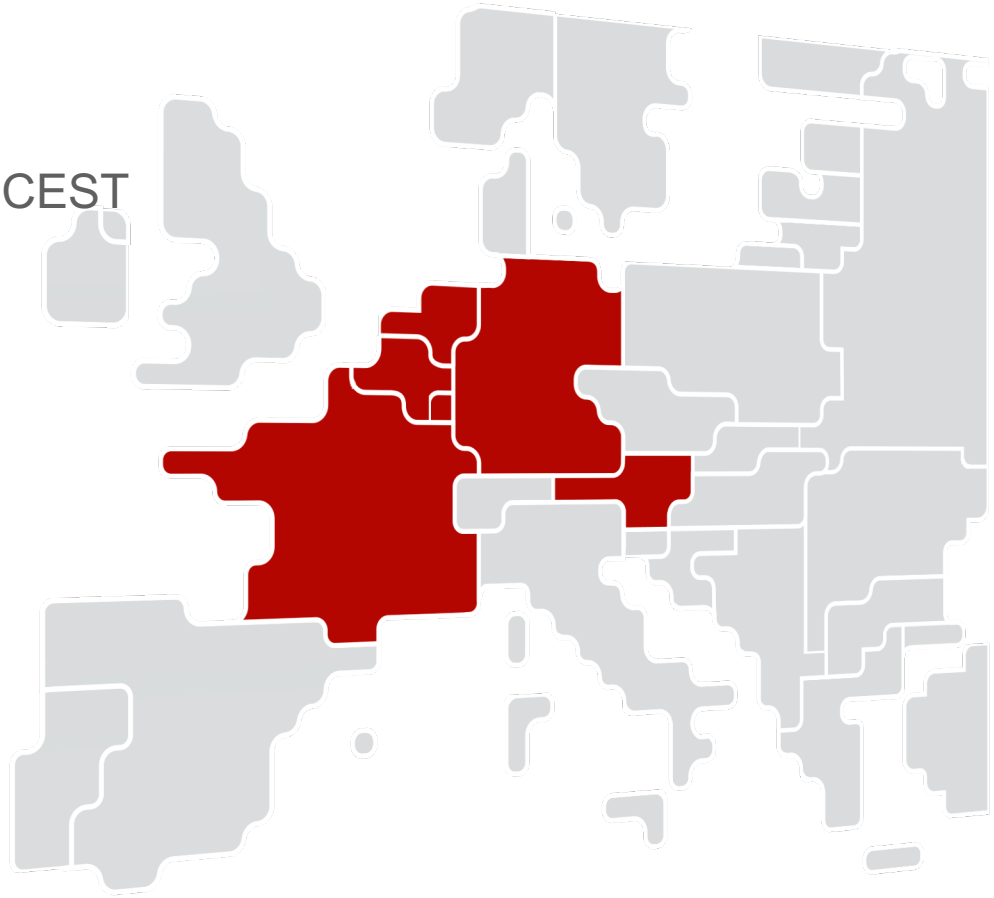
CWE Consultative Group

15th of June 2020

Conference call 10:00-14:30 CEST

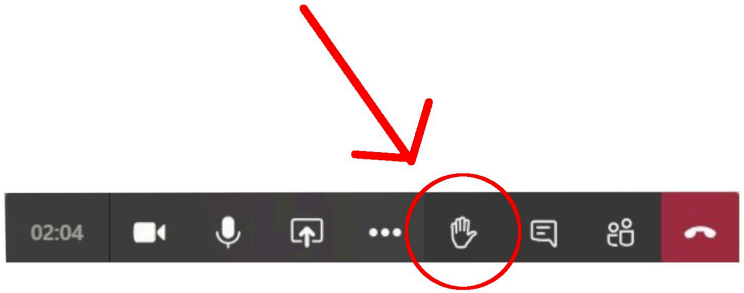


Welcome!

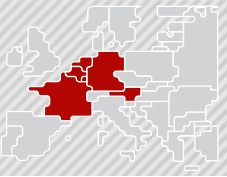
CWE Consultative Group call 15/06

- Please mute yourself during the call
  - If you dialled in via phone, you can mute / unmute by using *6

- If you have any questions, you are kindly asked to raise your hand via the ‘raise hand’ button.



1. Welcome & introduction



CWE TSOs welcome all representatives from CWE MPS and NRAs to the CCG call.

The following topics are on the agenda for today's call:

	SUBJECT	WHO	TIMING
1	**Welcome & introduction**	E. REN / H. ROBAYE	10:00 – 10:10
2	**Update CWE projects** • CEP implementation • Transparency: backfill historical CBs	E. REN	10:10 – 10:30

3	**Update CWE methodologies for CEP and ALEGrO implementation**
	• Introduction
	• CWE FBMC:
	  • Extended LTA formulation – pedagogical material
	  • Improved Virtual Branches – explanation
	  • Comparison between Extended LTA and Improved Virtual Branches
	  • Update on switch to FBP (high-level update)
		FB expert	10:30 – 12:00

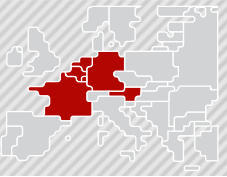
			Lunch break
4	**ALEGrO project** • Status of infrastructure project • Introduction to ALEGrO capacity calculation principles • Presentation of external parallel run results • Go-live approach • Publications	ALEGrO project	13:00 – 14:15
5	**AOB** • CWE NRAs' view on the publication of aggregated bid/offer curves by CWE NEMOs	N. SCHOUTTEET	14:15 – 14:30

➔ **Anything to add to the agenda?**

2. Update CWE projects

CEP implementation 1-2

E. REN



Last CCG call, CWE TSOs informed CWE MPs on the status of CEP implementation in CWE

- Successful CEP business go-live on BD 01/01/20.
  - For Amprion, TransnetBW, and TenneT DE – CEP minRAM of 11.5% is used (following the action plan) and CWE 20% minRAM* is respected
  - APG, Elia, RTE, and TenneT NL configuration setting of 20%* minRAM.
- CEP parallel runs have been performed for TenneT NL and Elia and will continue until the end of 2020 for APG and RTE
  - Operational data is enriched with expected minRAM updates for APG, Elia, RTE, and TenneT NL.

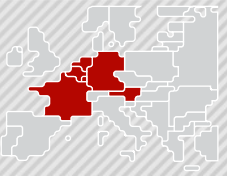
Derogations

- APG, Elia, RTE, and TenneT NL submitted a **derogation request** from the 70% requirement.
- These derogation request are approved by the respective regulatory authorities. The submitted derogations of CWE TSOs can be found in the package of submitted derogations from Core TSOs
- Status derogations:
  - APG: grounds for the current derogation are related to coordination and tooling (e.g. validation tool) and described in ‘work packages’. Outlook for next year depends on progress related to these work packages.
  - Elia: will submit a new derogation for 2021. The derogation will be comparable to the existing derogation, as the methodologies which are key to managing the flows in the electricity grid via coordinated capacity calculation and coordinated application of remedial actions as, mentioned in whereas (4) of the existing derogation, will not (all) be implemented before 2021. Also, the two foreseeable grounds as mentioned in whereas (6) and (7) of the derogation still apply
  - RTE: will submit a derogation for S2 2020 as there is still time needed for tool development.
  - TenneT NL: will submit a new derogation for 2021. The derogation will (most likely) be comparable to the existing derogation, as the methodologies which are key to managing the flows in the electricity grid via coordinated capacity calculation and coordinated application of remedial actionsas, mentioned in whereas (4) of the existing derogation, will not (all) be implemented before 2021. Also, the two foreseeable grounds as mentioned in whereas (6) and (7) of the derogation still apply.

Action plans

- For the following Member States, **action plans** are established: Germany, the Netherlands.

* Depending on operational security



2. Update CWE projects

CEP implementation 2-2

With the differences in scope depending on the local agreements per member state (MS), an update on the parallel run and current operations is provided on country level:

MS	Parallel run specificities
Austria	Voluntary calculations started on 30/12 based on non-industrialised tools. The MACZT minRAM target value is changed every day. As a next step, the results will be analyzed. The calculations so far are for internal operational testing and development of further tools (e.g. for validation).
Belgium	The parallel run is finished. The results of the parallel run from Business Day 07/01/2020 until 31/03/2020 can be found on a dedicated page on the JAO website, which includes publication of MNCC, LoopFlows, minRAM CWE target and minRAM reduction (if any) in the field minRAM justification.
France	Since end of March, RTE starts to monthly report to CRE the MCCC, MNCC, MACZT on RTE CNECs. Due to the covid-19 situation, the participation of RTE to the // Run environment delayed from the end of Q1 to finally takes place starting from BD 11/04/2020. So far, in this // Run environment, higher minRAM are sent from 2 to 4 BD per week, but results are not yet representative of the future 01/01/2021 situation because the phase of testing validation process had not started yet.
Netherlands	The parallel run is finished. The results of the parallel run from Business Day 22/02/2020 until 31/03/2020 can be found on a dedicated page of the JAO website.

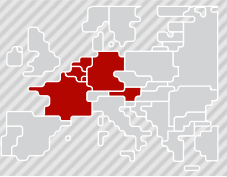
MS	Operational specificities
Belgium	Process and local tooling went live on April 1st including publication of MNCC, LoopFlows, minRAM CWE target and minRAM reduction (if any) in the field minRAM justification. This data provides full transparency to market parties about the outcome of specific calculation for BE and the effect of the derogation on the capacity made available by Elia for CWE FB MC.
Germany	The operational process is following the action plan: CEP minRAM of 11.5% is used and CWE 20% minRAM* is respected. The local German minRAM validation process has been updated. It is now a two-step approach. The first step is validation of the 20% minRAM. In case the outcome of this check is negative, an additional check of the 11.5% (CEP starting value) is performed.
Netherlands	Per 1/4/2020, also detailed results from the capacity calculation process are published in the JAO Utility Tool. Here, TenneT publishes: MNCC, LoopFlows, and MACZTmin in the field “minRAMFactorJustification”. This data provides full transparency to market parties about the outcome of specific calculations for NL and the effect of the action plan and derogation on the capacity as made available by TenneT for CWE FB MC.

* Depending on operational security

2. Update CWE projects

Transparency – backfill historical CBs

E. REN



Last CCG call (03/04), CWE TSOs informed MPs on the initiation of the backfilling of historical CBCOs

- Reminder on objective of the backfilling: provide a consistent set of data on JAO platform, in line with the transparency update of Autumn 2019 and as discussed with MPs

CWE TSOs started with publication of the flows in the JAO Utility Tool, in reverse chronological order, i.e. moving backwards in time.

Current status

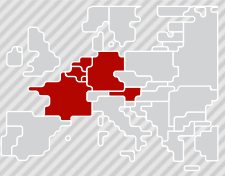
- Publications from 01/05/15 until 01/10/19 have been republished on the JAO Utility Tool, following the updated CBCOs naming.
- Some minor issues are being fixed for some BDs in 2015 and 2016. These are scheduled to be resolved be mid-June.

Next steps

- The backfill for the period after the Transparency Release (01/10/19 until 17/12/19) will commence after the above-mentioned fix has successfully been completed.
  - The backfill for this 2,5-month period requires a different preparation and approach as the transparency update in Autumn 2019 changed the output of the CWE TSOs system.
  - It is estimated to require 2 months to backfill the period 01/10/19 until 17/12/19.

3. Update CWE methodologies for CEP and ALEGrO implementation

E. REN



Introduction

CWE TSOs and NRAs agreed on the approach to include changes required for CEP and ALEGrO in the CWE approval documents.

- CWE TSOs submitted the updated CWE FBMC approval document to CWE NRAs on 06/05
- Submission of the updated ID ATC after FBMC approval document is foreseen by beginning of July
- CWE NRAs indicated to share their decision on both the DA and ID methodologies with CWE TSOs by mid September

The following updates are included in the updated approval documents and will be explained in the next slides:

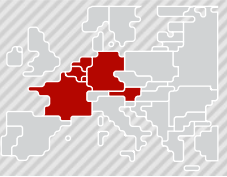
Approval document	CEP implementation	ALEGrO	Other
Overall	• Legal references updated in both approval documents, to bring in line with Regulation (EU) 2019/943		
CWE FBMC	• CEP minRAM calculation methods ○ Possibility to submit variable minRAM values per CBCO and MTU ○ MinRAM values to be submitted by each TSO in line with the national approach for CEP. ○ NOTE: national approaches are not described to ensure robustness and stability of the Approval document	• Updates to include ALEGrO cable ○ Evolved flow-based ○ New border	• Updates to include changes related to performance mitigations: ○ Extended LTA formulation ○ Improved Virtual Branches • Switch to flow-based plain (FBP)
ID ATC after FBMC (Annex 15.20 of FBMC AP)	• ID ATC evolutions for CEP	• Updates related to ALEGrO commercialisation	• Explanatory Note will be provided describing the (local) increase / decrease process

➔ *See next slide for more information on the changes related to the performance mitigations and the switch to FBP.*

3. Update CWE methodologies for CEP and ALEGrO implementation

Introduction and current approach

A. DANTHINE



Updates to include changes related to performance mitigations:

- As informed during the CCG of 03/04, performance challenges of FBCE & Euphemia with additional borders became apparent with the preparations for the implementation of ALEGrO: there was lack of scalability of the IT system.
  - The issue: the number of virtual branches which are created for the LTA inclusion process is exponentially linked to the mathematical dimensionality.

Current process

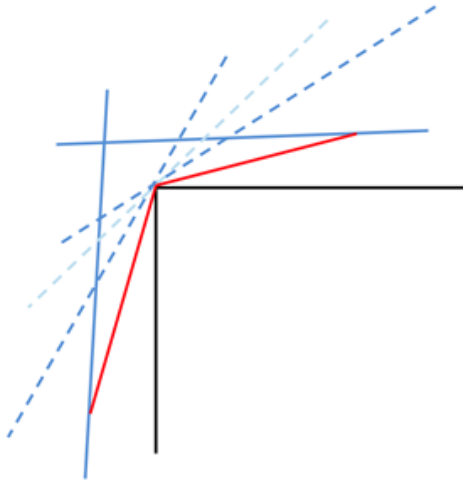
- Currently each real branch is replaced by its virtual counterpart in case the LTA corner creates an overload– leading to a high number of duplicate virtual branches. Hence, the number of virtual constraints generated during the LTA inclusion can be significantly reduced by removing this duplication step
- With the current approach, each virtual branch will be scaled with the corresponding RAM. It will lead to non-physical PTDFs for the virtual branches.
- A detailed example can be found in the annexes of the slides.

