Date: 7 October 2013

Communication to Market Participants

CWE Flow-Based Market Coupling

Subject: Outcome of the CWE FB MC Survey - Project answers to Market Participants' concerns and questions

Dear Market Participant,

The CWE FB MC Project partners would like to thank all Market Parties who participated in the public consultation process. Your feedback is well appreciated and will be taken into account in order to ensure that the next steps in the FB market coupling implementation will be smooth and transparent. The Project relies on good cooperation, which increases the understanding and confidence of Market Parties.

Therefore, we are pleased to provide you with the **following Q&A document** addressing key market concerns raised during the public consultation. The intention is to meet the expectations expressed by Market Parties by responding in a transparent and pedagogical manner to all questions which arose during the consultation process.

Please note that some of the answers in this document may require good understanding of the FB principles, so this document is by no means intended as an introduction to FB. Introductory information regarding FB can be found on the CWE partners' websites as well as on the CASC website: http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Documentation where also a glossary for the CWE FB MC terminology is available: http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Glossary.

The CWE Project also aims at tackling specific topics, frequently raised by survey respondents who expressed the need for further explanation and discussions, which will be provided during dedicated workshops of the next Market Forum.

Project Partners would like to remind you that the **CWE FB MC Market Forum will take place in Brussels on 10 October**. Please also keep in mind that the documentation and the Q&A Forum available on the CASC website will be updated and used by the Project during the next months to communicate with Market Parties and to best prepare the implementation of the FB methodology.

Best Regards,

CWE Flow-Based Market Coupling Project Partners

Questions & Answers

Content

I. FB capacity calculation method compared to ATC

1. What is the effect of FB on the allocation rules on the borders outside CWE and on ancillary services?

Under FB, interdependencies of the cross-border exchanges are reflected from the beginning of the process for all the directions within the capacity domain. This is in contrast to the current coordinated NTC process where the first step (initial local TSO computation) is not coordinated.

FB implementation is about the capacity calculation process within CWE. Allocation rules outside CWE are not affected.

As it is the case for any change potentially impacting market outcomes, and therefore flow patterns on the grid, FB might have an effect on ancillary services, but this consideration is purely theoretical and cannot result in a firm anticipation of any concrete impact.

2. Can the impact of FB on the forecast and calculation of forward/intraday capacities be explained?

The current approach of sharing of capacities between the different timeframes (year, month, day) is out of the scope of the CWE FB MC Project which only aims at better optimizing the capacities made available in Day-Ahead. Therefore there is no impact on the current process for forward capacities.

Besides, the FB Project ensures compatibility with the current ID process by delivering, after DA clearing, a set of ID ATCs derived from the FB domain. Project partners want to remind that the methodology to compute ID ATCs has been depicted in the feasibility report of October 2011 (http://www.casc.eu/media/CWE%20FB%20Publications/CWE_FB-MC_feasibility_report_2.0_19102011.pdf).

In addition, CWE partners are willing to publish ID ATCs which would result from the daily FB allocation within the framework of the external parallel run as soon as possible.

3. What is the mechanism for splitting capacities on Critical branches between CWE and CEE?

FB is a technical implementation project and does not reconsider the splitting of capacities. So far, there is no CB which is relevant for both CEE and CWE region. The question of capacity split is addressed at higher level and not in the scope of the FB Project. However, to avoid any security issues, the impact on the CWE grid of CEE exchanges and of all exchanges on borders with other regions is taken into account in the CWE methodology. Under standard hybrid coupling, the best assumption of these flows is taken into account in the D2CF and the FRM also covers the effect of these flows on the CWE critical branches.

4. What will be the impact of installing phase-shifters on borders with CEE (loop flows issue) on available capacity for CWE FB MC?

Such investigations have not been made. PSTs can be used for different purposes (e.g. on D-2 to optimize capacities or in real-time to safeguard N-1 security). PSTs will be taken into account in the common grid model (as well as other new network elements). The possible impact will depend on the operational usage of the PSTs.

5. Are internal conditions for identification of CBs and capacity allocation of German TSOs the same as for other CWE and CEE TSOs?

Generally each region can define its own rules depending on its specificities. However, the rules have to be compatible in first instance and be harmonized later on. The criteria list on how to assess CBs should therefore

be the same in the CEE andCWE region. The CWE region has already an established method and a harmonized approach between CWE TSOs exists, whereas in the CEE region agreed criteria have still to be defined. The CEWE FB experts group could harmonize in a second step the rules between the two regions, if inside the CEE FB Project a clear commitment to FB MC is reached.

