CWE FB MC project

PENTA SG1, February 12th 2015, Brussels

Agenda

1. **Flow based market coupling status**
   a. Progress report by TSOs and power exchanges
   b. Follow up on the adequacy issues and possible mitigation measures
   c. Time planning

2. **Structuring the discussion on future challenges concerning flow based market coupling**
   a. Further improvements to be developed after Go-live for a second version of Flow Based (NRAs feedback on their common requests for further improvements)
   b. Further extensions

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1 - Flow Based Market Coupling Project

a) Progress report: general overview

Here are the main achievements since previous PLEF meeting in October:

- Members of **the Florence Forum** (November, 27th), took note of the postponement of Go-Live date and fully supports the project in order to meet the new Go-Live date in spring.
- CWE chairmen presented project status and next steps at last **AESAG meeting** (January, 7th).
- **Adequacy study** which investigates the link between market coupling under FB and short term generation adequacy focusing in particular on the Belgian market and its ability to import
- **Parallel run performance report** including the analysis of observed days resulting in welfare losses or remarkable welfare gains from ATC to FB and information about the LTA inclusion
- Historical files with **fixed labeling of presolved CBCOs and of all CBCOs** since beginning of the parallel run (status until December)
- Ex-post publication as part of the parallel run of data for the **missed day 9th April 2014**

1 – Flow Based Market Coupling Project

a) Progress report: General parallel run performance - Representativeness of data

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2013	0							01 Jan
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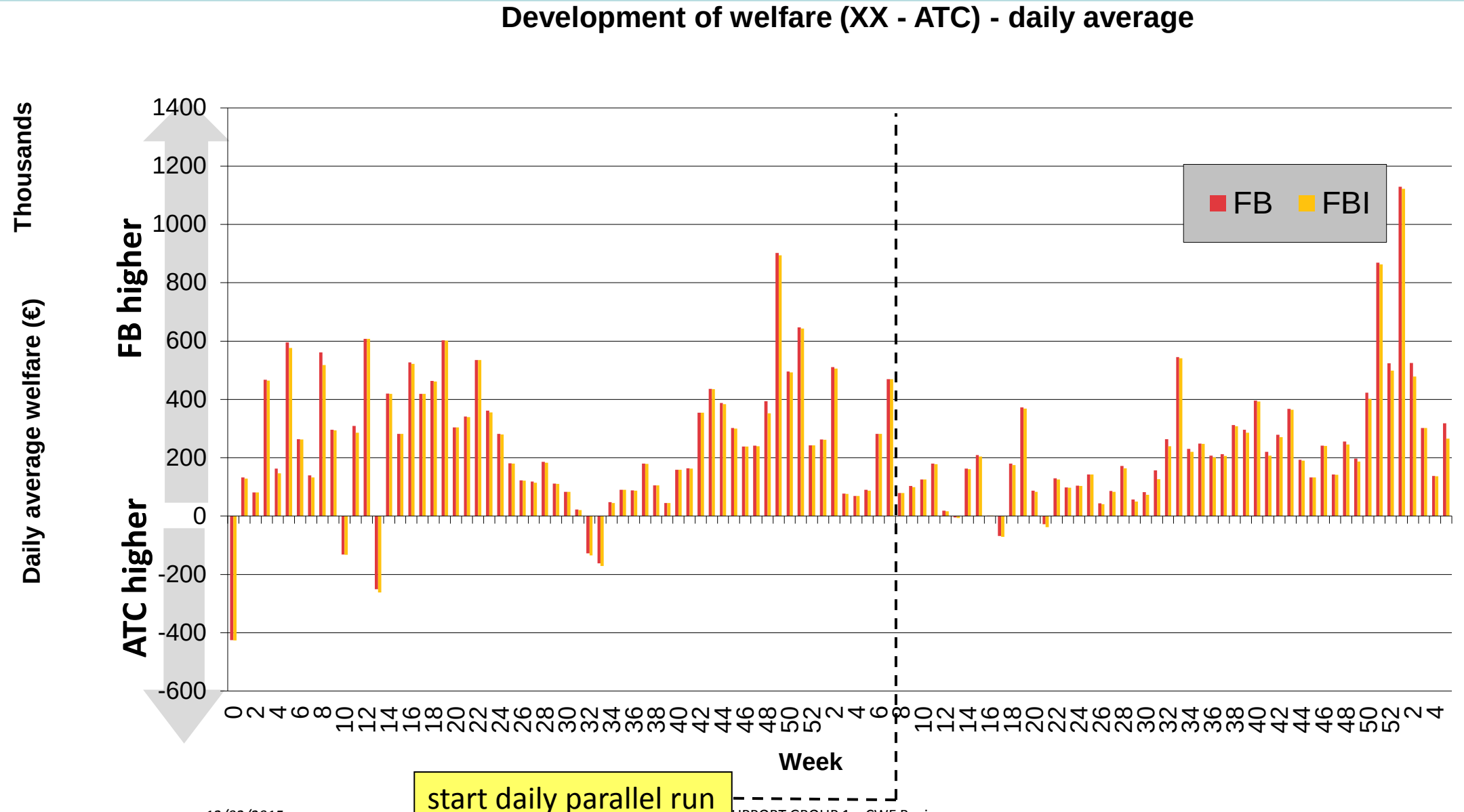
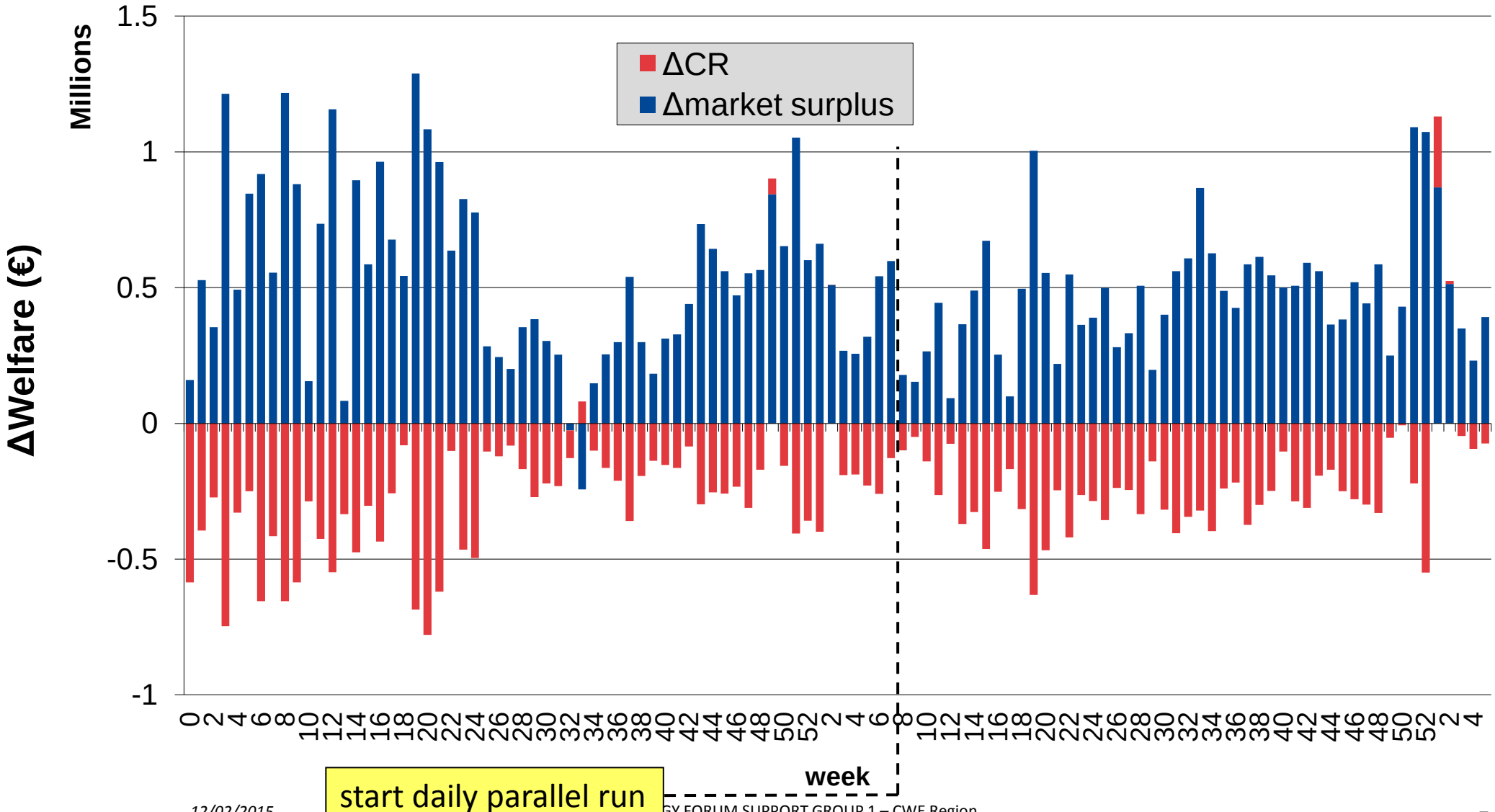
1 – Flow Based Market Coupling Project

