

# USERS' GROUP



## WG EMD-SO



Mar 31, 2022  
10:00 – 13:00



# Agenda

Actions	By	Due date	Finalised
Intraday: evaluate impact of new access to German ID market	J-M Reghem	Next WG EMD-SO	<input type="checkbox"/> today
Core FB DA: summary EXT // run from BE perspective	S. Van Campenhout	Next WG EMD-SO	<input type="checkbox"/> today

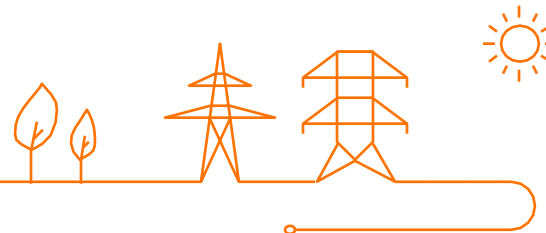
## Approval report previous meeting and follow-up actions

### European Market Design (10:00 – 12:00)

1. Core FB DA: EXT // run results – presentations by Elia (Steve) and CREG (Nico)
2. 70% MACZT Compliance Report – 2021 – presentation by CREG (Nico)
3. Intraday Market evolution: Status, statistics and planning (Jean-Michel)

### System Operations (12:00 – 13:00)

1. Operational report 2021 (Filip/Bernard)
2. MinRAM results 2021 + 360° (Filip/Bernard)
3. Ukraine synchronization (Filip/Bernard)



# Core FB DA: EXT // run results

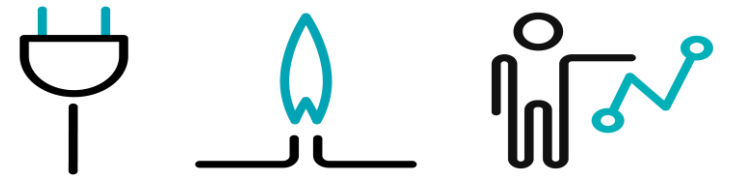


# INTERPRETATION OF THE CORE DA FB MC EXTERNAL PARALLEL RUN RESULTS

**ELIA WG EMD - SO**

Nico Schoutteet – Advisor, CREG

31 March 2022



**— CREG —**

Commissie voor de Regulering van de Elektriciteit en het Gas

## First, a word on the data...

**1.401.811**

(CNECs in pre-solved final domains)

The CREG analysed the results of the Core DA FB MC parallel runs, focusing on the pre-solved domains **from 1 October 2021 to 28 February 2022**

**3.395**

(MTUs)

**1.395.332**

(valid CNECs in pre-solved final domains)

Filtering on only those hours without spanning / default flow-based parameters, fewer (valid\*) observations can be investigated

**3.318**

(MTUs)

**281.300**

(valid CNECs in pre-solved final domains where RAM  $\neq$  0)

Filtering on only those hours where the RAM does not equal 0% of  $F_{max}$ , even fewer observations remain

**2.803**

(MTUs)

**Only 82,6% of all MTUs, or even only 20,1% of all CNECs, can be interpreted!**  
Furthermore, the reason for this RAM = 0% observations can only be guessed.

**— CREG —**

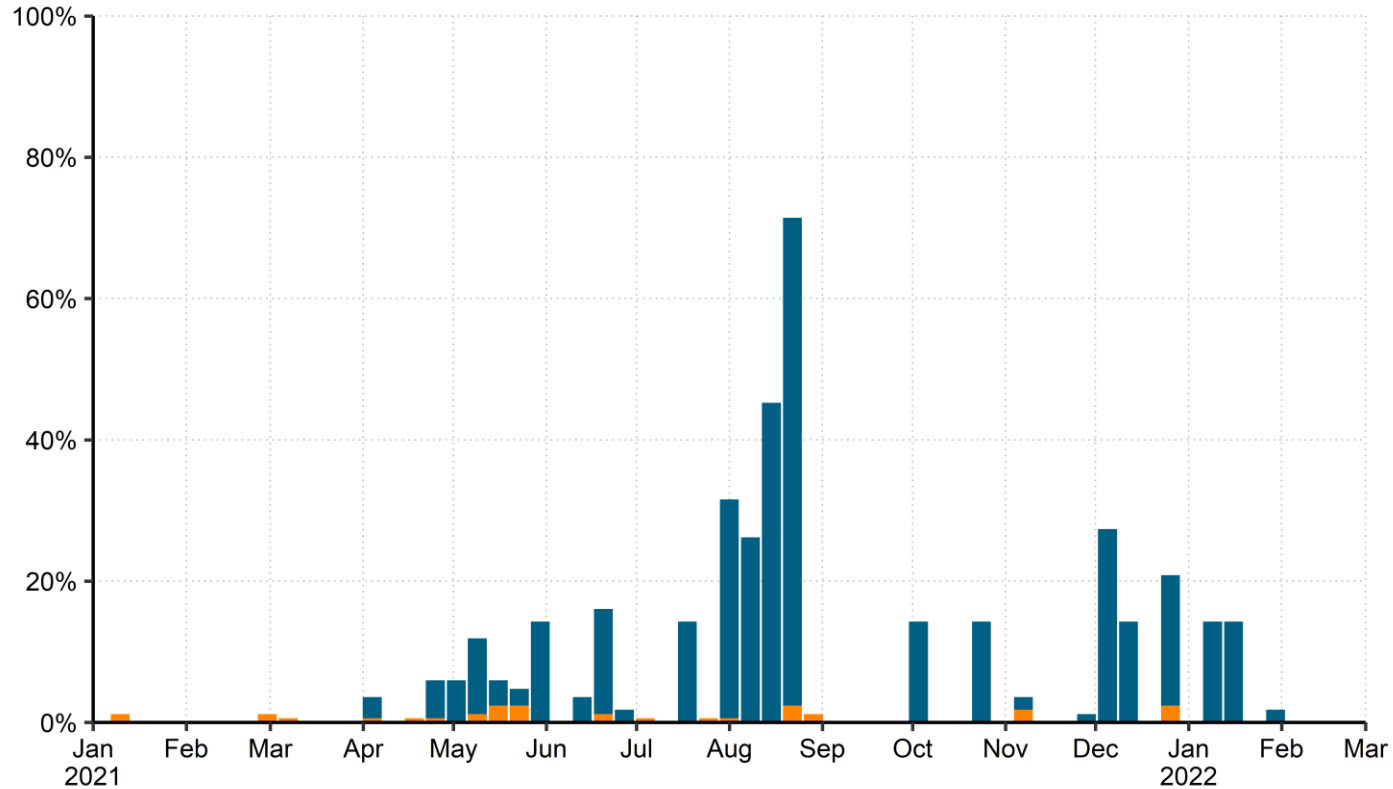
\* Valid in the sense that they can be interpreted and their results have meaning.

Obviously, the absolute number of spanning / DFP hours in itself are a valuable metric of the stability of the parallel runs.

# When was fallback (spanning / DFP) applied?

## Application of fallback in capacity calculation processes

Evolution of weekly fraction of hours with **spanning** or **default flow-based parameters (DFP)** in final computation



Source: calculations CREG based on data JAO Publication Tool

## Where do these CNECs with RAM = 0 come from?

For several TSOs, extremely high shares where CNECs have RAM = 0 are observed. These CNECs / timestamps are NOT marked as spanning / DFP.

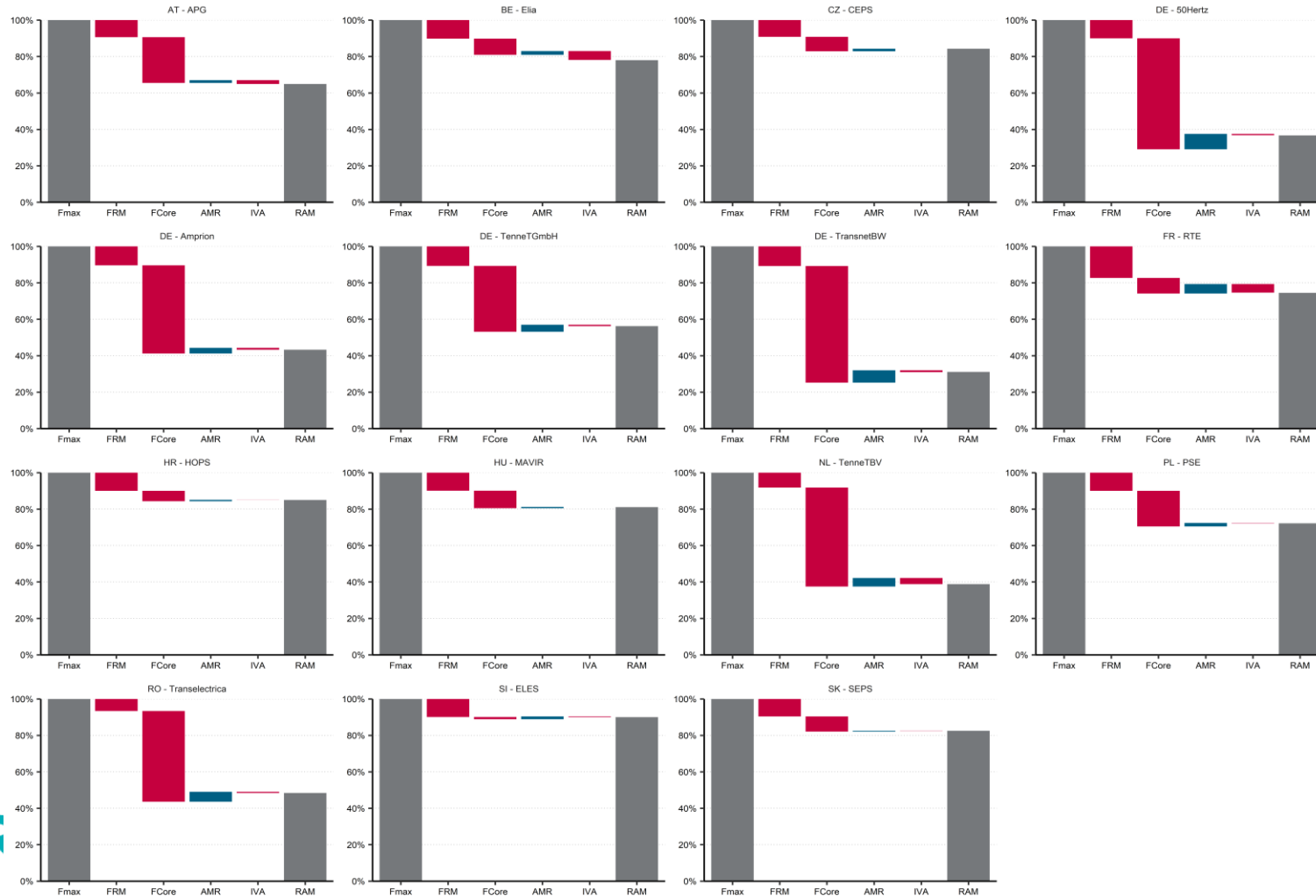
	RAM = 0	# of CNECs	Fraction where RAM = 0
50HERTZ	7.795	15.307	50,9%
AMPRION	503.973	525.462	95,9%
APG	38.408	78.273	49,1%
CEPS	182	11.852	1,5%
ELES	183	12.933	1,4%
ELIA	2.600	33.065	7,9%
HOPS	186	26.432	0,7%
MAVIR	182	27.691	0,7%
PSE	88.390	108.485	81,5%
RTE	182	7.327	2,5%
SEPS	182	28.236	0,6%
TENNETBV	78.128	88.979	87,8%
TENNETGMBH	77.359	91.574	84,5%
TRANSELECTRICA	213	12.064	1,8%
TRANSNETBW	306.763	314.536	97,5%
UNKNOWN TSO	14.134	19.595	72,1%

It is not clear how to interpret these values or under which conditions RAM = 0 materializes.

# Interpreting the *valid* results

## Breakdown of Fmax and RAM values

Average Fmax, FRM, FCore, AMR, IVA and RAM per TSO for all CNECs in the pre-solved final domain



Source: calculations CREG based on data JAO Publication Tool

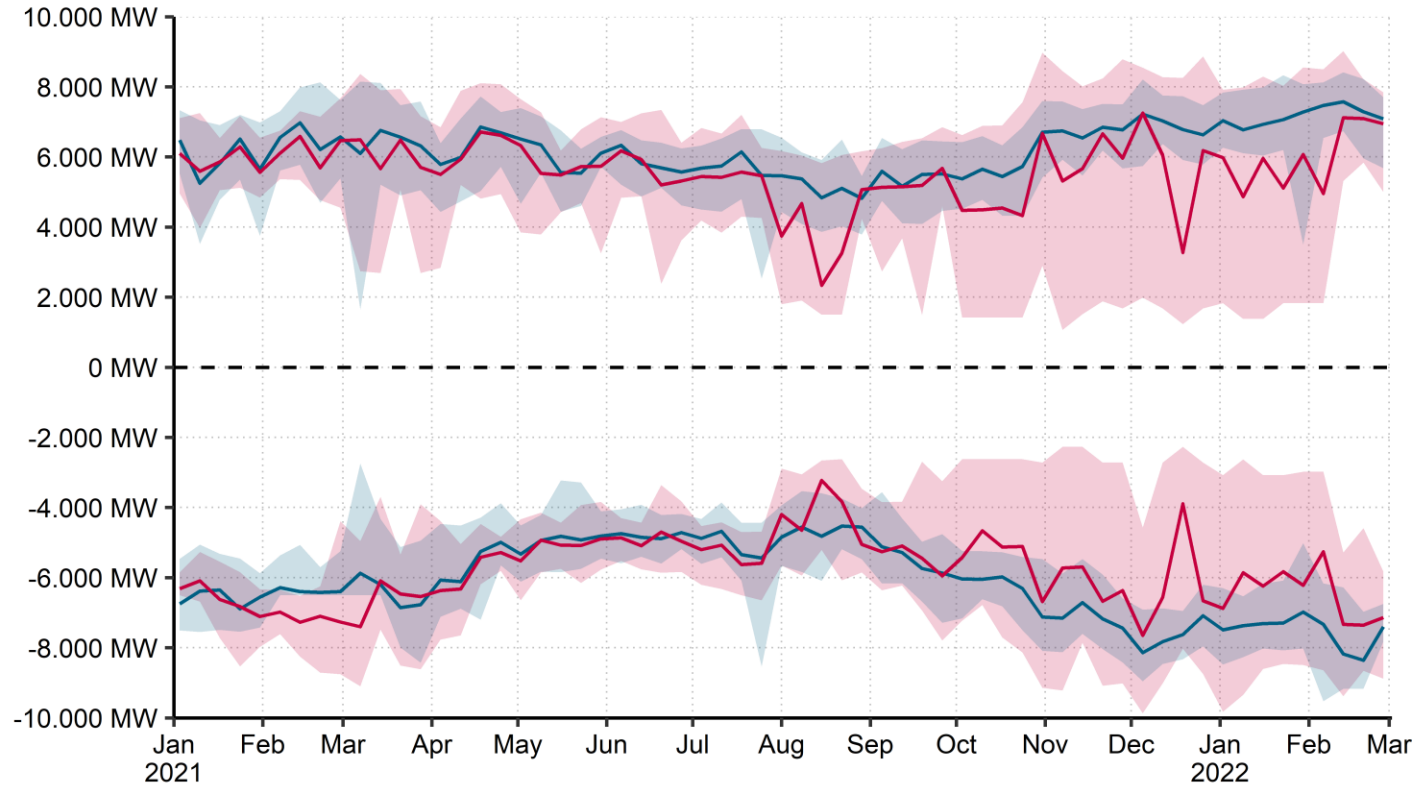
Note 1: blue values (AMR) increase the RAM, red values (FRM, FCore, IVA) decrease the RAM  
 Note 2: dataset only includes MTUs without spanning / DFP and CNECs with RAM not equal to 0



# Focus on Belgium min/max net positions

## Maximum net export and import position of Belgium

Evolution of weekly minimum, average and maximum import and export position of Belgium for **real** and **// run** results