6. ***LTA seem not to be curtailed even if they are out of the FB domain. Does it not go against market welfare to make those feasible?***

The LTA (long term allocated capacities) inclusion algorithm (see consultation document chapter 2.2.6.: http://www.casc.eu/media/CWE%20FB%20Publications/130502%20CWE%20FB%20MC%20Consultation%20Document.pdf) has been added for exceptional situations where remedial actions are difficult to model explicitly. In this case LTA inclusion algorithm is one way to express implicitly the remedial actions which can be taken to ensure that long term capacity is available. The intent is thus not to change arbitrarily the FB domain, but rather to make it in line with security assessments, so this LTA inclusion does not go against the welfare principles.

7. ***How to differentiate gains resulting from better TSO coordination and benefits from FB implementation?***

In the currently applied ATC based market coupling, CWE TSOs already coordinate on cross border remedial actions.
In June 2013, TSOs launched a comparable coordination approach within the FB parallel run, which means that TSOs will progressively coordinate their usage of cross-border remedial actions in the course of the parallel run, so that they eventually consider the same RA in FB than in ATC. This is expected to happen during the autumn 2013.The coordination is currently only performed on phase shifters and only some CWE TSOs are participating in FB coordination. The aim is to have all CWE TSOs involved and to extend the coordination on other remedial actions.
Finally the FB coordination will be based on the same remedial actions as the ATC one, but is expected to bring about increased benefits as it will apply to a better modeling of the grid. That means that the identified gain is only linked to the FB method itself, because there is already coordination in the ATC approach.

8. ***What does the statement "GSK must be linear" mean?***

The Generation Shift Key (GSK) defines how a change in net position is mapped to the generating units in a bidding area. Therefore, it contains the relation between the change in net position of the market area and the change in output of every generating unit inside the same market area. It can be mathematically proven that, due to convexity pre-requisite of the FB domain, the GSK must be linear under the current formulation of the optimization problem implemented in the market coupling algorithm.

9. ***Is it intentional that the cables to Nord Pool (NorNed, Kontek, Baltic cable) are not represented on the figure of paragraph 2.2.1 Merging?***

Be it in the CWE current scope or in NWE as it will go-live (standard hybrid coupling), there is no need to take into account the specific influence (PTDF) of those cables injections on CWE critical branches. In advanced hybrid coupling, those influences will be taken into account explicitly. A detailed description of standard and advanced hybrid coupling is included in FB Feasibility Report (http://www.casc.eu/media/CWE%20FB%20Publications/CWE_FB-MC_feasibility_report_2.0_19102011.pdf).

10. Can the notion " RAM" be better explained?

The reference flow (Fref) is the physical flow computed from the common base case, case prior to implicit capacity allocation via DAMC, and reflects the load on a critical branch given the exchange programs of the chosen reference day. Out of the formula:

RAM (Remaining Available Margin) = Fmax – Fref – FRM (Flow Reliability Margin) - FAV (Final Adjustment Value). For further explanation, please refer to the presentation made on the FB methodology and capacity calculation principles during the last Market Forum: http://www.casc.eu/media/CWE%20FB%20Publications/CWE%20MC%20FB%20Market%20Forum_2013_03_07.pdf.

The calculation delivers, with respect to the other parameters, the free margin for every CB. This RAM is one of the inputs for the sub-sequent process steps.

11. Are cross-border redispatch actions included in the list of Remedial Actions?

Not yet. According to their security policies, TSOs today do not consider XB redispatch at the capacity calculation stage. This situation is not specific to FB implementation and the possible adaption of local policies in this respect is addressed in other initiatives.

II. External parallel run performance

1. Why are more than 25% of the days within the external parallel run missing?

The external parallel run has started early in advance to support Market Parties and it already provided a lot of representative data, covering any type of situation (including high-wind scenarios in Germany) over the first 9 months of the year.

Please keep in mind that TSOs still work with prototype tools and not yet with the final industrialized system and that operators need to acquire experience before perfectly handling the process. Explanations for the missing days are provided in a transparent way for Market Participants to understand encountered issues (http://www.casc.eu/en/Resource-center/CWE-Flow-Based-MC/Parallel-Run-Results). The second half of the parallel run demonstrates the efficiency of mitigation actions implemented by TSOs resulting in an increase of representative days.

Please consider that the TSO FB operational process will be further explained during the CWE Market Forum in October in order to clarify to Market Parties the operational conditions of the external parallel run and resulting performance.

2. Could historical PTDFs be published via an ftp server?

As foreseen in article 3.1 of the transparency regulation EU-543-2013, the requested data shall be up to date, easily accessible, downloadable and available for at least five years. Data updates shall be time-stamped, archived and made available to the public. With the go-live of the ENTSO-E centralized EMFIP transparency platform at the beginning of 2015, TSOs will comply with these obligations and will provide an adequate access to current and historical PTDFs.