a) Progress report: General parallel run performance – Price convergence



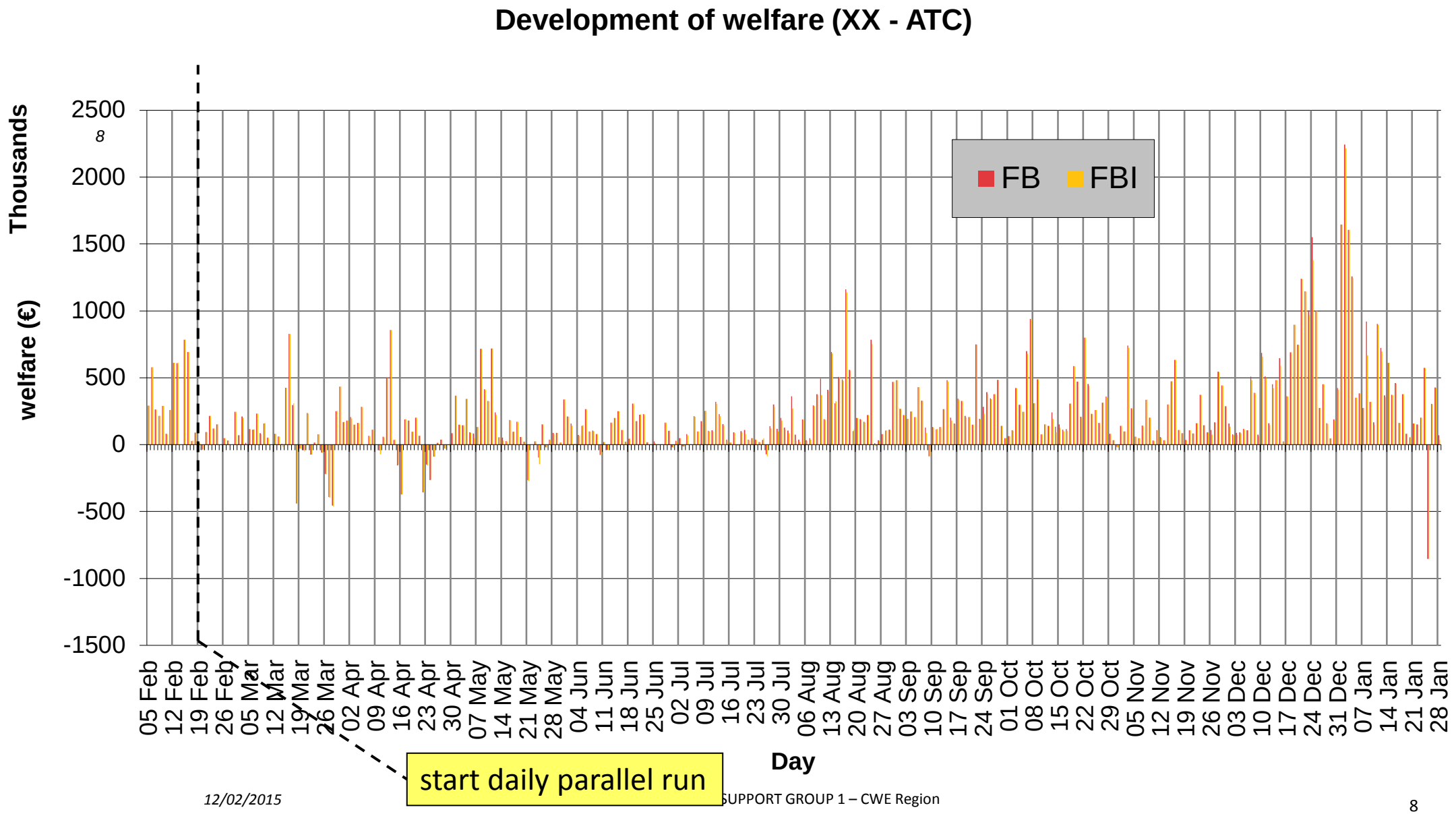
1 - Flow Based Market Coupling Project

a) Progress report: General parallel run performance – Change in weekly daily average welfare



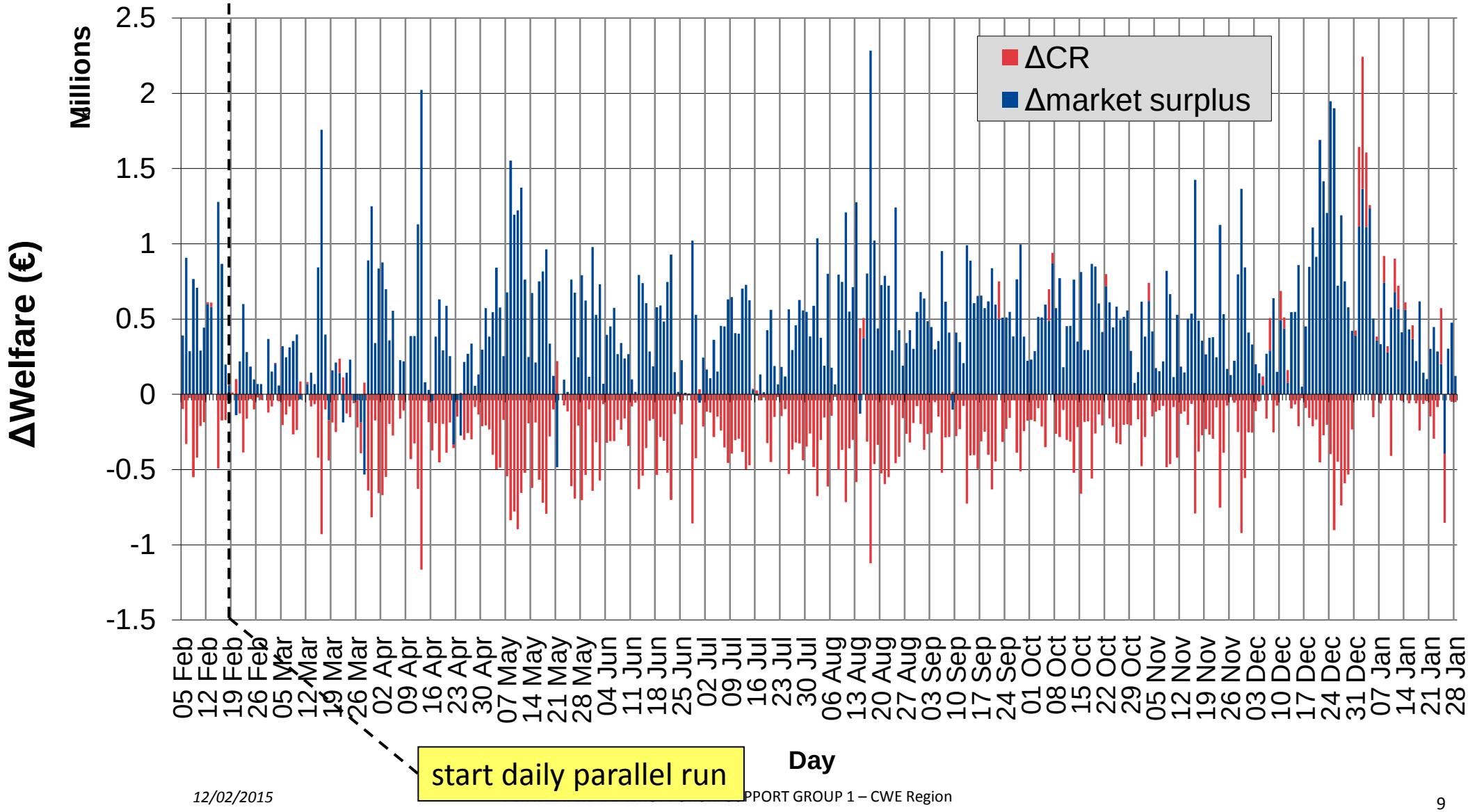
1 - Flow Based Market Coupling Project

a) Progress report: General parallel run performance – Change in daily welfare since NWE