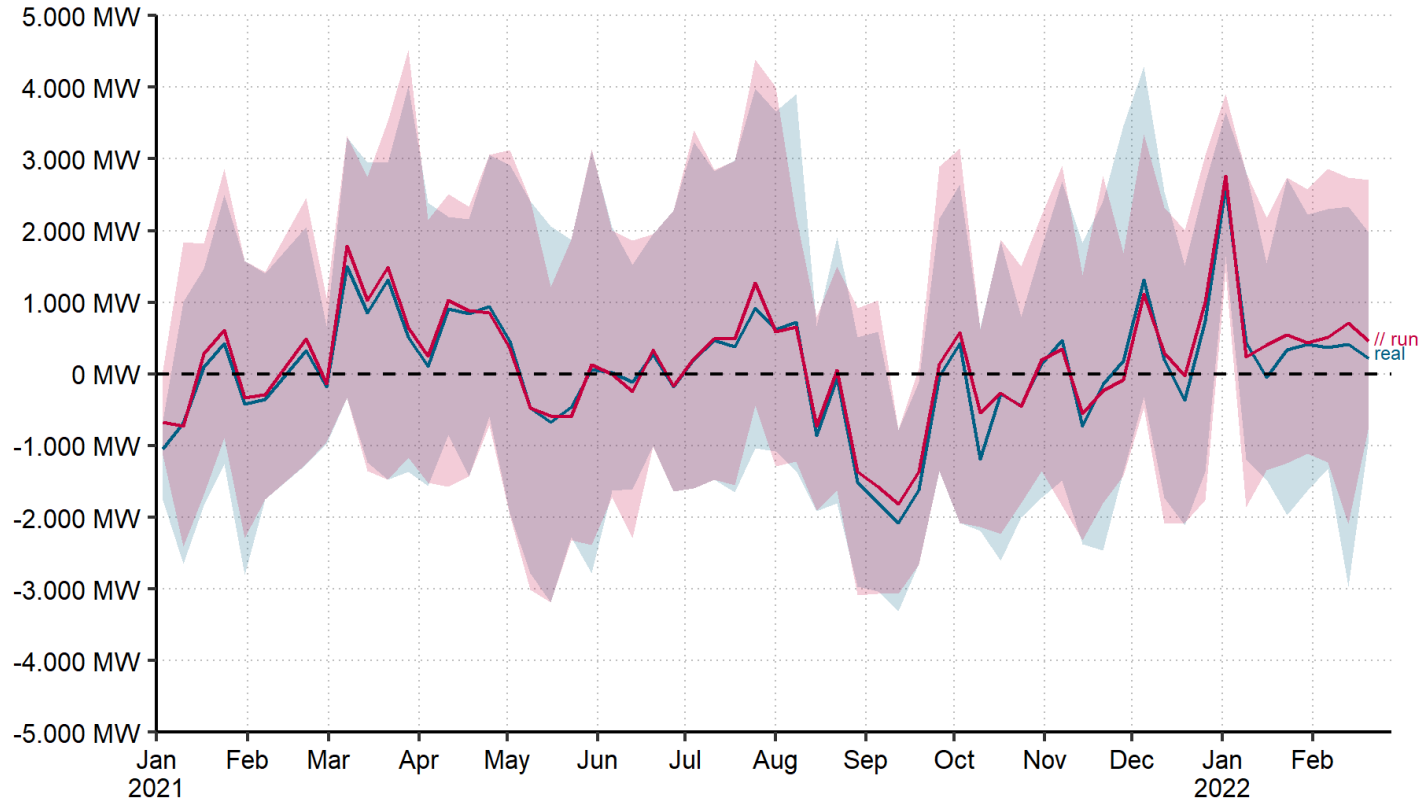


Source: calculations CREG based on data JAO Publication Tool and CWE TSOs  
Note: shaded areas indicates minimum and maximum range for real (blue) and // run (red) results

# Focus on Belgium SDAC net position

## Net position of Belgium

Weekly minimum, average and maximum (SDAC) net position of Belgium for **real** and **// run** results



Source: calculations CREG based on data JAO Publication Tool and Entso-E Transparency Platform

# Prices and net positions

Belgium shows a decrease in average price (-2,9 €/MWh) and an increase in net export (from -8 MW to +100 MW).

Most countries show price decreases, combined with up- or downward shifts in net export positions.

PRICE (€/MWh)	(a) // runs (all timestamps)	(b) // runs (timestamps without DFP / spanning)	(c) Reality (timestamps without DFP / spanning)	Δ (b) – (c)
AT	108,3	109,1	108,3	0,8
BE	102,0	103,7	106,6	-2,9
CZ	99,5	99,4	101,3	-1,9
DE_LU	93,9	93,8	96,9	-3,1
FR	109,5	110,3	111,2	-1,0
HR	118,4	115,8	116,9	-1,1
HU	120,9	118,4	116,3	2,1
NL	101,1	101,2	105,0	-3,8
PL	86,1	86,4	86,3	0,1
RO	119,2	117,1		
SI	115,4	114,3	116,9	-2,5
SK	113,6	114,0	104,0	10,0

Table 7 Prices resulting from external parallel run (with and without DFP/spanning) and reality

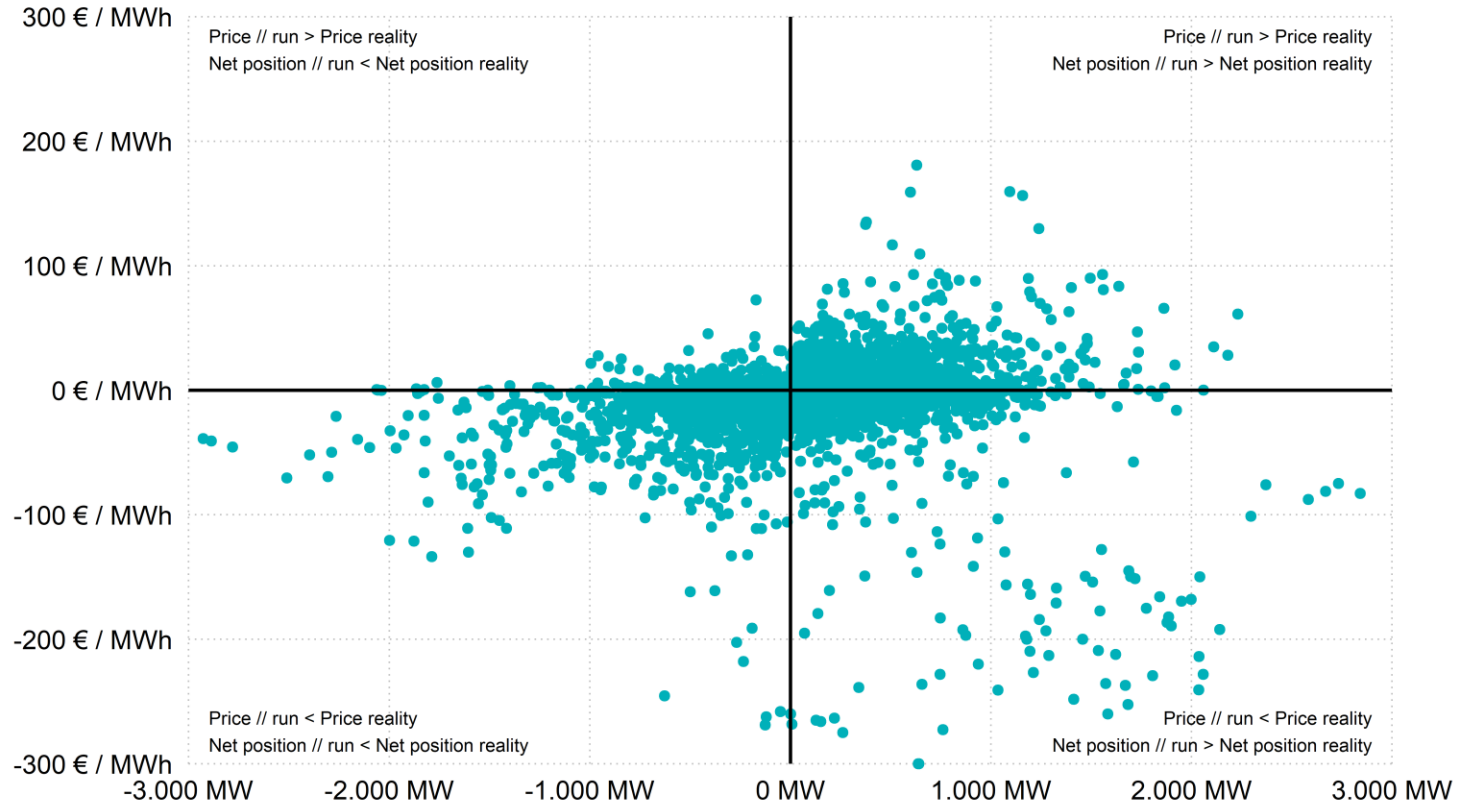
NET POSITION (MW)	(a) // runs (all timestamps)	(b) // runs (timestamps without DFP / spanning)	(c) Reality (timestamps without DFP / spanning)	Δ (b) – (c)
AT	-1.806	-1.948	-2.162	214
BE	98	100	-8	108
CZ	915	937	1.110	-173
DE-LU	1.487	1.565	1.512	54
FR	1.530	1.298	1.320	-22
HR	309	328	368	-40
HU	-1.490	-1.487	-1.420	-67
NL	-686	-597	-504	-93
PL	-7	-2	71	-73
RO	-38	-41	-89	48
SI	-240	-260	-258	-1
SK	53	43	27	15

Table 8 Net positions resulting from external parallel run (with and without DFP/spanning) and reality

# Focus on Belgium counter-intuitive results

## Link between prices and net positions

Price delta (// run - reality) and net position delta (// run - reality) for Belgium per hour

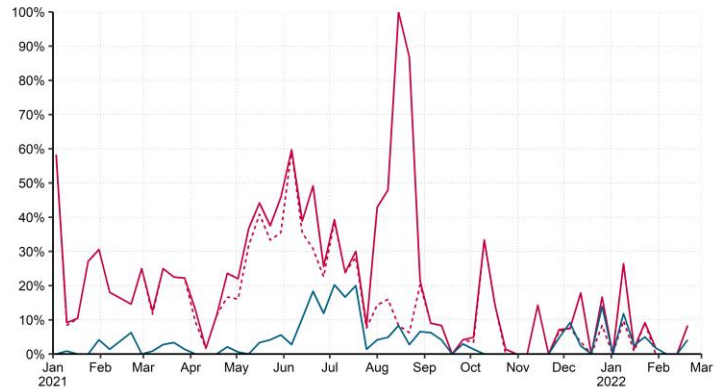


Source: calculations CREG based on data JAO Publication Tool and Entso-E Transparency Platform

# Price convergence

## Price convergence between Core bidding zones

Weekly total price convergence rate between all Core bidding zones **real** and **// run** results



Source: calculations CREG based on data JAO Publication Tool and Entso-E Transparency Platform  
Note 1: convergence is considered when the highest and lowest value for all Core bidding zones are less than 1 €/MWh apart  
Note 2: dotted red line shows results including timestamps with DFP/spanning, full red line shows result excluding timestamps with DFP/spanning

Significant increase in number of hours with full convergence between all Core bidding zones (from 4,0% to 25,1%) (excluding hours with DFP/spanning)

## Price convergence between CWE bidding zones

Weekly total price convergence rate between all CWE bidding zones **real** and **// run** results



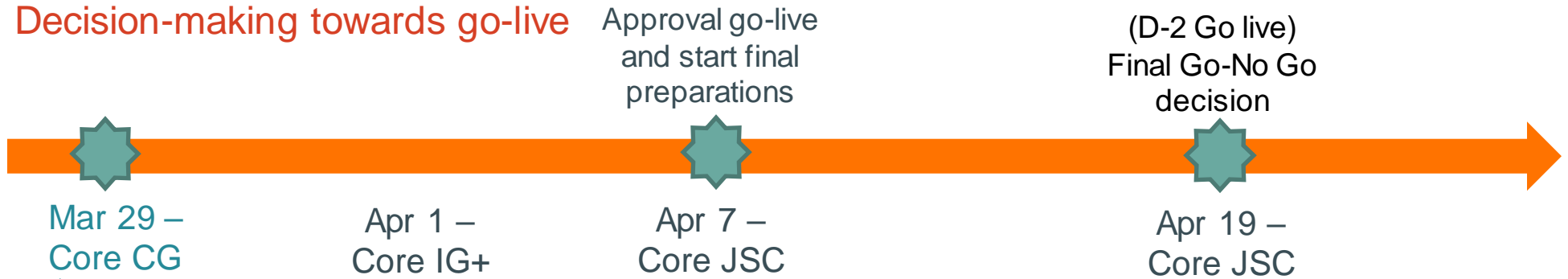
Source: calculations CREG based on data JAO Publication Tool and Entso-E Transparency Platform  
Note 1: convergence is considered when the highest and lowest value for all Core bidding zones are less than 1 €/MWh apart  
Note 2: dotted red line shows results including timestamps with DFP/spanning, full red line shows result excluding timestamps with DFP/spanning

On CWE level (5 bidding zones) however, convergence decreased from 47,1% to 38,1% (again excluding DFP/spanning)

# Elia's wrap-up

- 1. Decision-making towards go-live**
2. Market coupling results when pre-coupling runs smooth
3. Concerns: DFPs, ID ATCs
4. How Elia is defining the capacities on its grid elements

## Decision-making towards go-live



Core TSOs from a Capacity Calculation point of view expect to be timely ready by 20 April 2022 (trading day, D-1) for Core FB DA Capacity Calculation according to the Core DA CCM obligations

- The final measures and improvements to stabilize the process are foreseen to be implemented by beginning of April
- There however are remaining risks for finalizing the last implementations of a local implementation of an unforeseen ID ATC validation tool.

Core TSOs are aware and understand the concerns raised by some Market Participants/ associations (in CCG) related to:

- EXT/run results and stability
- ID ATC values after Core DA MC go live
- Publication tool

Core TSOs are of the opinion that ultimately this shall be discussed with Core NRAs during the ad-hoc Core IG+ call 01/04/2022.

The go / no go for Core FB DA Market Coupling go live is a Core Joint Steering Committee decision

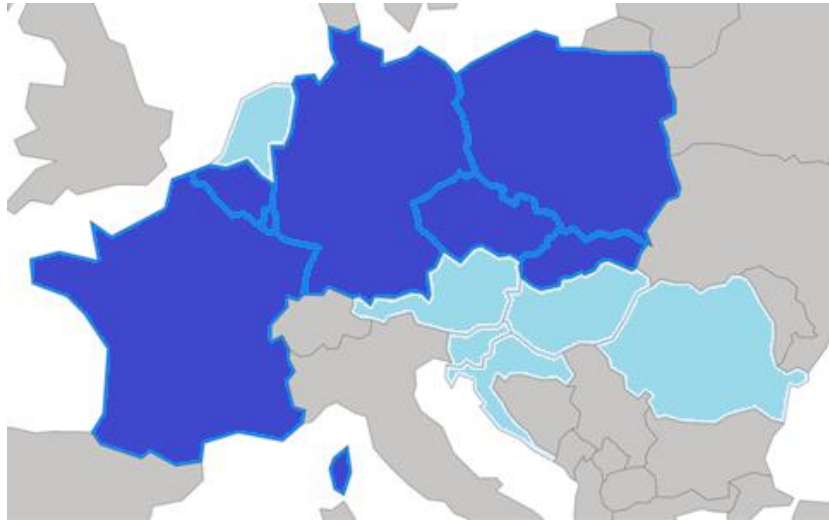
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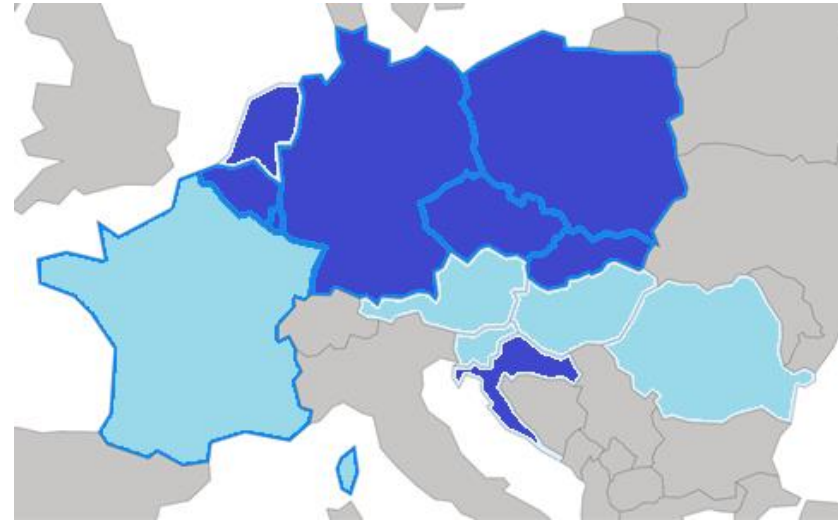


## Comparison of market coupling results between Core //run and current operations

The general direction of the net position per BZ (import/export) did not change in the //run compared to current operations.



Between June and September, the sum of Core MC net positions indicate that BE, CZ, DE/LU, FR, PL, and SK were net exporting (dark blue) while AT, HR, HU, NL, RO, SI were net importing (light blue)



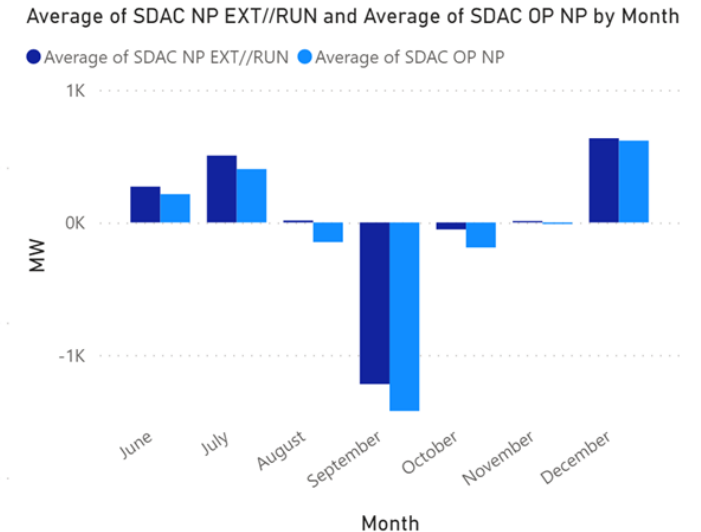
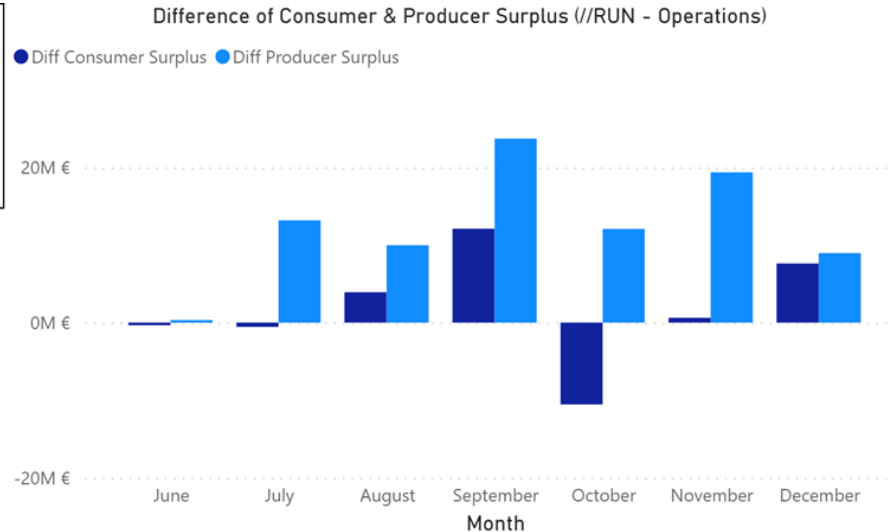
Between October and December, FR went from exporting to importing in line with operational reality

## Comparison of market coupling results between Core //run and current operations

- Dataset: period 18/06 – 31/12/2021 excluding hours where the pre-coupling resulted in DFP due to central failure or in DFP-like results due to application of individual fallback during local validation
- Core FB MC has an overall positive welfare effect in Belgium for the consumers and the producers.