For the interim period, the Project provides a separate publication, taking into account costs and benefits for the market. CWE Project Partners will try best to improve means of data publication during the external parallel run for MPs, notably in the view of future daily publication of simulation results. We also commit to investigate on possibilities to have an improved technical solution for data publication from go-live on.

3. Is it possible to maintain publication of ATCs after the implementation of FB?

Although the Project understands the rationale behind this request which is to compare both models, it is not foreseen to have a "reverse parallel run" after go-live. Since the ATC capacity calculation process is different from the FB one, this would require continuing the exceptional effort of running two processes in parallel which is too resource intensive.

As to comparison, the parallel run will have established a reference for FB thanks to a lot of simulation results covering different situations when Project Partners decide for the CWE FB MC go-live. The coverage of a sufficiently diverse amount of situations during the external parallel run will therefore be a key consideration when taking the go live decision. An independent calculation of ATCs after FB MC go live is therefore not considered.

4. Would it be possible to perform sensitivity analyses by changing different parameters?

The technical parameters implemented by TSOs result from thorough Security of Supply assessments, based on the operational conditions. Changing some hypotheses could lead to unrepresentative results and would represent a significant additional workload (as the qualification and verification steps would need to be done

again for each change). Therefore, it is not foreseen to provide Market Parties with this kind of additional analyses.

III. FB market simulation results compared to ATC

1. *Why can FB sometimes yield welfare losses compared to ATC?*

When capacities are allocated with a FB constraint which is more restrictive than under ATC, the social welfare may decrease, therefore these situations are carefully looked at. On the overall the FB domain gives larger opportunities to the market than is given under ATC, nevertheless occasionally constraints can be more restrictive under FB than under ATC. Since the start of the parallel run, many of these constraints appear having been improved by the enhanced coordination process

2. *Could the Project publish a study on historical price convergence under ATC coupling highlighting price volatility under FB?*

The CWE project partners are currently preparing and plan to publish a study on volatility and price convergence. FB results can only be provided for the parallel run period, whereas ATC coupling results can go back to 2007 (since the first day for Belpex market was in November 2006).

IV. Allocation principles and Intuitiveness

1. How will cross-border capacity allocation function under FB?

The notion of "bilateral cross-border capacity" is not relevant anymore in the FB approach. TSOs do no longer make choices on allocating cross-border capacity over different borders. These choices will now be made automatically by combining a detailed grid model with price signals communicated through the PX order books for the day-ahead implicit capacity allocation process.

Fundamentally, TSOs are providing to the allocation system the technical limitations and sensitivities of the grid regarding possible variations of net positions of each hub. This determines the value of the cross-zonal capacities for the coupled markets. The market coupling system optimizes feasible trades while respecting these constraints and looking for a global welfare maximum, implying that cross-zonal capacities will be used where the market needs them most (compared to an ex-ante choice by TSOs as in the ATC model).

These principles will be further explained during a dedicated session at the CWE Market Forum in October.

2. How do the algorithm and the intuitive patch work?

The PCR algorithm (Euphemia) will be used to clear the markets after the go-live of NWE Price Coupling and not the current CWE algorithm (COSMOS). Since FB will be launched after the NWE go-live, Euphemia will be the algorithm handling FB parameters.

The PCR Power Exchanges are currently in the process of compiling documents providing a thorough description of the Euphemia algorithm which is intended to be published before NWE go-live. This document will also describe how the FB allocation is implemented in Euphemia.

Please note that appendix 8.1 of the “CWE Enhanced Flow-Based MC intuitiveness report” explains all specific questions raised by Market Participants on the intuitive patch (http://www.casc.eu/media/CWE%20FB%20Publications/CWE_FB-MC_intuitiveness_report_v2_clean.pdf)

3. Is it possible to update the Intuitiveness Report 2012?

The qualitative argumentation developed in the 2012 report (http://www.casc.eu/media/CWE%20FB%20Publications/CWE_FB-MC_intuitiveness_report_v2_clean.pdf) is still valid but the CWE Project will update the quantitative findings in the Intuitiveness report with results from the parallel run covering the period from week 1 to week 37. As soon as it is finalized, it will be shared with Market Parties.

4. If the FBI variant is chosen, will the difference in total welfare between FBI and plain FB be monitored?

In case "intuitive" FB is implemented, the Project will indeed monitor welfare losses compared to "plain" FB. This way, CWE project partners can react in case too much welfare should be lost through application of the intuitive patch.