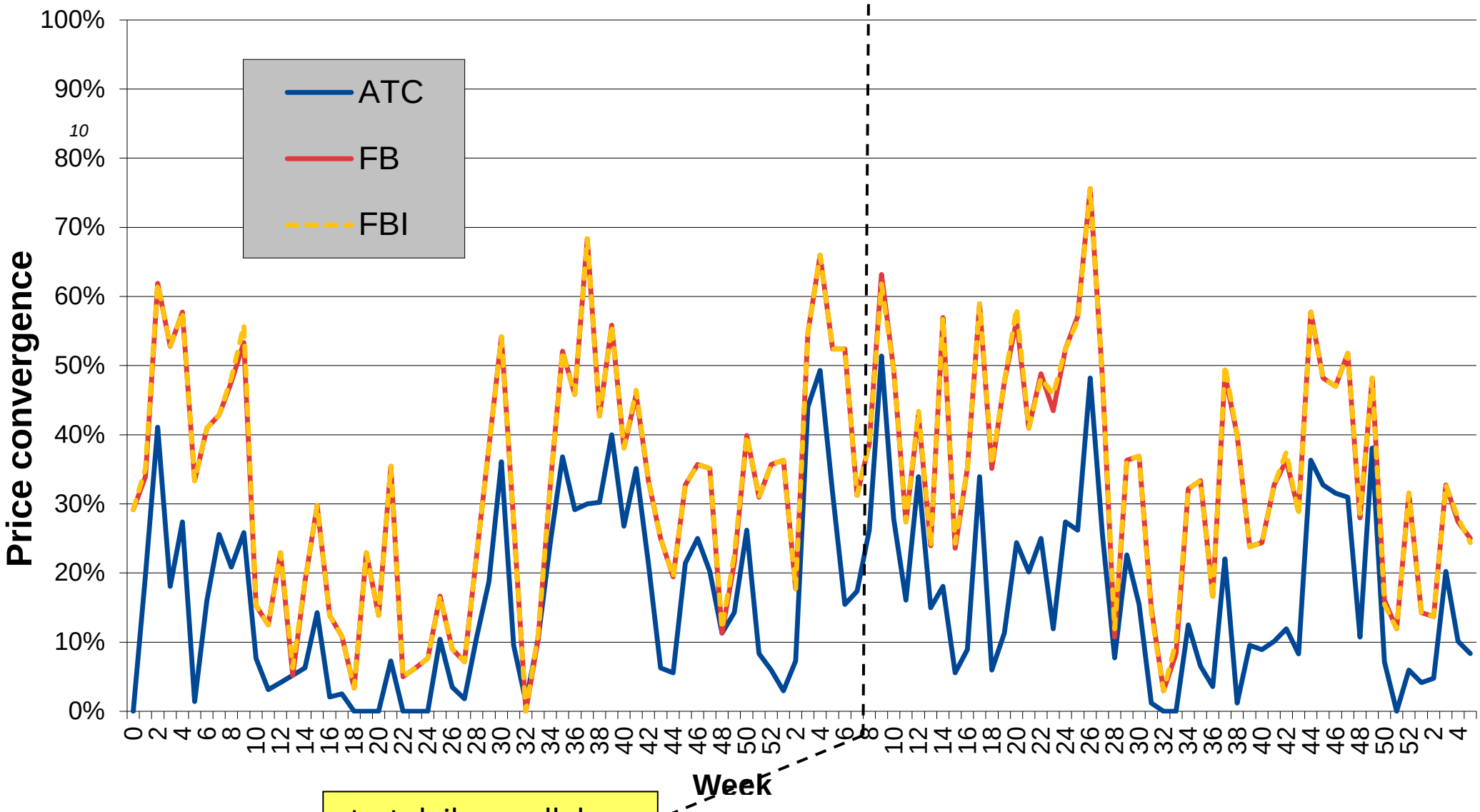
1 - Flow Based Market Coupling Project

a) Progress report: General parallel run - Change in daily welfare since NWE



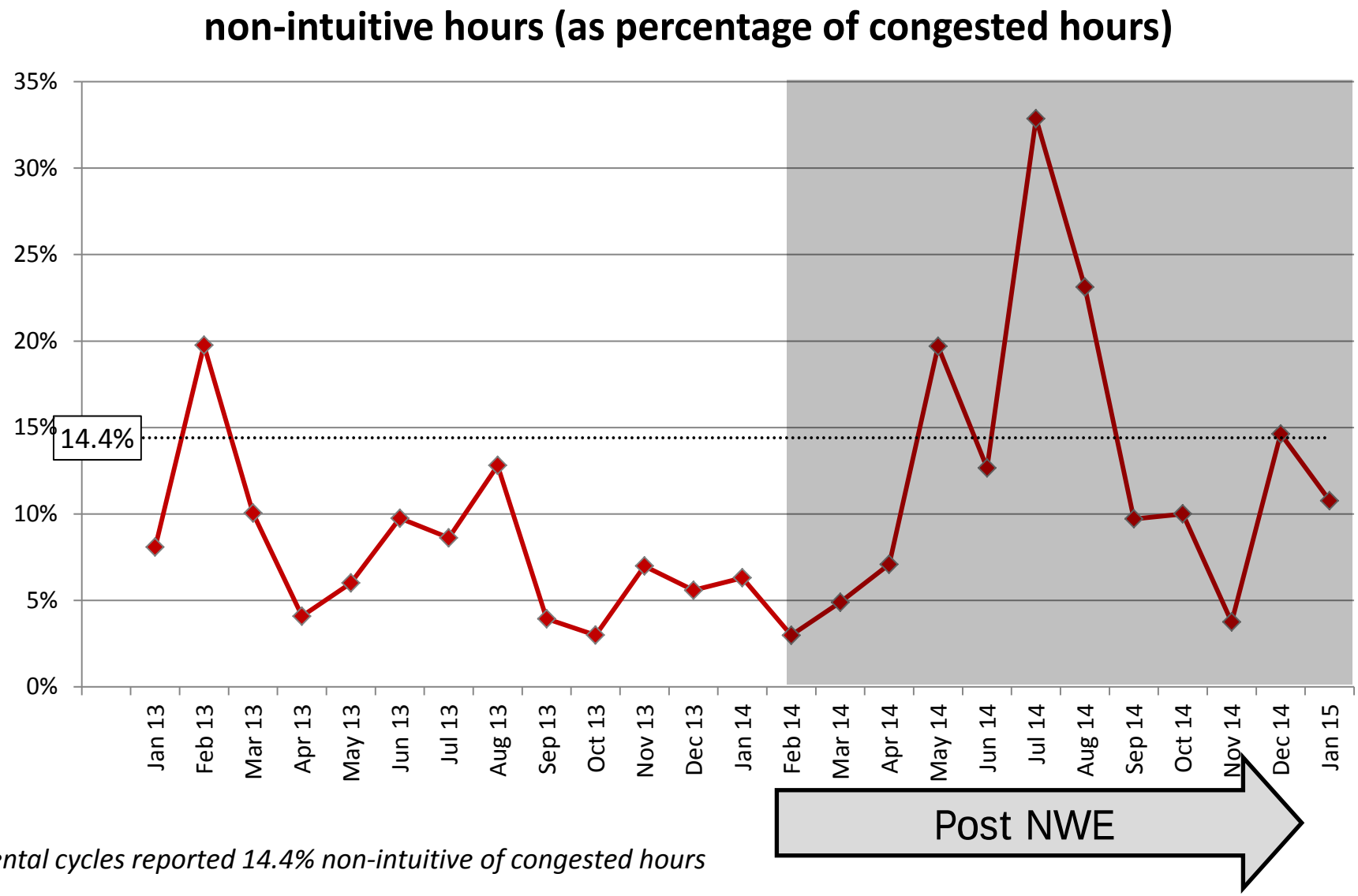
1 - Flow Based Market Coupling Project

a) Progress report: General parallel run - Price convergence



1 - Flow Based Market Coupling Project

a) Progress report: General parallel run - Intuitiveness (2013 wk0 - 2015 wk4)



