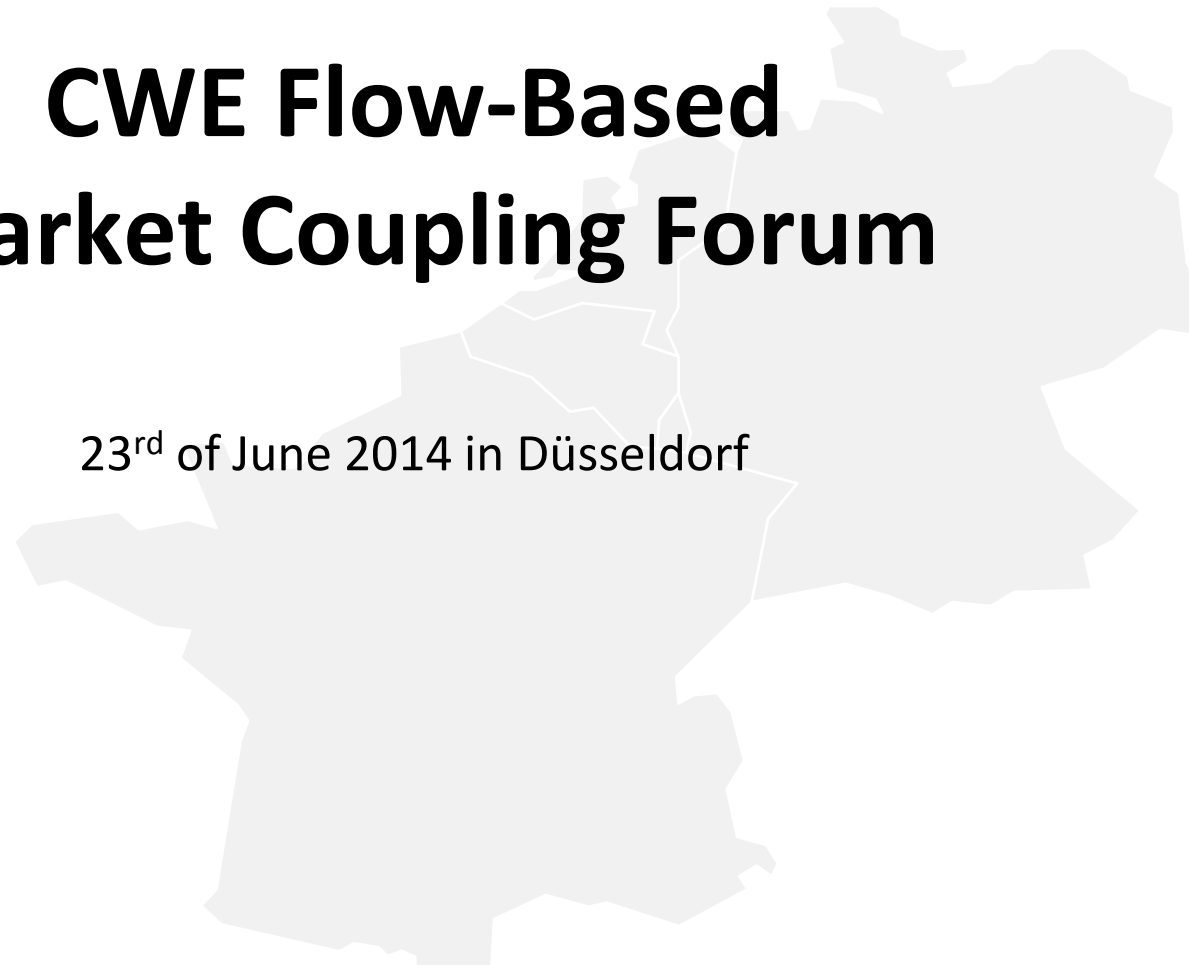




CWE Flow-Based Market Coupling Forum

23rd of June 2014 in Düsseldorf



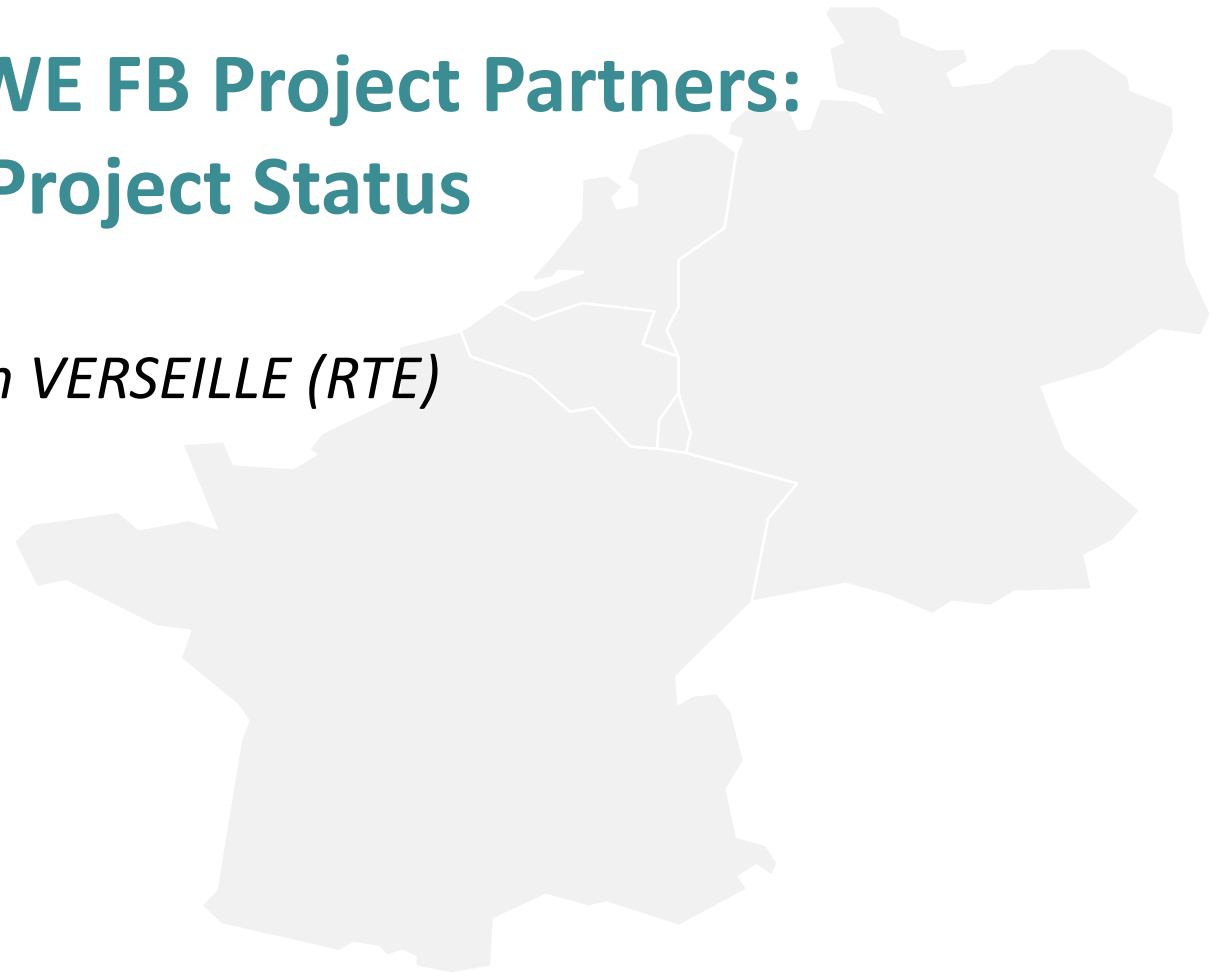
Agenda



Timing	Topic	Speaker
10.00 - 10.30	REGISTRATION AND COFFEE	
10.30 - 11.00	Introduction CWE FB Project Partners: Project Status <ul style="list-style-type: none"> Recent achievements Project planning and next major milestones 	Jean VERSEILLE
11.00 - 11.45	Parallel Run Performance	Joel HOEKSEMA Philippe NOURY Francois-Xavier DETRAZ
11.45 - 12.30	NRA Presentation on Public Consultation and Approval Process	CWE NRAs
12.30 - 13.30	LUNCH	
13.30 - 14.00	EFET presentation	Jérôme LE PAGE
14.00 - 14.45	Overview of Transparency and Monitoring Framework <ul style="list-style-type: none"> Progress on pending requests Plenary discussion 	Jochen BAMMERT
14.45 - 15.45	Stakeholder Acceptance Process <ul style="list-style-type: none"> Presentation of updated NRA approval package Analysis of FB vs FBI Project's Go Live criteria 	Dietmar BECK Joel HOEKSEMA Andrew CLAXTON
15.45 - 16.00	Plenary Discussion	---
16.00	COFFEE	

Introduction CWE FB Project Partners: Project Status

by Jean VERSEILLE (RTE)





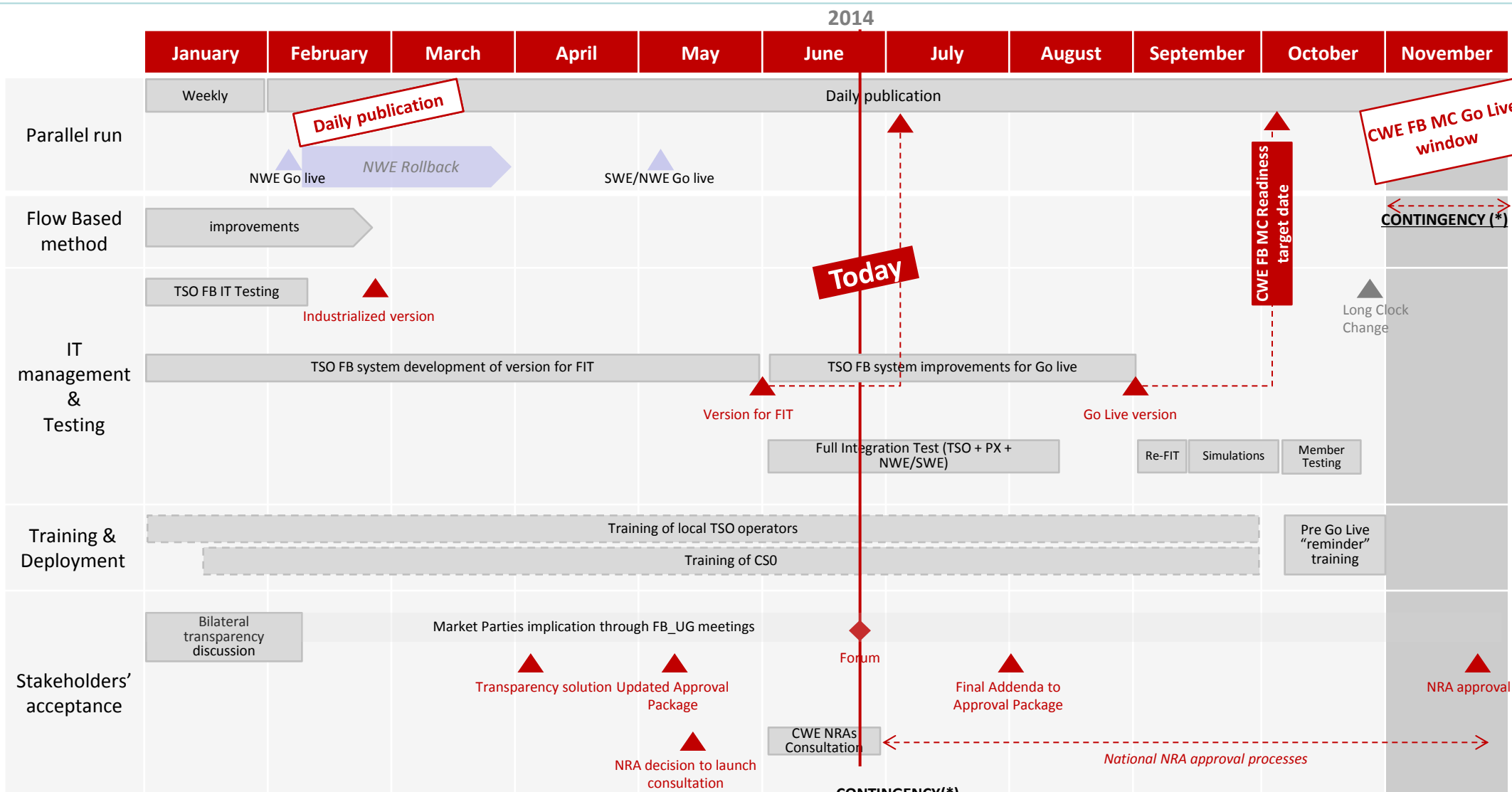
Introduction: Recent Achievements

- ▶ **One and a half year of external parallel run results** available and since 25th February on a daily basis, including Shadow Auction ATCs
- ▶ **Bilateral discussions with Market Participants and Flow Based User Group meetings** to identify satisfying transparency framework
- ▶ **Submission of updated Approval Package**, explaining the final design and implementation of the FB MC to CWE Regulators including **additional data publication**
- ▶ In the name of all project partners, the Chairmen would like to welcome all stakeholders to today's Market Forum





CWE FB MC project planning



- MPs' readiness

- IT system readiness and successful testing

- Appropriate management of interactions with other extension projects

- Availability of other NWE/SWE parties for testing



Next important milestones: Consultation

- ▶ Since June, 2nd, CWE Regulators are looking for **Market Parties' feedback** on the CWE FB MC solution via a **dedicated survey**
- ▶ CWE Project Partners are glad to provide you today with additional explanation you may need to reply to the survey until June, 30th
- ▶ CWE Regulators will provide further information regarding the consultation and approval process during a dedicated timeslot



Next important milestones: IT / Procedures Testing

“ No CWE FB MC Go Live without thoroughly tested systems ”

- ▶ Already since March, CWE Project Partners have been testing the communication and integration between TSO and PX systems in order to ensure the proper functioning of the whole MC process
- ▶ **Full Integration Testing** (FIT), currently taking place, ensures that information can be exchanged between different systems and in different situations (e.g. in Fallback mode, for day-light saving time, etc.)
- ▶ Most of the TSOs' normal operational procedures have been progressively tested in the parallel run since February
- ▶ These tests will be followed by **Simulation Testing** focusing on testing the daily operational process by respecting procedures and timings



Next important milestones: Member Testing

- ▶ Once these IT tests successfully finished, Market Participants will be invited to participate in **CWE FB MC member testing** during one week in October, a wish expressed by MPs during the consultation in August 2013
 - Specific scenarios (Normal day and Partial Decoupling) will be tested
 - Information, scenarios and logins to test systems will be provided in September
- ▶ Please note that member testing focusses on **testing the bidding process for MPs** and not on the representativeness of market coupling results which can be extracted from the FB parallel run

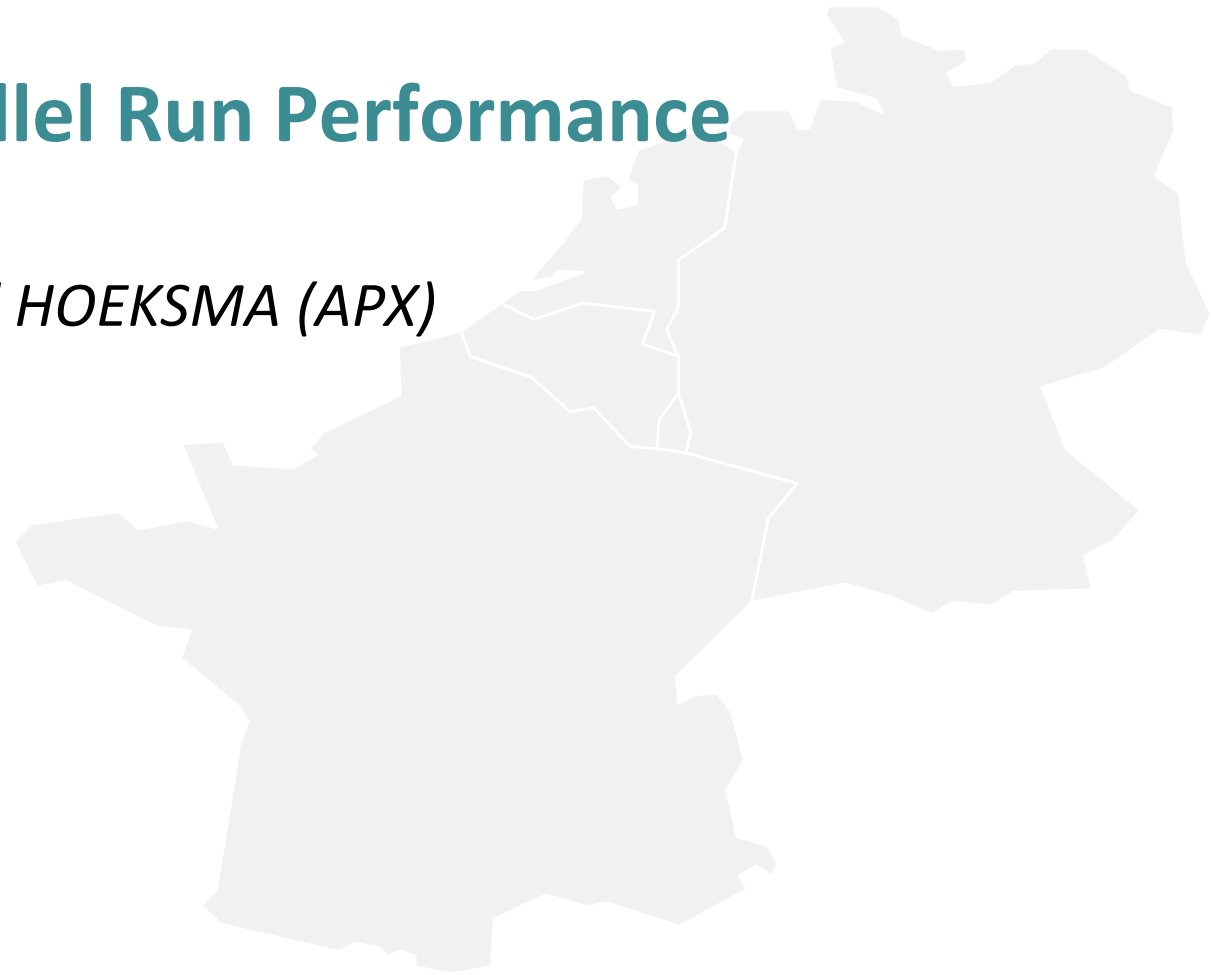


Next important milestones: Parallel run

- ▶ **Current daily parallel run is performed with TSO CS containing all methodological functionalities for Go Live**
- ▶ Updated release (**Full Integration Test version**), available end of May, only contains new features necessary for testing
 - New features concern TSOs' and PXs' internal operational interfaces and will not affect MPs' processes and operations
 - Only one new functionality: Fallback parameter calculation
 - Usage in the parallel run as of beginning of July
- ▶ **Go Live version** contains last improvements following parallel run experience and aligned with the approval package
 - Last improvements like: Reporting, transparency, system performance, etc.
 - Usage in the parallel run as of first week of October