The decision about implementing or not the intuitive patch is currently still pending. Project partners have consulted Market Parties on this specific issue in the market survey but no clear cut market position could be observed. Market Parties are of course invited to make their preference clear so as to take it into account for the final decision.

V. Operational process clarification

1. ***What is the impact of FB on the Shadow Auction Process?***

Under FB MC, the Shadow Auction concept fundamentally remains the same as today. The Fallback solution for CWE is the triggering of Shadow Auctions performed by CASC with TSOs providing ATCs derived from the FB domain. Timings and specific processes are addressed by the NWE Project.
CWE partners are currently working on Fallback procedures within the NWE environment. During the Market Forum, it is foreseen to explain the principles of the Fallback process. The CWE Project aims at sharing the full Fallback process with the Market and NRAs end of 2013.

2. ***What are the possible reasons for Fallbacks? Could explicit Shadow Auctions be a first option before Fallback to ATC MC?***

Fallback situations need to be clearly split into two main scenarios which are absolutely not correlated.
On the one hand, a fallback situation may occur during the pre-coupling step and could lead to down-graded modes for the FB capacity calculation process. This could result in under-optimized FB parameters but will not by itself trigger a decoupling.
On the other hand, the pre-coupling phase (including capacity calculation) can be correctly performedy, but an issue in the coupling process could trigger a decoupling. Should this second case arise, ATC based shadow auctions (with ATC values derived from the FB domain) will be organized.

3. ***Could Shadow ATCs be published as soon as there is a significant risk of decoupling and not only once the decoupling becomes certain?***

Technically ATCs for Shadow Auctions can be published every day. However, they can only be published when FB parameters have been computed. Theoretically ATCs for Shadow Auctions could be published earlier then 10:30, however the LT nominations (deadline at 9:30) are needed to compute them. If Market Parties wish so, TSOs are open to discuss moving the LT nominations deadline in order to gain time for an earlier publication of ATCs for Shadow Auctions.
Project partners would like to remind that the need for Shadow Auction ATC usage is linked to failure of the Market Coupling process, not to the TSO pre-coupling process. Even though the need to decouple is confirmed soon enough by Power Exchanges, ATCs for Shadow Auctions cannot be made available before the final computation of FB parameters in any case.

4. A Rollback procedure should be foreseen and preferably be available for a period up to 1-2 years.

The aim of the Rollback procedure is to cope with possible risks linked to the switch of a new system, i.e. from ATC MC to FB MC, within the first weeks after go-live as, even when tested thoroughly, there is always a risk of failure. A Rollback solution is therefore planned when switching the ATC based systems to FB MC on the launch day itself as well as during a period of two months after the CWE FB MC go-live. A Rollback would mean reestablishing ATC MC in the NWE framework with publication of ATC values by TSOs. If however (despite every effort being made to ensure that the solution promotes efficient markets results and optimal capacity utilization and price formation) unexpected and unacceptable market outcomes emerge, the Project will ensure the market coupling with ATCs until the issues can be solved.

Please consider that is not possible to maintain all systems operational (including change requests, etc.) during several months. Furthermore NRAs and Market Parties should bear in mind that the Rollback period is constraining further developments and impacting the CWE roadmap; it has therefore to be assessed thoroughly. Market Parties can thus be assured that FB will only go live when project partners, as well as NRAs and the Market, have enough confidence that a representative FB domain can be delivered every day, and system stability is provided as it was the case for ATC market coupling in 2010.

5. Could the "Rollback" triggering be speeded up and be operated within one day?

In case of a Rollback, ATC market coupling in the NWE framework will be reestablished. All systems have to be reinstalled, connections need to be tested and some preliminary tests have to be run which takes more than one day. The acceptable duration of these steps is in the process of being defined by project partners.

Please note that in any case market coupling will be maintained even during this period, meaning either interim FB MC or interim ATC MC with ATC values derived from the FB domain will apply.

6. How is the reference day for bank holidays and other special days determined?

CWE TSOs use all the same agreed reference calendar, which fixes the reference day as explained in the Public Consultation document (http://www.casc.eu/media/CWE%20FB%20Publications/130502%20CWE%20FB%20MC%20Consultation%20Document.pdf). The basic rule for reference days and bank holidays is to use the Sunday before as a reference day, but there might be exceptions (e.g. New Year's Day).

7. Is a joint simulation period with NWE foreseen and for how long?

For now, the CWE Project envisages having 3 months of joint simulations but the exact period is not determined yet.

8. Currently NTCs are published at 10:00. Will there be a 'NTC version' of FB parameters at 10:00?

It is not planned to deliver an "NTC" version (meaning FB parameters before LT adjustment).