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

1 - Flow Based Market Coupling Project

a) Progress report: creation of the CWE Consultative Group

- The CWE Consultative Group will be a subgroup of the overall Stakeholder Committee defined in the CACM network code

- Objective of the committee:
  - Provide information to stakeholders about FB performance and market outcomes
  - Provide information to stakeholders on upcoming changes in the CWE region (when applicable)
  - Consult Stakeholders about the allocation method's efficiency and potential impact of changes
  - Coordinate evolutions with the Market for an improved efficiency of the allocation method
- Participants :
  - CWE TSOs, PXs, FB User Group members but also a larger scope including institutional stakeholders (NRAs and associations) at a first stage. If FB MC is extended outside of the CWE region, further participants representing those areas might join the Committee.
- Start of the committee: the Consultative Group should be planned a few months after Go live.
- Next step:
  - The Project will contact FBUG members and associations in order to nominate a delegate or representative which will be joining this committee.

1 - Flow Based Market Coupling Project

b) Follow up on the adequacy issues and possible mitigation measures (1/11)

- In November 2014 the project published a report on Adequacy.
  - The focus of the report was on curtailment situations, i.e. the situation where price taking demand orders (submitted at maximum price) cannot be fully filled. Curtailment situations in DA could be indicative of adequacy issues in real time;
  - It was illustrated that “flow factor competition” may lead to situations where one market that clears below the maximum price, may force a curtailment situation in another market.
- NRAs deemed this property undesirable, and challenged the project to suggest a mitigation that would prevent such situations
- The following slides suggest the solutions the project considers to mitigate these effects

1 - Flow Based Market Coupling Project

b) Follow up on the adequacy issues and possible mitigation measures (2/11)

Option 1 – raise maximum price

- If the maximum price is raised sufficiently high the true cost of lost load could be reflected in the bids which is in line with a true energy-only approach.
- Flow factor competition would no longer be an issue: a market can only be denied its import if its clearing price exceeds the cost of lost load.

Challenges

- Especially when we consider raising the price in the whole MRC region this requires input from my involved parties, and might find opposition. More so if the required maximum price would deviate strongly from today's 3000 €/MW.

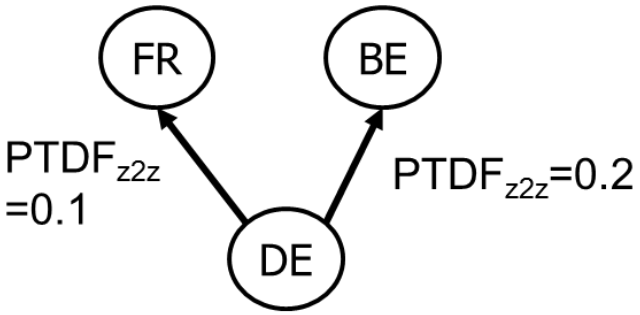
Option 2 – patch in matching algorithm Euphemia

- Alternatively we can try to prevent flow factor competition for price taking orders directly in Euphemia;
- Inside Euphemia we would artificially lift the price of price taking orders. If these orders become marginal, the final clearing price will be set to 3000€/MWh
- Since the lift of price is artificial, we get away with silly values (e.g. 1M€/MWh). This would effectively absolve price taking orders from flow factor competition
- The interaction with some other requirements can be challenging:
  - *Losses*: a market clearing just shy of 3000€ (e.g. 2999€) will be forced to export to a market in curtailment at "1M€", which will eventually be truncated to 3000€. The final remaining price difference is insufficient to cover the losses;
  - *Ramping*: similar as for the losses: one hour appears to generate a huge congestion rent, sufficiently large to offset some negative congestion rent from an adjacent hour (as a consequence of the ramping limit). After truncation of the price the huge congestion rent is reduced to a level it can no longer compensate the negative CR;
  - *FB "plain"*: examples exist for which a non-intuitive exchange is scheduled to allow a more beneficial trade take place elsewhere, involving a market importing at "1M€". After truncation negative CR results.

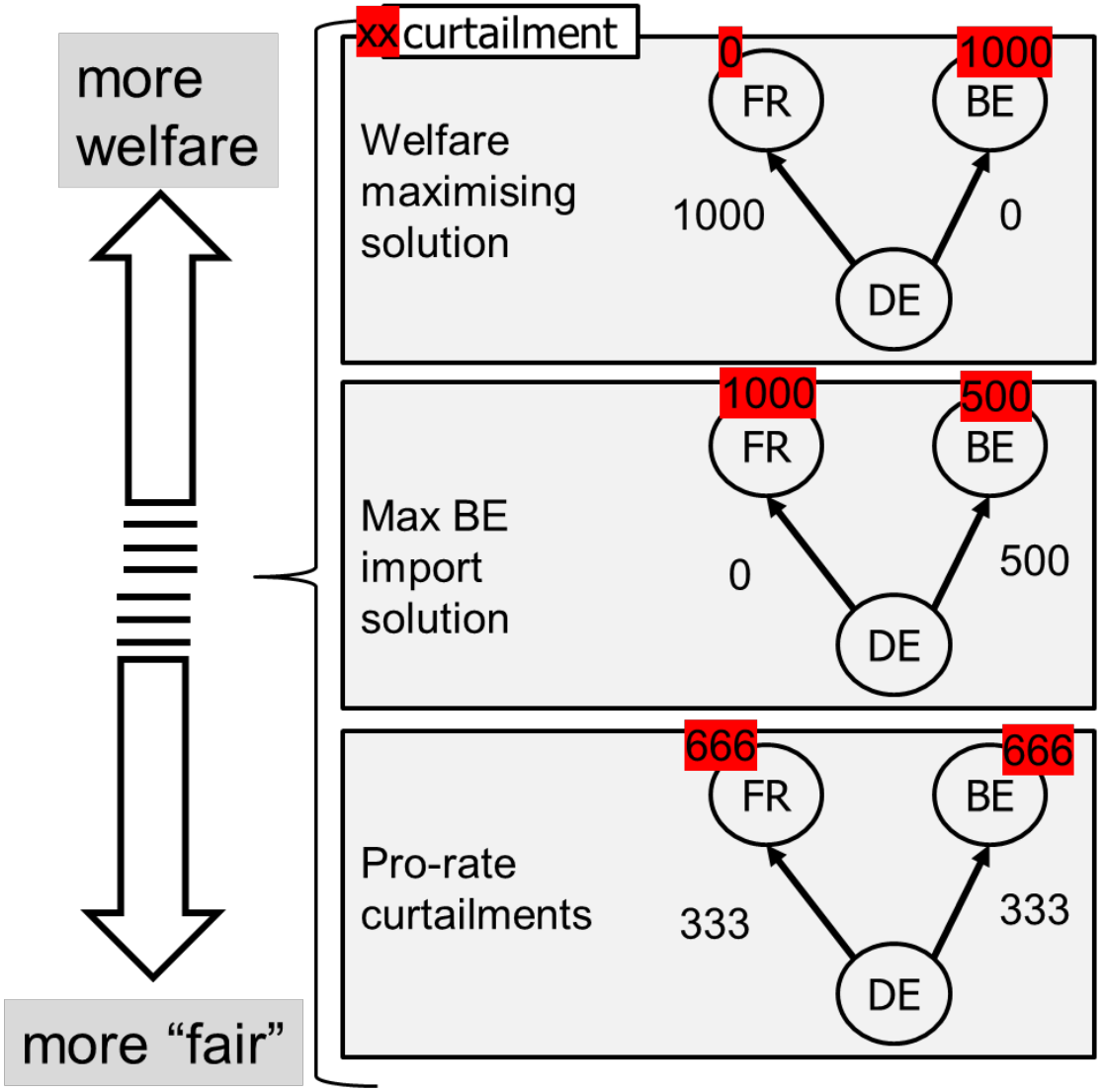
1 - Flow Based Market Coupling Project

b) Follow up on the adequacy issues and possible mitigation measures (4/11)

Example involving two markets simultaneously in curtailment. Both have 1000MWh PTO



- Curtailment in BE and FR;
- DE exporting hub;
- RAM = 100MW;
- What is “optimal” solution?