Year	Month	Price Diff BE
2021	June	-0.60 €
2021	July	-1.24 €
2021	August	0.03 €
2021	September	0.36 €
2021	October	3.58 €
2021	November	5.71 €
2021	December	4.53 €
<b>Total</b>		<b>1.90 €</b>



Positive = lower price in Core

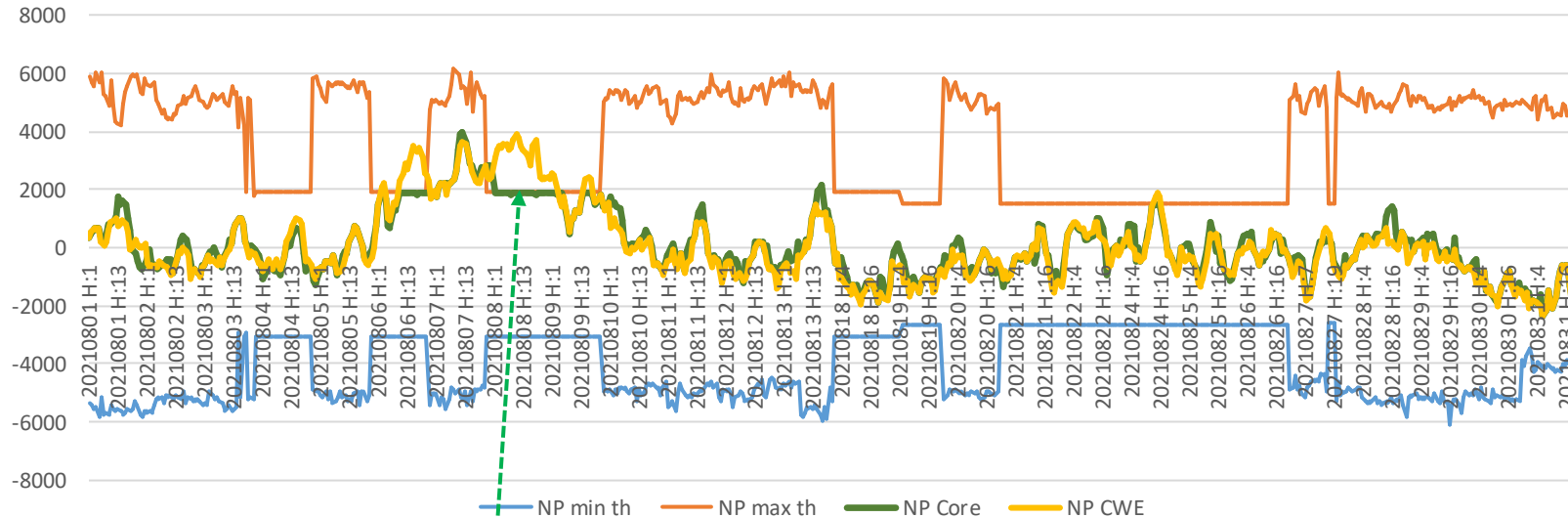
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# Impact of DFPs for Belgium

Occurrence of DFP or DFP like results: 10-20% still in Q1 2022

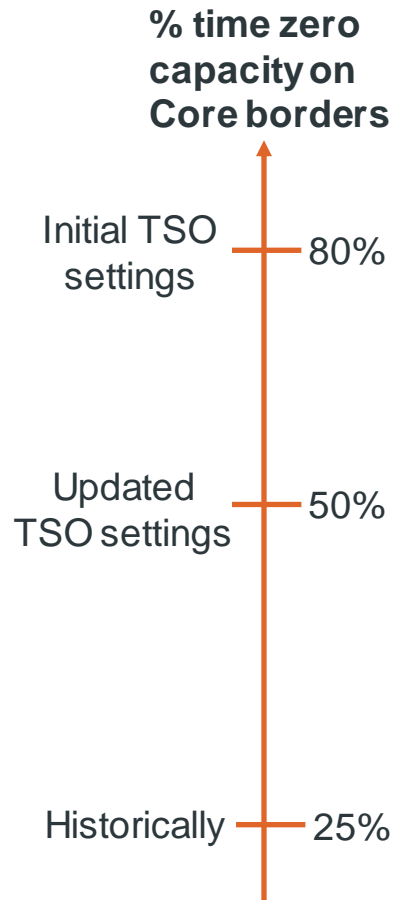
### DFPs can lead to lack of export capacity during summer



Net position of Belgium restricted to the available 2000 MW capacity  
Impact: negative prices due to incompressibility of production park  
No possibility to compensate through ID as ID capacities will very likely be zero

## High frequency of zero capacity for Intraday

Context: extraction of ID ATCs as left-overs of DA domain, prior to increase/decrease. This is a transitional process until FB IDCC goes live.



- **Core ID CCM: each TSO can decide whether to include some virtual margins before running the ATC extraction (AMR and/or LTA inclusion) – no justification required**
  - Compared to current practice in CWE (20% AMR + full LTA inclusions) this will lead to a step back, which Elia and CREG flagged as a critical concern
  - ACER got little support from other TSOs and NRAs to oblige the use of virtual capacity, and hence moves forward the approval of Core ID CCM amendment sticking to a voluntary approach
  - Elia heavily challenged this voluntary approach in its input during the hearing phase
- **Core CG Mar 29: Core TSOs presented results and an action plan with “possible improvements by Sep 2022”**
  - Today there is no concrete view/commitment how much the situation will improve
  - From the numerous analysis made, the key take-away is that LTA inclusion plays a crucial role. Most Core TSOs now aim at partial LTA inclusion, which decreases the frequency of zero ID ATC from 80% to 50%

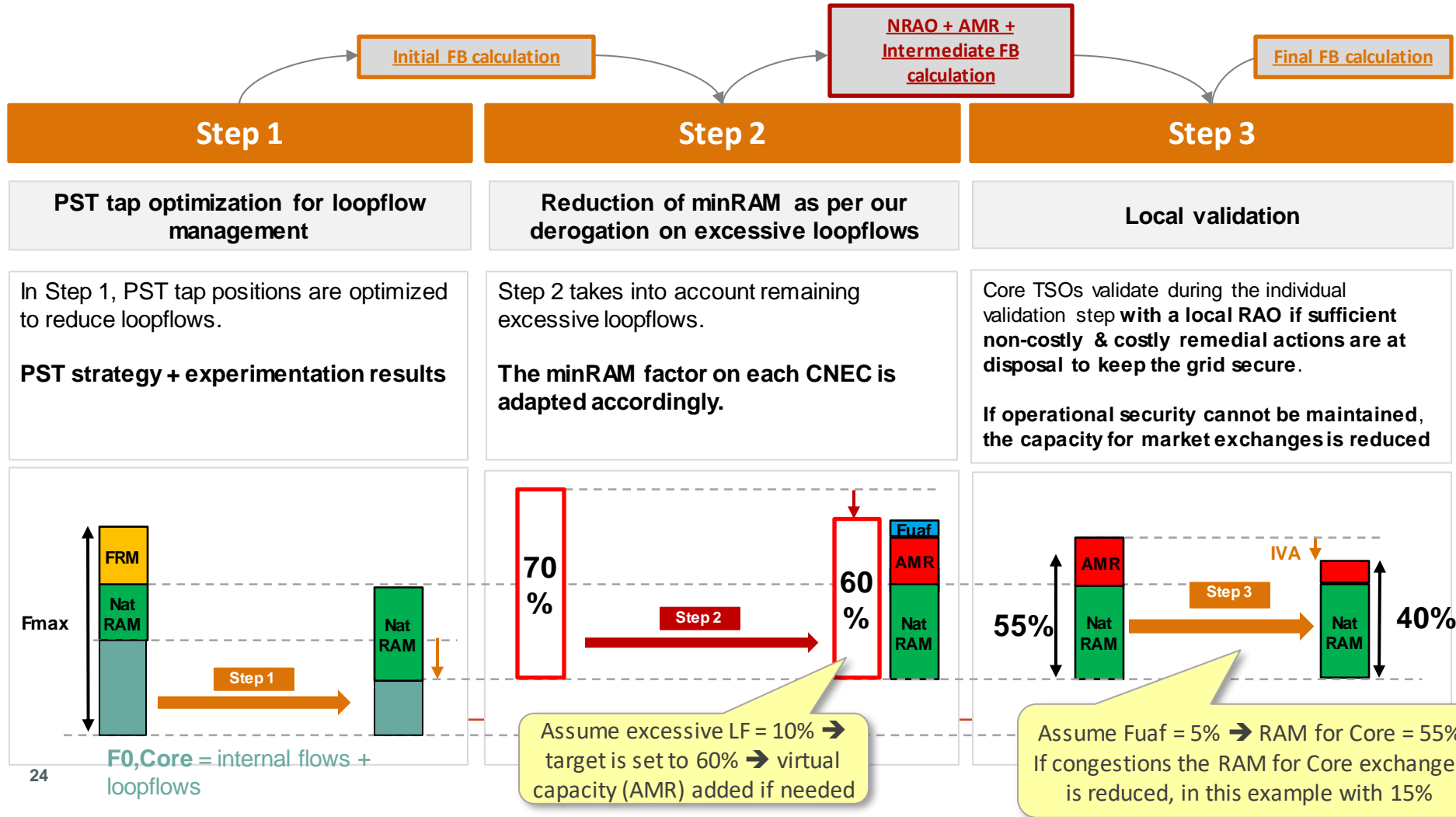
Core go-live on April 20<sup>th</sup>

**Discussion to align the views among Belgian parties**

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# Overview





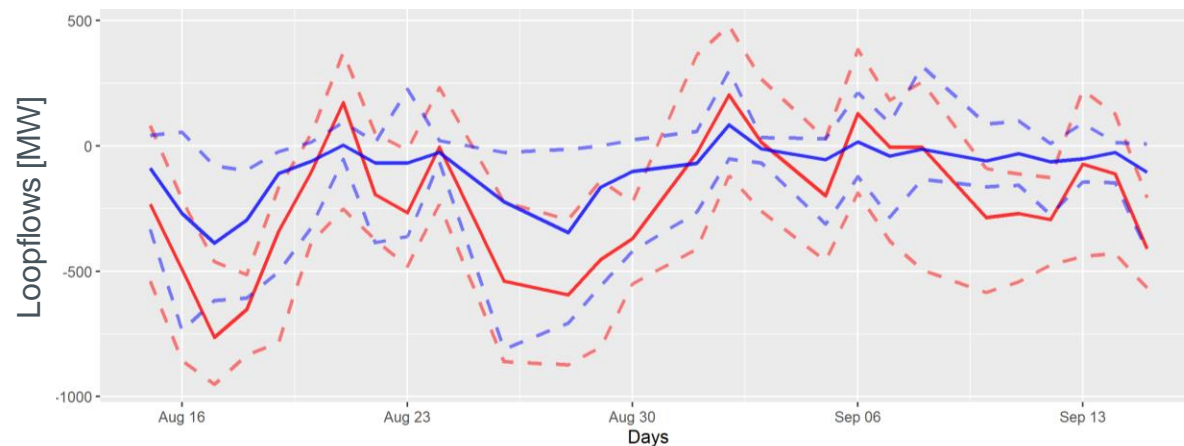
## PST strategy: approach

- Core DA CCMArt 10(5): each Core TSO may individually define the initial setting of its own non-costly and costly RAs, based on the best forecast of their application and with the aim to reduce the total loop flows on its cross-zonal CNECs → **Elia is frontrunner in using PSTs to reduce LFs**
- Approach
  - Reduce and balance of the loop flows on all the cross-borders element using the associated 380kV PSTs (Zandvliet, Van Eyck) & 220kV PSTs (Aubange, Monceau)
  - 380kV lines and PSTs: part of capacity calculation meaning that the PSTs are used
    - Locally: tap range for LF reduction [-8 +8]  $\Leftrightarrow$  *CWE: fixed tap at -3*
    - By the NRAO: tap range for preventive optimization [-8 +8] and additional 2 steps for curative  $\Leftrightarrow$  *CWE: [-6 +6]*
  - 220kV lines and PSTs: Elia removed the 220kV lines from the capacity calculation so they can't block the market
    - Taps on 220kV PSTs are set locally during loop flow optimisation, and passed on to the Core CGM
    - NRAO cannot change these taps as the PSTs are kept outside of Core capacity calculation (coherence with keeping the 220kV lines out)

## PST strategy: results

### Data sample: mid-Aug → mid-Sep

Total BE – NL. Negative value = loopflow north > south direction



#### Legend

- Average before optimization
- - - Max/Min before optimization
- Average after optimization
- - - Max/Min after optimization

Highest LF in % of Fmax across the 380kV lines: **~10% reduction**

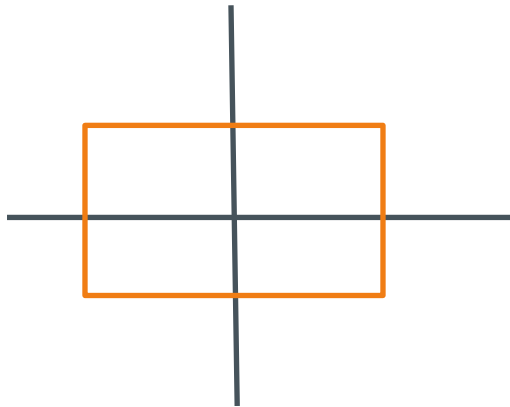
Percentile	Before optimization	After optimization
25%	17	8
50%	20	11.5
75%	24	15
95%	30	20.65
99%	33	25

PSTs	% MTUs at -8	% MTUs at 8
Zandvliet 1	24%	0%
Zandvliet 2	23%	0%
Van Eyck 1	1%	0%
Van Eyck 2	1%	0%
Monceau	0%	0%
Aubange	0%	4%

- Most loopflows pass through Zandvliet. To balance between Zandvliet and VanEyck, the optimizer will use more often the extreme position of Zandvliet
- Aubange taps set on +8 when there is a need to push back loopflow entering via FR

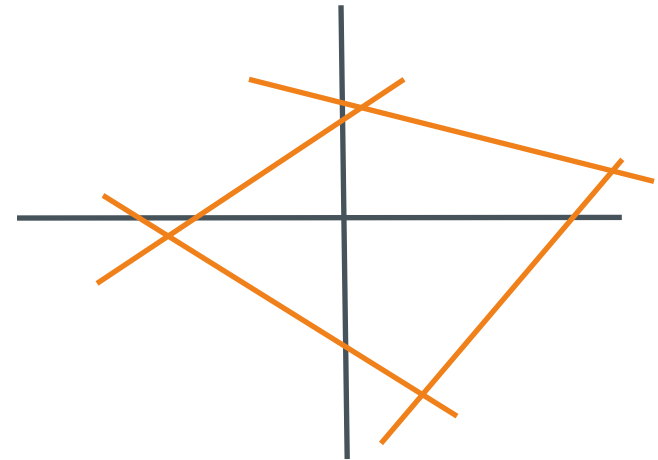
## Local validation: approach

LTA domain



No signals we should revise our approach: LTA curtailment remains an extraordinary measure

Intermediate FB domain

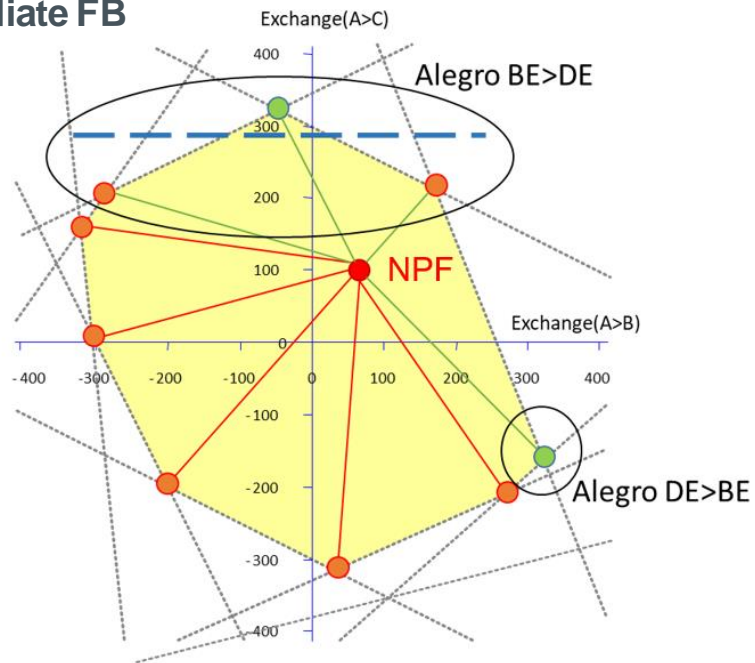


Feasibility of the intermediate FB domain is evaluated with a local RAO

## Local validation: approach

### Step 1 = vertices selection within a distance from NP Forecast

#### Intermediate FB domain



- **Pre-filtering:** filter from all vertices those closest to NPF with uncertainty interval P99. Closest = weighted Euclidian distance based on representative PTDFs.

