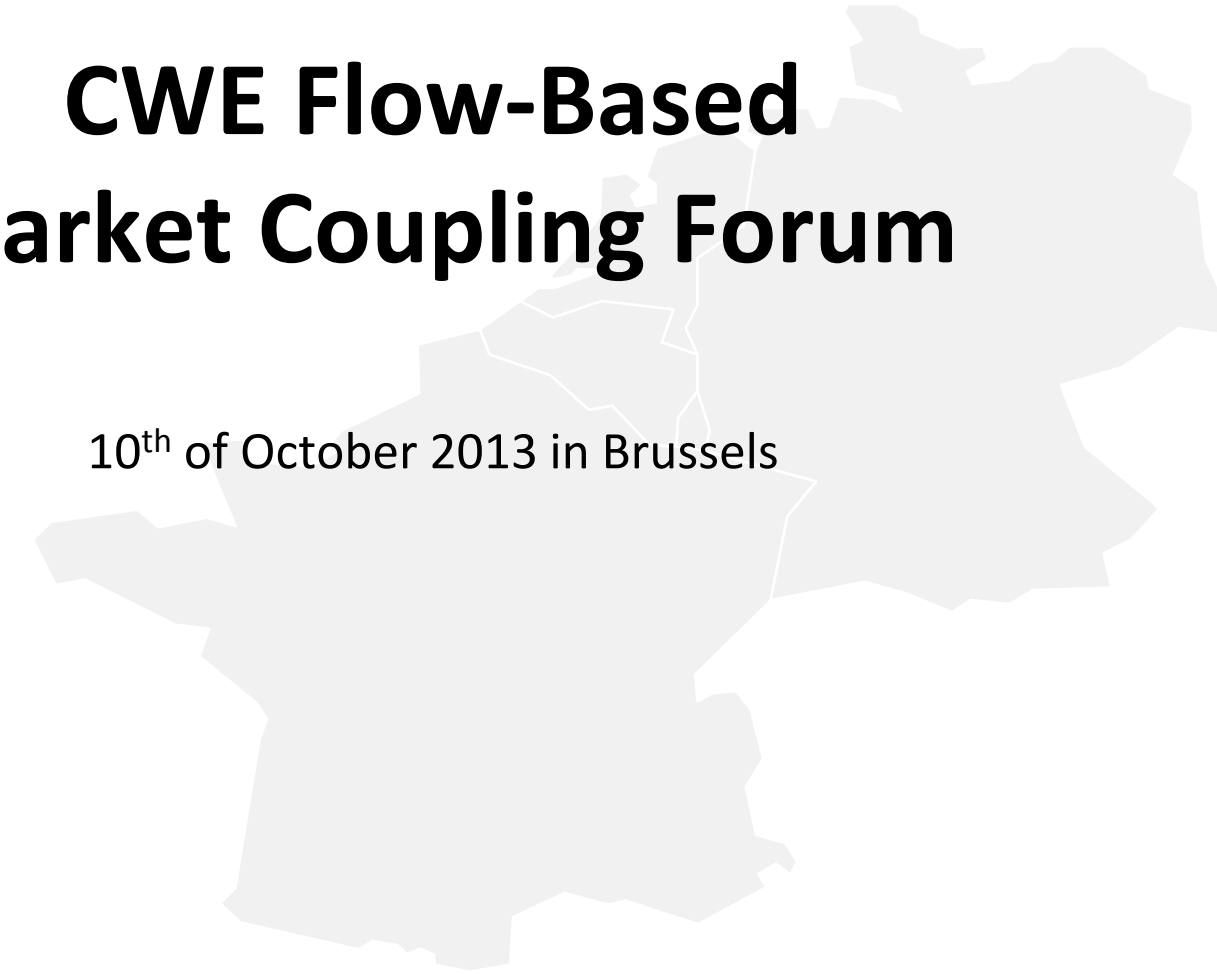
CWE Flow-Based Market Coupling Forum

10th of October 2013 in Brussels



Agenda

Morning session

Timing	Topic	Speaker
09.30	*REGISTRATION AND COFFEE*	
10.00 – 11.00	Introduction CWE FB project partners: Consultation outcome and project status	Jean VERSEILLE (RTE) Andrew CLAXTON (APX) Wim MICHIELS (ELIA)
11.00 – 11.30	Market concerns and go-live requirements from market view	Jérôme LE PAGE (EFET)
11.30 – 12.30	NWE DA Price coupling project status and go-live preparation	Tjitske KRAMER (APX)
12.30 – 13.30	*LUNCH*	

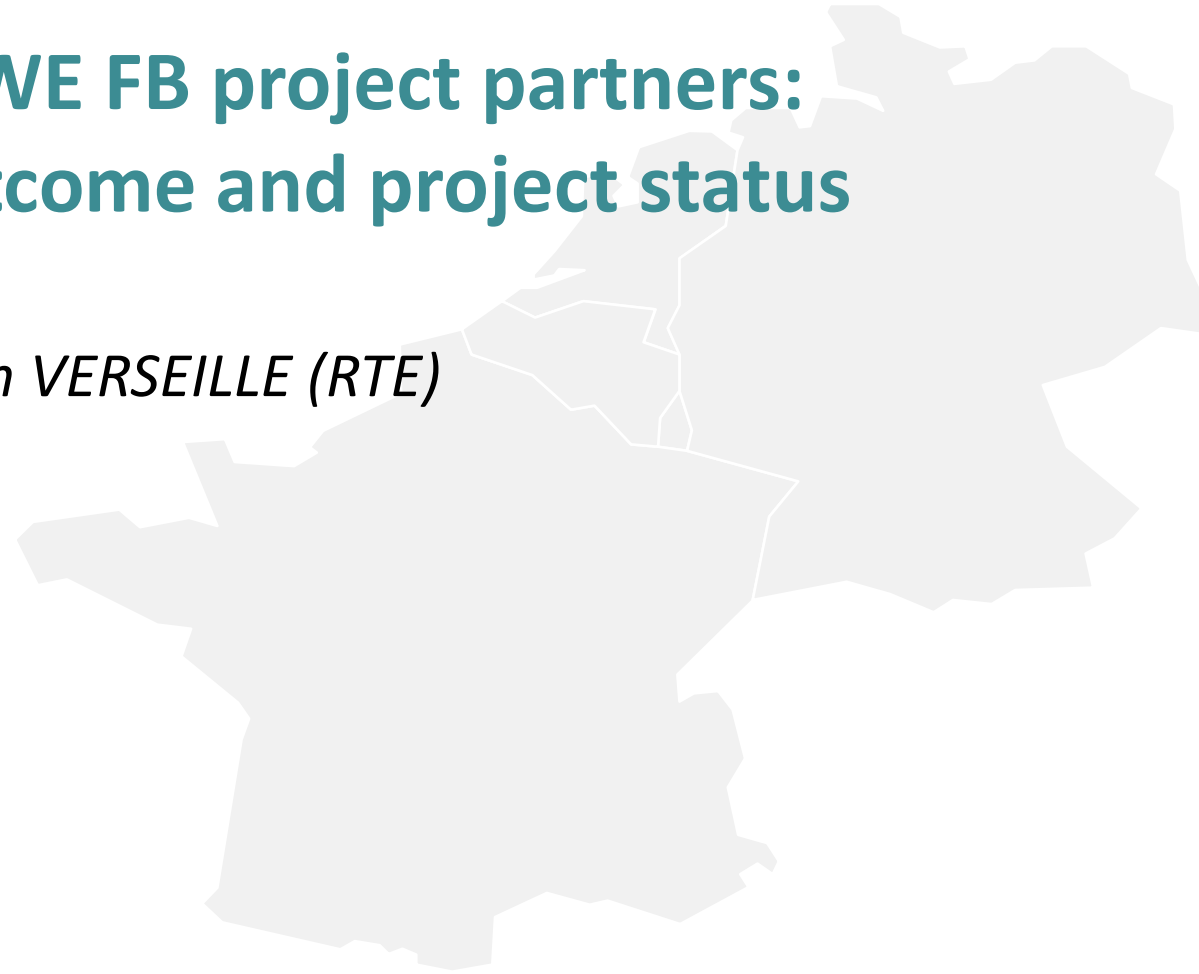
Agenda

Afternoon session

Timing	Group 1	Group 2
13.30 – 15.15	**Workshop Session 1**: Challenges linked to the FB capacity calculation method ▪ FB terminology and TSO operational process ▪ Transparency challenges ▪ Cases when ATC exceeds the FB domain	**Workshop Session 2**: Impact on market and interpretation of simulation results ▪ Allocation principles and non-intuitive cases ▪ Impact on Intraday capacities ▪ Shadow auctions fallback and rollback principles
15.15 – 15.30	*COFFEE BREAK*	
15.30 – 17.15	**Workshop Session 2**: Impact on market and interpretation of simulation results ▪ Allocation principles and non-intuitive cases ▪ Impact on Intraday capacities ▪ Shadow auctions fallback and rollback principles	**Workshop Session 1**: Challenges linked to the FB capacity calculation method ▪ FB terminology and TSO operational process ▪ Transparency challenges ▪ Cases when ATC exceeds the FB domain
17.15	*COCKTAIL*	

Introduction CWE FB project partners: Consultation outcome and project status

by Jean VERSEILLE (RTE)



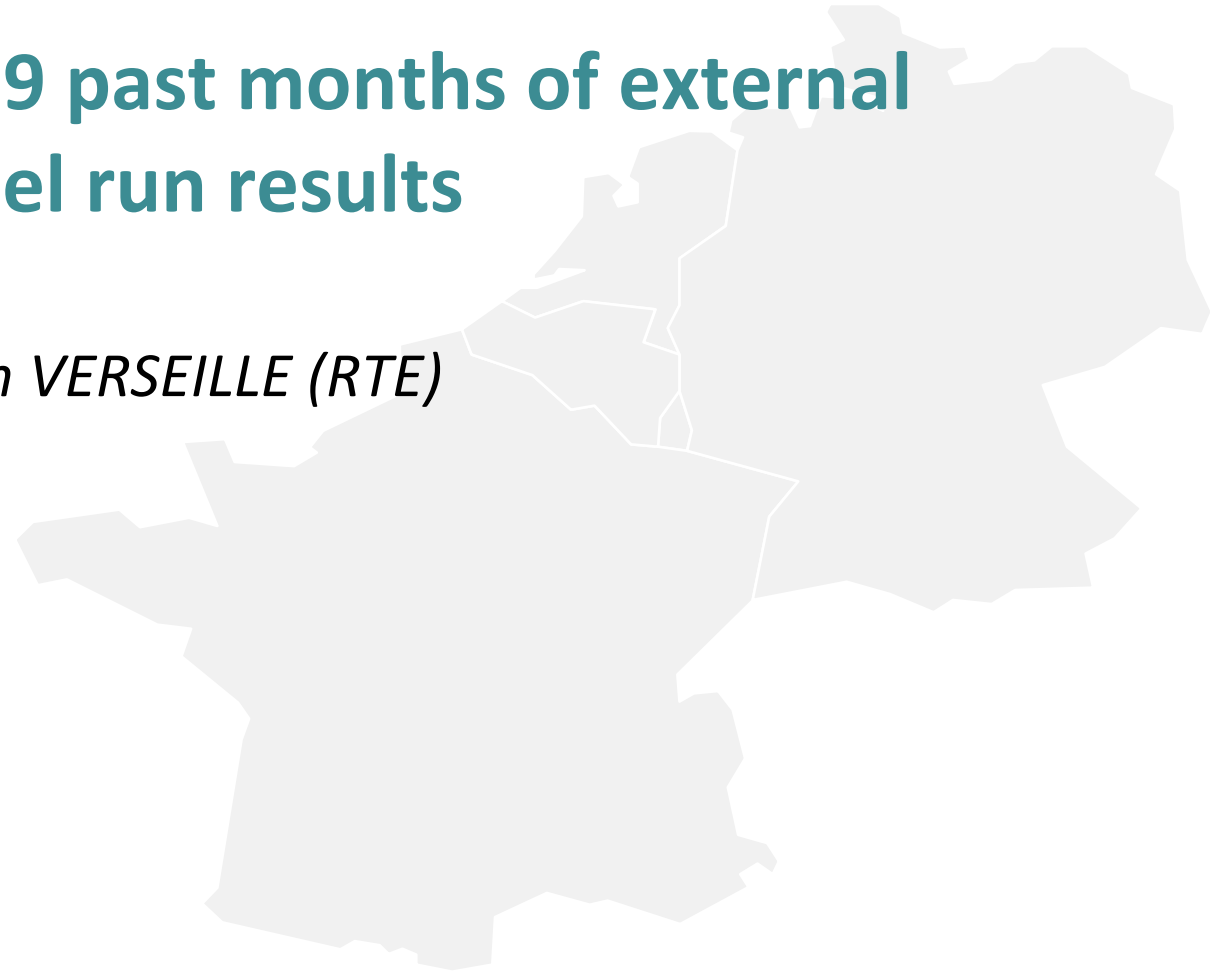
Introduction

Current Status of CWE FB MC Project

- The Project can look back today on **9 months of external parallel run** which encompasses Flow Based simulation results for various situations and scenarios
- After the public consultation and NRA approval package, constructive exchanges with Regulators and Market Participants on the Flow Based Market Coupling solution are ongoing
- In the name of all project partners, the Chairmen would like to welcome all stakeholders to today's Market Forum which will give the opportunity to continue the engaged dialogue by sharing the project's positions and explanation on the outcome of the market consultation

General review of 9 past months of external parallel run results

by Jean VERSEILLE (RTE)



External parallel run overview (1/2)

- The first months of the external parallel run indicated a **need for further stabilization of the operational process** in order to provide representative simulation results
- Non-representative days, which were consequently missing in the publication, were subject to project partners' investigation and reasons are published on CASC's website: http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Parallel-Run-Results

wk	Wed	Thu	Fri	Sat	Sun	Mon	Tue
0							01 Jan
1	02 Jan	03 Jan	04 Jan	05 Jan	06 Jan	07 Jan	08 Jan
2	09 Jan	10 Jan	11 Jan	12 Jan	13 Jan	14 Jan	15 Jan
3	16 Jan	17 Jan	18 Jan	19 Jan	20 Jan	21 Jan	22 Jan
4	23 Jan	24 Jan	25 Jan	26 Jan	27 Jan	28 Jan	29 Jan
5	30 Jan	31 Jan	01 Feb	02 Feb	03 Feb	04 Feb	05 Feb
6	06 Feb	07 Feb	08 Feb	09 Feb	10 Feb	11 Feb	12 Feb
7	13 Feb	14 Feb	15 Feb	16 Feb	17 Feb	18 Feb	19 Feb
8	20 Feb	21 Feb	22 Feb	23 Feb	24 Feb	25 Feb	26 Feb
9	27 Feb	28 Feb	01 Mar	02 Mar	03 Mar	04 Mar	05 Mar
10	06 Mar	07 Mar	08 Mar	09 Mar	10 Mar	11 Mar	12 Mar
11	13 Mar	14 Mar	15 Mar	16 Mar	17 Mar	18 Mar	19 Mar
12	20 Mar	21 Mar	22 Mar	23 Mar	24 Mar	25 Mar	26 Mar
13	27 Mar	28 Mar	29 Mar	30 Mar	31 Mar	01 Apr	02 Apr
14	03 Apr	04 Apr	05 Apr	06 Apr	07 Apr	08 Apr	09 Apr
15	10 Apr	11 Apr	12 Apr	13 Apr	14 Apr	15 Apr	16 Apr
16	17 Apr	18 Apr	19 Apr	20 Apr	21 Apr	22 Apr	23 Apr
17	24 Apr	25 Apr	26 Apr	27 Apr	28 Apr	29 Apr	30 Apr
18	01 May	02 May	03 May	04 May	05 May	06 May	07 May
19	08 May	09 May	10 May	11 May	12 May	13 May	14 May

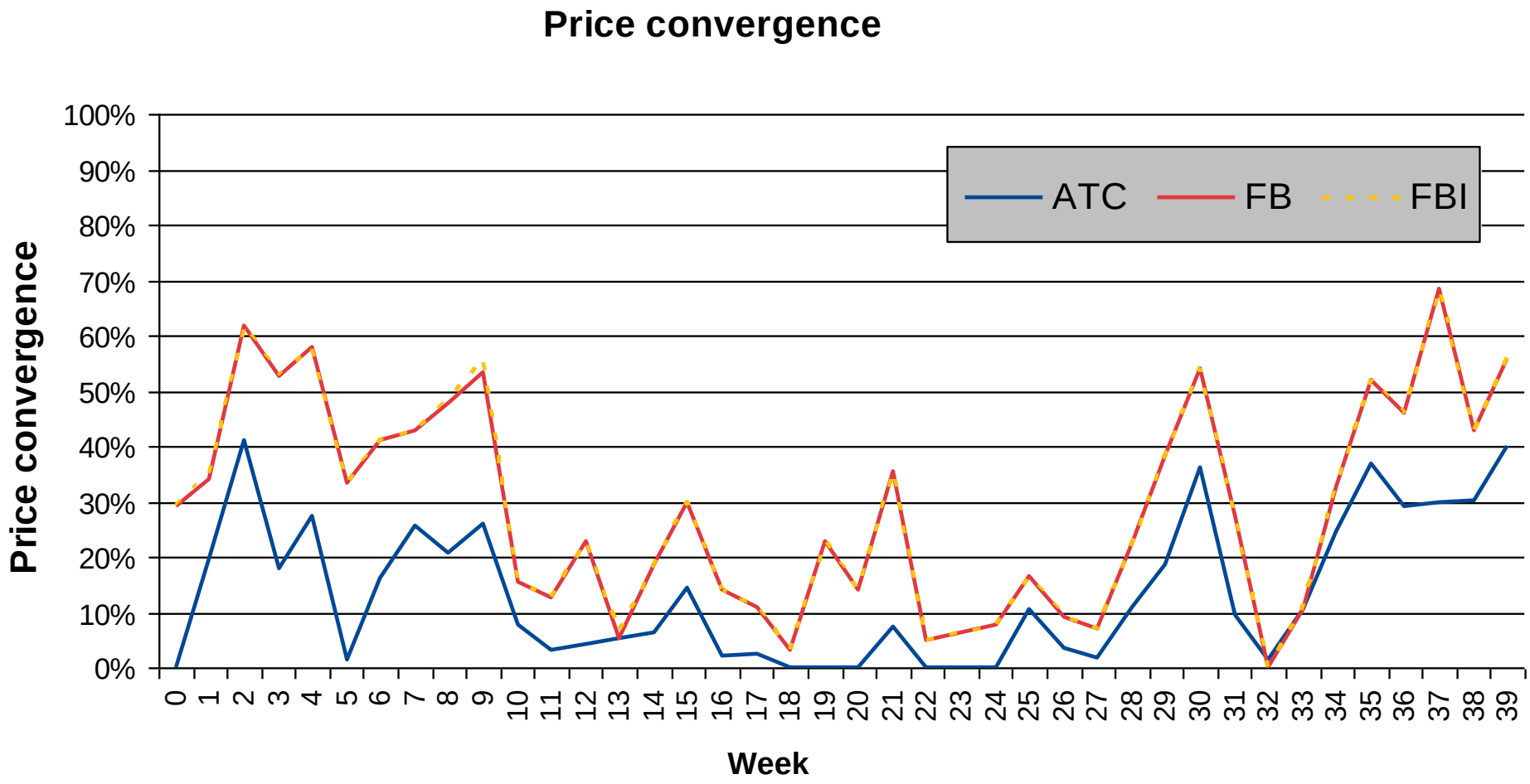
External parallel run overview (2/2)

- However, since the beginning of June, the number of representative days has increased **thanks to a an increased learning curve on operators' side** and more robust prototype tools

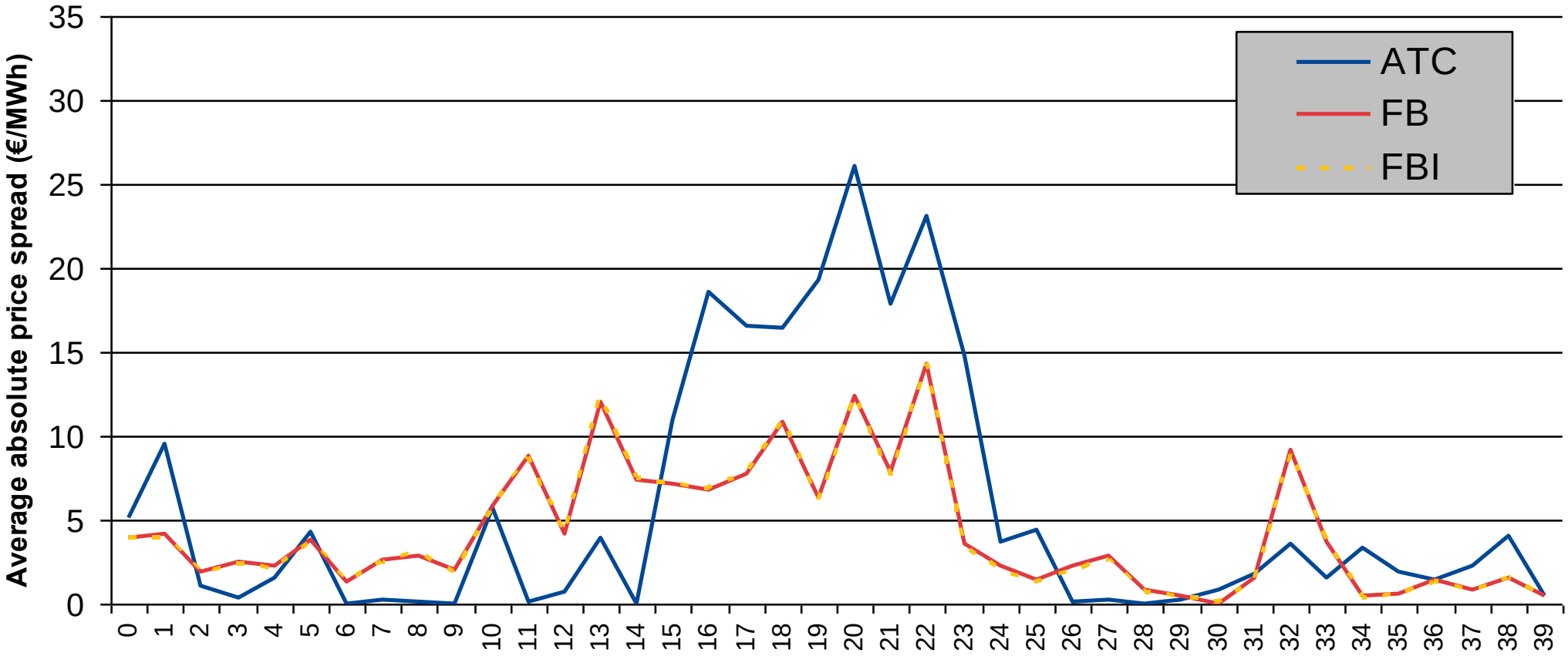
wk	Wed	Thu	Fri	Sat	Sun	Mon	Tue
20	15 May	16 May	17 May	18 May	19 May	20 May	21 May
21	22 May	23 May	24 May	25 May	26 May	27 May	28 May
22	29 May	30 May	31 May	01 Jun	02 Jun	03 Jun	04 Jun
23	05 Jun	06 Jun	07 Jun	08 Jun	09 Jun	10 Jun	11 Jun
24	12 Jun	13 Jun	14 Jun	15 Jun	16 Jun	17 Jun	18 Jun
25	19 Jun	20 Jun	21 Jun	22 Jun	23 Jun	24 Jun	25 Jun
26	26 Jun	27 Jun	28 Jun	29 Jun	30 Jun	01 Jul	02 Jul
27	03 Jul	04 Jul	05 Jul	06 Jul	07 Jul	08 Jul	09 Jul
28	10 Jul	11 Jul	12 Jul	13 Jul	14 Jul	15 Jul	16 Jul
29	17 Jul	18 Jul	19 Jul	20 Jul	21 Jul	22 Jul	23 Jul
30	24 Jul	25 Jul	26 Jul	27 Jul	28 Jul	29 Jul	30 Jul
31	31 Jul	01 Aug	02 Aug	03 Aug	04 Aug	05 Aug	06 Aug
32	07 Aug	08 Aug	09 Aug	10 Aug	11 Aug	12 Aug	13 Aug
33	14 Aug	15 Aug	16 Aug	17 Aug	18 Aug	19 Aug	20 Aug
34	21 Aug	22 Aug	23 Aug	24 Aug	25 Aug	26 Aug	27 Aug
35	28 Aug	29 Aug	30 Aug	31 Aug	01 Sep	02 Sep	03 Sep
36	04 Sep	05 Sep	06 Sep	07 Sep	08 Sep	09 Sep	10 Sep
37	11 Sep	12 Sep	13 Sep	14 Sep	15 Sep	16 Sep	17 Sep
38	18 Sep	19 Sep	20 Sep	21 Sep	22 Sep	23 Sep	24 Sep
39	25 Sep	26 Sep	27 Sep	28 Sep	29 Sep	30 Sep	01 Oct

Price convergence since the beginning of 2013

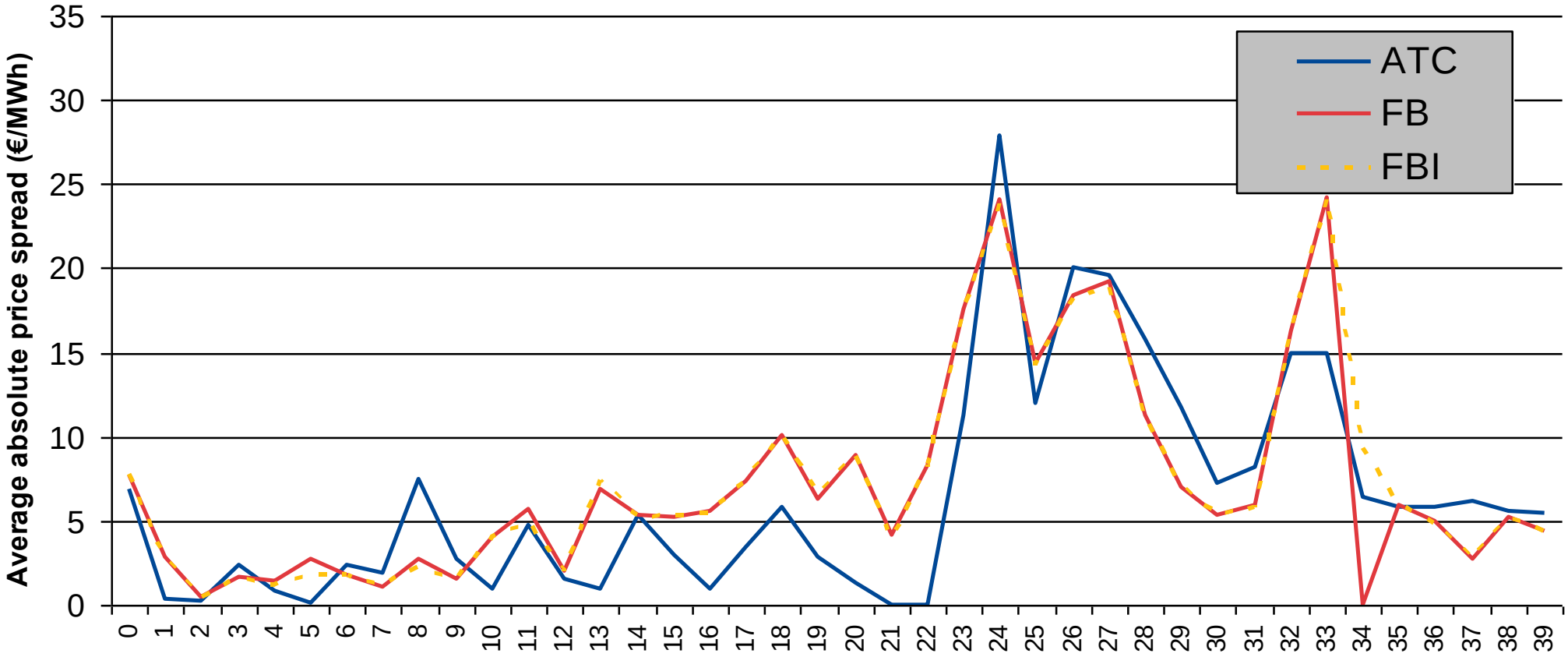
- This overview on the percentage of time with a single CWE price shows an **almost continuous higher price convergence under FB** than under ATC



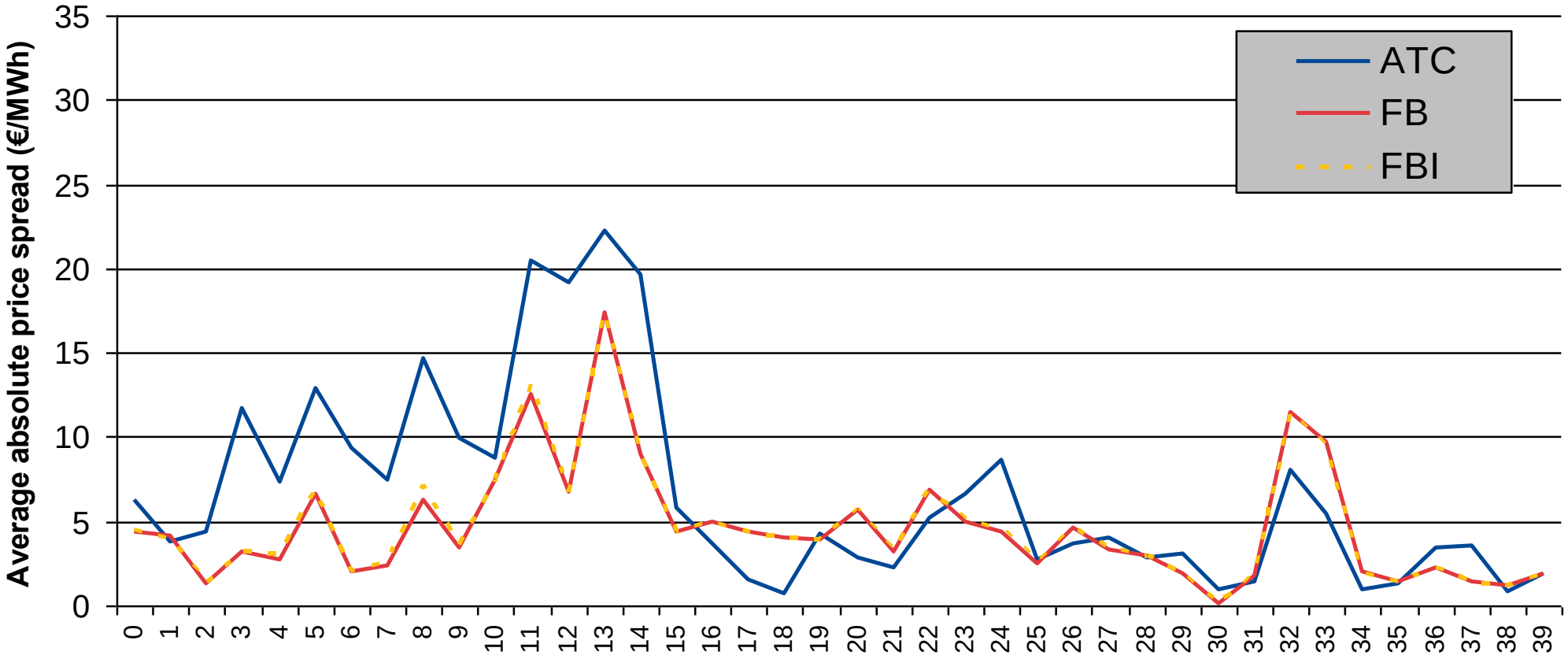
Cross border spreads BE-FR



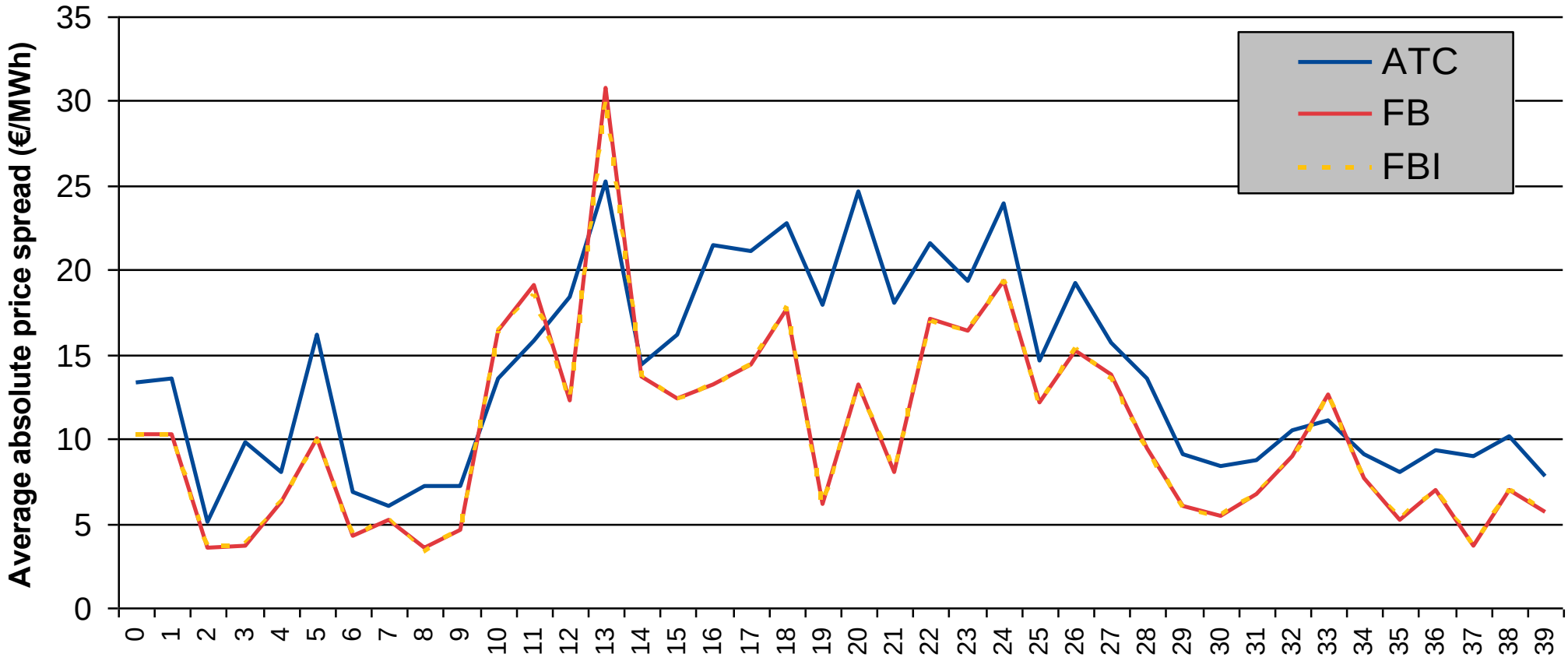
Cross border spreads BE-NL



Cross border spreads DE-FR

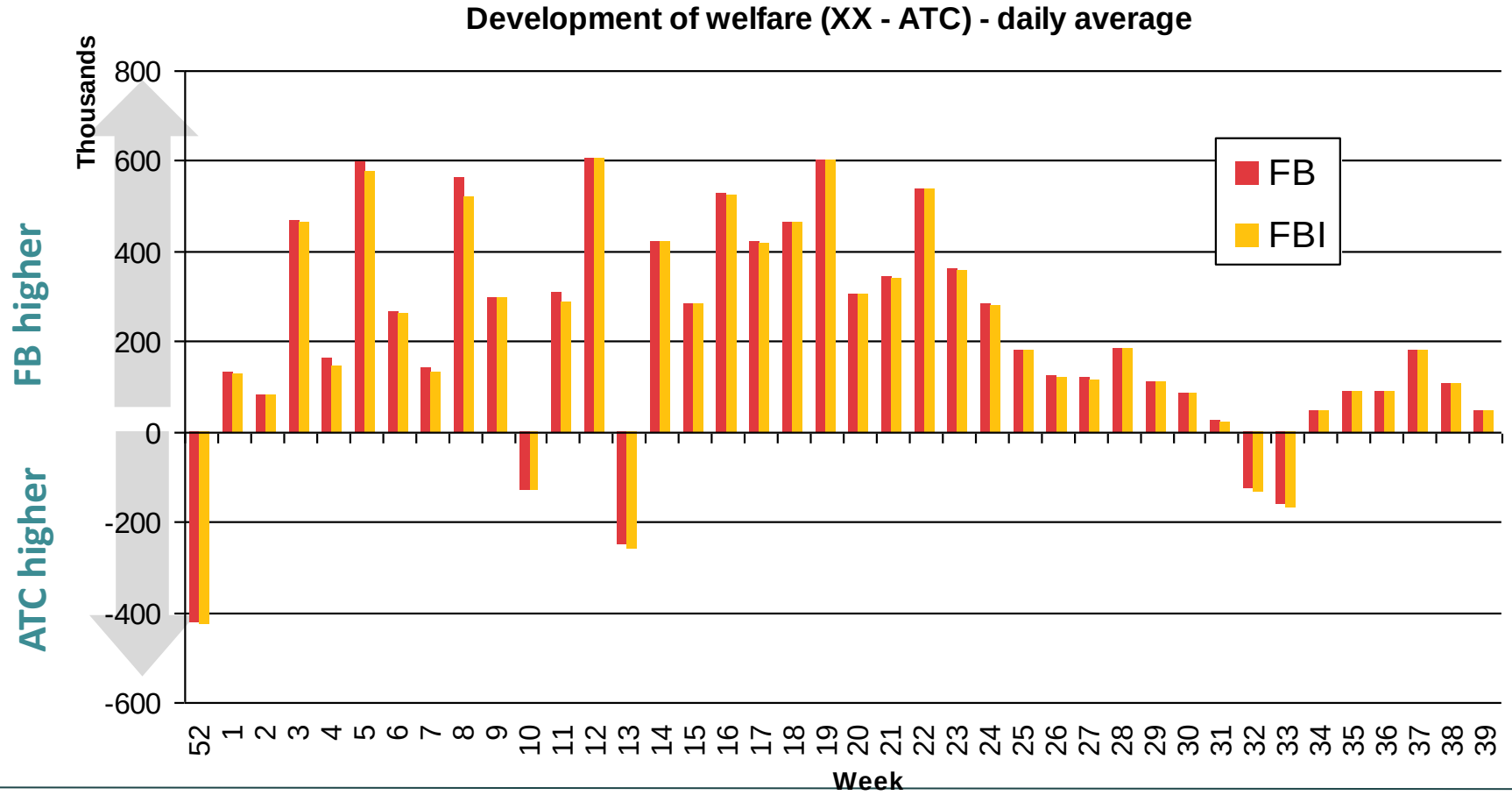


Cross border spreads DE-NL

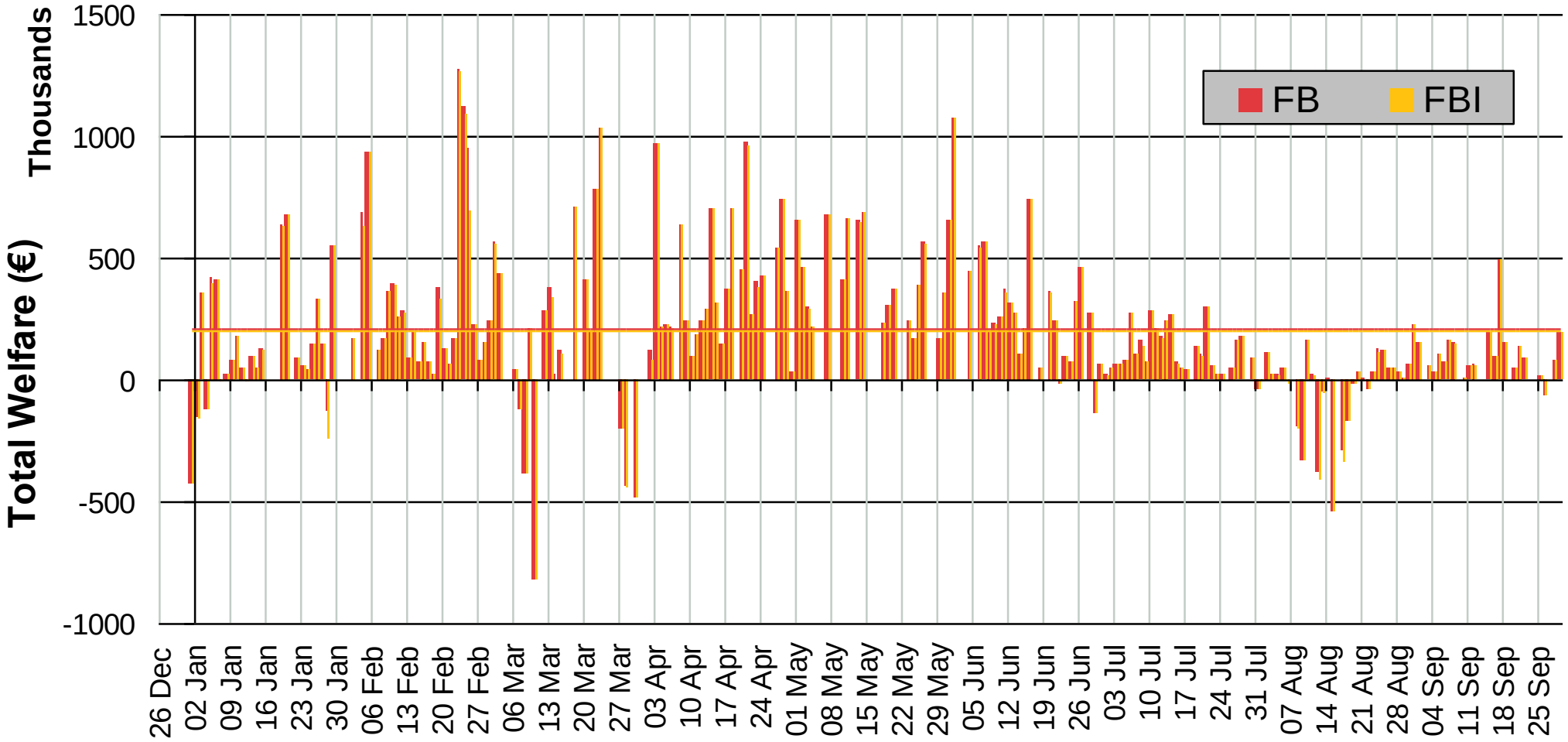


Day ahead market welfare (weekly, relative to ATC)