9. Would it be possible to publish the relevant data earlier than currently foreseen?

FB parameters cannot be published before the Long Term nominations are available, i.e. 9:30 the day of the auction. These LT nominations are required to complete the process to calculate FB parameters.

Once these LT nominations are made, time is needed to compute the FB parameters and to deal with contingencies linked to the different IT systems and distribution of the results. In any case, at least one hour is needed between the reception of the LT nominations by the TSOs and the publication of the relevant data.

VI. Benefits of Flow-Based and Fairness

1. ***What is the benefit of FB MC for Market Parties and why is it implemented?***

CWE FB is considered as an improvement compared to the current ATC based methodology.

- For the Market: FB increases the capacity offered to Market Participants on the CWE borders and by consequence generally increases total welfare for Market Participants.
- For Security of Supply: FB represents an enhancement concerning unusual market directions as under FB no assumptions need to be made for them. The FB method also triggers closer cooperation, thus increased coordination between TSOs in the CWE region.

2. ***Can a cost benefit analysis for FB MC be provided in order to justify lower liquidity in some markets (e.g., The Netherlands and Belgium)?***

Benefits regarding global welfare have already been demonstrated. Please see the published report of the first half year of the external parallel run attached to the approval document (http://www.casc.eu/media/CWE%20FB%20Publications/Approval%20Documents/Annex%20(16)_2%20Economic%20Assessment.pdf). Given FB MC is the target model set by the EU and the importance of its implementation is stressed in the ACER roadmaps, the CWE FB MC Project is legitimated and does not plan to perform further holistic cost-benefit analysis of FB MC.

If the concern raised suggests a decrease in liquidity in those markets due to lack of confidence of Market Parties in the FB methodology, please consider that Power Exchanges of course also bear this eventuality in mind but it is in itself challenging to quantitatively assess such a risk. From Project Partners' point of view, a loss in market liquidity is to be avoided through close cooperation with Market Parties. The CWE Project would like to stress that broad Market acceptance is seen as a high priority and a go-live requirement. Therefore we would not anticipate an unacceptable market impact due to the switch to FB MC in those markets.

3. ***Are there any effects on redispatch costs?***

Due to the fact that the FB model is more accurate and closer to the physics of the grid, it fosters an optimized consideration of all types of remedial actions, including redispatching measures. This process will be further explained during a specific session at the next Market Forum. Even though it is not possible to assess today the quantitative impact of FB on redispatching costs, it is expected that, thanks to FB, the latter will be triggered in better adequation to the actual physical needs of the grid.

Since FB MC allows more cross-border exchanges, and thus a more efficient global dispatch which results in an increased production and consumption of electricity at lower average costs (jointly representing the gain in welfare), the marginal costs of redispatch might increase as the remaining available units are the most expensive ones in the merit-order.

However, assuming the demand for redispatch remains unchanged, the final dispatch would still be more cost efficient than without FB MC. On the other hand, the total demand for redispatch is certainly lower as at least cross-border redispatch is less often needed since FB MC is naturally accompanied by a Flow-Based capacity calculation which reflects the actual physics of the flows in the grid in a far more detailed and precise way than under ATCs, and therewith provides with a better indication of the impact of the cross-border exchange on the monitored grid elements.

4. ***Are there any other effects like better renewable integration in the grid?***

FB contributes to further improving and optimizing the usage of the interconnection capacities and therefore the operation of all kinds of generating units. Regarding the integration of renewables, FB MC shows positive effects. Renewable generation can be better distributed, especially in hours of peak RES-generation and off-peak consumption. Re-calculations of ATC MC results with the FB methodology for instance simulate that negative price peaks in December 2012 and June 2013 could have been significantly mitigated under FB.

5. ***Does FB MC improve grid stability/system security?***

The question is understood as grid security related. With regard to System Security, Project Partners would like to remind that the CWE FB MC Project is committed to provide any possible additional capacity to the Market while keeping the currently level of System Security.
Yes, one of the benefits of FB from a TSO perspective is to have a capacity calculation model close to the physics of the grid. Compared to the current ATC approach, the FB process is a fully coordinated capacity calculation method which takes more details in into account (e.g. PTDFs) and discards in-exact assumptions (e.g. capacity split between borders). In some cases, FB capacity calculation can of course help minimizing unintentionally taken risks as it substantially improves the predictability of flows for the TSOs.
FB is thus expected to enhance grid stability due to a more precise calculation of the cross-border capacities.

6. ***What is the impact of the introduction of FB MC on neighboring regions, especially with regard to loop flows in CEE?***

From a market perspective the impact of FB MC is limited to the NWE region and the NWE MC project takes FB into account.
Please consider that loop flows are a result of intra-zonal exchanges and are therefore not affected by any cross-border allocation mechanism.