TSOs accordingly developed updates of the methodology to perform the LTA inclusion in order to improve performance and the reasons why both are needed:

- Improved virtual branches – Reduction of virtual constraints
- Extended LTA inclusion – Novel way of doing LTA inclusion in the Market Allocation part

Improved virtual branches

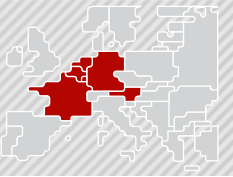
- CWE TSOs developed the Improved virtual branches in order to reduce the number of virtual branches. Improved Virtual Branches will not create duplicate as it was the case in the current LTA inclusion.
- Detailed example can be found in annex.
- The Virtual branches will not be scaled with the RAM like in the past.
- For the sake of transparency,
  - The most limiting line (Highest LTA margin) will give its name to the newly constructed branches (virtual branches).
  - The other lines will be shifted similarly to an application of FAV while with the current approach they were deleted.
- Moment of application: ALEGrO technical go-live



ALEGrO technical go-live will happen a bit prior the commercial go-live with ALEGrO constrained to 0.

3. Update CWE methodologies for CEP and ALEGrO implementation

Extended LTA inclusion (“Balas formulation”)



An R&D track with N-SIDE under SDAC governance successfully elaborated an alternative way for LTA inclusion directly in Euphemia.

- In the extended LTA inclusion process, the market coupling algorithm now receives two domains (one FB domain with MinRAM and one LTA domain) representing the flow-based Capacities of the CWE region.
- Euphemia does not recalculate the flow-based domain (it does not create an LTA included domain). Instead, the “Balas formulation for LTA inclusion” allows Euphemia to choose which combination of both domains creates most social welfare, where the share of the LTA domain and the share of virgin FB domain is expressed with a factor alpha.
- Mathematical formulation can be found in the enclosed document *LTA_inclusion_description_202004.pdf*

Extensive analysis has shown that the implementation of the ‘Balas formulation’ (Extended LTA inclusion) **yields the same market coupling results** as LTA inclusion via improved virtual branches:

- The min max net position of the FB domain correspond
- In addition, running market coupling simulations generated comparable welfare
- Minor differences have been observed due to rounding and because the ‘Balas formulation’ is more precise than the virtual branch creation
- Summary of the analysis can be found in annex.

It has been demonstrated that the Extended LTA formulation delivers significant gain in the performance of Euphemia.

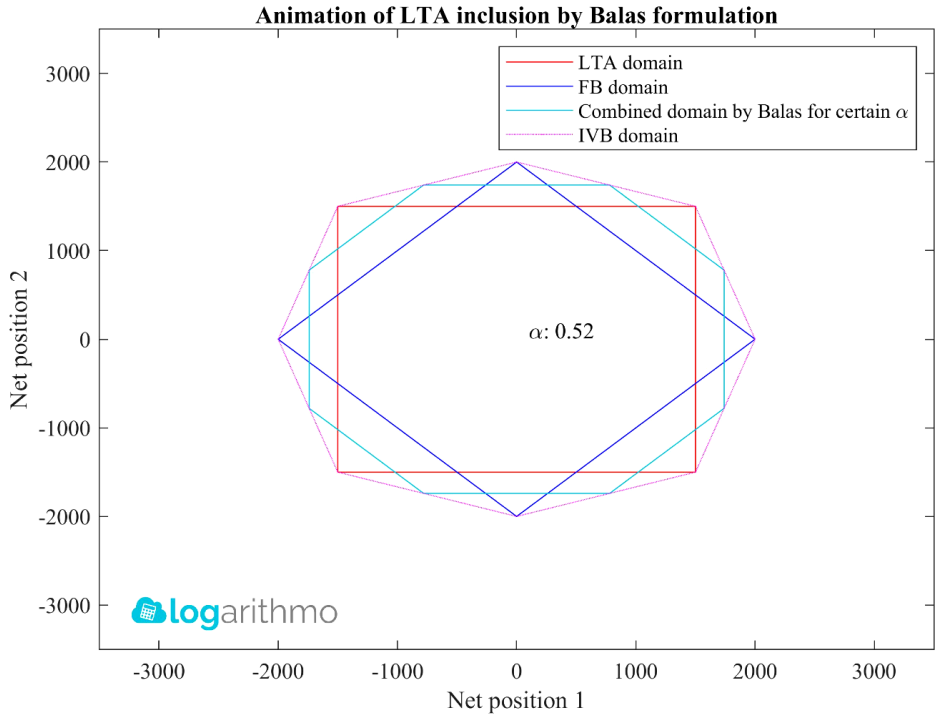
- Extended LTA will be used from the introduction of Euphemia 10.5 onwards.
- Even after the switch towards Extended LTA, the improved Virtual Branches Process will be kept for transparency (Final Flow-Based domain), ID ATC extraction, ATC extraction SA … *Improved Virtual branches is not scalable to a large number of BZs (e.g. Core)*

3. Update CWE methodologies for CEP and ALEGrO implementation

Extended LTA inclusion

Video exemplifying the extended LTA inclusion method

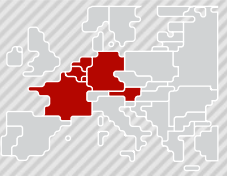
- https://fileserver.logarithmo.de/s/dJNRbzsDQjcKLi6



- The current link shows an animation of how extended LTA inclusion works. You can find in blue and in red, the FB domain and the LTA domain respectively which would be given as inputs to the market coupling as explained in the previous slide. The pink domain represents the domain created thanks to LTA inclusion done with virtual branches.
- As you can see in the animation, the cyan domain is the linear combination of the blue and the red domain considering different values of alpha (LTA - alpha=1 & FB - alpha=0). The animation shows that the set of feasible market coupling points will be the same as for the Virtual Branches approach.

3. Update CWE methodologies for CEP and ALEGrO implementation

Switch to flow-based plain



Also during the CCG of 03/04, the switch from flow-based intuitive to flow-based plain was announced

- In light of the current ACER Decision No 04-2020 on Algorithm methodology and conclusion that the intuitive flow-based approach is not legally compliant with CACM and taking into account the updated FBP-FBI report, CWE NRAs decided to switch from Flow-Based Intuitive (FBI) to Flow-Based Plain (FBP)
  - The updated FBP-FBI report was shared with CWE MPs on 27/02 and can be found enclosed as well.
- The switch will be applied from ALEGrO technical go-live onwards

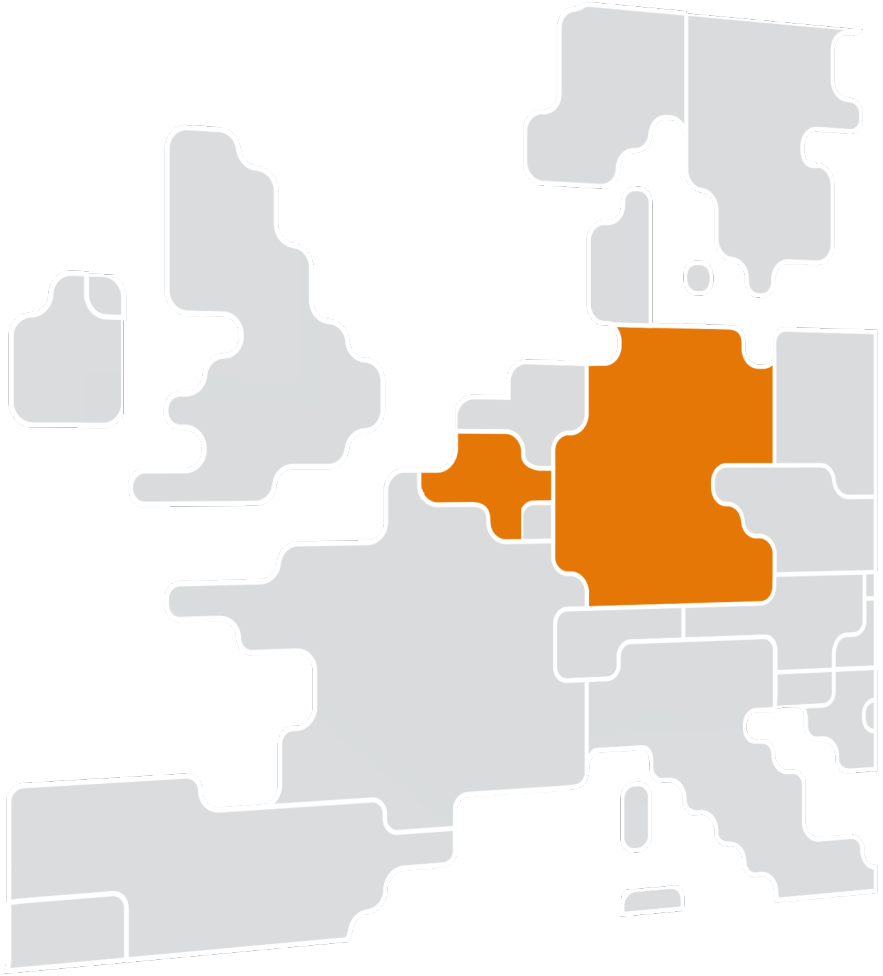
Switching to flow-based plain comes with the following benefits:

- Increasing social welfare applying FBP
- Increasing price convergence
- Increase of the performance of the algorithm

On top of the already provide FBP-FBI report, Market Participants will receive an “Explanatory Material for the Switch to FBP” by mid-Q3

ALEGrO project

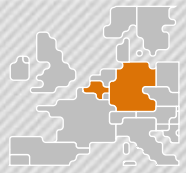
CCG call – June 15th 2020



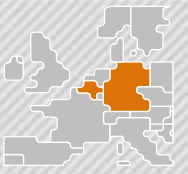
Welcome and introduction

Agenda

PMO



	SUBJECT	WHO	TIMING
1	**Introduction**	G.ETIENNE	5 min
	Infrastructure		
2	**Infrastructure project** • Progress of works	G.ETIENNE D.BECK	10 min
	Market Integration		
3	**Introduction to ALEGrO capacity calculation principles** • Project status • Project planning • Overview of timeframes • Set point determination	G.ETIENNE	20 min
4	**Day-Ahead implementation** • Evolved Flow-Based method	G.ETIENNE	15 min
5	**Presentation of external parallel run results**	G.ETIENNE	20 min
6	**CWE approval process** • Status	D.BECK	10 min
7	**Publications** • European Transparency Platform: publication of market data • Utility tool: FBP publication on JAO	D.BECK	15 min
8	**AOB**	ALL	



Implementation of ALEGrO high-voltage DC cable of 90 km between Belgium and Germany is further progressing

Project Partners welcome the opportunity today to inform Market Parties about the status and progress on

- Infrastructure project
- Market Integration of ALEGrO in CWE FB MC

The dedicated timeslot allows to deep-dive in

- Evolved Flow-Based (EFB) concept via which ALEGrO will be implemented within CWE
- Set point calculation for ALEGrO
- External parallel run results allowing Market Parties to assess the impact of ALEGrO on market coupling results
- The explanation of the regulatory and transparency framework

ALEGrO project partners trust that this meeting provides further helpful insights and welcome Market Parties' comments and questions*

A dedicated Q&A section on JAO's website has been set up

*further related questions can be asked via email to the dedicated project email address: alegro@magnus.nl

2. Infrastructure project

Progress of works

Civil works are progressing according to time schedule and foreseen to be completed within the next months

Elia:

- DC cable fully installed and tested (in how far possible)
- Converter completed – Reactive power test performed successfully
- Connection to the AC grid tested


Elia converter

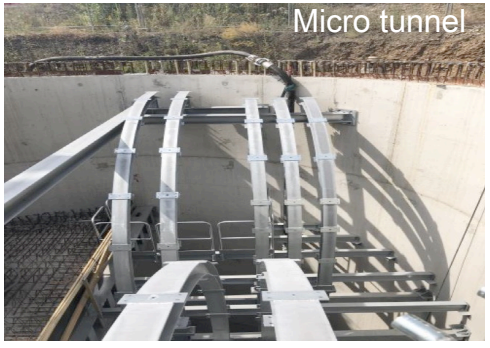
Amprion:

- Converter: modules have been installed, cable installation under progress
- Approx. 60% of cable pulling ready
- Approx. 25% of cable jointing ready
- Micro tunnel Aachen Brand ready
- Ongoing works on horizontal directional drilling (HDD)


Elia cable


Amprion converter


Jointing pit


Micro tunnel

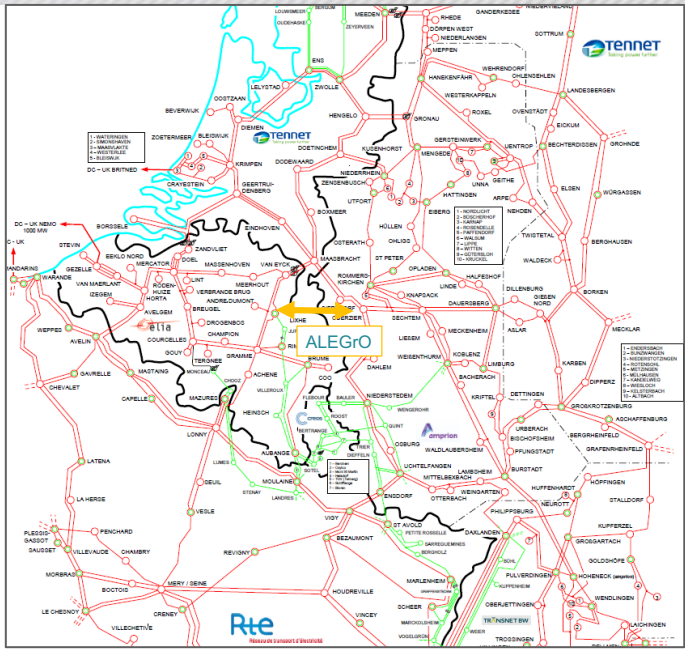
3. Introduction to ALEGrO capacity calculation principles