1 - Flow Based Market Coupling Project

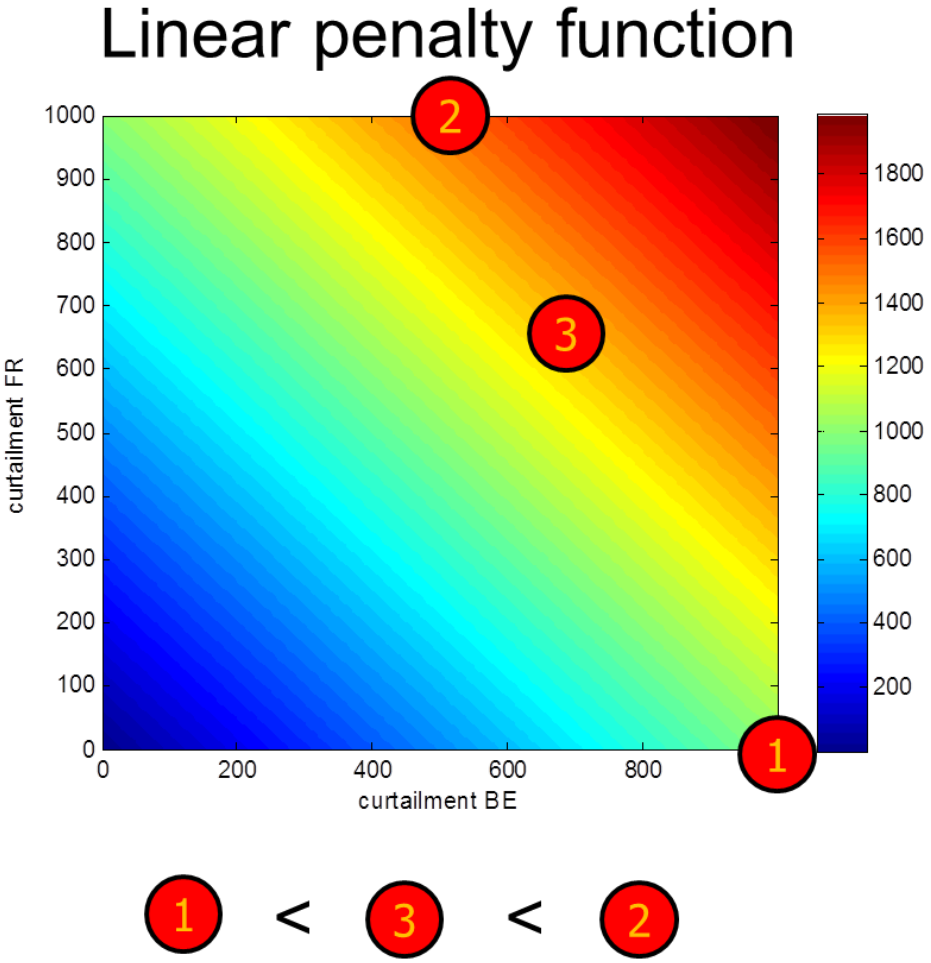
b) Follow up on the adequacy issues and possible mitigation measures (5/11)

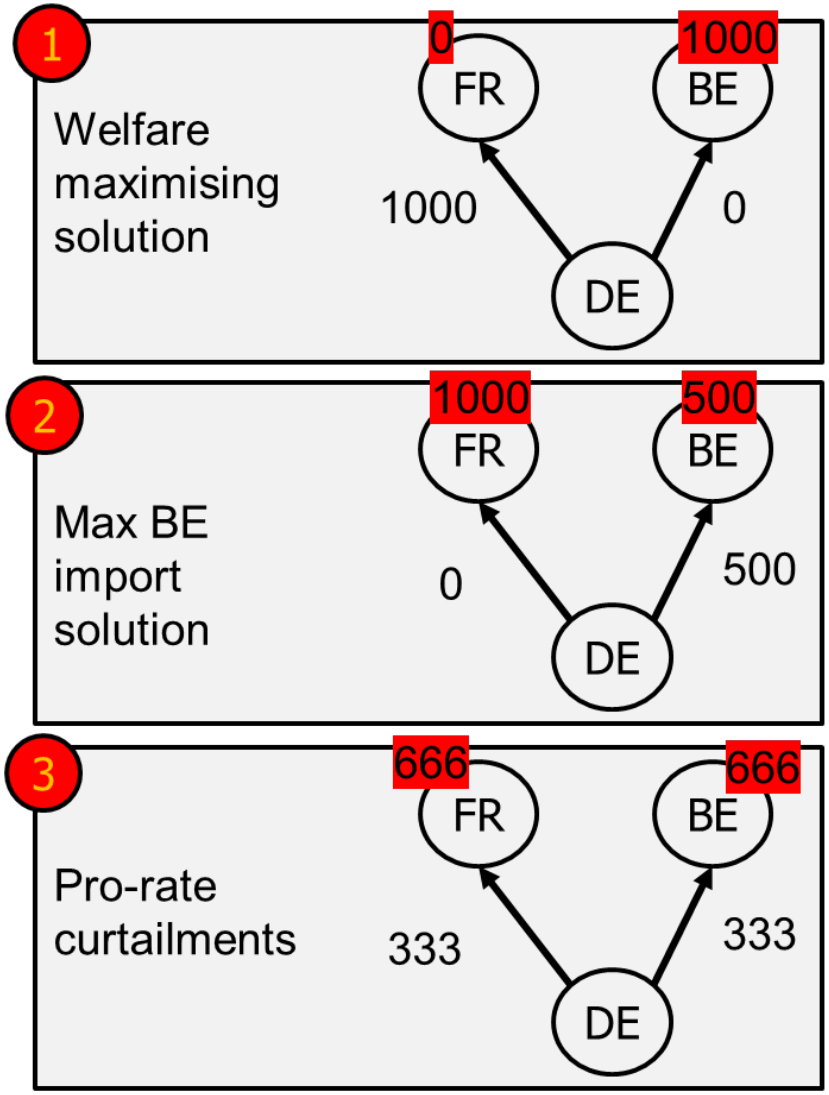
Option 2 – patch in matching algorithm Euphemia

- Option 2 considered lifting the prices of price taking orders
- Mathematically this is equivalent to penalizing the non-acceptance of price taking orders in the objective function of the algorithm
- This latter formulation allows different penalty strategies, e.g. rather than having a linear penalty a quadratic penalty can be considered, which balances out too extreme curtailments in any one market.
- The next slides illustrate the differences