7. ***Results seem to indicate that large countries would experience slightly lower prices under FB at the cost of much higher prices in smaller CWE countries.***

Despite apparent fear, the parallel run results so far show that BE and NL consumers actually benefit from FB MC: the average price tends to decrease in these countries for the observed period. The Economic assessment which was attached to the approval package also shows that daily baseload prices for BE and NL tend to be reduced under FB (please see p. 26: http://www.casc.eu/media/CWE%20FB%20Publications/Approval%20Documents/Annex%20(16)_2%20Economic%20Assessment.pdf).
Of course this is not the case for all individual hours, days or even quarters. For instance during Q1 2013 there would have been a price premium of € 0.51 for NL, however in Q2 there would have been a € 4.31 price drop. For Q1 and Q2 the analysis concludes that there is a decrease in price for NL, thus leading to an increase of consumer surplus under FB. For BE both Q1 and Q2 led to a decrease in price under FB of respectively € 2.77 and € 5.33.
To the extent the extreme prices (very high or very low prices) for BE and NL relate to non-intuitive exchanges (cheap markets forced to import or expensive markets forced to export) a mitigation exists in the form of opting for an "intuitive" FB (and not for the "plain" version).

VII. Transparency and Data requirements

1. How are Market concerns regarding predictability of market outcome tackled by the Project?

CWE Project Partners understand market concerns notably regarding price forecasting. Prices are deeply impacted by macro-economic fundamentals which may anyway appear to be much more uncertain or impacting than the switch to FB.

The CWE Project is however willing to discuss with Market Parties in order to jointly define which input parameters seem absolutely necessary to Market Participants in order to develop models enabling reasonable price forecasts.

2. "FB is less transparent than ATC."

CWE TSOs would like to remind that FB is by nature much more transparent than the ATC method. Increased transparency can be evaluated by comparing publication levels of approved ATC methodologies with all publications related to the FB MC project. Today, ATC values are provided but the underlying method is not depicted. FB concepts, on the other hand, have been subject to documentation, studies, reports and public consultation. Besides, the current parallel run gives access to indicators and analyses linked to FB behavior. Finally, the FB method is subject to a thorough monitoring and approval process by CWE NRAs. This being said, CWE Parties acknowledge the increased complexity and variability of FB constraints and the resulting challenge for Market Parties. Considering the potential impact on Market Parties' activities in terms of price forecasting, CWE Parties are willing to openly discuss the adequate level of transparency and data publication.

3. Transparency on Common Grid Model and base case assumptions (loads, generation, topology).

Providing the hourly common grid model (CGM) to Market Parties entails risks of non-protecting critical infrastructure and market manipulation or abuse through enhanced knowledge of the grid constraints. CWE TSOs are obliged by EU and national law to protect their critical infrastructure.

Besides, there is a stake of legitimacy around sensitive pieces of information such as the base cases. D2CF files are the result of a complex process which requires much effort, expertise and experience.

As a risk of market abuse, potentially leading to security of supply and/or financial consequences for TSOs, has been indentified in case of publication of grid related information with this level of detail; and given the uncertainty about actual usage Market Parties would have, it is not foreseen to provide this information. CWE TSOs are currently working out illustrative explanations about this risk and will share them with the Market.

Otherwise, please consider that "Long term grid models" do not exist as such, as TSO perform their long term studies by using complex hypotheses and multiple scenarios.

CWE TSOs intend to well balance interests and needs of the MPs and obligations related to infrastructure-protection.

4. Will the internal CWE Merging Guidelines be published?

The base case preparation is described in the published approval package, but we do not to publish the detailed internal guidelines.

5. ***How many nodes are considered for determining the GSKs and how will GSKs be harmonized amongst CWE TSOs?***

It is indeed unclear because CWE TSOs do not plan to publish detailed GSKs. Harmonization on GSK, as for any part of the FB process, is an on-going exercise which is facilitated by FB implementation, but one must keep in mind that since CWE TSOs operate in different conditions (different grid, different generation patterns etc...), variants in the GSKs applied by each TSO are inevitable.

CWE TSOs see a priori no operational risk of publishing detailed generation shift keys. However some confidentiality issues have been raised by Market Parties themselves (as GSK files could contain sensitive information communicated to the TSOs), who recommend to identify "the adequate level of aggregation". This demand from MP side is also in line with usual confidentiality clauses in contracts with generating companies, not allowing TSOs to publish data of generating companies, possibly related to business secrets.

