Meeting Minutes: PCR Technical Expert Meeting
Price Coupling of Regions
June 30th 2016 – Conference Call – 13:00-16:00 CET

Leader: Jose Javier Gonzalez, PCR Chair

Moderator: Radka Manurova

Company	Name
Verbund	Baltutis Mindaugas
Delta	Bosschaart André
Vattenfall	Bredenstein Axel
Vattenfall	Griffiths Jonathan
Fingrid	Hirvonen Ritva
EDF Trading	Kllokoqi Arben
ENTSO-E	Marcenac Ludivine
Statkraft	Messa Silvia
EDF	Phulpin Yannick
Vattenfall	Plomp David
EDF Trading	Sallée Patrick
Vattenfall	Timmer Roderick
Engie	Lefevre Eric

PCR Chair, Jose Javier Gonzalez welcomed meeting participants.

PCR Algorithm Working Group Members presented the material sent to the Participants in advance (attached below). It consists of 2 parts:

I. Presentation: *Transparency – response to Eurelectric's proposal*

II. Presentation: *PCR based coupling in MRC*

These Minutes record the Q&A:

III. Presentation: *Transparency – response to Eurelectric's proposal*

Slide 4 Indicators: Block statistics.

Nord Pool: Aggregated block information can be published by PCR, Information on individual areas block orders is up to the individual PCR Members (NRAs in some jurisdictions).
Currently the practice in the Nord Pool area is that individual block orders are published on the UK market only, in other market areas they are not published.

Statkraft (Silvia Messa): Are the blocks you are referring to the blocks from Belgium and Netherlands? Statkraft was informed that after the merge of EPEX and APX it will be possible to have these blocks published in Q3. Is it going to happen?

Nord Pool (Maria Karpinnen): it is up to each power exchange to decide what to do in this case.

EPEX (François Lucas): The idea was to homogenize the type of information that is shared on the market, and the slide presents only the PCR level. On current French and German market the information you are referring to is already available. Concerning the markets of APX information cannot be provided now but we could take your question separately from this presentation and EPEX will come back to you with this information.

Statkraft (Silvia Messa): Not publishing the blocks is not transparent and clear share of information and then we will wait for the block to be publish or for further information from EPEX in a separate communication.
EPEX will provide an answer to Statkraft on that matter as soon as possible.

Engie/Eurelectric (Eric Lefevre): PCR indicates that the reason for not publishing the blocks is the market power but what is important is that in the current situation only the owner of the Bids know which of his blocks are PRBs. So already you are contributing to increasing of market power of that party.

Nord Pool: In case of Nord Pool, publishing of individual block orders in Nordic and Baltic markets hasn't been yet requested. Publication of area curves per bidding area has been discussed and the conclusion was that in some areas the information about the curves could lead to get insight on the bidding strategy of other participants - due to the fact that there are few market participants. This will be discussed at NP in the customer advisory board.

Engie/Eurelectric (Eric Lefevre): In terms of PRBs the rest of the market is completely blind and this is a big issue.

PCR Chair: The conclusion is that on the level of PCR we can publish the aggregate information. And then it is up to each NEMO per bidding area (in some areas it is an NRA decision) to publish more information. It is difficult to agree on the global solution since the publication of the data varies depending on different market sizes and situations, it is difficult to achieve a uniform solution all over Europe for the transparency indicators when you speak about individual bidding area information to be published.

Engie/Eurelectric (Eric Lefevre): In terms of global welfare: the fact that there are PRBs and people do not understand how the price formation looks like has an impact on the overall welfare.

PCR Chair: Regarding the submitted blocks we all agree in PCR that we can publish, as we have been doing, the number of submitted blocks globally and each area can publish more detail. Regarding the PRBs we need to take a similar decision. Globally we can publish the number of PRBs and then it is left to each individual area to publish more detail about the PRBs in their own area.

Engie/Eurelectric (Eric Lefevre): it is critical to have information on PRBs per area. And especially the smaller the area the more important it is.

Statkraft fully agrees with the opinion of Engie.

PCR Chair: PCR suggests to discuss the PRB detailed information at the area level since taking a global decision on this matter is challenging in the short term due to very different regulations in different regions.