1 - Flow Based Market Coupling Project

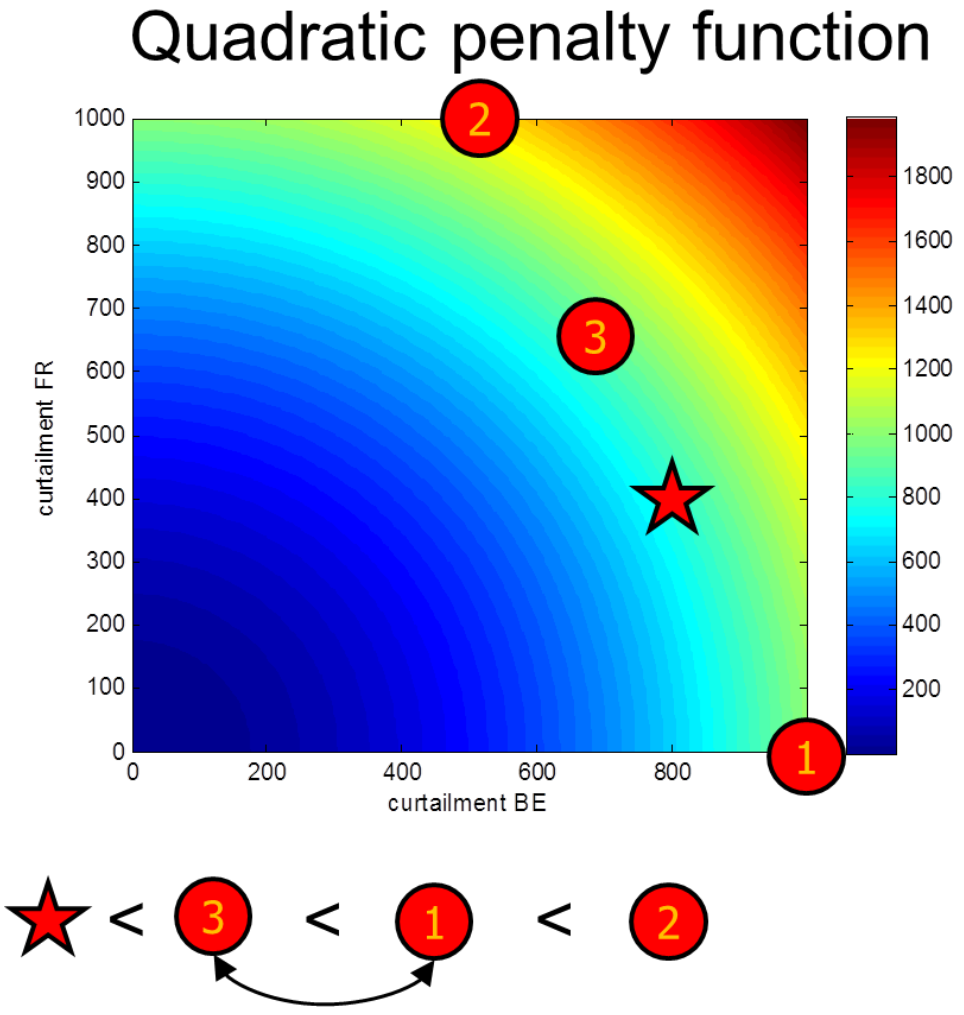
b) Follow up on the adequacy issues and possible mitigation measures (6/11)

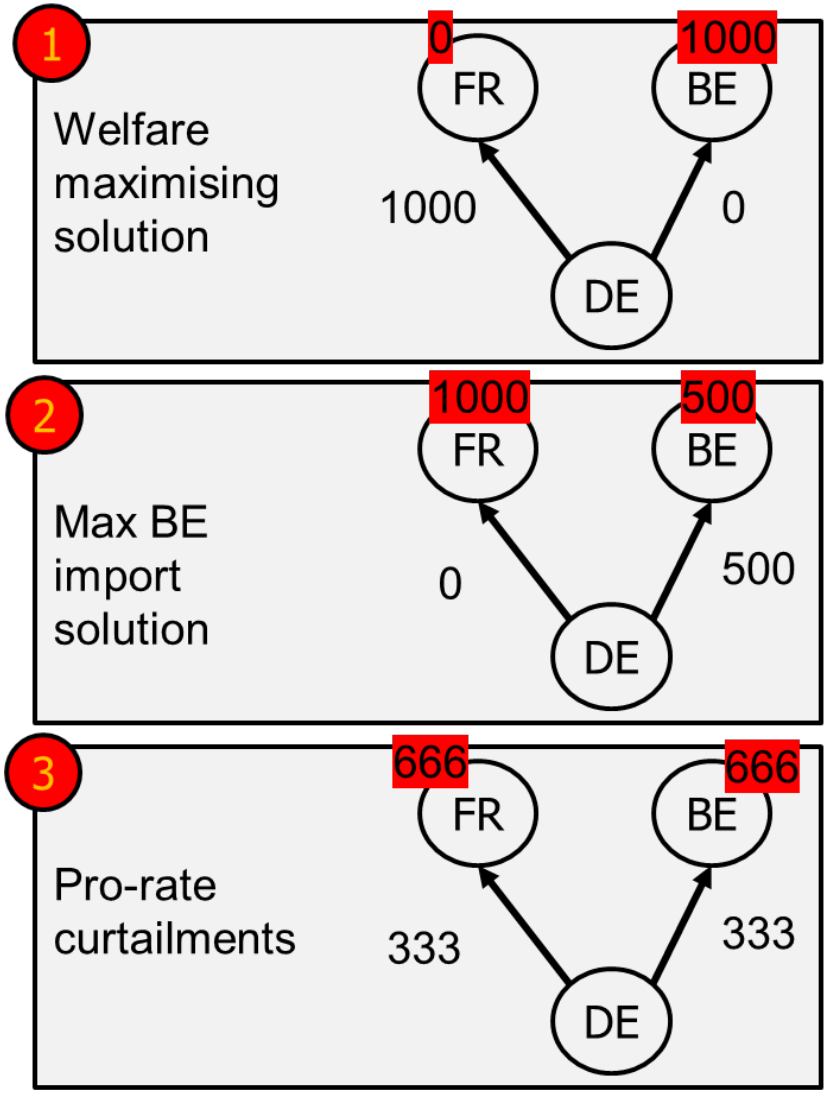




1 - Flow Based Market Coupling Project

b) Follow up on the adequacy issues and possible mitigation measures (7/11)



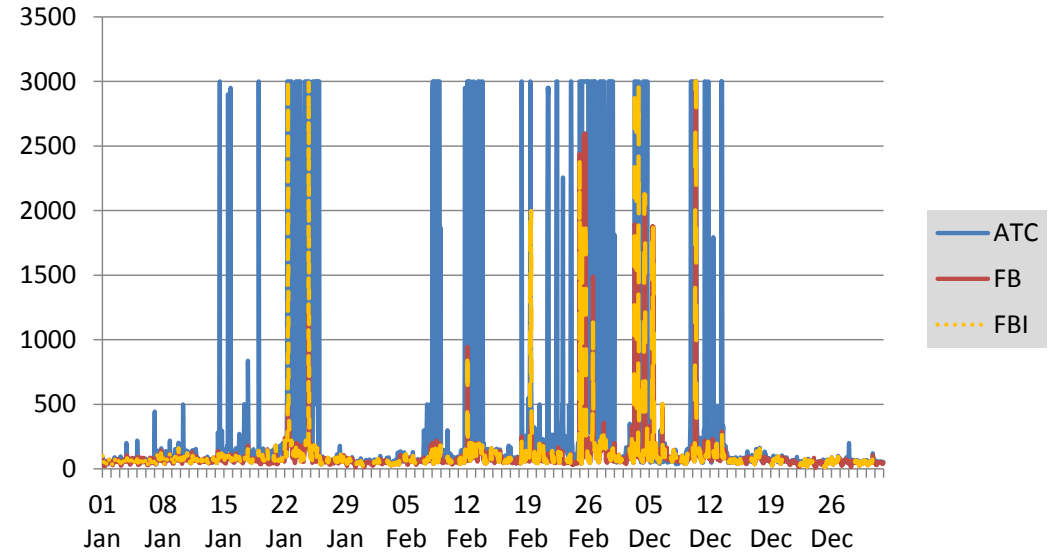


1 - Flow Based Market Coupling Project

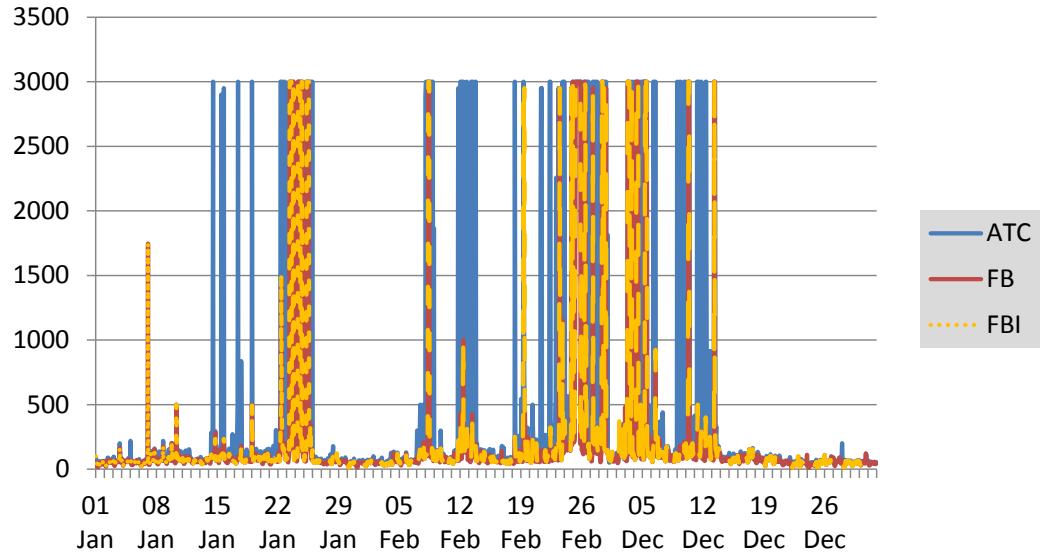
b) Follow up on the adequacy issues and possible mitigation measures (8/11)