- This overview shows the **gain in weekly DA market welfare** since the beginning of 2013
  - Explanation on weeks with negative welfare will be provided during the afternoon's workshops

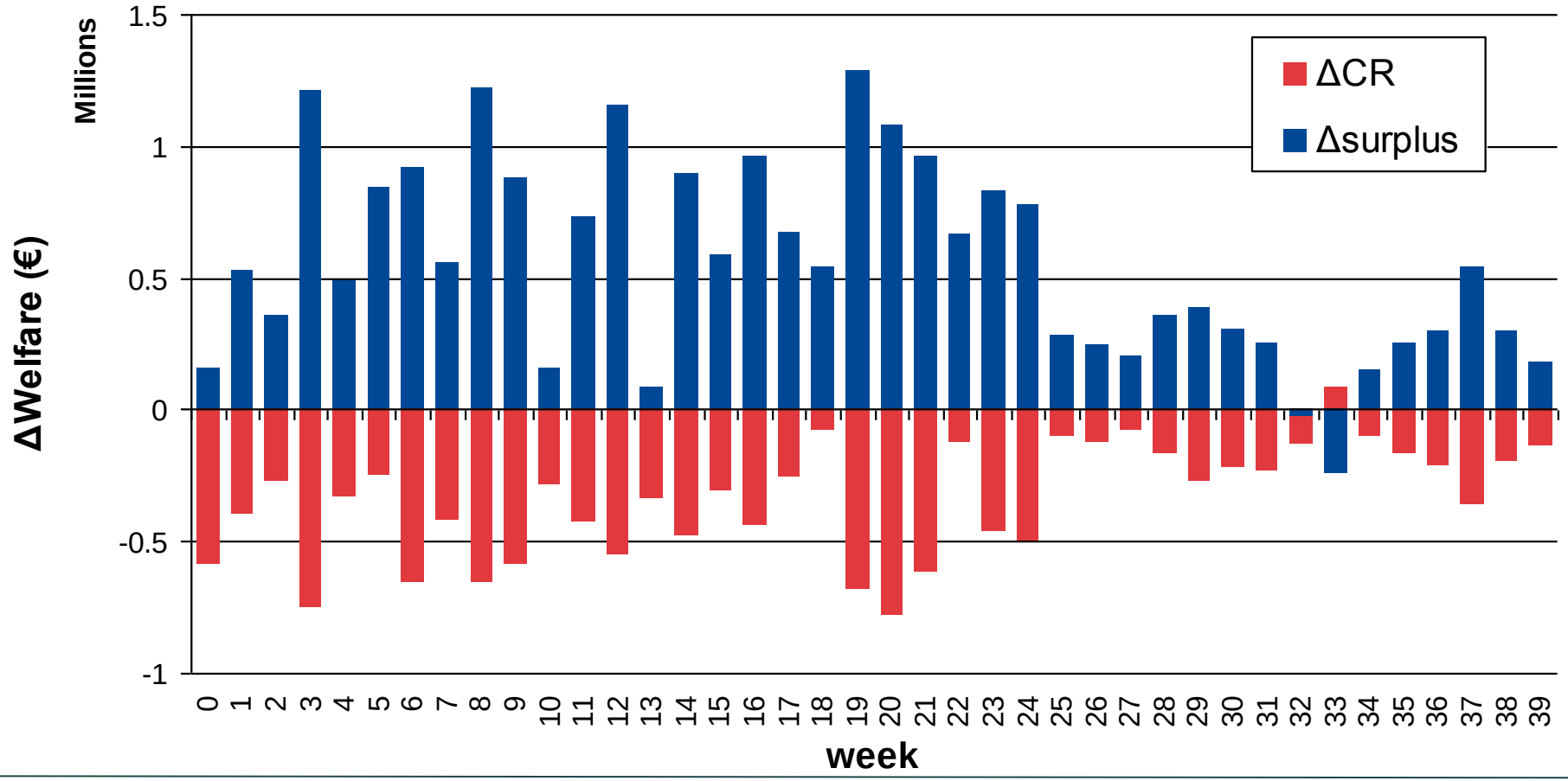


Day ahead market welfare (daily, relative to ATC)



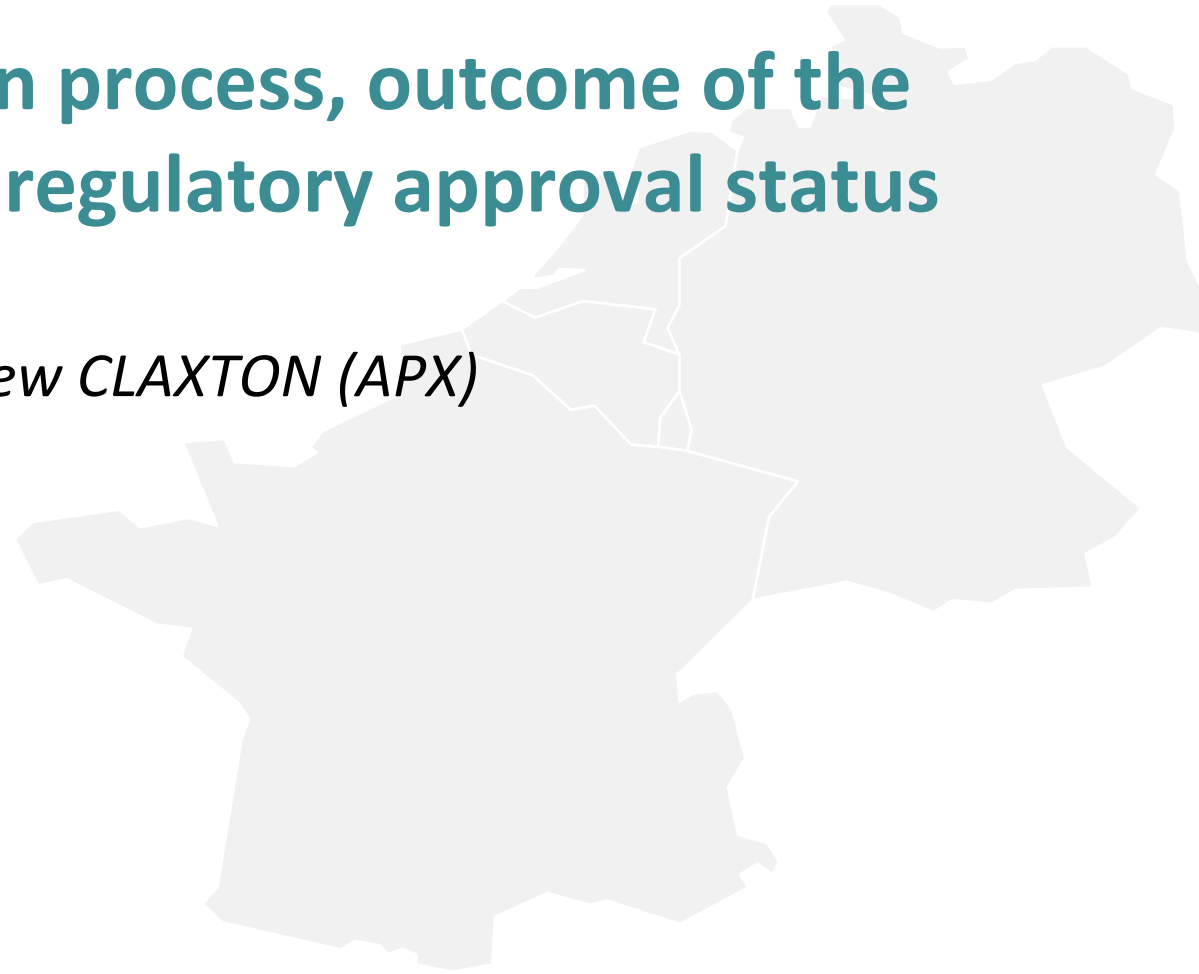
Change in weekly daily average welfare FB - ATC

- This overview, illustrating the **split of welfare in congestion rent and surplus**, indicates an always positive increase in the market surplus
  - Exceptional cases will be addressed during the afternoon's workshops



Public Consultation process, outcome of the market survey and regulatory approval status

by Andrew CLAXTON (APX)



NRA Approval Process

- On 1st August, Project Partners submitted the **CWE FB MC Approval Document** to CWE Regulators which also contains the concerns raised by market participants during the public consultation
- Since then, discussions with Regulators are ongoing and will be pursued during the next months
- The non-confidential parts of the Approval Document are available online on CASC's website: http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Approval-Documents

Public Consultation Process

- Project Partners would like to thank MPs for their responses to the public consultation on the CWE FB MC solution which took place from 2nd May until 1st July
- The outcome of the public consultation/survey can be structured according to following main concerns:

FB compared to ATC	Concerns on welfare losses, volatility of prices, timeframes
X // run performance	Dissatisfaction with results in terms of reliability and stability
Allocation Principles	Publication of the algorithm's functioning
Operational process	Request for knowledge of TSO harmonization
Timings	Worries regarding the tight deadlines
Fairness	Assessment of FB impact on smaller countries
Transparency	Request for capacity calculation inputs for price predictability

Public Consultation Process

FB compared to ATC

FB compared to ATC ▶ Concerns on welfare losses, volatility of prices, timeframes

MPs main remarks/concerns

Occurrence of welfare losses under FB	✓ **Workshop Session 1**
Impact of FB on Intraday	✓ **Workshop Session 2**
Study on price volatility	*Ongoing work*
Objective of LTA inclusion	*cf. Q&A Document*
Coordination between CWE and CEE	*cf. Q&A Document*

Public Consultation Process

X // run performance

X // run performance ▶ Concern about reliability and stability of results

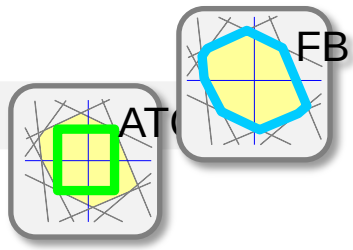
MPs main remarks/concerns

High number of missing days	✓ **Workshop Session 1**
Daily parallel run publication	✓ **Project Planning**
ATC publication after FB Go Live	*cf. Q&A Document*
Publication of historical PTDFs on ftp server	*cf. Q&A Document*
Sensitivity analyses	*ongoing discussions*

Public Consultation Process

Allocation Principles

Allocation Principles ▶ Publication of the algorithm's functioning



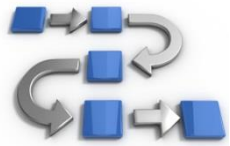
MPs main remarks/concerns

- Principles of XB allocation — ✓ **Workshop Session 2**
- Functioning Intuitive patch — ✓ **Workshop Session 2**
- Update of Intuitiveness Report — *Ongoing work*
- Criteria for choice FB vs. FBI — *Ongoing discussions*

Public Consultation Process

Operational process

Operational process ▶ Request for knowledge of TSO harmonization



MPs main remarks/concerns

- Coordination between TSOs
- Scope of Remedial Actions
- Fallback principles and Shadow Auction Process
- Foreseen Rollback Procedure

✓ **Workshop Session 1**

✓ **Workshop Session 2**

Public Consultation Process

Timings

Timings ▶ Worries regarding the tight deadlines

MPs main remarks/concerns

- Earlier data publication — ✓ **Workshop Session 1**
- Publication of ATCs for Shadow Auctions — ✓ **Workshop Session 2**
- General timings — *cf. NWE timings*

Public Consultation Process

Fairness

Fairness ▶ Assessment of FB impact on smaller countries

MPs main remarks/concerns

- FB impact on grid stability — ✓ **Workshop Session 1**
- Lower liquidity/higher prices in some markets — *cf. Q&A Document*
- Effect on redispatch costs — *cf. Q&A Document*
- FB impact on neighboring regions — *cf. Q&A Document*

Public Consultation Process

Transparency

Transparency ▸ Request for capacity calculation inputs for price predictability

MPs main remarks/concerns

- FB is less transparent than ATC — ✓ **Workshop Session 1**
- Price predictability under FB — *Ongoing discussions*
- Sensitivity analyses — *Ongoing discussions*
- Compliance with legal obligation for data publication — ✓ **Workshop Session 1**
- Year-ahead data publication

Public Consultation Outcome

Next steps and further information

- A lot of answers on the raised comments will be provided during the afternoon workshops
- Non-treated topics today as well as further information can be found in the Q&A Document of the public consultation, the published approval package as well as in existing project documentation
- Discussions on all issues will continue within the Flow Based Users Group

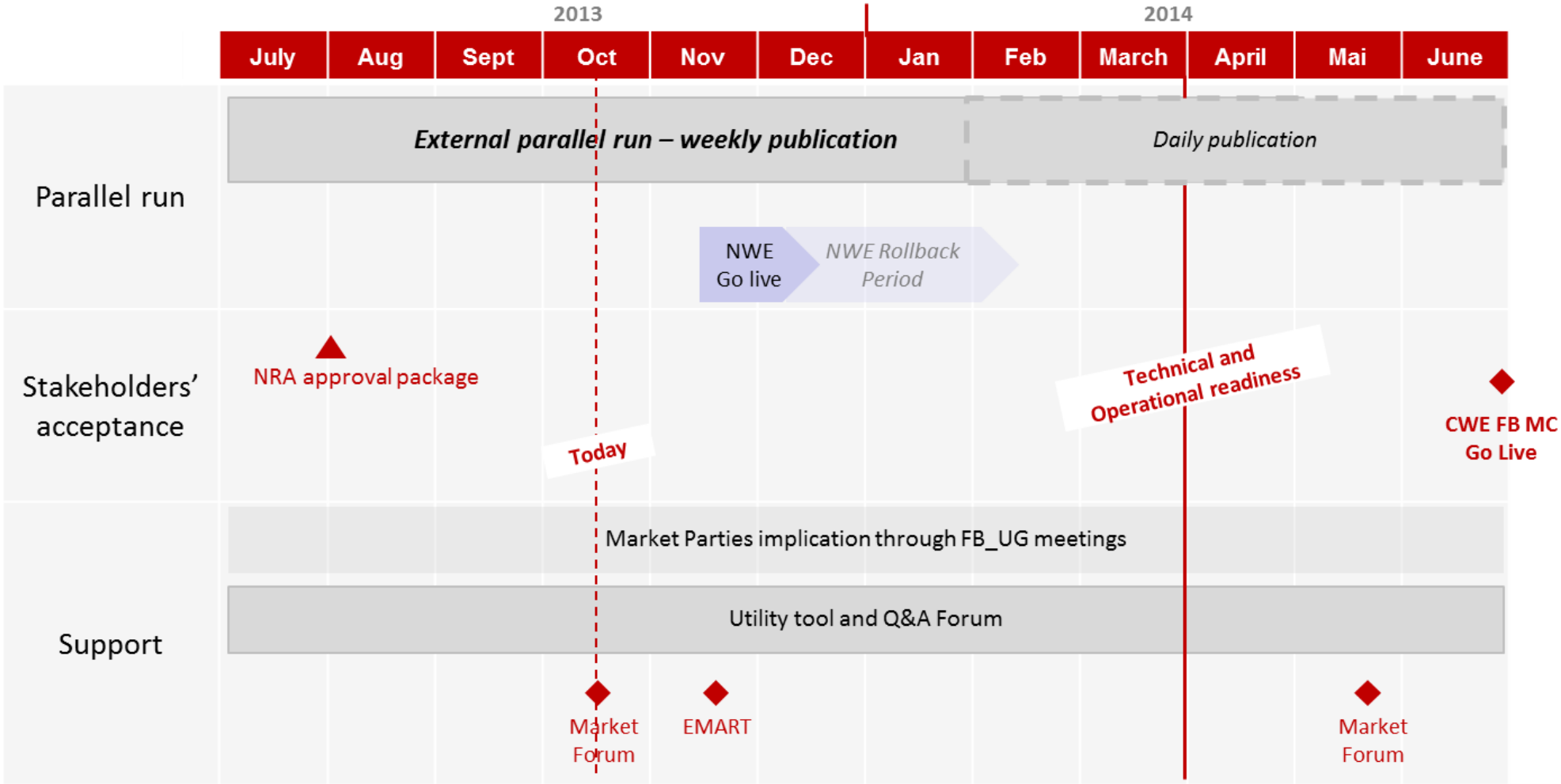
Do you have further ideas on how to increase the dialogue?

Q&A Document: http://www.casc.eu/media/CWE%20FB%20Publications/30092013_Market%20Communication%20Survey%20Outcome.pdf
Project Documentation: http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Documentation

Project planning and next major milestones

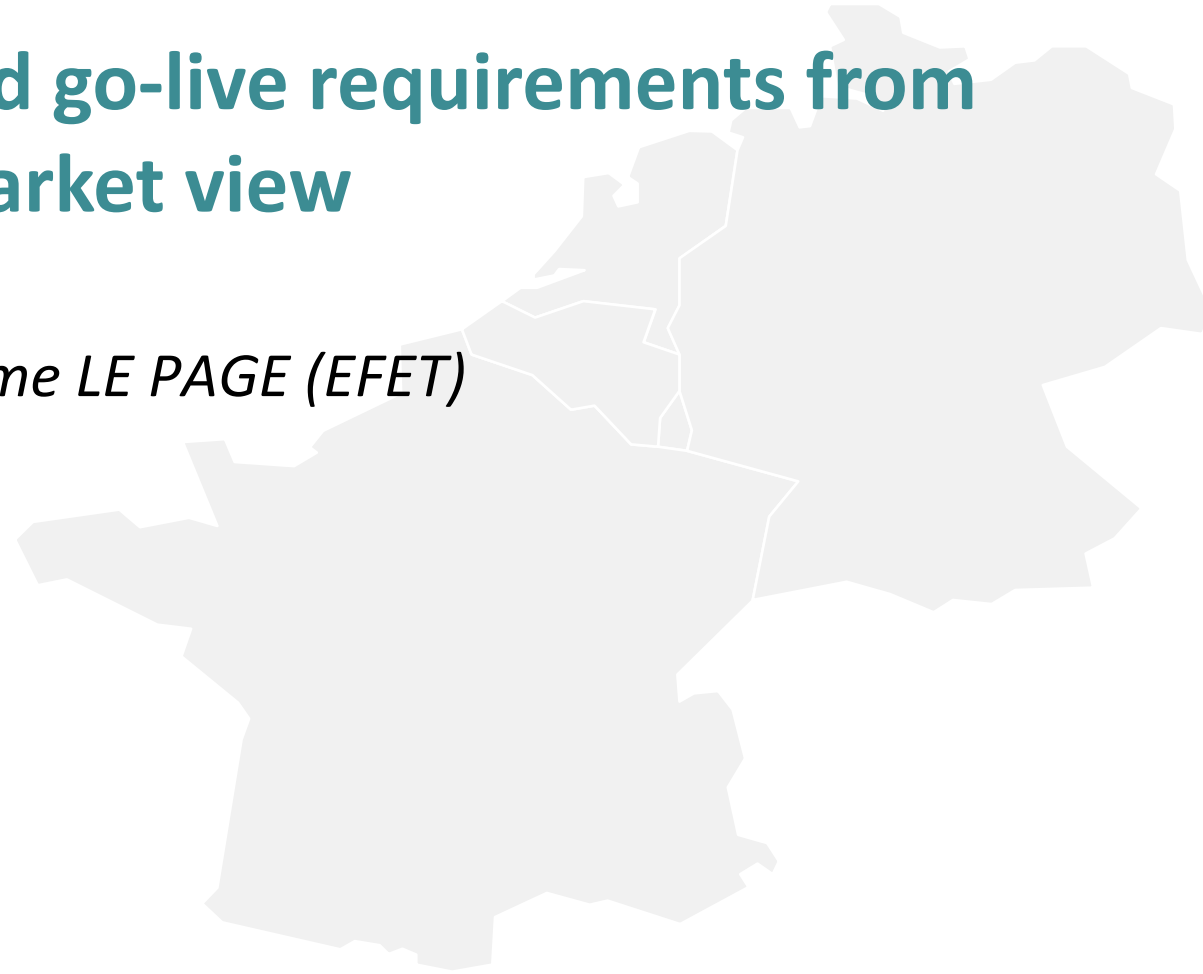
by Wim MICHIELS (Elia)

CWE FB MC Project Planning



Market concerns and go-live requirements from market view

by Jérôme LE PAGE (EFET)



CWE Flow-Based
Market Coupling Forum

Brussels, 10 October 2013

EFET observations and concerns

Jérôme Le Page

European Federation of Energy Traders

Summary

- EFET notes positive elements in overall stakeholder engagement efforts
  - Excellent and informative Feasibility Report
  - CWE Flow-Based Market Coupling Forums
  - Flow-Based User Group meetings + Q&A supporting website
  - CWE regulators workshop on Flow-Based market coupling
  - Stakeholder consultation and feedback report
- Still real dialogue is missing and is required for successful launch, because there are a number of areas of concern
  - Decision making process: Discrepancy between consultation report and proposed regulatory package
  - Reliability of the model: need to prove operational reliability of the model, including sensitivity to human errors + capacity to implement operational controls and back up solutions

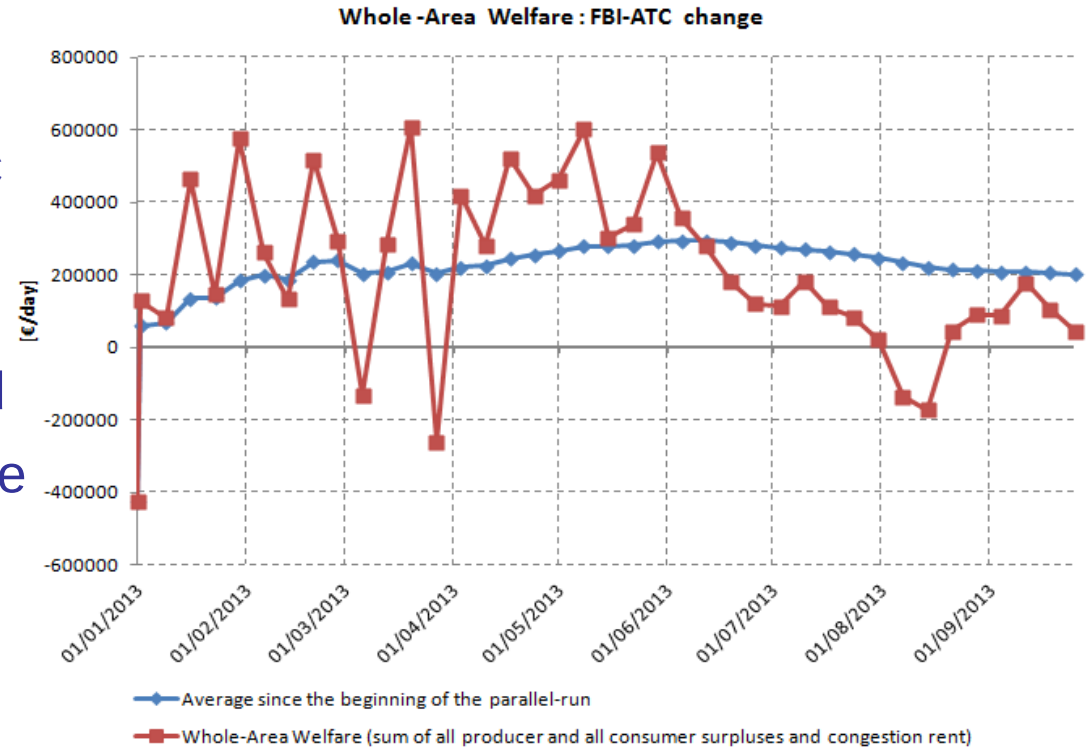
    Overall welfare gains to be calculated not only for the DA Spot auction (Forward, ID, OTC DA)
  - Transparency of the model and capacity of the market to adapt and trade in a FB environment: need for transparent CGM for modelling purposes + information on parameters' changes (RA,...)

Decision making process

- EFET welcomed the honest post-consultation report from the Project Parties in July
- However, the regulatory package circulated late August does not take account of the stakeholder feedback + many areas left open
- Market participants are not ready yet, nor the FB industrial tools & processes
- Rushed decisions are being made without the necessary justifications

Reliability of the model

- Uncertainty on the reliability of the model despite the start of the “parallel run”
  - the current parallel run is a useful step in order for all market participants to start preparing for flow-based and to get a first flavour on flow-based market coupling
  - however we consider that the real parallel run will only start when flow-based results will be published on a daily basis, in a normal time process and without any days missing
  - market participants would require systematic explanations on the days for which the social welfare was decreased compared to the NTC method, since this should not be possible in theory
- Beneficial effects should not be limited to the day-ahead stage, but also for the forward and intraday timeframes



Transparency of the model (1)

- Market participants need to “model the TSO calculations of cross-border capacities” to be able to forecast market prices (not only DA)
  - necessary for investments decisions, maintenance scheduling, operational scheduling, management of fuel contracts etc..

- How to improve transparency?

  Need to publish all price sensitive network information
  - Common Grid Model (network elements allowing for load flow calculations)
  - GSK, FRMs, list of critical branches, base case assumptions, remedial actions and other TSO parameter changes
  - PTDF (published preferably the evening before (D-2), and in any case before 8:00 am D-1 (well before the 10:30 am deadline that was in use for ATC values). Historical PDTF matrices should be made available via the ftp-server (not the utility tool)

Transparency of the model (2)

- Develop smarter solutions
  - Some first ideas exist, that can be used as starting input of dialogue, such as:
    - Calculate and publish “best fit ATCs”
    - Publish sensitivity of PTDF for selected scenarios
    - Publish parallel results for future cases (e.g. related to 10 YNDP)
  - Need to assess whether simplified solutions match companies’ modelling needs
- A direct dialogue with users is needed – bilateral meetings with companies are essential to assess whether smarter solutions would fit various company sizes, portfolio types, trading habits, etc.

Thanks for your attention

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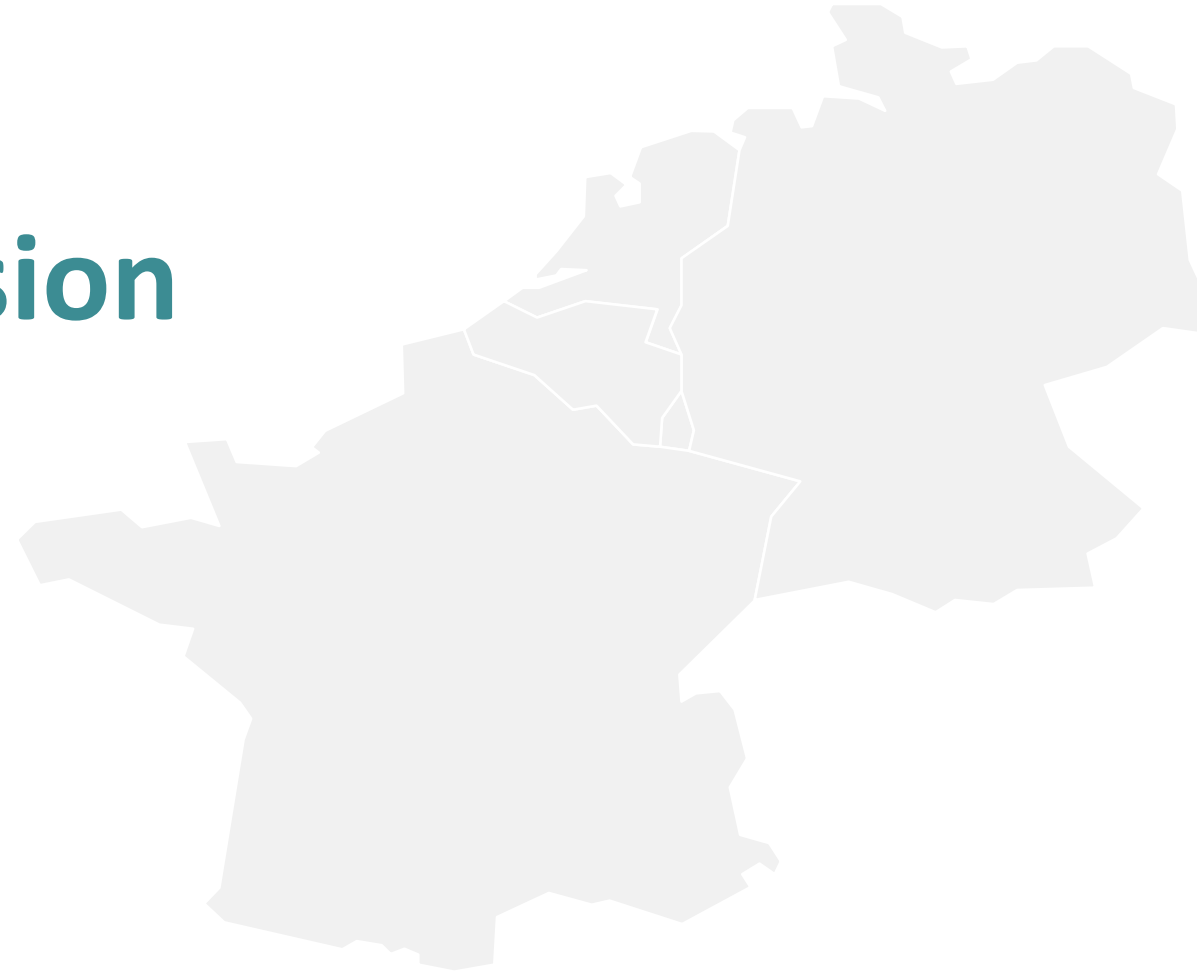
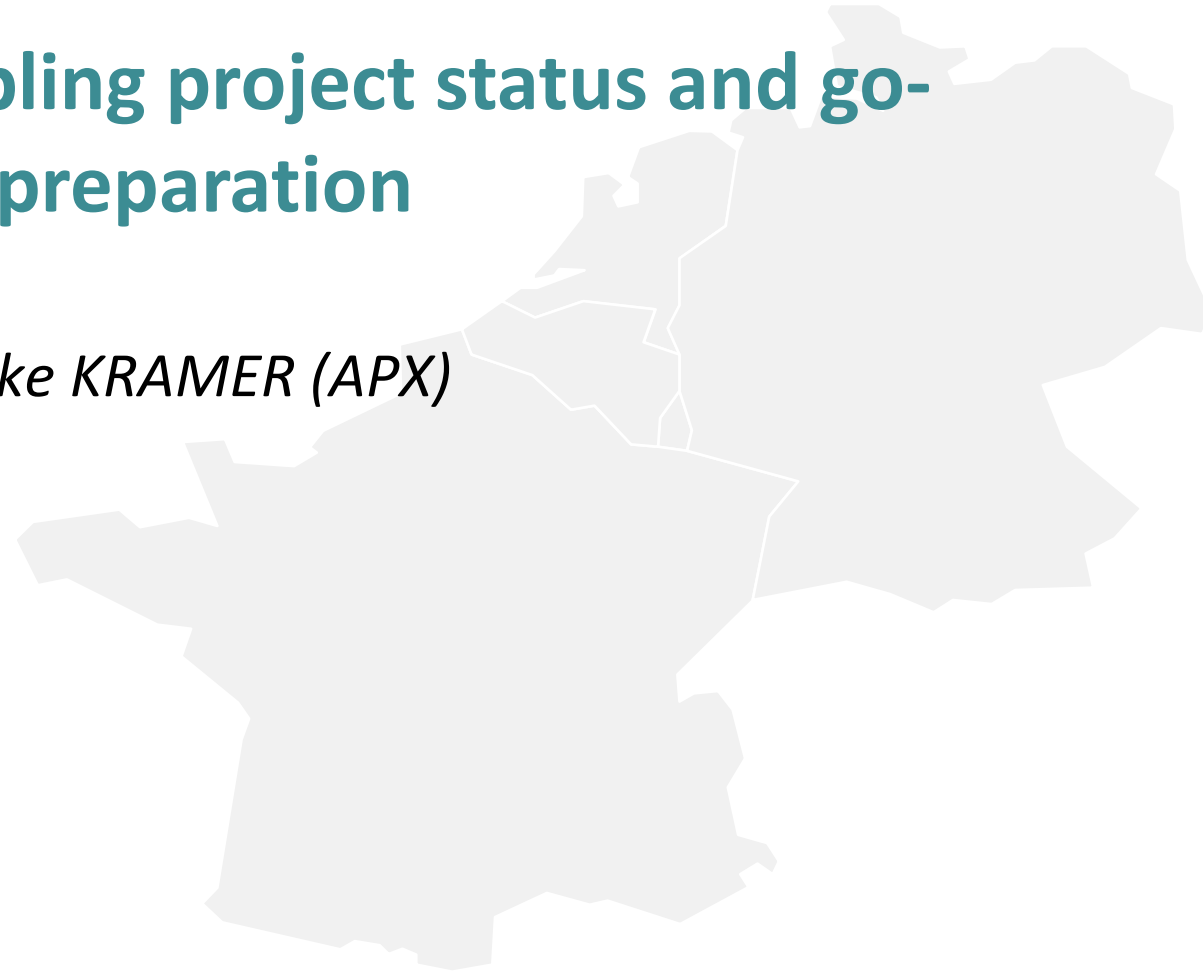
Q&A Session



The Forum Material as all project related documentation will be published on CASC's website:
http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Documentation

NWE DA Price coupling project status and go-live preparation

by Tjitske KRAMER (APX)



CWE FB stakeholder forum, Brussels, 10 October 2013

NWE Day-Ahead Price Coupling

Agenda

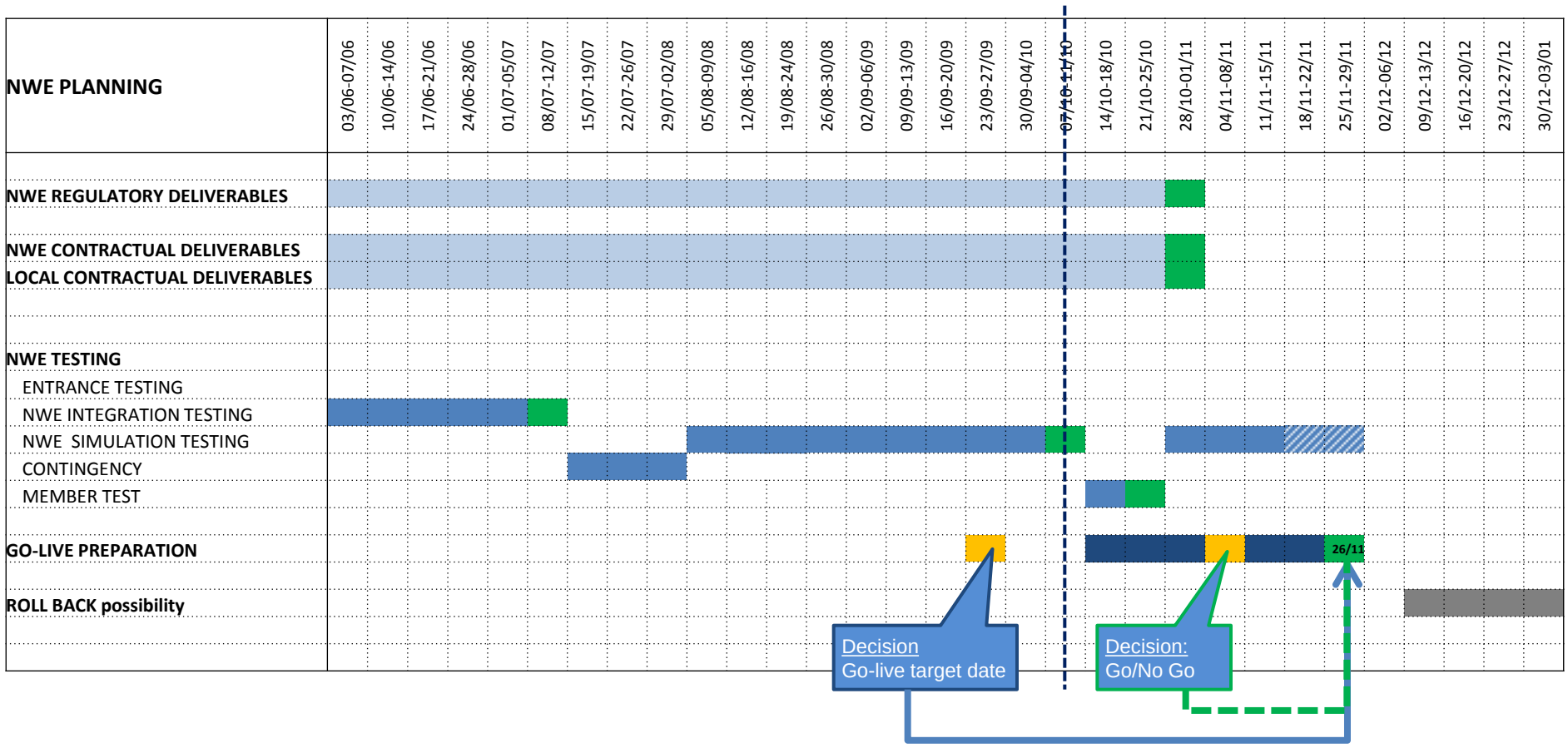
1) Status NWE
   - Simulation testing
2) Planning until Go-live
3) Target Go-live date
4) Member test
   - Member test scenarios
   - Full decoupling
   - Partial coupling
5) Implementation harmonized Price Caps

1) Status NWE

Testing

- Simulation Testing phase extended until 31/10/2013.
  - Normal Day scenarios
  - Backup scenarios
  - Fallback scenarios (full decoupling and partial coupling)
- Complexity due to
  - testing with 50+ systems and 150+ interfaces involved.
  - New partial coupling procedures and system functionality.
- NWE Parties are working hard to meet the acceptance criteria for simulation testing

2) Planning until Go-live



3) Target Go-live date

The Target Go-live date has been set at 26 November for delivery at 27 November, pending:

- Successful completion of the Simulation Test phase
- Successful completion of the Member Test phase
- Signing of all contracts and agreements
- Regulatory approval

Final Go/No Go decision to launch will be taken early November.