$$d = \sqrt{\sum_{i=1}^N PTDF_i * (Vertex_i - NPF_i)^2}$$

- **ALEGrO:** create 2 groups in the pre-filtered vertices, using Min and Max NP of ALEGrO as key parameter
- **Adaptable scenario framework:** select from these 2 groups the vertices corresponding to the scenario's chosen for validation
  - Closest to NPF
  - Maximum import FR+BE (winter)
  - Maximum south > north exchanges (summer)

## Local validation: approach

### Step 2 = evaluation of vertices with local RAO

- **Perform an AC loadflow in PowerFactory on the selected vertices. In case of overload, attempt to solve with remedial actions**
  - PST taps: 8 taps in preventive, 2 more in curative thus 10 in total
  - National RD potential: STEGs & offshore wind
  - Topological: currently not supported by PowerFactory
  - Cross-border RD potential: not used, this is for the full coordinated validation phase
- **The local RAO tries to reduce the maximum overload seen on all relevant CBCOs (i.e. not the frequency of the overloads). In case of remaining congestion, apply IVA is applied**
  - IVA can occur on non pre-solved BE CNECs from the intermediate domain
  - IVA can occur on CNECs with no virtual RAM

## Local validation: results

	SEP 2021	OCT 2021	NOV 2021	DEC 2021
<b>Meeting capacity target [% MTUs]</b>				
CWE	91%	90%	87%	80%
CORE	31%	20%	51%	30 %
<b>Not meeting target [% MTUs] - CORE</b>	<b>69%</b>	<b>80%</b>	<b>49%</b>	<b>70 %</b>
<i>Due to fallback in local tooling</i>	34%	4%	10%	< 1%
<i>Due to insufficient local RA potential</i>	35%	76%	39%	70%

**We experience a more frequent capacity reduction in Core compared to CWE (action plan: next slide)**

### Normal operation

- **Average size of capacity reduction: ~14% of Fmax**
- **Average capacity for Core exchanges: ~80% of Fmax for pre-solved CNECs (cf. CREG presentation)**

**Fallback approach: minimum of 20% capacity for Core exchanges is secured**

## Local validation: root cause analysis of increased capacity reduction

### Local bug on HVDC

- It was expected that in the CGM the HVDCs were represented by a load
- This load value is used in our local tool to set the value of the HVDC generator in the detailed grid model
- Cases were identified where the HVDC in the CGM were represented by a generator → wrong scenario was hence assessed

**Solved since Mar 14th 2022**

### Merging issue

- Core TSOs recently discovered an inconsistency in the CGM impacting the Net Positions of Germany, Belgium and Poland in the CGM.
- As a consequence, the zero-balanced flows, RAMs and other relevant parameters of the capacity calculation are affected, especially for CNECs in and close to the affected bidding zones.

**Expected to be solved begin Apr**

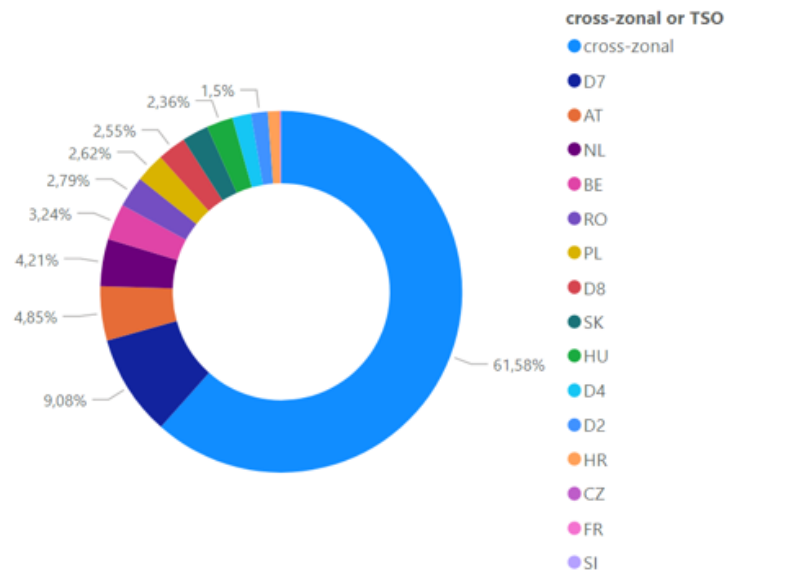
### Redistribution error DC imbalance

- Local validation is performed in AC load flow
- Capacity calculation process applies a DCLF approach, where the DC imbalance is proportionally redistributed over all loads of the main island.
- This distorts the flows and overloads as seen on the CNECs during local validation.

**DC imbalance threshold is set to 5% to trigger DFPs if surpassed.  
After summer 2022: implement improved DC imbalance distribution**

## Which grid elements are limiting the market coupling?

Share of limiting CNEs per tieline or TSO internal



CNE	Count of Shadow Price	RAM%	max z2zPTDF
[AT-D2] St. Peter 2 - Pleinting 258 [OPP] [AT]	599	54,93 %	0,05
[CZ-PL] Wielopole - Nosovice [DIR] [PL]	536	50,69 %	0,04
[SK-PL] Lemesany - Krosno Iskrz 2 [OPP] [PL]	461	65,11 %	0,11
[D7-D7] Buerstadt - Lamsbheim BUERST W [DIR]	263	33,37 %	0,13
[NL-NL] Diemen-Lelystad 380 Z [OPP]	263	25,64 %	0,20
[AT-HU] Wien Suedost - Gyoer 245 [DIR] [AT]	246	31,52 %	0,06
[FR-D7] Vigy - Ensdorf VIGY2 S [DIR] [D7]	241	33,50 %	0,10
[AT-CZ] Duernrohr 1 - Slavetice 437 [OPP] [AT]	213	53,71 %	0,15
[SK-SK] V.Dur - Levice 2 [DIR]	206	36,86 %	0,18
[D8-D8] Pasewalk - Vierraden 306 [DIR]	204	30,35 %	0,08

% MTUs	AUG 2021	SEP 2021	OCT 2021	NOV 2021	DEC 2021
PL AC Export	34,6%	45,0%	22,7%	33%	40,2%
PL AC Import	10,3%	0,1%	6,8%	2,7%	5,6%

- Most limiting: Poland, Germany, Austria
- In between: Belgium, Netherlands, Slovakia, Romania
- Least limiting: Czech, Slovenia, Croatia, Hungary, France
- TOP 5 Belgian CNEs limiting (frequency)

CNE	AUG 2021	SEP 2021	OCT 2021	NOV 2021	DEC 2021
[BE-FR] Achene - Lonny 380.19 [DIR] [BE]	0,0%	2,1%	3,7%	5,8%	1,9%
[BE-BE] Achene - Gramme 380.10 [OPP]	0,7%	0,6%	5,9%	2,8%	1,9%
[BE-BE] Lixhe - Gramme 380.11 [OPP]	12,3%	1,5%	0,0%	0,4%	0,5%
[BE-FR] Avelgem - Avelin 380.80 [OPP] [BE]	0,9%	7,4%	1,0%	0,0%	0,0%
[BE-BE] PST Zandvliet 1 [DIR]	0,0%	3,6%	3,9%	0,0%	1,6%

Note: begin 2022 we relabeled our PSTs as XB elements, in line with the Core CCM



# 70% MACZT Compliance Report – 2021

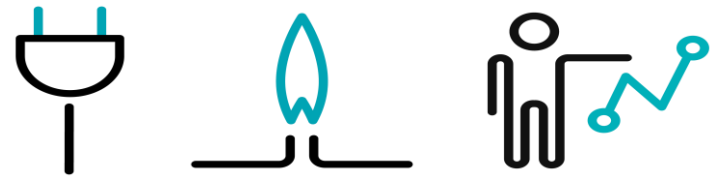


# 70% MACZT COMPLIANCE REPORT - 2021

**ELIA WG EMD - SO**

Nico Schoutteet – Advisor, CREG

31 March 2022



**— CREG —**

Commissie voor de Regulering van de Elektriciteit en het Gas

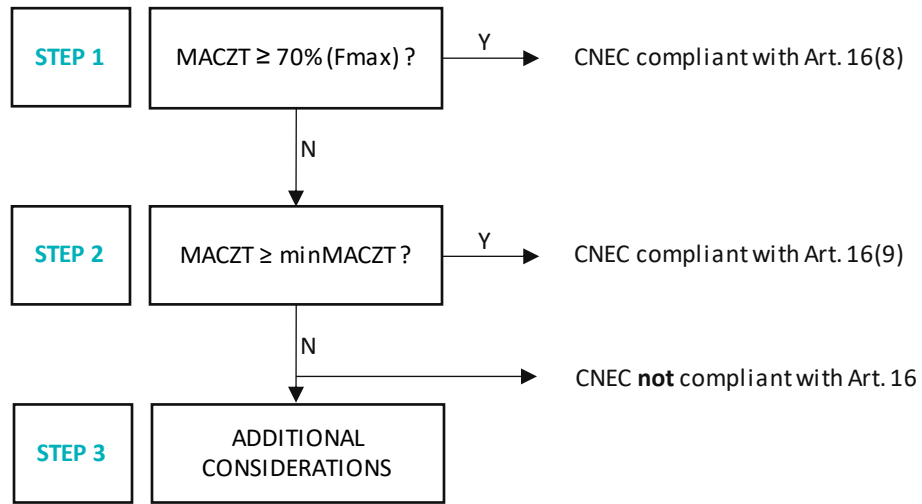
## Context / some considerations

- The CREG assessed the compliance of Elia with the legal obligations in Regulation (EU) 2019/943, Art. 16 (i.e. “the 70% requirement”), focusing on the period from **1 Jan 2021 to 31 Dec 2022**.
- The same principles as in the same report for 2020 were applied (see also methodological aspects). This report (Study (F) 2183) may be found [here](#).
- Since last year, further developments require particular attention:
  - Approval of a new derogation request from Elia, focusing **only on the loop flow derogation**
  - Further discussion with ACER, Entso-E and TSOs on the harmonization of the monitoring and compliance assessments.
  - Specific situations in the Elia network
- Report for 2021 approved by the CREG’s Board of Directors, publication foreseen in the coming days.
- This presentation presents the main findings of the 2021 report.



## Reminder on the methodology

- Stepwise approach for checking the compliance and presenting the analyses



- Methodological approach for determining the minMACZT (cf. CREG [decision](#) on derogation for 2021)

$\mathit{minMACZT} = 70\% - \mathit{max}[0; LF_{calc} - LF_{accept}]$ , where

$$LF_{calc} \text{ on internal network elements} = \frac{[30\% - FRM]}{2}$$

$$LF_{calc} \text{ on cross - border network elements} = 30\% - FRM$$

# General results

**62,2%**

(in terms of MTUs)

Elia complied with the minMACZT requirements during **62,2% of the hours** in the considered period, a decrease since 2020 (where this metric reached 81,3%)

**99,2%**

(in terms of CNECs)

Elia complied with the minMACZT requirements on **99,2% of the observed network elements** in the considered period, a status quo with the 2020 results

A more detailed breakdown\* of the compliance scores:

## IN TERMS OF CNECs

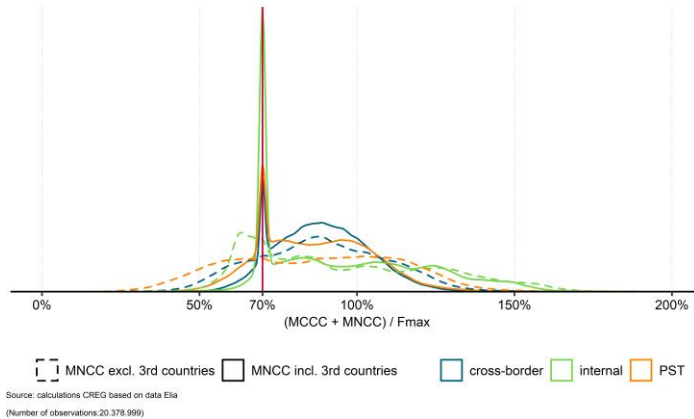
	2020 (n = 13,3725,393 CNEs)		2021 (n = 20,378,999 CNEs)	
	STEP 1	STEP 2	STEP 1	STEP 2
Cross-border	94,0%	99,8%	93,0%	99,7%
Internal	91,8%	98,8%	95,1%	99,0%
PST	87,4%	99,7%	85,8%	99,6%
<b>All</b>	<b>91,8%</b>	<b>99,2%</b>	<b>93,5%</b>	<b>99,2%</b>

## IN TERMS OF MTUs

	2020 (n = 6,528 MTUs)		2021 (n = 8,616 MTUs)	
	STEP 1	STEP 2	STEP 1	STEP 2
Cross-border	0,5%	95,0%	2,4%	90,9%
Internal	2,1%	77,2%	2,2%	50,6%
PST	0,3%	97,0%	1,8%	86,9%
<b>All</b>	<b>1,5%</b>	<b>81,3%</b>	<b>2,1%</b>	<b>62,2%</b>

# Detailed results step 1 (assessing against 70% threshold)

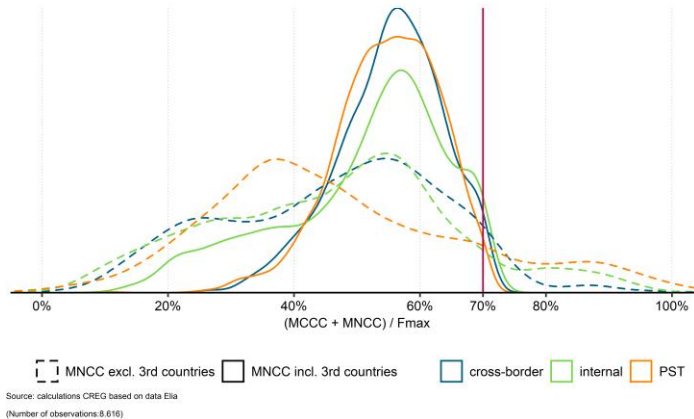
Compliance with 70% threshold of all CNECs (STEP 1)  
Density plot of MACZTs for each CNEC compared to 70% of F<sub>max</sub>



In terms of all observed CNECs, results are strongly oriented towards compliance with 70% of F<sub>max</sub>.

However, very high (> 100%) and very low (< 50%) values are observed.

Compliance with 70% threshold of CNECs with lowest MACZT per MTU (STEP 1)  
Density plot of MACZTs for CNEC with lowest MACZT per MTU compared to 70% of F<sub>max</sub>

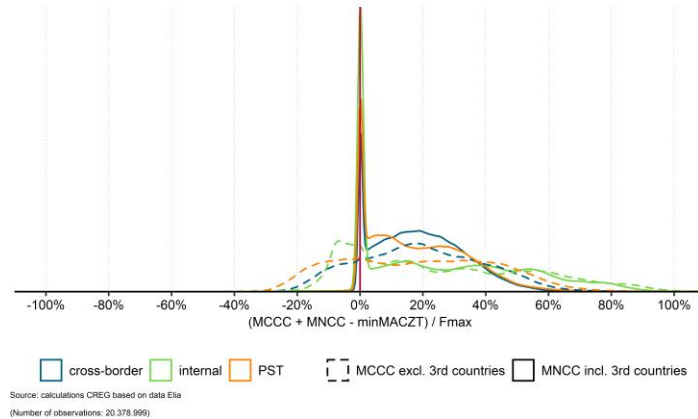


In terms of all MTUs (by looking at the CNEC with the lowest MACZT), very little hours (1,5%) where all CNECs respect the 70% MACZT threshold are observed.

Most often, the CNEC with the lowest margin has an MACZT of 40 – 70% of F<sub>max</sub>.

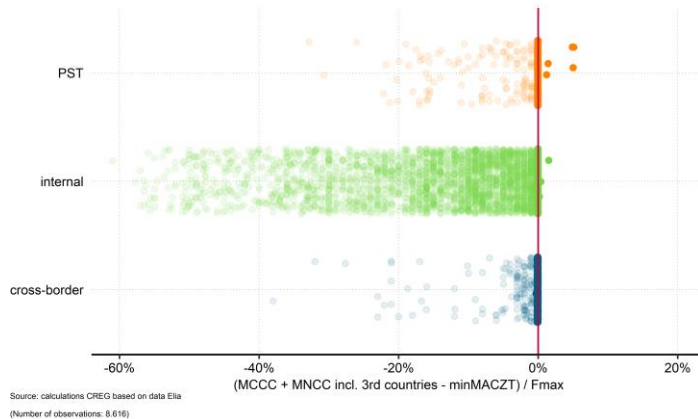
# Detailed results step 2 (assessing against minMACZT threshold)

Compliance with minMACZT threshold of all CNECs (STEP 2)  
Density plot of MACZTs for each CNEC compared to the minMACZT



Again, in terms of CNECs, the results are oriented towards compliance with the minMACZT. Very low values are observed, albeit rather rarely.