- To assess the effectiveness of the solutions simulation will be run on winter 2013 data, where demand is added to the OBKs to trigger curtailments
- The following slides provide market results in the absence of any patch.
- Prices show that FR is affected more than BE, and the issue is more prominent under ATC than under FB

Prices BE



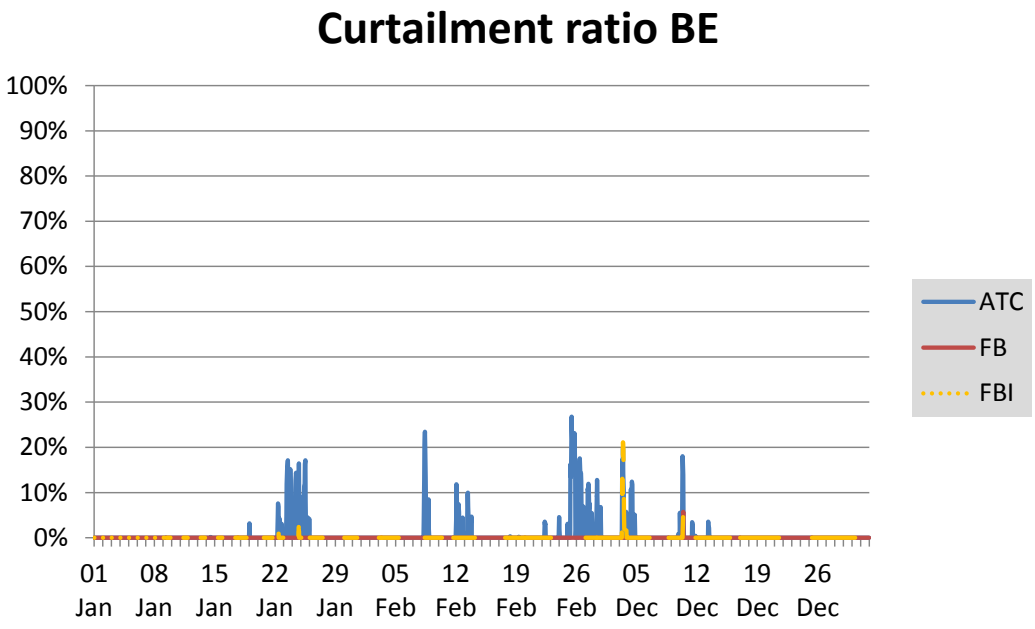
Prices FR

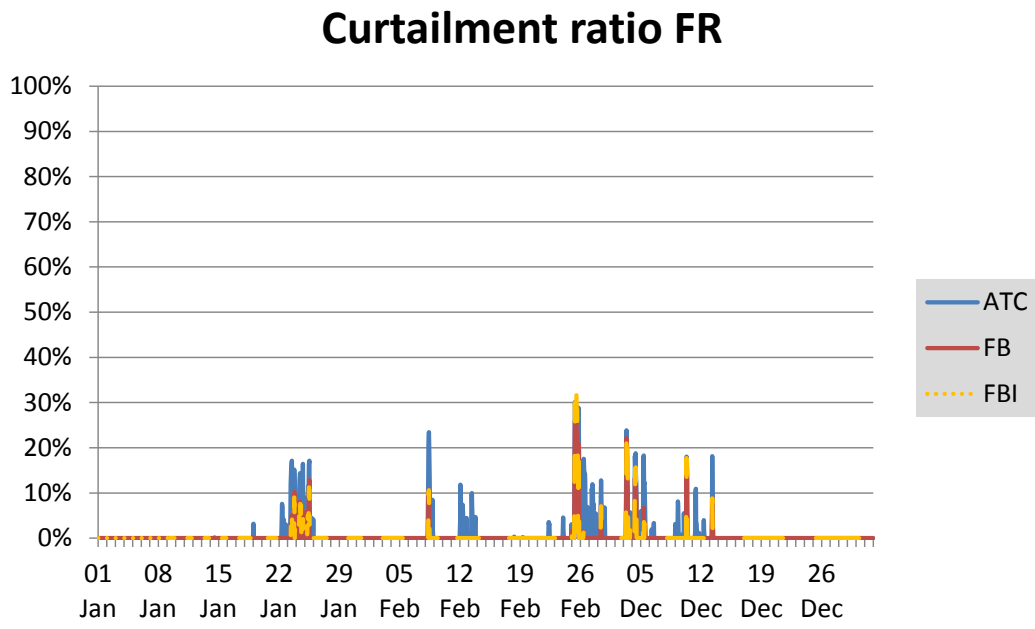


1 - Flow Based Market Coupling Project

b) Follow up on the adequacy issues and possible mitigation measures (9/11)

- Curtailment ratios (percentage of unassigned PTOs) will be different from zero if prices hit 3000€/MWh. Consequently the curtailment ratios of FR under FB or FBI are non-zero more frequently than BE

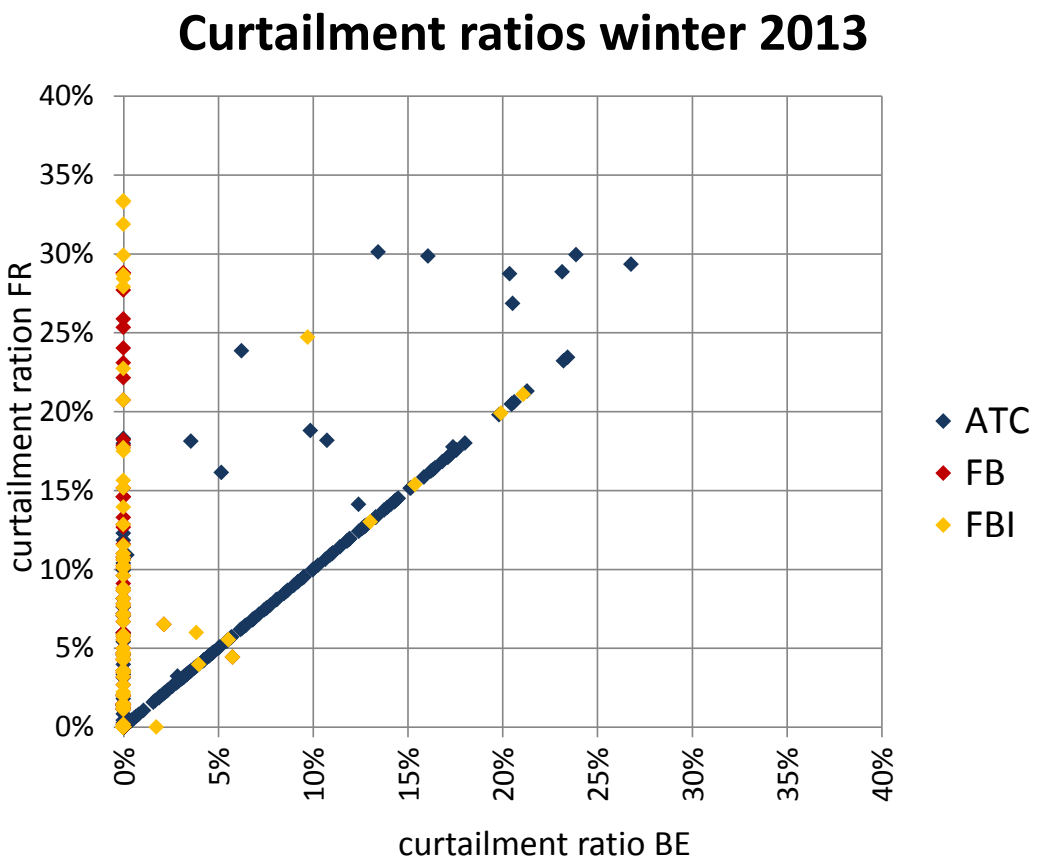




1 - Flow Based Market Coupling Project

b) Follow up on the adequacy issues and possible mitigation measures (10/11)