Launch activities have been started.

4) Member test

Testing

- Member Test still to be performed and planned for 14/10 – 25/10
  - Approx. 95 members (NWE + SWE) after closure of registration
  - On request of members, testing of nomination process has been added to all test days.

Date	Simulation	Settlement Process [i]	Nomination Process
Monday, October 14	Normal Day	Yes	Yes
Tuesday, October 15	2nd auction triggering in CWE / GB	Yes	Yes
Wednesday, October 16	Full decoupling of NWE	Yes	Yes
Thursday, October 17	Partial Coupling 1 (Nordic-Baltic area will be decoupled from the CWE. CWE and GB remain coupled.)	No	Yes
Friday, October 18	No testing	N/A	N/A
Saturday, October 19			
Sunday, October 20			
Monday, October 21	Partial Coupling 2 (missing order books EPEX)	Yes	Yes
Tuesday, October 22	Full decoupling of NWE	Yes	Yes
Wednesday, October 23	No test foreseen, but can still be used as backup testing day	No	No
Thursday, October 24	No test foreseen, but can still be used as backup testing day	No	No
Friday, October 25	No testing	N/A	N/A

Normal Day Scenario

PCR Normal process

PCR Normal Process
55 min

NotificationProcess
60 min

12:00	OBK GCT
12:10 – 12:27	Calculation
12:28 – 12:41	Preliminary PX validation
12:42	Publication of preliminary results (incl. market clearing price) to the market and sending of the results to TSOs
12:42 – 12:54	Final TSO validation
12:55	Publication of Final Results (incl. market clearing price) Start of Notification Process
13:55	End of Notification Process

Note: All these timing could be changed after the final testing

Testing TIMINGS for NWE Member Tests

	Production	Testing	
		13:00	**NWE kick-off call**
Pre-Coupling	09:00	12:30	start of the Market Coupling session
	10:30	13:00	Target time for submission of the CZCs and Allocation Constraints in the PMB
	10:30	13:00	CZCs publication
	NA	13:00	PX OBK open for 1 hour
	11:00	13:15	Latest time to start IC for Network data missing in PMB
	11:15	13:25	Deadline for message of risk of NWE partial coupling for CZC reasons (ATCs set to 0)
PCR Normal Process 55 min	12:00	14:00	PX OBK Gate Closure Time
	12:10	14:10	PMB GCT, reception of all OBK in PMBs -> Start of Calculation
	12:10	14:10	Latest time to start an IC for ATC or OBK related reasons
	12:20	14:20	Deadline to send message for risk of partial Coupling
	12:27	14:27	End of Calculation
	12:28	14:28	Reception of Results in all PX Systems
	12:29	14.29	Start of 10 min preliminary validation
	12:39	14:39	End of preliminary PX validation process -> Generation of Preliminary PX Confirmations
	12:40	14:40	Reception of all Preliminary PX Confirmations in PMB -> Sending of Global Preliminary PX Confirmation
	12:40	14:40	Deadline to declare partial Coupling
	12:41	14:41	Reception of Global Preliminary PX Confirmation in every PX IT System
	12:42	14:42	Publication of preliminary results to the market and sending of the results to TSOs
	12:42	14:42	Deadline to send a publication delayed message
	12:42	14:42	Start of 10 min Final Confirmation process
	12:52	14:52	End of final validation process -> Generation of Final Confirmations
	12:53	14:53	Reception of all Final Confirmations in the PMB -> Sending of Global Final Confirmation
	12:54	14:54	Reception of Global Final Confirmation in the Local PMBs
	12:55	14:55	Publication of Final Results -> Start of Notification Process
Notification Process **60 min**	13:05	15:05	Latest time to start an IC and invite TSOs
	13:20	15:20	Deadline to send message for risk of full decoupling
	13:50	15:50	Deadline to declare a full decoupling
			Notification Process according to local procedures
		16:30	**NWE debrief call**

Special routine scenario: 2nd auction CWE / GB

PCR Normal Process
55 min

2nd Auction CWE/ GB
48 min*

Notification Process
60 min

12:00	OBK GCT
12:08	Check + send OBK
12:10	Reception of all OBK in PMBs -> Start of Calculation
12:27	End of Calculation
12:28	Reception of Results in all PX Systems -> PX identification of thresholds/curtailment reached
12:33	IC opening and agreement on a fixed time for reopening OBK
12:35	PCR message sent from PXs to TSOs and MPs: Inform about Second Auction and reopening of order books
12:38	Start reopening of OBK for 10 min
12.42	PCR message sent from PXs to TSOs and MPs: Inform about the delay in market results publication (optional) TSO message to MPs: Inform Market to update shadow auction bids
12:48	OBK GCT
12:56	Check + send OBK
12:58	Reception of all OBK in PMBs -> Start of Calculation
13:15	End of Calculation
13:16	Reception of Results in all PX Systems
13.17	Start of 10 min preliminary validation
13:20	PCR message sent from PXs to TSOs and MPs: Inform about delay and risk of decoupling (optional) TSO message to MPs: Inform Market to update shadow auction bids & shifting of notification deadline
13:27	End of preliminary PX validation process -> Generation and sending of Preliminary PX Confirmations
13:28	Reception of all Preliminary PX Confirmations in PMB -> Sending of Global Preliminary PX Confirmation
13:29	Reception of Global Preliminary PX Confirmation in every PX IT System
13:30	Publication of preliminary results (incl. market clearing price) to the market and sending of the results to TSOs
13:30	Start of 10 min Final Confirmation process
13:40	End of final validation process -> Generation and sending of Final Confirmations
13:41	Reception of all Final Confirmations in the PMB -> Sending of Global Final Confirmation
13:42	Reception of Global Final Confirmation in the Local PMBs
13:43	Publication of Final Results (incl. market clearing price) -> Start of Notification Process
14:43	End of Notification Process

* the Second Auction in CWE / GB is a single process taking 48 minutes.

3) Special routine: Nordic routine for max prices

PCR Normal Process
55 min

Special Routine Nordics
42-55 min*

Notification Process
60 min

12:00	OBK GCT
12:08	Check + send OBK
12:10	Reception of all OBK in PMBs -> Start of Calculation
12:27	End of Calculation
12:28	Reception of Results in all PX Systems -> PX identification of thresholds/curtailment reached
12:30	Activation of PMB Max-Price Plug-In to perform the needed steps linked to NPS Special Procedures
12:33	IC opening to inform about that the NPS Special Routines for Max Price handling has started
12.42	PCR message sent from PXs to TSOs and MPs: Inform about the delay in market results publication (optional) TSO message to MPs: Inform Market to update shadow auction bids
12:50 - 13:11	PMB Max-Price Plug-In process in accordance with NPS Special Routines finalized
12:52 - 13:13	Reception of updated Nordic-Baltic OBK and or ATCs in PMBs -> Start of Calculation
13:09 – 13:30	End of Calculation
13:10 - 13:31	Reception of Results in all PX Systems
13:11 – 13:32	Start of 10 min preliminary validation
13:20	PCR message sent from PXs to TSOs and MPs: Inform about delay and risk of decoupling (optional) TSO message to MPs: Inform Market to update shadow auction bids & shifting of notification deadline
13:22 - 13:33	End of preliminary PX validation process -> Generation and sending of Preliminary PX Confirmations
13:23 –13:34	Reception of all Preliminary PX Confirmations in PMB -> Sending of Global Preliminary PX Confirmation
13:24 – 13:35	Reception of Global Preliminary PX Confirmation in every PX IT System
13:25 – 13:36	Publication of preliminary results (incl. market clearing price) to the market and sending of the results to TSOs
13:26 – 13:37	Start of 10 min Final Confirmation process
13:36 - 13:47	End of final validation process -> Generation and sending of Final Confirmations
13:37 – 13:48	Reception of all Final Confirmations in the PMB -> Sending of Global Final Confirmation
13:38 – 13:49	Reception of Global Final Confirmation in the Local PMBs
13:39 – 13:50	Publication of Final Results (incl. market clearing price) -> Start of Notification Process
14:39 – 14:50	End of Notification Process

* the Special Procedure for the Nordics is an iterative process which will run the number of times necessary taking into the 13.50 full decoupling deadline when NWE is coupled.

Full decoupling scenario

- Full decoupling of NWE

  A full NWE decoupling is a situation where it is not possible, for a specific day, to allocate the Cross Zonal Capacities (CZCs which corresponds to ATCs) via the implicit allocation for the internal CWE, for GB, for the CWE – Nordic interconnectors and for the CWE – GB interconnectors. (i.e. the latest fallback time for a procedure in the time schedule is reached and no price coupling solution is found before the decoupling deadline).

  - Internally in CWE and for the CWE – Nordic interconnectors (except Baltic Cable) shadow auctions organized by CASC will be held and results published. The 3 PXs within CWE will reopen the order books and perform local DA spot market calculations without using cross border capacities.

  - For the Nordic – Baltic area including the link with Poland, price coupling will be performed by NPS utilizing the cross border capacities within this region. NPS will do so after results for shadow auctions on 3 CWE-Nordic links have been published and after re-opening of the orderbooks.

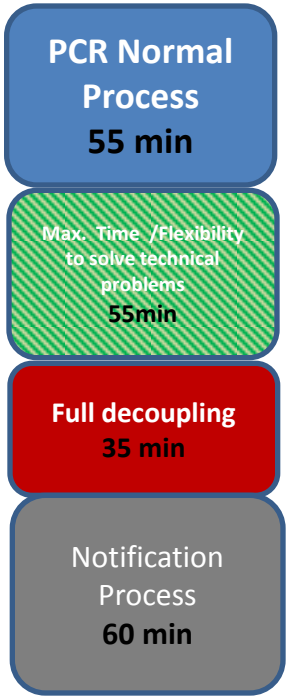
  - For the GB region the IFA and BritNed capacity will be decoupled and explicit auction will run by Unicorn (IFA) and BritNed capacity is given to intraday (not part of the test). The virtual capacity between N2EX and APX UK will also be set to zero. The two PXs will then run their own calculations independently of each other.

  - For the IFA Interconnector explicit auctions, organized by RTE/NGIC via Unicorn their service provider, will be held and results published.

Full decoupling scenario – main principles

- In case of full decoupling the processes are local, meaning that NWE timing constraints are not applicable:
  - The notification deadline of 15.30 is not applicable internally in the Nordic-Baltic area, nor internally in GB.
  - It is applicable for the notification by market parties of utilization of Explicit Capacity bought in Shadow Auctions on CWE/ Nordic, CWE-internal and CWE/ GB interconnectors.
- Communication in case of fallback is organized regionally/locally (different info, different timings)
- On PX side
  - 20 minutes time allowance for Market Parties for order book reopening
- On TSO side
  - Shadow auctions organized by CASC are applicable for the internal CWE borders and the CWE – Nordic interconnections (except for Baltic Cable). Timings in the scenarios are based on the shadow auctions organized by CASC.
  - Shadow auctions organized by RTE/NGIC are applicable for FR/GB border only (IFA interconnector), this consists of daily explicit auctions
  - Fallback for BritNed → capacity goes to intraday
  - Fallback for Baltic cable → capacity goes back to the cable owner.

Full decoupling scenario



12:00 OBK GCT
12:08 Check + send OBK
12:10 Reception of all OBK in PMBs -> Start of technical issues
12.42 PCR message sent from PXs to TSOs and MPs: Inform about the delay in market results publication
(optional) TSO message to MPs: Inform Market to update shadow auction bids
13:20 PCR message sent from PXs to TSOs and MPs: Inform about delay and risk of decoupling
(optional) TSO message to MPs: Inform Market to update shadow auction bids & shifting of notification deadline
13:50 IC declares the Full Decoupling
PCR message sent from PXs to TSOs and MPs: Inform about Full decoupling
(optional) TSO message to MPs: Inform Market about shifting of notification deadline
13:55 Start reopening of OBK for 20 min
14:15 OBK GCT -> Start of local auction (*CWE local auction timings taken in consideration*)
14:25 Publication of local results (incl. market clearing price) -> Start of Notification Process
15:25 End of Notification Process

Partial coupling

- Partial Coupling in NWE means:
  - Any scenario where one or more bidding areas and/or interconnectors are temporary not participating in NWE Market Coupling while the remaining bidding areas/interconnectors still participate in NWE Market Coupling.
  - The CZCs for the decoupled borders / interconnectors will be allocated via the fall back solution for these temporary not participating borders / interconnectors.
  - NWE parties will try to couple as many borders / interconnectors as possible.
    - E.g. if CWE must decouple internally, all other NWE borders/ interconnectors will remain coupled. For the CWE countries this means that Germany will remain coupled with the Nordics via the CWE – Nordic interconnectors, the Netherlands will remain coupled through NorNed with the Nordics and through BritNed with the UK, whereas France will remain coupled through IFA with the UK.

Partial coupling is triggered

- during the pre-coupling process, at the latest at 11:45
- during the coupling process, at the latest at 12:40

Partial coupling scenarios for member test

Partial coupling 1: Decoupling of Nordic-Baltic Area

- The Nordic-Baltic area will be decoupled from the CWE and GB area. This means the following interconnectors will decouple:
    - DK1 – DE interconnector
    - Kontek interconnector
    - NorNed interconnector
    - Baltic interconnector

- Shadow auctions organized by CASC are organized for the first 3 interconnectors. The fallback arrangement for Baltic Cable is not part of the testing.

- In the Nordic – Baltic area including the link with Poland, price coupling will be performed utilizing the cross border capacities within this region. Nord Pool Spot will do so after results for shadow auctions on three CWE-Nordic links have been published and after re-opening of the order books The IFA and BritNed interconnectors remain in the price coupling. The CWE and GB areas hence remain coupled.

Partial coupling scenarios for member test

Partial coupling 2: Decoupling of CWE internal area and French- GB interconnector and German – Nordic interconnectors due to missing order books from EPEX in the price coupling.

- The internal CWE border (BE-FR, NL-BE, NL-DE and FR-DE borders) will be decoupled from the Nordic-Baltic area and GB. Shadow auctions organized by CASC will be run for these borders.

- France will be decoupled from GB by decoupling the IFA interconnector. An explicit auction organized by RTE/NGIC via their service provider Unicorn will be run for this interconnector.

- Germany will be decoupled from the Nordic-Baltic area by decoupling the DK1_DE, Kontek and Baltic interconnector. Shadow auctions organized by CASC will be run for the DK1 – DE and KONTEK cable.

- The Netherlands however will remain price coupled with GB through the BritNed interconnector and with the Nordic-Baltic area through the NorNed interconnector

Partial coupling scenarios

PCR Normal Process
40 min

Partial Coupling
70 min

Notification Process
60 min

12:00	OBK GCT
12:08	Check + send OBK
12:10	Reception of all OBK in PMBs -> Start of technical issues
12:20	PCR message sent from PXs to TSOs and MPs: Inform about delay and risk of decoupling (optional) TSO message to MPs: Inform Market to update shadow auction bids
12:40	IC declares the Partial Decoupling -> IC agreement on a fixed time for reopening OBK PCR message sent from PXs to TSOs and MPs: Inform about Partial Decoupling and reopening of OBK (optional) TSO message to MPs: Inform Market about shifting of notification deadline
12.42	PCR message sent from PXs to TSOs and MPs: Inform about the delay in market results publication (optional) TSO message to MPs: Inform Market to update shadow auction bids
12:45	Start reopening of OBK for 10 min
12:55	OBK GCT
13:03	Check + send OBK
13:05	Receipt of all OBK in PMBs, Start of Calculation
13:20	PCR message sent from PXs to TSOs and MPs: Inform about delay and risk of decoupling (optional) TSO message to MPs: Inform Market to update shadow auction bids & shifting of notification deadline
13:22	End of Calculation
13:23	Reception of Results in all PX Systems
13:24	Start of 10 min preliminary validation
13:34	End of preliminary PX validation process -> Generation and sending of Preliminary PX Confirmations
13:35	Reception of all Preliminary PX Confirmations in PMB -> Sending of Global Preliminary PX Confirmation
13:36	Reception of Global Preliminary PX Confirmation in every PX IT System
13:37	Publication of preliminary results to the market (incl. market clearing price) and sending of the results to TSOs
13:37	Start of 10 min Final Confirmation process
13:47	End of final validation process -> Generation and sending of Final Confirmations
13:48	Reception of all Final Confirmations in the PMB -> Sending of Global Final Confirmation
13:49	Reception of Global Final Confirmation in the Local PMBs
13:50	Publication of Final Results (incl. market clearing price) -> Start of Notification Process
14:50	End of Notification Process

Communication to the market - summarized

Time/Deadline	Communication
~ 12:35	• Second Auction • PCR message to PXs and subsequently MPs and TSOs: Second Auction is declared
12.20 12.40	• Partial Coupling • PCR message to PXs and subsequently MPs and TSOs : Risk of Partial coupling • (TSO message to MPs: Inform Market of fall back processes) • PCR message to PXs and subsequently MPs and TSOs : Partial coupling and re-opening of orderbooks
Regular publication time (12:42)	• PCR message that process is delayed from PXs* to TSOs and MPs (timings to be confirmed). • (TSO message to MPs: Inform Market of fall back processes)
13:20	• PCR message to PXs and subsequently MPs and TSOs: Inform Market about Incident and risk of decoupling. • (TSO message to MPs: Inform Market of fall back processes (update of explicit shadow auction bids) & shifting of notification deadline to 15h00).
13:40	• End of update shadow auction bids • Start of explicit shadow auction calculation
13:50	• Decision of Full decoupling • PCR message to PXs and subsequently MPs and TSOs: Full decoupling is declared • (TSO message to MPs: notification deadline has been extended to 15h30)
13:50-14:00	• Publication of the explicit shadow auction fall back results. (target is to publish immediately after 13.50 and at the latest at 14:00, feasibility of these timings must still be confirmed).

NB 1. The fallback solutions and processes as well as their associated contents and timings are organized on local / regional level and not on NWE level. Timings are therefore indicative and additional messages can be sent (e.g. IFA CMS will also sent messages in case of a fall back situation)

NB 2. The shift of notification deadlines only applies for CWE internally and CWE borders.

Harmonized Price Caps

Following harmonized price caps have been agreed:

- + 3000 EUR/MWh
- - 500 EUR/MWh

The thresholds to trigger a 2nd auction in CWE and GB remain the same:

- + 500 EUR/MWh and -150 EUR/MWh for CWE
- + 500 GBP/MWh and -150 GBP/MWh for GB

- The harmonized price caps will be implemented at go-live (or just before).
- Your local Power Exchange will update you on the exact date / procedure of updating the price caps.

Workshop Session 1:
Challenges linked to the FB capacity calculation method

by Philippe NOURY (RTE), David DUDOIGNON (TRANSNET BW) and Rouquia DJABALI (EPEX SPOT)

Workshop 1

Agenda

I. FB terminology and TSO operational process
II. Transparency challenges
III. Cases when ATC exceeds the FB domain

Practical advise:

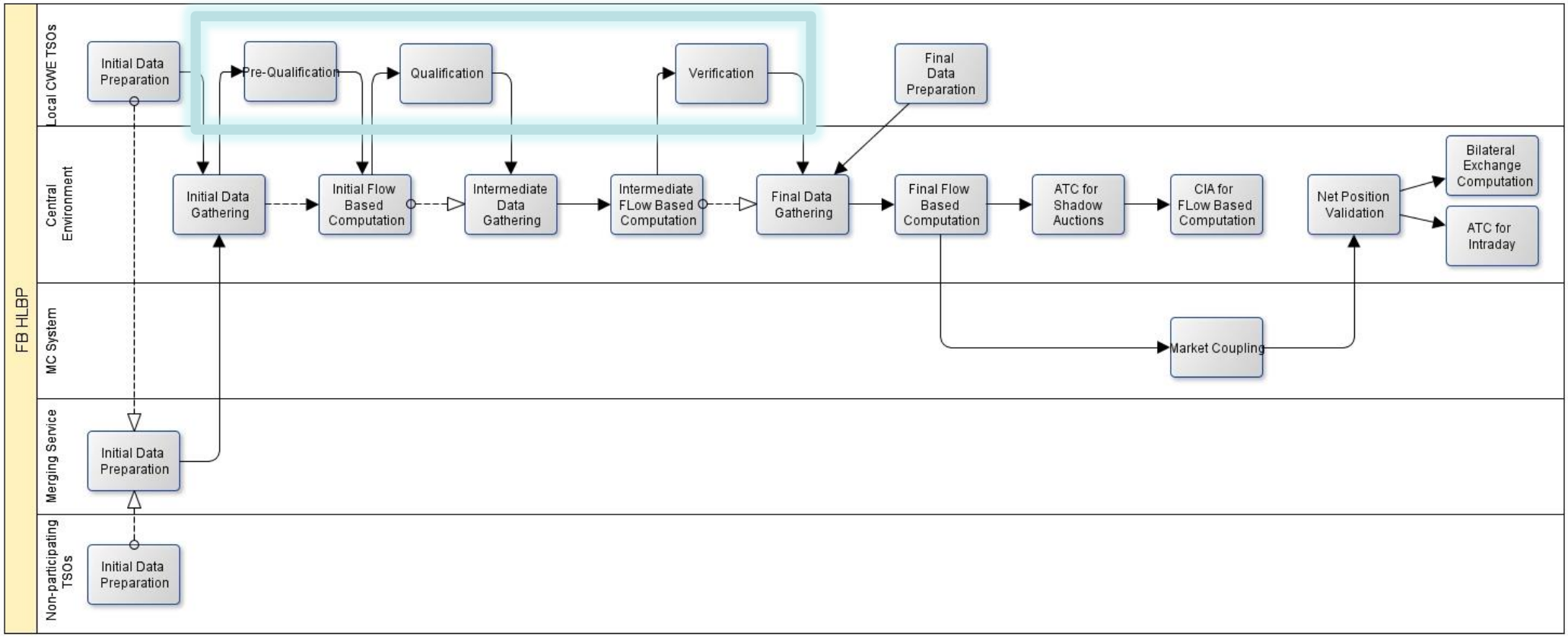
- This workshop is meant to be **interactive** and to give room for discussions
- Please feel free to **ask your questions** or to **comment** after each section
- Questions that go beyond the scope of this workshop will be collected and answered via the Q&A Forum afterwards

FB operational process

- In essence: capacity calculation is and remains work done by TSO operators
- Under FB, the capacity calculation process is more formalized than under ATC, in terms of
  - Input data
  - Computation
  - Operational procedures
  - Coordination among TSOs
- Under FB, the capacity calculation is more complex and more precise than under ATC
- Operational experience is crucial for the execution of the FB operational process

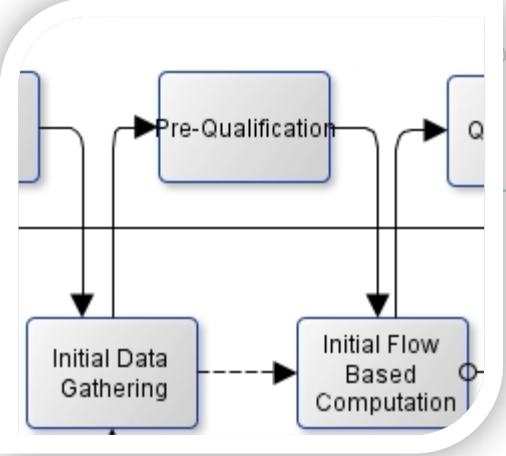
FB High-level business process

- The process chart highlights the complexity of the FB process → experience and training is needed to perform the calculations



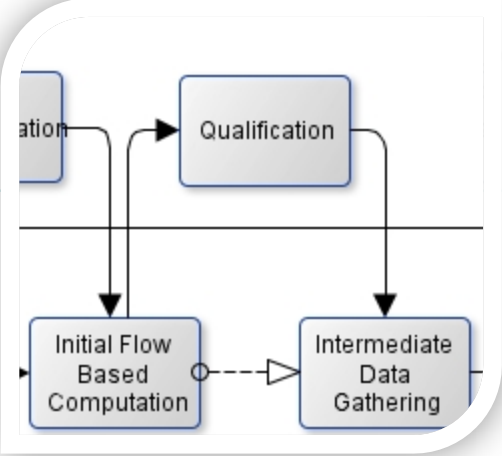
- The focus in this presentation is on the local processes (highlighted)

Pre-qualification



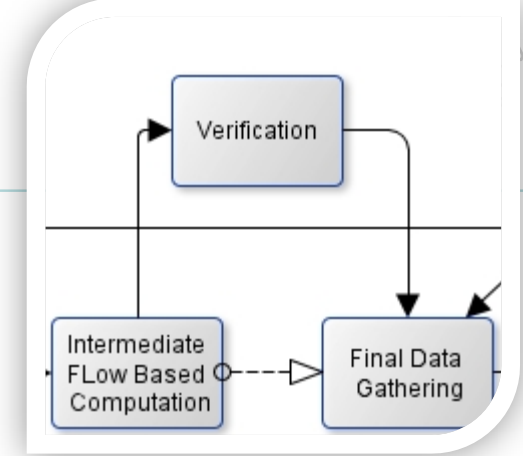
- Before the first FB parameter calculation, every TSO checks the **consistency of the applied CB-file with the forecasted grid-situation**
- Special attention is given to the **remedial actions (RA)** described in the CB-file. Every TSO can check, if the described RAs are available in the forecasted grid situation, or if some adaptations might have to be done
- This **pre-qualification** step gives the opportunity to **share information** and **exchange RA** with adjacent TSOs

Qualification



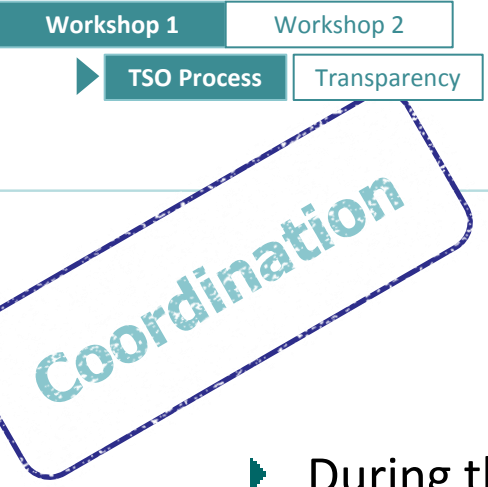
- FB-domain **coordination**: For each non-redundant CB, limiting the FB-domain, the TSO checks if remedial actions (RA) are at hand that could enlarge the FB-domain. Such in order to support the market in the relevant market directions, while respecting security of supply
- RAs with a **significant influence** on elements of neighboring grids will be **coordinated** before being implemented in the CB file
- **The determination of the impact of RAs requires experience and a good knowledge of the grid**

Verification



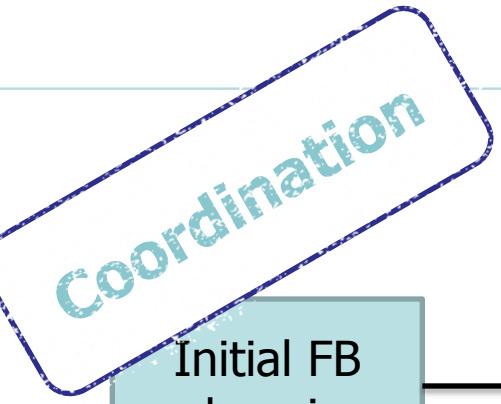
- After the qualification phase, CB files are updated and result in an increased FB domain, that respects the Security of Supply (SoS)
- As the FB computation is a simplified grid security analysis, during the verification stage the resulting FB domain is checked locally by the TSO experts by using more advanced analyses (taking into account reactive power, voltage, and other effects which cannot be covered by FB calculations)
- If security issues are discovered, TSOs can update their CB files (by adding new CBs, that were not perceived upfront as being limiting (for instance in the case of combined and/or unusual scheduled outages), by adding RA which were not considered before, or by adapting the Final Adjustment Value)
- In addition the TSOs can update their external constraints in order reflect findings out of the aforementioned checks

Phase Shifting Transformer (PST) coordination



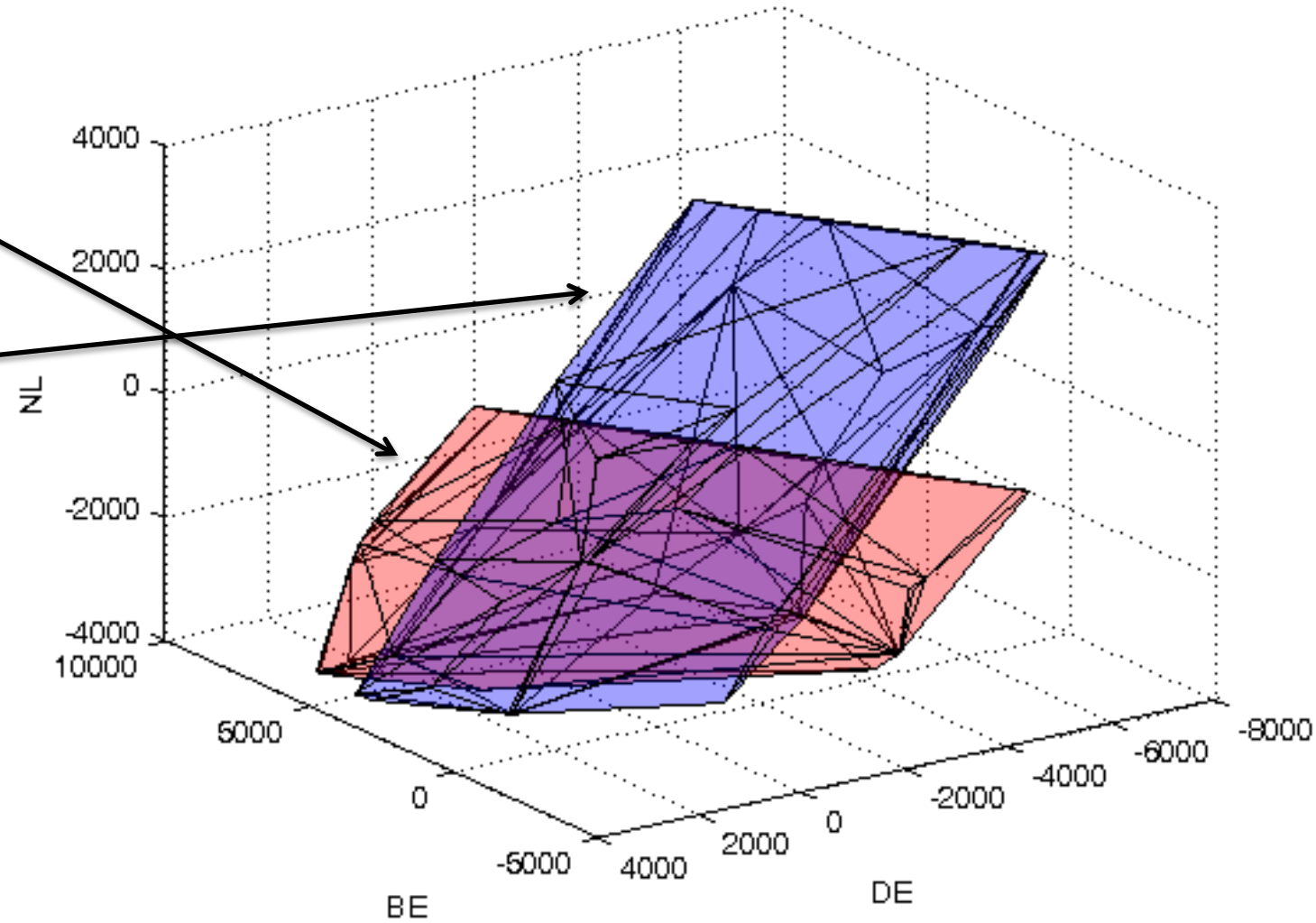
- During the D-2 / D-1 capacity calculation process, TSOs have the opportunity to **coordinate on PST settings**
- For each non-redundant CB, limiting the FB-domain, the TSO checks if **PST settings are at hand that could enlarge the FB-domain**. Such in order to support the market in the relevant market directions, while **respecting security of supply**
- This means that the LTAs and relevant market directions are covered by the Flow Based method. TSOs try to reach this by using only internal PSTs as a first step and CWE PSTs in a second step if this would not be enough
- CWE TSOs are currently implementing equivalent procedures for **other types of topological remedial actions**

Phase Shifting Transformer (PST) coordination



Impact of qualification and verification on a FB domain – 26 September 2013, 10h30

- Initial FB domain
- FB domain after qualification and verification



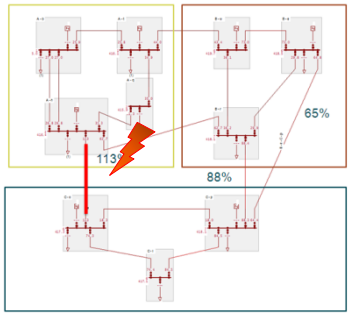
Coordination

Q&A Session

Transparency discussion: Context

- During the consultation, MPs have strongly and formally expressed their need to be provided with FB related data in order to manage the shift from ATC to FB on their side
- **Main reasons:**
  - Short-term price modeling adjustments
  - Long-term price forecasting for hedging and investment purpose
- Practically, the request concern the **integrality of FB related data used for the computations**, and on an **ex-ante basis** (i.e. before daily auctions):
  - Detailed GSKs
  - Detailed base cases, or D2CF
  - Detailed Critical Branches, that is the provision of all the fields related to any CB: name / location in plain language, decomposition of the RAM into Fmax, FAV, FRM and Fref
- CWE TSOs have identified that such "extended" publications could entail some risks. In addition, an analysis carried out by CWE TSOs legal experts, regarding the obligations in terms of publication, will be proposed
- CWE partners wish to remind that the proposal made in the approval package on publication, as well as this current document, should not be seen as a definitive "closed door", but rather as **elements of a dialogue which should help to build a solution satisfying for all concerned parties**

Transparency discussion
-
Risks for TSOs



TSO perspective

SOS issues with a TSO perspective

Stating the problem

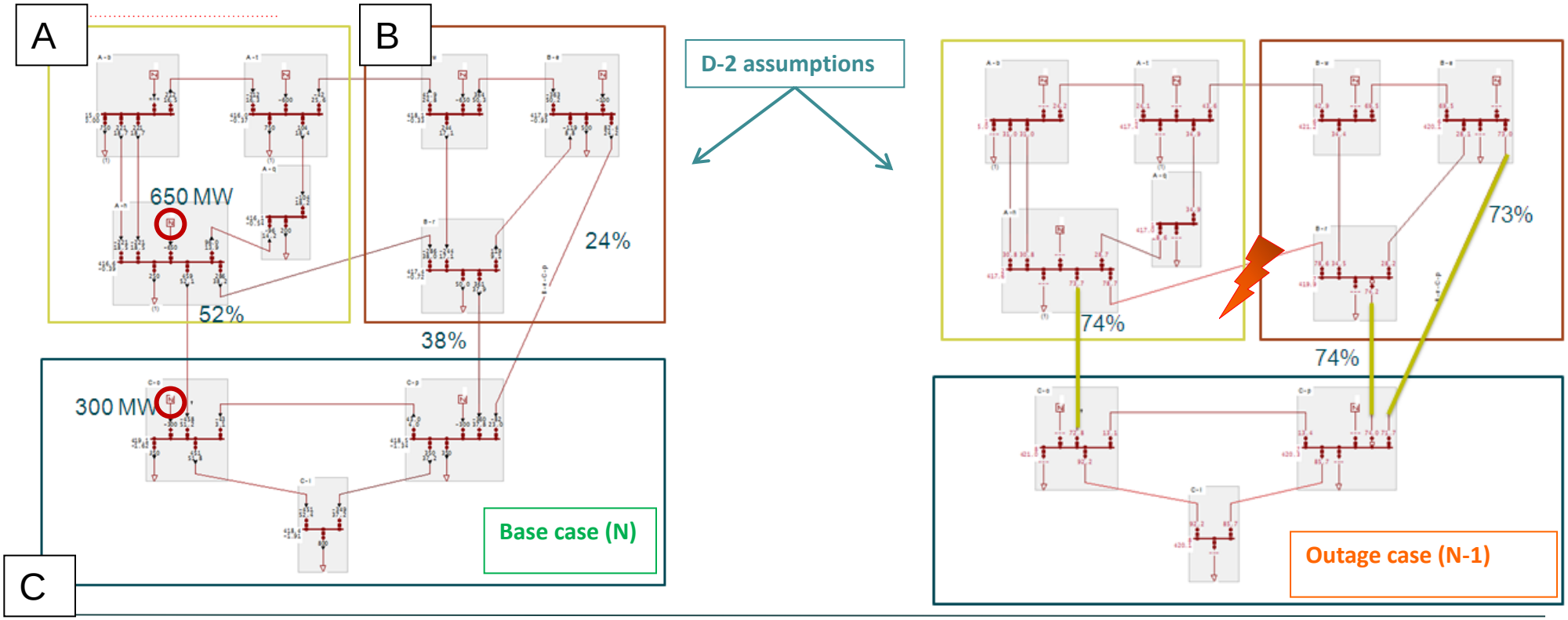
- To perform capacity calculation, TSOs use power plant forecasts. MPs do not send schedules for this time horizon (D-2)
- These forecasts are taken into account in the D2CF and GSK parameters -> a FB Domain is calculated
- The following slides illustrate the risks of an **ex-ante publication of detailed critical branches, GSK's and common grid models to MPs**
- Two examples will be developed:
  1) How to force TSOs to redispatch the power plant´s infeeds thanks to "adequate" XB shifts within the generation pattern
  2) How to influence the physically possible Net Positions thanks to internal trade-off between 2 power plants within the same hub

TSO perspective: Example 1

SOS issues with a TSO perspective

XB shifts in the generation pattern

- Consider a "3-hub" simplified network which is, like in the TSO operational process, monitored in N and N-1 conditions
- After load flow analyses and check against SOS principles, the situation is assessed safe
- => **No further action are considered by the TSOs at capacity calculation stage**

