2018**			**Q1/2019**			**Q2/2019***		
Average EPEX Spread AT/DE [M]	€ 8,55	€ 5,14	€ 8,22	€ 6,62	€ 3,22	€ 2,45	€ 0,78	€ 0,03	€ -0,34
Average EPEX Spread AT/DE [Q]	€ 7,33			€ 4,37			€ 0,27		
FTR's monthly	€ 0,88	€ 5,75	€ 3,82	€ 6,06	€ 5,06	€ 3,21	€ 1,37	€ 0,50	€ 0,44
FTR's yearly	/			€ 3,33					
* Until 25.06.2019									

Summary of Results since Go-Live

- The CWE flow-based capacity calculation process has provided for import (DE>AT) capabilities of 5.2 GW on average
- The average price spread between DE and AT has been 3.98 EUR/MWh
- While Q4 2018 showed relatively high imports and price spreads, spreads have been significantly decreased, or even turned negative accompanied with exports (AT>DE), in Q2 2019
- Both situations can be explained by economic fundamentals
- When assessing the value of imports/exchanges between DE and AT, also the price for allocated FTRs have to be taken into account

CONCLUSIONS

Conclusions

- AT/DE TSOs and NEMOs have implemented all steps required by the framework agreement between E-Control and BNetzA in an overall challenging project environment
- With the implementation of this border the existing CWE flow based solution has been extended for the first time
- All implemented processes for capacity calculation and allocation have been running smoothly since go-live*
- In particular the economic impact of the bidding zone split has been difficult to anticipate
- Actual results from flow based market coupling and long term capacity allocation are now available for 9 months and provide a broad picture of the impact on the market

*Except for the partial de-coupling on 07/06/2019, which was caused by local issues of a power exchange

Questions???