Project status

G.ETIENNE

✓ Achievements

- Development of IT systems for the capacity calculation process (as can be seen in EXT // run)
- Submission of updated CWE regulatory approval package to Regulators
- Regulatory support for the switch to Flow-Based Plain mitigating algorithm performance issues



Ongoing activities

- Review and potential amendment of contractual framework
- External parallel run
- Testing of IT systems on MRC level

Stakeholder management

- Alignment with CWE TSOs and NEMOs
- Ongoing exchanges with Regulators and Market Parties

3. Introduction to ALEGrO capacity calculation principles

Project Planning & go-live plan

The ALEGrO project aims at technical readiness by end of Q3 2020. The go-live is foreseen for Q4 2020

- The exact date will be communicated at a later stage given that the construction of the interconnector is still ongoing. Market Parties can expect more clarity during the summer period
- There will be a technical go-live in the market followed by a commercial go-live. During this technical go-live, the systems will migrate to the ALEGrO ready version, but no capacity will be allocated on the interconnector. At the moment of technical go-live, CWE will apply Flow Based Plain (FBP)
- A ramp-up of DA capacity is foreseen to facilitate the significant changes to operational processes. TSOs expect this to be swift and will communicate the details at a later time
- TSOs aim to introduce ID and LT capacity as soon as possible
- Around the go-live of Alegro, the Extended LTA formulation principle will also be introduced. The exact timing is still to be determined

3. Introduction to ALEGrO capacity calculation principles

Overview of timeframes

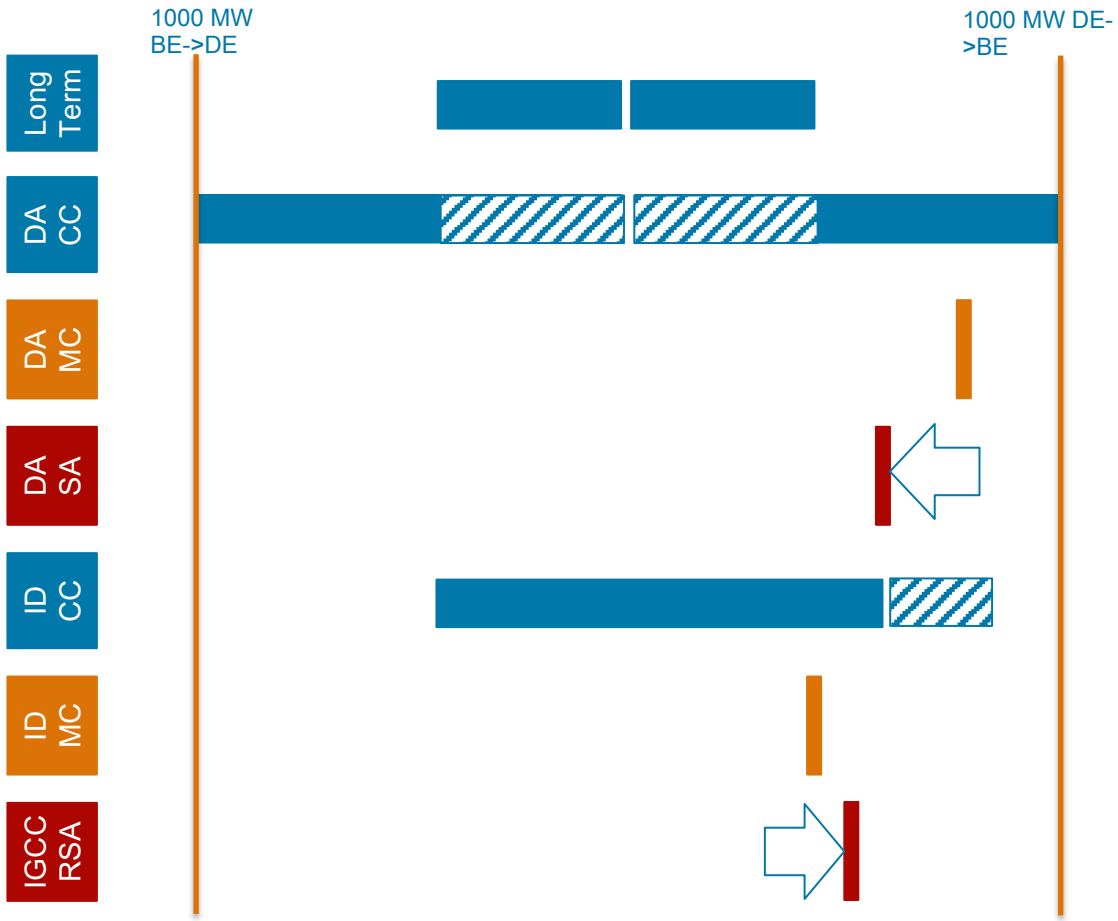
ALEGrO will be introduced with different concepts for different time frames

	Long Term	Day Ahead	Security Analysis	Intraday	Balancing & Real Time
Description	Provide a part of the capacity as hedging product to the market	Allocate ALEGrO as efficient as possible in the DA market	Secure the exchange of Alegro or solve congestion with Alegro	Offer remaining capacity in the ID market	Net imbalances between countries / Operate Alegro in real time
Scope	Bilateral Amprion / Elia	Regional (CWE)	Regional	Bilateral and regional	European Bilateral
Project	Bilateral (later Core)	CWE / Core SDAC (Euphemia)	CWE Coreso / TSCNET	CWE XBID	IGCC RSA EMS

3. Introduction to ALEGrO capacity calculation principles

Set point determination

The allocation of ALEGrO in the Day-Ahead market results directly in the determination of the set point



Process

- Part of the capacity is made available in the LT auction for hedging purposes. FTR options, so no nominations
- In principle the full capacity of the interconnector is available during capacity calculation. Minimum LT is guaranteed via LTA inclusion
- MC algorithm will determine the optimal set point of the interconnector. Losses are not considered in DA/ID
- Set point of the interconnector can be changed during the CSA by a Remedial action. With possible impact on the ID ATC
- Intraday capacity will be calculated and result in an ATC
- During continuous ID allocation the set point will be determined by the market
- After the ID market, IGCC or RSA can still lead to a change in final set point of ALEGrO

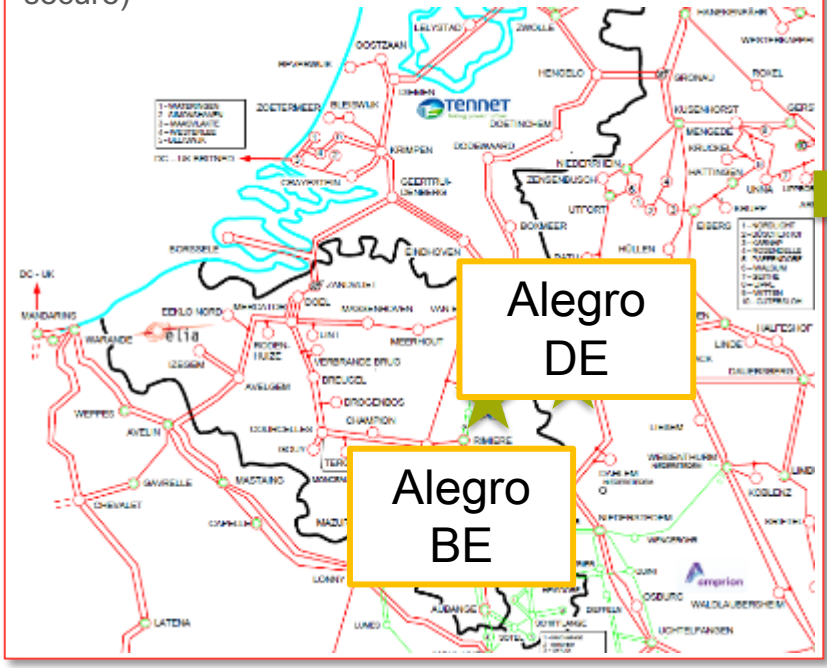
4. Day-Ahead implementation

Reminder: Evolved Flow Based (EFB) – basic idea

Flow based parameters for EFB

By placing the GSK in the connection point we can see the influence of the net position of the DC interconnector on all lines

We can also model the N-1 of Alegro (and make it secure)



Result

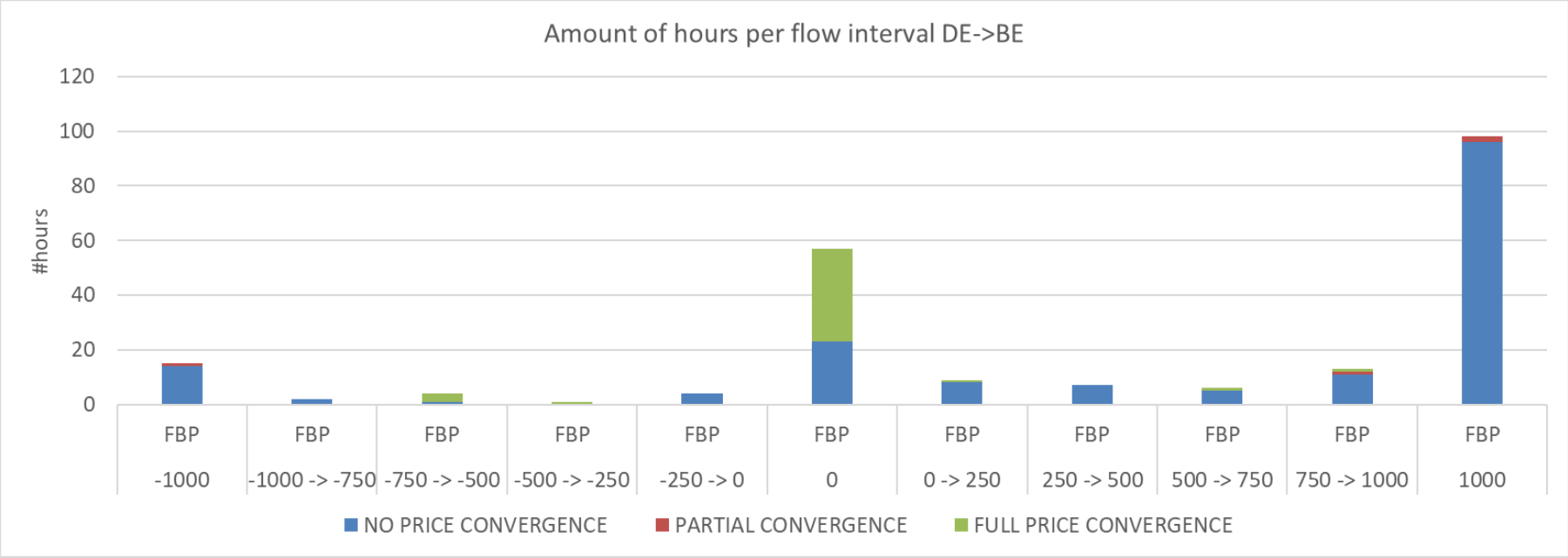
	RAM	BE	DE	FR	NL	…
CNEC 1	…	…	…	…	…	…
CNEC 2	…	…	…	…	…	…
…	…	…	…	…	…	…
CNEC 3	…	…	…	…	…	…

Alegro BE	Alegro DE
…	…
…	…
…	…
…	…

The initial FB parameters (zone to slack PTDFs) remain the same for the existing hubs. The RAM at zero balanced is not impacted.

For an internal DC connector two columns are added to represent the impact on both sides of the cable.

Distribution of allocated flow on ALEGrO for 10 BDs simulated during the internal parallel run to illustrate the effect of Evolved Flow Based



- Situations where the flow over the interconnector is less than 1000 MW even without price convergence in CWE
  - Market coupling algorithm explicitly made the trade off between an AC and DC exchange considering the impact on the congested CNEC
- From the figure it cannot be deducted whether a flow on the interconnector was non intuitive or not (against the market spread BE-DE), however, with the application of FBP such situations can be expected

5. Presentation of external parallel run results

Reminder on principles

The ALEGrO External Parallel Run started on 1st of May and will continue until go-live

- After a ramp-up process, 7 BDs per weeks are published since 1st of June

Calculation

- Daily calculations are done from D-2, with the final computation being run in D-1
- MC calculations are performed in D+21 for publication

Publication

- Publication of results with Flow-Based Plain, following the NRA decision to have the switch from FBI to FBP implemented as of ALEGrO go-live

- Publication via the updated version of the Utility Tool in the ALEGrO parallel run section on JAO website