General Parallel Run Performance

by Joel HOEKSMMA (APX)



Parallel Run Performance

Representativeness of data



Year	wk	Wed	Thu	Fri	Sat	Sun	Mon	Tue
2013	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
	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
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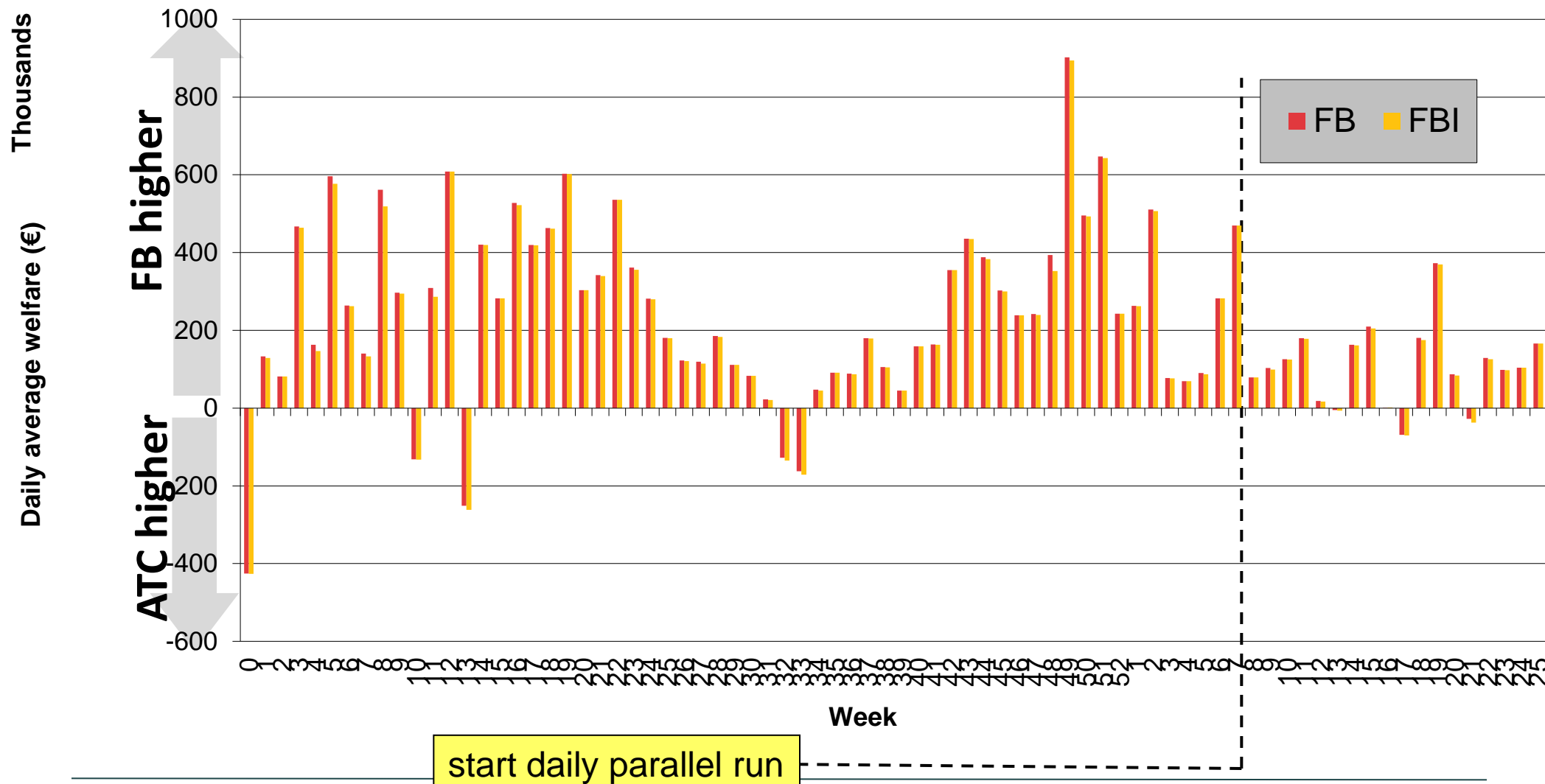
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	13	26 Mar	27 Mar	28 Mar	29 Mar	30 Mar	31 Mar	01 Apr
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Parallel Run Performance

Weekly day ahead market welfare

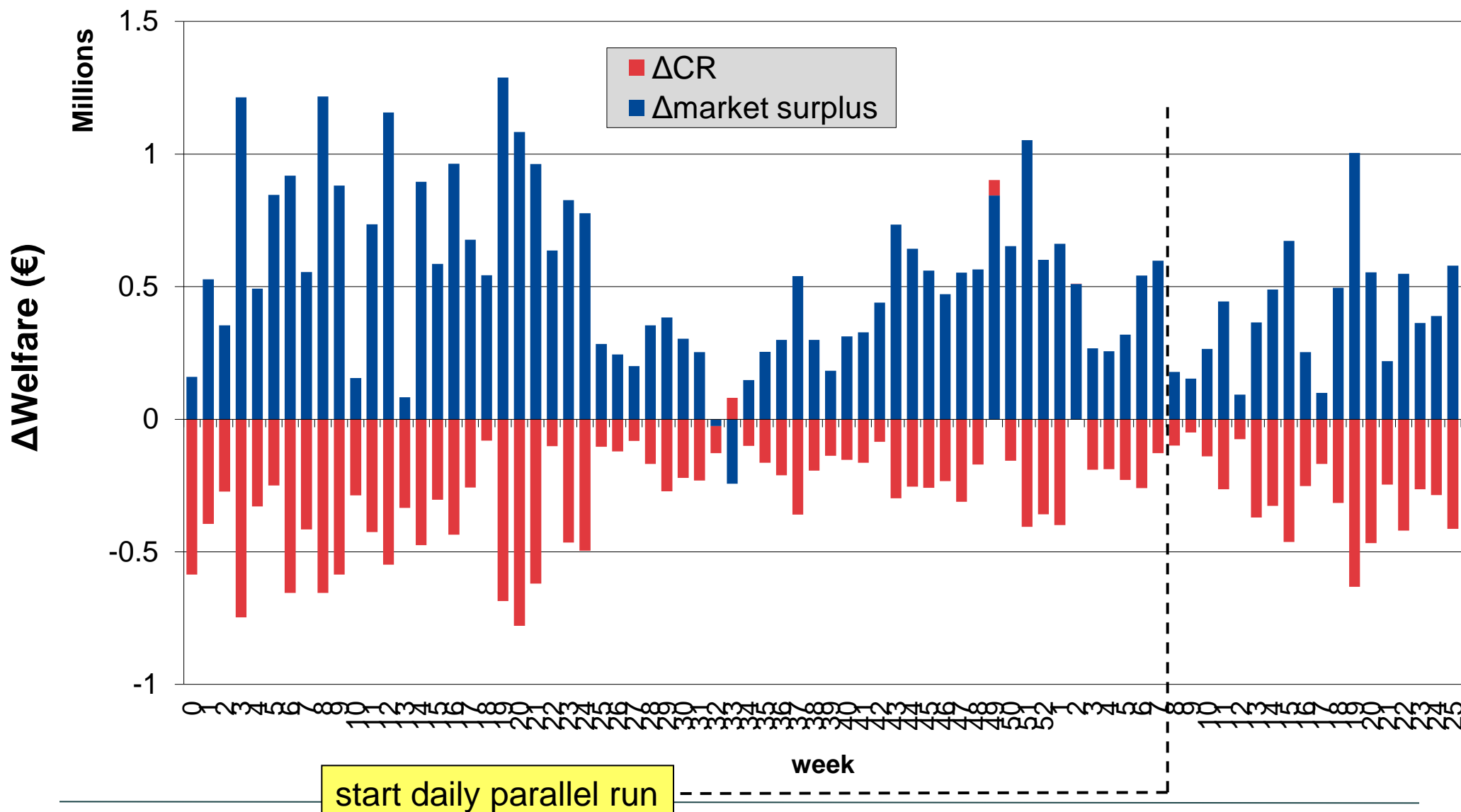
Development of welfare (XX - ATC) - daily average