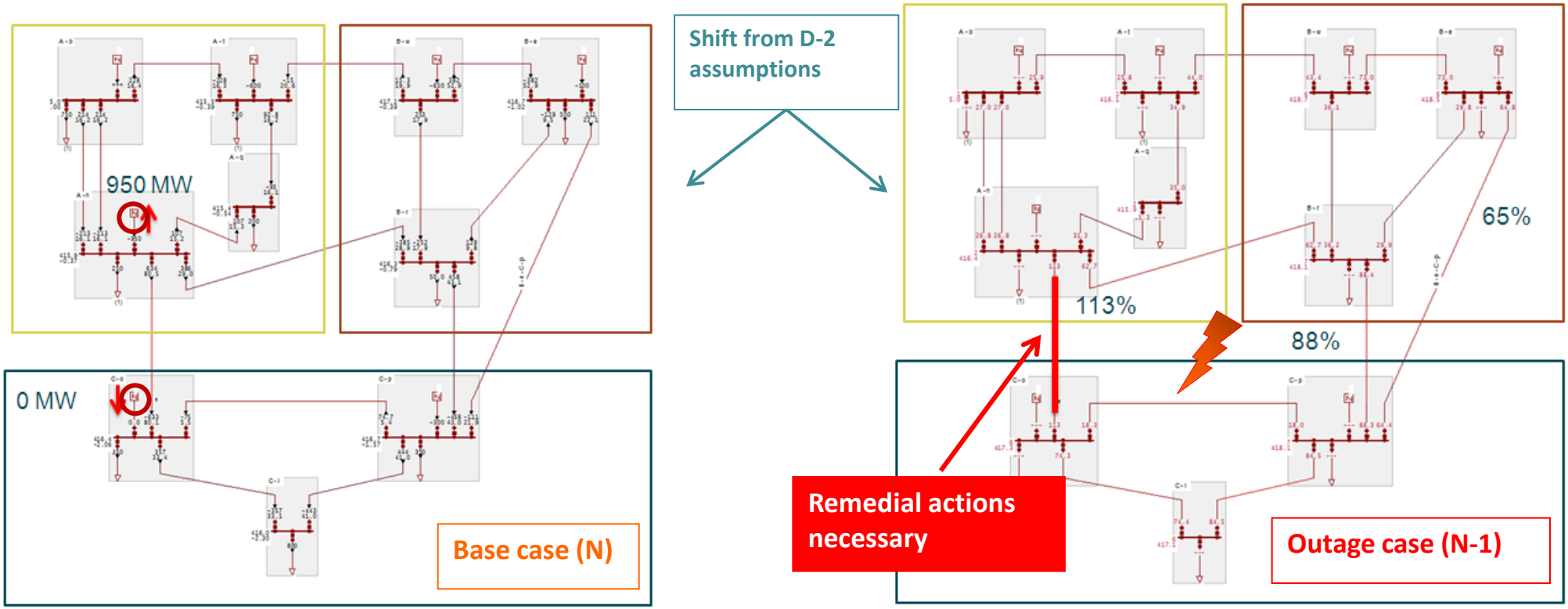


TSO perspective: Example 1

SOS issues with a TSO perspective

XB shifts in the generation pattern

- Let's imagine a shift of the generation pattern
- The situation then becomes unacceptable (c.f. the overloaded CB), from an SOS perspective.
- **=> The concerned TSOs may have to trigger redispatching actions in order to mitigate the overload**



TSO perspective: Example 1

SOS issues with a TSO perspective

XB shifts in the generation pattern, first conclusions

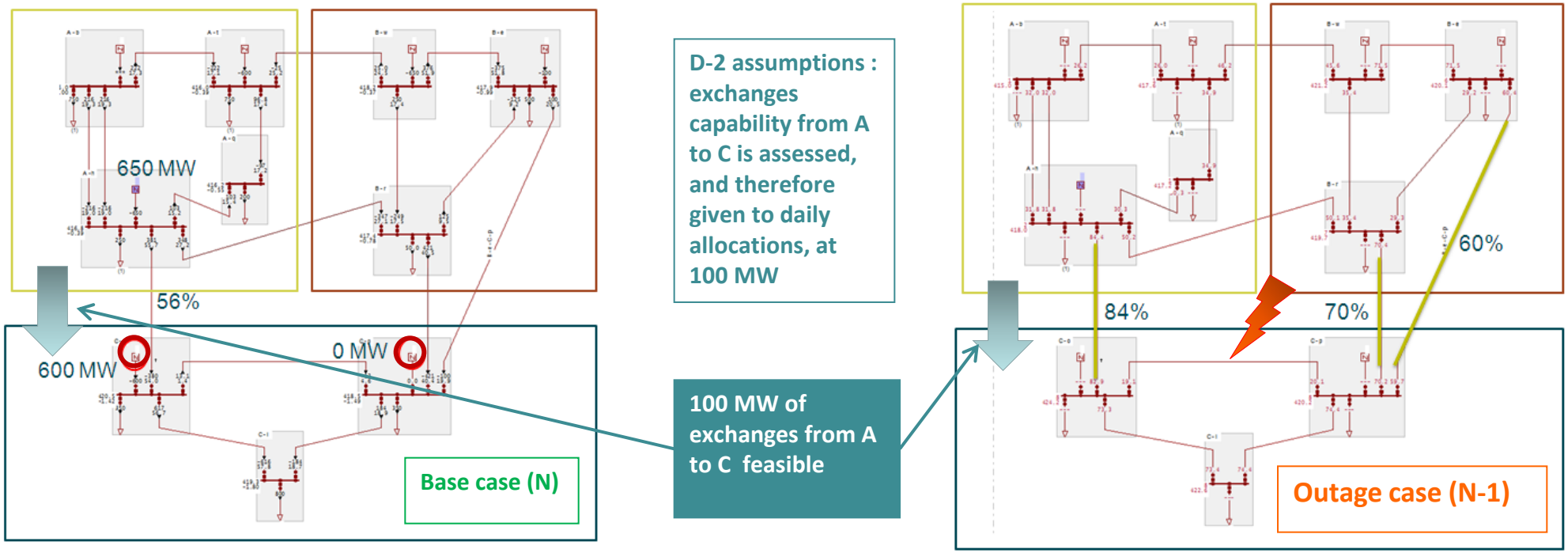
- Detailed publication of all data will let MP's know which elements constraint the capacity calculation domain
- Having access to the full model of the grid, can then allow to assess, how shifts of the generation pattern would affect the lines loading, with respect to their available margins
- MPs, thanks to the publication of the GSK's and the influence of its power plants on each CB, could therefore in theory **create (or release) constraints** on some of them, potentially leading to overloads
- This situation can **result in necessary remedial actions** (even in N situation), to the benefit of the player if the pattern was "adequately" shifted from the TSOs' base case assumptions
- Should such cases arise, **TSOs would face financial exposure and potentially significant SOS issues**

Transparency discussion: Example 2

SOS issues with a TSO perspective

Influence on practical, real time, feasible Maximum/Minimum Net Positions

- In order to make the case easier to understand, let's consider a simplified network, that is, like in the FB process, monitored in N and N-1 conditions
- After load flow analyses and check against SOS principles, the situation is assessed safe
- => **No further action are considered by the TSOs at capacity calculation stage**

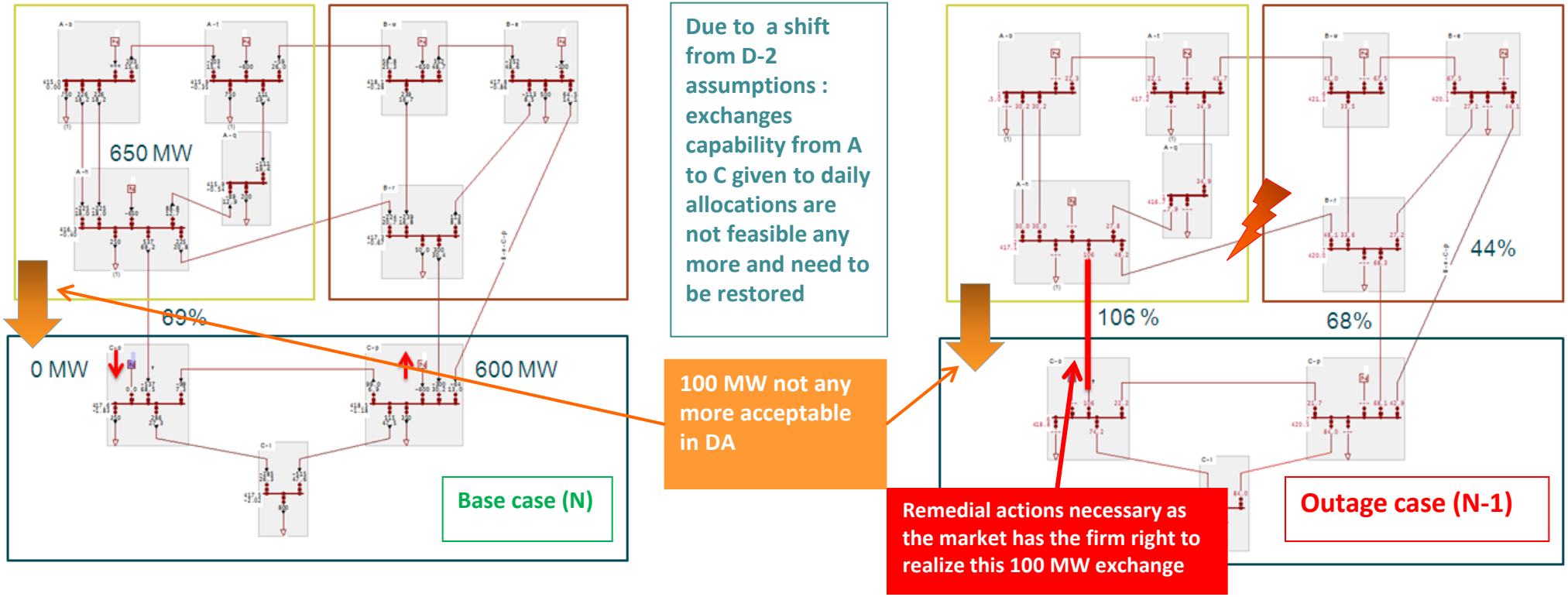


Transparency discussion: Example 2

SOS issues with a TSO perspective

Influence on Maximum/Minimum Net Positions

- Let's imagine a shift of the generation pattern, this time happening within one hub
- **The situation becomes unacceptable in N-1 (c.f. the overloaded CB), from an SOS perspective**
- The concerned TSOs may have to **trigger redispatching actions in order to mitigate the overload**



Transparency discussion: Example 2

SOS issues with a TSO perspective

XB shifts in the generation pattern, other observations

- In this case, the net positions of each country are not affected by the shift of the generation pattern. However, the **practical import / export physical capabilities of the hubs are affected**
- Once again, the concerned TSOs will have, should the case arise, to trigger actions in order to re-establish these exchange capabilities, which are physically firm
- These actions would be triggered closer to real time, **potentially generating some profits on the balancing markets for some parties and/or generating an SOS breach for TSOs**

Transparency discussion

Confidentiality of data linked to CGM

- Finally, CWE TSOs would like to highlight that the requested CGM contain confidential / sensitive elements:
  - The merged D2CF also contains data corresponding to non-CWE TSOs. CWE TSOs cannot take the initiative to disclose such information, and removing “non CWE data” from the merged CGM would result in completely inconsistent, useless files
  - CGM, as well as detailed GSK, contain information and hypothesis on generation patterns that Market parties might not want to be publicly disclosed
  - The level of detail contained in the D2CF largely exceeds the normal standards of Entsoe publications. CWE TSOs simply do not have the right to overcome these standards
- For these reasons, CWE TSOs remain quite cautious with respect to the request of publishing detailed information

Transparency discussion: Legal assessment (1/2)

Publication of critical branches

- In order to identify legal obligations in terms of transparency, CWE TSOs' legal experts have reviewed the following texts : REMIT, CACM NC and the Transparency Regulation

- From the **REMIT analysis**, it appears that:
  - while there are a lot of uncertainties surrounding the concept of "inside information" to be published under REMIT, it nevertheless clearly appears that it would be in total contradiction with EU legislator's ratio legis to compel TSOs to disclose information related to the CBs they operate, if such disclosure had a negative impact on the security of energy supply and would expose the CBs to terrorist attacks, among others threats
  - Furthermore, it is common settled case-law that primacy should be granted to public interests over individual interests when those two categories enter into contradiction and, consequently, that the principle of security of energy supply should prevail over the market participants' interest of daily bidding strategy
  - should someone consider that the obligation to publish information related to CBs exists under REMIT, it could be argued that the exemptions from publishing inside information foreseen under REMIT also apply to CBs, namely:
    - Article 4(2) regarding inside information in general and
    - Article 4(7) regarding sensitive information relating to the protection of critical infrastructure, as defined in the Critical Infrastructure Directive

- the **draft CACM NC** does not oblige TSOs to publish information related to CBs. Indeed, while the draft CACM NC provides an exhaustive list of which items must be made publicly available (e.g. back-up procedures), such list does not contain as such an obligation to publish information related to the identification and location of CBs

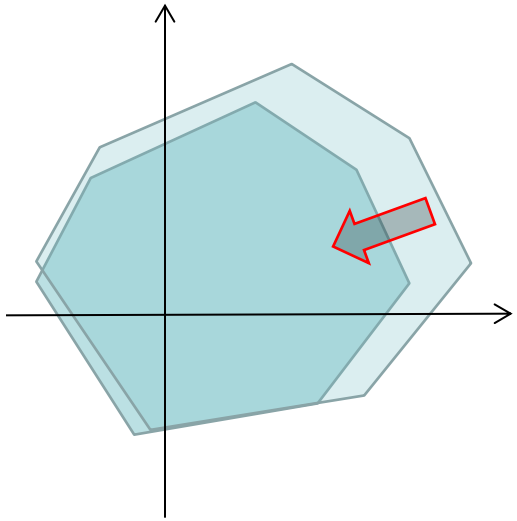
Transparency discussion: Legal Assessment (2/2)

Publication of critical branches

- the **Transparency Regulation** foresees the possibility for TSOs not to disclose information related to the identity and location of the CBs which is considered by their respective Member State as sensitive critical infrastructure protection related information

- Therefore, CWE TSOs conclude that the **current publication proposal** (as developped in the approval package) is **legally compliant**
- It is also confirmed, from a legal standpoint, that the risks associated to the disclosure of "sensitive information" (with respect to European Directive 2008/114 on critical infrastructures) has to be taken into account when addressing publications of XB capacities, and especially publication related to FB critical branches
- Interim analyses are currently being carried out on a national basis in order to specify clearly the abovementioned risk. These analyses, which will in a second step be coordinated at CWE level, do not in any case prejudge the eventual publication modalities which will be deployed when CWE Flow Based goes live

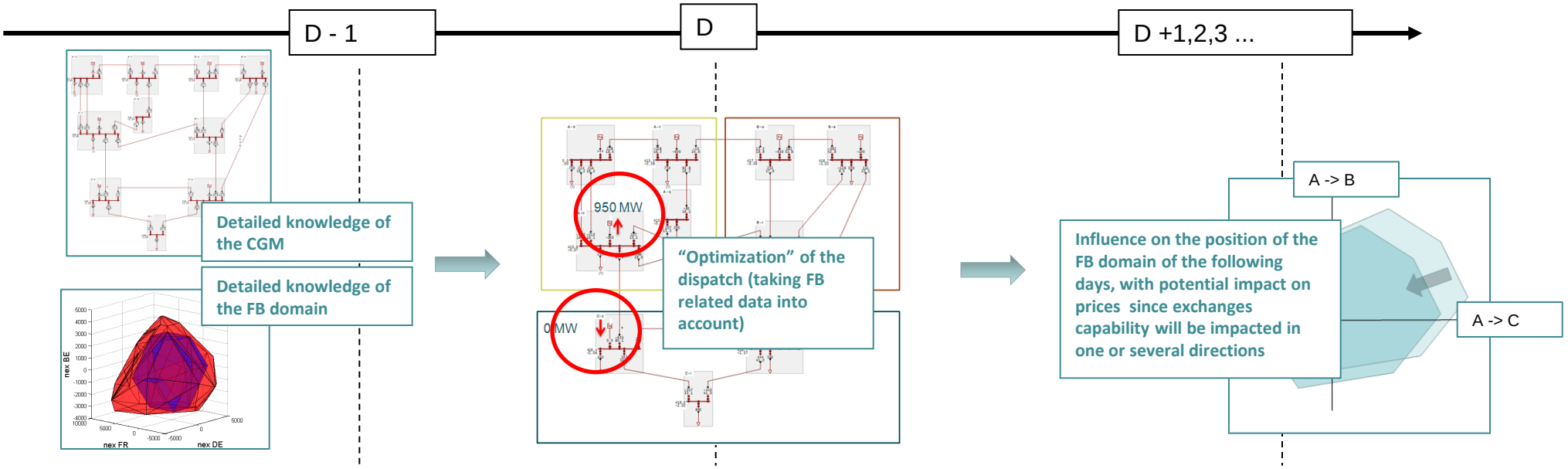
Transparency discussion
-
Potential consequences for the Market



Potential consequences for the market

Identification of potential side effects on the market

- Firstly, in addition to the "TSO-related risks" identified above, such behaviors might accentuate dominating positions as they would only be available to owners of physical assets
- The specific knowledge (detailed CBs, GSKs and elements of the CGM) could be used from day to day to eventually influence the shape of the FB domain, with potential consequences on price formation, as illustrated below:



- Finally, such practices, if deployed frequently, could alter the capability of the TSOs to make adequate forecasts of generation patterns, which will require a response in terms of risk hedging. In Flow Based language, this means that the potential increase of uncertainties related to generation pattern will force TSOs to increase security margins (so-called FRM), to the detriment of the market as a whole

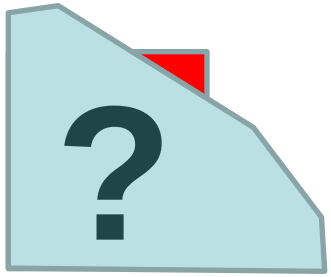
Conclusion

SOS risks for TSOs and potential side-effects for the market

- CWE partners commit to set up an objective and to discuss with MPs in order to **jointly identify adequate standards for data publication** under Flow Based
- The provision of consistent full data may be used in theory to alleviate / increase constrains on the grid. For CWE TSOs, this has a **potential impact on Security of Supply**
- CWE TSOs have also identified **side effects linked to extended publication**, potentially affecting the market :
  - Possible influence on the formation of the FB domain for the next days (and therefore potentially affecting spot prices)
  - Increased uncertainties for TSO (due to late generation dispatch adjustments) and therefore increased security margins. This increase of uncertainty might also affect the capability of market players to anticipate generation patterns and therefore prices on the spot
- CWE partners believe that this risk identification will help to foster a constructive dialogue and to design data publication modalities respecting the constrains of all the involved stakeholders
- The Project remains open to further explain and discuss this issue with the NRAs and Market Parties in order to reach an appropriate compromise, thereby taking into account the following aspects:
  - Legislation
  - Market parties' needs
  - Impact on the efficiency of system operations
  - Interim discussions on national levels (e.g. with respect to critical infrastructure)

Q&A Session

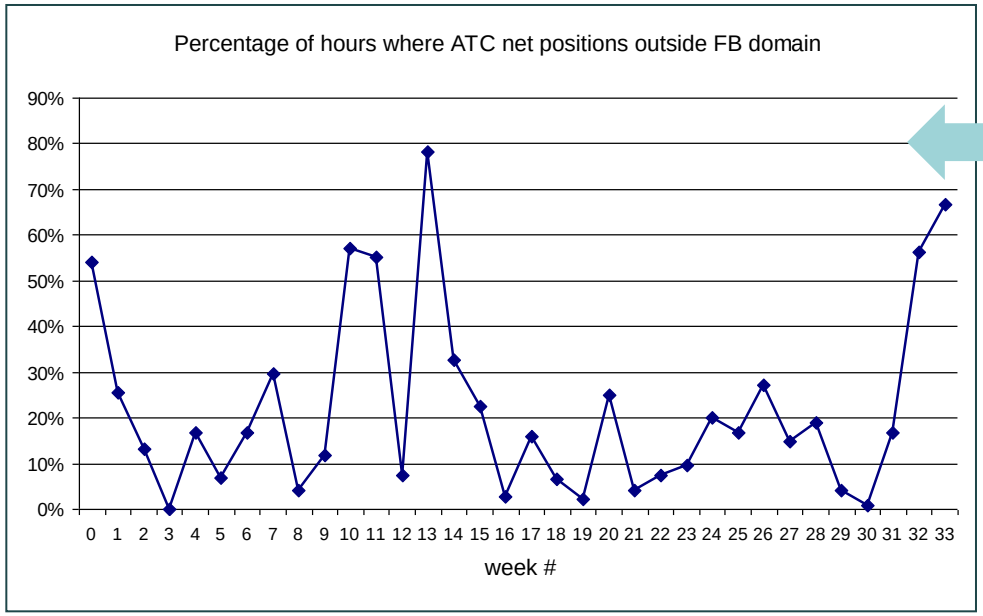
ATC exceeding the FB domain

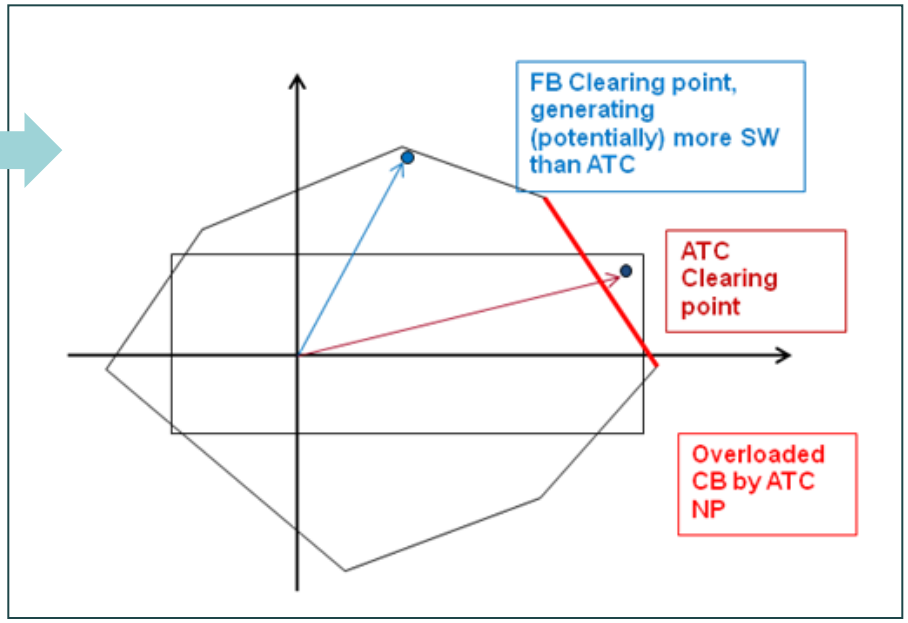


Why ATC sometimes exceed the FB domain : Conceptual introduction

Some facts

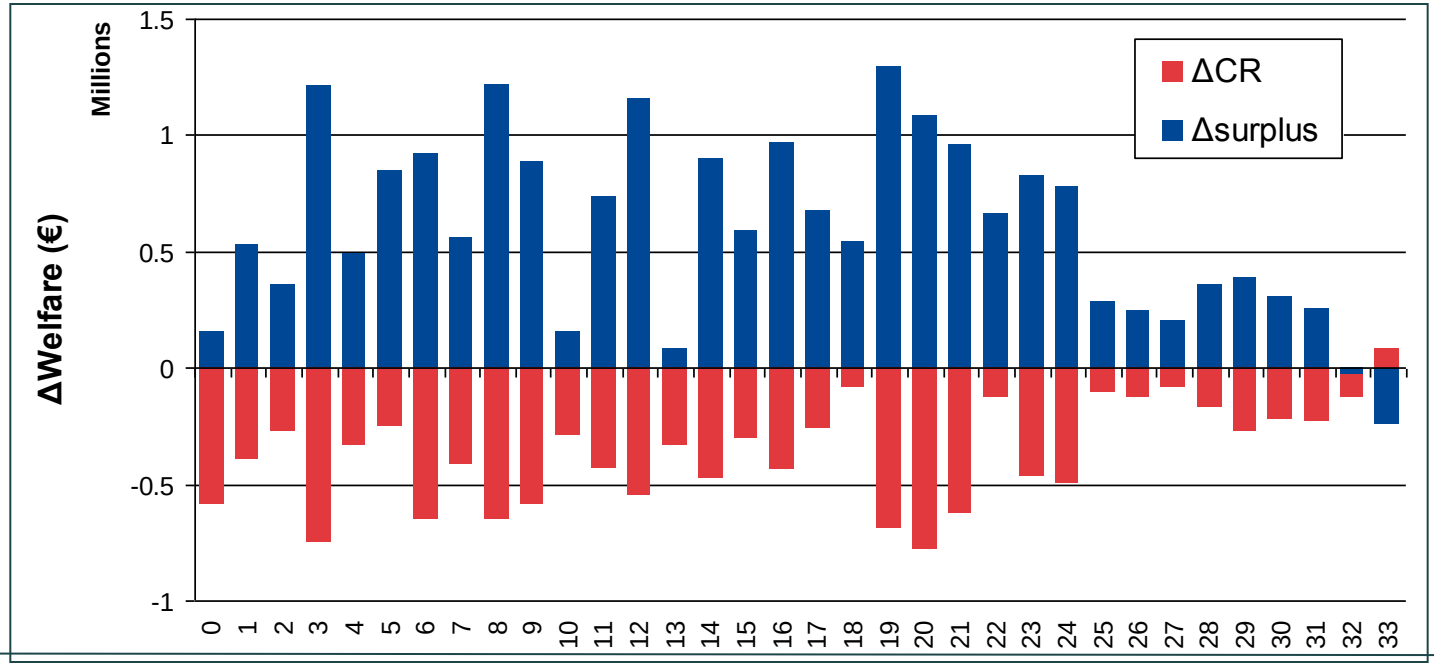
- It has been observed during the FB parallel run that the ATC clearing point is sometimes (in average 1 out of 5) out of the FB domain, meaning that **some FB critical branches would be overloaded by the exchanges generated by the ATC** market coupling solution





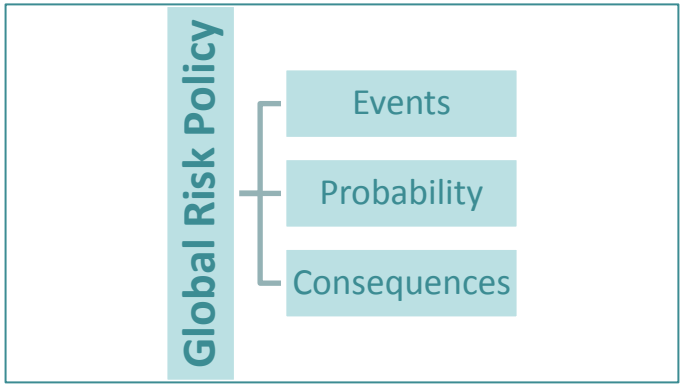
Why ATC sometimes exceed the FB domain : Conceptual introduction

- Such cases raise questions about the consistency of the risk policy standards followed by CWE TSOs from ATC to FB. **Should not the ATC systematically be covered by the FB domain ?** If not, does it mean that current ATCs entail too much risk for the TSOs ? Or that FB sometimes happen to be over-conservative ?
- We will see, from a conceptual angle then with a practical example, why **such cases can happen without contradicting the consistency of the risk policies** applied by the TSOs
- Before, CWE TSOs wish to remind that in the vast majority of cases, including the ones where FB constraints are violated by the ATC clearing point, **the trade-off remains largely in favor of the Flow Based approach**, with respect to welfare and convergence indicators



Why ATC sometimes exceed the FB domain: Globality of TSO SOS policies

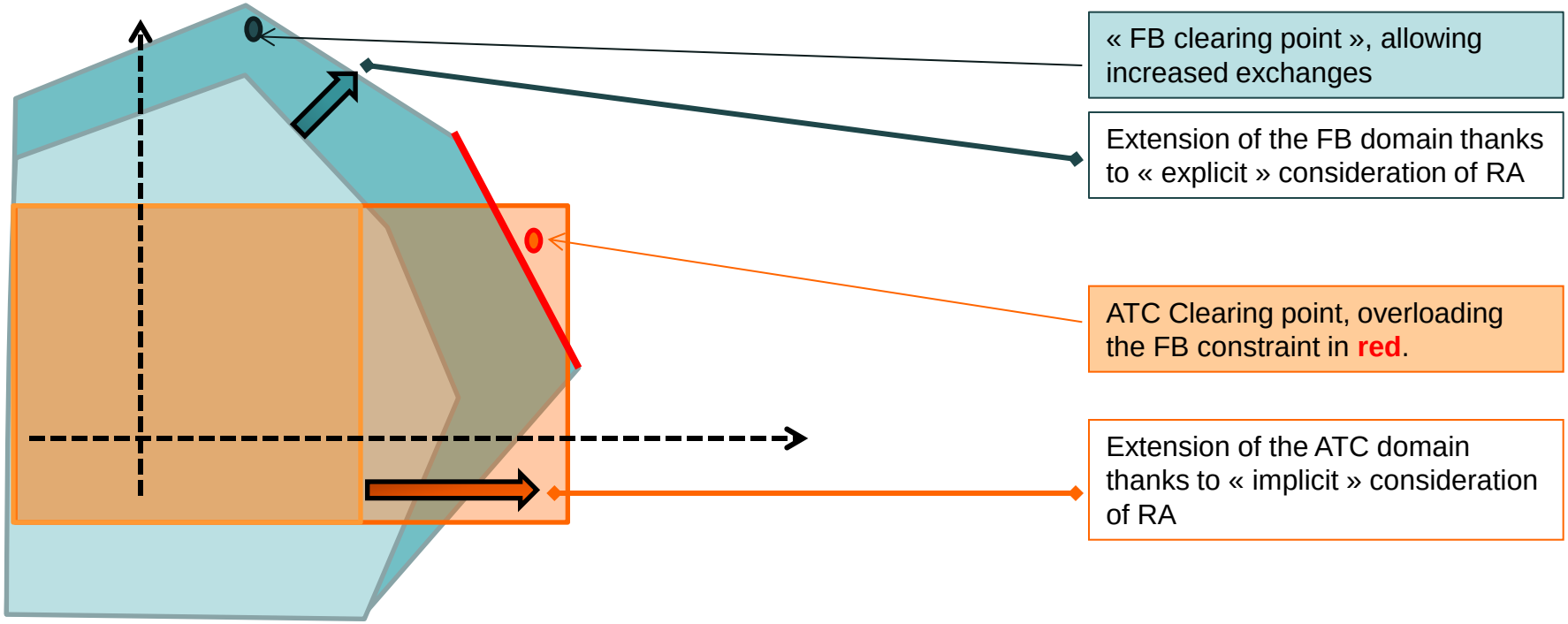
- TSOs apply **global risk policies which are strictly equivalent in ATC and FB**
  However, the differences at implementation level and the increased accuracy of the FB model can sometimes lead to discrepancies between two independent approaches which are based on different assumptions
- Focusing on single cases does not give a representative image of risks management as TSOs' SOS policies are global, statistical approaches



- Therefore, one cannot draw the conclusion that ATCs are not safe or that FB is over conservative. Discrepancies are normal, even though **CWE TSOs expect a progressive decrease in their occurrences** in the course of the parallel run**, thanks to increased experience**
- However, **losses of welfare from ATC to FB, which do not happen systematically when the ATC domain is not fully covered by the FB one**, deserve circumstantial explanations

Same SOS policies but different modeling assumptions

- These somehow abstract concepts can be better understood when **comparing the usage of remedial actions in ATC and FB**
  - The consideration of RA in FB, thanks to a better physical model and enhanced coordination between TSOs, results in a **increased capacity domain**, yet potentially overloaded by some ATC "corners", which on their side result from a "simpler" consideration of RA



- The situation is therefore "normal" but during the parallel run, also a learning phase for TSOs, the efficiency of coordination procedures on the one hand, and the better consideration of all types of remedial actions (including costly ones should the case arise) in FB will increase, which is expected to make such cases scarcer

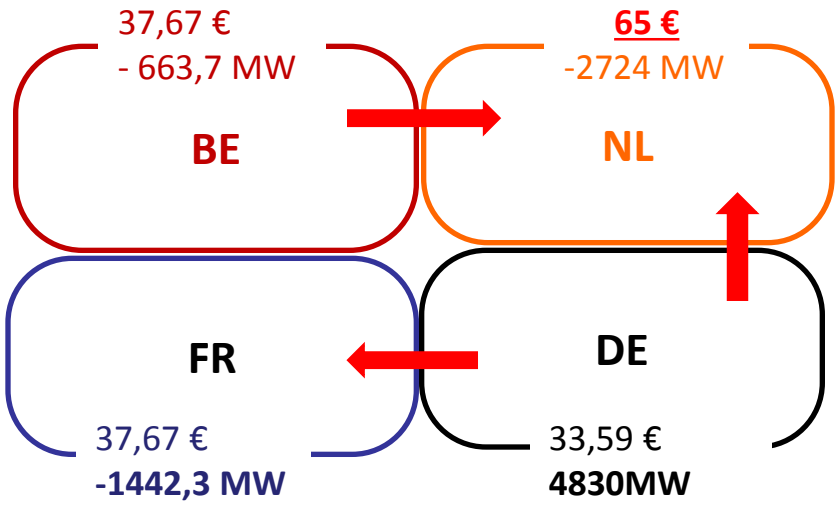
Focus on parallel run results

- These concepts will be illustrated by focusing on two specific cases from the parallel run
  1. **"Normal" parallel run day** (with promising welfare gain from ATC to FB)
  2. Parallel run day from **week 33 displaying a significant degradation of day-ahead market welfare**
- In both cases, the ATC solution violates some FB constraints
- We will see that the specific conditions of the parallel run mainly explain such situations

Focus Case n°1 : week 28, DA welfare gain = 1.2 M€

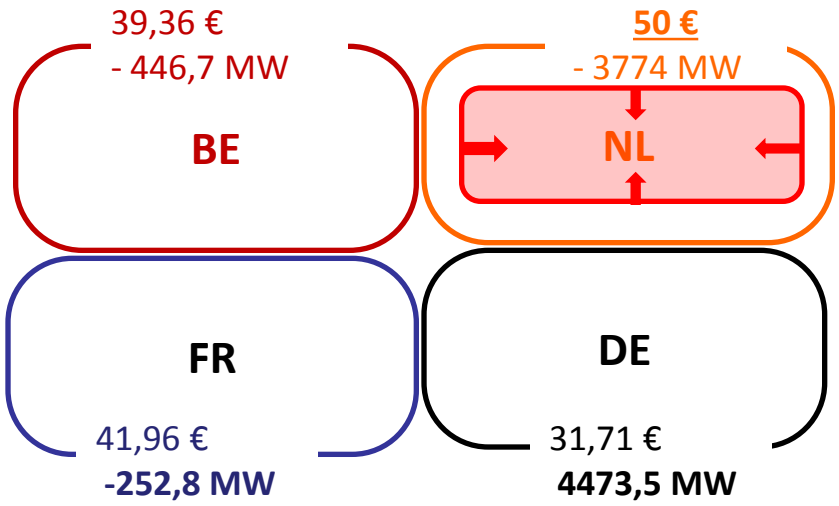
Situation: 11th of July, at 2 – 3 pm

ATC market coupling



- Congested situation in ATC
- Limiting ATC from Germany to France, from Belgium to the Netherlands, and from Germany to the Netherlands.

FB market coupling



- Congested situation in FB or FBI. Active CB is the import limit of NL.
- However the situation significantly improves, prices converge more, mainly thanks to increased imports into NL.

Welfare gain of this day, from ATC to FB, is 211 k€.

Focus Case n°1 : week 28, DA welfare gain = 1.2 M€

Situation: 11th of July, at 2 – 3 pm

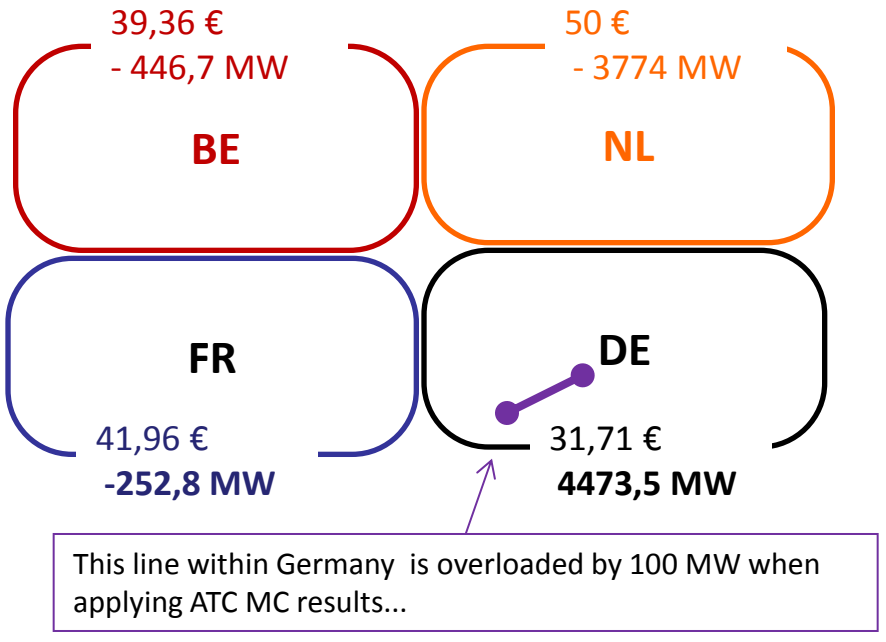
So everything went fine ? Yes but...

- One may have noticed that the ATC clearing point actually violates one FB CB, which is a line within Germany (N-1 case), between 2 German TSOs.
- The check can be performed in the utility tool, which displays an overload of 100 MW when applying strictly ATC MC results.

Does it mean that the ATC domain is not safe ?

- NO, the ATCs computed by the TSOs implicitly consider the usage of a topological RA
- As the line is an “interconnector”, this RA needs to be shared, thanks to coordination between the two concerned TSOs
- Some topological RA are not completely implemented in FB (precisely because RA are explicit in FB, which makes their consideration more accurate but more difficult to implement), which is why sometimes the “missing RA” generates a decrease of day-ahead market welfare.

FB market coupling

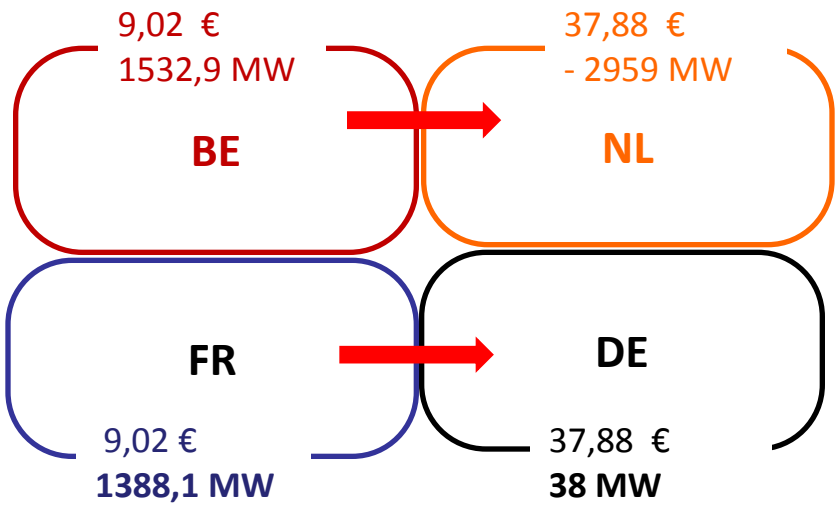


Coordination (and therefore sharing) on all type of topological remedial actions in FB will be accomplished shortly by CWE TSOs

Focus Case n°2 : week 33, DA welfare "gain" = - 1 M€

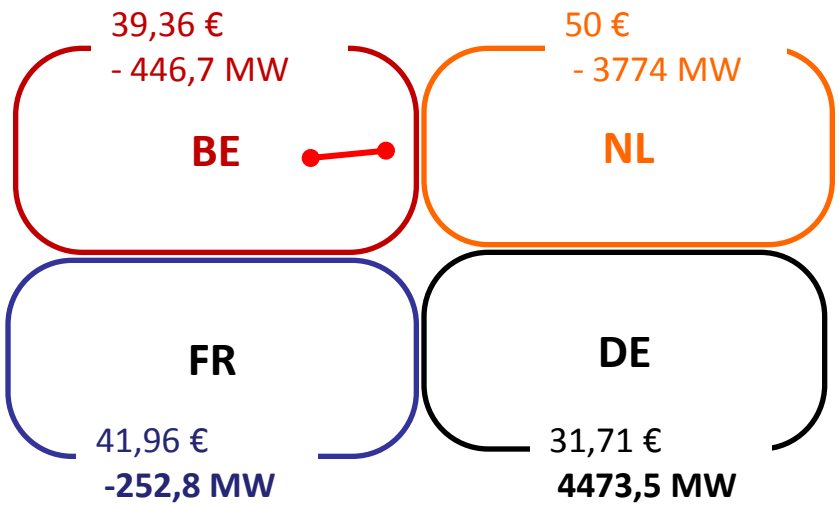
Situation: 15th of August, at 6 – 7 am

ATC market coupling



- Congested situation in ATC
- Limiting ATC from France to Germany, from Belgium to the Netherlands.