- The scatter shows that under ATC (for uncongested BE-FR) it is possible to equalize curtailment ratios between BE and FR. FB mostly manages to prevent double curtailments.
- To gain further insight in double FB curtailments we will further increase BE demand in our dataset



1 - Flow Based Market Coupling Project

b) Follow up on the adequacy issues and possible mitigation measures (11/11)

Next steps

- Pending the test results of these mitigation options the project will assess the described options. Assessment will be based on
  - Effectiveness: it should mitigate the problem
  - Manageable: any adverse consequences associated to the mitigation should either be mitigated itself or be accepted

- These options will be proposed to the NRAs and added to the approval package

1 - Flow Based Market Coupling Project

c) Time planning until Go-Live (1/3)

- On 2 Feb 2015, CWE NRAs have informed the Project that the final approval of the CWE Flow-Based methodology by all CWE-NRAs is now foreseen for the 23rd of April 2015

- NRA-approval is a major prerequisite for go-live, therefore the impact on the go-live date is currently under investigation

- The project partners will inform market parties as soon as a new target date has been decided on

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c) Time planning until Go-Live (2/3)

- Project partners still plan to complete all acceptance criteria and be technically ready for Go-Live by April 1st. Project partners are still improving technical and operational implementation
  - Performance of daily parallel run with TSO CS v1.1 since October; TSO CS v1.2 (Go Live version) in operations by 09/02, preparing results for BD 11/02
  - Connectivity tests and Full Integration tests between all systems (incl. Italian Borders functionalities) are currently being performed
  - Simulations testing will be performed in February
  - Final market operators training and member tests will be performed beginning of March
- The last **Market Forum** will take place on March, 6th 2015, in Paris.
- Due to technical constraints, the **parallel run process** will terminate about a few days before the Go-Live date of Flow-Based Market Coupling

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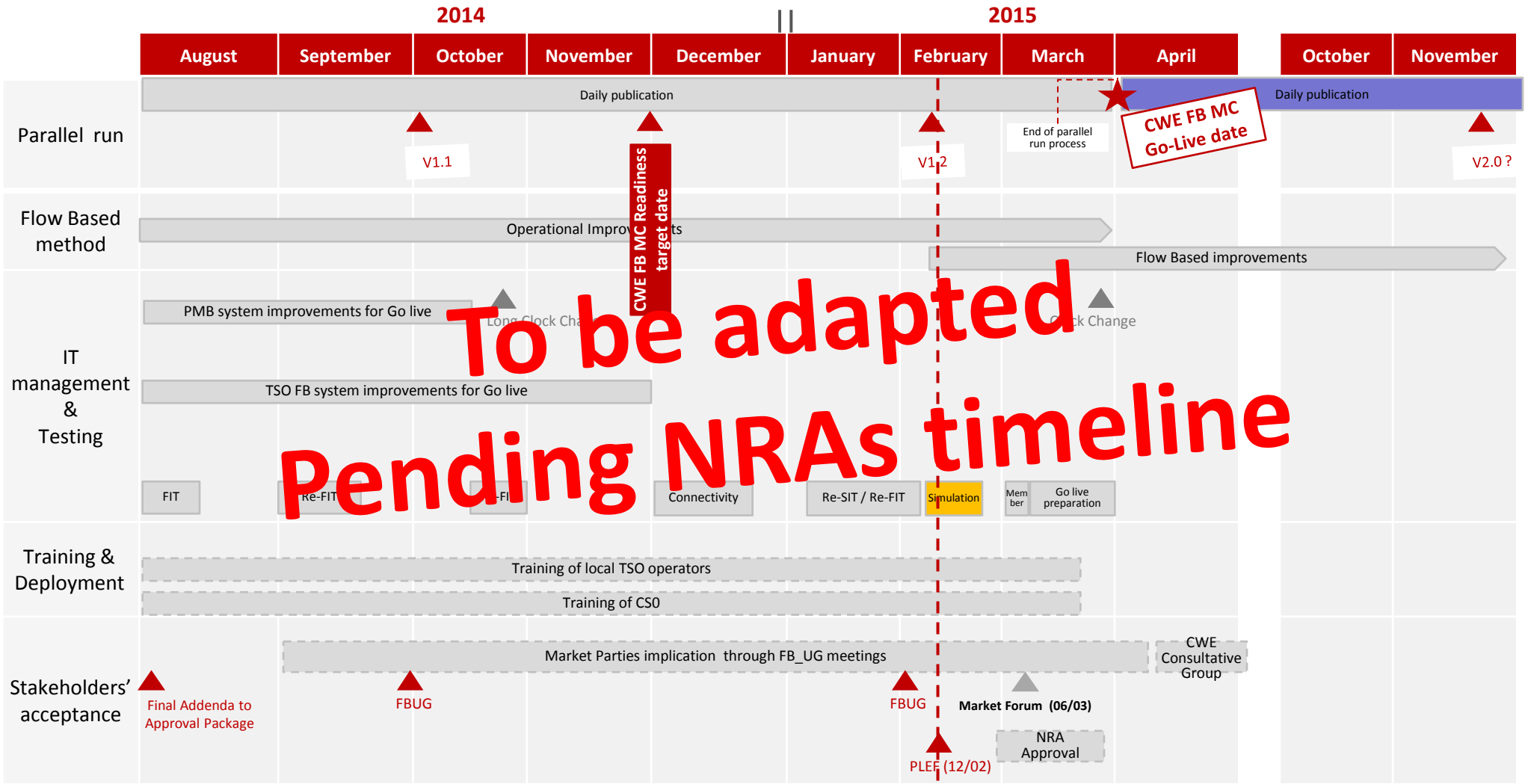
c) Time planning until Go-Live (3/3)

Planning to be reassessed following NRAs announcement on February 2nd FBUG meeting



To be adapted

Pending NRAs timeline

1 - Flow Based Market Coupling Project

a) Progress report: NRAs acceptance

- **Main open NRAs' requests for go live approval[1)]:**
  - Adequacy recommendations (final solution) to be provided to NRAs until 20th February latest, afterwards national consultation in BE
  - Publication Back-ups/Fallbacks + re-computation of missed days (published beginning of February)
  - Publication of the aggregated D2CF information (end of Feb latest)
  - Intraday: Final explanations/ confirmations regarding re-computation to NRAs
  - Improvement of the monitoring reports, including proxy NTC-Market results
  - Formal change of the approval doc related to paragraph 10.4 ("Publication of aggregated information related to the D-2 common grid model")
  - Publication of the static grid model (after Go Live)
  - Proposal regarding the LTA+ concept, giving more LT-capacity to day-ahead under pre-conditions (to be processed on bi-national level)

1) Further open requests of lower priority, they can be fulfilled after go live (see also part "future challenges" of this presentation)

Agenda

1. **Flow based market coupling status**
   a. Progress report by TSOs and power exchanges
   b. Follow up on the adequacy issues and possible mitigation measures
   c. Time planning

2. **Structuring the discussion on future challenges concerning flow based market coupling**
   a. Further improvements to be developed after Go-live for a second version of Flow Based (NRAs feedback on their common requests for further improvements)
   b. Further extensions

2 - Structuring the discussion on future challenges concerning flow based market coupling

a) Further improvements to be developed after Go-live for a second version of Flow Based (NRAs feedback on their common requests for further improvements)

- Review of the external constraints based on operational experience
- Integration of the new BE-LUX interconnector/PST
- Ongoing improvement of the quality of D2CFs and to the application of better optimization of the usage of Remedial Actions (potentially includes discussion on costly actions)
- Based on the basis scenario, further developments of future scenarios in the framework of the Consultative Group
- Introduction of flow-based method for ID capacity calculation…

2 - Structuring the discussion on future challenges concerning flow based market coupling

b) Further extensions

- Improvements of the GSK (prerequisite: more binding information on D-2 from generator‘s side)
- Extension to further regions/ countries
- Coordination with the CEE-FB operation