Compliance with minMACZT threshold of CNECs with lowest MACZT-minMACZT per MTU (STEP 2)  
Point cloud of MACZT of each CNE with lowest MACZT-minMACZT per MTU compared to the minMACZT



Applying a tolerance margin of 0,5% results in most often the CNEC with the lowest margin respects the minMACZT, hence the MTU is marked as compliant (62,2% of MTUs).

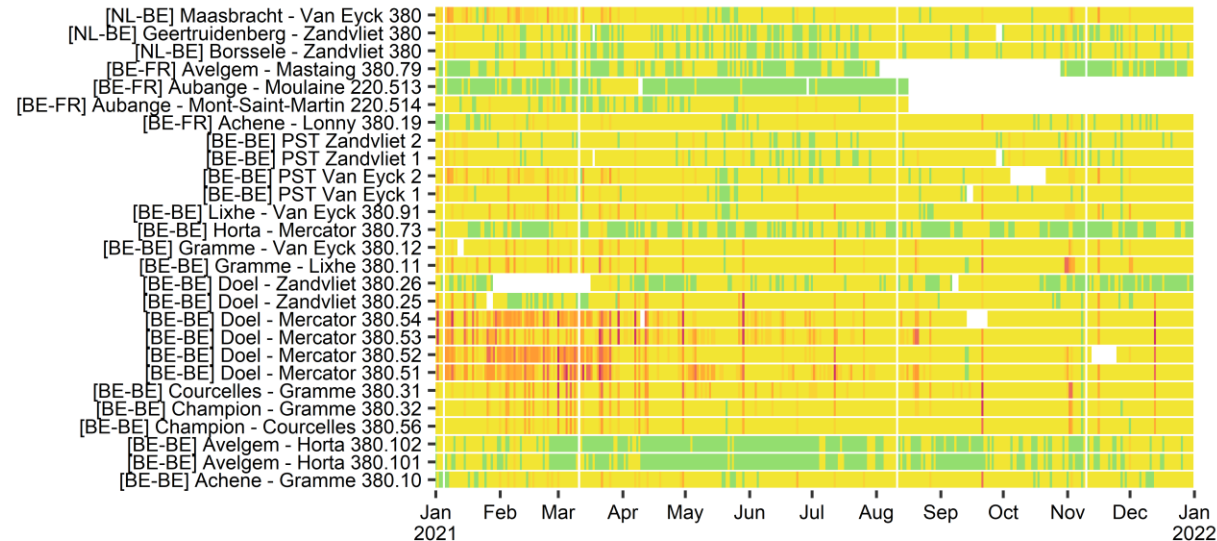
However, plotting outliers shows very low values (MACZT is about 60%pp lower than minMACZT)

# Detailed results additional considerations

The impact of the grid reinforcements from the Brabo I and II projects, in combination with a full nuclear availability, resulted in (very) low available margins on the Zandvliet – Doel – Mercator axis.

## Compliance with minMACZT per observed CNE in 2021

Heatmap of daily lowest observed MACZT - minMACZT values per CNE



**$\Delta$  = lowest (MCCC + MNCC incl. 3rd countries - minMACZT) per day**

<span style="color: red;">■</span> $\Delta < -50\%$	<span style="color: orange;">■</span> $-40\% < \Delta < -30\%$	<span style="color: yellow;">■</span> $-20\% < \Delta < -10\%$	<span style="color: green;">■</span> $\Delta > 0\%$
<span style="color: red;">■</span> $-50\% < \Delta < -40\%$	<span style="color: orange;">■</span> $-30\% < \Delta < -20\%$	<span style="color: yellow;">■</span> $-10\% < \Delta < 0\%$	

Source: calculations CREG based on data Elia

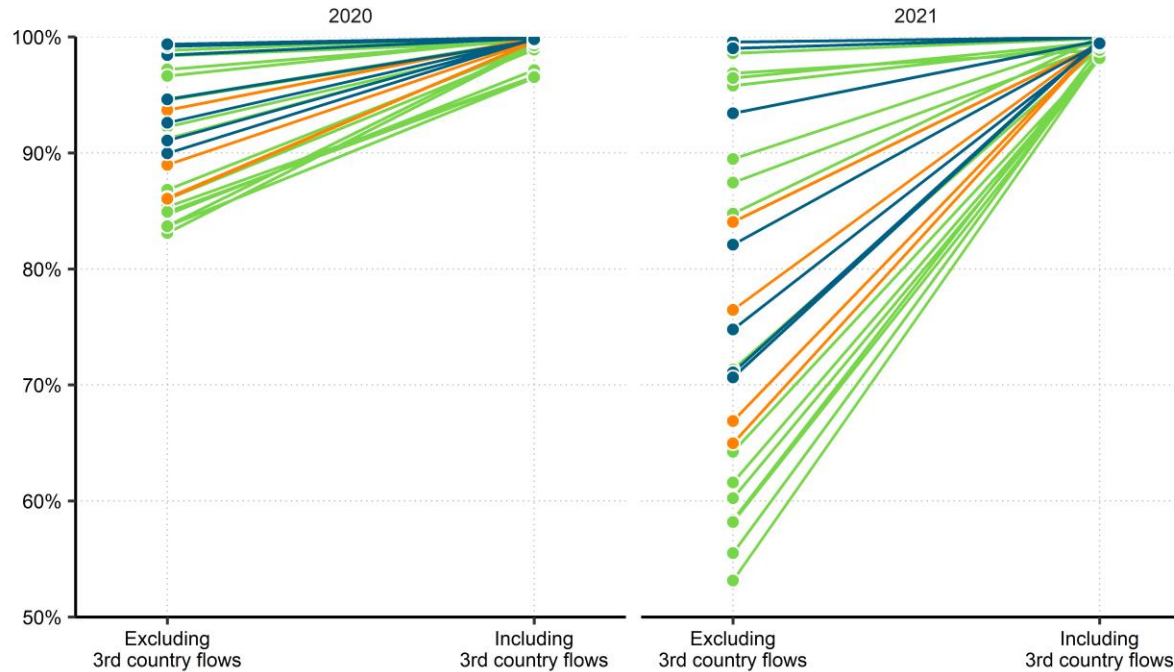


# Detailed results impact of 3<sup>rd</sup> country flows

On the consideration of third country flows, the Brexit (and hence, the labelling of the UK as a “third country” since 1 Jan 2021) has had a significant impact:

## Impact of consideration of third country flows

Compliance with minMACZT per CNE, including and excluding 3rd country flows in MNCC



Source: calculations CREG based on data Elia

## Conclusions on the observed results

In general, the available margins on network elements comply with the legal obligations (i.e. the minMACZT requirement): 99,2% of all CNECs marked as compliant in 2021 (exactly the same as in 2020).

However, more hours are observed where at least one CNEC does not comply with minMACZT: only 62,2% of MTUs marked as compliant in 2021 (81,3% in 2020).

This represents a clear step back, however, the broader context needs to be taken into account. In particular, the situation on the axis Mercator – Doel – Zandvliet is considered here.

Notwithstanding these problems, there do not seem to be structural congestions (aspect of time) nor extremely low values (aspect of intensity).

The CREG urges Elia to:

- further develop and implement, jointly with other Core NRAs, the coordinated procedures for capacity allocation and congestion management (i.e. the CACM provisions);
- identify and implement local measures to increase the available margins;
- share/apply best practices; and
- increase transparency in the market coupling processes

# ID market evolutions

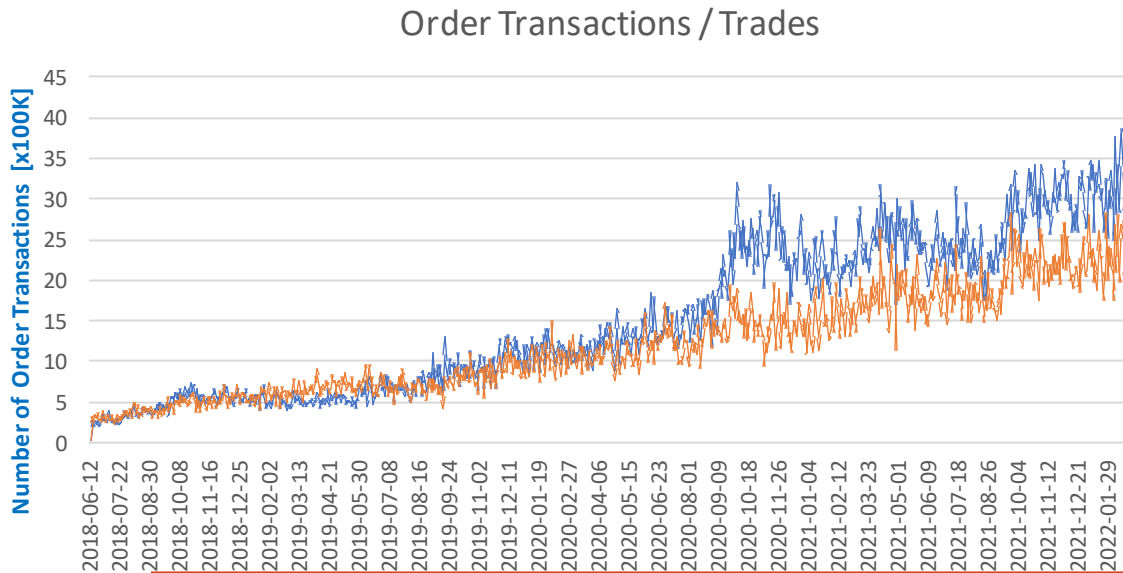
Status, statistics and planning



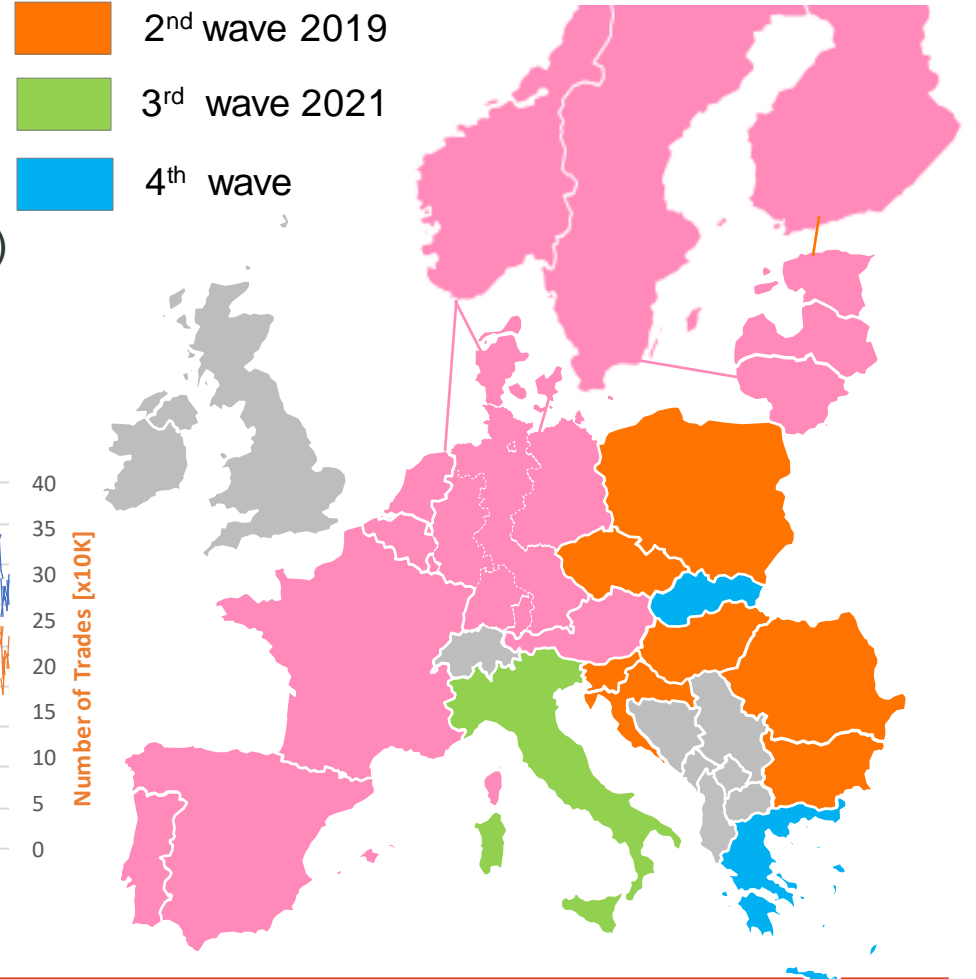
# SIDC – Continuous trading

## Indicators for February 2022:

- 67ms for order execution (average percentile 93%)
- ~ 2.6 millions orders per day (average - 3.3M peak)
- > 206.000 executed trades per day  
→ 8600/hour, ~2.4/s



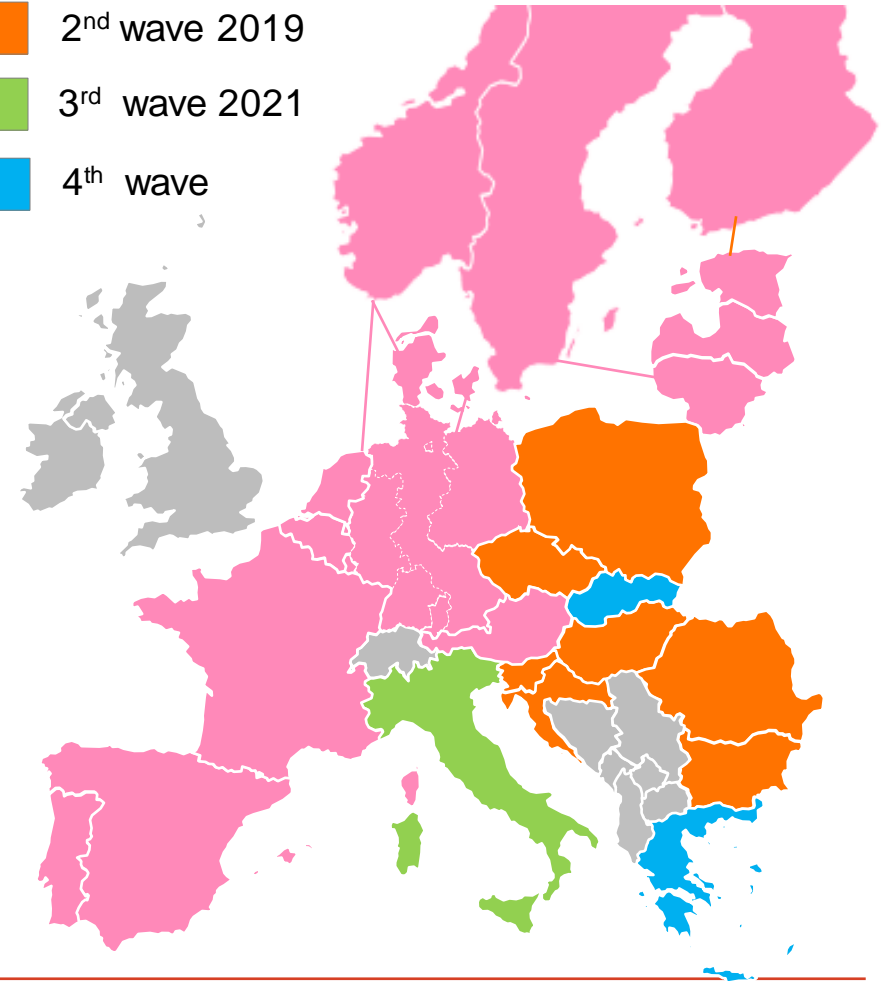
- 1<sup>st</sup> wave 2018
- 2<sup>nd</sup> wave 2019
- 3<sup>rd</sup> wave 2021
- 4<sup>th</sup> wave