FB market coupling



- Congested situation in FB or FBI. Active CB is an internal line of BE, close to the NL border.
- The line is overloaded in the basecase (without any outage happening), i.e. in the so called "N-case".
- It appears that the constraint in BE limits even more the exchange in CWE, especially towards NL, than ATC do.

Welfare "gain" of this day, from ATC to FB, is - 540 k€

Focus Case n°2 : week 33, DA welfare "gain" = - 1 M€

Situation: 15th of August, at 6 – 7 am

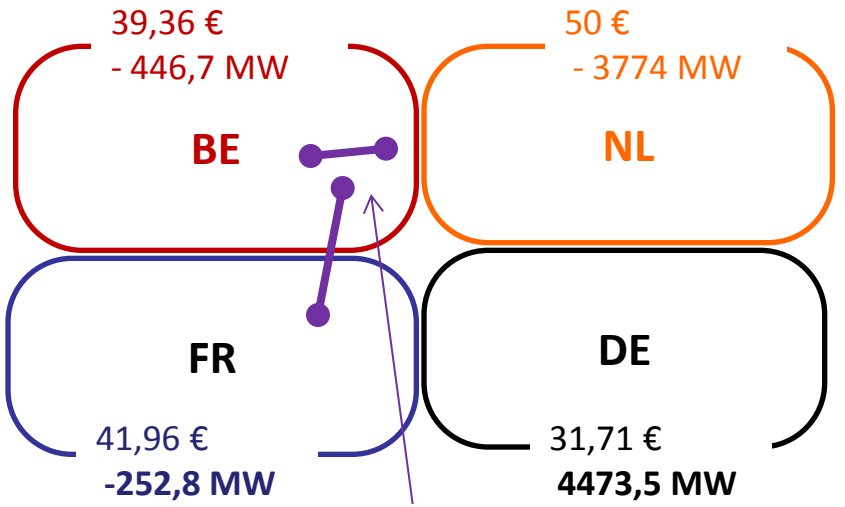
How to explain this drop of SW ?

- Obviously, the drop of SW means that the ATC clearing point is out of the FB domain.
- One can see in the utility tool two overloads appearing when applying the ATC solution. One is due to the CB already active in FB (internal BE line) and the other is due to a BE-FR interconnector monitored in N-1 situation.

Does it mean that the ATC domain is not safe ?

- NO, as in the previous case, it appears that the FB domain is over constraining, mainly due to incomplete coordination.
- The first CB is an internal line overloaded in "N" (or basecase) situation, for which coordination was not considered upfront.
- The other CB is an interconnector BE-FR monitored in N-1. After internal investigation, the concerned TSOs decided that this did not have to be monitored in the framework of a FB computation.

FB market coupling



These 2 BE CBs drastically limit the exchanges in CWE (with respect to ATC) as they are respectively overloaded by 281 and 300 MW when applying the ATC solution.

A: Proper coordination on pre-fault (or "preventive") remedial actions will be shortly implemented by CWE TSOs

B: The CB set is continuously monitored and adjusted, as a normal aspect of the parallel run learning opportunity

Conclusion

- Two explanation for cases where the ATC solutions exceed the FB domain:
  1. a **conceptual** one: globality of TSOs risk policies
  2. a **technical** one: different modeling assumptions
- These situations are therefore normal and should in principle not raise concerns, especially when keeping in mind that FB is creating in average more welfare than ATC
- However, the frequency of such "ATC > FB" cases, and the fact that single outliers have in some cases led to a decrease of day-ahead market welfare can be explained by circumstantial factors, mainly linked to the semi-operational conditions of the parallel run:
  - **Coordination on all type of topological remedial actions in FB** will be accomplished shortly by CWE TSOs
  - **Proper coordination on pre-fault remedial actions** will be shortly implemented by CWE TSOs
  - **The CB set is continuously adjusted**, as a normal aspect of the parallel run learning opportunity
- For these reasons, CWE TSOs expect the number of such cases (especially the "day-ahead market welfare drop" situations) to decrease along the course of the parallel run, even if the absolute disappearance of such situations is not a goal in itself, as contradictory to the independence of the FB approach

Q&A Session

Workshop Session 2:
Impact on market and interpretation of simulation results

by Joel HOEKSEMA (APX), Raphaël BOURGEOIS (Elia), Pieter SCHAVEMAKER (e-bridge)

Workshop 2

Agenda

I. **Explanation of Allocation principles: functioning of the algorithm and intuitive patch**

II. **Impact on Intraday capacities**

III. **Shadow auctions fallback and rollback principles**

Practical advise:

- This workshop is meant to be **interactive** and to give room for discussions
- Please feel free to **ask your questions** or to **comment** after each section
- Questions that go beyond the scope of this workshop will be collected and answered via the Q&A Forum afterwards

FB Capacity Calculation principle

- TSOs impose constraints to the market coupling algorithm in order to safeguard the grid
- FB constraints have two components:
  - **Remaining Available Margin (RAM):** number of MWs that can be used by the trades
  - **Power Transfer Distribution Factor (PTDF):** indicates how much MWs are used by the net positions resulting from the trades
- **The FB search space is the concatenation of the above mentioned constraints**

FB MATRIX

=

As many lines as there are **constraining critical branches** defined by TSOs

+

As many columns as there are **hubs (for each PTDF)**

+

One column for the **RAM** (the **limiting value**)

- In CWE, there are 4 hubs, but the overall DA balance imposes the sum of CWE Net Exchanges (Nex) to equal 0 (linear bound between the four hubs). Consequently, the CWE search-space is **3 dimensional**, each constraint being modeled by a plane in this space

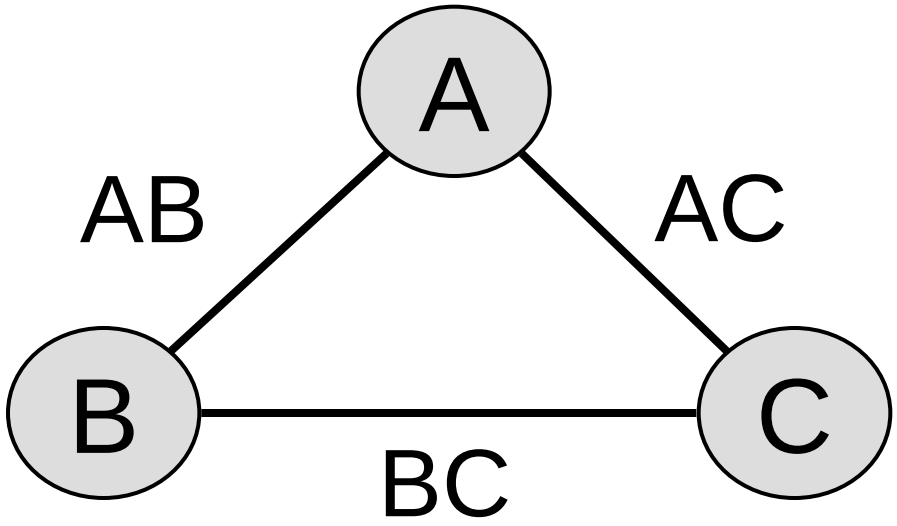
Capacity allocation: basic principle

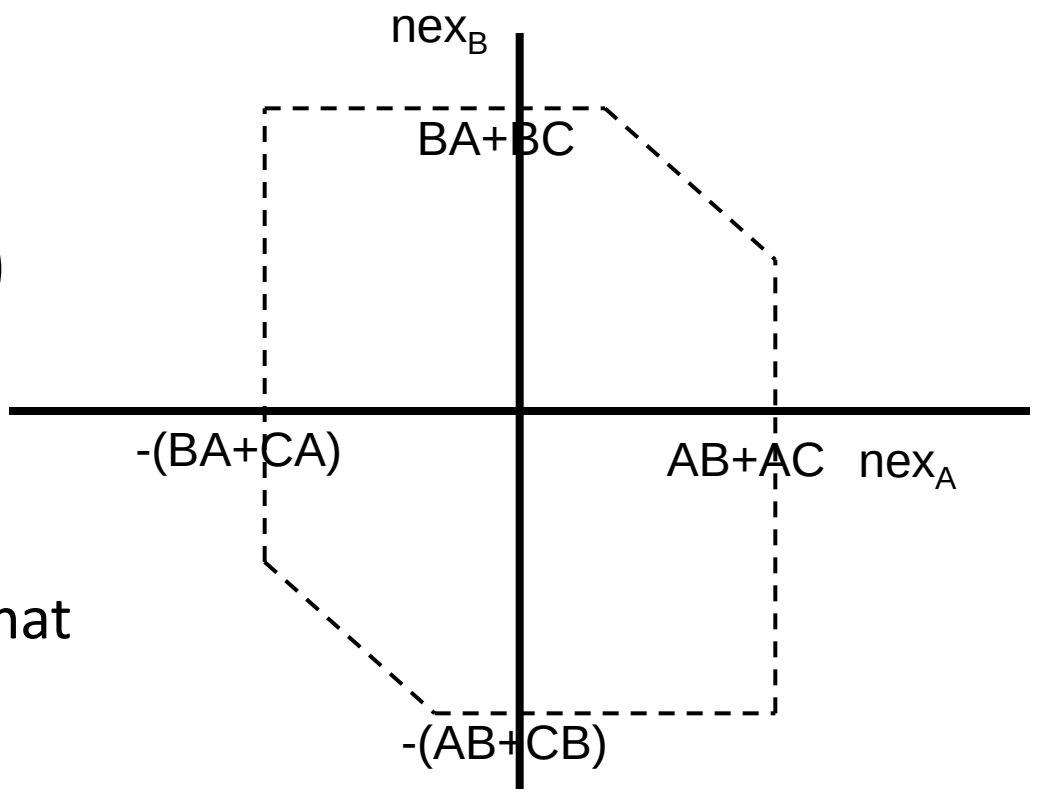
- All the bids of the local/national Power eXchanges are brought together in order to be matched by a centralized algorithm.
- Objective function: Maximize Day-ahead Market Welfare
- Control variables: Net positions
- Subject to: ∑ net positions = 0

Grid constraints

Capacity allocation: basic principle

- ATC constraints





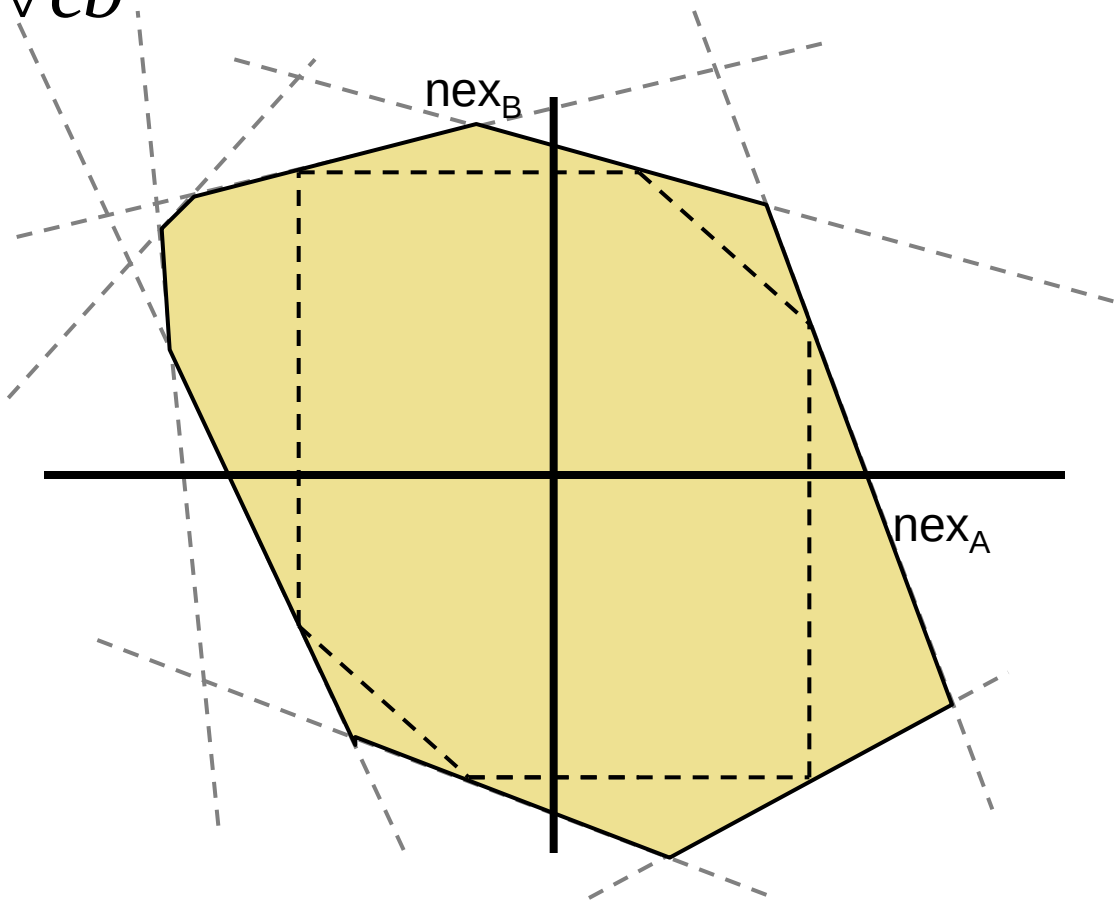
- During allocation the exchanges A→B have no direct impact on what can be allocated on A→C

Capacity allocation: basic principle

- FB constraints

$$\sum_{z \in Z} PTDF_z^{cb} \cdot nex_z \leq RAM_{cb} \quad \forall cb$$

- During allocation an exchange A→B uses some of the scarce margin, therefore directly impacting what can be exchanged on A→C



Capacity allocation: basic principle

- FB constraints
  - Consider two exchanges: either A→B or A→C
  - Consider only an ε exchange: no impact on prices
  - A→B:
    - Welfare increases by $(mcp_B - mcp_A) * \varepsilon$
    - Usage of margin: $(PTDF_A - PTDF_B) * \varepsilon$
  - A→C:
    - Welfare increases by $(mcp_C - mcp_A) * \varepsilon$
    - Usage of margin: $(PTDF_A - PTDF_C) * \varepsilon$
  - For a solution to be optimal, assigning the margin to either A→B or A→C should results in identical welfare contribution. If one would result in more welfare increase than the other, we could improve overall welfare by shifting this balance

Capacity allocation: basic principle

- Equilibrium condition:

$$\frac{(mcp_B - mcp_A)\cdot\varepsilon}{(PTDF_A - PTDF_B)\cdot\varepsilon} = \frac{(mcp_C - mcp_A)\cdot\varepsilon}{(PTDF_A - PTDF_c)\cdot\varepsilon} = \mu$$

$$\Rightarrow mcp_B - mcp_A = (PTDF_A - PTDF_B)\cdot\mu$$
$$\Rightarrow mcp_C - mcp_A = (PTDF_A - PTDF_C)\cdot\mu$$

- In general:

$$mcp_i - mcp_j = \sum_{cb}\left(PTDF_j^{cb} - PTDF_i^{cb}\right)\cdot\mu_{cb}$$

Capacity allocation: basic principle

- Three market example:

€ 40
+600
A

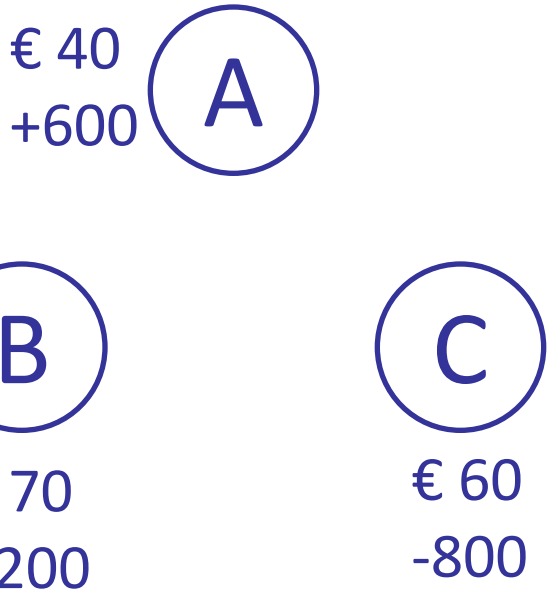
B
€ 70
+200

C
€ 60
-800

- The prices and net positions are an outcome of the allocation process
- The indicated PTDF is only the constraining one (we assume the other PTDF constraints did not constrain the market, so they were omitted)

Capacity allocation: basic principle

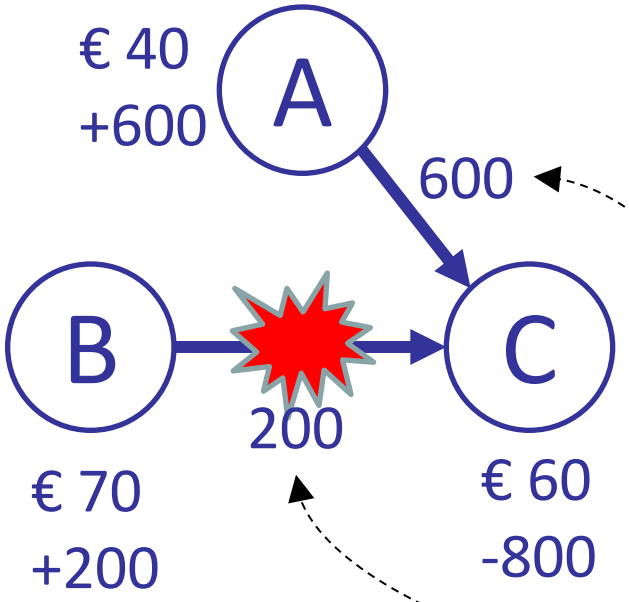
- Three market example:



- This respects our price relationship for μ = 40:

Capacity allocation: basic principle

- Three market example:

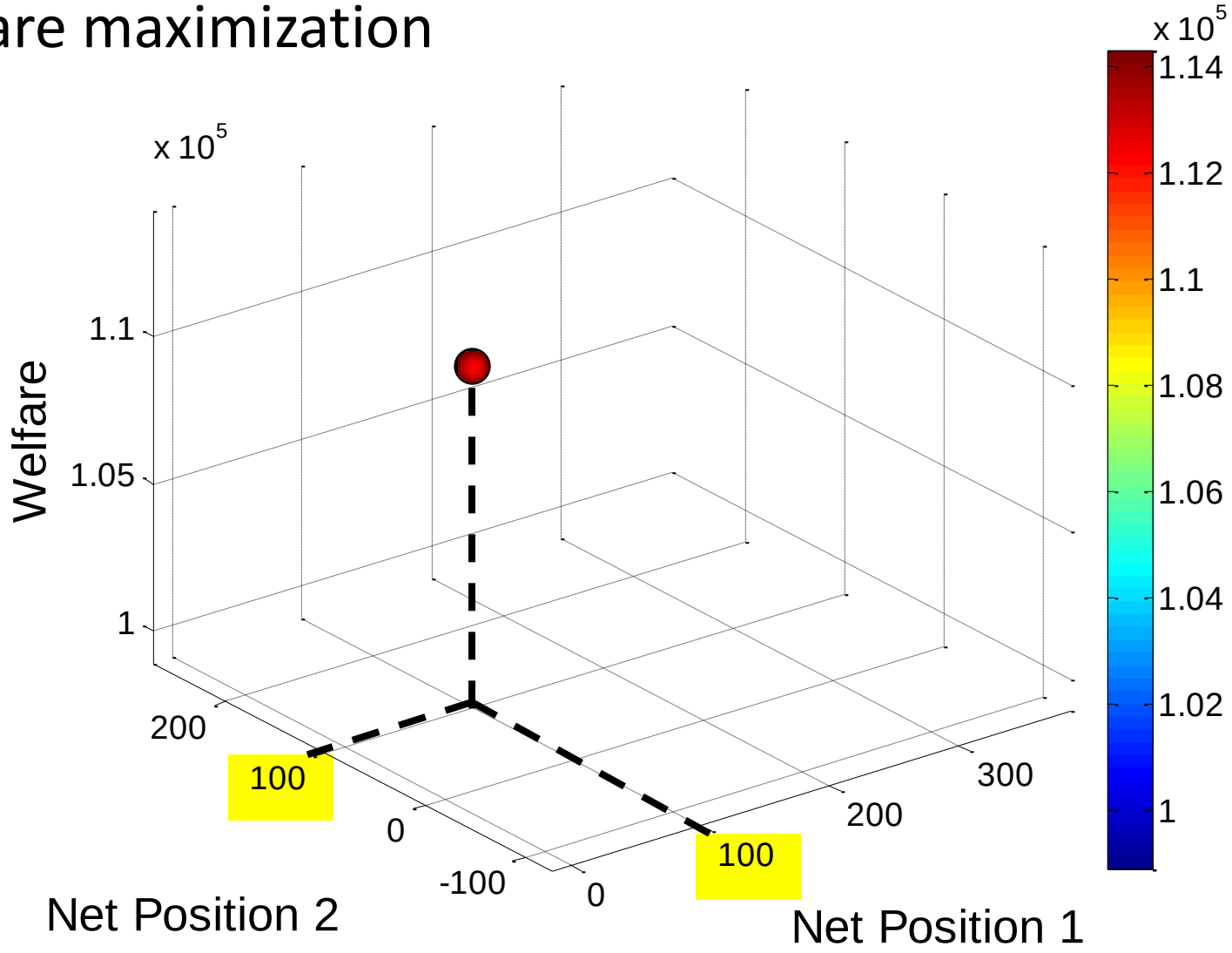


- But not intuitive!