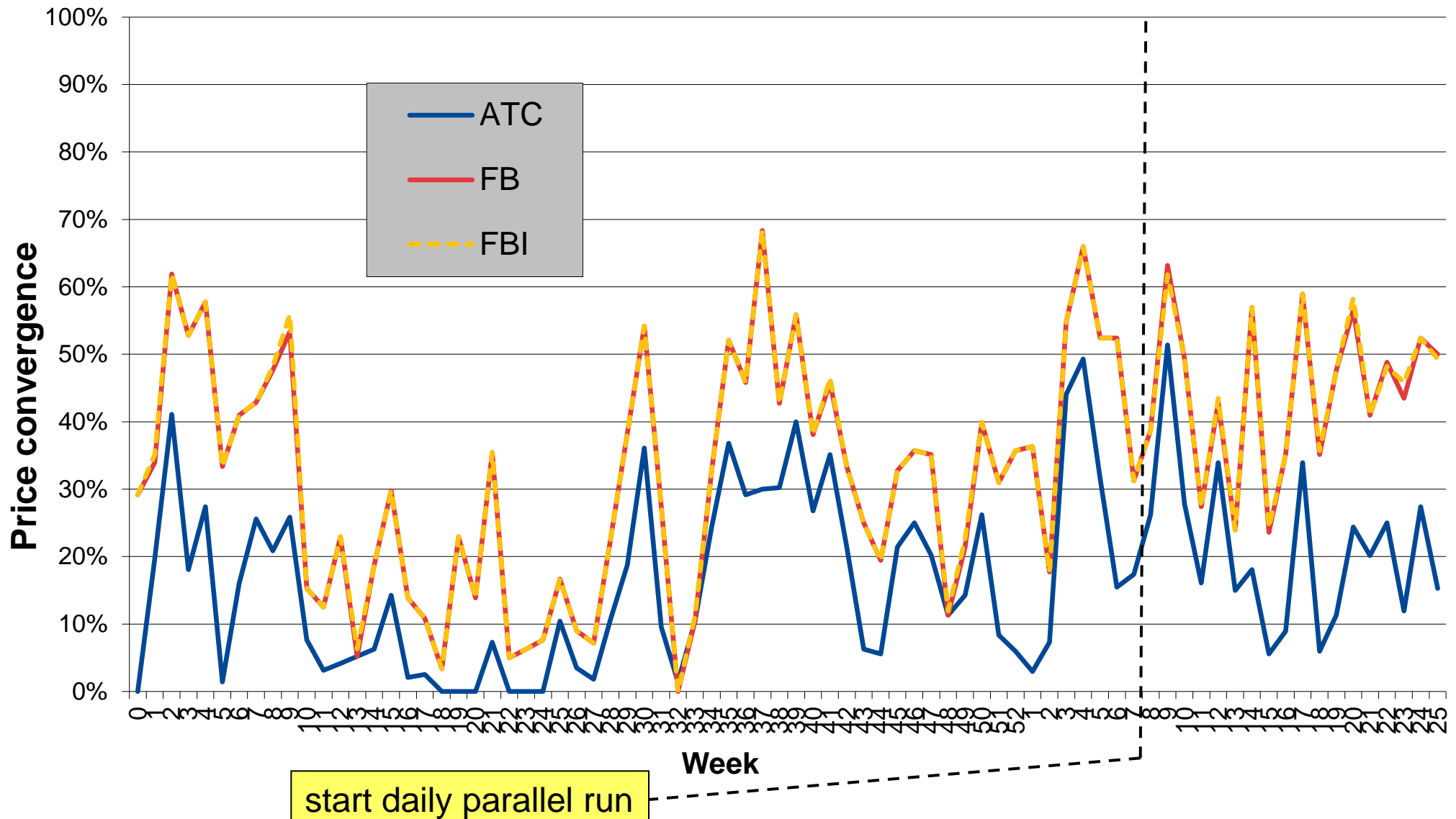
Parallel Run Performance

Change in weekly daily average welfare



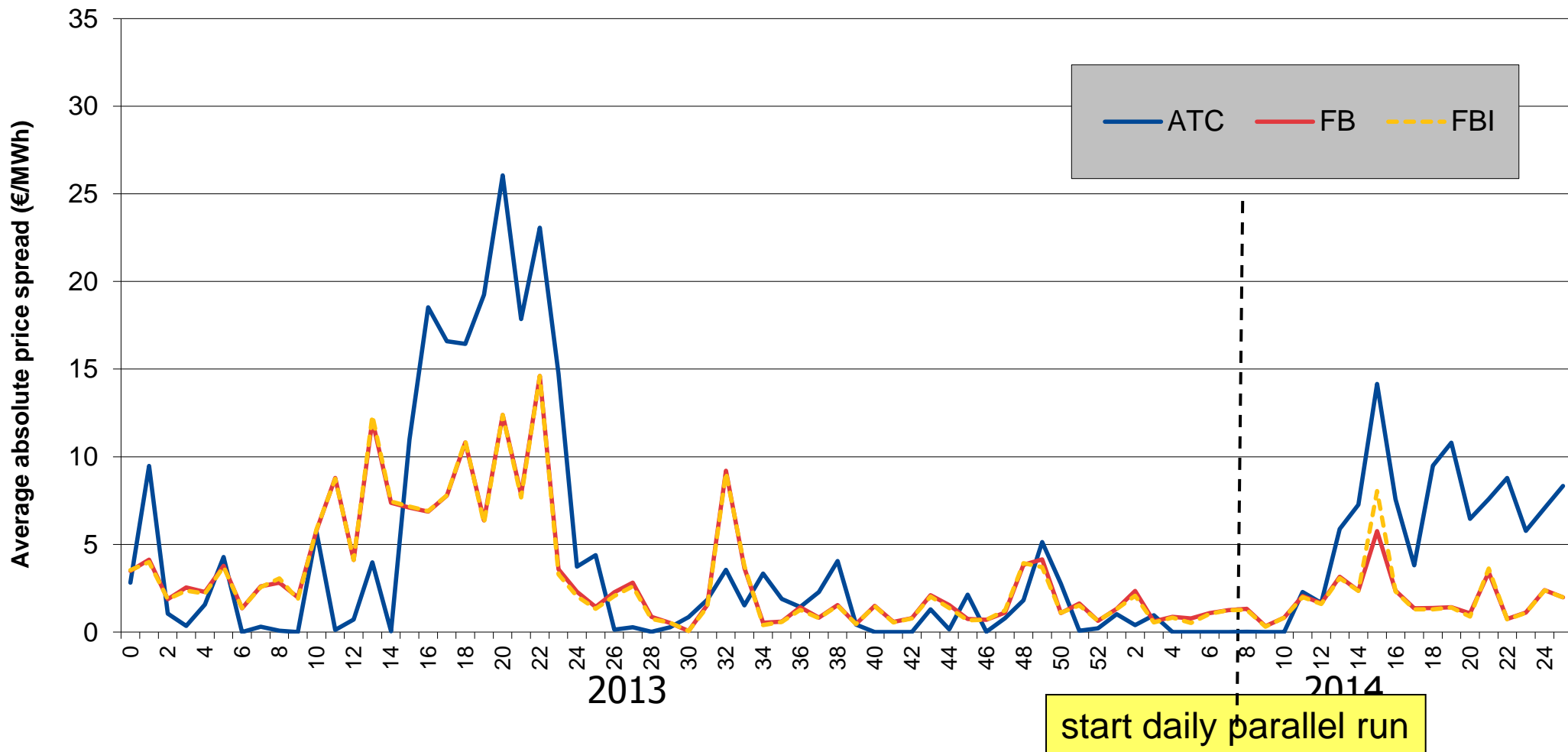
Parallel Run Performance

Price convergence



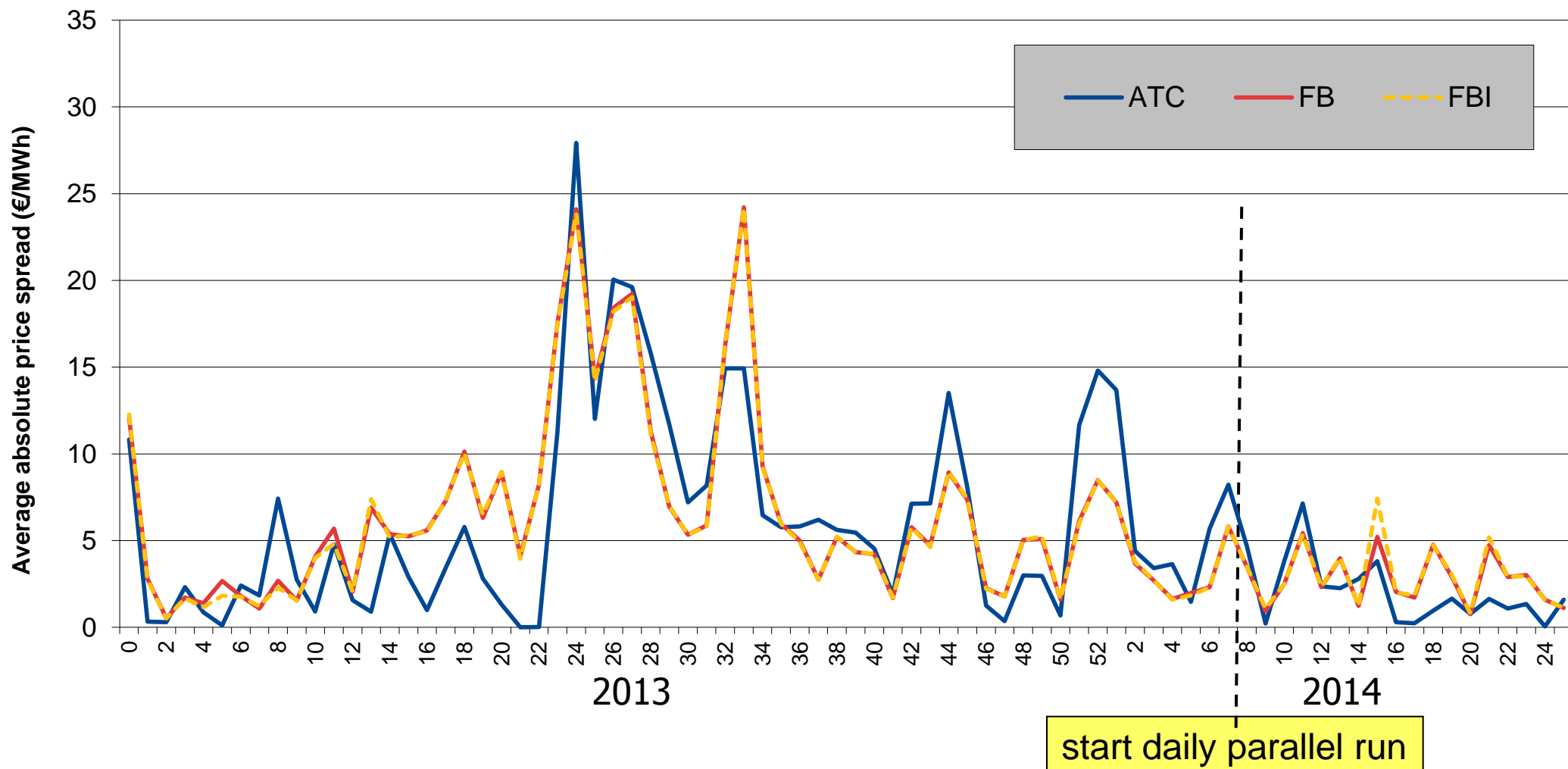
Parallel Run Performance

Cross border spreads BE-FR



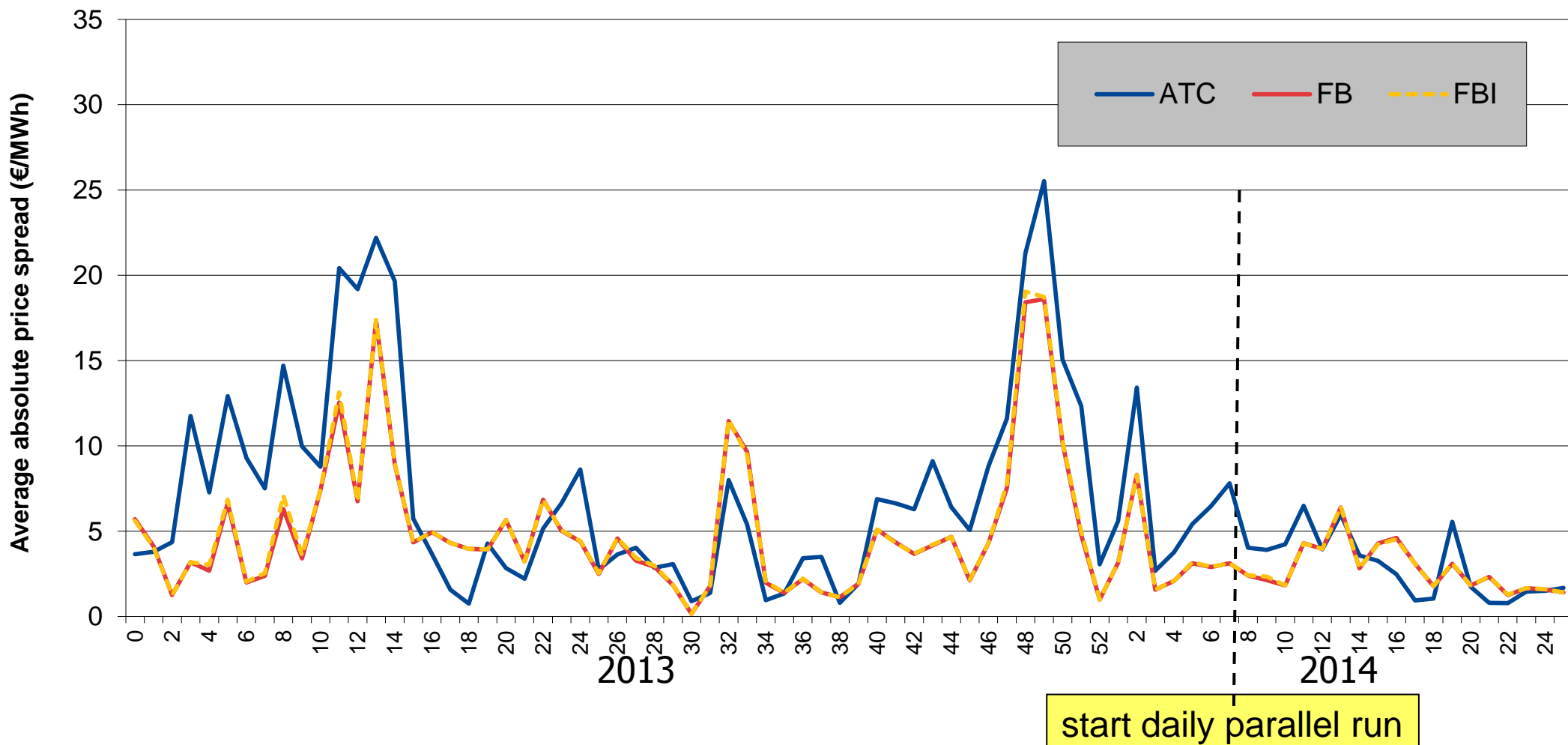
Parallel Run Performance

Cross border spreads BE-NL



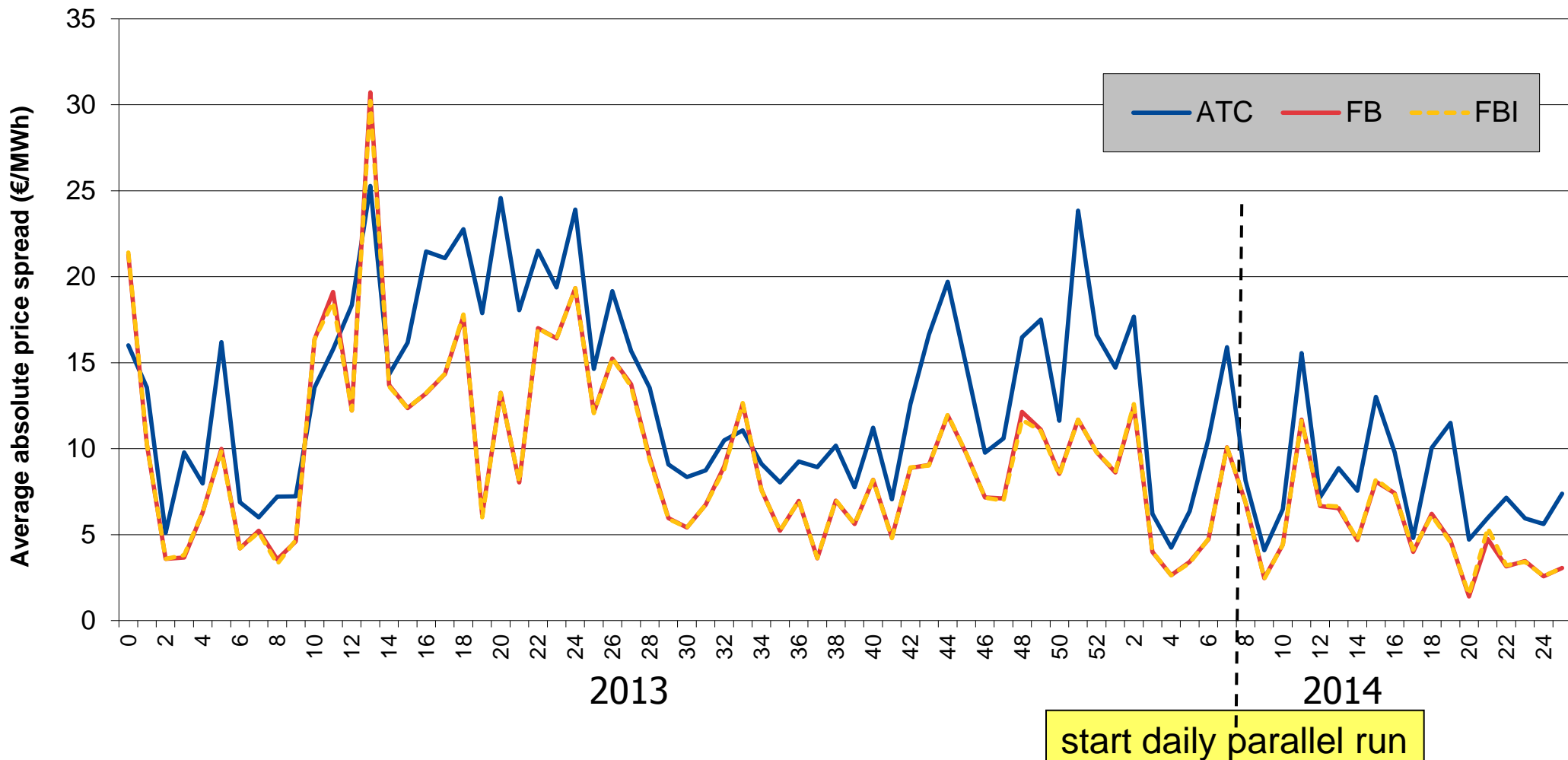
Parallel Run Performance

Cross border spreads DE-FR



Parallel Run Performance

Cross border spreads DE-NL





Parallel Run Performance

Intuitiveness (2013 wk0 - 2014 wk25)

	Number of hours where the situation is bilateral non-intuitive	Proportion of hours where the situation is bilateral non-intuitive	Proportion of congested hours where the situation is bilateral non-intuitive
pre-NWE	444	5.5%	8.0%*
post-NWE	175	5.5%	9.8%*

**experimental cycles reported 14.4% non-intuitive of congested hours*

Parallel Run Performance

ATC vs. FB: where are we today?

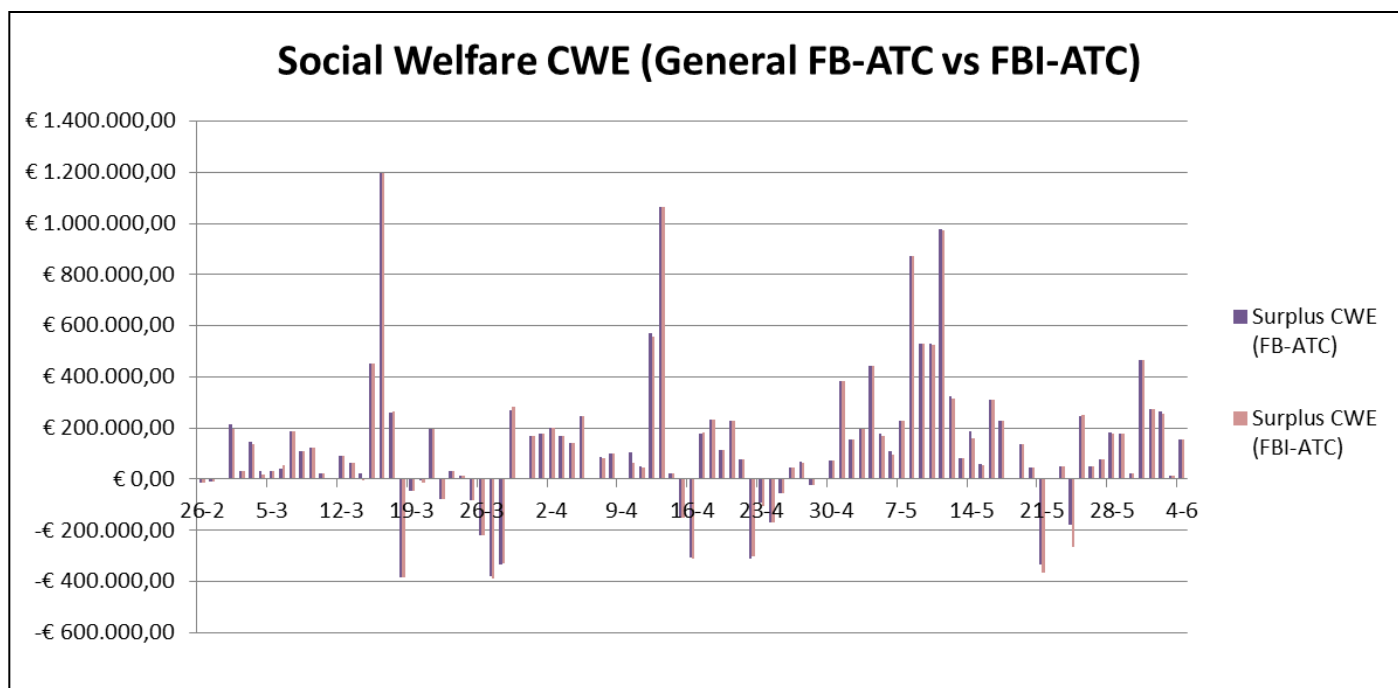
by Philippe NOURY (RTE) and Francois-Xavier DETRAZ (CORESO)





Overall Daily External Parallel Run Performance

- From the start of the daily external parallel run, on average there is **130 k€ social welfare** gain compared to ATC while ensuring grid security



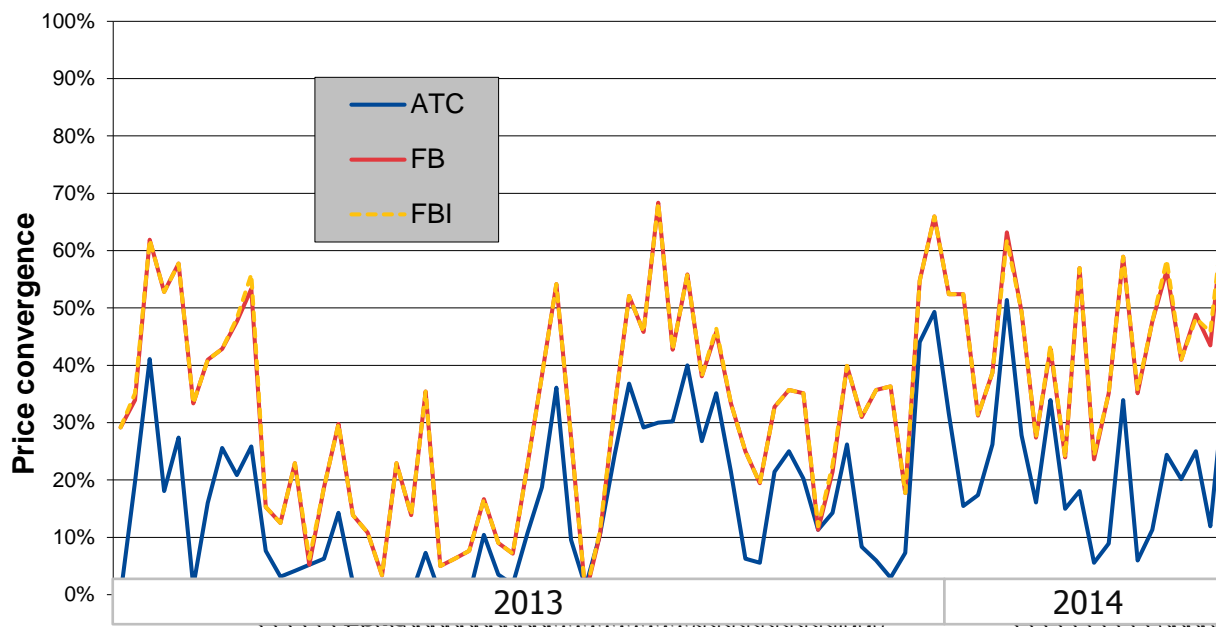
	Average per day
Buyer Surplus CWE (FB-ATC)	€ -20.006,67
Seller Surplus CWE (FB-ATC)	€ 391.324,56
Market Surplus CWE (FB-ATC)	€ 371.317,89
Congestion Revenue CWE (FB-ATC)	€ -240.378,17
Surplus CWE (FB-ATC)	€ 130.939,71

Overall Daily External Parallel Run Performance

Convergence



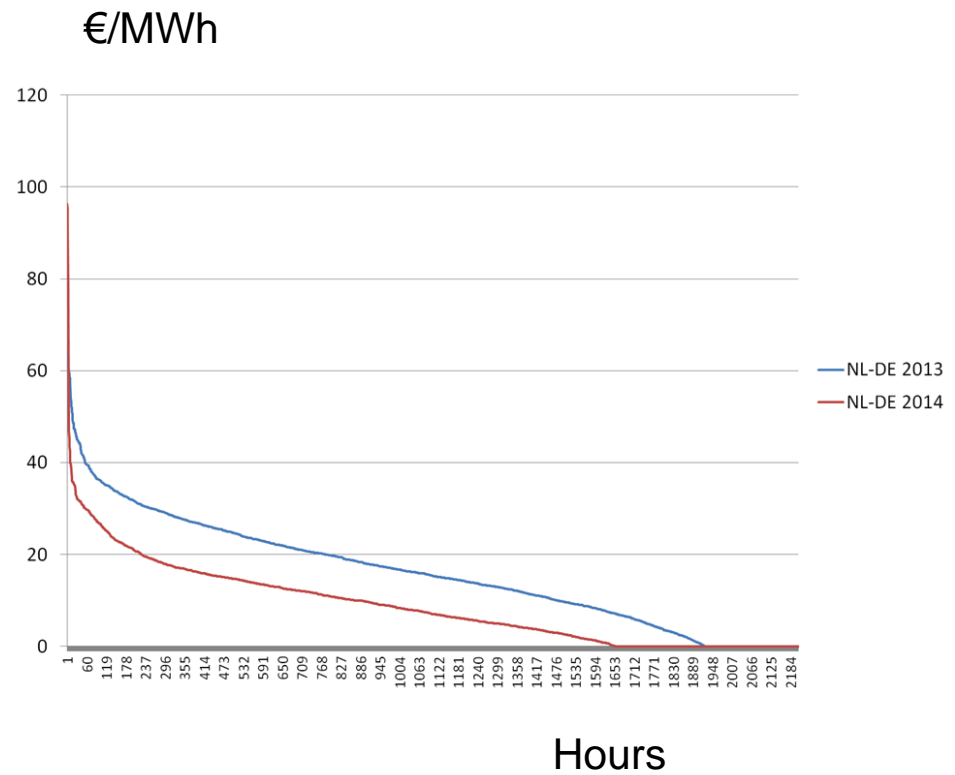
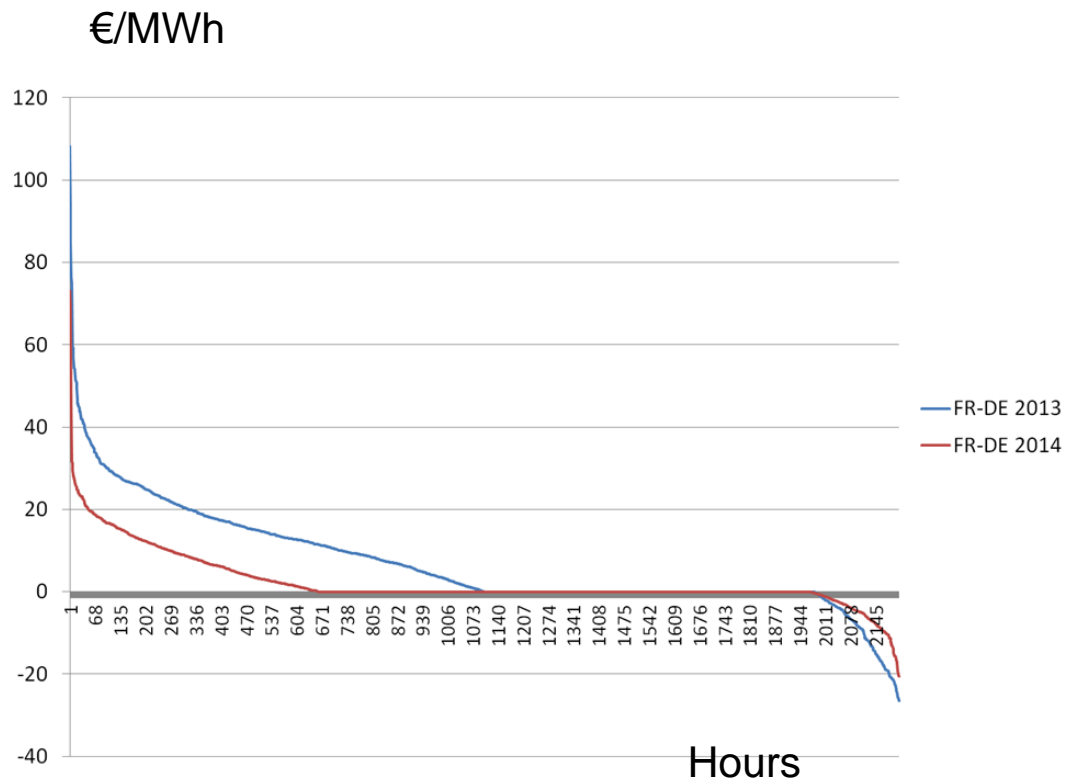
- ▶ From the start of the external parallel run, **convergence indicators have been constantly better in FB than in ATC** which is an indicator of increased exchanges
- ▶ One can observe **improved convergence rates in 2014 compared to the same period in 2013**:
 - A likely consequence of a less constrained winter
 - May contribute to reduced social welfare gain of FB vs. ATC observed during the parallel run