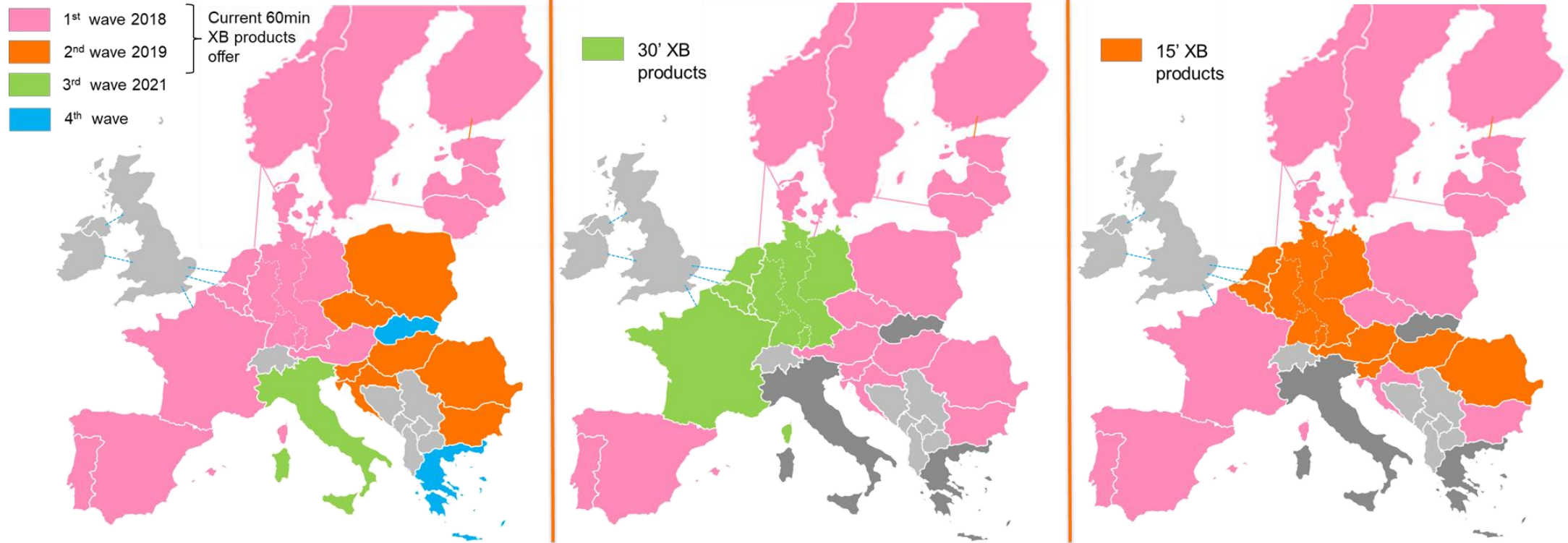
# SIDC – Border extension status

LIP		Participants	Foreseen allocation
	IT-AT, IT-FR, IT-SI <b><u>3rd wave OK</u></b>	<b>NEMOs:</b> BSP, EPEX, Nord Pool, GME <b>TSOs:</b> APG, RTE, TERNA, ELES	Implicit <b><u>Sept 2021</u></b>
	SVK-AT, SVK-CZK, SVK-HU, SVK-PL, GR-IT GR-BG <b><u>4th wave</u></b>	<b>NEMOs:</b> EPEX, Nord Pool, HUPX, OKTE, OTE, TGE, GME, HENEX, IBEX <b>TSOs:</b> SEPS, CEPS, PSE, APG, MAVIR, TERNA, ADMIE, ESO	Implicit <b><u>Estim. Dec 2022</u></b>

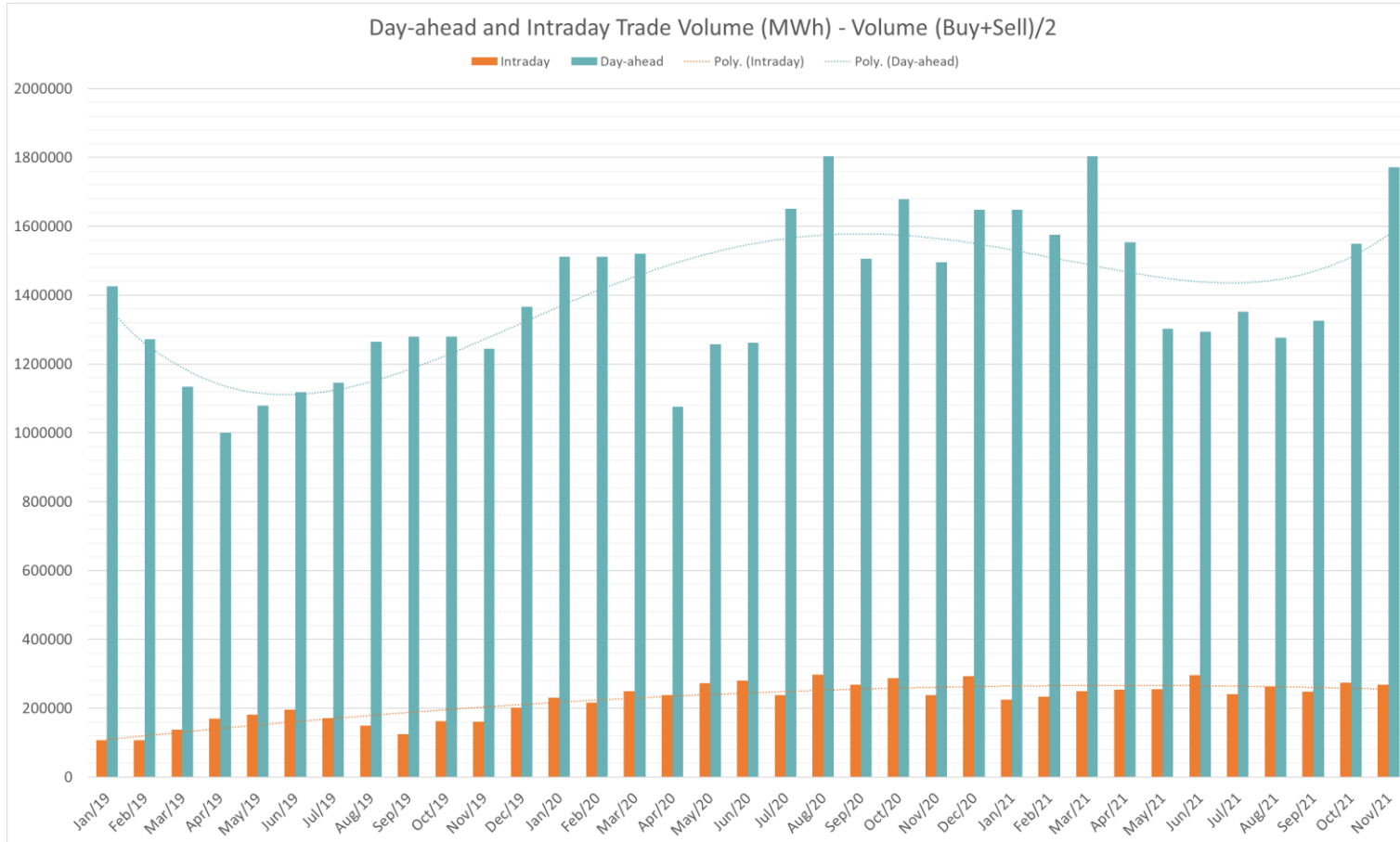
- 1<sup>st</sup> wave 2018
- 2<sup>nd</sup> wave 2019
- 3<sup>rd</sup> wave 2021
- 4<sup>th</sup> wave



# Intraday improvements - Waves and markets – Status March 2022



# Intraday Indicators: Belgium – DA vs ID



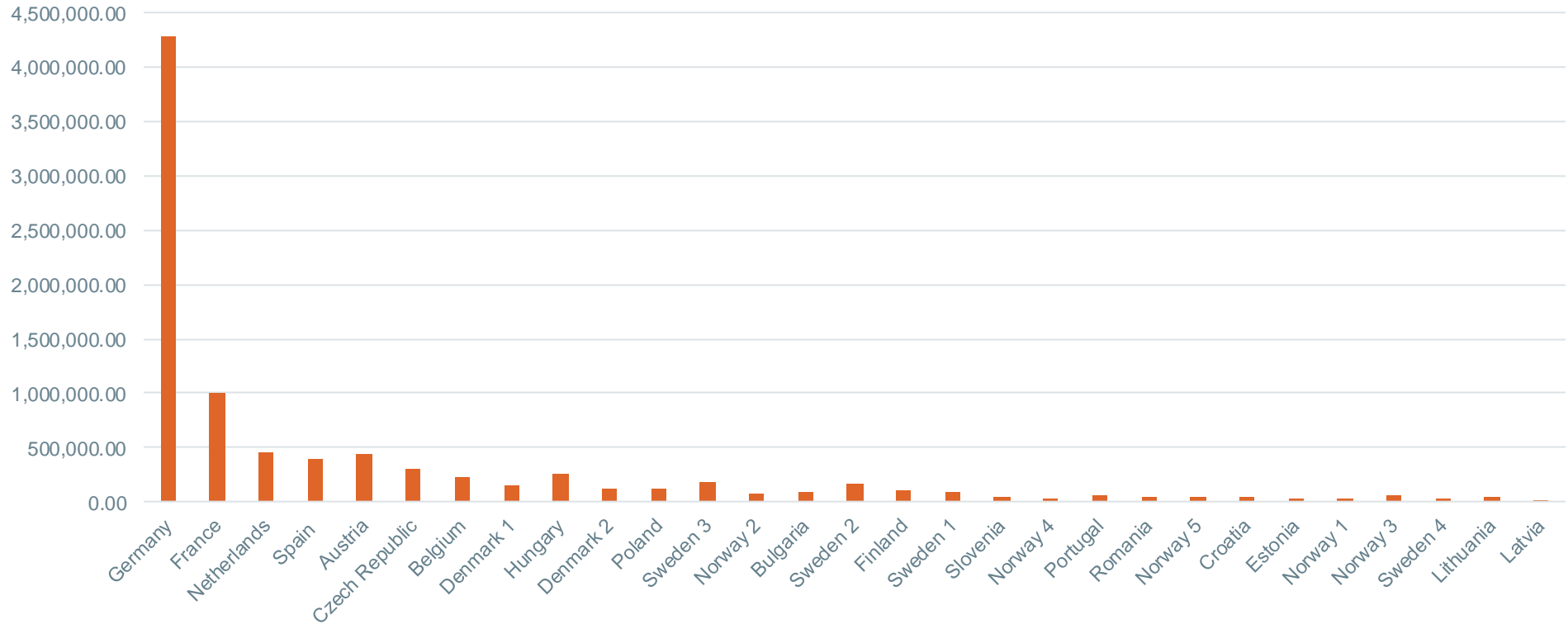
Volume (TWh)	2019	2020	2021
DA	14.61	17.92	17.95
ID	1.87	3.11	3.10

Volume increase 2019 → 2020  
 DA: ~23% - ID: ~66%  
 2020 → 2021: stability DA and ID

2019: ~89% DA - 11% ID  
 2020: ~85% DA - 15% ID  
 2021: ~85% DA - 15% ID

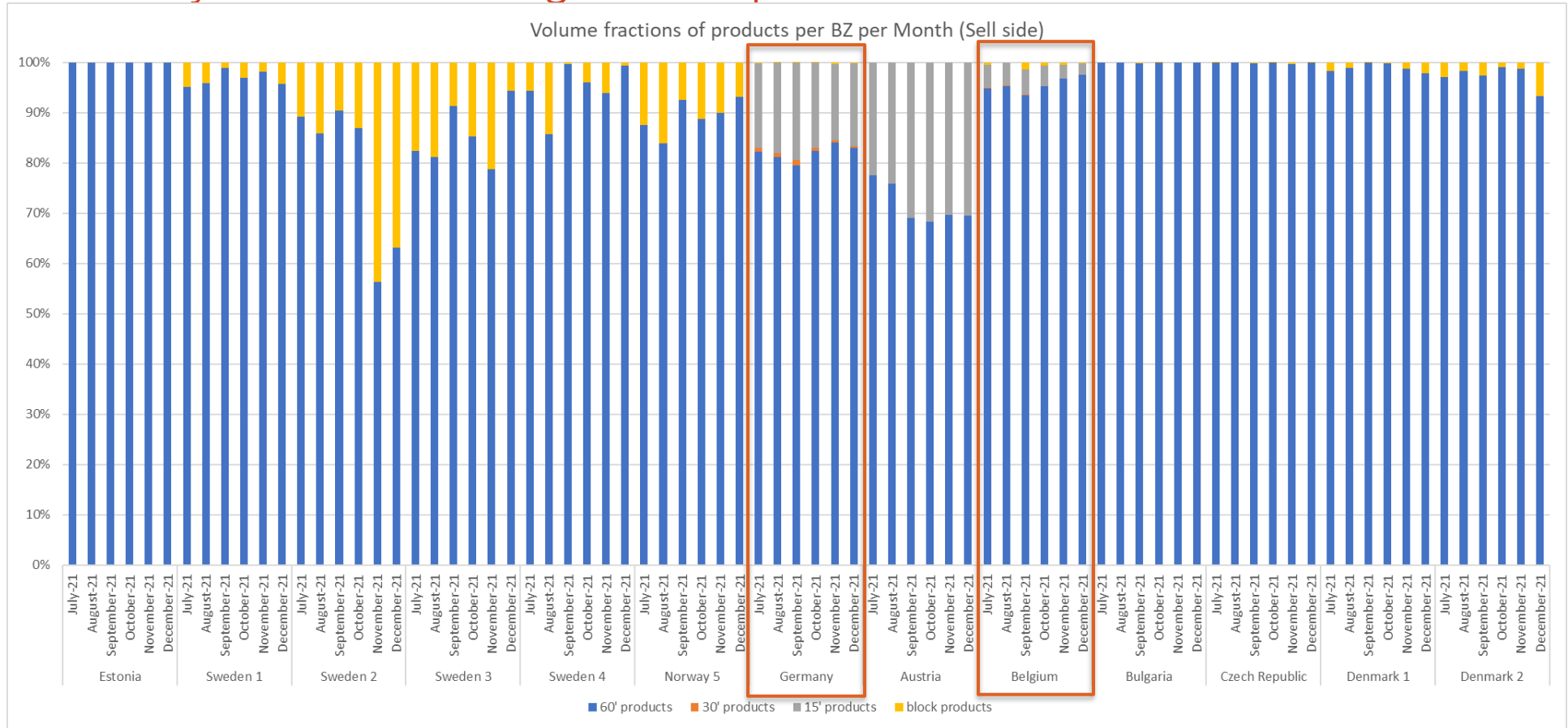
# Intraday Indicators: Belgium - Impact of ALEGrO and 15min MTU

Traded Volume per BZ per Month (Buy+Sell)/2 [MWh] - December-21





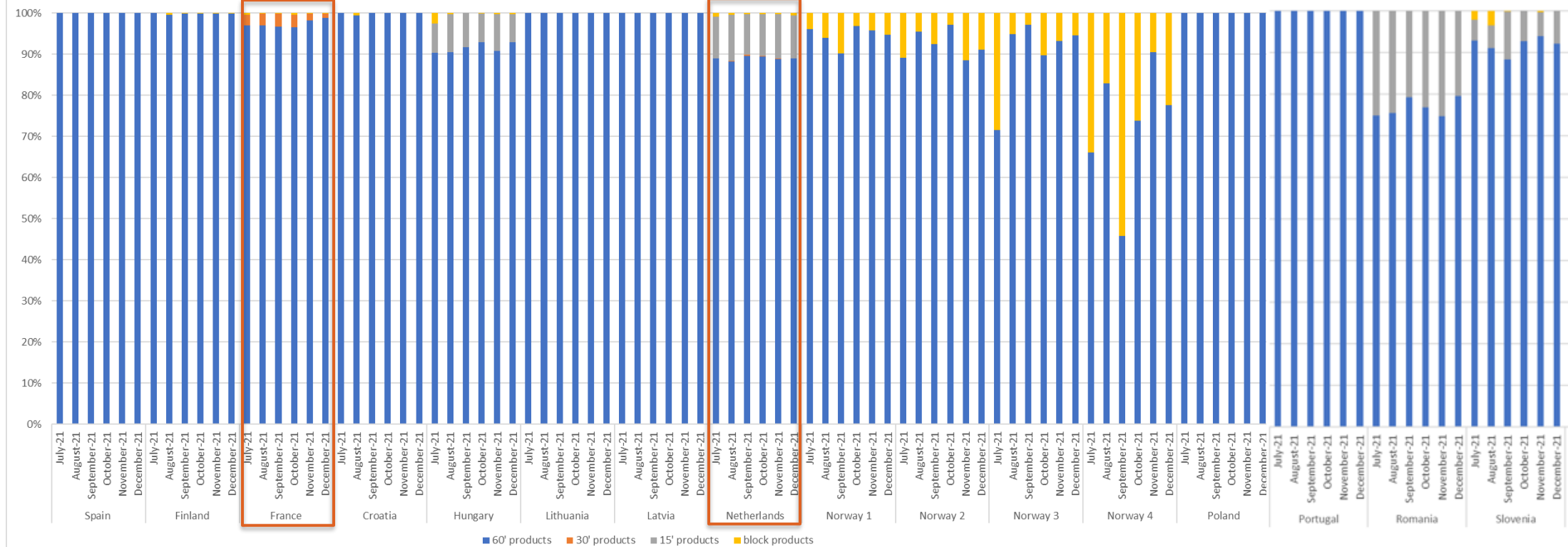
# Intraday Indicators: Belgium - Impact of ALEGrO and 15min MTU



Note: Only trades within XBID → not incl. trades in last hour before realtime for EPEX