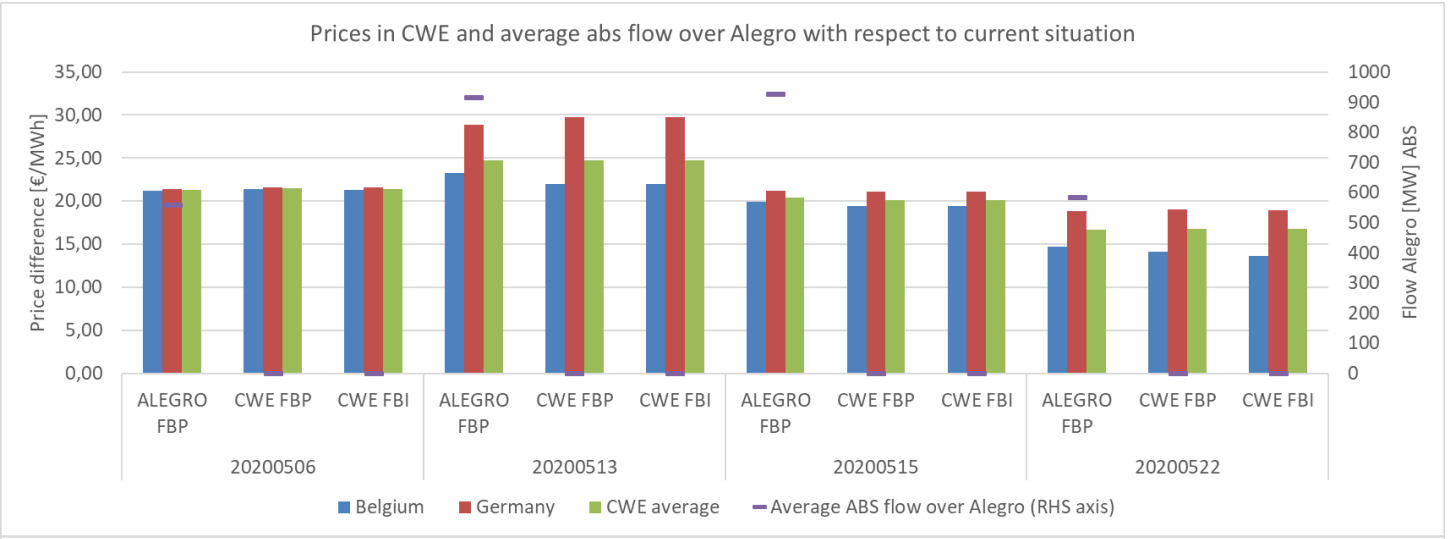
BDs published

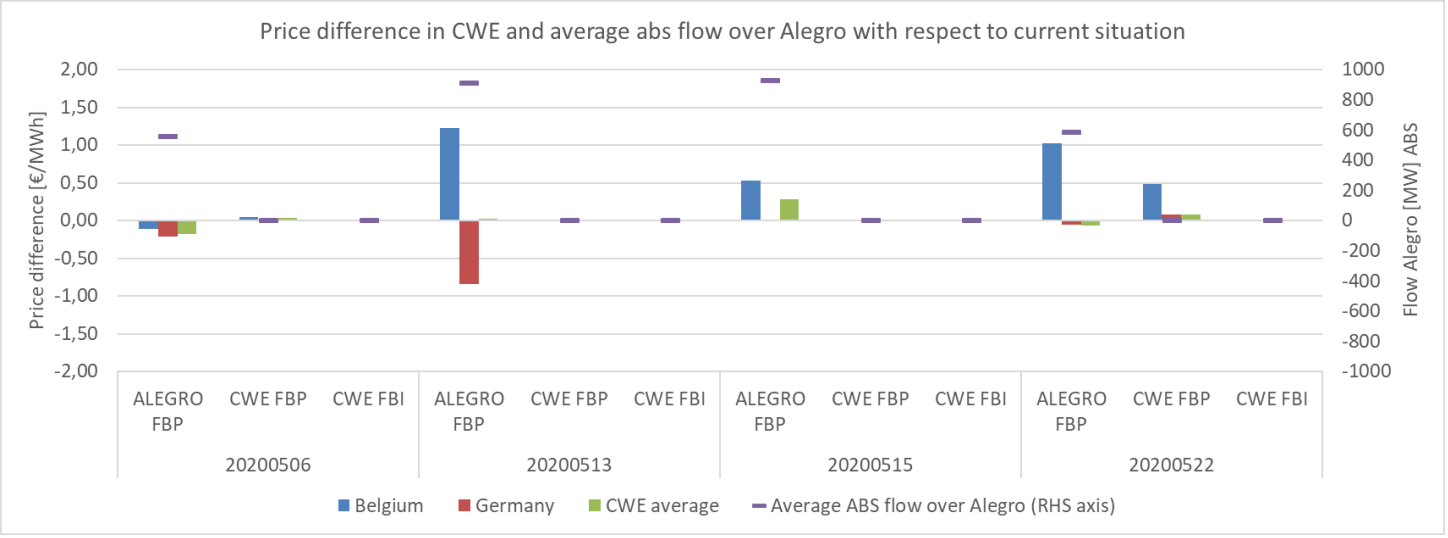
- Following the ramp-up approach, the following days are calculated before switching to a 7/7 calculation
  - Please note that during the ramp up, there can some quality issues. This will be remedied during the switch the 7/7 calculation

- 08/05: not published due to issues in back office tools
- 04/06: application of default FB parameters (as in CWE)

5. Presentation of external parallel run results

Impact of Alegro on prices in CWE



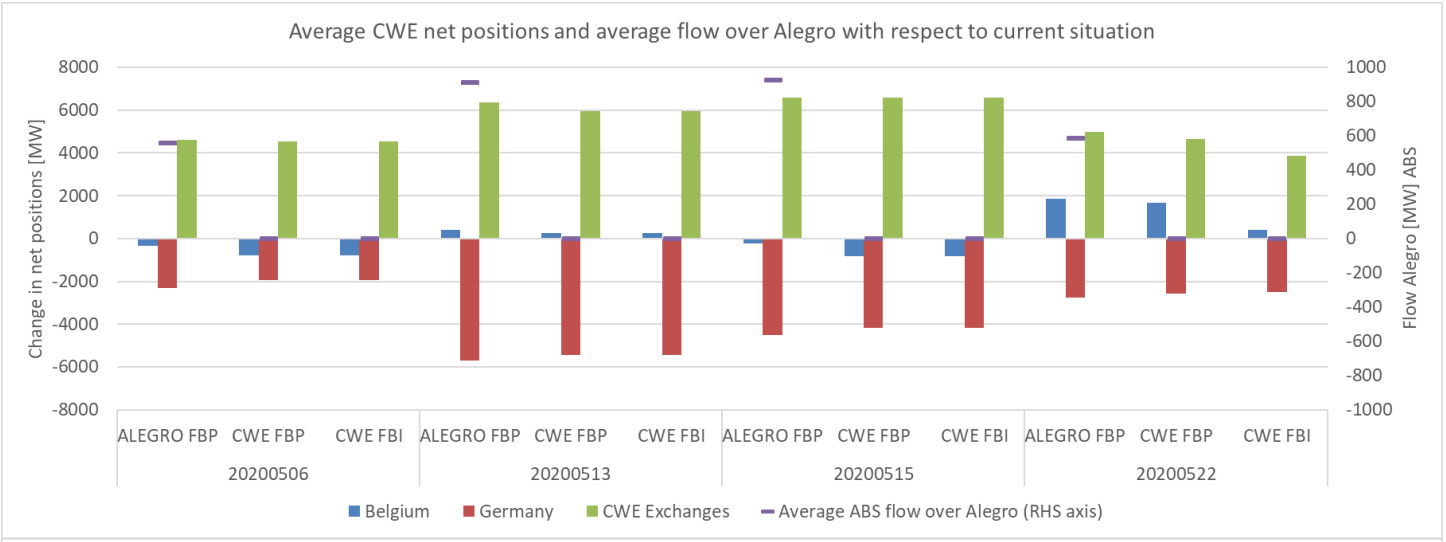


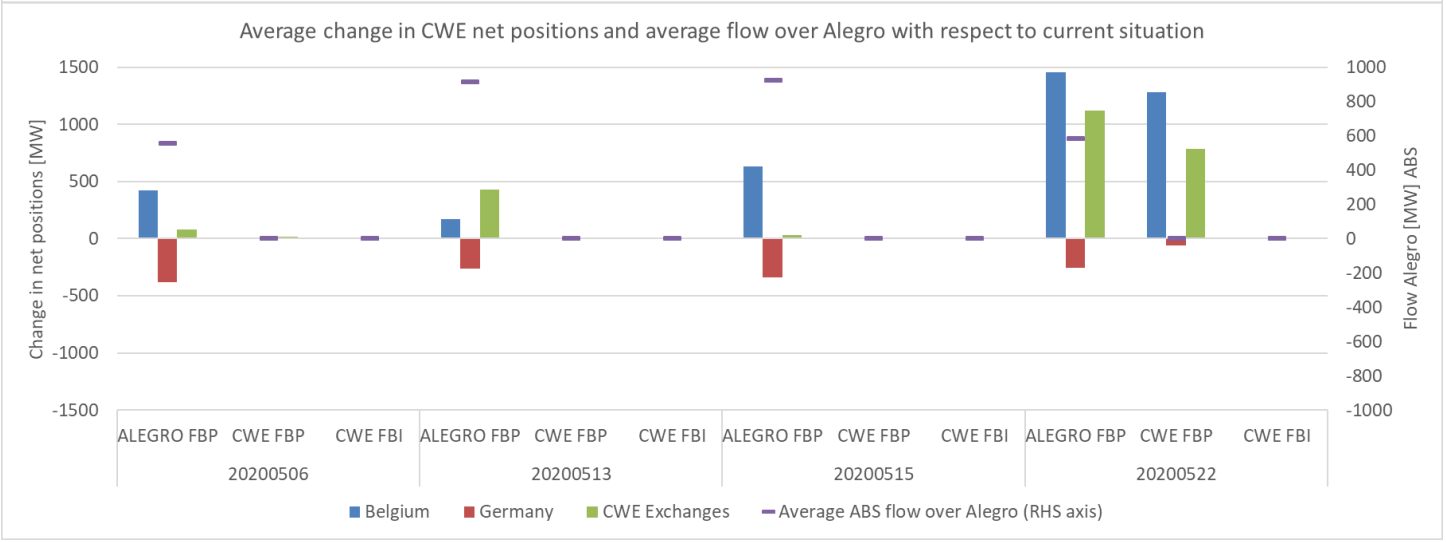
These graphs show the impact of prices in the CWE region.

- They illustrate the impact of switching to FBP and ALEGrO
- Both changes increase price convergence rates
- High utilization of the interconnector (e.g. on 20200513) are linked with significant price changes in BE and DE

5. Presentation of external parallel run results

Impact of Alegro on net positions in CWE



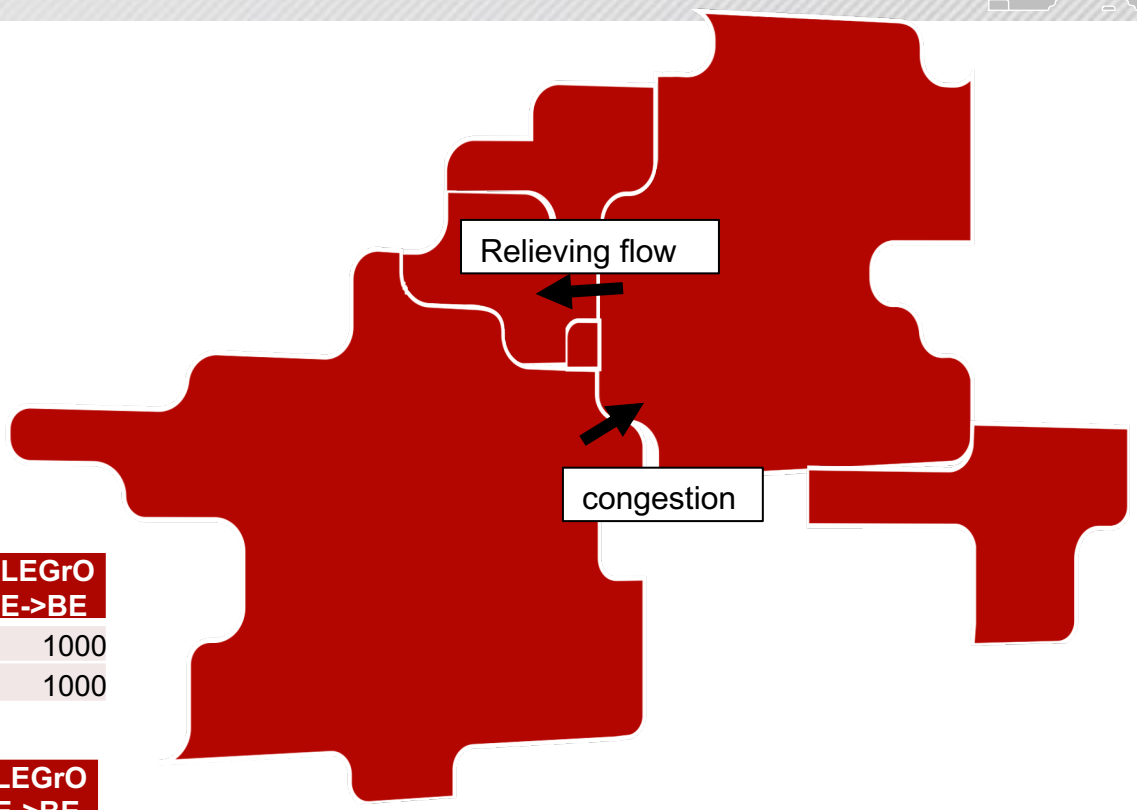


These graphs show the impact on net positions in the CWE region.

- They illustrate the impact of switching to FBP and ALEGrO
- Both changes increase exchanges in CWE
- High utilization of the interconnector (e.g. on 20200522) are linked to significant changes in net positions and exchanges in the region.

The example below shows

- The relieving effect of a flow on ALEGrO on an LTA included branch (using iVB the PTDF has no relation to physics):
  - PTDF FR->DE = 1,03
  - PTDF DE->BE (ALEGrO) = -0,5
- A non intuitive exchange from DE → BE on ALEGrO to achieve that relieving effect



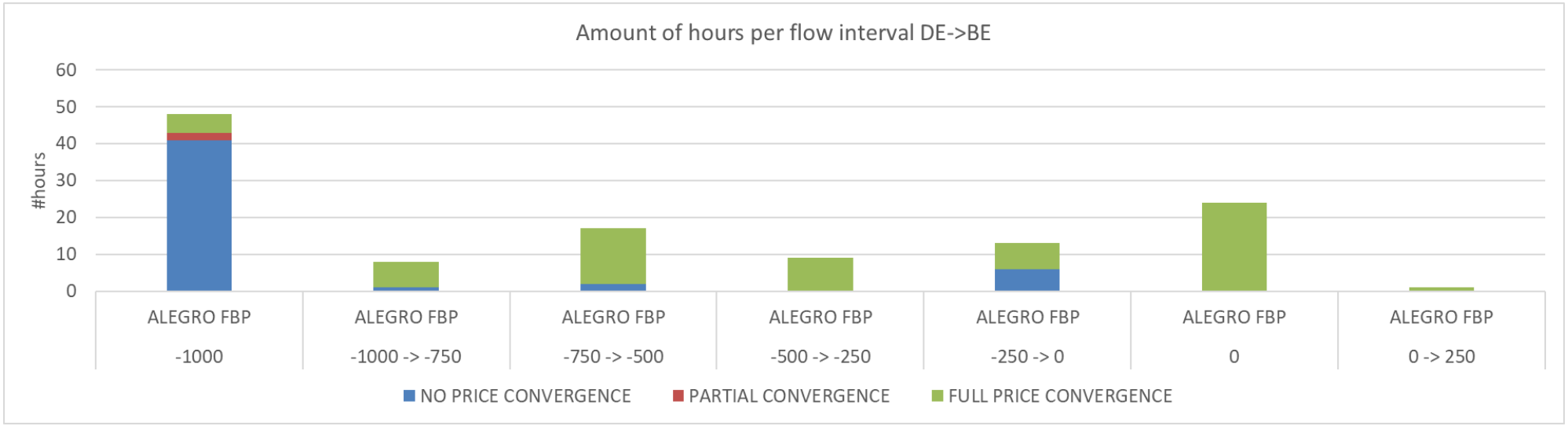
Alegro FBP	AT	BE	DE	FR	NL	ALEGrO DE->BE
Price [€/MWh]	18,29	12,67	19,88	10,82	17,28	1000
FB NP [MW]	-2125	1845	-3622	1963	1939	1000

CWE FBP	AT	BE	DE	FR	NL	ALEGrO DE->BE
Price [€/MWh]	19,58	12,88	20,88	10,67	18,16	0
FB NP [MW]	-2119	1657	-2853	1343	1973	0

Delta	AT	BE	DE	FR	NL	ALEGrO DE->BE
Price [€/MWh]	-1,29	-0,21	-1	0,15	-0,88	1000
FB NP [MW]	-6	189	-769	621	-34	1000

5. Presentation of external parallel run results

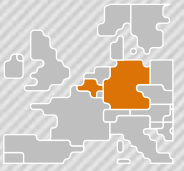
Flow over the interconnector



- Under current market (i.e. the days for which market coupling has been performed in May), there is a clear tendency of import into Belgium to allow for an increase import into Germany.
- At full price convergence, the interconnector is still used up to a certain extend. Allowing a redistribution of flow in the region.