Overall Daily External Parallel Run Performance Spreads



► ATC spreads narrow in S1 2014 compared to 2013





High-level differences between ATC and FB capacity calculation

- ▶ **FB is a more harmonized, formalized and sophisticated capacity calculation process, performed today independently from the ATC process (1/4)**
- ▶ (A): **More harmonization and coordination:** FB is coordinated at inputs level (CBCO, GSK are used to provide a common set of FBP) while ATC is coordinated at output level (joint verification performed on NTCs provided individually)
 - ⇒ This sophistication / complexity has been more challenging to integrate into operational procedures and tooling but is required in order to bring FB closer to the physics of the grid
 - ⇒ Coordination process already running and TSOs continuously improve the regional coordination
- ▶ (B): **Physics of the Grid:** Technical constraints and remedial actions are **taken explicitly into account** in the centralized FB calculation (cf. previous forum workshop)
 - ⇒ In a word, FB is closer to the physics of the grid
- ▶ (C): usage of the grid model “**D2CF**”: ATC uses two D2CF grid models “only” for verification of individual NTC values ; FB uses 24 D2CF models as a direct technical input for the capacity calculation process
 - ⇒ The gain in reliability of the capacity calculation process is significant, but this puts higher requirements on the quality of the D2CF in FB
 - ⇒ Based on the learnings during the parallel run and after Go Live, improvements in the D2CF will be implemented by the TSOs whenever this seems necessary



High-level differences between ATC and FB capacity calculation

- ▶ **FB is a more harmonized, formalized and sophisticated capacity calculation process, performed today independently from the ATC process (2/4)**
- ▶ (D): **Monitored elements:** In Flow Based the number of critical branches has increased
 - ⇒ Operating conditions have evolved dramatically (e.g. RES penetration) so in any case TSOs need to change their capacity calculation process, and especially to adjust the set of monitored elements, which is done through FB
 - ⇒ The set of CB monitored under ATC made sense at the moment of this design with less cross border loop flows
 - ⇒ Monitoring properly the relevant set of CBs is not possible in ATC method
- ▶ (E): **reliability margins:** due to the possibility to come closer to the physical limits under FB, TSOs need to apply a stricter method to assess reliability margins (FRM), on a CB per CB basis, and not any more per border. In a few cases, this has lead to a decrease of possible exchanges from ATC to FB



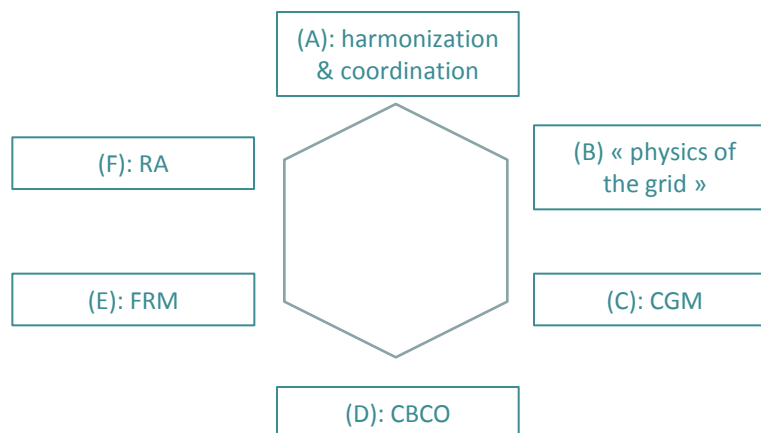
High-level differences between ATC and FB capacity calculation

- ▶ **FB is a more harmonized, formalized and sophisticated capacity calculation process, performed today independently from the ATC process (3/4)**
- ▶ (F): **Remedial Actions (RA)**: TSO's local risk policies precisely describe the range of RA that can be taken into account during the capacity calculation process (number of PST taps, topological actions, amount of redispatching etc...). The complete range of available RA cannot be “given” to capacity calculation, because TSOs need to keep at hand some RA in order to cope safely with real time events
 - ⇒ In FB, RA are included explicitly within the critical branches definition. Which means that TSOs can strictly apply their risk policies in this respect
 - ⇒ In ATC, the consideration of RA is implicit (TSOs assume indirectly the positive effect of RA on their NTCs). In practice, the ATC approach does not allow a strict implementation of RA, according to their risk policies
 - ⇒ In practice, it happened that some XB exchanges observed in ATC market coupling were actually supported by RA (extreme PST taps, costly redispatch) that TSOs did not consider when computing the capacities two days before
 - ⇒ In such cases, the welfare comparison between ATC and FB is questionable, because the cost of the RA eventually supporting high level of NTCs in real time is not part of the DA market welfare optimization
 - ⇒ Such cases are isolated and can account for, punctually, welfare decrease from ATC to FB. It cannot be concluded from few isolated cases that ATC model is more risky or that FB model is more conservative



High-level differences between ATC and FB capacity calculation

- ▶ **FB is a more harmonized, formalized and sophisticated capacity calculation process, performed today independently from the ATC process (4/4)**
- ▶ Starting from ATC solution as a reference, differences in FB results could then be interpreted according to the previous 6 main factors
- ▶ This can help to structure and understand, on a case-by-case basis, where the concrete differences lay, but also to identify potential improvements



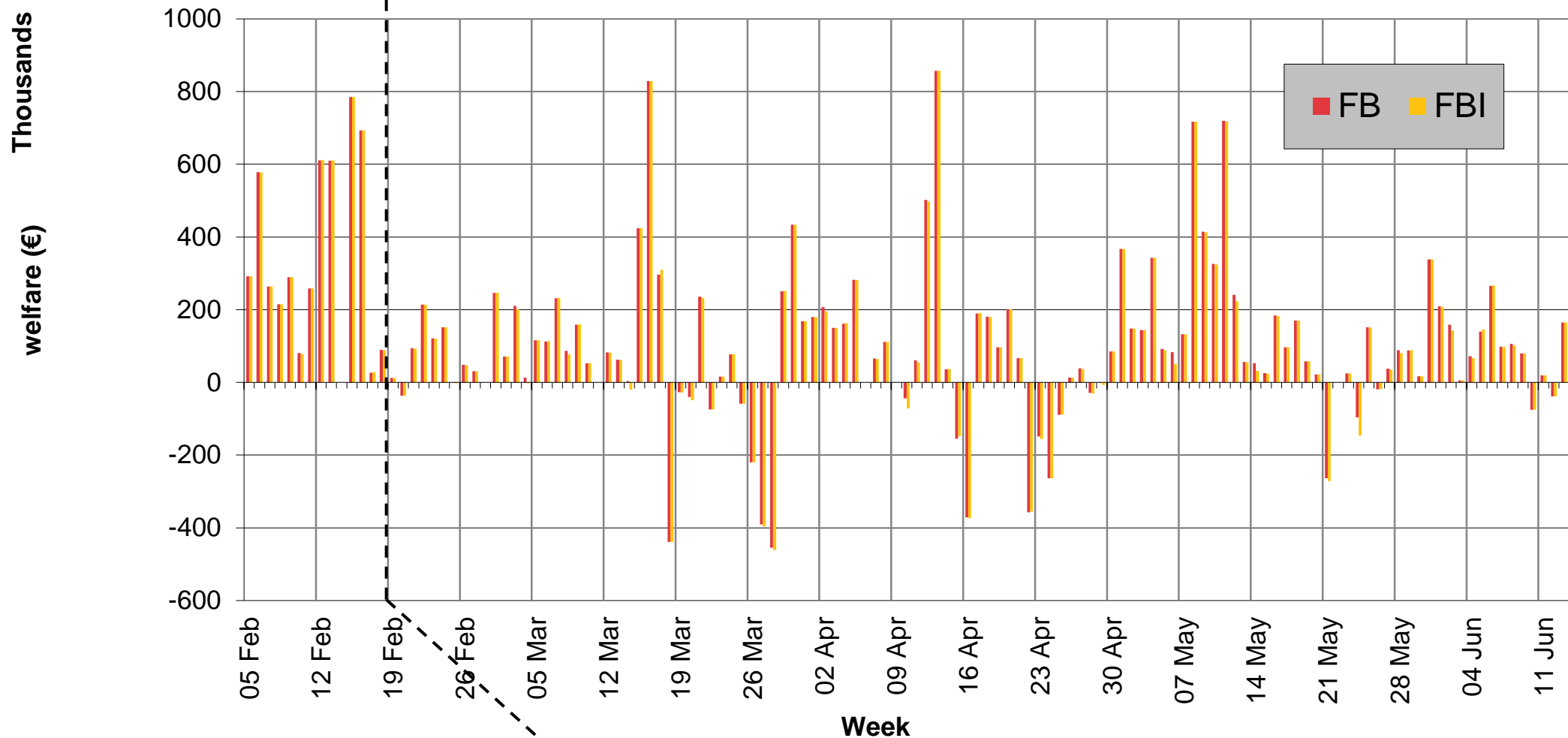
- ⇒ The FB formalism allows for a more explicit application of TSOs' risk policies in FB than in ATC. This inevitably led to discrepancies in the results, sometimes under FB to the detriment of the market but in the clear majority of cases to its benefit
- ⇒ We will now focus on specific welfare decreases to illustrate these notions



Parallel Run Performance

Daily day ahead market welfare

Development of welfare (XX - ATC)



start daily parallel run



Parallel run performance: focus on market surplus decreases

- Days where the FBMC resulted in a lower market welfare than the ATC MC are subject to an extensive study
- This study may also better explain the cases where ATCs and LTAs fall outside the FB domain

- 10-3-2014 → -30476 EUR
- 18-3-2014 → -158900 EUR
- 22-3-2014 → -170788 EUR
- 25-3-2014 → -45172 EUR
- 26-3-2014 → -34367 EUR
- 27-3-2014 → -187407 EUR
- 28-3-2014 → -518856 EUR**
- 16-4-2014 → -73359 EUR
- 22-4-2014 → -353898 EUR**
- 23-4-2014 → -36715 EUR
- 24-4-2014 → -283456 EUR
- 21-5-2014 → -195135 EUR (only FBI model)
- 24-5-2014 → -195135 EUR (only FBI model)

Potential clusters
(same period)

Loss of MS is not linked here to the methodology, but to a learning effect (human error)



Parallel run performance: focus on market surplus decreases

- ▶ Such situations need to be accounted for, but also provide opportunities to better explain some fundamental differences between the ATC and the FB approaches
 - Studies are performed by the service providers SSC, Coreso and external support
 - The idea is to define a systematic approach to investigate these situations and to identify “clusters” or “patterns” in order to foster a better understanding of FB and opportunities for improvement
 - Two days, as part of potential clusters, will be highlighted in the following slides
 - **March 28, 2014** (-518 856 EUR compared to ATC MC)
 - **April 22, 2014** (-353 898 EUR compared to ATC MC)
 - It is foreseen to provide NRAs and Market Parties with a full report with an update of all days listed to provide explanation on possible causes
 - Project partners propose not to perform a similar approach for the other 300-plus positive days

1. 10-3-2014 → -30476 EUR
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Potential clusters
(same period)

Loss of MS is not linked here to the methodology, but to a learning effect (human error)

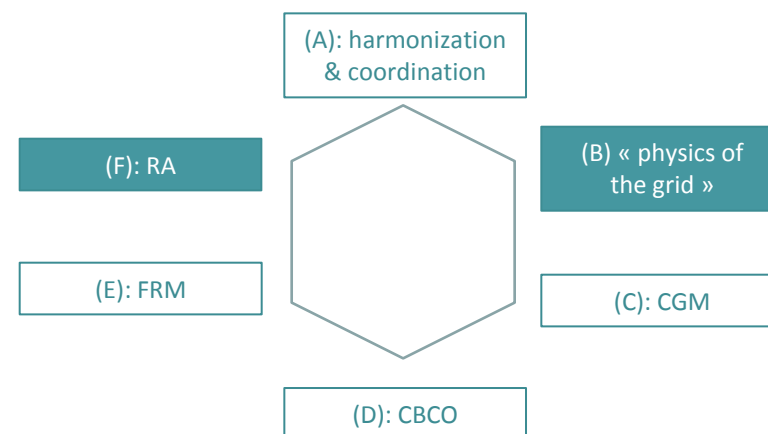


Explanation on variations in social welfare between ATC and FB

March 28, 2014

- The D2CF was of good quality
- An erroneous set of PST taps was applied in FB by one TSO
- With the PST coordination proposed by one of the coordination centers (it was used by the TSOs of this coordination center, but not by this one TSO), the FB domain could have been larger but not as large as ATC
- The ATC domain was, from a FB point of view (with a non-zero FRM) not secure at the capacity calculation stage (with its limited amount of tap positions)
- In real-time the ATC domain was secure due to the fact that more tap positions are available in real-time

Loss of MS is clearly linked here to a lack of coordination on RA deployment and therefore on a different level of risks resulting from the erroneous set of PST taps in FB



⇒ **Mitigation measure: better application and coordination of Remedial Actions in the capacity calculation stage** → An agreement between the coordination centers has been reached and in general it should be reminded that RA coordination is continuously improved via a dedicated TF

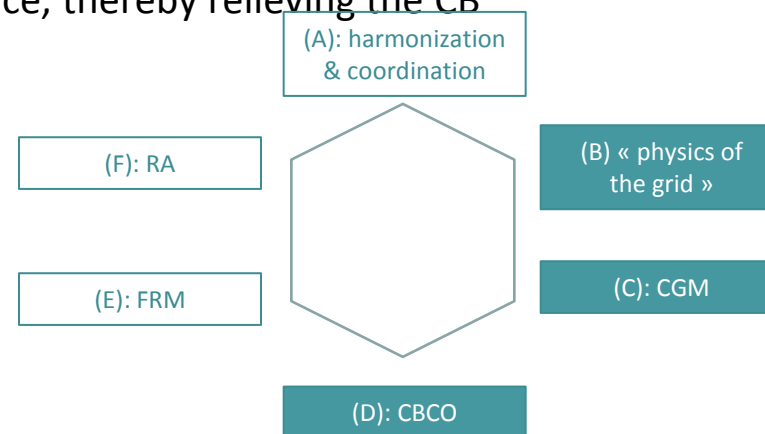


Explanation on variations in social welfare between ATC and FB

April 22, 2014

- The IGM (Individual Grid Model) of one TSO was not of a good quality for this day
- TSO uses at the moment for its IGM exactly the same generation pattern as was running on reference day (18th of April)
 - A generator block was running on the reference day, but not on the target day
 - This generator block is located nearby an internal CB under FB capacity calculation; under ATC capacity calculation this internal CB is not monitored
- When ATC MC point is reflected in D2CF, it shows that CB is slightly overloaded. As PST taps hardly impact this specific CB, only redispatch (with an effect on global social welfare) could have been used in real-time
- No problem in real-time though, as the block was out of service, thereby relieving the CB

The loss of welfare is a combination of factor (b),(c) and (d): if the consideration of more monitored elements (d) together with a better model of the generation impact (b) is a general improvement, the forecast errors in the basecase (c) can lead to a punctual decrease of quality. Somehow, (c) has been « amplified » through improvements on (b) and (d).



⇒ **Mitigation measure: the building process of this TSO's IGM is currently being adjusted. In parallel, TSOs currently carry out a common initiative to increase the reliability of their CGM. But in any case the basecase accuracy will remain constrained by information available to TSOs, especially schedules from the market**



Variations in social welfare between ATC and FB

► Conclusion: FB performance, what to expect then?

- The parallel run has displayed frequent decreases of welfare (at global or even down to market level), which needed to be reported and accounted for towards stakeholders. For the sake of transparency, CWE partners have initiated these individual investigations on cases of abrupt market welfare decrease
- In some cases (21st May), these decreases are clearly linked to a learning effect of the FB project and may not be considered as representative of the eventual performance of the FB process
- In practice, only thorough, case-by-case analyses can lead to a clear understanding on how these factors (A to F) play to the benefit, or to the detriment, of FB. There are no simplistic explanations to account for observed discrepancies
- While two days of the parallel run have already gone through this analytical framework, CWE partners will review the other so-called “negative welfare days” in order to foster transparency and confirm potential improvements for the method
- CWE partners could identify fundamental, methodological factors to account for differences on these two days
- Significant differences between ATC and FB were expected in some occasions, as a result of a stricter application of TSOs risk policies under FB and better physical modelling (exact consideration of remedial actions, systematic monitoring of relevant internal lines...)