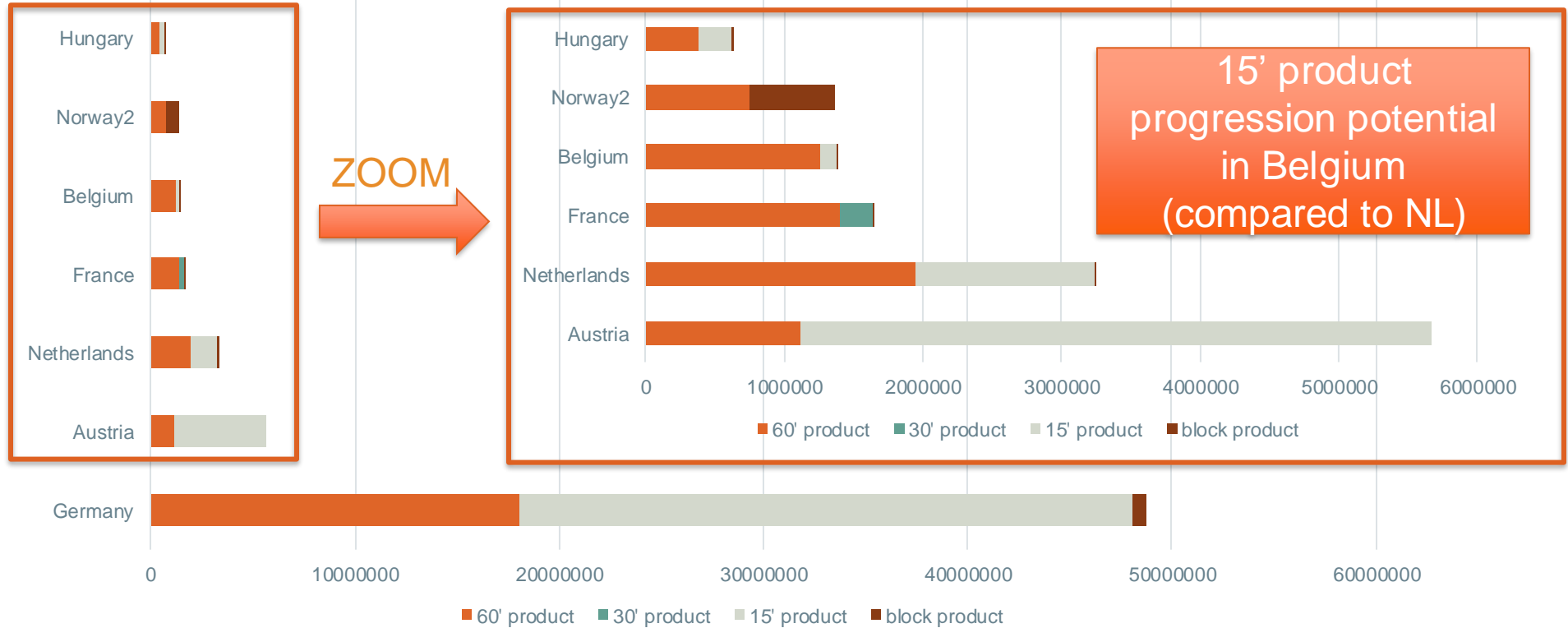
# Intraday Indicators: Belgium - Impact of ALEGrO and 15min MTU

Volume fractions of products per BZ per Month (Sell side)



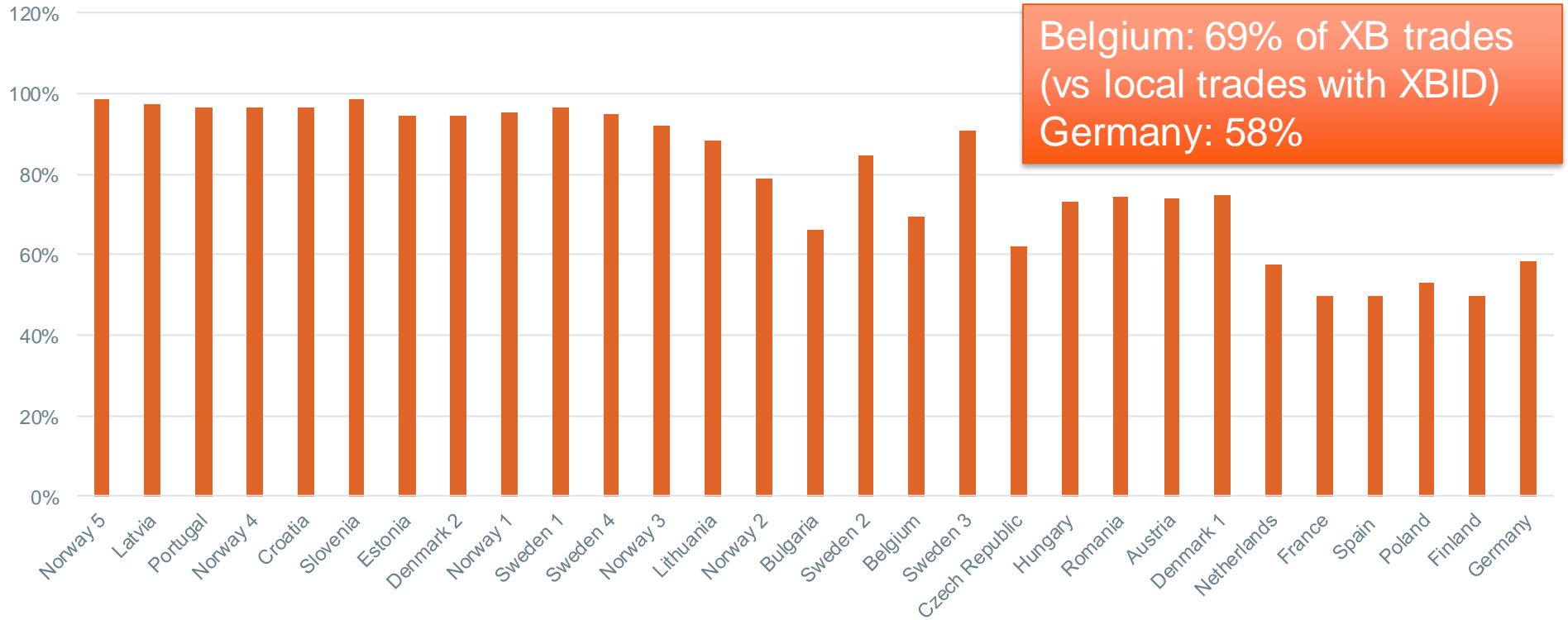
# Intraday Indicators: Belgium - Impact of ALEGrO and 15min MTU

Number of orders per product and per bidding zone (February 2022)



# Intraday Indicators: Belgium - Impact of ALEGrO and 15min MTU

Share of cross-bidding zone trades vs. overall BZ volume - December-21



Note: Only trades within XBID → not incl. local trades in last hour before realtime for EPEX

# 15min MTU: 96 gates on BE-NL and BE-DE

10 December 2020 - XBID:

- BE-NL, BE-DE, NL-DE 15 min
- BE-FR 30 min

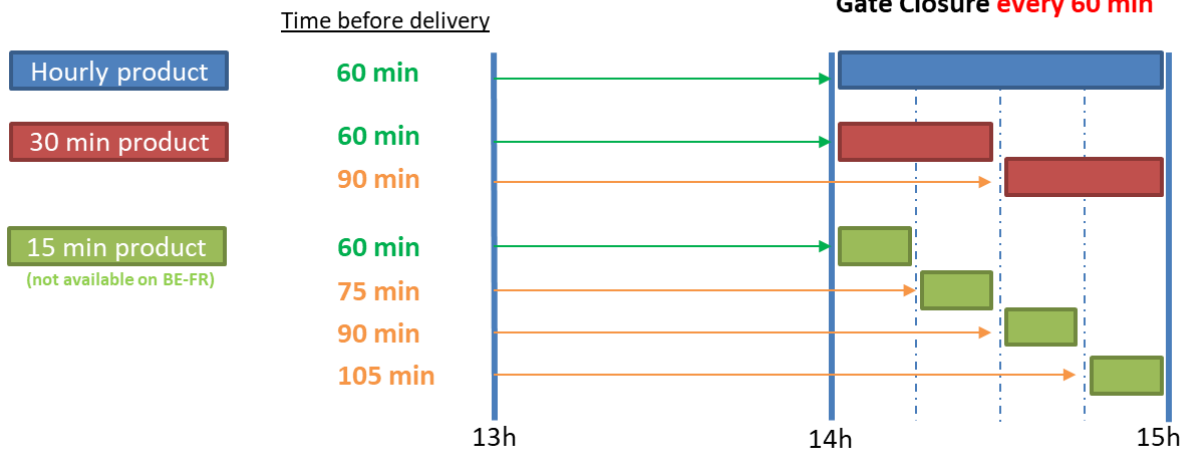
Mid-September 2022

- 96 gates (closer to RT) on BE-NL and BE-DE

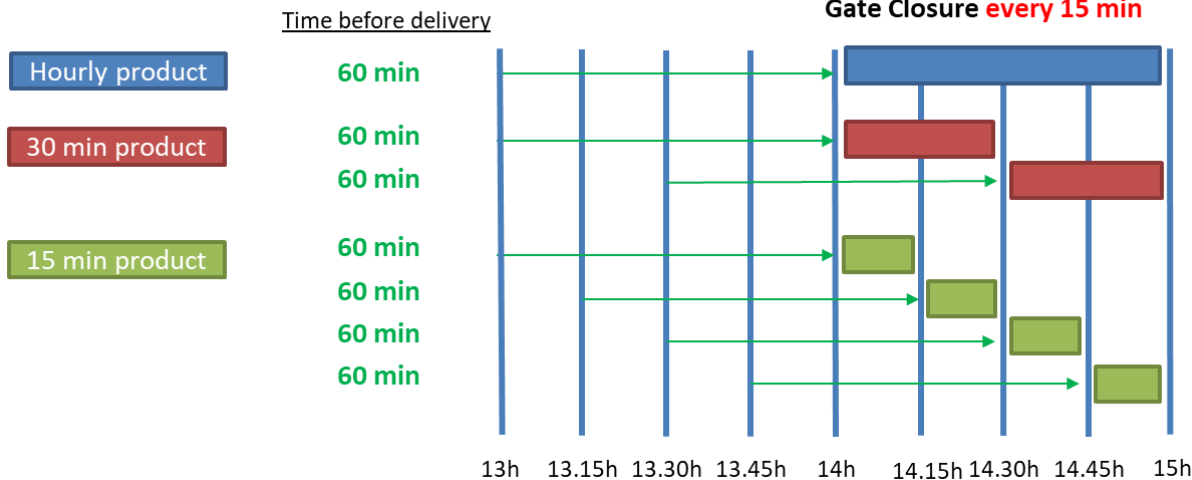
48 gates project on BE-FR cancelled  
(TERRE platform issue for RTE)

→ postponed to 01/2025 with 96 gates and 15min MTU

## BE-FR, BE-NL and DE-BE borders –10/12/2020

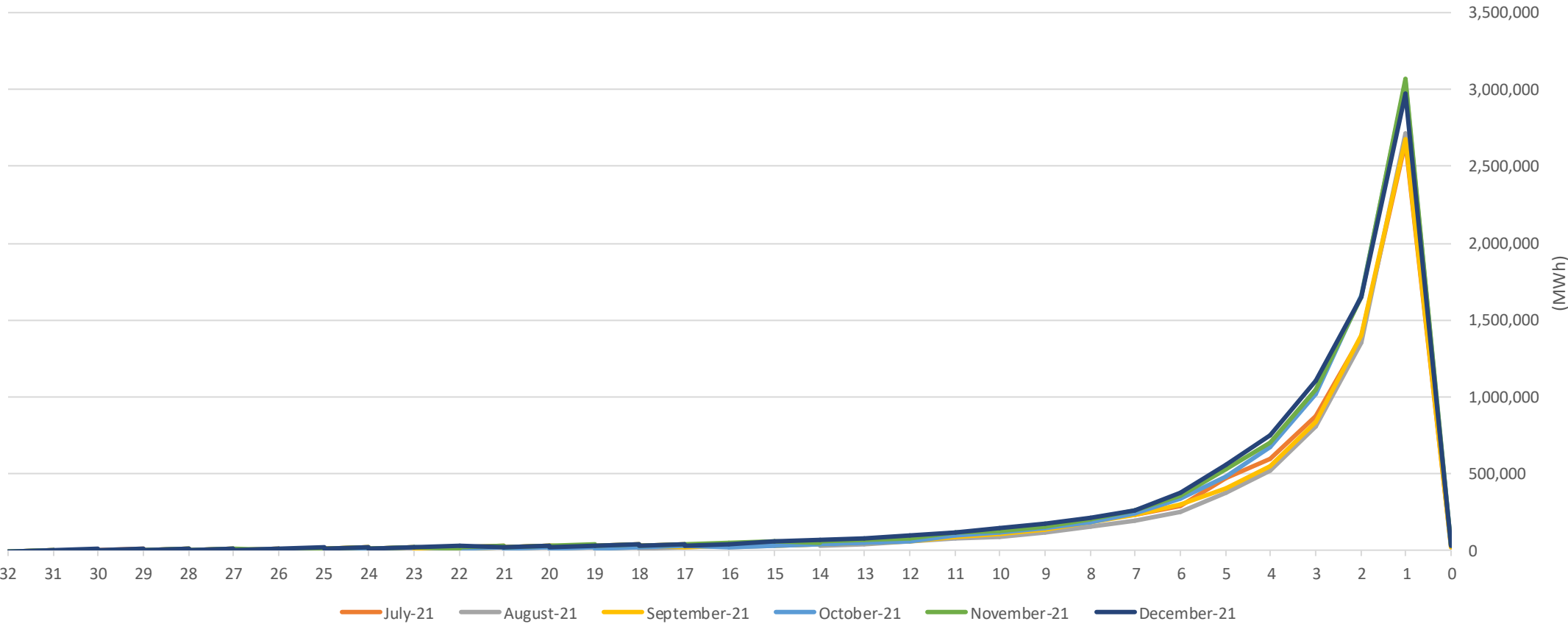


## BE-NL and DE-BE borders – Sept 2022



# 15min MTU: 96 gates → closer to realtime

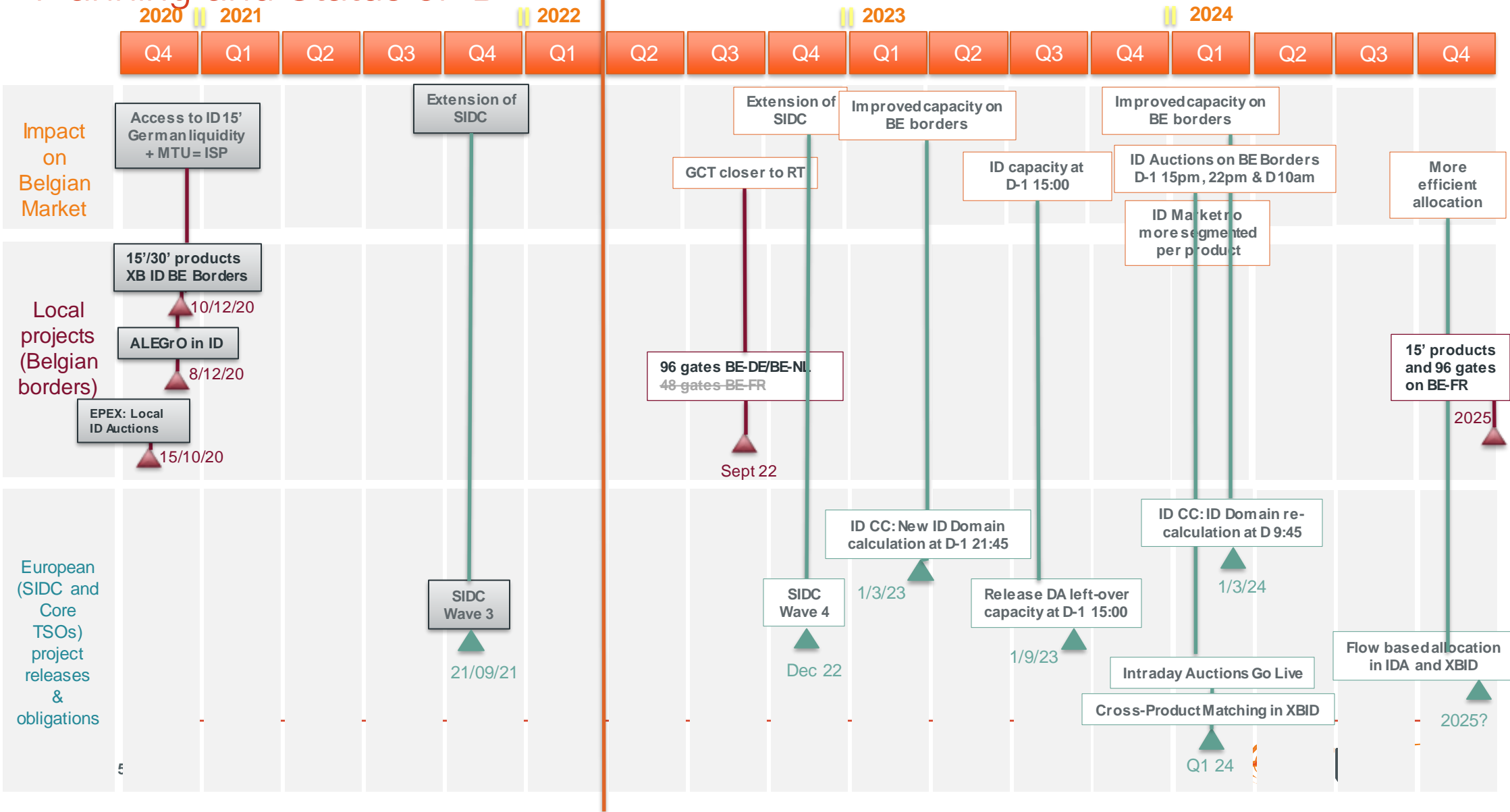
SIDC - Total volume matched within hours before delivery



Note: Only trades within XBID → not incl. local trades in last hour before realtime