Possible decomposition of net positions

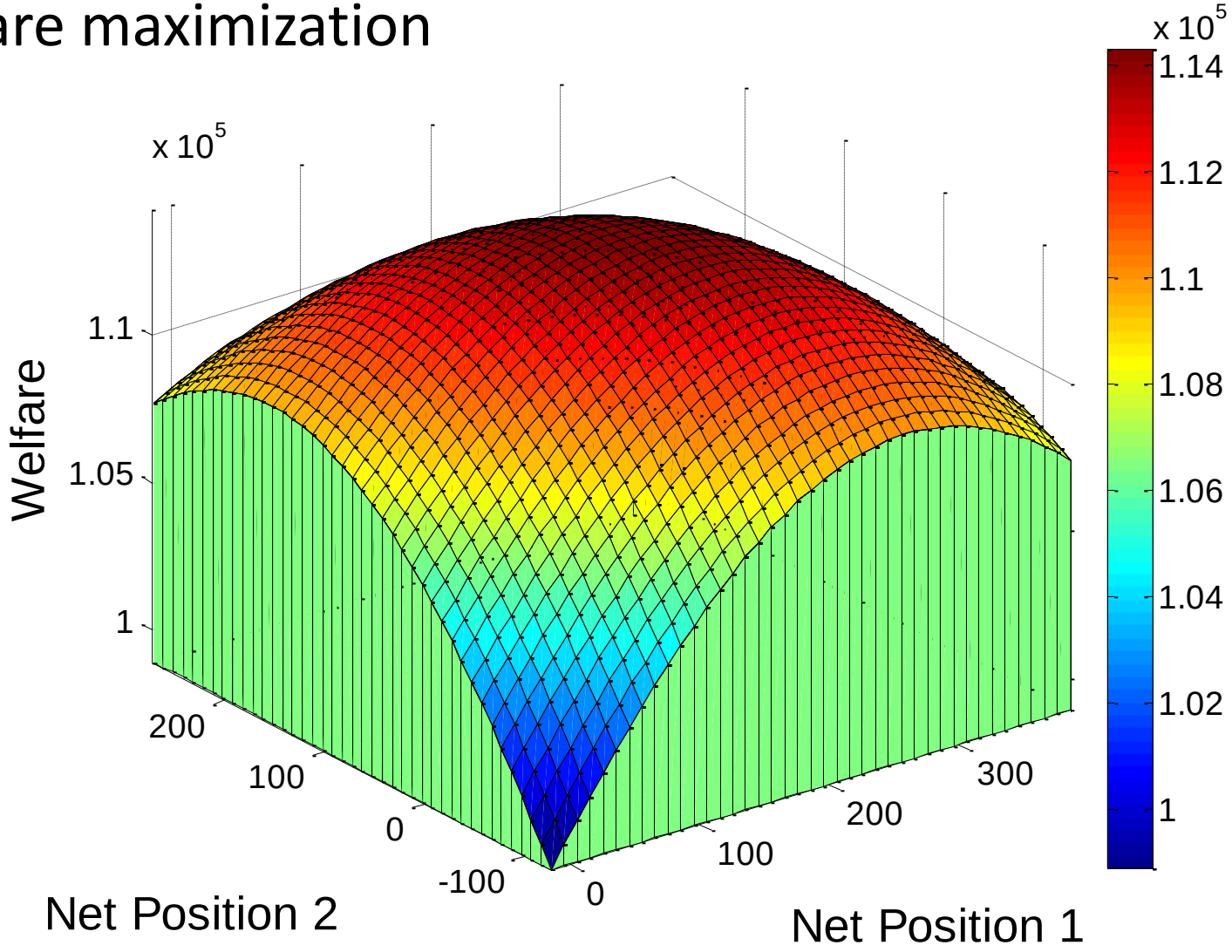
Capacity allocation: basic principle

- Welfare maximization



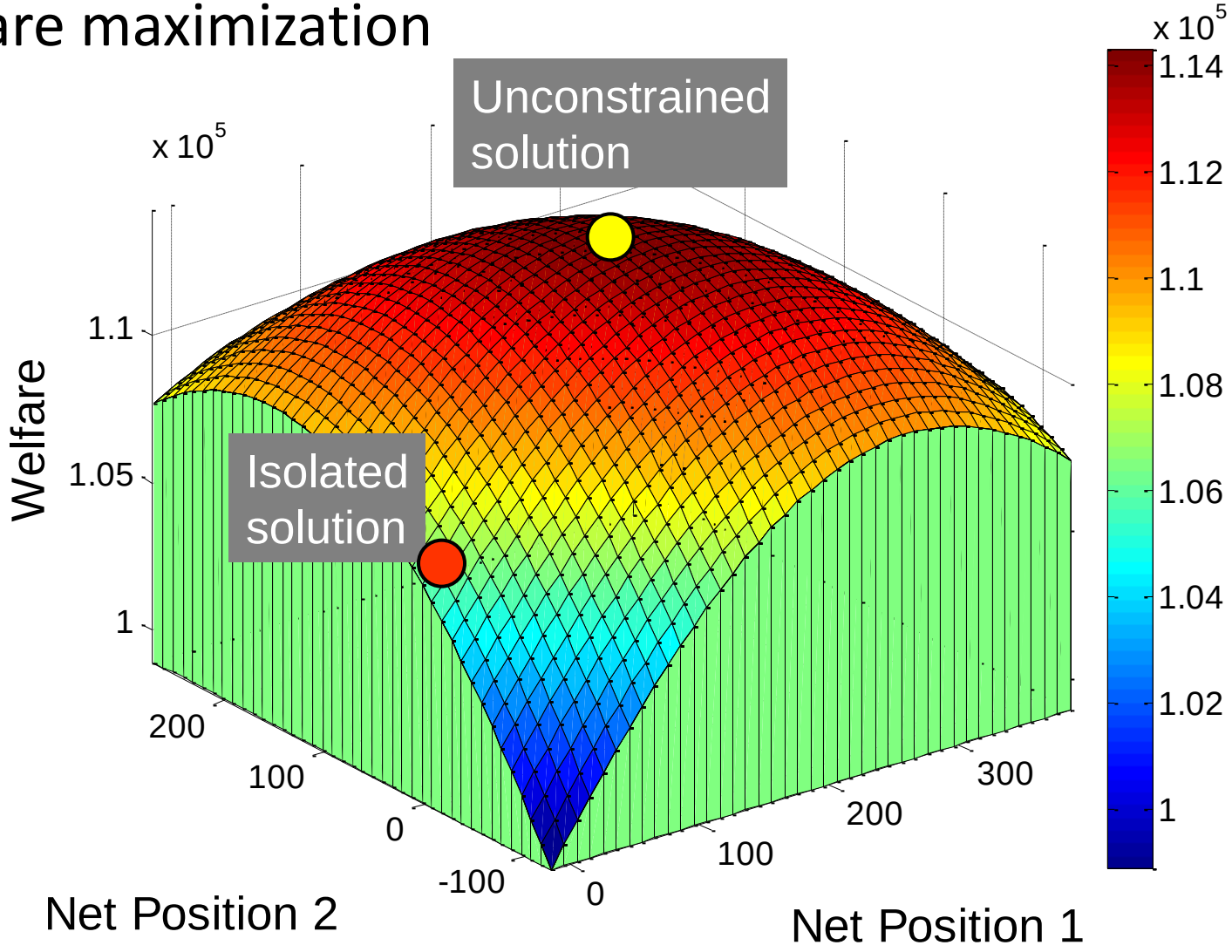
Capacity allocation: basic principle

- Welfare maximization



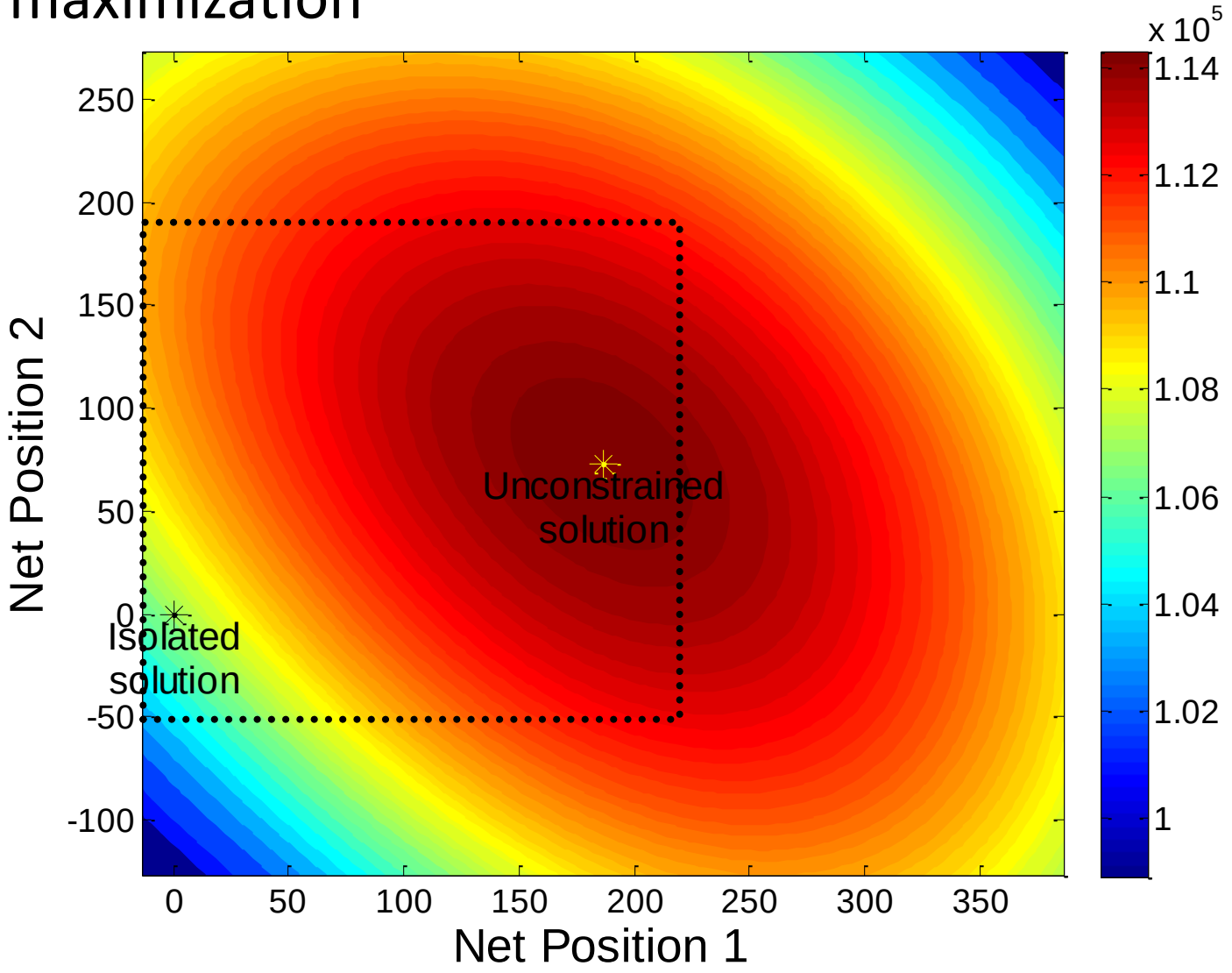
Capacity allocation: basic principle

- Welfare maximization



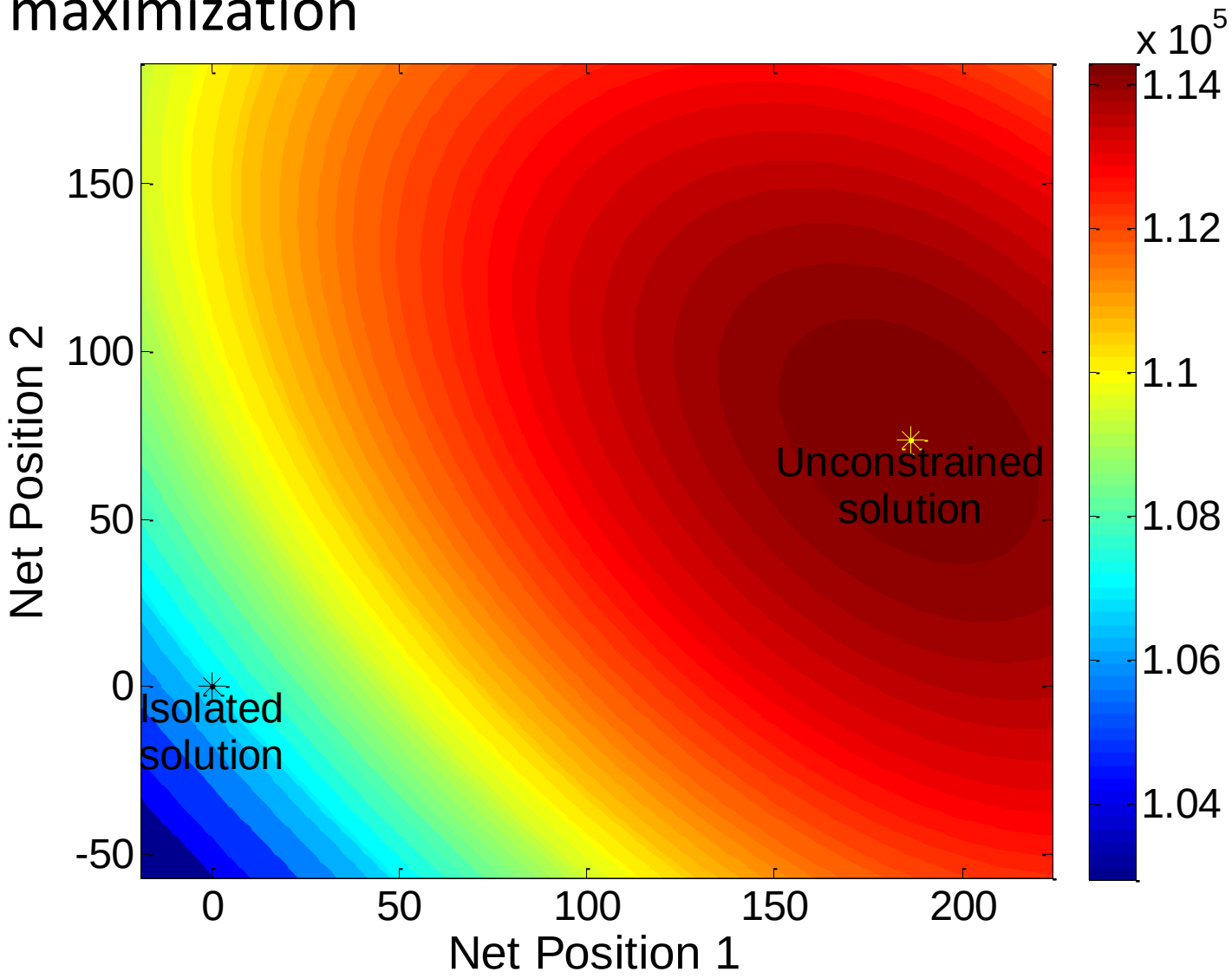
Capacity allocation: basic principle

Welfare maximization



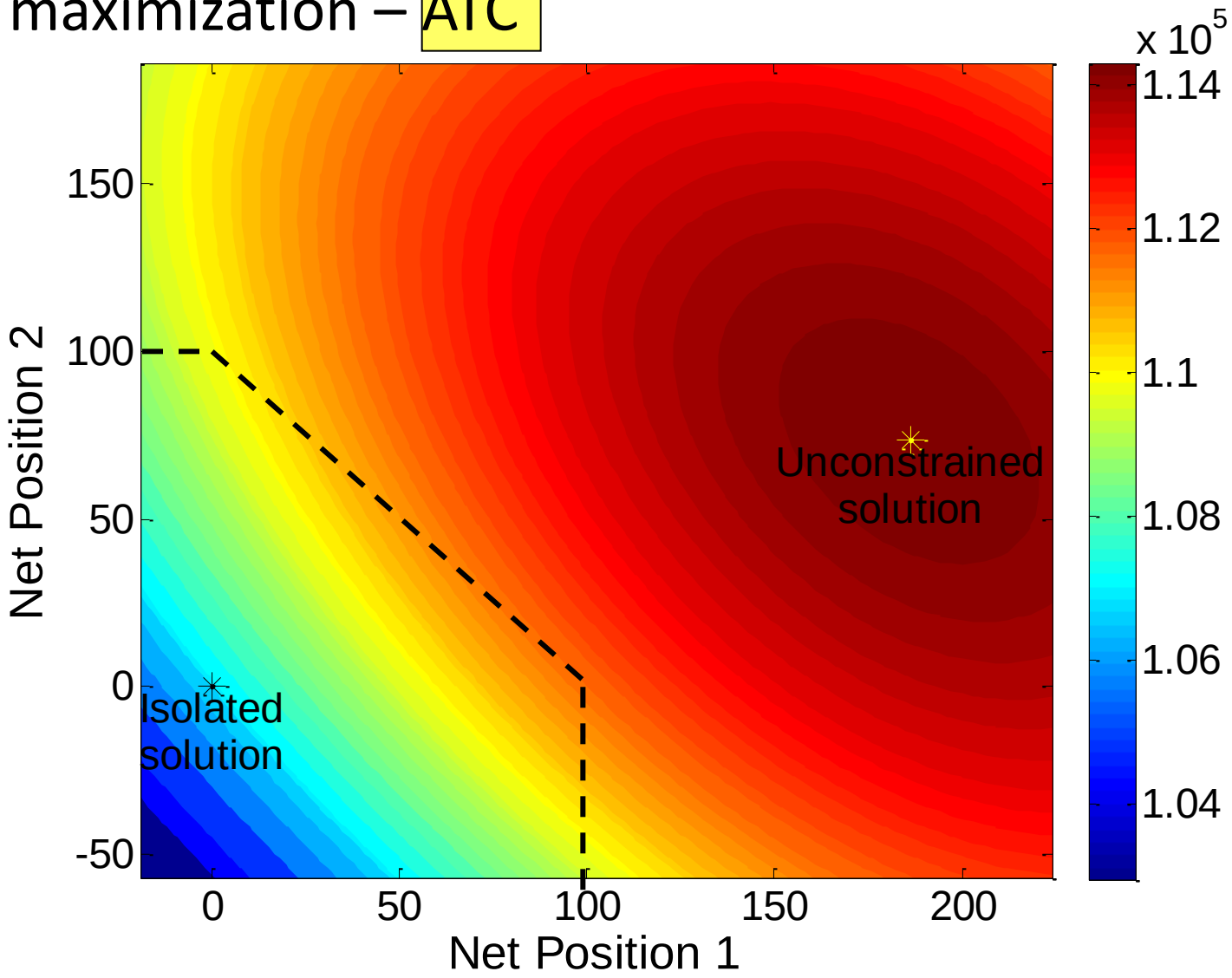
Capacity allocation: basic principle

Welfare maximization



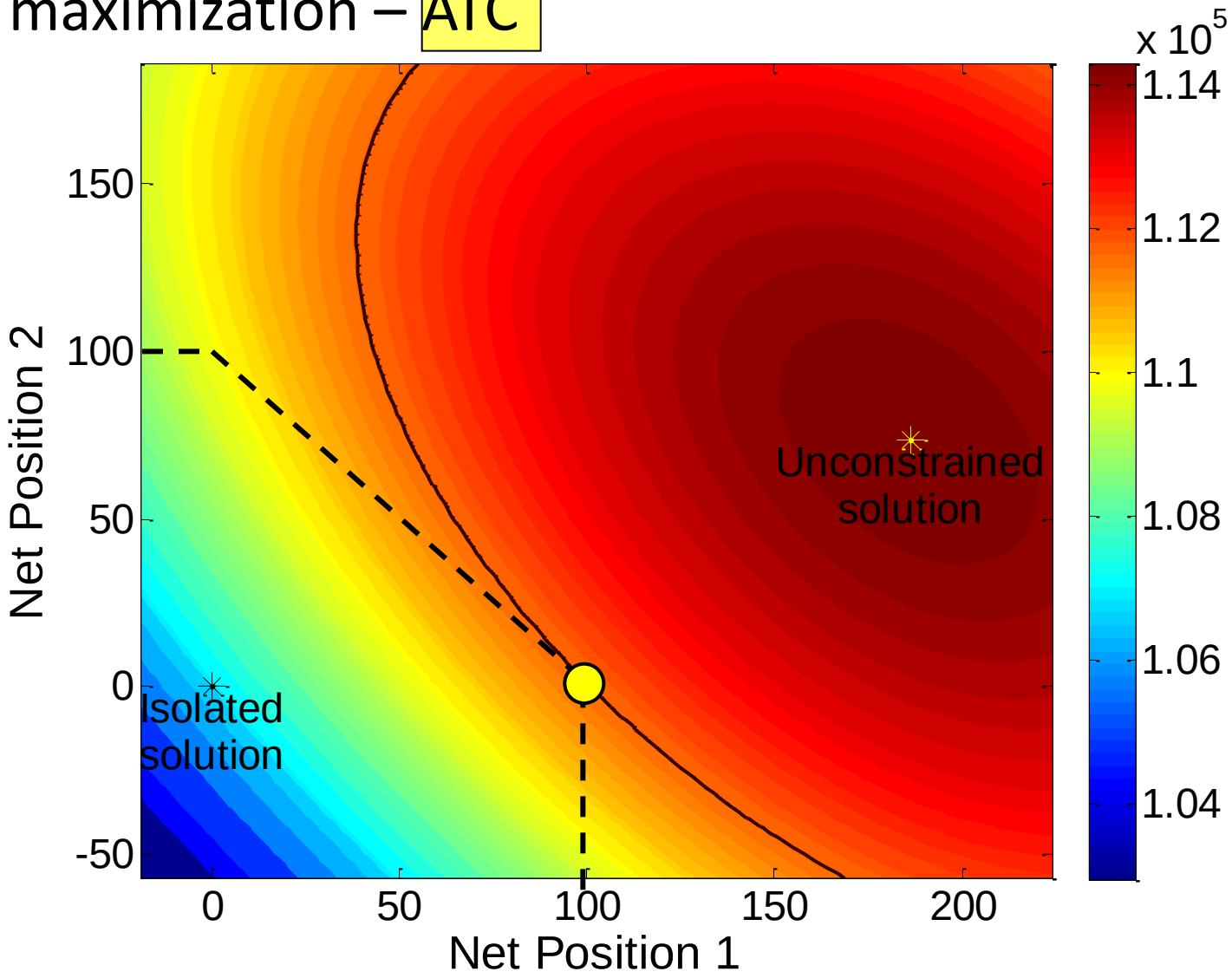
Capacity allocation: basic principle

- Welfare maximization – ATC



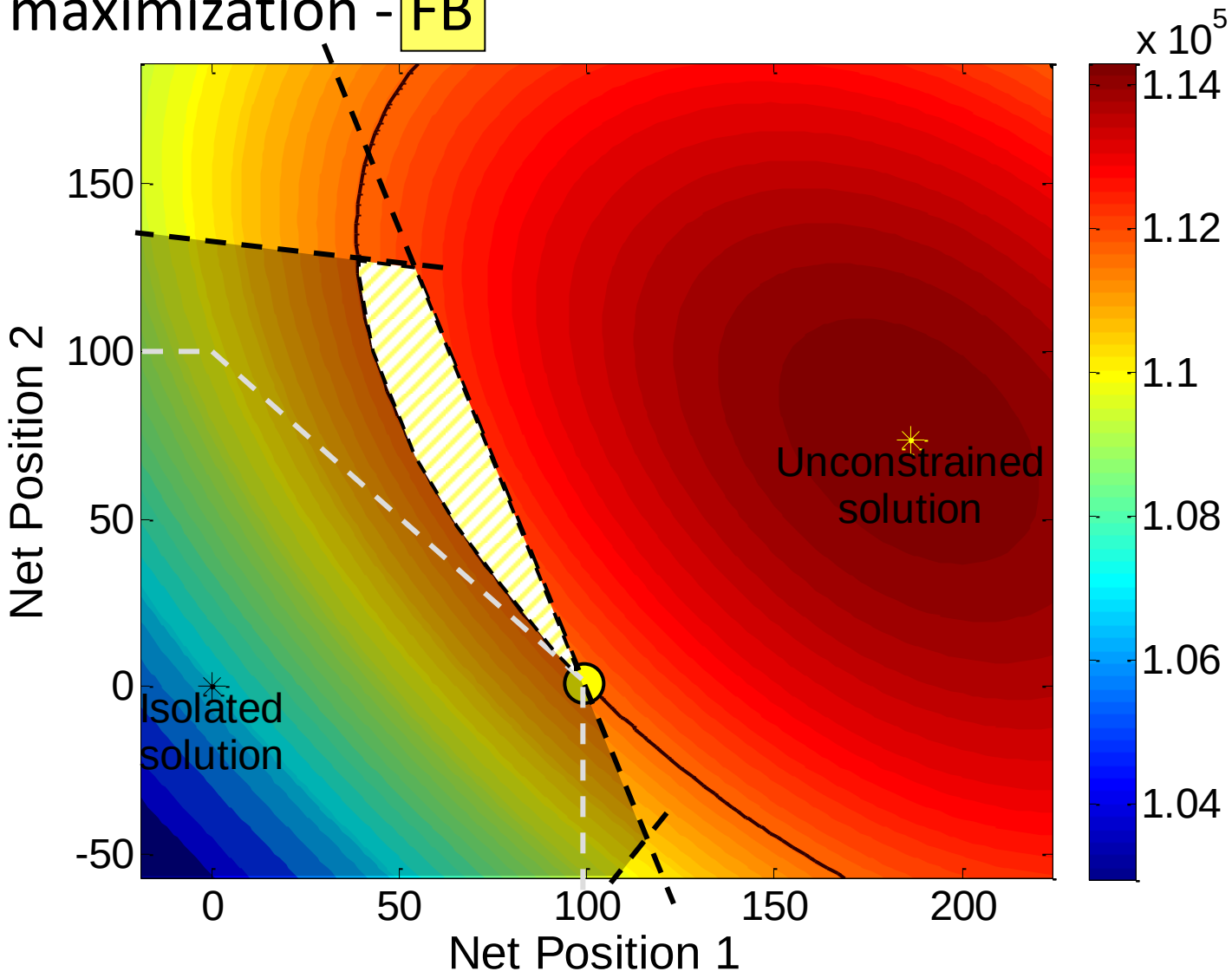
Capacity allocation: basic principle

- Welfare maximization – ATC



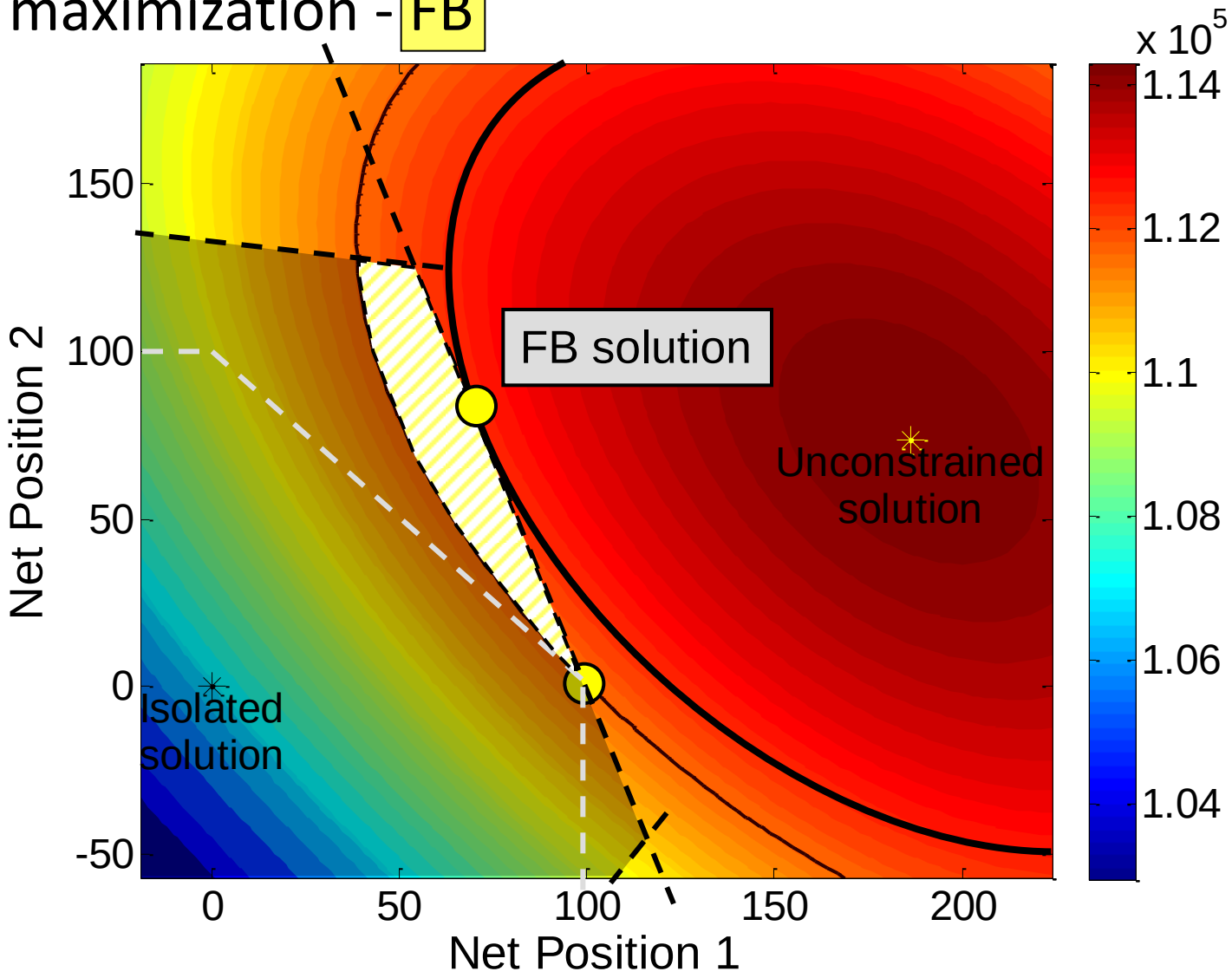
Capacity allocation: basic principle

- Welfare maximization - FB



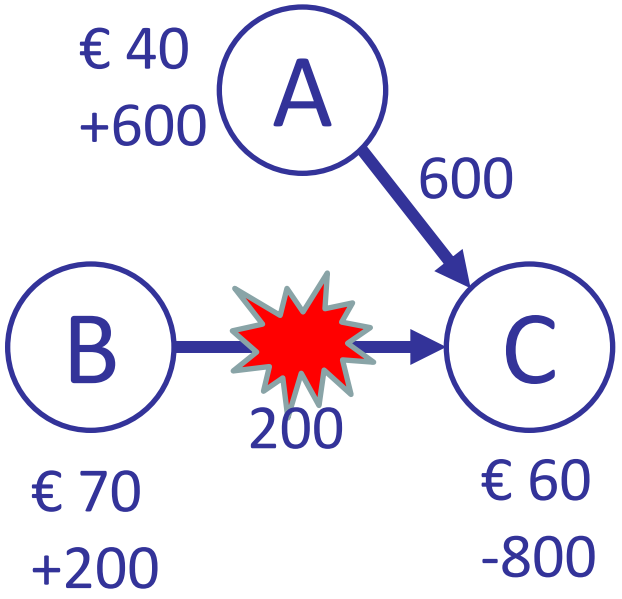
Capacity allocation: basic principle

- Welfare maximization - FB



Capacity allocation: basic principle

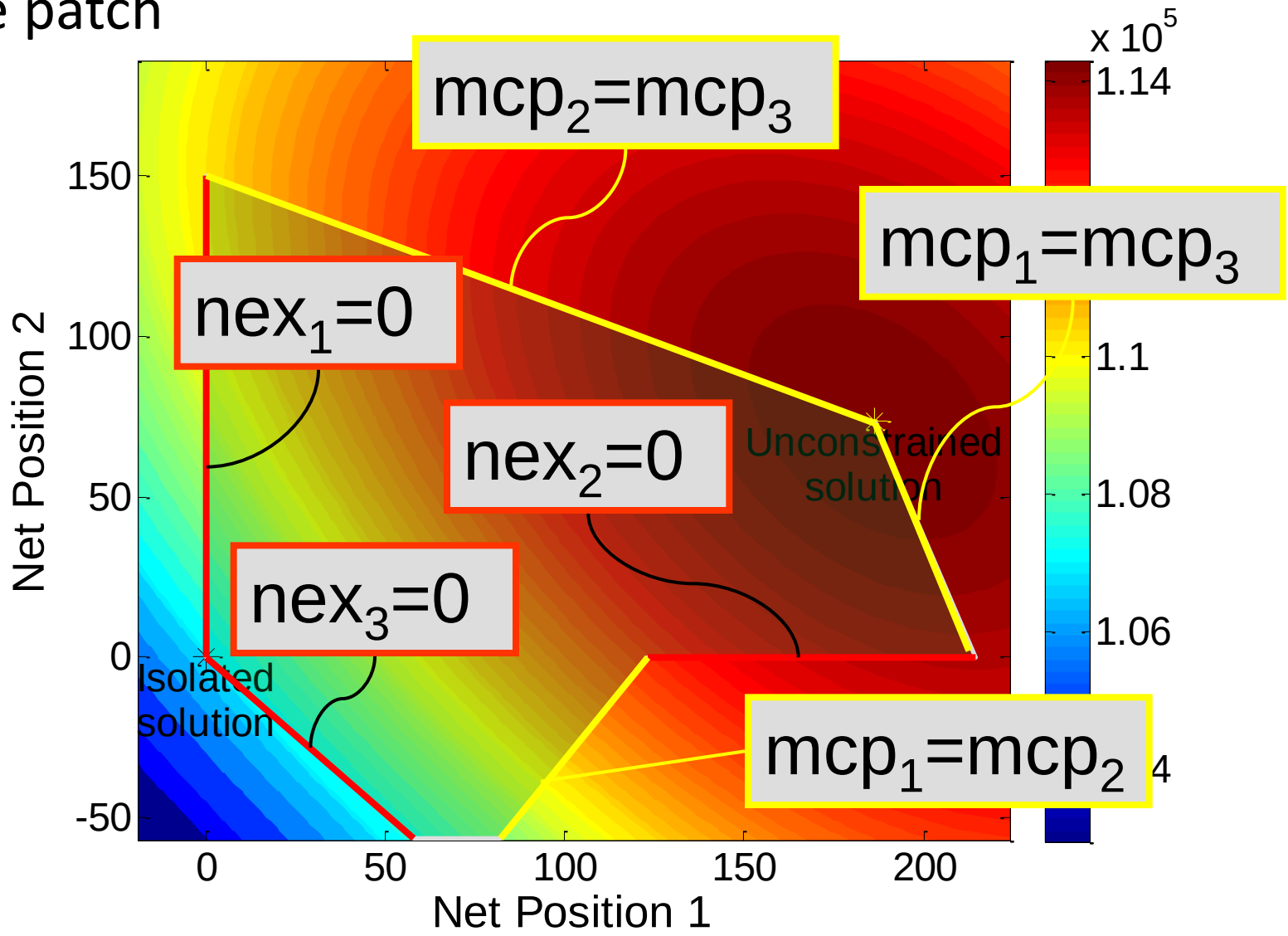
- Intuitive patch – prevent non-intuitive results, such as:



- Consequently part of the domain will be discarded

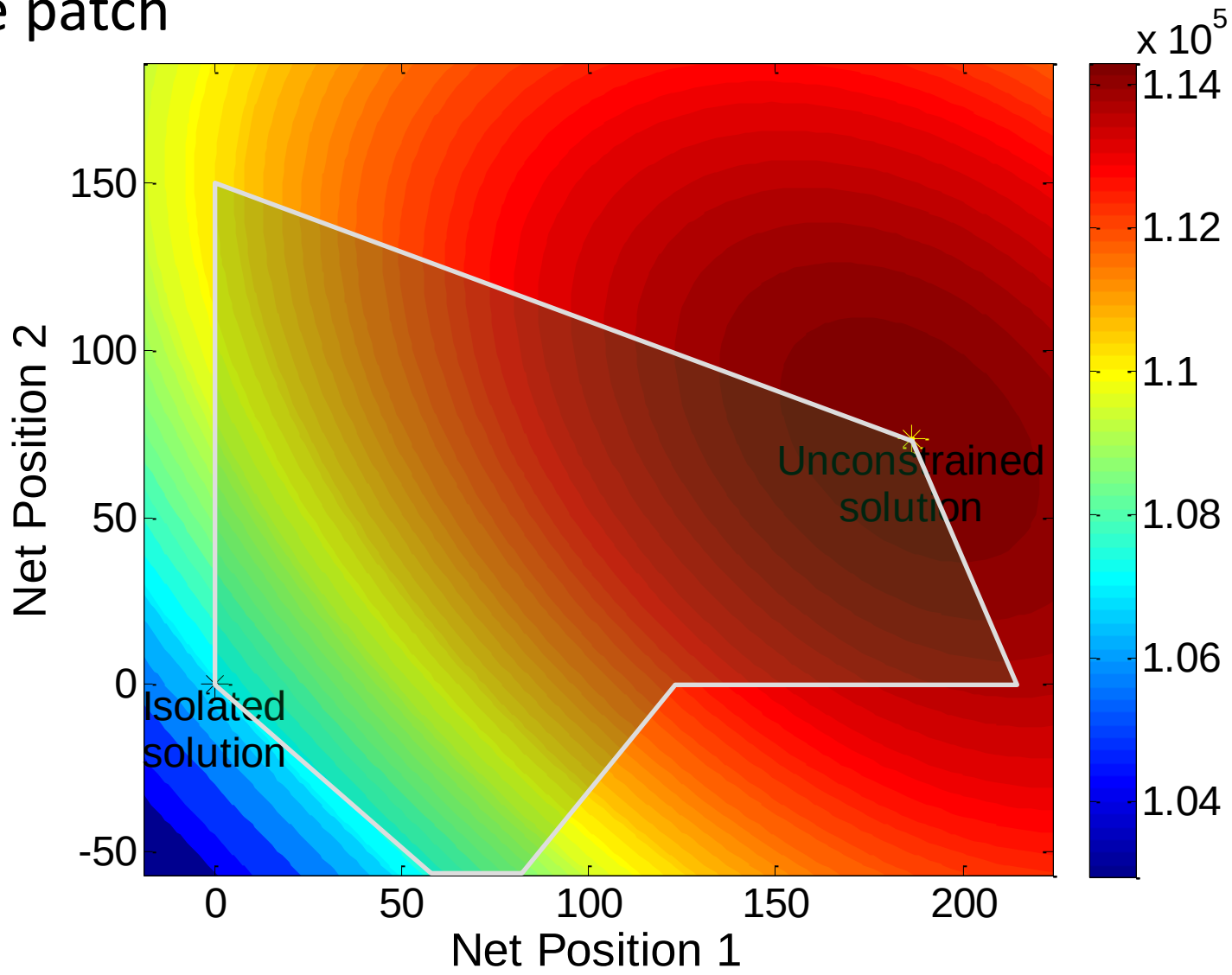
Capacity allocation: basic principle

- Intuitive patch



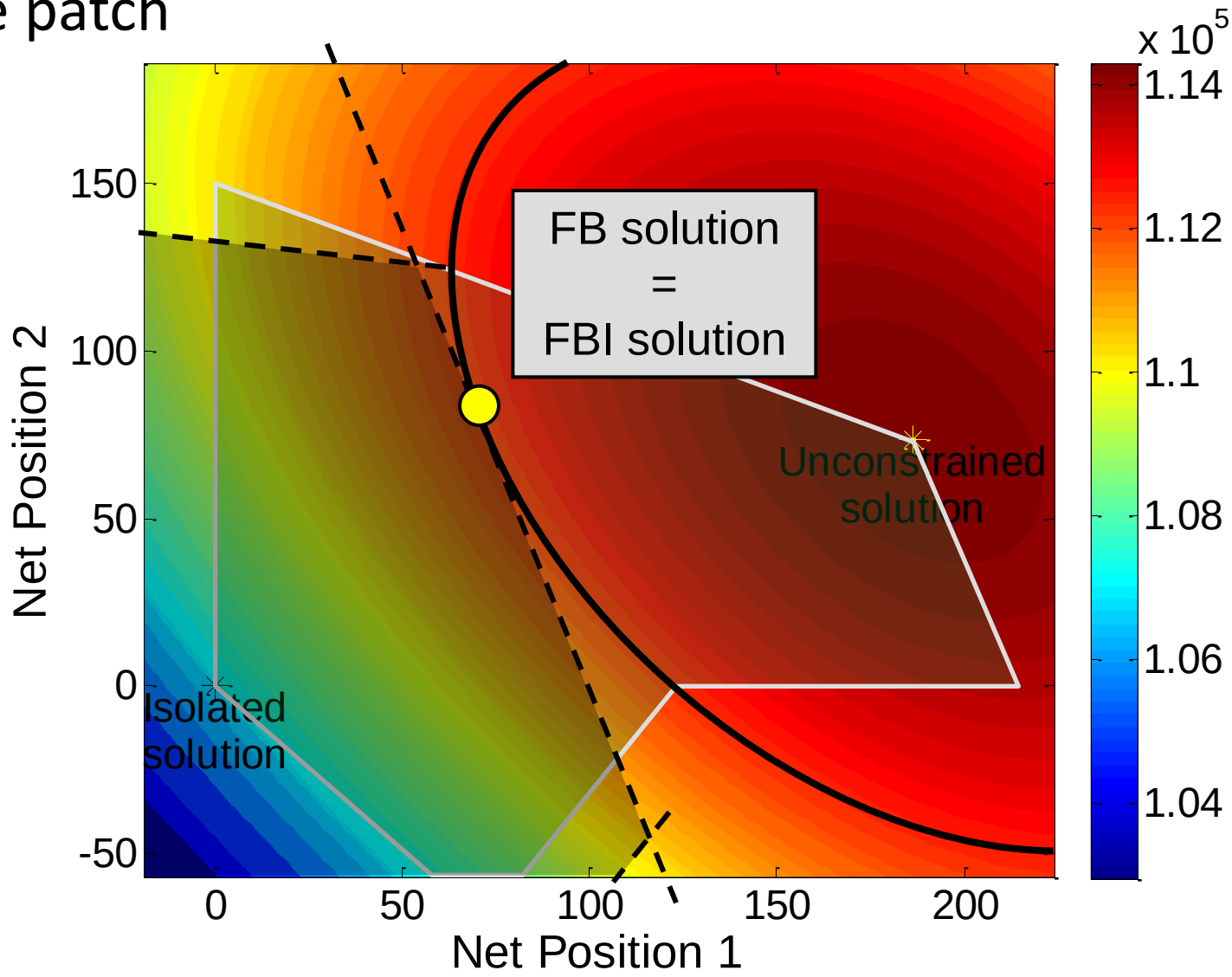
Capacity allocation: basic principle

- Intuitive patch



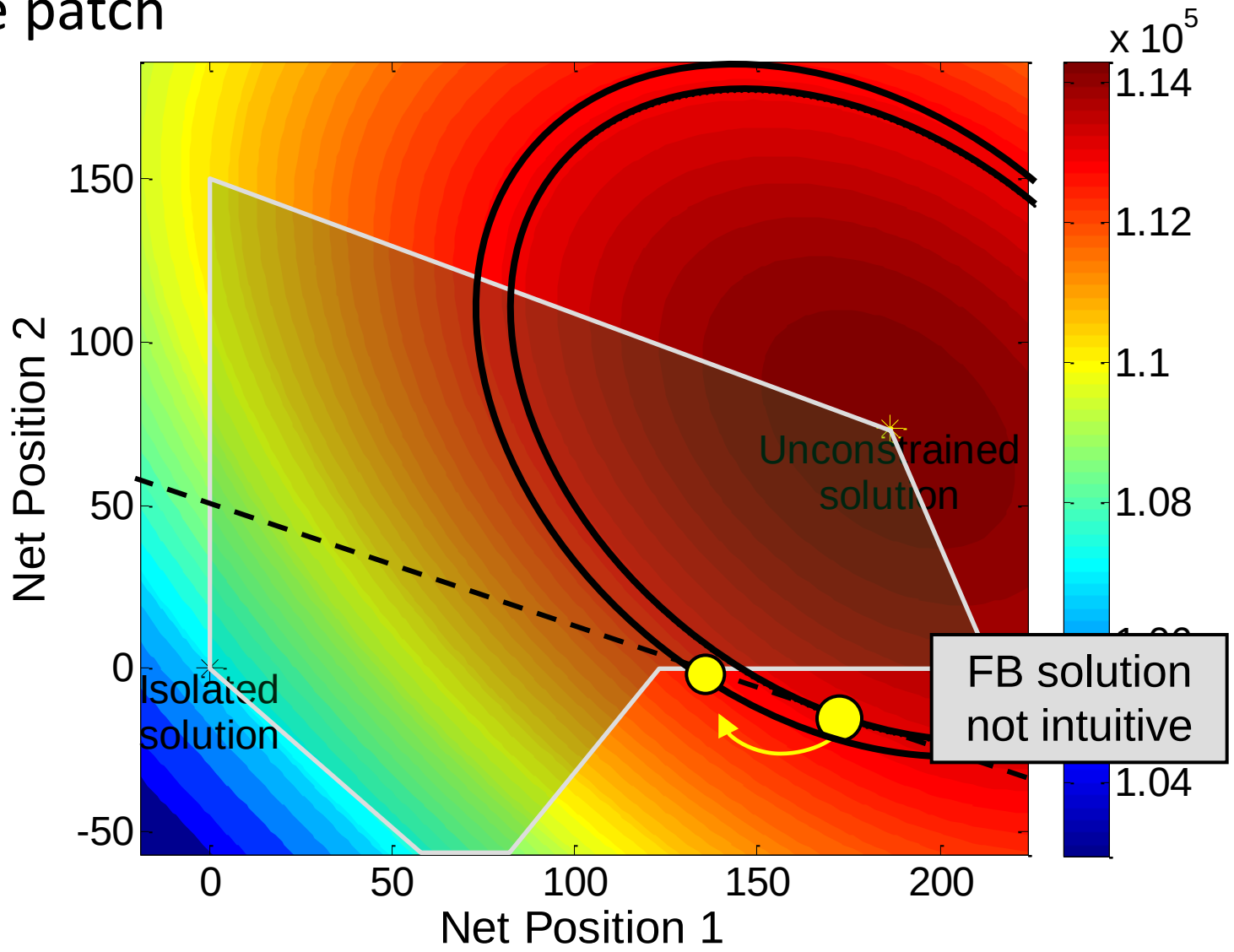
Capacity allocation: basic principle

- Intuitive patch



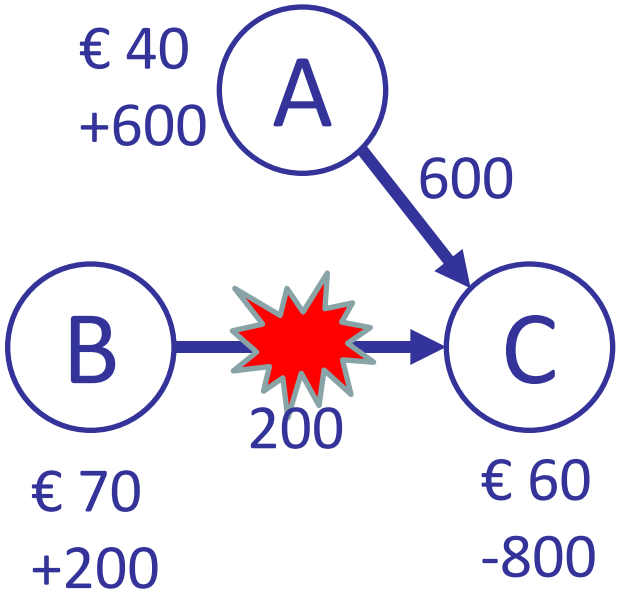
Capacity allocation: basic principle

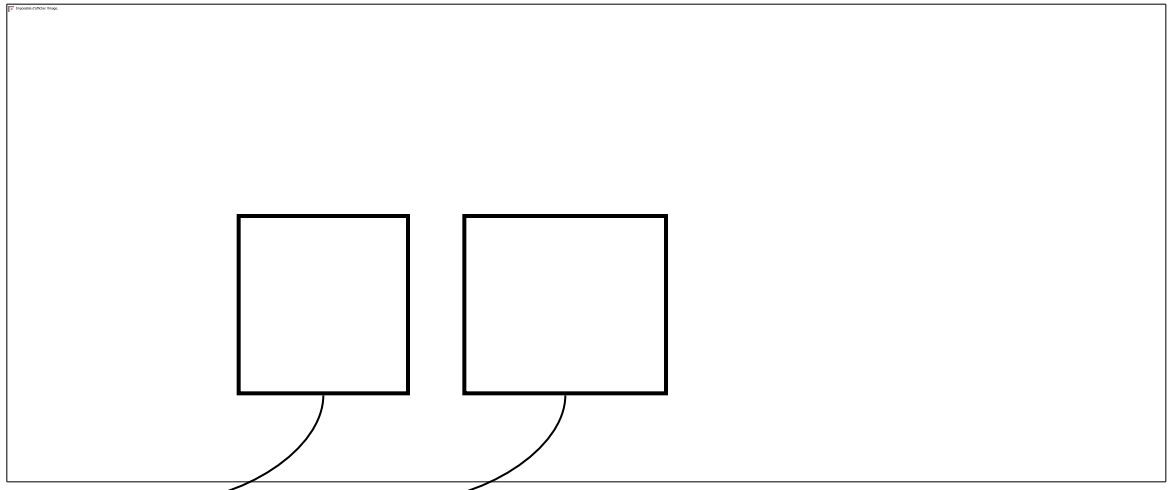
- Intuitive patch



Capacity allocation: basic principle

- Back to our earlier example:





- B→C loads CB by ($PTDF_B$-$PTDF_C$)
- = -0.5 – (-0.25) = -0.25 ⇒ the CB is relieved

Capacity allocation: basic principle

- Intuitive patch - implementation
  - The fact that certain exchanges can relieve congestions, could be overcome by discarding these effects;
  - The "intuitive patch" seeks bilateral flows, such that:
    - The bilateral flows match the net positions (i.e. it is a decomposition of the net position);
    - The bilateral flows are subjected to the FB constraints, but discarding relieving effects:

$$\sum_{(i,j)} flow_{ij} \cdot \max\left(PTDF_i - PTDF_j, 0\right) \leq RAM_{cb}$$

Capacity allocation: basic principle

- Intuitive patch – implementation (continued)

$$\sum_{(i,j)} flow_{ij} \cdot \max\left(PTDF_i - PTDF_j, 0\right) \leq RAM_{cb}$$

- This formulation could be used to replace all FB constraints
- However, this would be unnecessary limiting. Instead they will be added on at a time for those constraints that lead to non-intuitive situations

Capacity allocation: basic principle

- Intuitive patch - implementation
  - Consider a decomposition into flows. For any flow i→j > 0 prices must be such that:

$$mcp_i - mcp_j = \sum_{cb} \left(PTDF_j^{cb} - PTDF_i^{cb} \right) \cdot \mu_{cb}$$

  - For "intuitive patch" this becomes:

$$mcp_i - mcp_j = \sum_{cb} \max\left(PTDF_j^{cb} - PTDF_i^{cb}, 0 \right) \cdot \mu_{cb}$$

  - Finally the special case for which flow i→j = j→i = 0:

$$mcp_i - mcp_j \geq \sum_{cb} \max\left(PTDF_j^{cb} - PTDF_i^{cb}, 0 \right) \cdot \mu_{cb}$$

Capacity allocation: basic principle

- Intuitive patch - implementation
  - The FB constraint expressed in bilateral exchanges that replaces the original can either be:
    - "tight", i.e. constraining:
      - A partial convergence will result. Since this new constraint is tight, it means the solution came off the original constraint
  - Leading to a zero net position rather than a partial convergence. The new constraint will still be tight, but the market with a zero net position will not contribute to it. This implies that the original FB constraint remains tight too

Capacity allocation: basic principle

- All the bids of the local/national Power eXchanges are brought together in order to be matched by a centralized algorithm.
- Objective function: Maximize Day-ahead Market Welfare
- Control variables: Net positions
- Subject to: ∑ net positions = 0

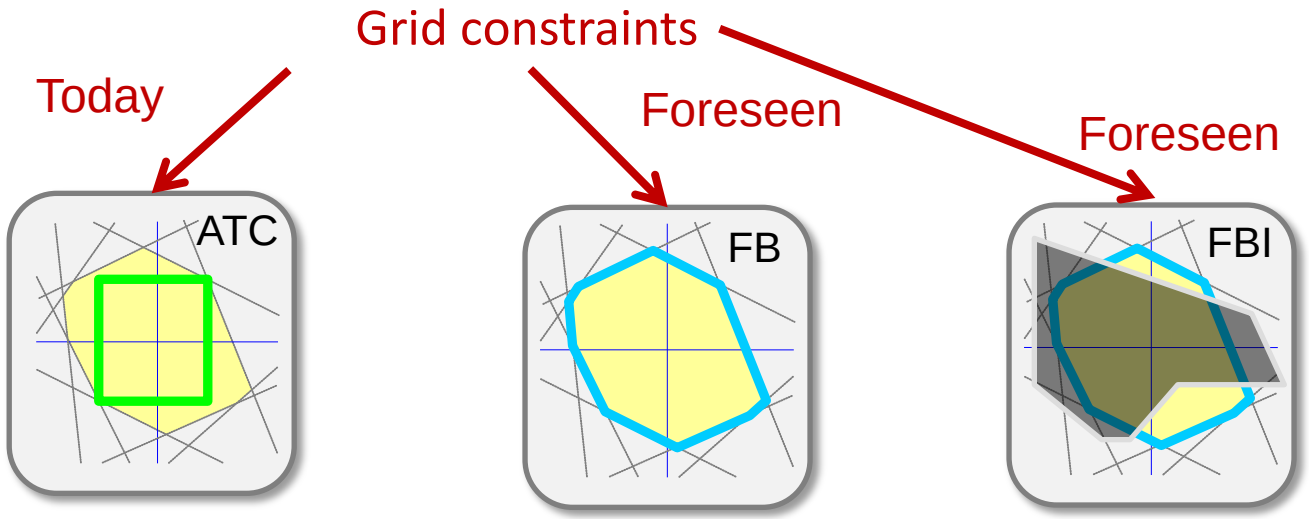
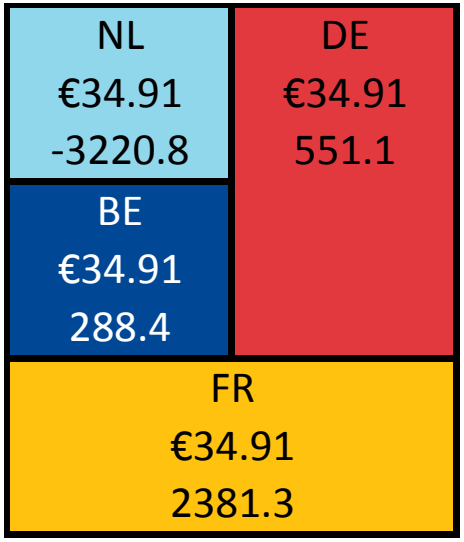
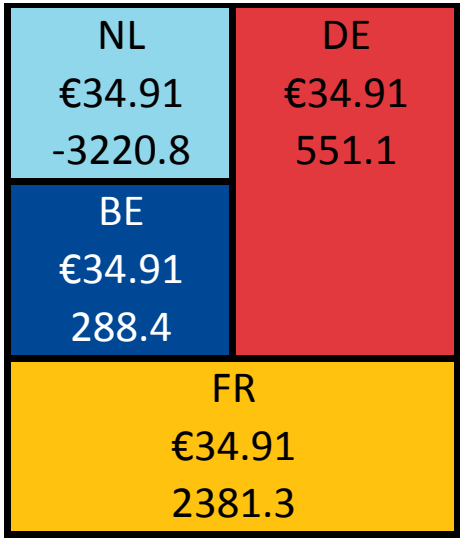


Illustration no difference FB and ATC

16 July, hour 7



ATC MC clearing



FB MC clearing

- No change in block selection
- Same result under FB and ATC

Illustration no difference FB and ATC

16 July, hour 7

- FB domain typically larger than ATC domain;
- Two ATC corners outside the FB domain, namely:
  - BE max import
  - BE max export
  - These are considered unlikely corners