Variations in social welfare between ATC and FB

► Conclusion: FB performance, what to expect then?

But CWE partners wish to remind that:

- Parallel run figures are largely in favor of FB
- Fully understanding the causes of the performance changes since February, and being confident that appropriate measures are in place and are stable, are important go-live acceptance criteria
- TSOs are confident to manage the remaining improvements in the FB project in accordance with the current Go-Live planning
- It does not mean that TSOs have decided to freeze the FB method after Go live. On the contrary, in a continuous improvement framework, TSOs are currently improving their coordination process and their CGM elaboration

Parallel Run Performance

Stability of the results



- ▶ **FB performance (daily parallel run stability):** as can be seen in the overview from the parallel run 96% of the results are representative for the complete external parallel run period

- ▶ **Introductory disclaimer:** this presentation focuses on fall-back seen from a capacity calculation perspective. Decoupling scenarios are not linked to this discussion

Year	wk	Wed	Thu	Fri	Sat	Sun	Mon	Tue
2013	0							01 Jan
	1	02 Jan	03 Jan	04 Jan	05 Jan	06 Jan	07 Jan	08 Jan
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	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
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	19	08 May	09 May	10 May	11 May	12 May	13 May	14 May
	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
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	19	07 May	08 May	09 May	10 May	11 May	12 May	13 May
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Parallel Run Performance

Stability of the results



- ▶ **Missing days of daily parallel run are related to learnings or missing fallback solutions**
For these instances, mitigations are or will be implemented
 - **February, 28th**: unavailability of Private System (analysis tool to enlarge FB domain and perform risk assessment)
 - **March, 11th**: technical error of one application server leading to impossibility for common computation assessment
 - **April, 6th**: bug in merging tool leading to choice of one reference day
 - **April, 9th**: low D2CF quality leading to exceptional high PTFs rejected by the validation check
 - **May, 22nd**: issue in local D2CF file creation due to failed delivery of updated local calculation module
- ▶ For more detailed explanations, please refer to CASC website:
<http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Parallel-Run-Results>
- ▶ Please note that March, 30th and May, 18th have been reclassified ex-post

Parallel Run Performance

Stability of the results



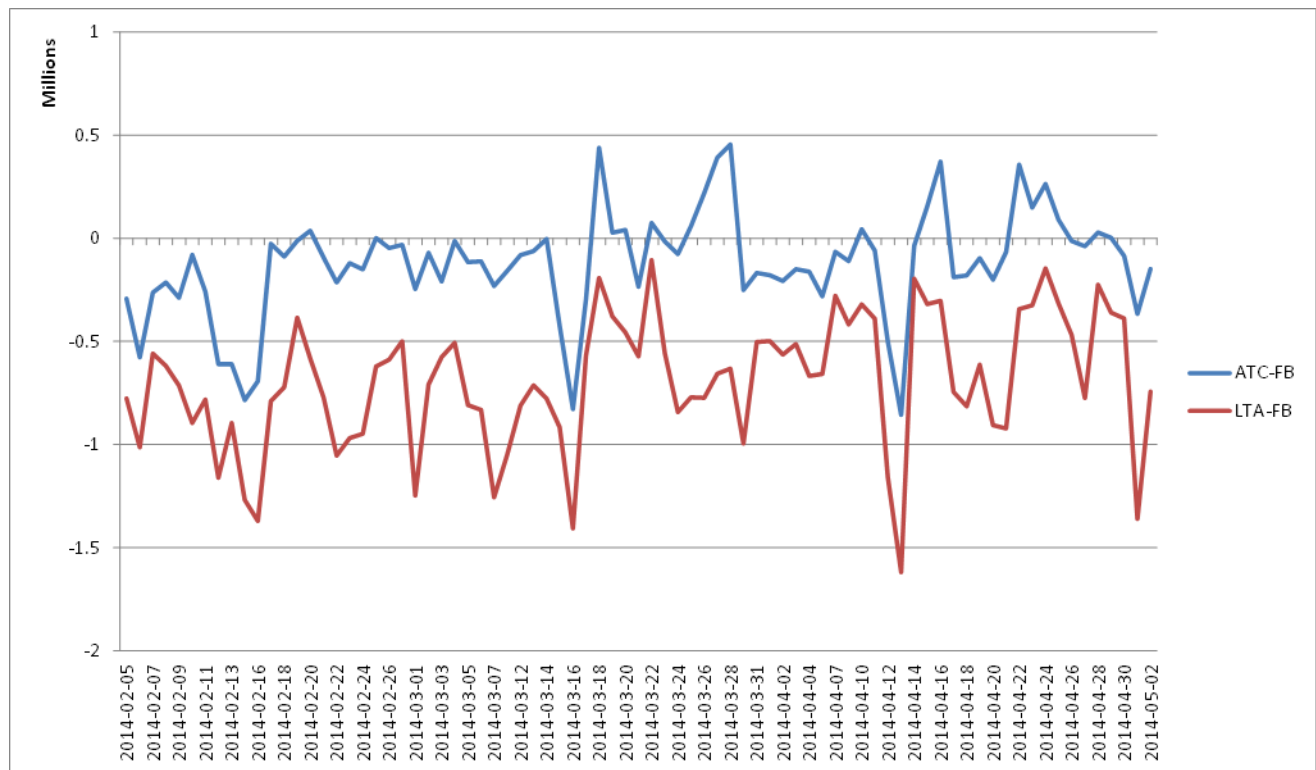
- ▶ **The ability to deliver daily results in the current parallel run so far is not in all perspectives representative of the post Go Live period:**
 - System and IT support currently deployed are not the definitive ones
 - Mitigation actions have already been implemented
- ▶ All in all, project partners wish to remind that such situations are not unusual at this stage of a project (5 months before Go Live). Implementation of new systems and gain of experience is expected to result in a continuously improved stability
 - **The so-called “missed days” of the parallel run will not result in isolated markets after Go Live. Whatever happens, TSOs will provide capacities to the allocation system**
 - In case of impossibility on TSO side to compute FB parameters according to the optimal process, “fall-back” parameters will be delivered



Parallel Run Performance

Stability of the results

- ▶ In case of impossibility to compute FB parameters, TSOs will provide capacities based on Long Term Allocation or rights, with the option to adjust in real time to give more capacity on top of LTA rights
- ▶ The magnitude of Fallback FB parameters, if applied, can be found in the corridor with LTA values as the “worst case”
 - Please note that the blue line will not exist anymore after Go Live



Parallel Run Performance

General conclusion




- ▶ **The FB project was launched for several reasons among others: increase in social welfare, higher price convergence and increase of transparency, whilst ensuring Security of Supply**
- ▶ **External parallel run meets these expectations**
 - This is showed by the higher social welfare higher and price convergence overall under FB compared to ATC
 - Isolated cases of social welfare decrease could be expected and can be explained by methodological factors
 - In addition continuous improvements are ongoing and will always continue after Go Live
- ▶ **The occurrences of missing days are normal for parallel run and are expected to decrease thanks to gained experience and delivery of final systems**
- ▶ **TSOs commit to deliver always FB parameters also in case of fallbacks and backups situations**
- ▶ **The full stability of, and ongoing ability to manage, the operational performance remain critical Go Live criteria**

NRA Presentation on Public Consultation and Approval Process

by CWE NRAs



ACER

 Agency for the Cooperation
of Energy Regulators



Bundesnetzagentur



Update from the CWE regulators

Flow-Based Market Forum
23rd June 2014

Agenda

- Zoom on the consultation
- Focus on progress made in the last months
- Next steps towards the Go-live from a regulatory perspective
- Next steps in improving the methodology after Go-live

Launch of the CWE NRAs public consultation

- CWE NRAs are positive about the Flow-based methodology and its global positive impact
- CWE NRAs believe the Project has everything in their own hands to deliver Flow-Based methodology in November 2014
- CWE NRAs thus launched June 2nd the Public Consultation, with specific questions

 Market players are invited to answer before June 30th.

Agenda

- Zoom on the consultation
- Focus on progress made in the last months
- Next steps towards the Go-live from a regulatory perspective
- Next steps in improving the methodology after Go-live

Focus on progress made in the last months – in terms of transparency

CWE NRAs in close cooperation with the project have achieved the followings:

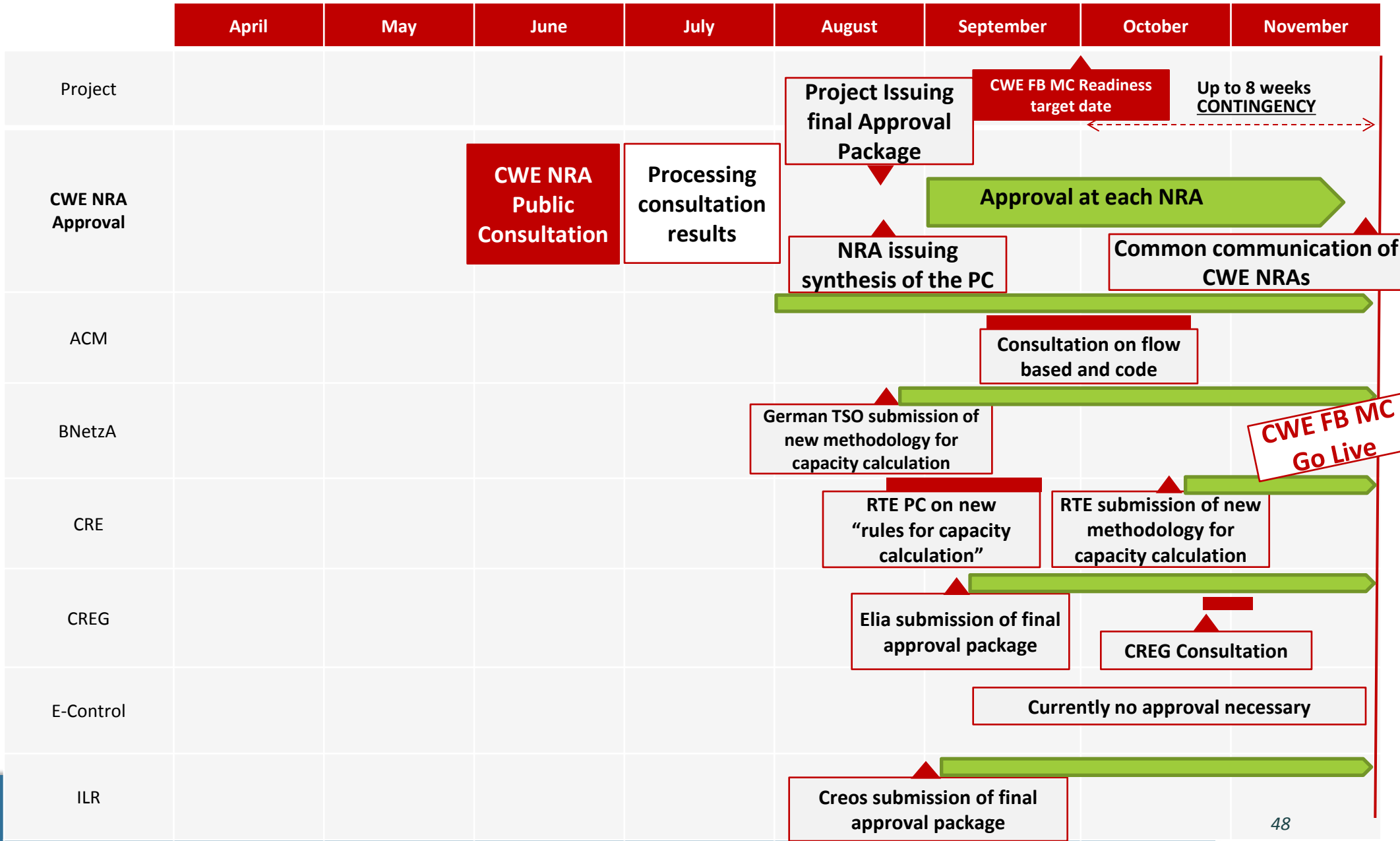
- Ex-post publication of FB parameters with a fixed numeration has been clarified in the Approval package
- Grid matrix publication is still under discussion with the Project: the goal being to give a static view with some technical information on the grid (impedance, length...).
 - » NRAs see the harmonization at this level of transparency as important
- More transparency on Remedial Actions, and a better explanation of their taking into account and impact on the Flow-Based domain
- Publication of ATC for Shadow auctions on the CASC website
- More explanation about the missing days – detailed reports to NRAs

Focus on progress made in the last months – in other areas

- The expectations of the NRAs have been specified for the monitoring reports to be delivered to NRAs when going live in order to have a thorough monitoring of FB
- New analysis delivered under request of NRAs to the project about FB/FBI. This, and the public consultation will be elements for NRAs to take a decision on this issue
- GSK improvement in order for the methodologies to be more harmonized (implemented in June 2013)

Agenda

- Zoom on the consultation
- Focus on progress made in the last months
- Next steps towards the Go-live from a regulatory perspective
- Next steps in improving the methodology after Go-live



NRAs checkpoint for go-live 1/2

- NRAs are positive about Flow-Based implementation and its global positive impact. Some points are still to be checked through:
 - » the coming months of the parallel run,
 - » Your answers to the public consultation,
 - » studies from TSOs
- Level of transparency towards market players
- Monitoring: completion of the template of periodic for regulators

NRAs checkpoint for go-live 2/2

- Reliability of the FBMC process:
 - » Robustness of the FBMC results via regular process (missing days, market results)
 - » Testing of fallback mechanism. Between other elements, NRAs have required to be provided estimation of the welfare in case of Fallback
- Intuitive vs non-intuitive
- Welfare allocation
- Flow-Based interaction with security of supply
- Deeper monitoring on import/export limits and their impact on welfare

Agenda

- Zoom on the consultation
- Focus on progress made in the last months
- Next steps towards the Go-live from a regulatory perspective
- Next steps in improving the methodology after Go-live

Improvements to be studied and put in place after Go-Live 1/3

- External constraints
 - Each NRA will require its national TSO(s) to provide a study assessing the way external constraints are taken into account in FB (and compare with the way they are currently taken into account in ATC).
 - This could lead to a change in their modelization

Improvements to be studied and put and place after Go-Live 2/3

- CBCO selection
 - 5% rules efficiency will have to be further studied and proved by CWE TSOs
- D2CF composition
 - APG network situation have to be properly taken into account in the D2CF for further integration – already ongoing in parallel to go-live preparations

Improvements to be studied and put and place after Go-Live 3/3

- Closer cooperation with other regions – to start quickly and enhanced gradually for consistent FB development
- GSK evolution towards hourly adaptation
- Intraday capacity calculation
 - Studies and roadmaps have been required by NRAs. Within the project first thoughts is a two step approach (ATC in a first step, FB being the target)
- Common grid model in the frame of the ENTSO-E workstream

Thank you for your attention!

Autoriteit
Consument & Markt



Bundesnetzagentur



COMMISSION
DE RÉGULATION
DE L'ÉNERGIE

CREG



E-CONTROL



Focus on the public consultation questions 1/5

1. What kind of improvements do the FB(I) principles **and** implementation bring for the whole market **and** for you as a market participant?
2. Are there improvements **in other areas than transparency** you would like to suggest the project partners to implement **before Go-Live**?
3. Are there improvements **in other areas than transparency** you would like to suggest the project partners to implement for a future Flowbased 2.0?

Focus on the public consultation questions 2/5

4. Do you have any preferences for the Flow-Based plain or Flow-Based intuitive market coupling? For additional information we refer to annex 13 of the Approval Package.
- FB-plain
 - FB Intuitive
 - no preferences

Please state why.

5. Do you understand the capacity calculation model presented?
- informal level
 - intermediate, I understand the explanation of most technical parameters
 - high, I understand the explanation of all technical parameters very well

If applicable, which additional information to the capacity calculation model and/or the explanation of all technical parameters do you need?

Focus on the public consultation questions 3/5

6. Do you understand the spot and forward price formation under FB(I) MC?
- informal level
 - intermediate
 - high/expert

If applicable, which additional information related to price formation under FB(I) MC you wish to be published?

7. Do you consider you will be in a position **to bid properly in the Flow-Based environment from the Go-Live** date now expected at the end of 2014? Please explain and make a link with the **studies or tools you may have developed** to be prepared for Go-Live.

Focus on the public consultation questions 4/5

8. Is the current proposal for **data publication** sufficient for your daily Flow-Based operation?
- Yes
 - No

In your opinion, which data, if any, should be additionally published, and why would this data be essential for you? Could you **explain in which way it could be more useful** than the one the project currently proposes to publish?