6. CWE approval process

Status



CWE Approval Package submitted to CWE NRAs on 06/05

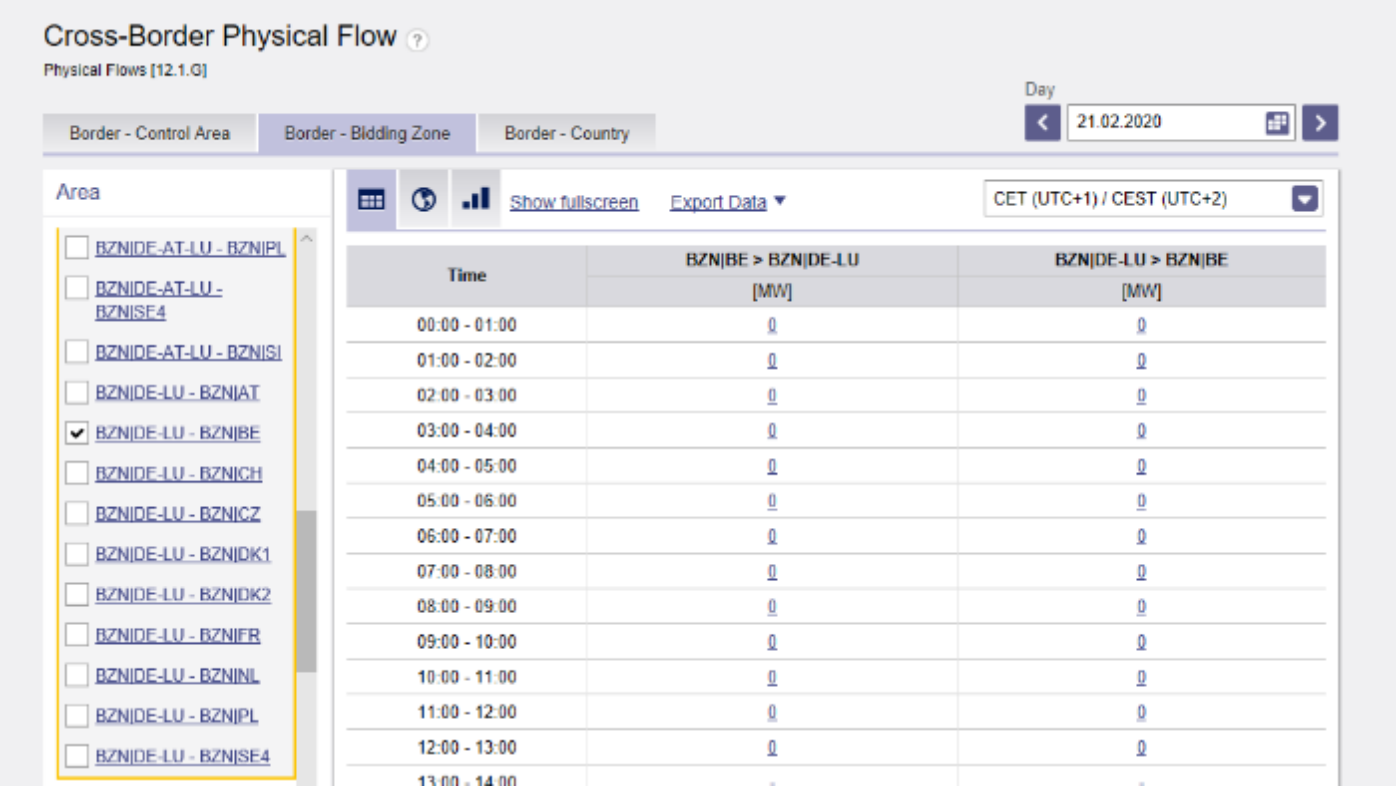
- Amended Approval Package for CEP and ALEGrO including updated Annexes
- CWE Approval is on track and NRA approval can be expected by September

7. Publications

European Transparency Platform

In line with the transparency regulation obligations (EU-543/2013) ETP will be updated for all data items for this new bidding zone border

- Example cross-border physical flow to be already published for the active power commissioning test-phase



7. Publications

Utility tool (I)

The Utility Tool as main practical used data-provision resp. transparency tool will (only) change in details due to the addition of the ALEGrO (DC) border

JAO Joint Allocation Office

Utility Tool

Reference time:	1) Check volume *(interactive module)*	2) Max volume *(information module)*
date: 2020-06-10 *hour:* 1	Here you can check the simultaneous execution of trading volumes of the markets involved in the CWE Market Coupling	Here you can find the maximal trade volumes (MWh/h) which can be physically transported between two Hubs under the condition that no other trade is executed between other Hubs.

HUB TO HUB EXCHANGES

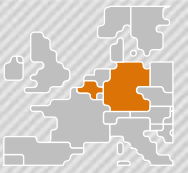
	Hub-to-Hub trade in MWh/h (please insert values)	Test 1: hub to hub inside FB space
DE=>AT	0	Trades feasible
DE=>BE (DC)	0	
DE=>NL	0	
DE=>FR	0	
NL=>BE	0	
NL=>FR	0	
BE=>FR	0	

	direction -->	direction <--
DE=>AT	4039	5027
DE=>BE	4781	4788
DE=>NL	3606	2091
DE=>FR	4501	4874
NL=>BE	2557	4071
NL=>FR	2428	5007
BE=>FR	2490	4697

HUB POSITION

	Hub Positions trade in MWh/h (please insert values)	Test 1: sum hub positions = 0	Test 2: hub positions inside FB space
ALBE	0	OK	Trades feasible
ALDE	0		
AT	0		
DE	0		
BE	0		
FR	0		
NL	0		

	export	import
ALBE	1000	-1000
ALDE	1000	-1000
AT	5374	-4045
DE	9666	-11053
BE	5522	-6000
FR	7197	-6693
NL	2726	-5173



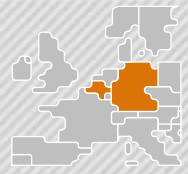
Two additional (virtual) hubs in the PTDF-sheets:

	ALBE-hub	ALDE-hub	AT-hub (MW)	BE-hub (MW)	DE-hub (MW)	FR-hub (MW)	NL-hub (MW)	Sum
Test Hub to Hub	0	0	0	0	0	0	0	0
Test Hub Positions	0	0	0	0	0	0	0	0

ID	Critical Branc	EIC code	Critical Outag	EIC code	ALBE-hub	ALDE-hub	AT-hub	BE-hub	DE-hub	FR-hub	NL-hub	RAM (MW)
85188	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01692	0	0.99666	0.02265	0.00835	0.07615	0	4969
85207	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01997	0	0.99734	0.01575	-0.00291	0.0683	0	5015
85217	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.03062	0	-0.99811	0.01859	-0.01203	0.04838	0	4129
85226	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.00499	0	-0.99844	0.04523	0.02296	0.02296	0	4200
85288	[BE-BE] Gram	22T-BE-IN-LI01	[BE-BE] Y - Ar	22T20161020--	-0.3261	-0.0299	0.00972	0.1425	-0.00779	0.05468	-0.01622	938
85331	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.02657	0	-0.99885	0.02297	0.02297	0.02297	0	4181
85366	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.0044	0	-0.99846	0.03245	0.02804	0.03487	0	4216
85408	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.00042	0	-0.9992	0.00042	0	0.04001	0	4149
85420	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01805	0	0.99728	0.01675	0	0.0695	0	4997
85433	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	-0.01758	0	-0.99932	0	0.02298	0.02298	0	4195
85441	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01832	0	0.99747	0.01575	-0.00291	0.06682	0	5011
85453	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01887	0	0.99757	0.01292	-0.00595	0.06548	0	5030
85475	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.00829	0	-0.99975	0.01464	0	0.01464	0	4067
85487	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.01232	0	-0.99985	0.00724	0.00724	0.00724	0	4083
85490	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.00098	0	-0.99854	0.00694	0.05307	0.00694	0	4386
85598	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	-0.00266	0	-0.99944	0	0.00266	0.03329	0	4142
85660	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01776	0	0.9971	0.01931	0.00155	0.07141	0	4992
85747	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.02088	0	0.99794	0.00615	-0.02007	0.05685	0	5111
85762	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.02263	0	-0.99403	0.03142	-0.02919	0.09776	0	4227
85810	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.00661	0	-0.99843	0.03638	0.02976	0.02976	0	4218
85812	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.00368	0	-0.99981	0	-0.00368	0.01895	0	4083
85850	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01788	0	0.99744	0.01532	-0.00256	0.06743	0	5010
85854	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	-0.00078	0	-0.99938	0	0.03523	0	0	4272
85918	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.03037	0	-0.99883	0.01463	0	0.03462	0	4126
85924	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01832	0	0.99739	0.01405	-0.00291	0.06831	0	5017
85944	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	-0.02563	0	-0.99876	0.01044	0.03607	0.02039	0	4264
85962	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01832	0	0.99734	0.01736	-0.00291	0.0683	0	5014
86005	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01788	0	0.99725	0.01788	0	0.06965	0	4996
86030	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.0044	0	-0.99829	0.04071	0.0363	0.02038	0	4277
86096	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	-0.02297	0	-0.99945	0.00694	0.022	0.00694	0	4175
86164	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	-0.01943	0	-0.99942	0.00694	0.02637	0.00694	0	4199
86202	[AT-AT] Strass	14T-220-0-027:	[AT-AT] Strass	14T-220-0-027-	0.02537	0	-0.99939	0.00694	0.022	0.00694	0	4187
86249	[D2-AT] Y - St.	10T-AT-DE-00(	[D2-AT] Y - St.	10T-AT-DE-00(	0.01714	0	0.99726	0.01714	0	0.06983	0	4997

7. Publications

Utility tool (III)



Additionally to the MAX/MIN NET POS of DE and BE, the max net pos of the virtual HUBs are provided:

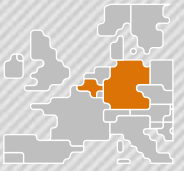
- Helps MPs to better understand/ separate the impact of the DC-line

	Prog	ALBE	ALDE	AT	BE	DE	FR	NL
hour 1	MinALBE	-1000						
	MaxALBE	1000						
	MinALDE		-1000					
	MaxALDE		1000					
	MinAT			-4045				
	MaxAT			5374				
	MinBE				-6000			
	MaxBE				5522			
	MinDE					-11053		
	MaxDE					9666		
	MinFR						-6693	
	MaxFR						7197	
	MinNL							-5173
	MaxNL							2726
hour 2	MinALBE	-1000						
	MaxALBE	1000						
	MinALDE		-1000					
	MaxALDE		1000					
	MinAT			-4035				
	MaxAT			5655				
	MinBE				-6000			
	MaxBE				5626			
	MinDE					-11271		
	MaxDE					10938		
	MinFR						-7517	
	MaxFR						6949	
	MinNL							-4810
	MaxNL							3865

hour	Min ALBE	Max ALBE	Min ALDE	Max ALDE	Min AT	Max AT	Min BE	Max BE	Min DE	Max DE	Min FR	Max FR	Min NL	Max NL
1	-1000	1000	-1000	1000	-4045	5374	-6000	5522	-11053	9666	-6693	7197	-5173	2726
2	-1000	1000	-1000	1000	-4035	5655	-6000	5626	-11271	10938	-7517	6949	-4810	3865
3	-1000	1000	-1000	1000	-4043	5519	-6000	5716	-11400	11248	-7723	6873	-4679	4078
4	-1000	1000	-1000	1000	-4041	5518	-6000	5717	-11101	11944	-8206	6612	-4737	4127
5	-1000	1000	-1000	1000	-4035	6115	-6000	5733	-10482	12499	-8994	5835	-4835	3813
6	-1000	1000	-1000	1000	-4035	6519	-6000	5661	-10679	11863	-8841	5704	-4734	3926
7	-1000	1000	-1000	1000	-4035	5822	-6000	5712	-9452	12369	-9508	5212	-4744	3976
8	-1000	1000	-1000	1000	-4035	4950	-6000	5601	-8262	12260	-8901	5312	-4883	3164
9	-1000	1000	-1000	1000	-4035	4827	-6000	5505	-8213	11878	-8362	5399	-4890	2965
10	-1000	1000	-1000	1000	-4035	4820	-6000	5495	-8296	11463	-7679	5820	-4924	3285
11	-1000	1000	-1000	1000	-4035	4915	-6000	5389	-9145	10868	-7115	6268	-4804	3513
12	-1000	1000	-1000	1000	-4035	5015	-6000	5442	-9786	10393	-6739	6671	-4724	3602
13	-1000	1000	-1000	1000	-4035	5076	-6000	5432	-10338	10017	-6114	7043	-4632	3673
14	-1000	1000	-1000	1000	-4035	5090	-6000	5427	-10157	10890	-6939	6477	-4628	3629
15	-1000	1000	-1000	1000	-4035	5155	-6000	5509	-10347	11241	-7410	6341	-4491	3844
16	-1000	1000	-1000	1000	-4035	5132	-6000	5626	-9967	11434	-7804	6142	-4485	3845
17	-1000	1000	-1000	1000	-4035	5689	-6000	5607	-9694	11586	-8301	5741	-4419	3995
18	-1000	1000	-1000	1000	-4035	5128	-6000	5521	-9481	11823	-8203	5604	-4526	3576
19	-1000	1000	-1000	1000	-4035	4974	-6000	5580	-9541	11583	-8044	5555	-4539	3932
20	-1000	1000	-1000	1000	-4035	4867	-6000	5525	-9713	10891	-7300	5858	-4329	3687
21	-1000	1000	-1000	1000	-4035	4921	-6000	5518	-9647	10698	-7459	5726	-4154	3289
22	-1000	1000	-1000	1000	-4035	5003	-6000	5476	-10098	10796	-7502	5685	-4180	4048
23	-1000	1000	-1000	1000	-4035	5022	-6000	5411	-11568	10456	-6479	6884	-4508	4131
24	-1000	1000	-1000	1000	-4035	5213	-6000	5573	-11381	10166	-6551	7101	-4862	3021

8. AOB

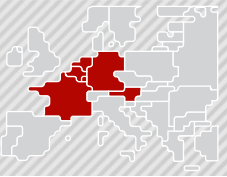
ALL



Are there any further questions?