# Planning and Status of ID



# Operational report 2021 - See separate presentation



Adobe Acrobat  
Document



# MinRAM results 2021 + 360°



## 1. Key drivers from the minRAM incentive leading to more capacities for the DA market

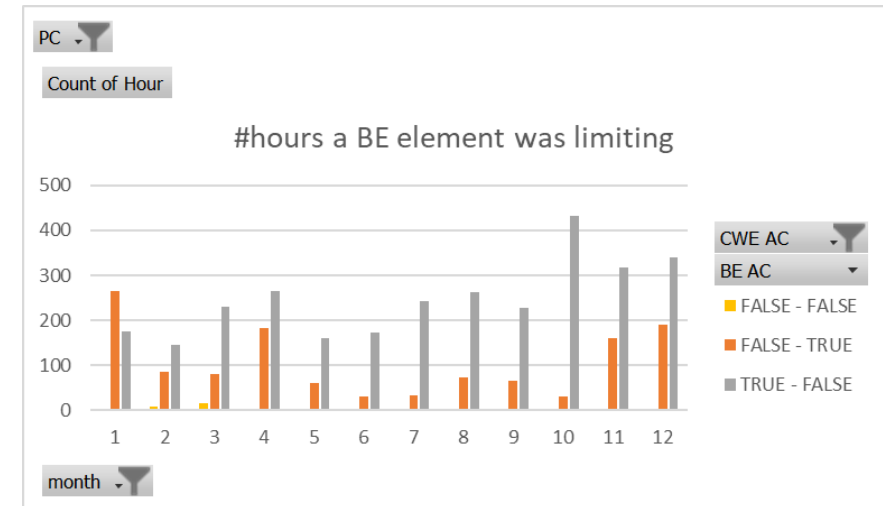
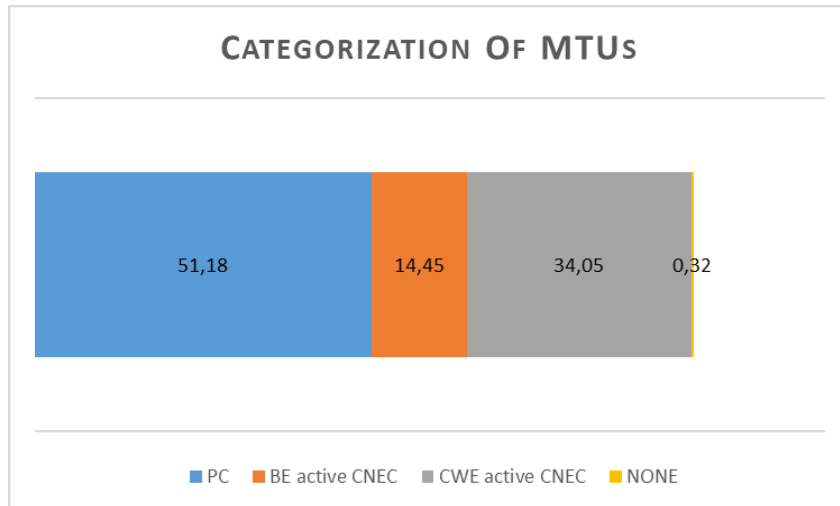
1. Number of MTUs on which a BE CNEC was an active constraint (the lower, the better)
  - This depends on the market needs
  - This depends on the overall CWE capacity given (the higher the RAMs on relevant CWE CNECs, the better)
2. A lot of price convergence at high BE load MTUs
3. A high RAM for BE active constraints especially at high BE load MTUs
  - 70%/60% should be Elia's objective for XB/INT CNECs
4. A high RAM for non-BE active constraints
5. Reduced redispatch costs



BE LOAD condition

## 2a. Results of 2021

#MTUs with a Belgian Active Constraint + Price Convergence Rate



- More than 50% of time Price Convergence was obtained
- A non-Belgian element is twice as likely to be limiting the market than a Belgian element
- In 2021, highest rate of Belgian elements limiting the market was in January, April, November and December; even though outage are more likely to be planned in the inter-season/summer period → Elia well optimizes the outage planning to not impact too much the DA market capabilities

- *Note1: A price difference <1€ between neighboring BZs is considered as considered as Price Convergence between those BZs*

## 2b. Results of 2021

### RAM on Belgian Active Constraints

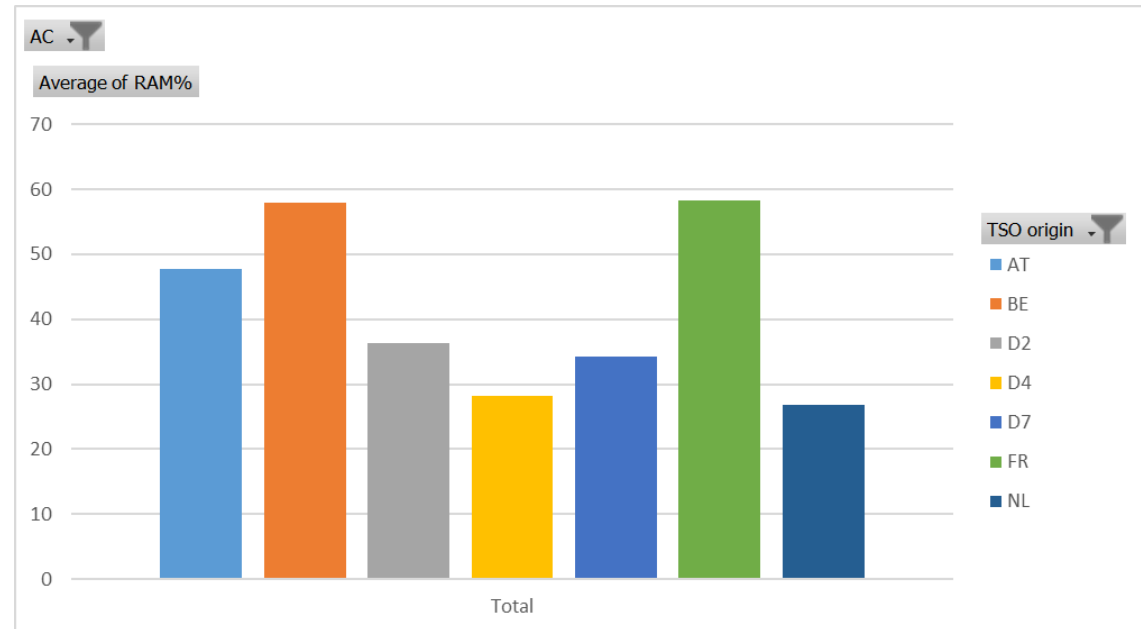
- Belgian Active Constraints are more likely to be seen for a market clearing resulting in **North to South** direction, most constraints are then on:
  - BE-FR cross-border lines (or Gramme-Achêne)
  - PST Zandvliet
- However for those cases an average RAM value close to or bigger than 60% are seen.
- In the rare case where limiting from **South to North**, this mostly happens on Avelin-Avelgem or Gramme-Lixhe
- Here even bigger average RAM values are observed
- Note1: RAM values in South-to-North direction are big due to high North-to-South loopflows*
- Note2: As more than 1 Belgian element can be simultaneously limiting, the total number of Belgian Active Constraints is bigger than the total number of MTUs on which a Belgian element was limiting*

Row Labels	Average of RAM%	Count of AC MTU
[BE-BE] Achene - Gramme 380.10 [OPP]	63,7	170
[BE-BE] Doel - LIEF 380.51 [DIR]	25,0	10
[BE-BE] Doel - Lief 380.52 [DIR]	23,6	33
[BE-BE] Doel - Mercator 380.54 [DIR]	19,9	2
[BE-BE] Doel - Zandvliet 380.25 [OPP]	58,2	47
[BE-BE] Doel - Zandvliet 380.26 [OPP]	61,3	5
[BE-BE] Gramme - Lixhe 380.11 [DIR]	49,3	88
[BE-BE] Gramme - Van Eyck 380.12 [DIR]	48,5	23
[BE-BE] Horta - Mercator 380.74 [OPP]	45,3	2
[BE-BE] LIEF - Mercator 380.51 [DIR]	44,7	48
[BE-BE] LIEF - Mercator 380.52 [DIR]	25,9	5
[BE-BE] PST_VANYK_1 [S - N]	56,6	7
[BE-BE] PST_VANYK_2 [N - S]	75,4	25
[BE-BE] PST_VANYK_2 [S - N]	52,1	2
[BE-BE] PST_ZANDV_1 [N - S]	49,6	329
[BE-BE] PST_ZANDV_1 [S - N]	89,2	7
[BE-BE] PST_ZANDV_2 [N - S]	53,2	187
[BE-BE] PST_ZANDV_2 [S - N]	77,4	21
[BE-FR] Achene - Lonny 380.19 [DIR] [BE]	57,2	115
[BE-FR] Avelgem - Avelin 380.80 [DIR] [BE]	66,5	335
[BE-FR] Avelgem - Avelin 380.80 [OPP] [BE]	66,6	132
[NL-BE] Maasbracht - Van Eyck 380 White/28 [DIR] [BE]	78,6	4
<b>Grand Total</b>	<b>57,4</b>	<b>1597</b>

## 2c. Results of 2021

### Comparison of RAM with non-Belgian Active Constraints

- Belgian Active Constraints have an average RAM ~60%, just like French active constraints
- Austrian Active Constraints reach on average RAM 50%
- German and Dutch Active Constraints reach an average RAM of ~30%



## 2d. Results of 2021

### Conclusions

Elia clearly achieves the objectives for optimizing for the DA market by

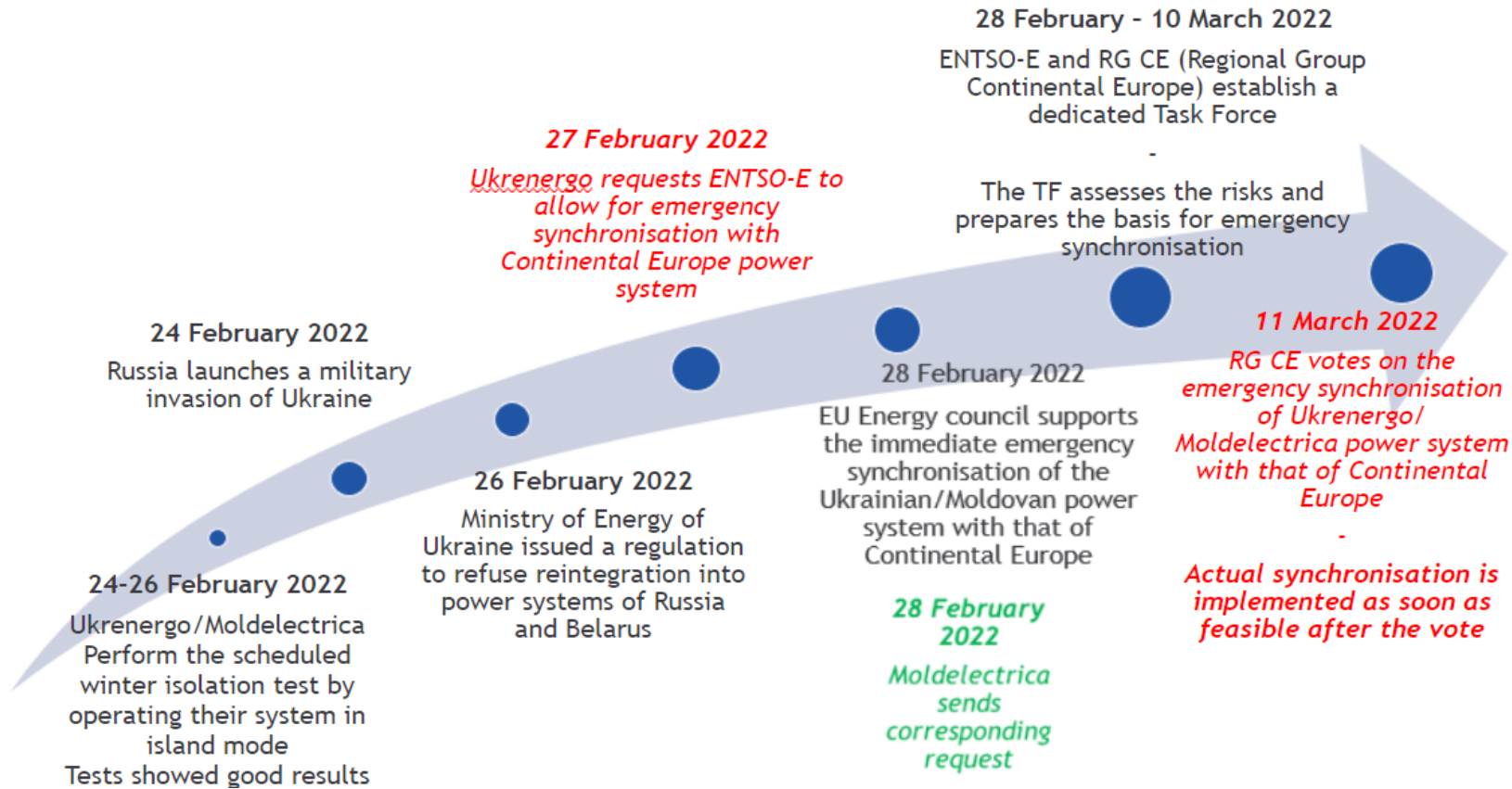
1. **Reducing the MTUs on which a Belgian element is limiting** (<15% of time) AND this even when impacting planned outages are organized (in summer period)
2. Achieving a **high price convergence rate** (>50% of time)
3. When Belgian elements are limiting, this is with a **relative high RAM** (total average ~60%)
4. The **RAM on non-Belgian Active Constraints is between 30 and 60%**

**Elia plays its role to improve each of the KPIs leading to more capacities for the DA market**



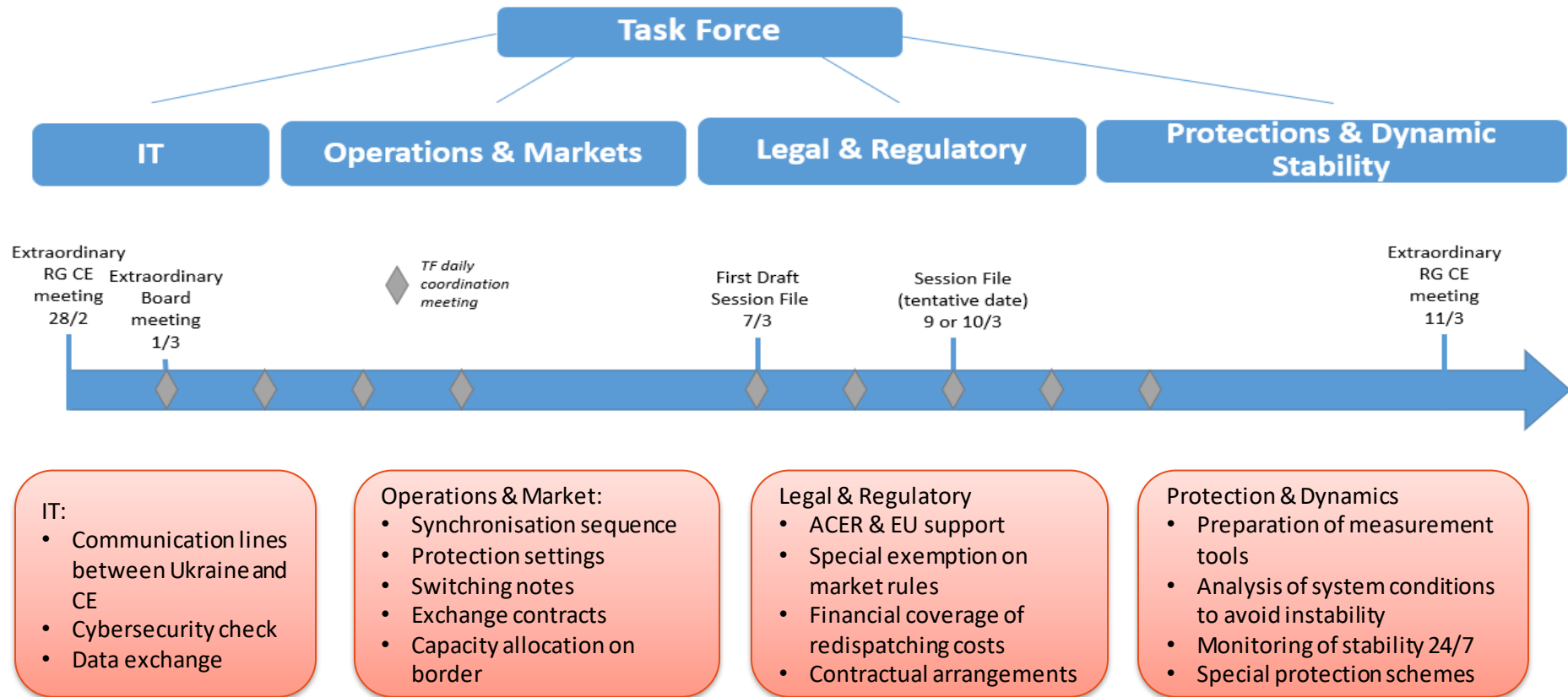
Ukraine synchronization

# Ukraine Synchronisation. Timeline





# Ukraine Synchronisation. Preparation



## Ukraine Synchronisation. 16 March

Early morning : internal preparations at all TSOs

9:20 Start of the coordination call – all TSO connect

9:30 Start of the synchronization sequence – preparation

10:00 – 11:00 Preparatory switching at PSE, Mavir, SEPS, Transelectrica, Moldelectrica and Ukrenergo

11:00 System stability check before synchronisation

**11:13:44** Synchronisation of the 750 kV line between Hungary and Ukraine

11:15 Ukrenergo changes frequency control to ACE control mode

11:15 – 11:25 Further closing of 6 lines between CE and Ukraine on 400 and 220 kV level

11:30 System stability check after synchronisation

14:30 Finalisation of the synchronization sequence. Confirmation that the system is stable and connected