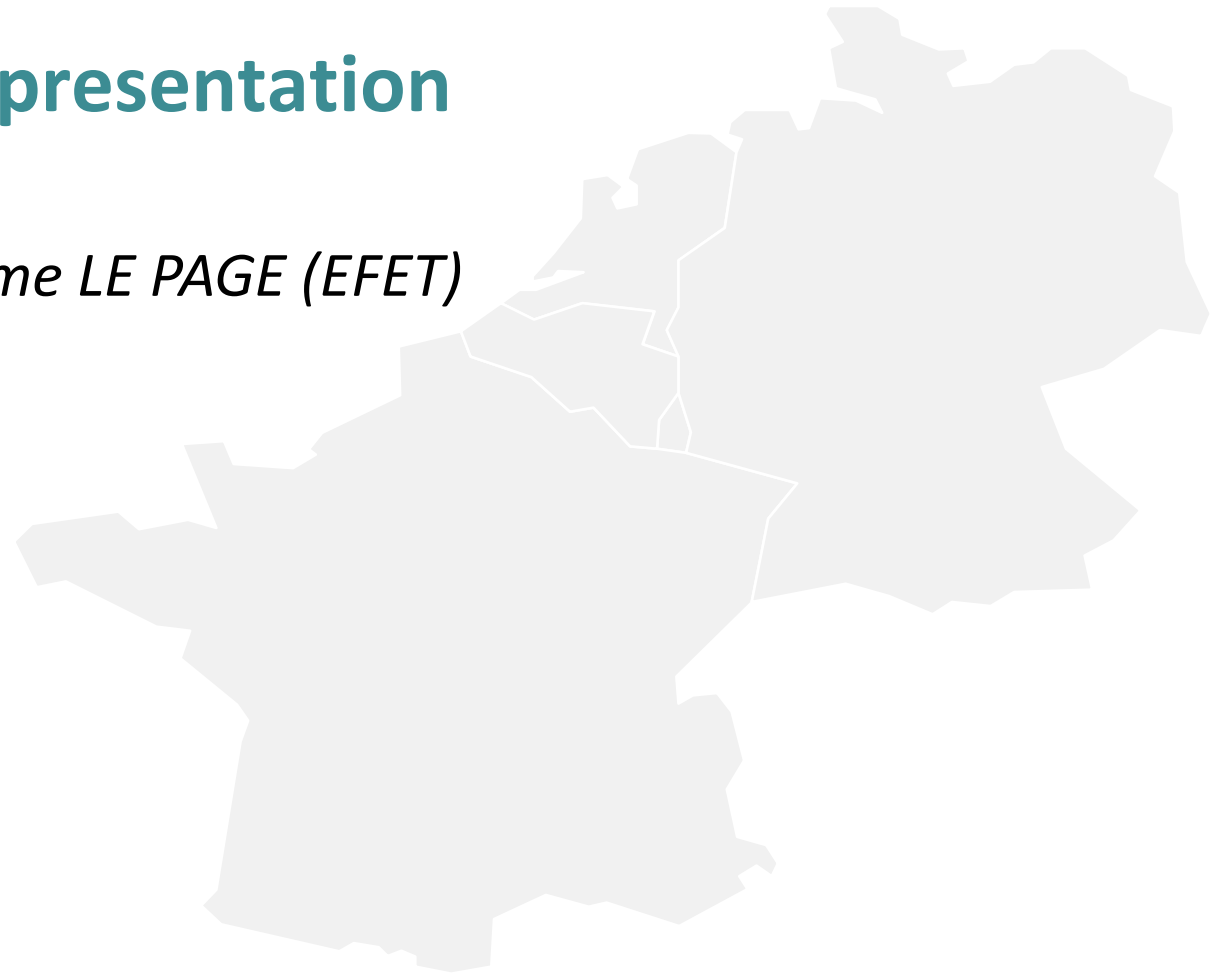
9. If applicable, are there additional studies / indicators you would like to be processed during FB(I) implementation on the market side either before or after Go-Live? Please explain why.

Focus on the public consultation questions 5/5

10. In terms of parallel run performance and the outcome of the Member Testing, what do you consider as **criteria for the Go Live**? Please consider performance of the regular FBMC as well as the FBMC under fallback conditions (see section 4.6 of the Approval Package).
11. What type of technical event or market results, linked to FB(I) MC implementation, should potentially **trigger a rollback** to the ATC market coupling? Please be as specific as possible. Please note that the Rollback triggering will be a JSC decision
12. Do you have any other or more general comments concerning flow based market coupling?

EFET presentation

by Jérôme LE PAGE (EFET)



CWE Flow-Based
Market Coupling Forum

Düsseldorf, 23 June 2014



European Federation of Energy Traders

EFET observations and concerns

Jérôme Le Page



Summary

- EFET notes positive elements in overall stakeholder engagement efforts
 - Concrete actions towards market participants taken after the last FB Forum
 - FB parallel run has clearly shown some beneficial effects of the FB model in DA
 - Flow-Based User Group meetings & new stakeholder consultation

- Quality of dialogue improved but some elements missing for successful launch
 - Market acceptance and requirements of the market to be able to work in a FB environment : market participants need to have the necessary elements to be able to handle the model before go-live. CEE validation of CWE FB results is also needed.
 - Reliability and stability 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 DA welfare gains not to be overestimated (probably around 20 to 30 M€) and should be put into perspective because of possible welfare losses in other time frames
 - Transparency of the model : one year of quality data with full transparency needed before go-live. Important open questions still remain unanswered.

Decision making process

- EFET welcomed the honest post-consultation report from the Project Parties in July 2013. The Project Parties were proactive in contacting market participants to identify their needs, but **promised improvements are still pending** and **implementation measures need to be checked**.
- Also some essential information is still missing to explain FB MC results and the FB model is still subject to substantial evolutions. The **stability of the model** and the **quality of the information provided** is still uncertain.
- Market participants need to test the full stable FB market coupling tool with promised transparency in order to declare technical readiness.

Reliability and robustness of the model

■ Robustness of the model

- Since beginning of daily parallel run results (25th of February to 18th of June):
 - 104/114 days published complete and before the deadline (91% only)
 - 25/108 days with overall DA welfare destruction (23%)
 - Average DA welfare increase (overall FBI-ATC) is 97k€/day or 35M€/year (without potential negative welfare impact on intraday or forward markets?)
 - Clear benefits of Flow-Based (e.g. 13/04/2014, +857k€), but welfare increases seemingly due to slacker parameters rather than FB (e.g. windy 16/03/14, +828k€)
 - Still several “bugs” e.g. the shadow-auction ATCs
- Why such a large number of non-representative and welfare-destroying days? What happens on these days? Market confidence and realisation of the expected welfare gains needs demonstration of industrialised tool.

■ Other clarifications

- Readiness of TSOs to produce “industrialised” FB parameters with clear liability
- Economic / efficiency justification for the criterion to label some internal branches as critical branches and for the application of “external constraints” (export/import limits) is missing

Stability of the model over time

- **Stability of the model**
 - Any significant change in the model should be consulted in advance with stakeholders
 - e.g. new “external constraints” added to the model recently
 - Possible switch to a 2.0 version will require appropriate testing (parallel run), NRA supervision, and market consultation
 - Quality plan needed: sensitivity to team shifts and tool / process errors to be eliminated

- **Stakeholder Committee to be implemented prior to go-live**
 - As discussed at the Florence Forum, a Stakeholder Committee should be set up according to the Guideline on Governance of the CACM NC
 - Relevant information and quality data should be provided to stakeholders to enable them to provide advice to the Project Parties on the functioning of FB and for significant changes and/or a 2.0 version

The need for transparency of the model

- 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, forward trading etc.

- How to improve transparency?
 - Need to publish 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))

Additional information needed and remaining questions to compute “typical” FB matrices



- Missing data to provide information on all days
 - Need for:
 - Load in each country
 - Wind and solar forecast
 - Available capacity per fuel
 - As used in the base case, i.e. to allow the market to perform “regressions”
 - Need to have sensitivities for PTDF on those typical days regarding unavailabilities (maintenances) of most important lines or unavailabilities (maintenances) of power plants that can impact much the PTDF
 - Need information on future constraints on maximum imports/exports per country as well as maximum imports/exports of neighboring regions
- Remaining questions
 - What is the process to calculate PTDF for one typical day? How time consuming?
 - How many typical days can we ask for? 10-20-50-100?
 - At which frequency will those PTDF be recalculated? Once or twice a year?

Conclusions

- Will sufficient transparency be provided to market participants to allow them to model FB results?
- Will TSOs be able to dispatch FB results appropriately, incl. in CEE?
- Will FB results be regular enough to provide appropriate forward price signals?
- Will FB parameters and fall-back solutions be robust and stable enough?
- Will NRAs provide appropriate supervision corresponding to well-defined responsibilities of the Project Parties?

Market participants need one year of experimentation on a stable model with quality and reliable data + answers to key remaining open questions (forward scenario, etc...) to be in a position to declare their readiness

Thanks for your attention



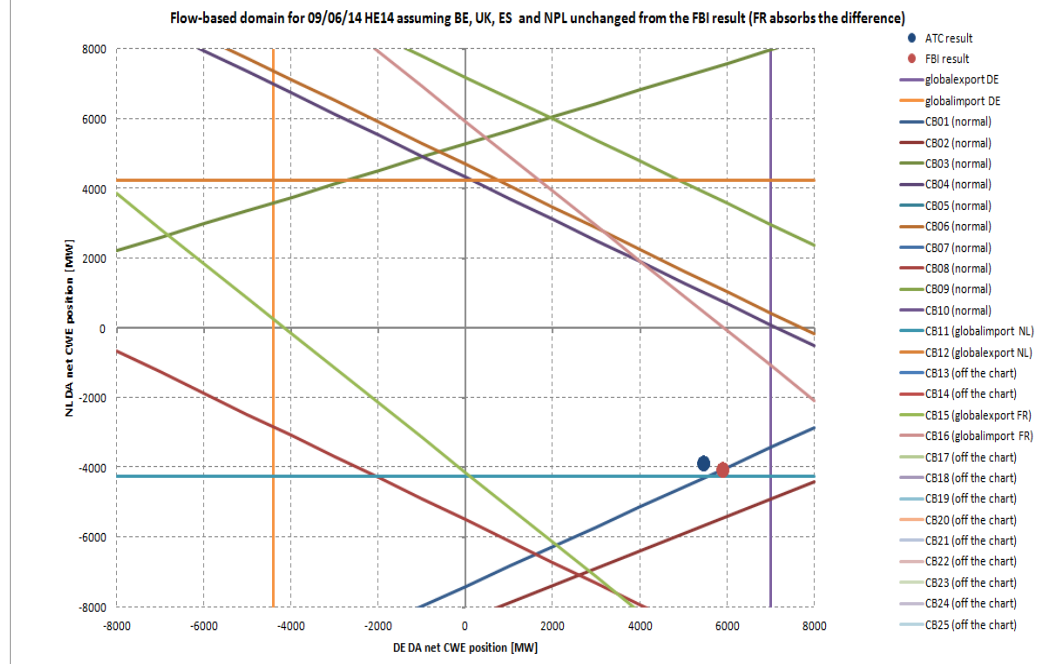
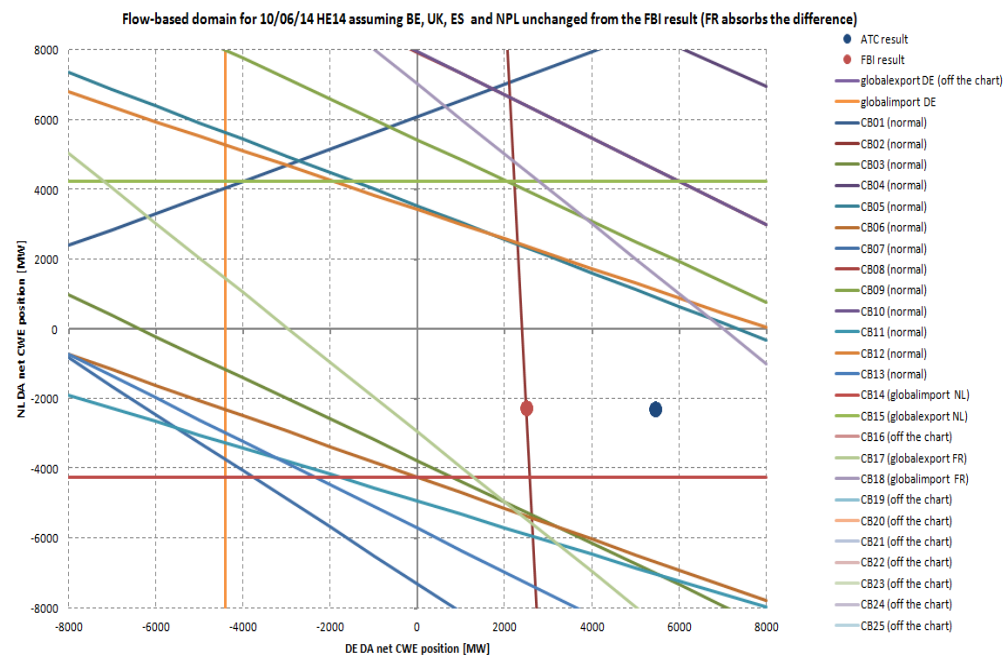
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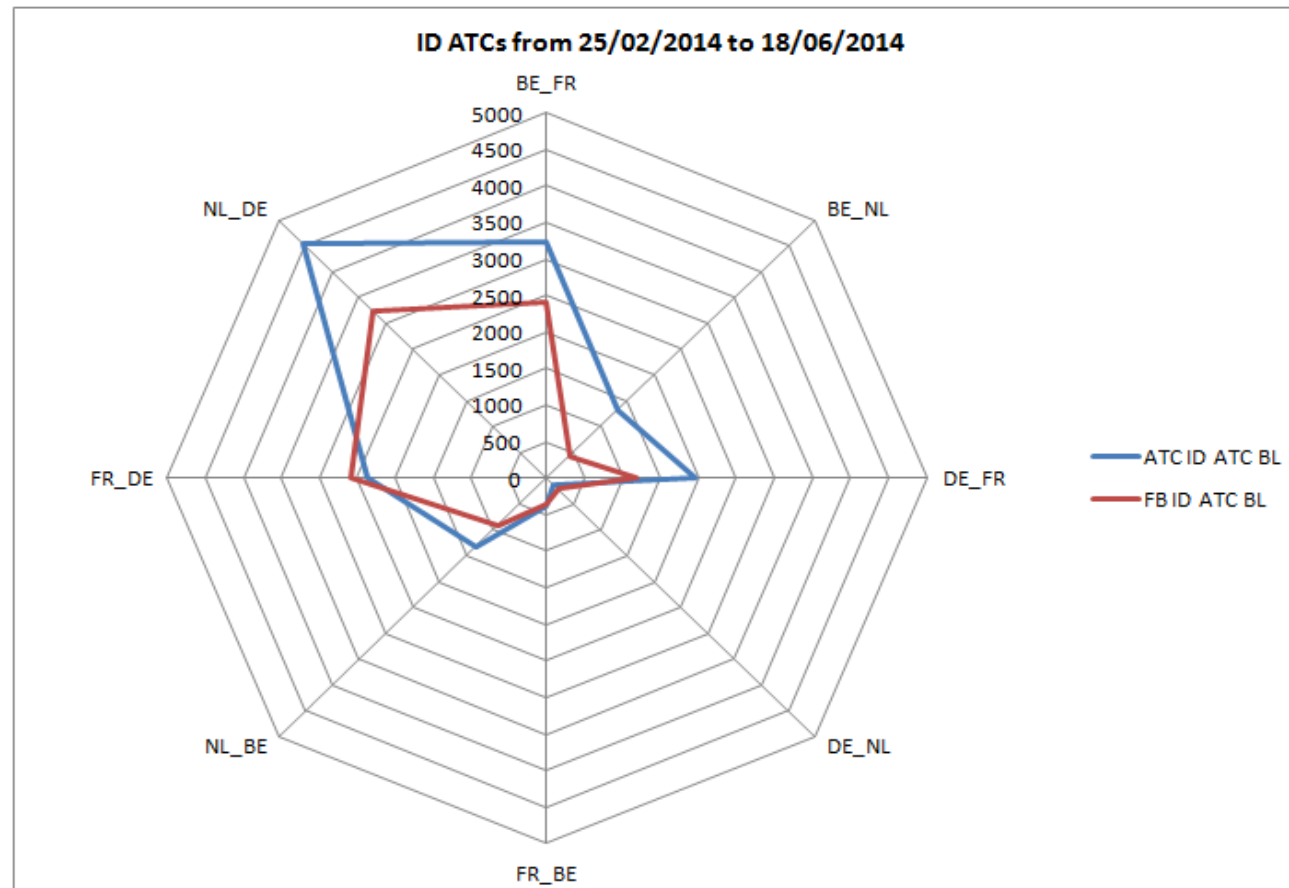
Back-up slides

- Example why it is impossible for the market to forecast market results
 - For delivery Tuesday 10/06/2014 a set of constraints are active on HE10 to HE16.
 - These constraints were absent the previous day under the same conditions...
 - ATC based results were much more stable and predictable for these days



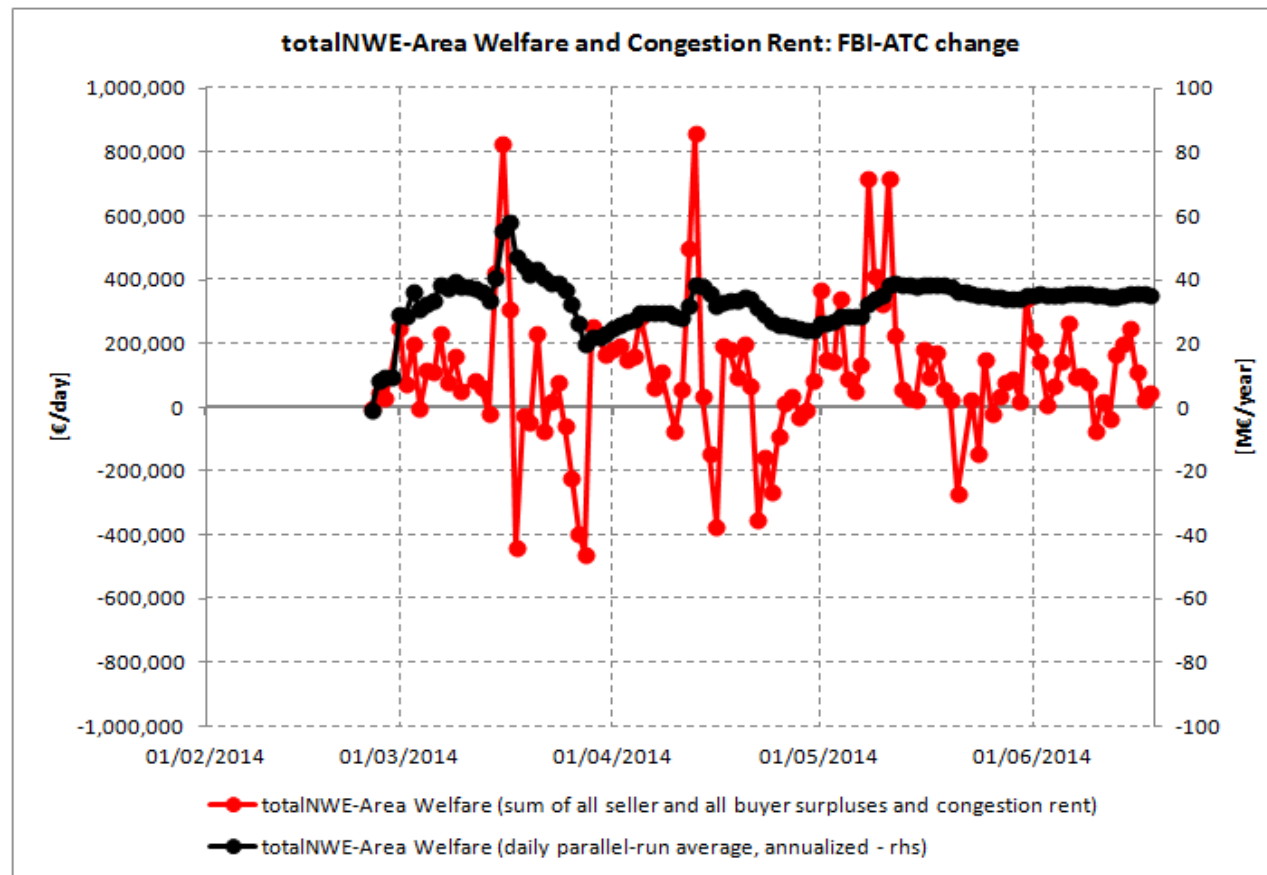
Back-up slides

- Approx. 20% of the extra capacity in simulated DA FB welfare coming from ID Flow-Based ID ATCs are consistently smaller than the current ones in all directions