5. AOB

E. REN



1. CWE NRAs' feedback on the publication of aggregated bid/offer curves by CWE NEMOs

- Enclosed file added 12/06

2. Next CCG meeting

CWE TSOs propose to schedule the next CWE CG meeting end of September / beginning of October

- **Physical meeting or conference call (depending on developments related to Covid-19)**
  - ALEGrO
  - Update ongoing projects CWE
    - Status backfill historical CBs
    - CEP implementation: //run follow-up
  - Status of the updated CWE approval documents CWE FBMC & ID ATC after FBMC (CWE NRA approval / implementation)
  - Transition to Core CCR
  - Other topics

CWE NRAs' update on the publication of aggregated bid/offer curves by CWE NEMOs

CWE Consultative Group

15 June 2020

Autoriteit Consument & Markt

Bundesnetzagentur

COMMISSION DE RÉGULATION DE L'ÉNERGIE

CREG

E-CONTROL

ILR INSTITUT LUXEMBOURGEOIS DE RÉGULATION

- CWE NRAs took the initiative of calling upon the development of a technical solution for the publication of **aggregated bid/offer curves** in MNA environments
  - Launch of an informal consultation of CWE stakeholders
  - Discussions with CWE NEMOs initiated
  - Raising the topic into the appropriate pan-EU forums: Trilateral Coordination Group and CACM TF
  - Presentation of a *joint position paper* for next MESC (17 June)
- The initiative was **welcomed both by stakeholders and CWE NEMOs**. Main points from the informal consultation are:
  - All orders (stepwise curves + blocks) shall be anonymized and published
  - Only the aggregated curves shall be published by NEMOs
  - Data shall be published using NEMO existing channels
  - Data shall be published ASAP after Final Market Results (i.e. in the afternoon)
  - Geographical scope (BZ aggregation) should respect confidentiality of MP
  - The implementation should be done ASAP in the following months
- **CWE NRAs agree with stakeholders' demands**

- CWE NRAs **submitted to all NRAs a proposal** for extending the position paper to the whole SDAC
- The proposal includes caveats to account for:

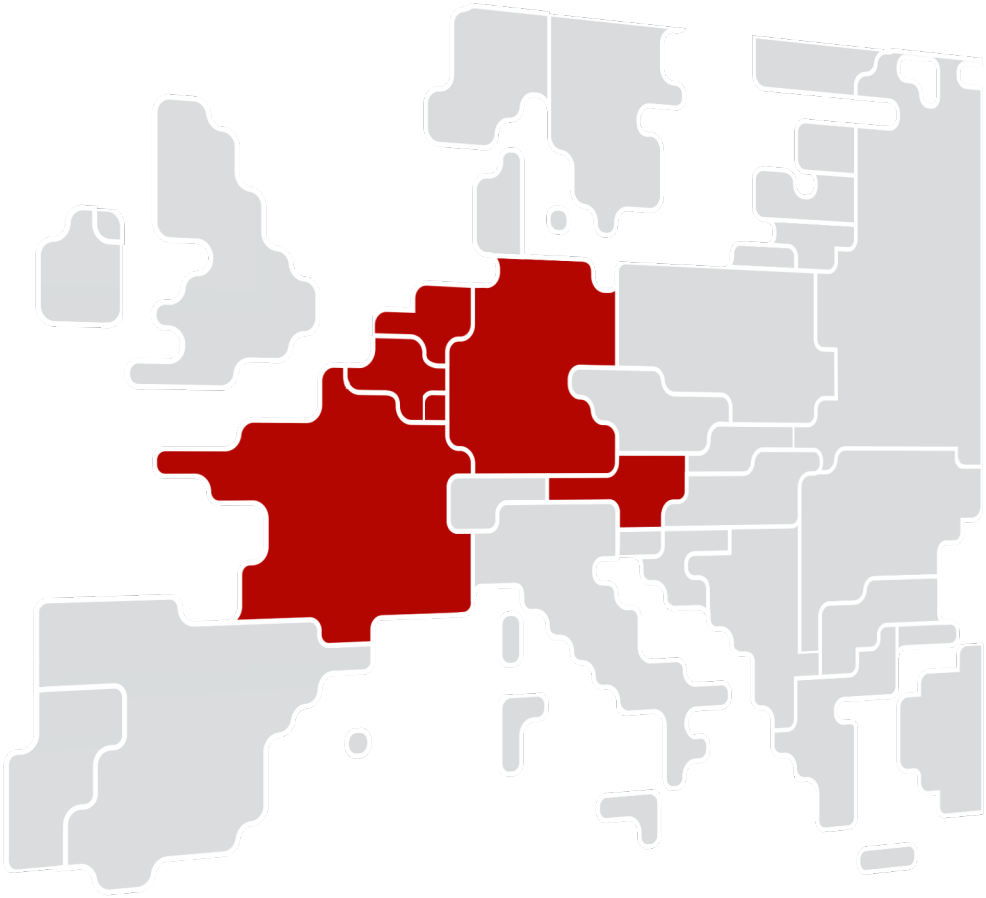
(a) BZ with **insufficient liquidity to ensure confidentiality** of individual Market Participants

(b) Countries **using the "unit-bidding approach"**

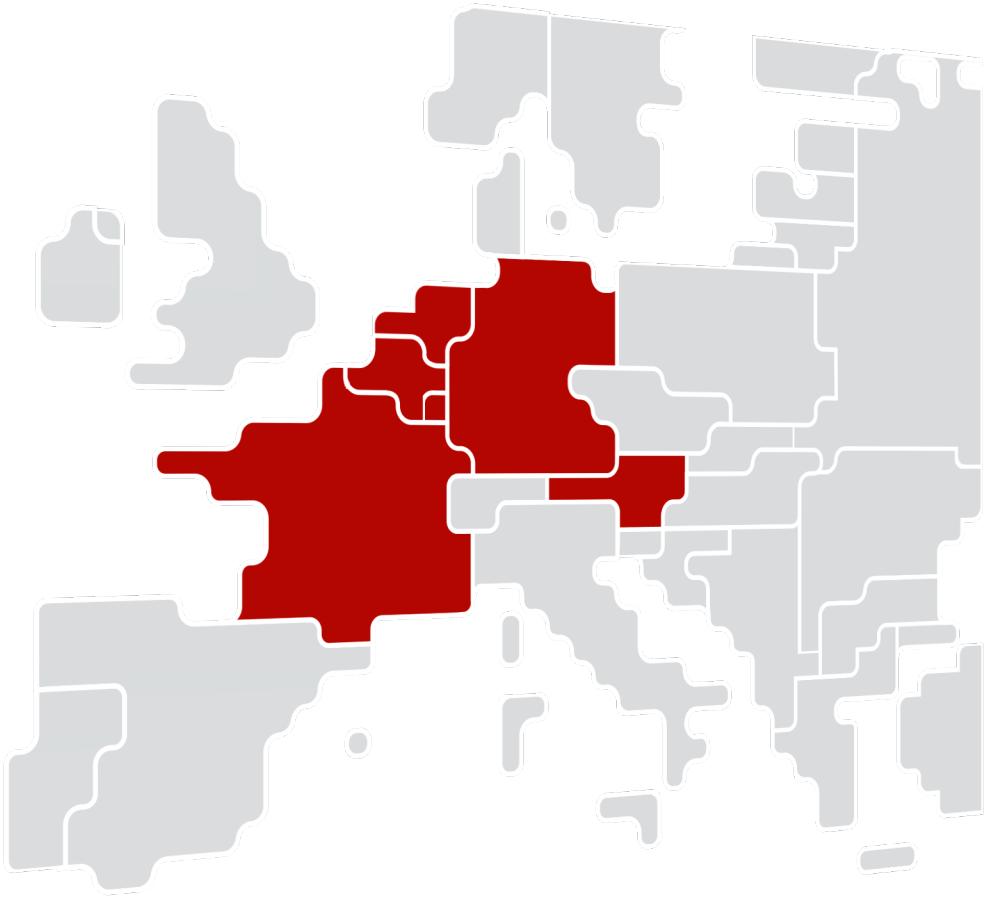
- Majority of NRAs welcome the initiative and **agree on the value of market transparency**
  - Countries in the (a) situation need **more flexibility in order to find the best compromise in spatial granularity**
  - Countries in the (b) situation are **satisfied with the flexibility** provided for in the implementation

Extended position paper is currently in final stages of NRAs' validation, will be shared with the MESC on 17 June