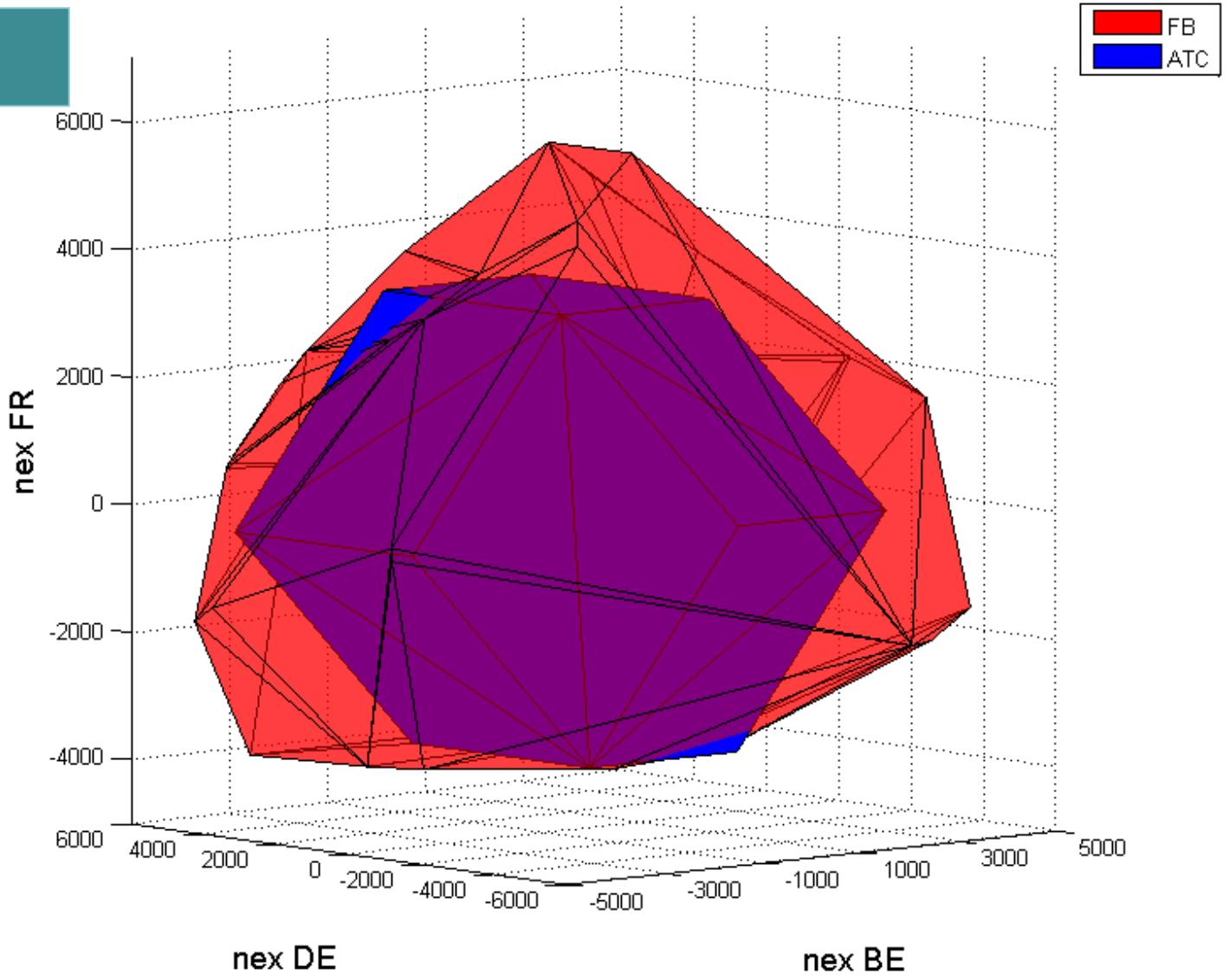


Illustration no difference FB and ATC

16 July, hour 7

- FB domain typically larger than ATC domain;
- Two ATC corners outside the FB domain, namely:
  - BE max import
  - BE max export
  - These are considered unlikely corners
- Graph may look pretty, but hard to read. Let us consider slices instead:

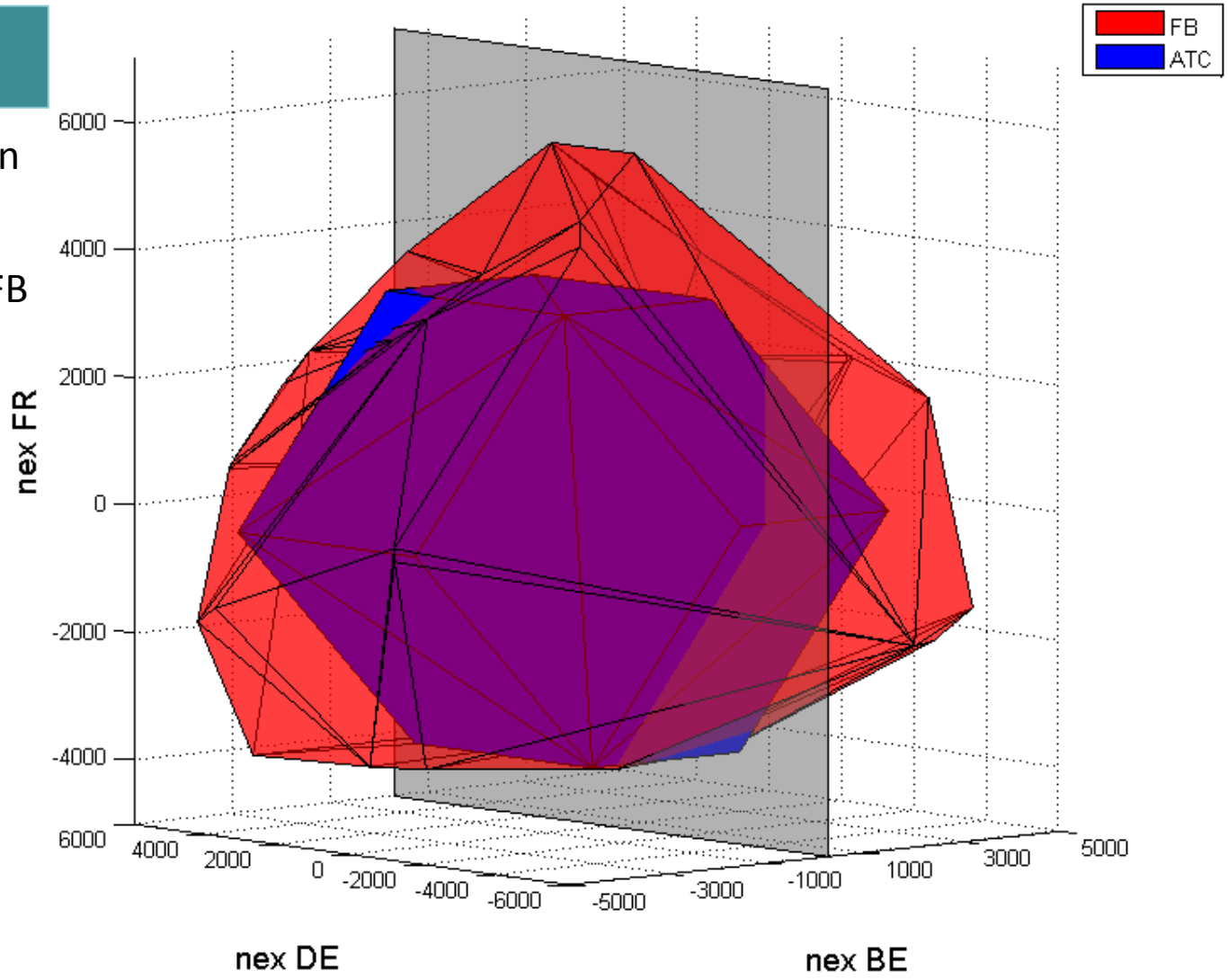
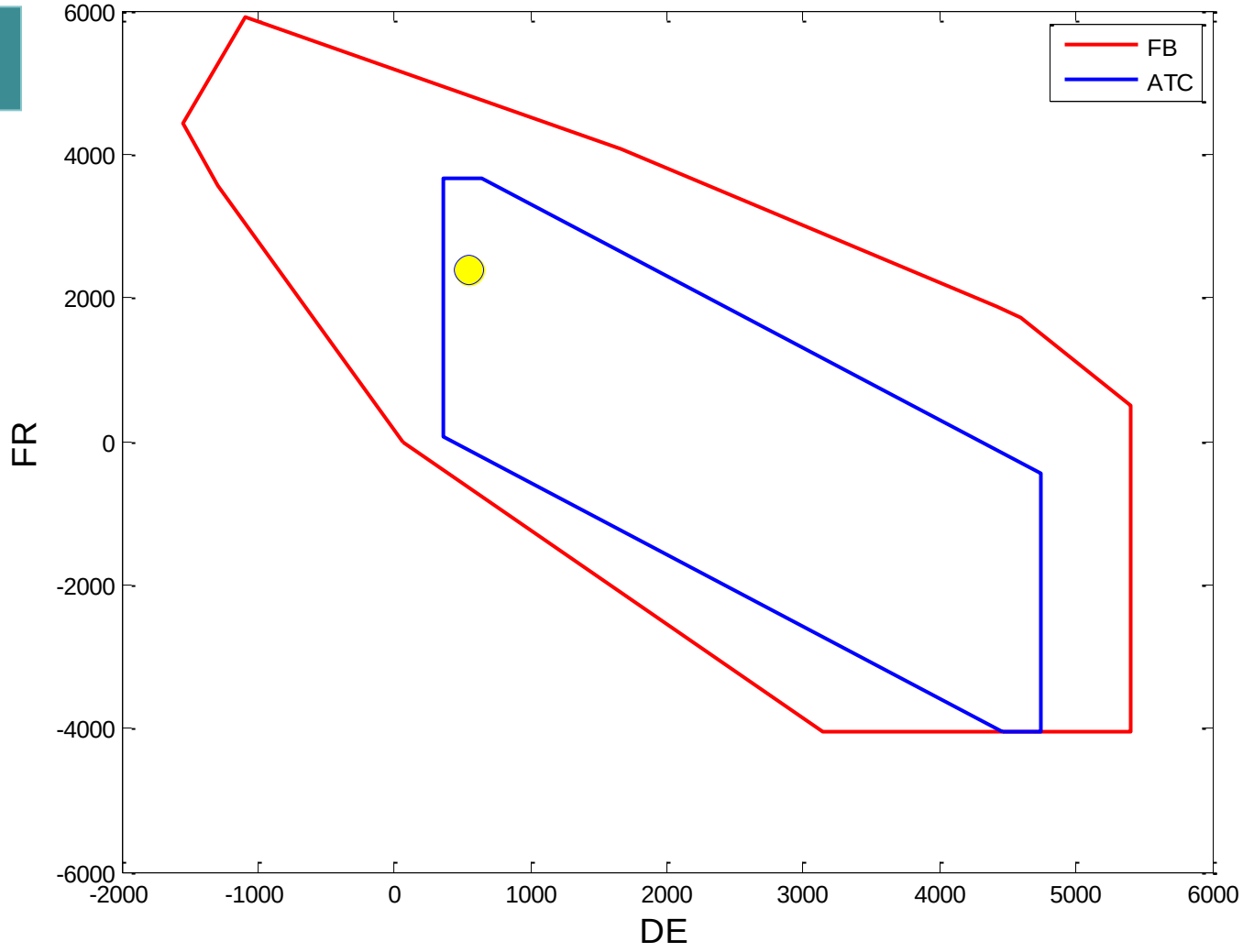


Illustration no difference FB and ATC

16 July, hour 7

- Slice of domains;
- nex NL fixed to FB value
- BE follows from balance constraint
- Solution feasible in both FB and ATC domain
- Single CWE price



Intuitive patch leading to isolation

13 August, hour 9

NL	DE
€52.86	€58.03
-2558.9	257
BE	
€25.37	
655.9	
FR	
€13.55	
1646	

FB MC clearing

NL	DE
€53.12	€54.40
-2268.2	0
BE	
€25.40	
655.9	
FR	
€13.48	
1612.3	

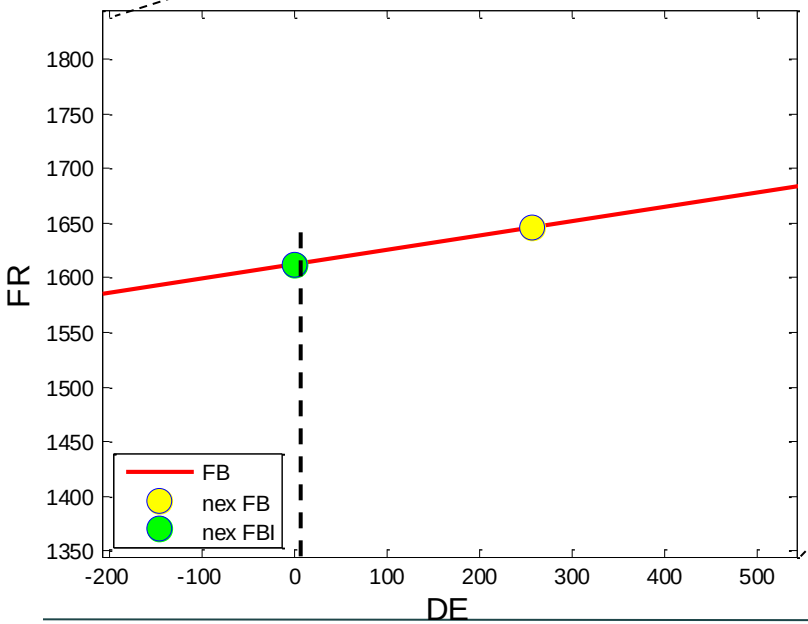
FBI MC clearing

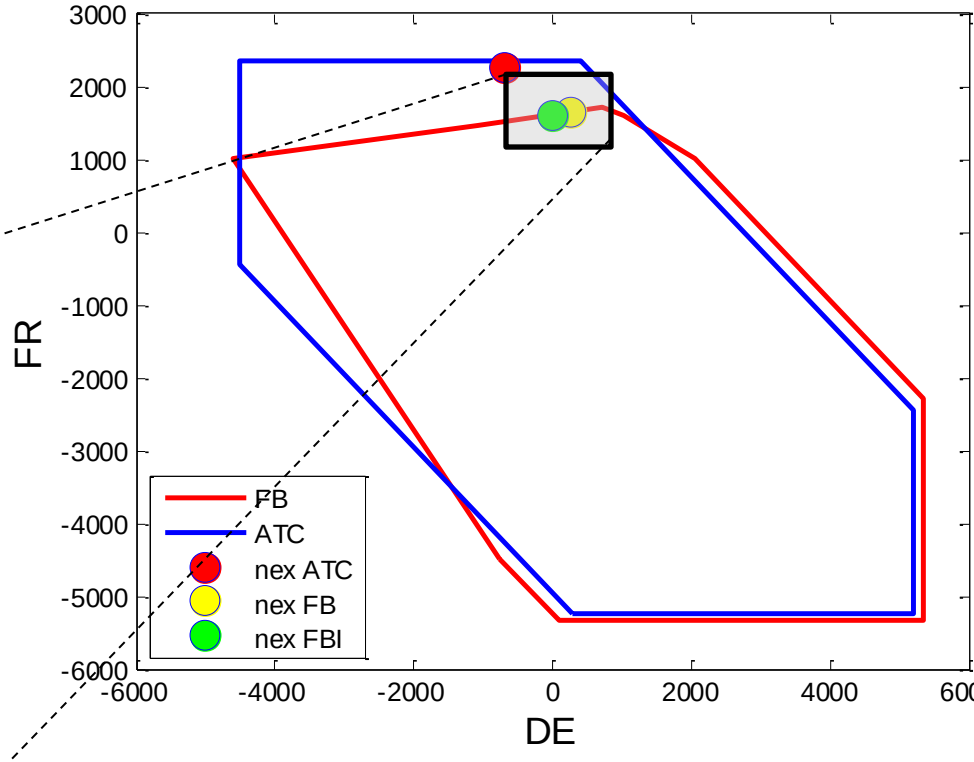
- No change in block selection
- DE becomes isolated

Intuitive patch leading to isolation

13 August, hour 9

- No change in block selection
- DE becomes isolated

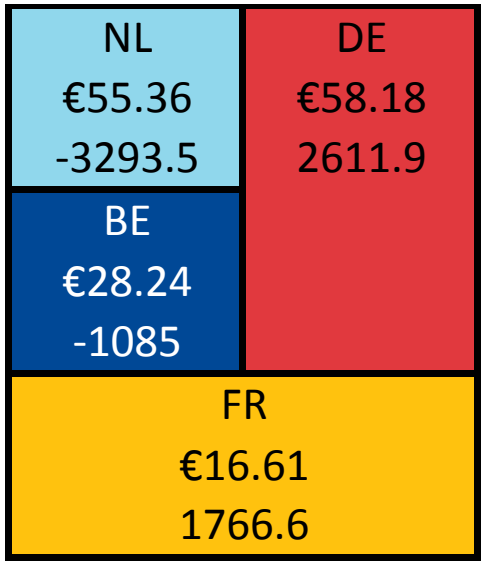




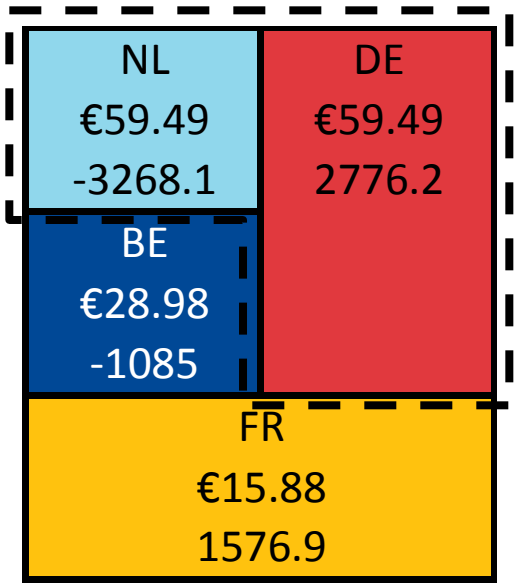
- The FB constraint remains "tight"

Intuitive patch resulting in partial convergence

12 August, hour 19



FB MC clearing



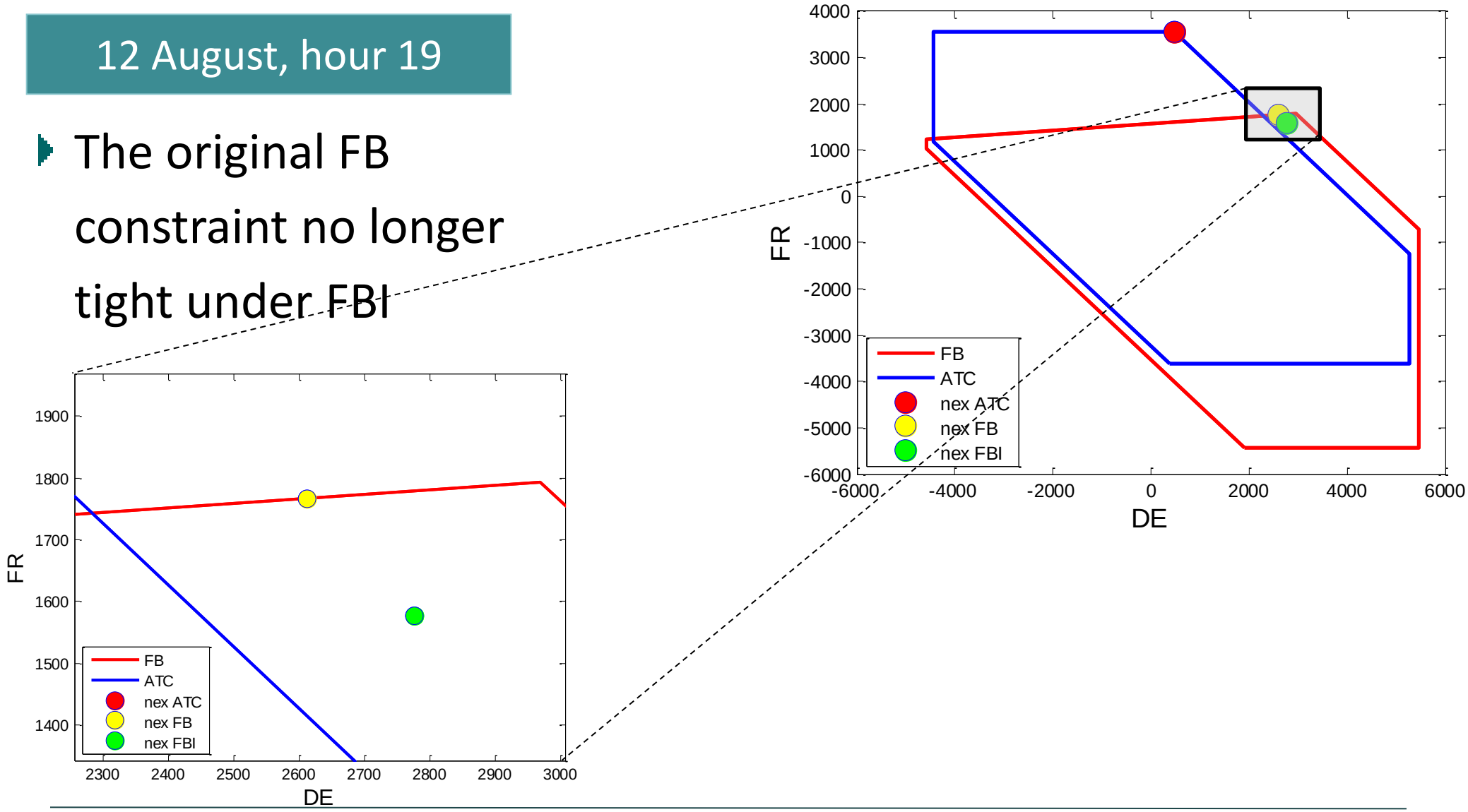
FBI MC clearing

- No change in block selection
- Non-intuitive: DE expensive and exporting
- "Intuitive patch" creates a partial convergence with NL

Intuitive patch resulting in partial convergence

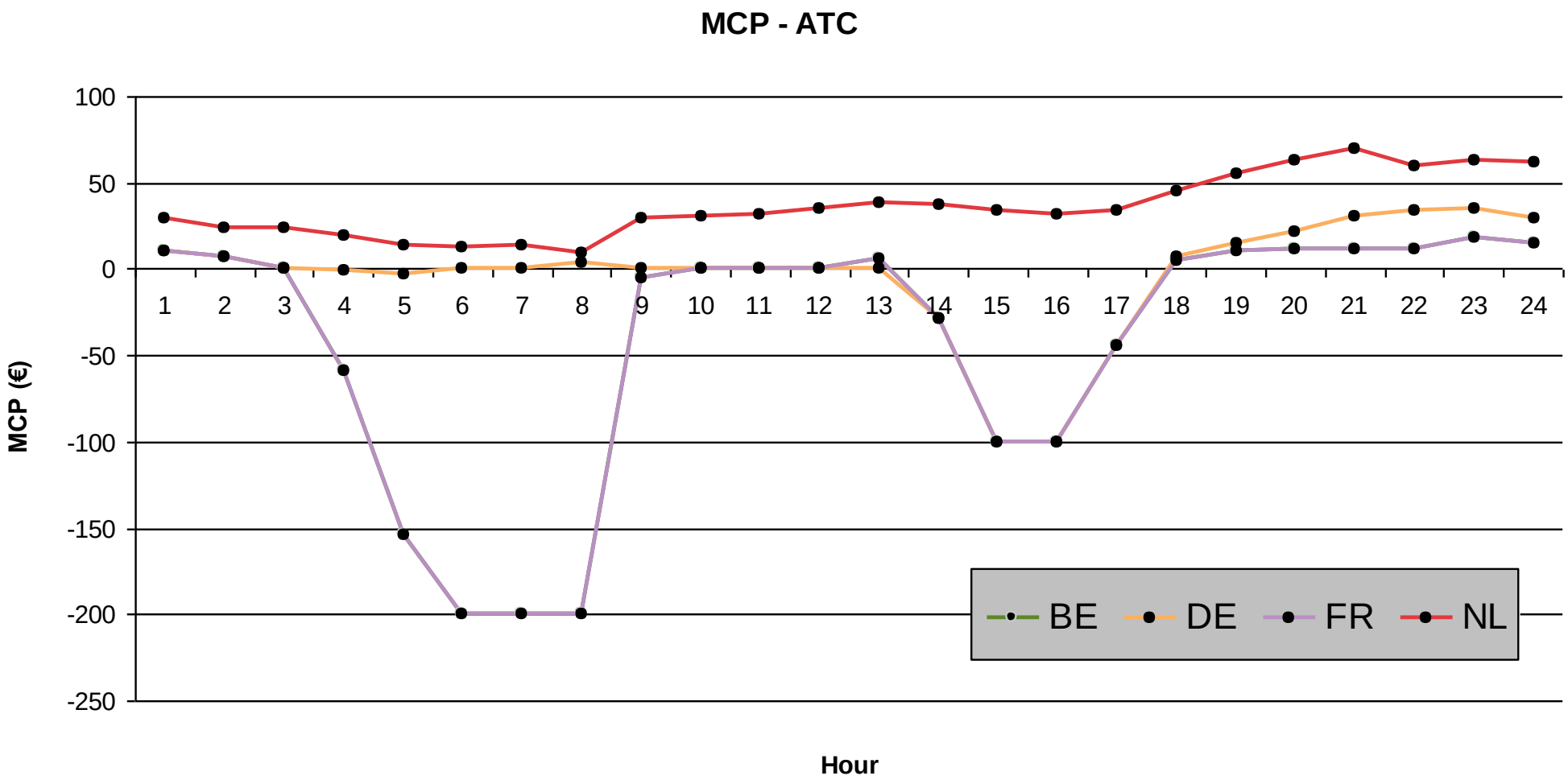
12 August, hour 19

- The original FB constraint no longer tight under FBI



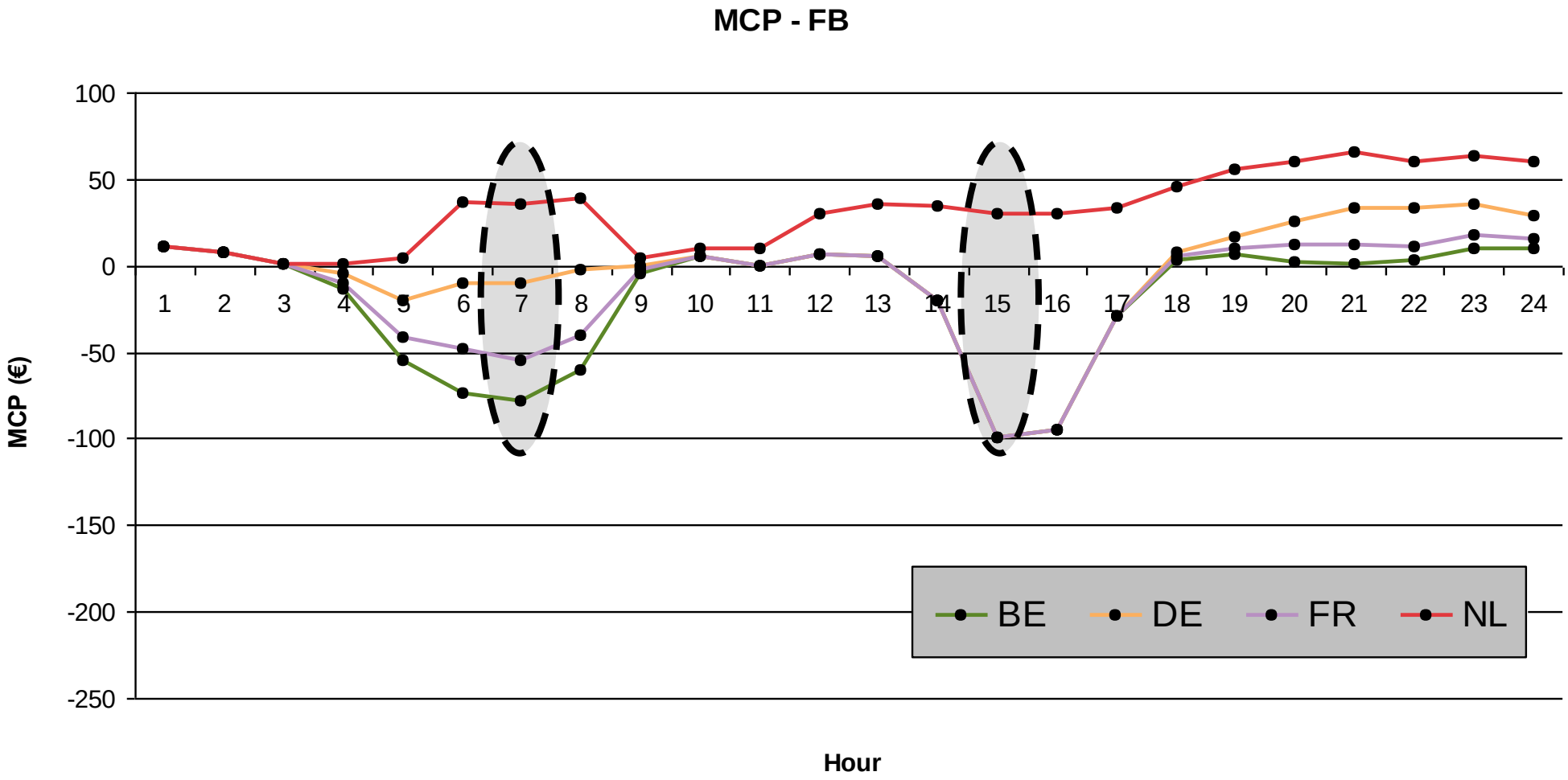
Parallel run: interpretation of results

16 June



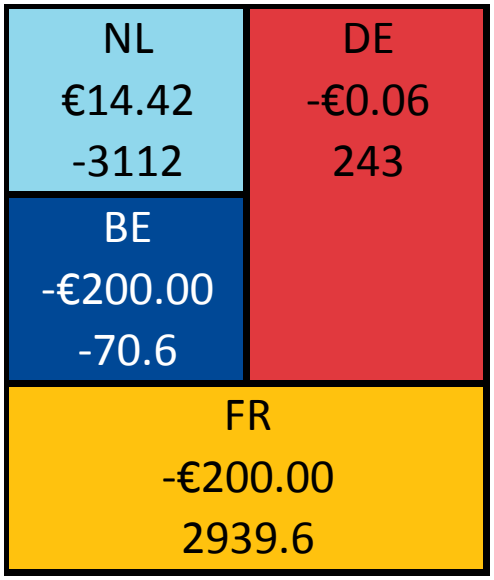
Parallel run: interpretation of results

16 June

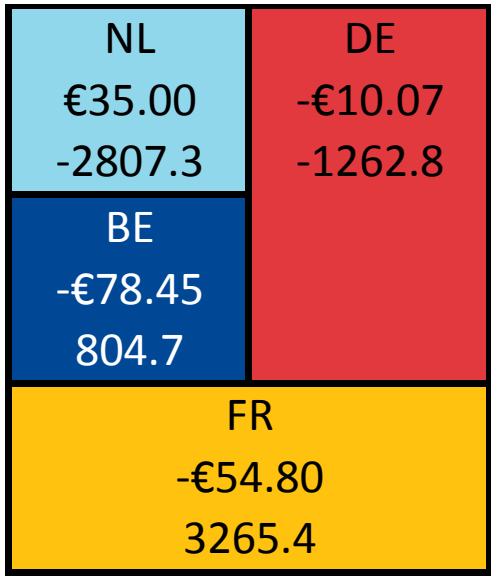


Parallel run: interpretation of results

16 June, hour 7



ATC MC clearing



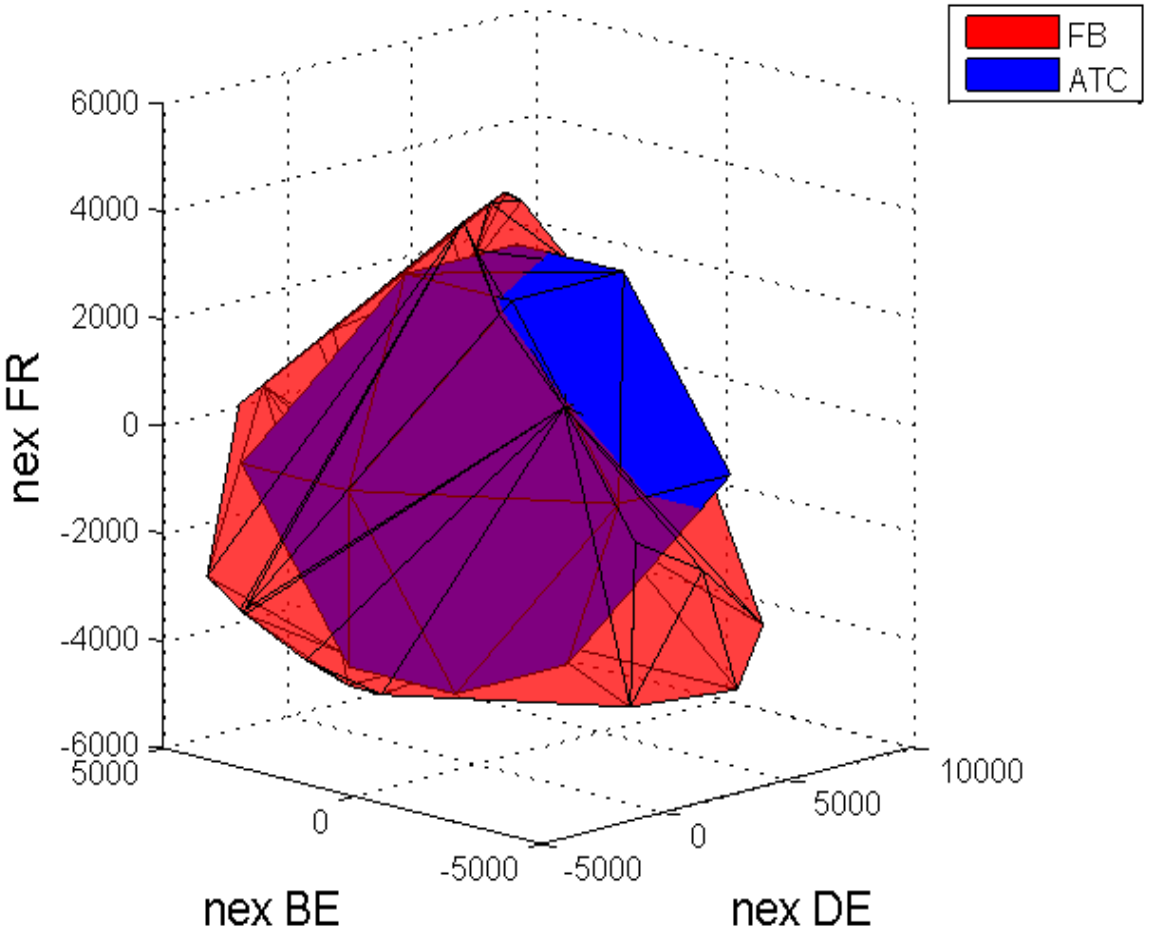
FB MC clearing

- The strong negative BE and FR prices somewhat mitigated under FB
- NL can import slighty less, DE more of the cheap energy

Parallel run: interpretation of results

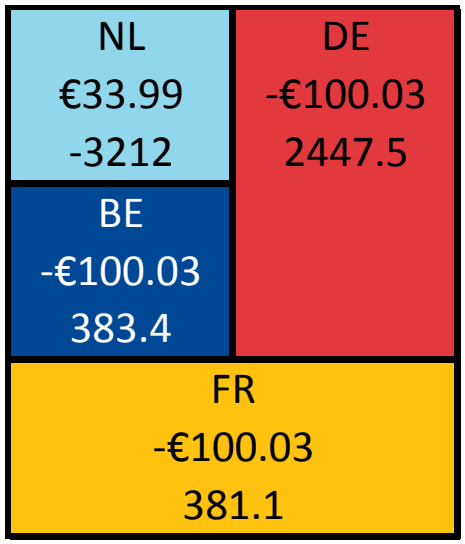
16 June, hour 7

- ATC and FB solutions are quite different. They do not allow for 2d slices;
- The 3d illustration of the domain shows that DE can import much of the FR and BE exports

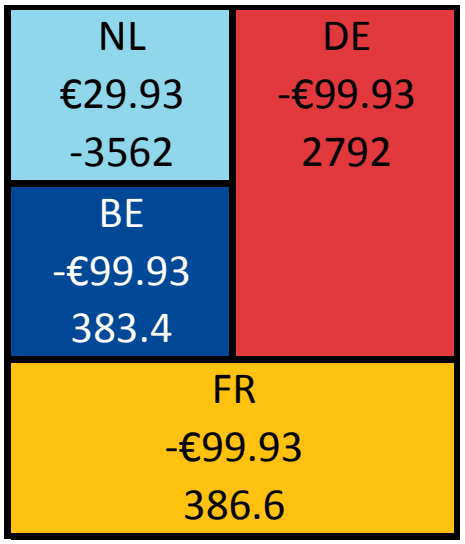


Parallel run: interpretation of results

16 June, hour 15



ATC MC clearing



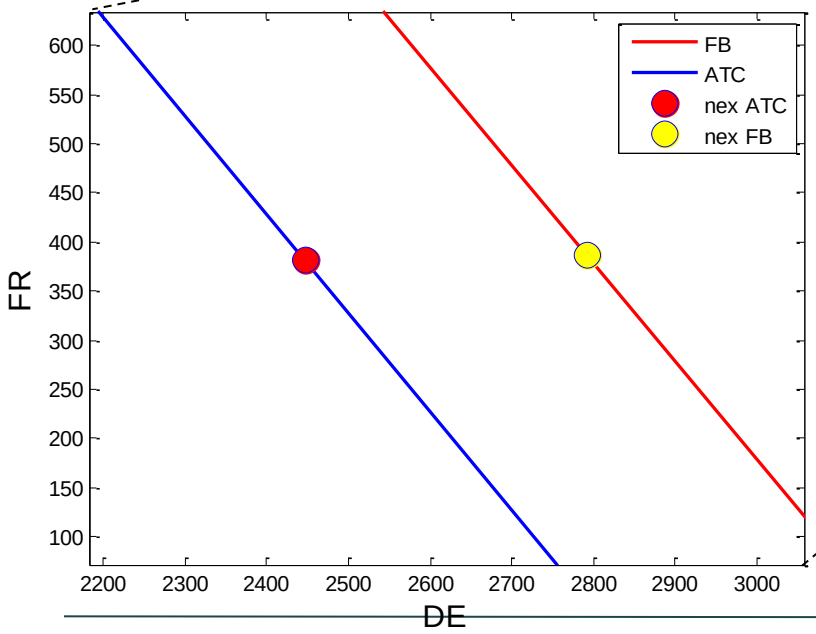
FB MC clearing

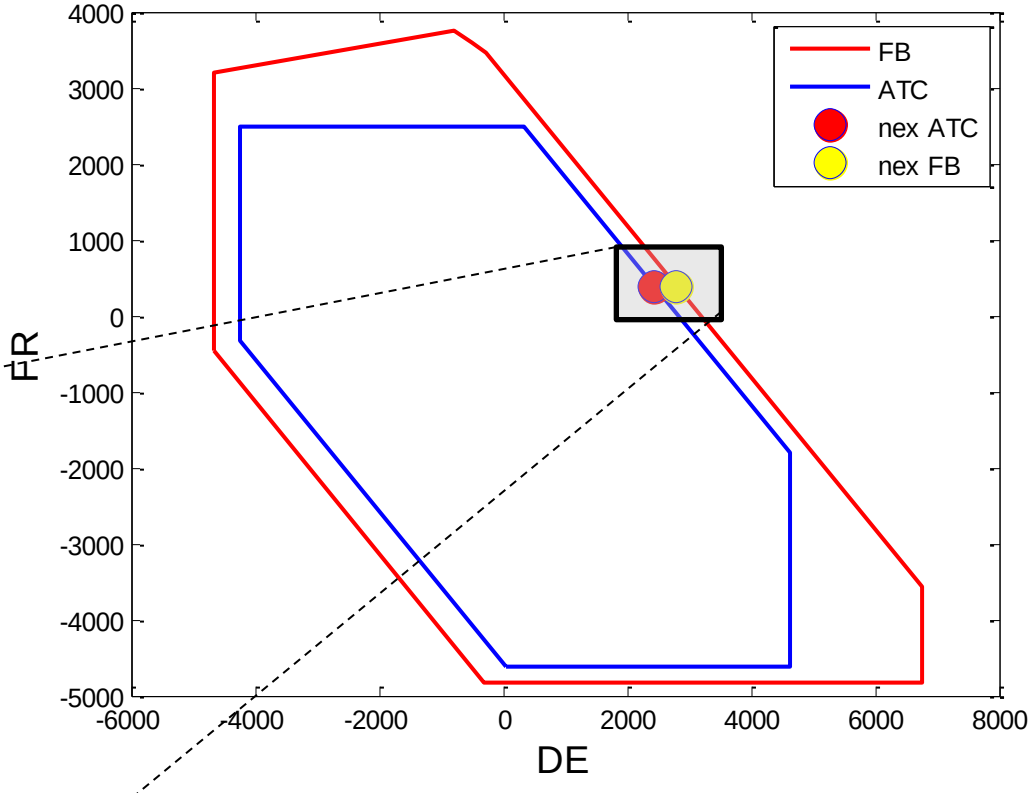
- Negative price in BE, DE and FR not mitigated by larger FB domain
- An NL import limit was hit
- Consequently price convergence for BE, DE, FR

Parallel run: interpretation of results

16 June, hour 15

- Nex BE fixed to FB value (= ATC value)
- FB domain allowed from slightly more exchanges.