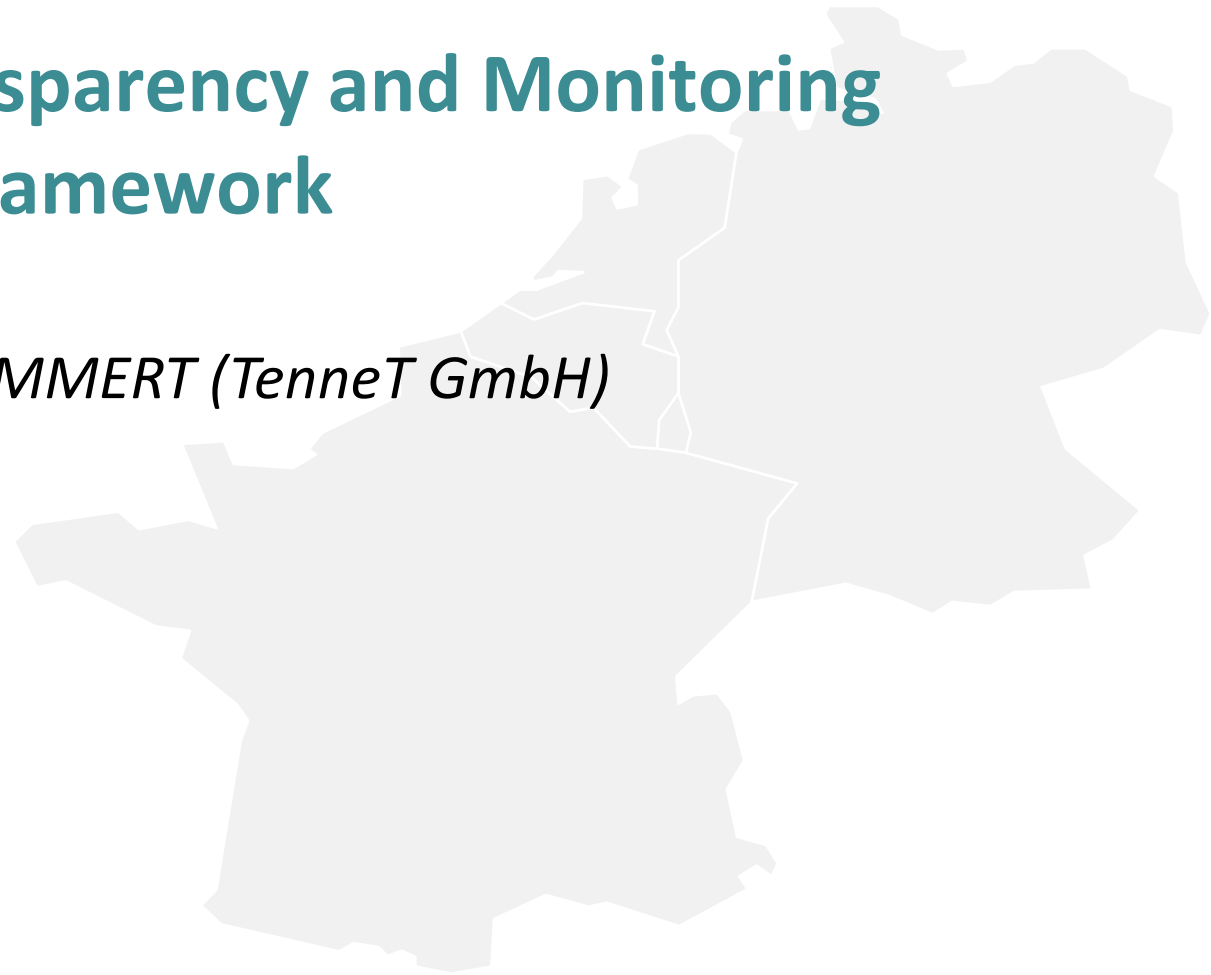
Back-up slides

- Welfare development across the “daily+industrialized+NWE+SWE” parallel-run?
 - more and more of the CWE welfare increase is offset by losses in the rest of the area.
 - Publication of prices and flows on non CWE areas would be needed (NWE+SWE parallel run)



Overview of Transparency and Monitoring Framework

by Jochen BAMMERT (TenneT GmbH)



Summary of current transparency framework

Legal context



- ▶ In addition to national legislation, related to transparency, on common EU-level Project Partners have to comply with the following main obligations



EU-714/2009

Especially article 5 of the Congestion Management Guidelines

EU-543/2013

Transparency Guidelines, leading to the centralized ENTSO-E platform (Go-live on 5th January 2015)

EU-1227/2011

Regulation on wholesale energy market integrity and transparency (REMIT)

- ▶ For the time being, until the complete operation and establishment of the ENTSO-E platform, Project Partners have decided to provide easily accessible data on CASC-website

Summary of current transparency framework

Overview of data publication framework following discussions with MPs



- ✓ **Parallel run start** **Final FB parameters** at 10:30 (Random anonymized CBs, PTDFs, RAMs)
- ✓ **December 2013** **Initial Intraday ATCs** available after FB MC
- ✓ **March 2014** **ATCs for Shadow Auctions** at 10:30
- ✓ **June 2014** **Fixed anonymized CBCOs** at D+2
- ✓ **FB MC Go-live** **Initial FB parameters** at 8:00 (before LT nominations)
- ✓ **FB MC Go-live** **Fixed anonymized CBCOs** at D+2 with location (hub/border)
- Under investigation D2CF assumptions (including ex post for the parallel run)
- Under discussion with NRAs Technical details of the grid
- Under investigation on ENTSO-e level for post Go Live Long term scenarios for FBP sensitivity to infrastructure changes (new interconnectors, power plants) and outages

Summary of current transparency framework

Daily publication as of Go Live



- ▶ **Data publication sequence as of Go Live before Gate Closure Time:**

- ▶ Initial Flow-Based parameters (without LT-nominations) 8:00
 - Random anonymized Critical Branches, PTDFs, RAMs

- ▶ Long-Term nominations on CWE-borders 10:30

- ▶ Final Flow-Based parameters 10:30
 - Random anonymized (same as at 8:00) Critical Branches, PTDFs, RAMs

- ▶ Shadow Auction ATCs 10:30



Summary of current transparency framework

Daily publication as of Go Live – ex-post

▶ Fixed, anonymized CBCOs at D+2 expressed

- ▶ FB results are normally provided with random anonymous IDs for MC. To meet the request to be able to perform statistical analysis on occurrences of CBCOs, fixed anonymous IDs have been created to be published for ex-post analysis

▶ Period

- Fixed anonymous IDs for Flow based results will be available for July 2013 till – present

▶ Method

- Fixed anonymized ID for standard, spanned or LTA included (virtual) CBs fulfils the pattern XXXXABBB, where following algorithm is applied:
 - X - Every day the same CB/CO will have the same ID
 - A – (one digit) If the same CBCO (outage/branch) is used more with different Fmax
 - B – (three digits) Is applicable only for LTA covered CBs

▶ Publication

- During the parallel run, the fixed IDs will be published manually regularly on both EPEX FTP in a separate folder and on CASC Website (see next slide)
- As of Go Live, results will be automatically published on CASC website

For some instances, data could not be linked to original CBs due to changes in naming on local TSO side

Summary of current transparency framework

Daily publication as of Go Live – ex-post



Home

Market data

News / Events

Resource center

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Resource center

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CWE, CSE and Switzerland

- ▶ Registration
- ▶ Auction Rules
- ▶ Additional Documents
- ▶ More Information

Intraday Auctions

- ▶ Registration
- ▶ Auction Rules

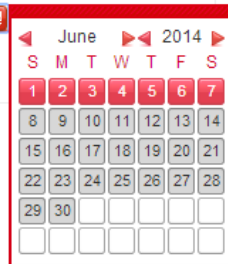
DK borders

CASC.EU > RESOURCE CENTER > CWE FLOW-BASED MC > PUBLICATION CWE FLOW-BASED EXTERNAL PARALLEL RUN

Download Casc Utility Data

 Excel

Date: 2014/06/07


 Xml

From: 2014/06/07

To: 2014/06/07

Download

Fixed anonymous IDs will be reflected in both the Utility tool & XML that can be downloaded from CASC website

Utility tool (sheet PTFD)

	DE-hub (MW)	DE-hub (MW)	FR-hub (MW)	NL-hub (MW)	Sum			
Test Hub to Hub	0	0	0	0	0			
Test Hub Positions	0	0	0	0	0			
ID	BE-hub	DE-hub	FR-hub	NL-hub	RAM (MW)	Test Hub to Hub	# of constraints violated	Test Hub position
CB1678	0.12297	-0.12818	-0.18064	-0.0818	1096			
CB1679	-0.07935	-0.30593	-0.17841	-0.45331	1442			
CB1680	-0.074	0.16298	0.06361	0.21541	876			
CB1681	-0.08013	0.16262	0.06383	0.19177	879			
CB1682	0.10815	-0.36533	0.21946	0.50954	1144			
CB1683	-0.04501	0.04788	0.04989	0.03083	338			
CB1684	0.09196	-0.08938	-0.01617	-0.11556	798			
CB1685	0.0792	-0.11437	-0.2068	-0.05059	1034			
CB1686	0.07043	-0.1219	-0.21426	-0.05793	1029			
CB1687	-0.03741	0.03747	0.04703	0.01796	309			
CB1688	-0.00838	-0.08313	-0.03373	0.11488	820			
hour 1	CB1689	0.01409	0.14015	0.06283	-0.0846	956		
	CB1690	0.01228	0.23129	0.14742	-0.00957	1111		
	CB1691	0.03005	-0.13605	0.07508	-0.09874	986		
	CB1692	0.02164	0.13787	0.05491	-0.04289	783		

XML

```

<Pdtf>
<Date>2014-06-05T00:00:00</Date>
<CalendarHour>13</CalendarHour>
<RowNumber>2036</RowNumber>
<RemainingAvailableMargin>858.0000</Remaining
<BE>0.1364400000</BE>
<DE>-0.0303000000</DE>
<FR>0.1777600000</FR>
<NL>0.0025100000</NL>

```

Summary of current transparency framework

Daily publication as of Go Live after GCT



- ▶ In addition to price- and volume publications on individual PX-websites, the following information will be commonly published (daily 14:00)

- ▶ On www.casc.eu
 - Capacity allocated (used margin on CBs)
 - Congestion income
 - Hub net positions

- ▶ On www.europeanpricecoupling.eu
 - Overview of the hourly CWE Hub prices for the day D+1
 - Bilateral exchanges for the day D+1

Summary of current transparency framework

General and event-driven information



▶ General information published

- Description of the coordinated CWE Flow Based capacity calculation methodology
- High-level business process of Flow Based capacity calculation
- Description of the CWE FB MC solution
- Rollback arrangements
- Harmonized Auction Rules (including the arrangements for Shadow Auctions)
- Euphemia-description

▶ In case of Shadow Auctions announcement, MPs and NRAs are informed by Email



Progress on open MPs' requests

▶ Aggregated D2CF data

- MPs expressed the need to have insight in forecasting of TSOs for analysis and the ability to build models. In line with this request TSOs worked on aggregated data from D2CF

▶ Indicators

- CWE TSOs have prepared data reflecting Vertical load, Generation and Reference Bilateral Exchanges on aggregated (hub) level of the D2CF

▶ Implementation

- TSOs commit to publish aggregated D2CF data however still have to perform the impact assessment for the operational implementation
- Project Partners will provide further feedback in October 2014



Progress on open MPs' requests

▶ Long-term scenarios (10 years ahead)

- To be able to assess the effect of the long term changes in the grid on the FB results, long term scenarios with FB results have been requested
- Project Partners have considered this request but concluded that this is not in scope of this project, but will be dealt with in dedicated ENTSO-E groups with specialized grid planning experts involved

▶ Year ahead scenarios

- The FB Day Ahead project does not aim for scenarios related towards long term capacity calculation timeframes
- TSOs plan to take this topic into account with the implementation of the network codes



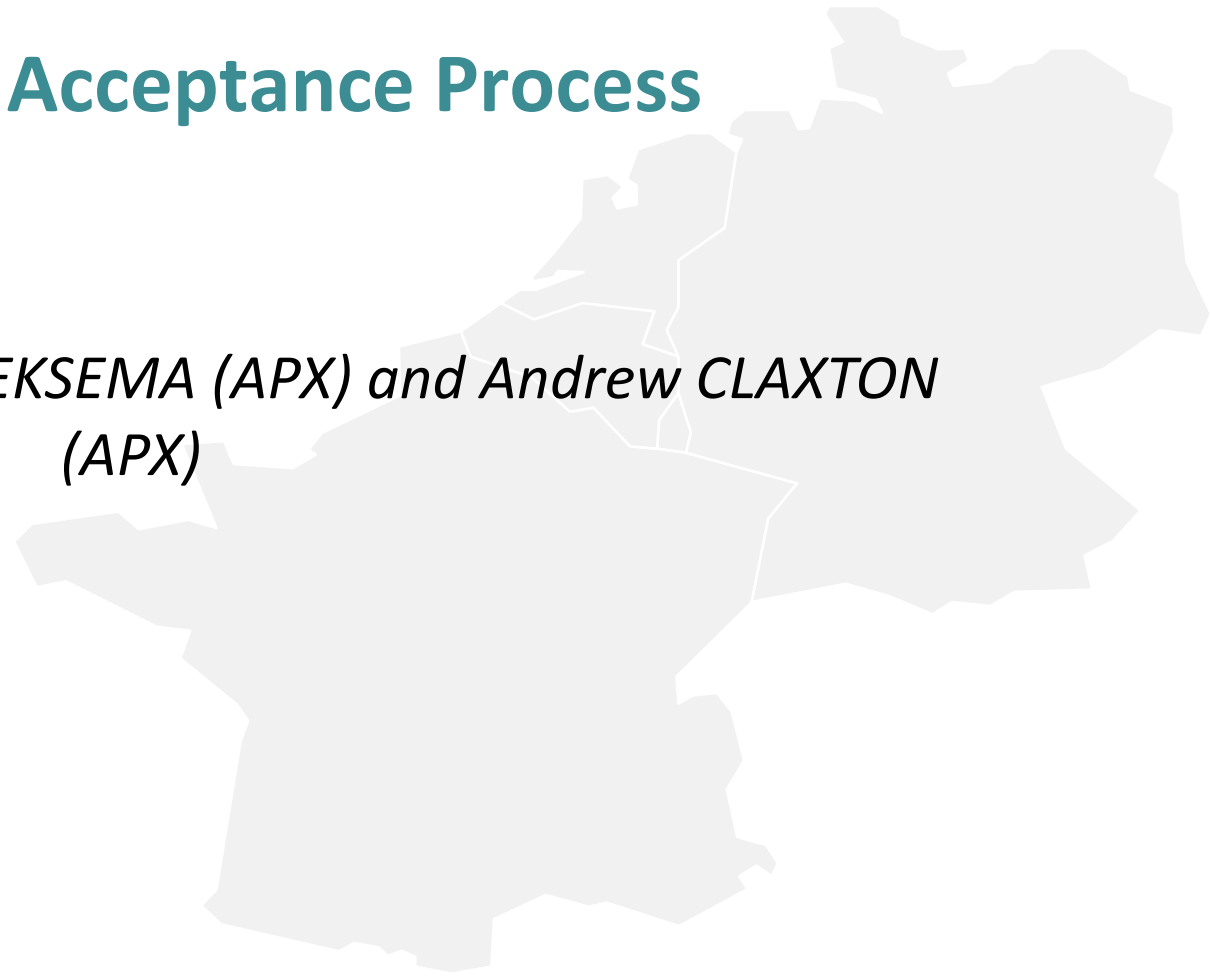
NRA Monitoring of CWE FB MC

- ▶ **CWE NRAs and Joint Steering Committee will monitor FB results and the quality of numerous indicators**
- ▶ Items related to the FB capacity calculation
 - **Checks related to references** (LTA, NTC (temporary))
 - **Capacity related indicators** (Min/Max Net Positions, Intraday ATCs , Shadow Auction ATCs, Max Bex, Volume)
 - **Back-up usage** (default FB parameter usage, spanning usage)
 - **Inputs for computations and capacity limiting related inputs** (line sensitivity checks, FAV usage, External constraints)
- ▶ Items related to the FB capacity calculation
 - **Market constraint related information** (e.g. Active CBs, congested CBs)
 - **Shadow prices, Usage of Shadow auction**
 - **Price-convergence indicators**
 - **Comparison FB intuitive and FB plain**

The provided list of examples is not exhaustive, but should provide an idea on indicators used!