The CWE Project does not plan any publication of details at the moment (however the methodology is published) but is willing to have a continuous dialogue with Market Parties. The efficiency and adequacy of the GSK design remain a Regulators prerogative, in the monitoring framework.

6. ***Is it foreseen to test with Market Parties what the impact of FB would be on their generation/consumption decisions? Are GSKs sufficiently realistic to anticipate the real dispatch of power plants under FB?***

Comparing the GSKs used in the model to actual generation dispatch is an interesting idea but it would not really be a big step forward. For a more perfect GSK approach generating companies should be obliged to send and disclose their merit order, and this seems not to be realistic. Project Partners therefore cannot commit to this kind of analysis in the framework of this Project.

In this respect, CWE TSOs wish to remind that the main stake in FB modeling is having nearly realistic inputs like for GSKs, but the eventual accuracy of the model to predict the flows on the grid and its propensity to foster efficient market results. Therefore imperfection of GSK modeling is not in itself an issue from the Project perspective, as long as the model as a whole is accurate enough in flows forecasting.

7. ***Can TSOs use other GSKs during the AC load flow check?***

TSOs are not using other GSKs during the so-called verification phase. They assess with local tooling (running AC load flows for instance) whether the eventual FB domain respects their own risk policies. In order to do so, TSOs will study some relevant "vertices" of the FB domain and build a study case on this basis. During this process, TSOs will naturally try to implement more sophisticated modeling assumptions, which are in their local tooling and adapted to their own risk policies. As a result minor adjustments of single generation, slightly deviating from the general and overall GSK, cannot be excluded.

8. Can a sensitivity analysis on the 5% threshold be provided?

Basic concepts for CB selection are described in the consultation document (http://www.casc.eu/media/CWE%20FB%20Publications/130502%20CWE%20FB%20MC%20Consultation%20Document.pdf) and additional details related the 5% rule are provided in the approval package (http://www.casc.eu/media/CWE%20FB%20Publications/Approval%20Documents/130801%20CWE%20Flow%20Based%20MC%20solution%20Approval%20document.pdf). These indeed encompass the possibility for individual TSOs, therefore individual operators, to make ad hoc adjustments to the "5 % rule". This partial freedom given to operators is absolutely crucial within a capacity calculation exercise; otherwise they would have to cover themselves by taking a much more conservative approach. Any exception to the "5% rule" will be justified and reported to regulators.

The 5% threshold is already based on thorough security analyses performed by the TSOs, who would have to maintain the initial CBs for grid security reasons in any case. As the exercise has somehow already been made and justifies the 5% threshold from a TSO view, it is not planned to provide the Market with further sensitivity analyses.

Nonetheless, TSOs (and NRAs) constantly assess the relevance of this CB selection principle and may adjust this value in the future. So far, the active CBs of FB MC (meaning CBs having congested the market) have always respected the principles described in the consultation document, being in some cases very close to the threshold value. This tends to confirm the adequacy of the threshold applied.

9. Can a sensitivity analysis be performed in order to see the impact in case of "external constraints" removal?

"External constraints" (see consultation document 2.1.9.: http://www.casc.eu/media/CWE%20FB%20Publications/130502%20CWE%20FB%20MC%20Consultation%20Document.pdf) are designed and implemented by TSOs for security reasons. They result from thorough and sophisticated studies (stability studies, grid collapse etc...) and each TSO describes in detail the rationale behind its import/export limits in the approval package. As for the CB, TSOs cannot commit to time consuming sensitivity analyses while whatever the findings of these studies (but obvious outcomes are expected, i.e. an increase of welfare when the constraints are removed), the constraints will have to be maintained any way.

10. Would it be possible to harmonize the CBCO (Critical Branch – Cricital Outage) selection and make it less dependent on "TSO policies"?

It is not the intent of the CWE FB implementation to harmonize all individual TSO risk policies; however FB facilitates an increased harmonization in general between TSOs. TSOs indeed continuously put efforts into harmonizing their processes further. For instance by having a central computation process, following the same FRM definition principles, progressively coordinating their usage of cross-border remedial actions, or converging on the same CBCO selection principles thanks to the 5% rule. It should be highlighted that under FB methodology 80% of the processes are harmonized amongst TSOs. Harmonization is achieved on CB selection, RAs (Remedial Actions), PST (Phase-Shifting Transformer) coordination, and the FAV (Final Adjustment Value) and units selection for GSKs (Generation Shift Keys).

As regards the CBCO selection specifically, a quantitative criteria, which is accepted and respected by all CWE TSOs, is used. This criteria results from previous analyses of the FB experts to determine the relevant set of CBs coping with the particularities of a FB capacity calculation. But there are still local practices with specific processes fitting to each TSO's grid situations.