Annexes

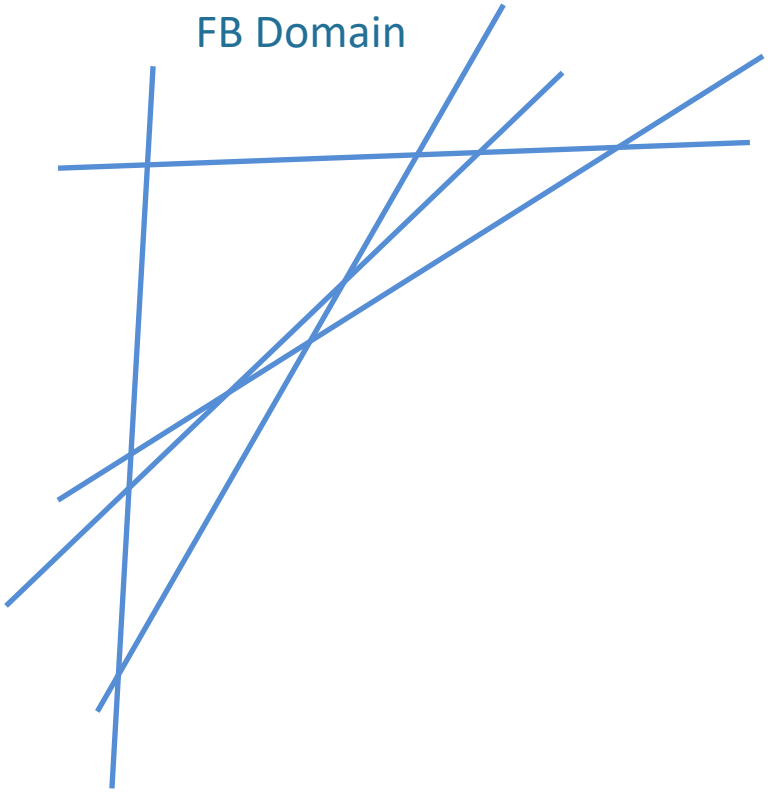


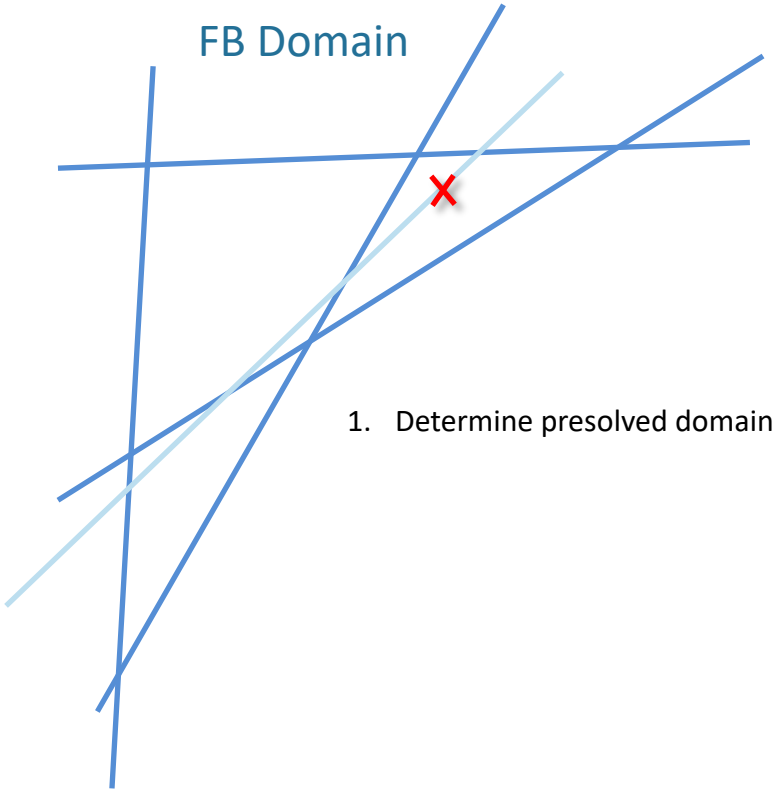
Annex – Current LTA



3. Update CWE methodologies for CEP and ALEGrO implementation

Introduction and Current approach

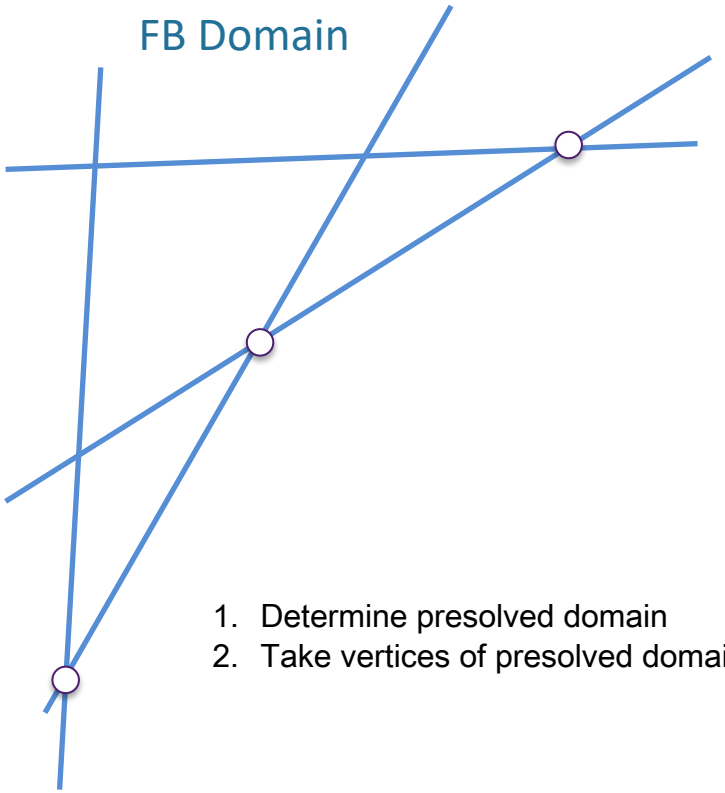




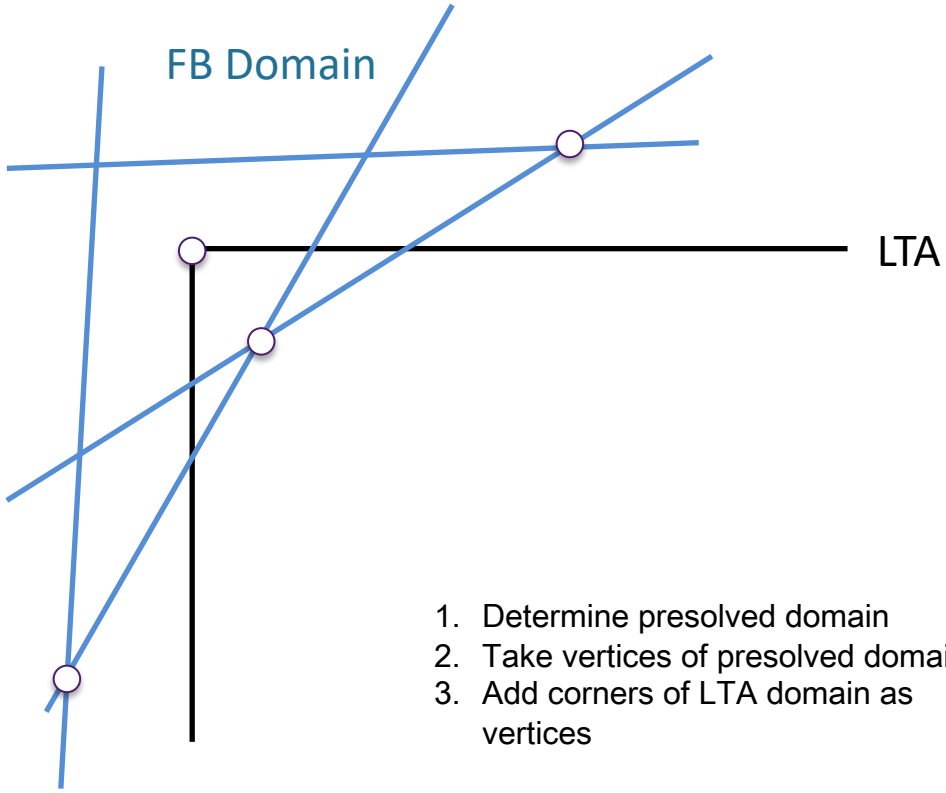
1. Determine presolved domain

3. Update CWE methodologies for CEP and ALEGrO implementation

Introduction and Current approach



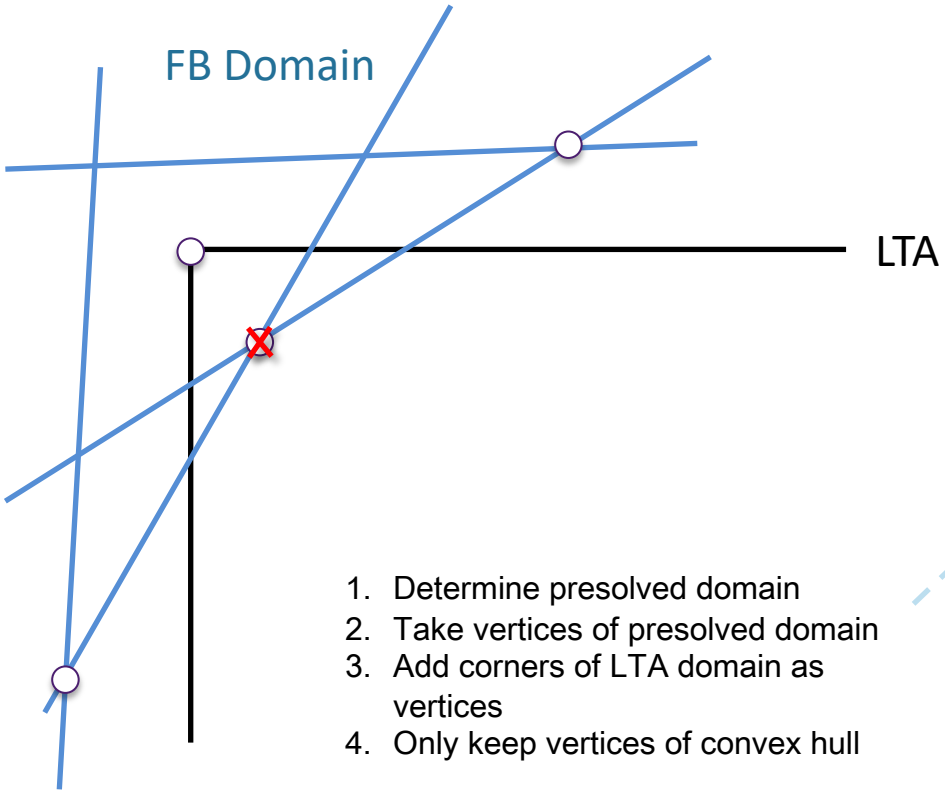
1. Determine presolved domain
2. Take vertices of presolved domain



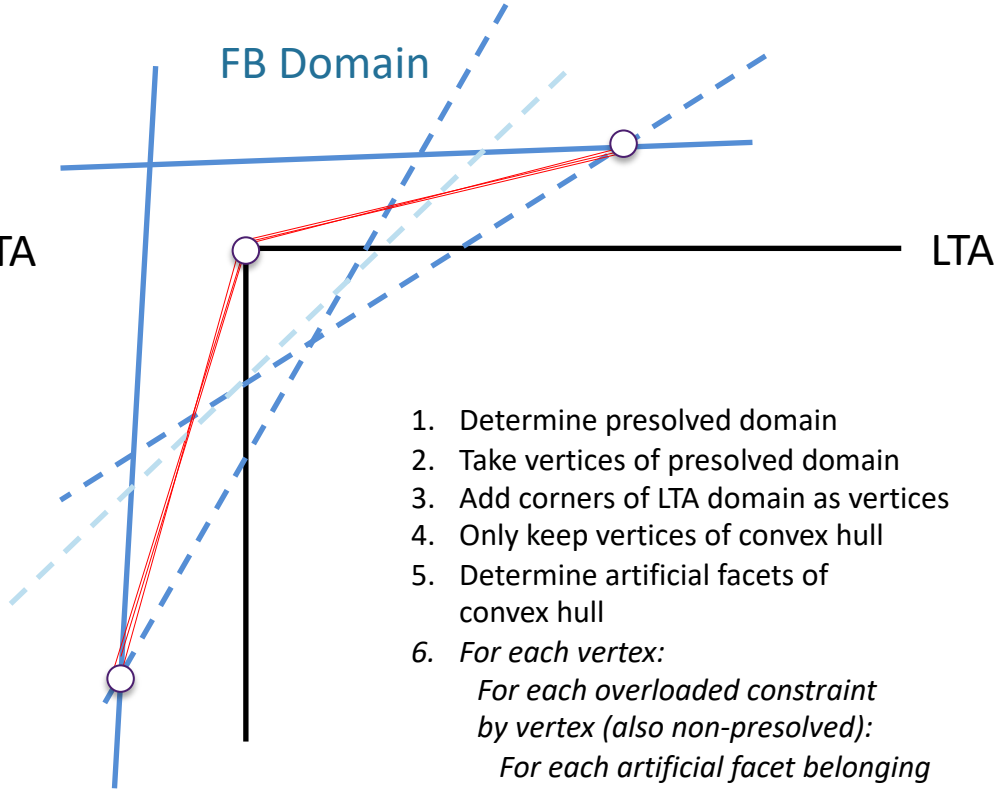
1. Determine presolved domain
2. Take vertices of presolved domain
3. Add corners of LTA domain as vertices

3. Update CWE methodologies for CEP and ALEGrO implementation

Introduction and Current approach



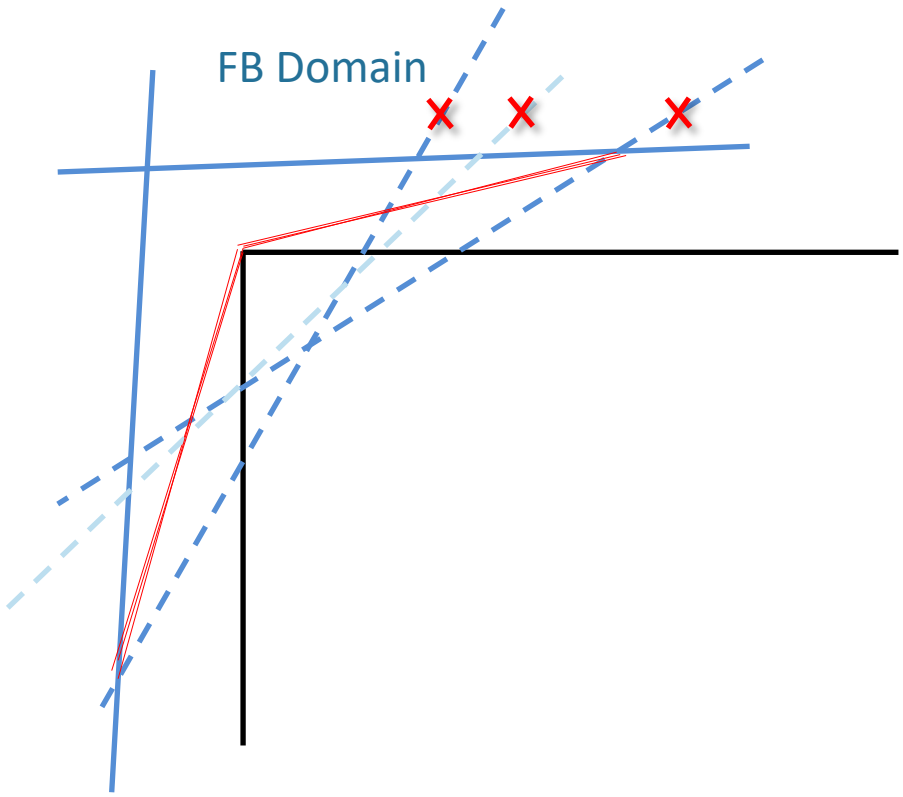
1. Determine presolved domain
2. Take vertices of presolved domain
3. Add corners of LTA domain as vertices
4. Only keep vertices of convex hull



1. Determine presolved domain
2. Take vertices of presolved domain
3. Add corners of LTA domain as vertices
4. Only keep vertices of convex hull
5. Determine artificial facets of convex hull
6. *For each vertex:*
   For each overloaded constraint by vertex (also non-presolved):
   For each artificial facet belonging to vertex:
   Add a virtual branch based on artificial facet but scaled to constraints desired RAM

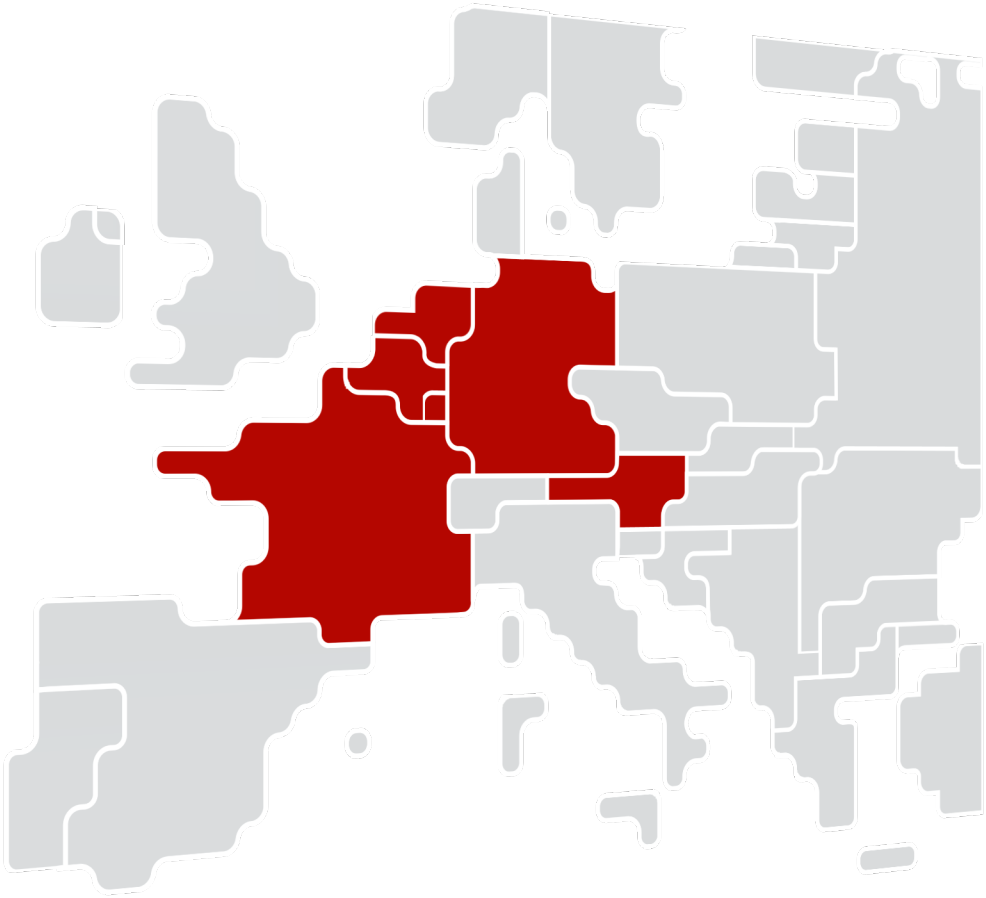
3. Update CWE methodologies for CEP and ALEGrO implementation