Stakeholder Acceptance Process

*by Dietmar BECK, Joel HOEKSEMA (APX) and Andrew CLAXTON
(APX)*





Updated NRA Approval Package

- ▶ After submission of **initial Approval Package in August 2013**, Project Partners have prepared an **updated version in May 2014** containing
 - Clarifications and elaborated explanations in the capacity calculation chapter
 - **Reviewed version of the chapter on publication of data** and transparency following bilateral MPs and Flow Based User Group discussions
 - **Updated Economic Assessment** including parallel run results until Q1 2014
 - Detailed **analysis** for a set of criteria agreed upon with NRAs regarding the **selection of FB vs. FBI**

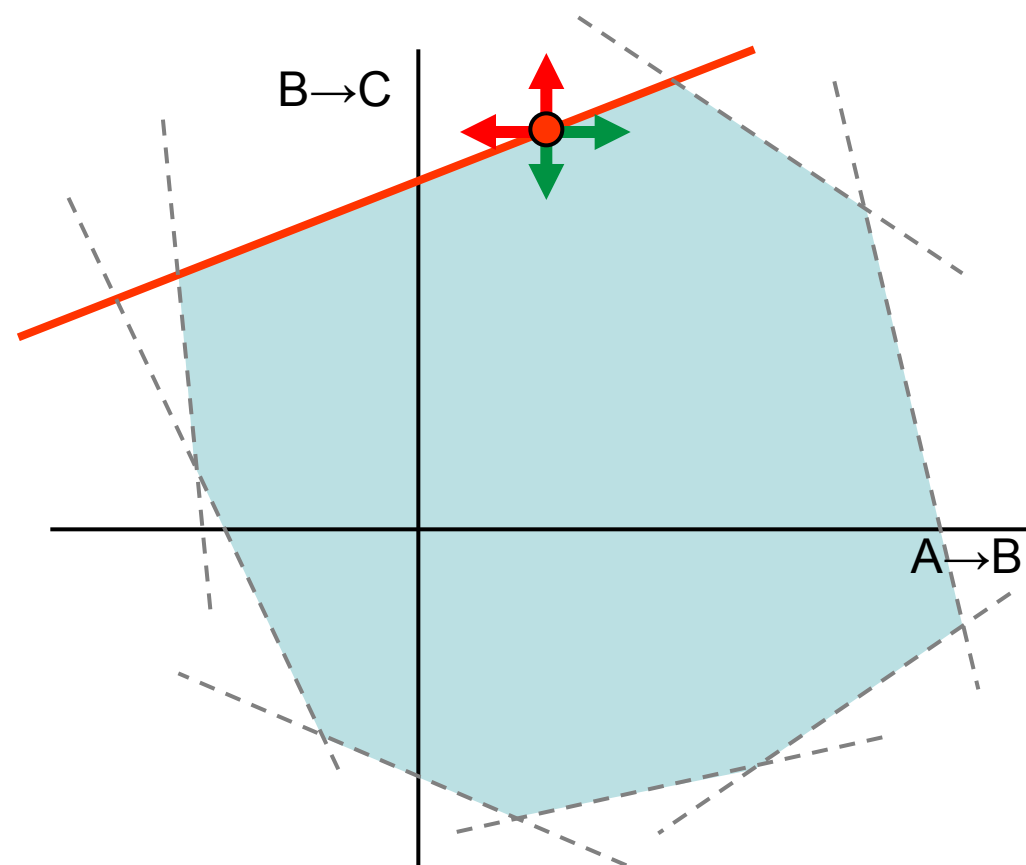
- ▶ This document is the basis for the current public consultation
- ▶ **Consultation outcome and potential adjustments** will be taken into account by the project via **addenda to the current formal document**



Analysis for selection FB vs FBI

► Recall that under FB MC non-intuitive situations can occur:

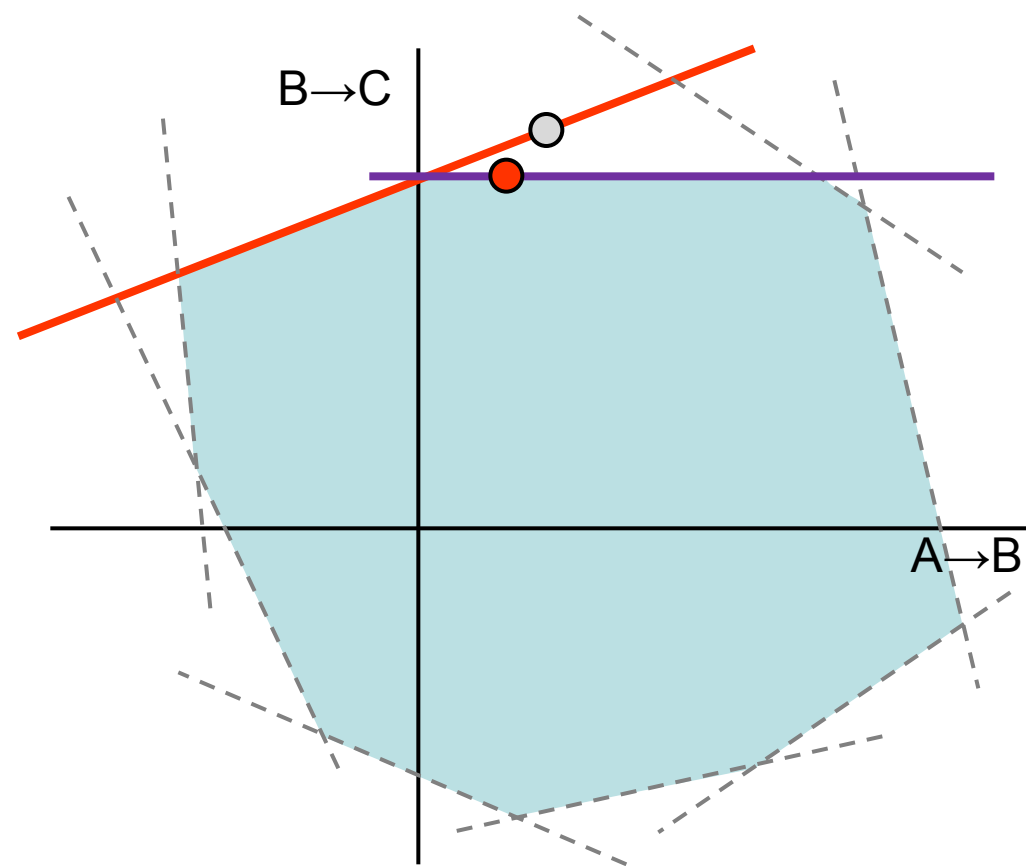
- $B \rightarrow C$: cannot increase, but can decrease \Rightarrow must be intuitive
- $A \rightarrow B$: cannot decrease, but can increase \Rightarrow must be non-intuitive
 - It must be that in order to allow the level of $B \rightarrow C$ exchange observed, a level of $A \rightarrow B$ exchanges is scheduled to relieve some of the constraints on the red CB





Analysis for selection FB vs FBI

- ▶ Non-intuitive exchange can be prevented by discarding relieving effects:



- ▶ Allowing the non-intuitive situations is called FB “plain”, or plainly FB
- ▶ Disallowing relieving effects (and consequently the non-intuitive situations) is called FB “intuitive”, or FBI



Analysis for selection FB vs FBI

- ▶ Ideally a clear cut choice for either alternative would have been added to the approval package
- ▶ From the project's point of view the pros and cons for the two alternatives did not identify a clear preference
 - Cf. next slides explore different criteria considered by the project
- ▶ Please provide your feedback on this subject in the NRA consultation



Analysis for selection FB vs FBI

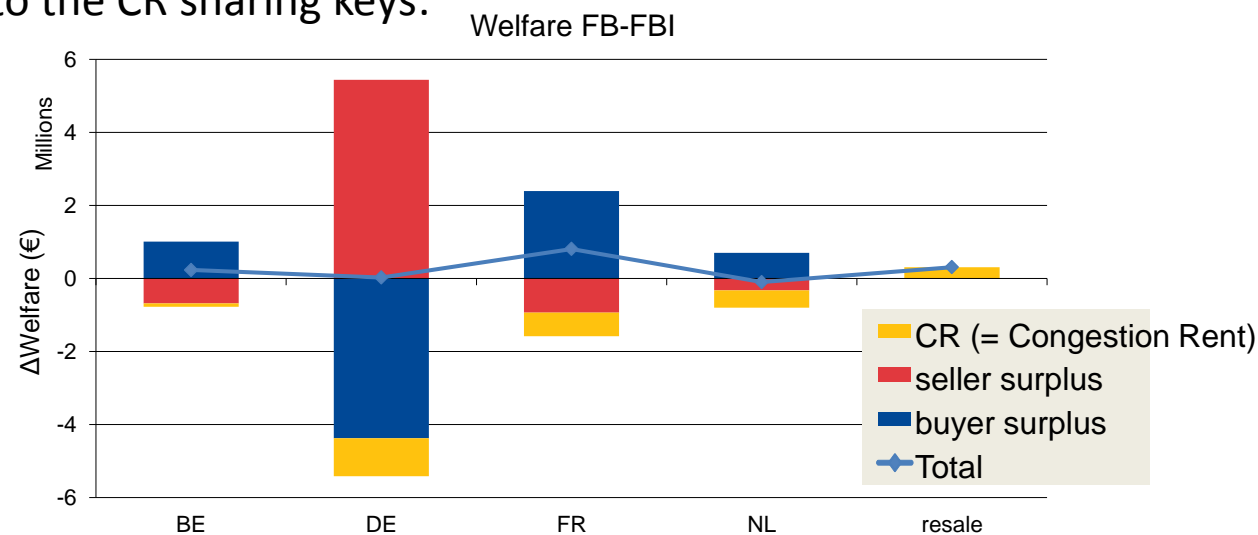
Criterion	In favour of FB “plain”	In favour of FB “intuitive”
Volatility	inconclusive	
Price Signal	Negligible difference	
Liquidity	resilience analysis: inconclusive	
Welfare (global)	Unknown	Unknown
Welfare (DAMW)	X (though relatively small)	
Welfare repartition	No statistically significant difference	
ID	X (considering DA capacity should not be allocated to ID)	X (considering ID capacity is higher; mitigates DA welfare loss)
Investment	inconclusive	
SoS	inconclusive	
Communication to general public	Arguments against either alternative exist	



Analysis for selection FB vs FBI

Impact on global welfare and repartition of welfare

- ▶ Data for the 2013 parallel run days
- ▶ To get a complete picture we break down welfare per area and factor in CR, and attribute it to areas in accordance to the CR sharing keys:



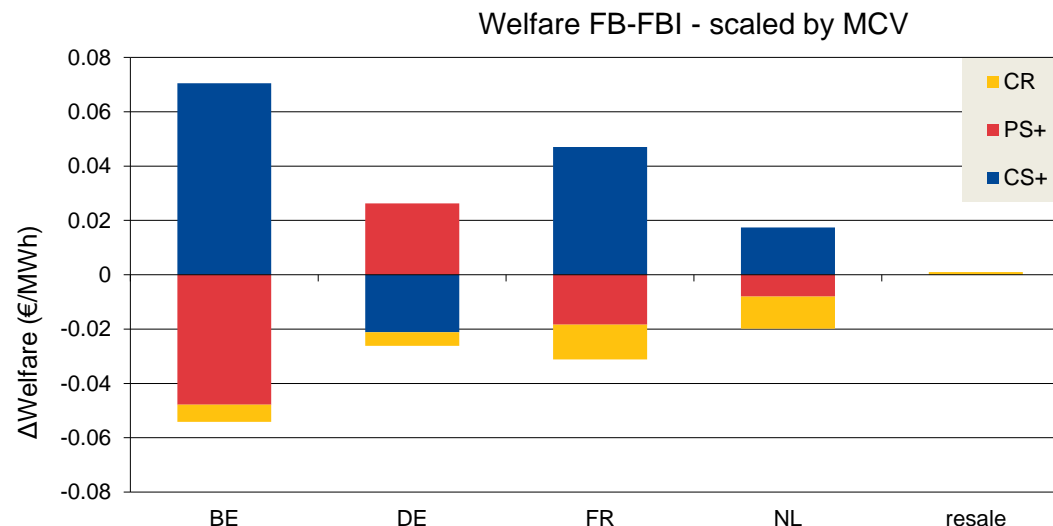
- ▶ There are some transitional effects:
 - FB “plain” favours DE sellers and BE, FR and NL buyers
 - FB “intuitive” favours DE buyers and BE, FR and NL sellers and CR
- ▶ Aggregate effects (total = $PS^+ + CS^+ + CR$)
 - For NL: welfare under FBI exceeds welfare under FB. The value of 100k€ is not statistically significant
 - For all other markets: FB yields more welfare although these values too are not statistically significant



Analysis for selection FB vs FBI

Impact on global welfare and repartition of welfare

- ▶ From a purely theoretical point of view: for DAMW FB “plain” yields more than FB “intuitive”
- ▶ Considering the differences in allocation of welfare over the different areas we observe that FB results in more welfare for BE, DE and FR, and FBI results in more welfare for NL. None of these effects are statistically significant though
- ▶ We note some transitional effects with regards to buyer and seller surplus:
 - FB “plain” favours DE sellers and BE, FR and NL buyers
 - FB “intuitive” favours DE buyers and BE, FR and NL sellers and CR
 - These effects should be put in perspective though:
 - Scaled by the respective market sizes the differences are more comparable:





Analysis for selection FB vs FBI

Communication of results to general public

- ▶ Justifying the market outcome to the general public (e.g. administrations, press, etc.) could prove more challenging under “plain” FB in the case of a non-intuitive situation
- ▶ Questions will typically come for extreme situations, e.g.:
 - Cold waves
 - Peak prices (very high or very low)
 - Impact nuclear phase out
- ▶ More details can be found in annex 16.13 of the approval document, available via http://www.casc.eu/media/pdf/FB/Annex%2016_13%20Intuitiveness%20Analysis%20for%20the%20FB-FB%28I%29%20selection.pdf
- ▶ The mitigation of (perceived) negative impact on local markets is acknowledged by the Project as a legitimate concern but its inability to quantify the “real” social welfare makes any decision in this respect difficult



Analysis for selection FB vs FBI

Communication of results to general public

- ▶ Examples of difficulties associated with FB “plain”:
 - Justifying non-intuitive cases forcing Belgium to export while having the highest prices, for instance in case of cold wave would be mission impossible, especially knowing that public money is invested to guarantee SoS
 - Conversely, explaining the non-intuitive cases where Belgian units are not allowed to export even if they offer the cheapest price is incoherent with the efforts to encourage investments in cheap and flexible generation units
 - Justifying why DE exports its (off market) RES to adjacent markets where prices are already lower

- ▶ Examples of difficulties associated with FB “intuitive”:
 - Some extreme market situations can be identified (e.g. price spikes, because adjacent markets were not willing to make some relieving non-intuitive exchanges) that could be mitigated by FB “plain”



Analysis for selection FB vs FBI

- ▶ Arguments both in favor and against “plain” FB exist
- ▶ Arguments both in favor and against “intuitive” FB exist
- ▶ Considering a number of indicators no convincing preference emerged
- ▶ We request MPs to voice their preference via the NRA consultation

Note

- Regardless of what alternative will be chosen, the other alternative will still be monitored
- Technically the option to switch the decision always remains available. This switch will only be made if compelling reasons exist to do so, and anyway requires NRA approval



Project's Go Live Criteria

- ▶ For complete confidence when taking the decision to go live, the project has **clear Go Live Criteria** which are monitored and need to be met

STAKEHOLDERS' ACCEPTANCE

- ✓ NRA approval of CWE FB MC solution
- ✓ Acceptable data publication framework
- ✓ Stable and robust parallel run
- ✓ Available reporting
- ✓ Successful member testing

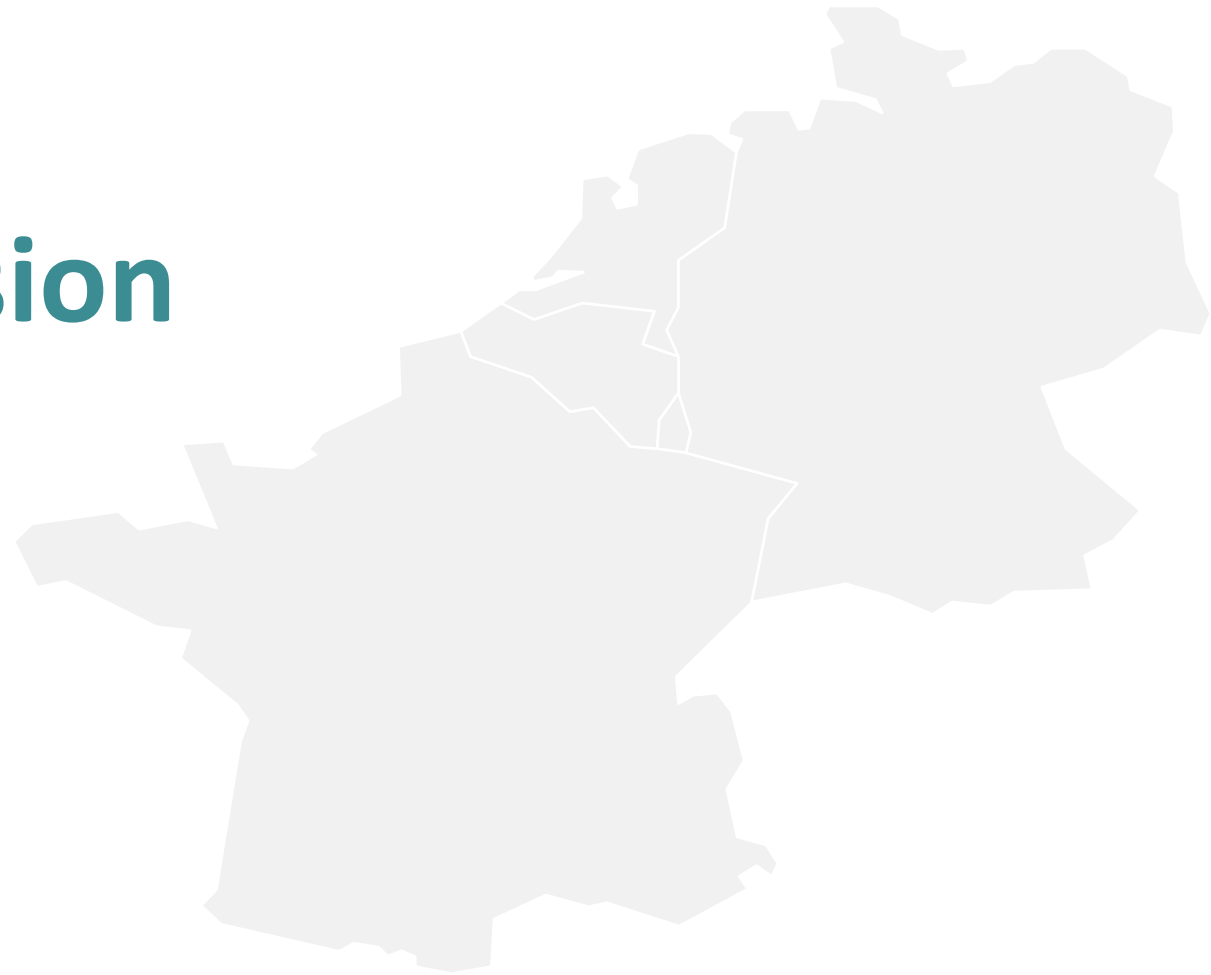
PROCESS , IT and OPERATIONS

- ✓ Stability of operational procedures
- ✓ Successful training of all operators
- ✓ Operational readiness of all IT systems
- ✓ Successful testing of whole MC process
- ✓ Adequate performance monitoring and control in place

METHODOLOGY

- ✓ Finalized FB methodology
- ✓ Selection for FB vs. FBI

Q&A Session



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

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