Statkraft: each small area influences also the other areas and not having the PRB information for some of the market areas keep market participants blind towards a certain part of the market. If we are running a pan-European market the rule should be the same for all the regions. Statkraft requests a uniform level of transparency

PCR Chair:: As indicated PCR can take the decision to publish aggregated information, the level of transparency per bidding area unless it is established at an European level Regulation has to be left to each individual area decision (NEMO or NRA depending on the jurisdiction)

Slide 5: Indicators: Block Statistics on local search.
No questions raised

Slide 6: Indicators: Timing
No questions raised

Slide 7: Indicators: Quality
No questions raised

Slide 8: Indicators: Quality

EDF/Eurelectric (Yannick Phulpin): Optimality gap can be a good indicator as far as it is quite small because then we can see that the solution that has been reached is very close to what will maximize social welfare. However even after the release of the new version of the optimality gap even if we have days with more significant optimality gap there is no certainty whether it is going to be sufficient to know that a good result has been obtained.
Would PCR consider to continue to disclose the results after 2 hours? Even if the quality indicator is computed at least for some time until there is confidence in this indicator, it still would be useful to publish the 2 hour analysis.

PCR Chair: PCR needs to discuss this internally. Technically it would be possible.

Engie/Eurelectric (Eric Lefevre): Beyond the optimality gap, ENGIE is interested to know how many/what is the different number of PRBs between the short run and long run and also whether it will be possible to inform about the variance in terms of prices. Maybe PCR could aggregate the delta in terms of prices. It is not clear how information from the optimality gap can be translated into price formation.
The problem seem to be also the robustness of the solution we find.

PCR Chair: This is a very difficult question. The optimality gap relates to the objective function which is to optimize the welfare, the other are transparency indicators which could be misleading since they are not the objective of the optimization function. The objective function is not to minimize the number of PRBs. Hence between a solution with more welfare and more PRBs and a solution with less welfare and less PRBs, the algorithm will return the first one. The number of PRBs depends on the bidding behavior of the participants and on the way the bids are created.
There is some relation between the number of PRBs and the optimality of the solution, but it is not one to one. It is difficult to establish a relation. We will always have a caveat that the number of PRBs depend not only on the optimality of the solution but on the bid characteristics.

Engie/Eurelectric (Eric Lefevre): Do the zonal positions change a lot when the welfare is increased? Do the prices vary? What is the consequence for each zone? Are the zones going to change a lot during the optimization process? Engie would like to know what is the magnitude of the changes. Information about the gap will be available in euros but market participants do not know whether it is very significant when looking at the areas' level.
Engie would like to know what is the consequence in terms of net position of the different bidding areas when the gap is reached.

PCR Chair: PCR does not have global answer to this question. PCR will try to evaluate the question and in which manner to provide meaningful information.

Engie committed to send to PCR some ideas about the criteria.

Delta (André Bosschaart): Delta would like to see for the 2h run how much time the Algorithm spends in each sub-steps (reading, branch and bound, PUN problem, etc..) and see the improvements in terms of number of PRBs after 10 min, 20 min, 30 min etc. within the 2 hours. Would it be possible to look into it? How many solutions have you found in 10 min and how many solutions you have found within 2 hours that are better than the previous ones? What are the improvements?

PCR Chair: PCR will discuss internally how to present the evolution of the quality indicators of the different solutions obtained.

Slide 9: Indicators: Heuristics

EDF/Eurelectric (Yannick Phulpin): If you are making the offline analysis of the Delta P rule, it's good to review from time to time what will be the right level for it. EDF would like that the datasets to complete this study are as complete as possible and representative of the types of situations that can be encountered. The assessment of the right level for this rule shall be conducted periodically.

PCR Chair: PCR agrees with the proposal and it is what is proposed to be done in the slides. PCR could conduct a periodic evaluation of this kind of rule running for 1, 3 or 5 euro as an example and the sensitivity of the results to the Delta P value.

Delta (André Bosschaart): You mentioned also that you would even consider not to run the heuristics, is that correct? Delta would like to keep heuristics.

PCR Chair: PCR has not indicated this, the Delta P was introduced for valid reasons and there are no indications that it should be removed

Slide 10 and 11: Indicators: Heuristics (2)

No questions raised

II. Presentation: *PCR based coupling in MRC*

EDF/Eurelectric (Yannick Phulpin): Where those complex orders are applied?

nSide: For now, they are used only in Spain and Portugal. The new estimation of the gap is supposed to mitigate this issue [the overestimation of the gap]. This is the goal of the new approach.

Slide 44:

EDF/Erelectric (Yannick Phulpin): In this figure how many MICs did you deactivate?

nSide: We will check and come back to you. Around 80 were in the original set, but probably around 50 were filtered.

Slide 52:
EDF/Erelectric (Yannick Phulpin): In slide 52 the orders associated with supply and demand, how the values were set?

nSide: The quantity for these orders is the maximum quantity they can have. It corresponds to the capacity of the line because it represents the import and export in the two regions. It is the maximum quantity that can be exchanged between these two regions. The price is set to the average price between France and Spain in a Euphemia valid solution that we found prior to this gap estimation.