- Mainly DE could export more of its cheap power

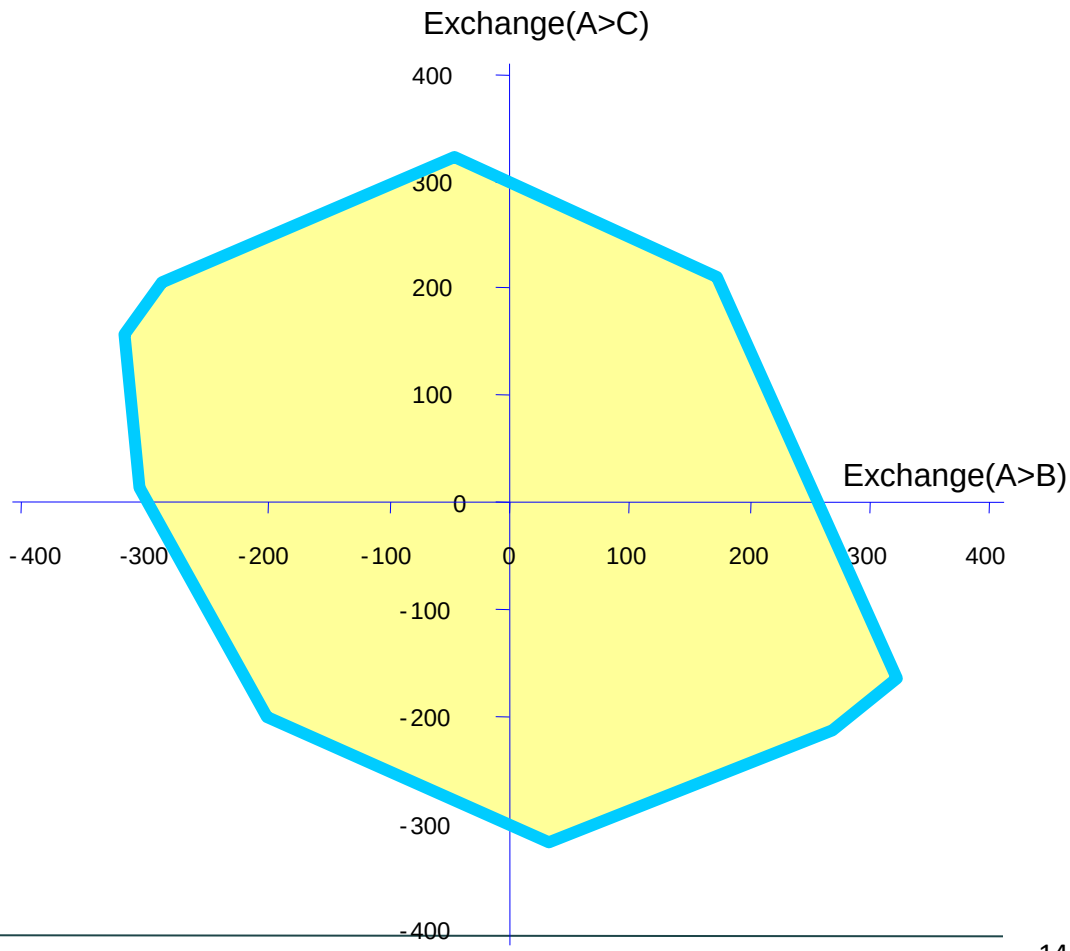
Q&A Session

FB for Day-Ahead: what about ID (1/4)?

- After the implementation of FB DA, the logical next step will be the development of FB ID

- Till then, the same basic principle like today: capacity left after the DA stage ➔ initial input for the ID stage

FB domain before the DA FBMC

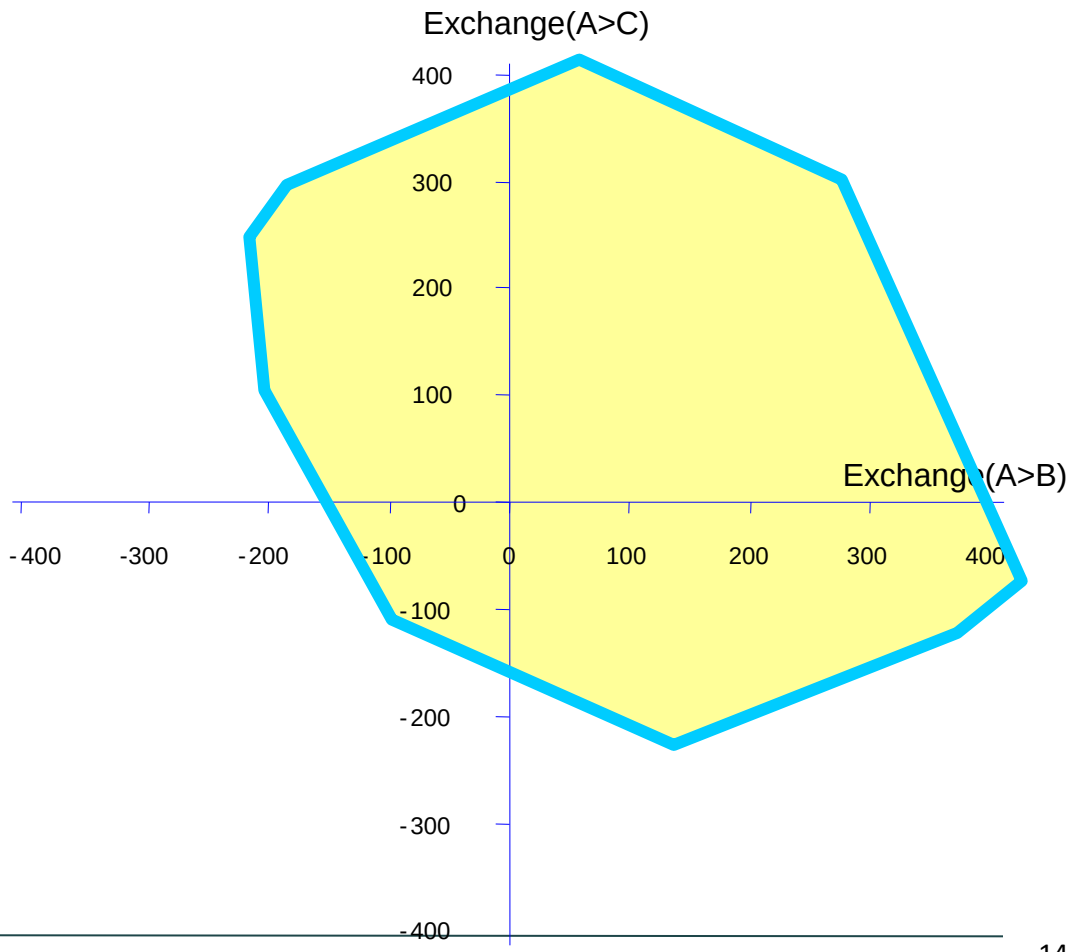


FB for Day-Ahead: what about ID (2/4)?

- After the implementation of FB DA, the logical next step will be the development of FB ID

- Till then, the same basic principle like today: capacity left after the DA stage ➔ initial input for the ID stage

FB domain after the DA FBMC

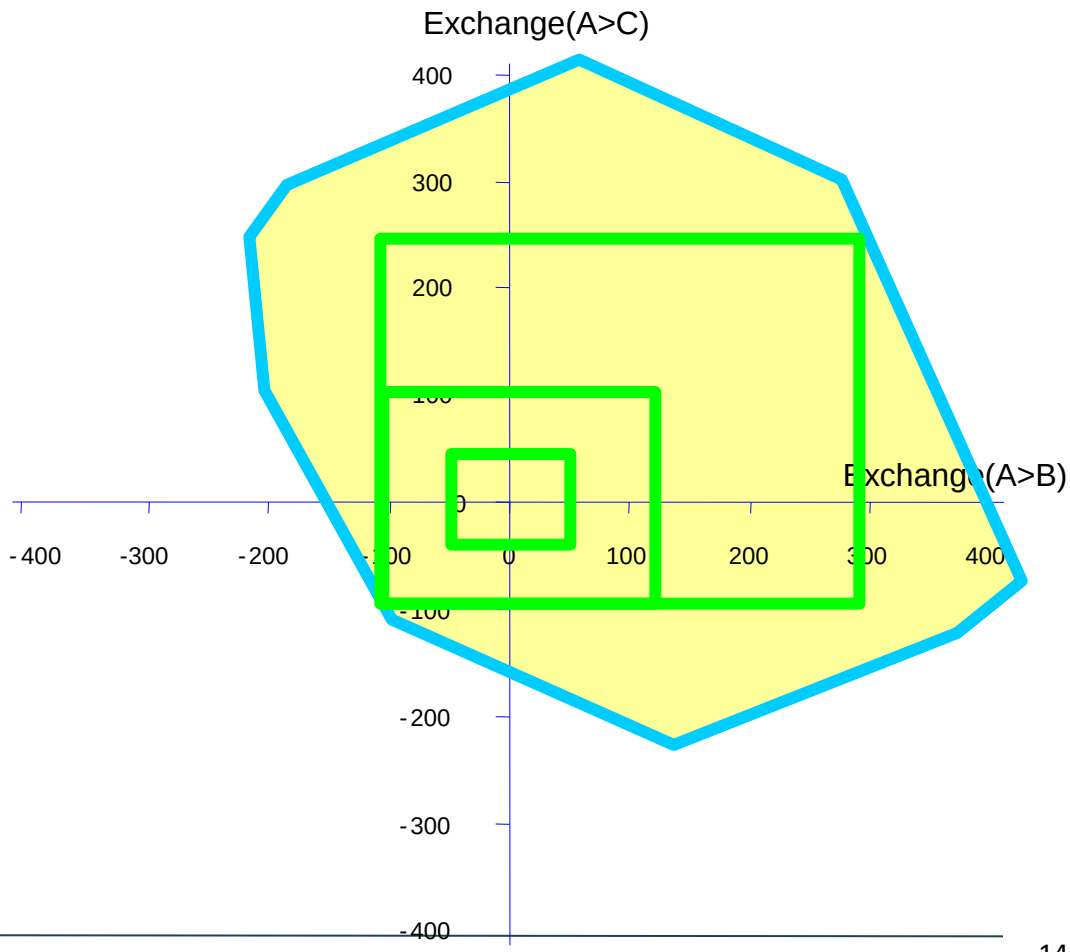


FB for Day-Ahead: what about ID (3/4)?

- After the implementation of FB DA, the logical next step will be the development of FB ID

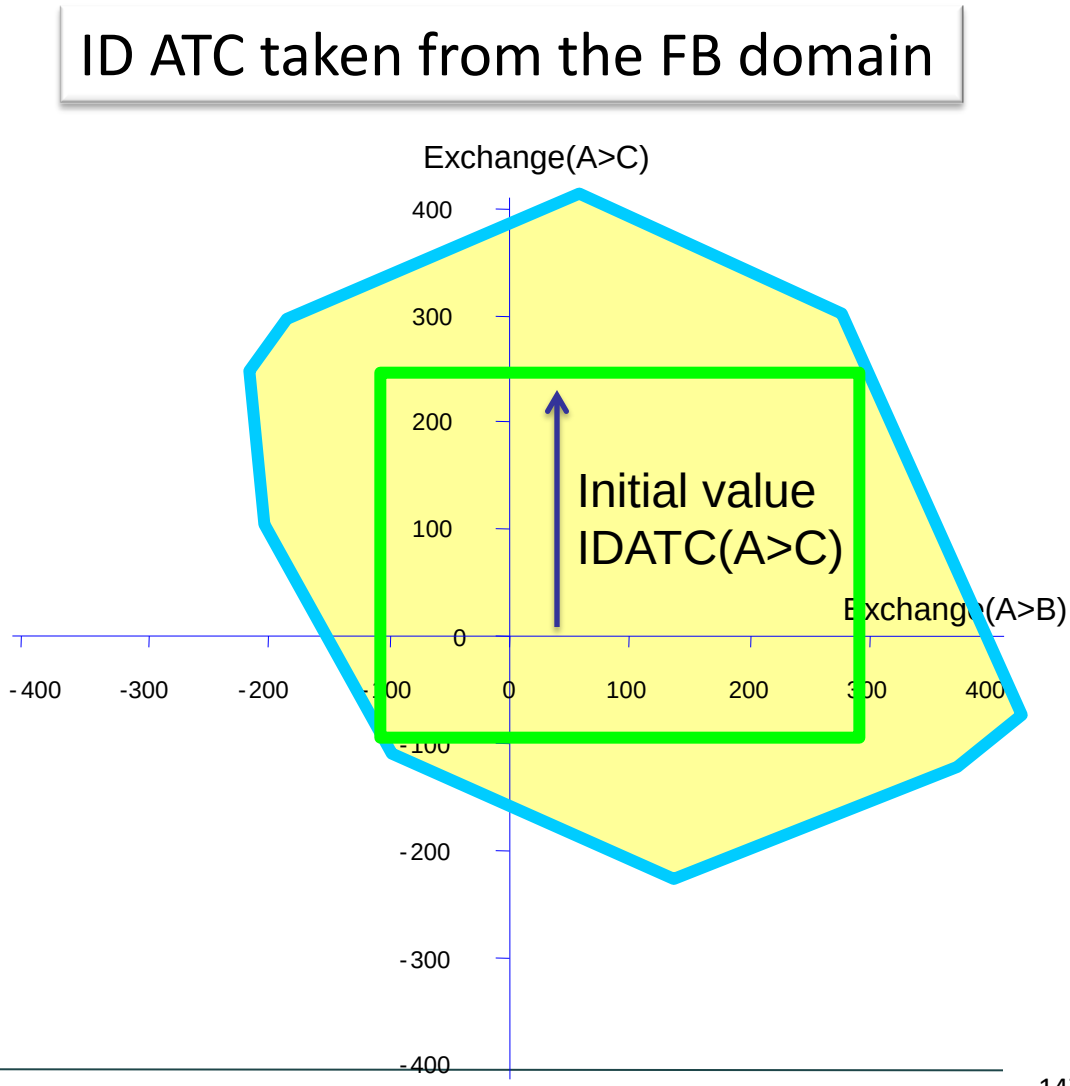
- Till then, the same basic principle like today: capacity left after the DA stage ➔ initial input for the ID stage

ID ATC taken from the FB domain



FB for Day-Ahead: what about ID (4/4)?

- Although being 'arbitrary' in the sense that other ATC-determination strategies could have been selected, a fixed rule is now applied to determine the ATCs from the FB domain
- Initial values ID ATC in this example:
  - IDATC(A>B) = 300
  - IDATC(A>C) = 250
  - IDATC(B>A) = 100
  - IDATC(C>A) = 100

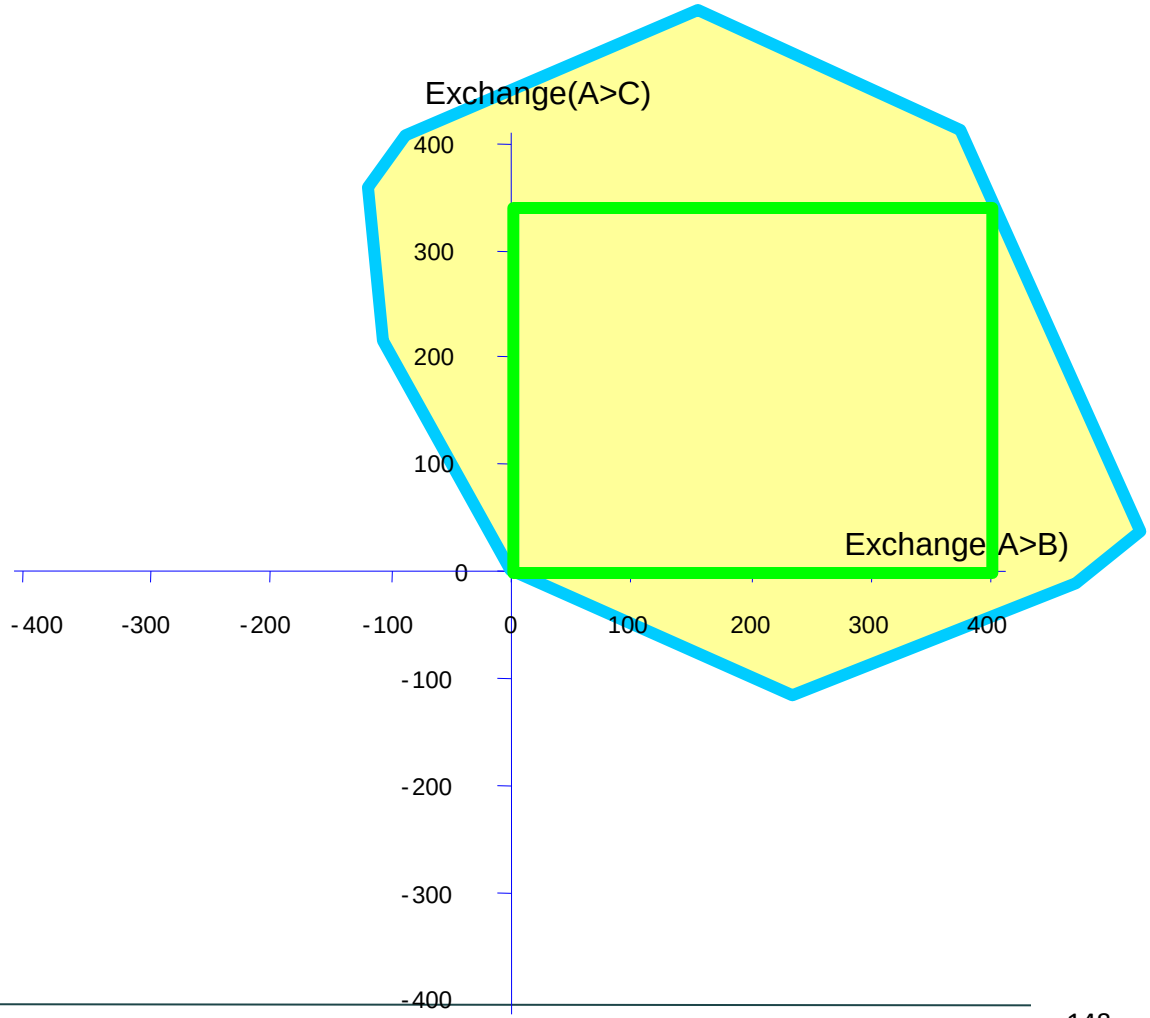


Initial values of IDATCs: an example

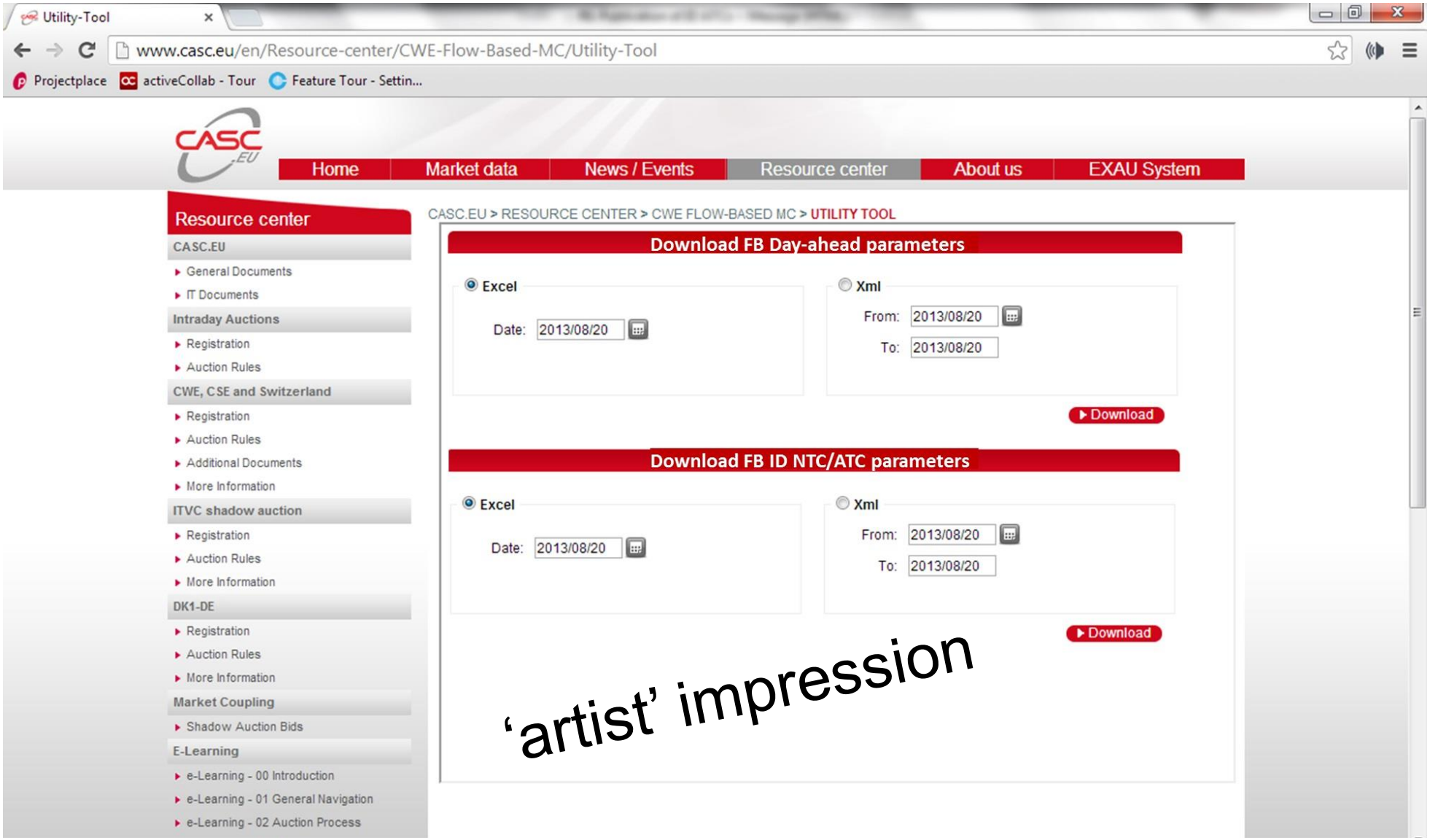
- In this example, after the DA FBMC, initially no capacity is left in the direction C>A and B>A

- Initial values ID ATC:
  - IDATC(A>B) = 400
  - IDATC(A>C) = 350
  - IDATC(B>A) = 0
  - IDATC(C>A) = 0

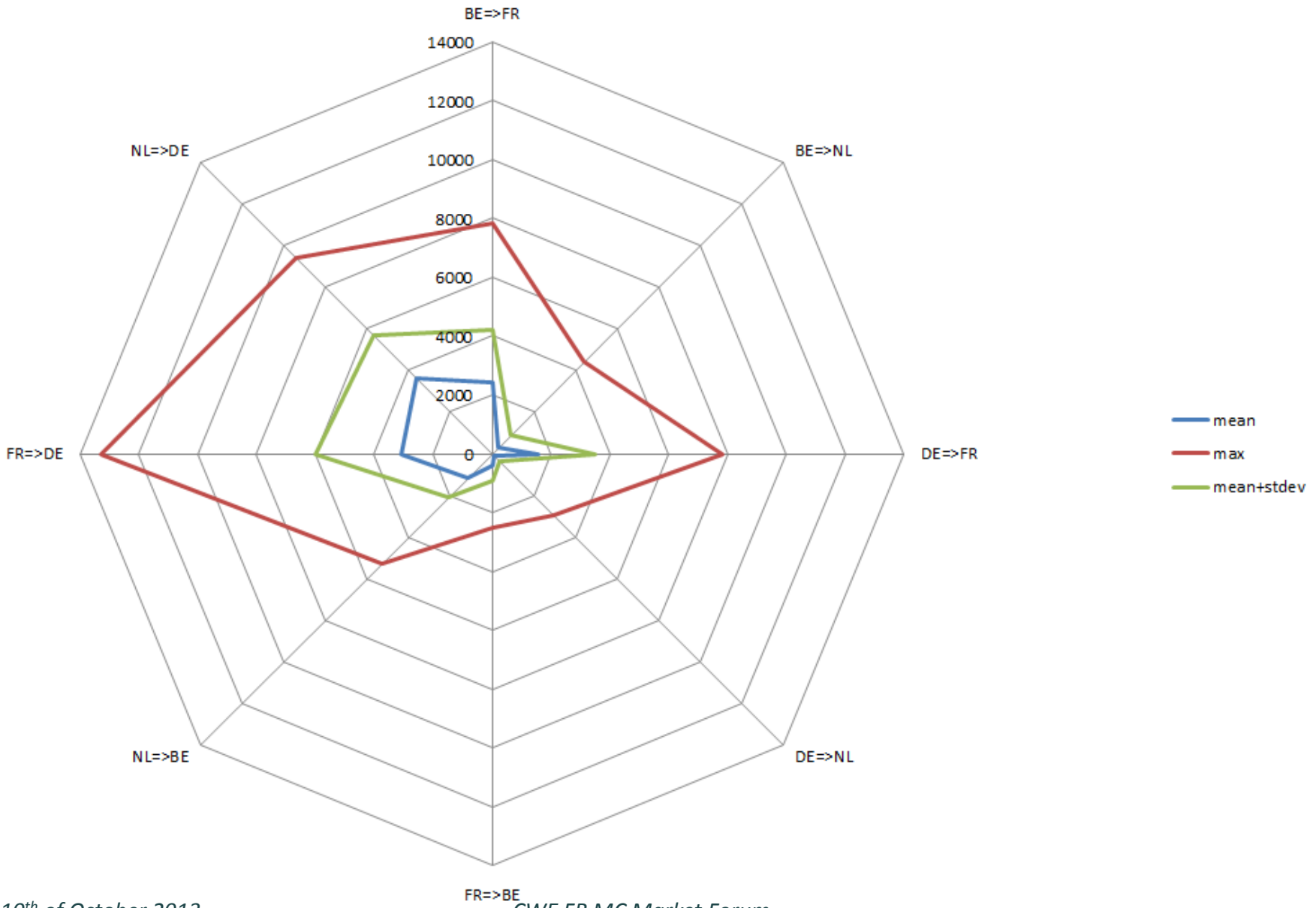
FB domain after the DA FBMC



Proposed publication of simulated ID ATC values



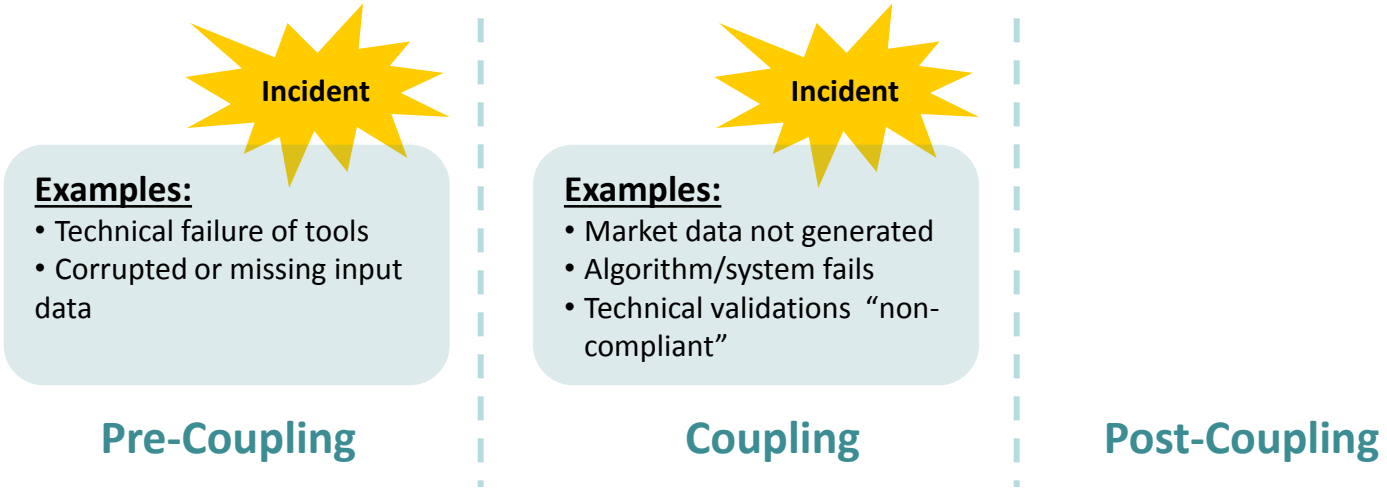
Overview of initial IDATC values (Jan 2 – Sept 3, 2013)



Q&A Session

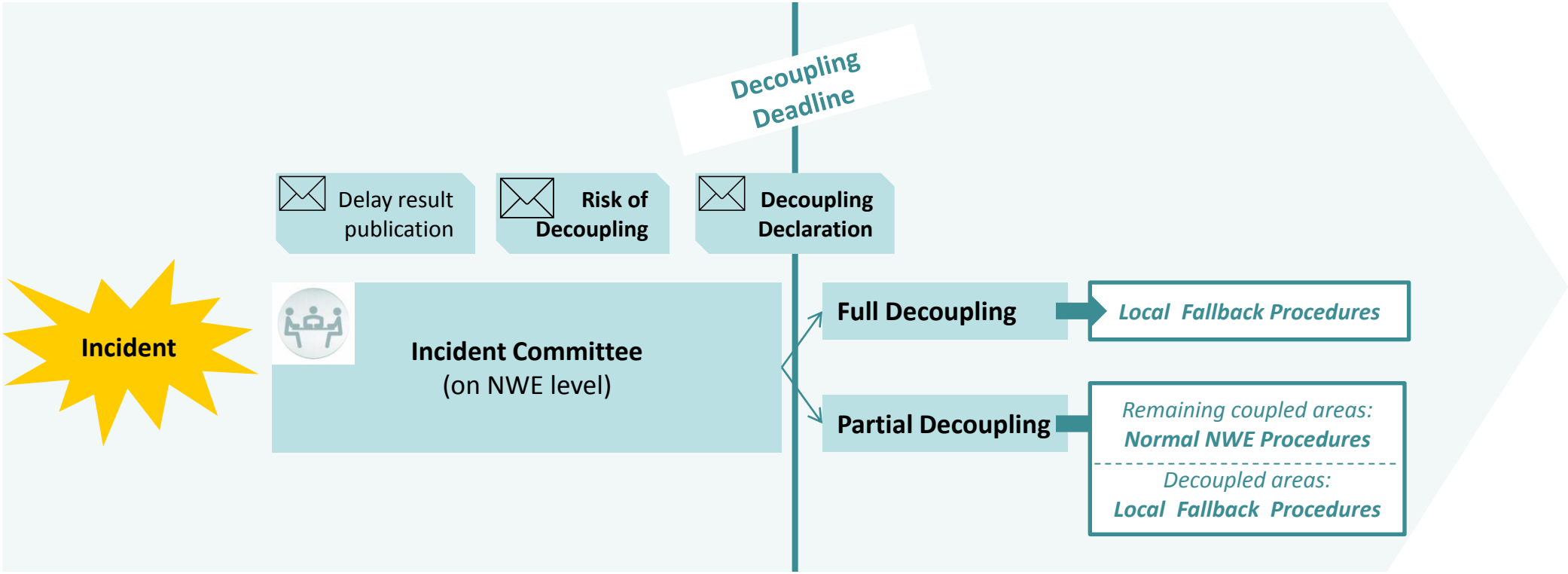
Fallback for capacity allocation

- A Fallback situation may occur at two different steps in the process:



- Workshop 2 focuses on the Fallback arrangement in case of a problem in the coupling process, after the reception of FB parameters by the PXs
- This situation occurs when the NWE price coupling has not given Market Coupling Results at the time limit to trigger the Fallback
- Each Region within the NWE price coupling has assured a Fallback solution

Fallback Process and Declaration



! In any case, if CWE is decoupled, ALL internal borders are decoupled → no partial coupling inside CWE !

Focus Partial Decoupling:

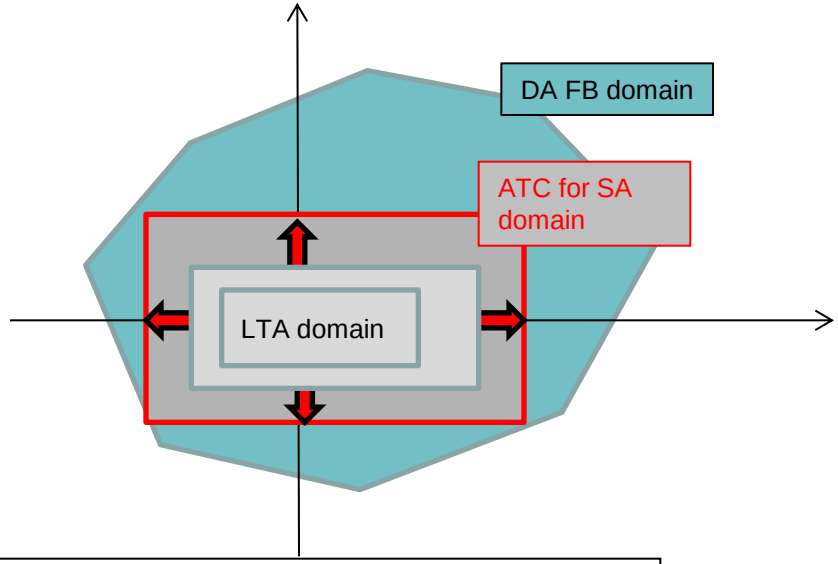
- **3 different cases:**
  - Incident related to the capacities
  - Incident related to coupling process
  - Incident known in advance
- **The following consequences might result:**
  - Some or all external borders decoupled but CWE internal borders remain coupled
  - Only CWE internal borders decoupled but external borders coupled
  - CWE internal borders decoupled and some or all external borders decoupled

Fallback Solution and Shadow auction principles

- According to local Fallback Procedures, the Fallback solution for CWE internal borders and interconnectors (DK1-DE, NO-NL) are Shadow Auctions via CASC
- The Shadow Auction Process does not change compared to the current mechanism under ATC MC
- TSOs will still provide ATCs (derived from the FB domain for Shadow Auction purposes) to CASC
- Pre-registered MPs may file, amend or withdraw, bids for capacity
- The Fallback situation can be declared
  - **during the daily session**
  - **in advance** for the next sessions of CWE MC in case of any foreseen unavailability
- From the time of running the Fallback auction, MPs are not allowed to update their bids anymore

Fall-back principles: ATC for shadow auctions

- After several simulations over the parallel run period, CWE TSOs have determined a model for shadow auctions ATCs:
  - **Similar approach to the ID ATC computation**: Remaining margins are equally split between the four borders and then transformed into ATC via PTDFs. This iterative process (all CB's margins will not be exhausted simultaneously) stops when the difference between two steps becomes inferior to a given threshold
  - 2 "starting points" were considered for this method: LTnom clearing point or LT allocated rights. As in average the 2 possibilities provide capacities with the same order of magnitude, and as LT rights were not systematically covered when starting from LTnom clearing point, **it has been decided to start from LT allocations**



The full model is described in the approval package: http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Approval-Documents

Shadow auction process

1. MPs entitled with CASC submit shadow auction default bids through the web-based User Interface anticipating a possible decoupling (amendments or withdrawing possible up to the running of the shadow auctions)
2. The EXAU (Explicit Auction System) creates shadow auctions on a daily basis
3. ATCs are provided by TSOs to CASC on a daily basis
4. Should a Fallback situation be declared by the NWE Parties, MPs will be informed and can update their bids according to the new time schedule communicated by the Parties
5. After the deadline, bids can no longer be updated. CASC runs the Shadow auctions calculations
6. After (partial/full) decoupling is announced, Shadow Auction results are published and Programming Authorizations are provided to TSOs and MPs
7. Local PXs re-open their order books to enable MPs to adapt their bids based on the Shadow Auction Results and then publish the local Market Results
8. MPs may submit their nominations to TSOs according to the existing processes

Rollback solution

- Risk of failure when switching from the ATC based systems to FB MC on the launch day itself as well as during the first period after the launch despite thorough testing
- For risk mitigation, the Rollback option will be kept available during two months after the CWE FB MC Go Live
- In case the Rollback is declared by the CWE JSC, **ATC MC in the NWE framework** (as of after NWE Go Live) **will be reestablished** by
  - **Reinstalling all Rollback systems:**
    - CWE TSOs will roll back to the ATC based version of the TSO Common System
    - CWE TSOs will roll back to the ATC processes and/or Back-end systems
    - PX will still use the PMB as Market Coupling system
    - PMB configuration will be switched to ATC mode
    - Trading system interfaces will remain unchanged
    - All interfaces between TSOs, between PXs, and between TSOs and PXs will be re-established
  - **Testing the connections**
  - **Running a couple of test scenarios**

Rollback process

- During the interim period necessary to install the Rollback and according to the origin of the incident, the following will be applied:

		Unacceptable / Unexpected market results presumably due to FB constraints	Technical issue on the Market Coupling side
Interim *Period for installation of all systems*	Capacity format	**FB parameters**	**ATC values** derived from FB domain
	Market Coupling	**FB MC**	**ATC MC**
Rollback *All systems installed and operational*	Capacity format	ATC values	ATC values
	Market Coupling	ATC MC	ATC MC

Message to MPs in case of Rollback:
All necessary information regarding
- Practical modalities
- Potential duration
- Time schedule of explicit auctions
- etc.

- The duration of the different periods is still under definition by Project Partners

Q&A Session

CWE Project Partners would like to thank you for your attention and participation!