11. It is not acceptable that TSOs have a different assessment of FRMs. Could seasonal patterns or day/night patterns instead of a stable value allow some additional welfare?

TSO fundamentally apply the same principles to assess their FRMs (Flow Reliability Margins) and have no choice but to keep the freedom to punctually adjust some values, mainly to cope with data quality issues during the statistical process. Some corrupted data in the statistical sample may lead to completely unrealistic FRMs. It has actually been observed that a blunt automation of the FRM process sometimes resulted in values representing several times the capacity of the lines; obviously, in such cases, a critical ex-post assessment is necessary). Otherwise, if FRM processes were fully automated, TSOs would have to apply more conservative principles in order to cover data quality issues, which would result in significantly bigger FRMs to the detriment of the Market.

TSOs would also be ready to discuss the publication of individual FRMs per CB, as well as the other fields of the margin like FAV or Fmax, but wish to remind that this information cannot be subject to contestation from the Market as monitoring and adequacy assessment is strictly a Regulators prerogative.

CWE-Regulators already get from all days of the external parallel run the data to monitor these parameters; data reporting will be continued after the go-live.

Finally, the ideas related to FRM optimization (e.g.: seasonal patterns) are indeed interesting. CWE partners would like to stress that the proposed FRM method is already a big improvement compared to currently used TRMs used to calculate NTC values. Future improvements are always possible as the perfect method does not exist.

12. Would it be possible to publish the FAV (Final Adjustment Value) and report on TSO corrections?

As this data remains critical in terms of capacity calculation procedures, CWE TSOs would like to understand the practical usage which would be made of such parameters before considering publishing them to the Market. The monitoring of these data already falls into NRA's prerogatives. Therefore, it is only planned to report to NRAs.

13. The European transparency regulation obliges TSOs to provide all the relevant FB parameters sufficiently in advance of the allocation process.

Due to the fact that no single FB capacity calculation and allocation is in operation yet, there is rare practical experience on practical relevance of data and parameters related to FB. So far, the Project is compliant with the current legal obligations. However, the Project is open to discuss the relevance of parameters for the Market. However from point of view of the Project, as long as there is no clear guidance via legislation, additional publications have to be guided by the following aspects: needs of Market Participants, efforts compared to benefits, protection of critical infrastructure, confidentiality / criticality of the information, priority. Priority to the crucial parameters should be given at the beginning, after a learning period after Go-live, and operational experience further improvements will be made.

14. Why is publication of Shadow prices not foreseen anymore?

In compliance with the transparency regulation EU-543-2013 (Art. 11.1 b) "all the relevant FB parameters in case of FB capacity allocation" have to be published. Due to the fact that no single FB capacity calculation and allocation is in operation yet, there is rare practical experience on practical public-relevance of data and parameters related to FB. The Project is open to discuss the relevance of publishing Shadow prices for the Market on the occasion of next FB User Groups and Forums.

15. Would it be possible to publish PTDFs and non-anonymous CBs a year ahead like for NTCs today?

FB is computed on day-ahead, it is not feasible to publish information ahead of DA timeframe. FB takes into account parameters which change on a daily basis and which are very difficult to predict. The TSOs did perform a test already some time ago on calculating a longer period of FB parameters which showed that this resulted in unrealistic values, thus we concluded it would not bring any value added for Market Participants to publish this kind of data.

16. Could typical PTDFs be provided for instance for specific grid situations like windy or sunny days?

The CWE Project Partners welcome interesting suggestions which could better support Market Parties and will investigate the interest and feasibility of providing such patterns.

17. Would it be possible to describe in detail daily common TSO processes and report on recurrent issues?

CWE TSOs see a priori no operational risk of publishing detailed procedures. However, these procedures integrate complex, sophisticated, built over years' experience of TSOs in relation with their risk management policies. Thus, providing in an understandable and concise way all the knowledge related to congestion management is hardly feasible. Furthermore it is not very clear for CWE TSOs which usage could be made of such information so further explanation would be required from Market Parties. As part of their prerogatives and for monitoring purposes, NRAs do have access to this information and ensure the processes are compliant with other stakeholders' interests. For these reasons, it is not planned to extend reporting or publication of detailed procedures. The CWE Project will though try to better explain the rough processes in a pedagogical manner on the occasion of the next Market Forum in order to improve Market understanding and not contribute to feed misunderstandings anymore.

18. Can aggregated curves be published?

Power Exchanges are investigating the technical feasibility of publishing the aggregated curves resulting from the FB allocation process during the last part of the parallel run. PXs commit to make reasonable efforts to publish the information as soon as practically feasible.