Q&A at the end of the presentation:
Delta (André Bosschaart) question to the last slide: Is there any way to put into production an algorithm based on the geographical decomposition since it seems like a better approach?

nSide: The approach that is proposed here does not provide a feasible solution. The solutions that we get from the decomposition provide just a better estimation of the upper bound and a better estimation of the gap. But we could maybe obtain feasible solutions building on the solutions we get from the decomposition. It could be an option but it has to be evaluated.

Delta (André Bosschaart): question about the last point on slide 54 “Our developments will focus on decreasing this residual gap”. Is it related to calculating better the upper bound or improving the optimization of the solution?

nSide: [1:50:00] We first look into reducing/refining the value of the gap that we can obtain /publish. And then we can think about improving the solutions.

PCR Chair: One exercise is to improve the upper bound, and the other exercise is to improve the solution. This slide is focusing on decreasing the upper bound as much as possible.

nSide: We are also currently working to improve the solution using other approaches.

Delta (André Bosschaart): Question regarding slide 53: the optimality gap is 17 k€. Could you also give the 99th percentile?

nSide: The vertical line in the middle of the box is the median, on the left of the box it’s 25^{th} percentile, on the right of the box it’s the 75^{th} percentile, and the line until 60k is at most 1.5 the interquartile range.

Participant: Is it possible to provide it? There is a question about the exceptions, so what are the optimality gaps in those moments? It is important to focus on the tails of the distribution of the optimality gap. These could be very well the moments that the algorithm has no optimal solutions.

nSide: This has to be discussed in PCR.

PCR Chair: OMIE each day finds the optimum solution in 20 seconds with only the Iberian (Spain and Portugal) bids. When the problem is decomposed the optimum solution for the OMIE area is always found. PCR Chair refers to slide 47. PCR without the Iberian bids will remain challenging but the solution will always have a gap unless the global optimum is encounter.

EDF Trading (Arben Kllokoqi): EDF underlines the non-efficiency of the algorithm and there is a lot of welfare on a daily basis lost, and a lot of companies suffer. Market participants are also wrong about the price signals given because the way it is being calculated is wrong. Is PCR considering something that could bring quick wins? The complexity comes from smart orders but also the complex orders, was there a consideration to remove this orders? Would it bring improvement to the algorithm?

PCR Chair: PCR is performing this improved Gap calculation to publish the quality of the solution in an objective way. What we need to do is to calculate properly the best estimation of the Gap between the Upper Bound of the welfare and the welfare of the solution published.
As indicated the remaining Gap comes from various sources, one of them, not mentioned in the question, being the number of block bids that is increasing. The number of smart orders has remain almost fixed since the beginning of the Market Coupling and removing them (and substituting them for a proportionally equivalent number of block bids) could deteriorate the true Gap instead of improving it.

Nord Pool (Hilde Rosenblad): All the paradoxically rejected block orders are rejected not due to non-optimality. We observe that paradoxically rejected orders are correctly rejected. Otherwise the price wouldn't also have the block conditions. For the prices – it cannot be said that they are incorrect.

EDF Trading (Arben Kllokoqi): I understand that there are PRBs that are legitimately rejected, but there are many PRBs rejected, which shouldn't be rejected at all. And on this instances we have a marginal price that is actually calculated wrong, not only for that day but also for the next day.
The reason is because of the dynamic dispatch, the start-up cost for tomorrow are calculated based on the price of today –which is wrong. Hence the price for the next day is indirectly incorrect. This is the problem on the market on a daily basis. From what I understood it is the block bids that cause the complexity. Is that right?

PCR Chair: I would like to comment on your previous statement that there are many PRBs wrongly rejected which is not a fact, because the true gap is small. Otherwise the gap would be bigger. If we were in a situation where if we run the algorithm for 4 hours the solution would be completely different in terms of much smaller true gap, then you might be right, but this is not the case. When we run the algorithm for 2 hours the improvement is marginal. Also for letting the algorithm running for 20 min – the improvements were minimal.

Participant: If we run Euphemia for another 2 hours it would be beneficial to draw the to draw the distribution of the optimality gap and compare this one with the distribution of the optimality gap when running EUPHEMIA in normal time window.

PCR Chair: If the objective function was, instead of maximizing the welfare to minimize the number of the paradoxically rejected bids then the solution will be different but this is not the Market Model in CACM.

Paradoxically rejected blocks that simply can go into the solution, without any other bid getting out and improving the welfare is what the reinsertion module tries to find, with the latest releases even some combinations of blocks are tested.

The Chairman concluded the meeting by saying that in the past they focused a lot on improving the quality of the solution but not so much on the indicators for measuring the quality of the solution. It is important to keep on focusing on the quality of the solution as well as on finding the right measures to present the quality of the solution.

This minutes will be sent to the Market Stakeholder Committee once reviewed by PCR, nSide and meeting Participants, where further actions will be discussed.