Introduction and Current approach



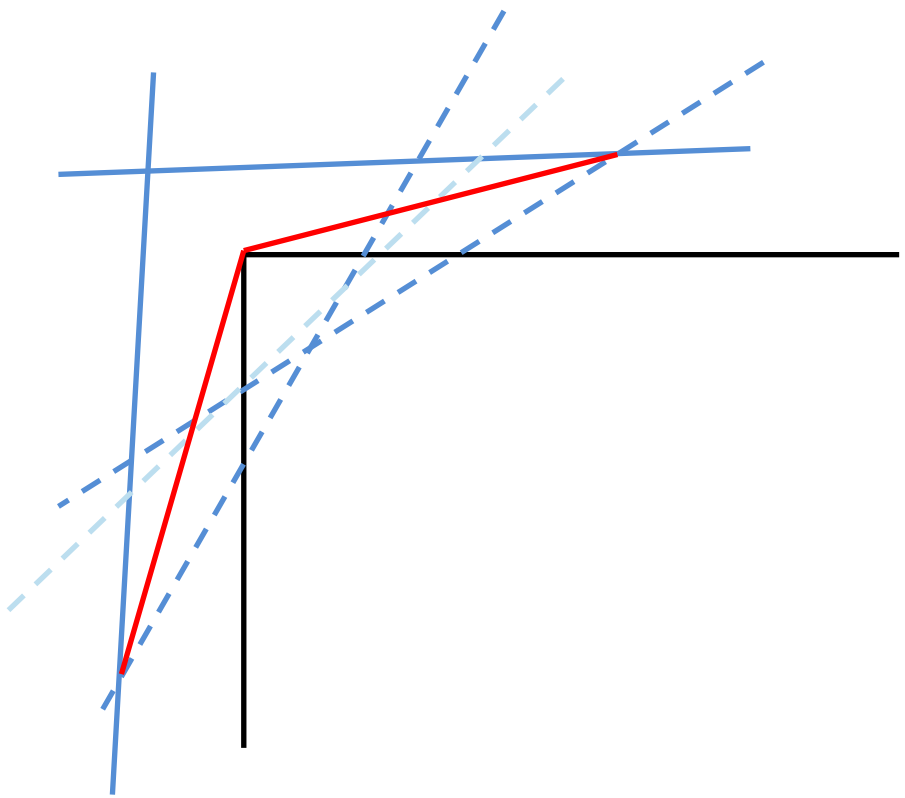
1. Determine presolved domain
2. Take vertices of presolved domain
3. Add corners of LTA domain as vertices
4. Only keep vertices of convex hull
5. Determine artificial facets of convex hull
6. *For each vertex:*
   For each overloaded constraint by vertex (also non-presolved):
   For each artificial facet belonging to vertex:
   Add a virtual branch based on artificial facet but scaled to constraints desired RAM
7. Delete overloaded constraints

Annex – Improved Virtual Branches



3. Update CWE methodologies for CEP and ALEGrO implementation

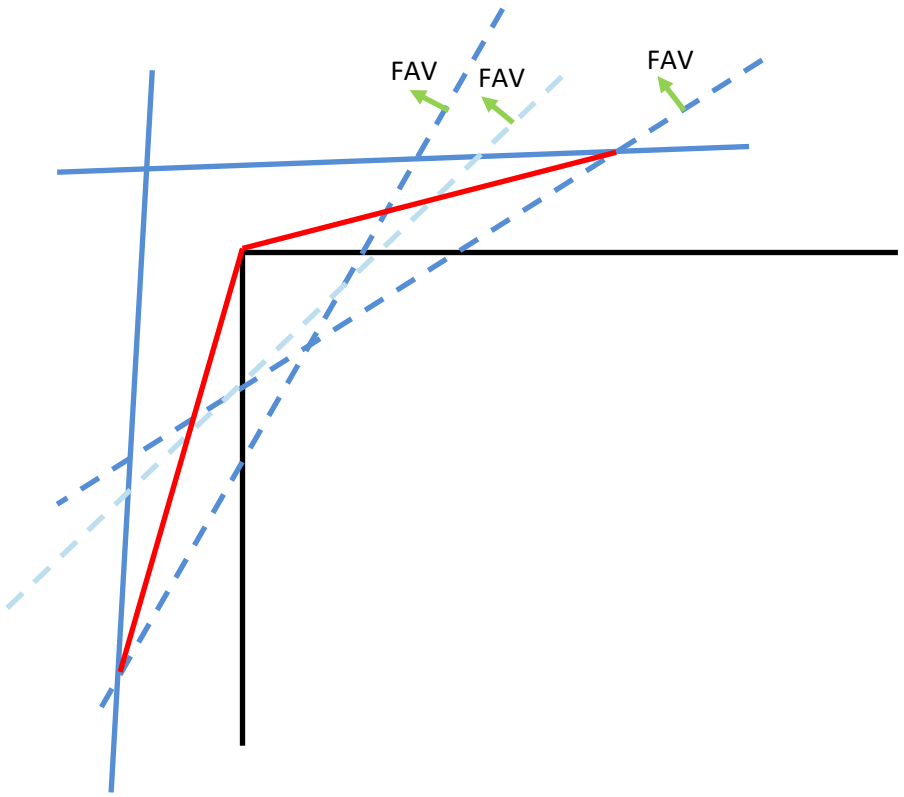
Improved Virtual Branches



1. Determine presolved domain
2. Take vertices of presolved domain
3. Add corners of LTA domain as vertices
4. Only keep vertices of convex hull
5. Determine artificial facets of convex hull
6. *For each artificial facet:*
   Add a virtual branch (only once!)

3. Update CWE methodologies for CEP and ALEGrO implementation

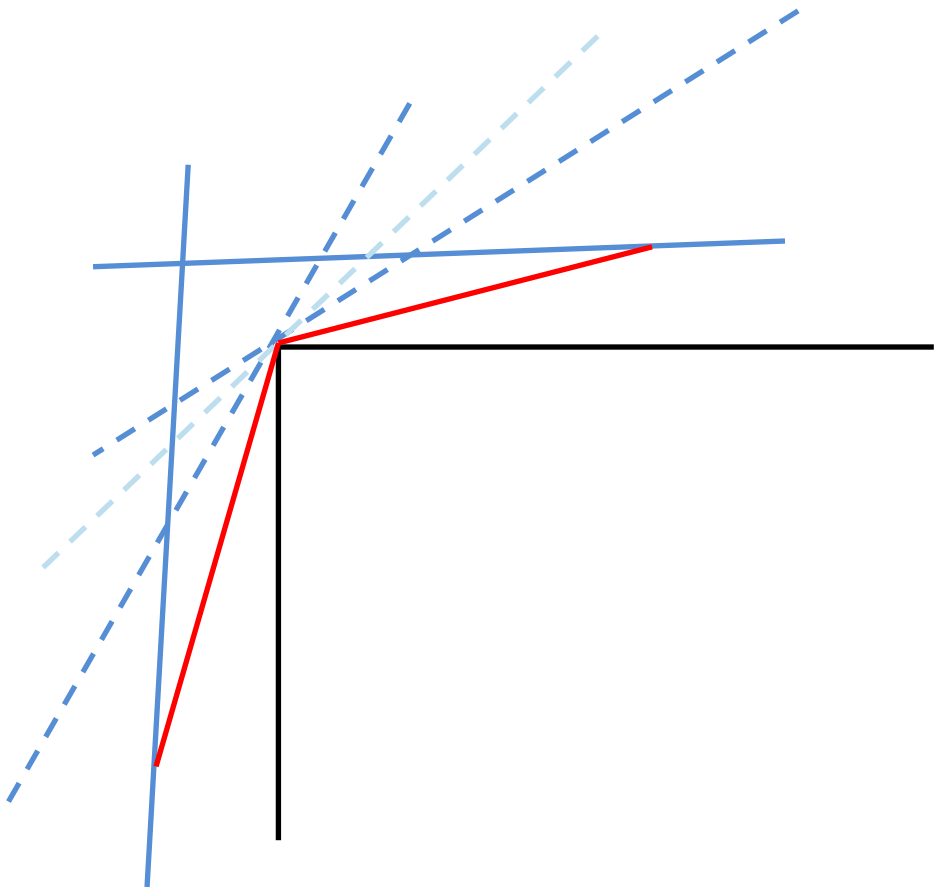
Improved Virtual Branches



1. Determine presolved domain
2. Take vertices of presolved domain
3. Add corners of LTA domain as vertices
4. Only keep vertices of convex hull
5. Determine artificial facets of convex hull
6. *For each artificial facet:*
   Add a virtual branch (only once!)
7. *For each overloaded constraint:*
   Apply FAV approach with LTA margin for LTA corner with highest LTA overload

3. Update CWE methodologies for CEP and ALEGrO implementation

Improved Virtual Branches



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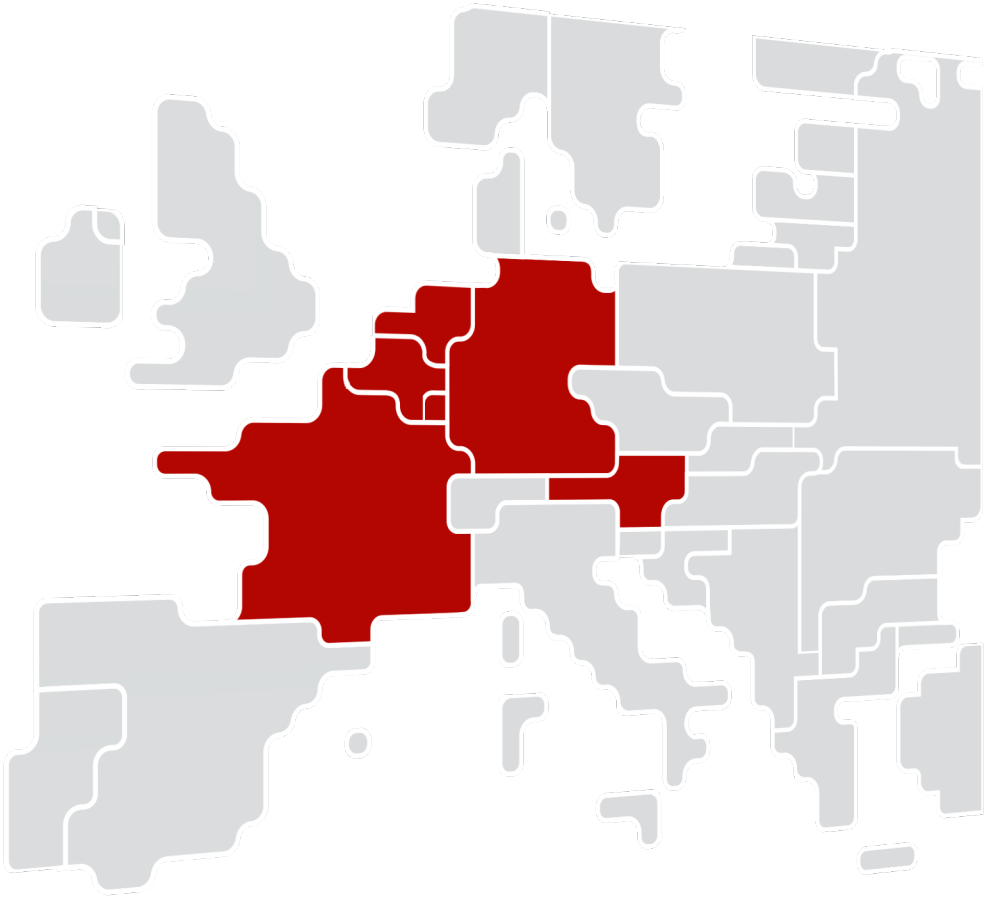
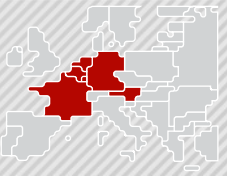
7. *For each overloaded constraint:*
   Apply FAV approach with LTA margin for LTA corner with highest LTA overload

Annex – Comparison IVB and Extended LTA



Validation of Extended LTA inclusion

Capacity calculation - Flow-based domain indicators (Min/Max Net Positions)



Validation of flow-based domain

- Analysis performed:
  - Obtain Min/Max NP from classical Virtual Branch (VB) domain (F206)
  - Obtain Min/Max NP from the Extended LTA inclusion
    - Extended LTA inclusion has been modelled by logarithmo in an optimization prototype
    - F204 virgin domain and LTA domain are used as input domains, and the Min/Max NP are determined by the optimization constrained by the Extended LTA domain formed by these two domains jointly (Balas formulation)
- Key results:
  - **Min/Max NP are almost identical for Extended LTA and VB approach, proving the general applicability of the Extended LTA approach from a CC perspective**
    - Mean deviations of Min/Max NPs are for all bidding zones below 0.02% (< 1 MW)
    - Max deviation of Min/Max NPs is 13MW
      - Even if the deviation is small, it is worth mentioning that this is an extreme outlier for an unlikely market direction, where the VB generation made the FB domain actually too large in the past
    - These slight deviations are due to rounding and small inaccuracies in the creation of Virtual Branches