Feedback on BD 2015-09-22

CWE Flow based Market Coupling

CONTENTS

TABLE OF FIGURES

1. Context

In May 2015 the Flow-Based Market Coupling was successfully launched. This marked a crucial milestone for European market integration and paves the way towards the completion of the European Internal Energy Market. CWE market coupling is successfully running using the CWE Flow-Based methodology since then. By optimizing the overall CWE market welfare, while ensuring the physical grid limits, the usage of the grid infrastructure is enhanced. On September 22nd, 2015 a number of challenges were however faced within the Belgium grid. These challenges put pressure on the Belgian electricity prices. Market parties and Regulators raised questions upon the market results of 22nd September 2015 and requested feedback by the CWE TSOs. Subsequently, TSO experts started their analysis which resulted in this paper. By means of market oriented facts and grid operational facts, more insight is given on the situation.

In the course of 2014 Belgium was confronted with forced outages of several nuclear production facilities; the loss of the production facilities resulted in a generation shortage, which led to adequacy issues. The Belgium dependence on imports from neighboring countries caused high transit / loop flows in the control areas of the neighboring TSOs, which resulted in grid challenges within the CWE region. In 2015 several nuclear production facilities came back into operation, however some nuclear production facilities were again confronted with forced outages.

The issue on September 22nd, 2015 is related to the adequacy issues as faced in the winter of 2014 / 2015 and linked to avoiding adequacy issues for winter 2015 / 2016. From August 2015 on, maintenance activities were planned in the Belgian grid in order to prepare the installation of a second Phase Shifter Transformer (PST) in substation Zandvliet. This 380 kV substation Zandvliet is located close to the Dutch border and interconnects the Belgian grid with the Dutch grid. Other maintenance works were also planned in the Belgian grid. As can be found on the entso-e transparency platform, these additional maintenance works involved the following assets: 52 DOEL – MERCATOR (22T-BE-IN-LI015X) / L_ACHENE – LONNY (10T-BE-FR-000015) / 10 ACHENE – GRAMME (22T-BE-IN-LI0130). During the capacity calculation process, operational experts followed the normal procedures for calculation the capacity. Due to the simultaneous different locations of the limiting branches, it was not possible to find an outcome in the PST coordination phase to releave the constraints in a part of the CWE area without aggravating other parts. The calculated capacity led to market results close to the technical feasible maximum import for the Belgian hub. However, high prices were monitored.

The challenges faced on September 22nd, 2015, although extraordinary, are not unique. During winter 2014 / 2015 for example, extraordinary procedures in the ATC methodology had to be developed that safeguarded the security and reliability of the CWE region, especially for the Belgian control area. Coordination efforts have been put forward to manage power flows and adequacy to guarantee grid security since then. The situation of September 22nd was experienced for the first time using the Flow Based methodology. Despite a parallel run of two years, it was necessary to gain real life experience of these particular circomstantes of grid maintenance, large generation outages (both planned and unplanned) that led to the particular adequacy issue in Belgium. An event such like the event of September 22nd will be used by CWE TSOs to enhance the CWE FB methodology, since continues improvement is a main concern of CWE TSO's. So, although efforts are being made, issues such as on September 22nd, 2015 cannot be excluded towards the future in case we face similar circumstances.

2. Market results

2.1 Overview of events

The PST of Zandvliet was put out of service on the 22nd of August for maintenance works in order to prepare the installation of a second transformer before the upcoming winter period.

On the 21st of September, it was communicated by Engie that the nuclear unit in Tihange 1 (N&S) with a total installed capacity of 1000MW would remain unavaible due to maintenance works, which caused more stress on the Belgian hub on the level of import.

For the 22nd of September, the forecasted solar infeed decreased, which reduced the available margins even further.

2.2 Impact on market results – CWE level

During the first auction, a market price of 500 EUR/MWh for the Belgian hub was reached for hour 15. This triggered as foreseen the procedure for a second auction: the order books are reopened by which the market parties have the possibility to update their bids for all hours.

At 13h38, the second auction ended successfully and no prices above 500 EUR/MWh were seen (see **Error! Reference source not found.**Figure 1).

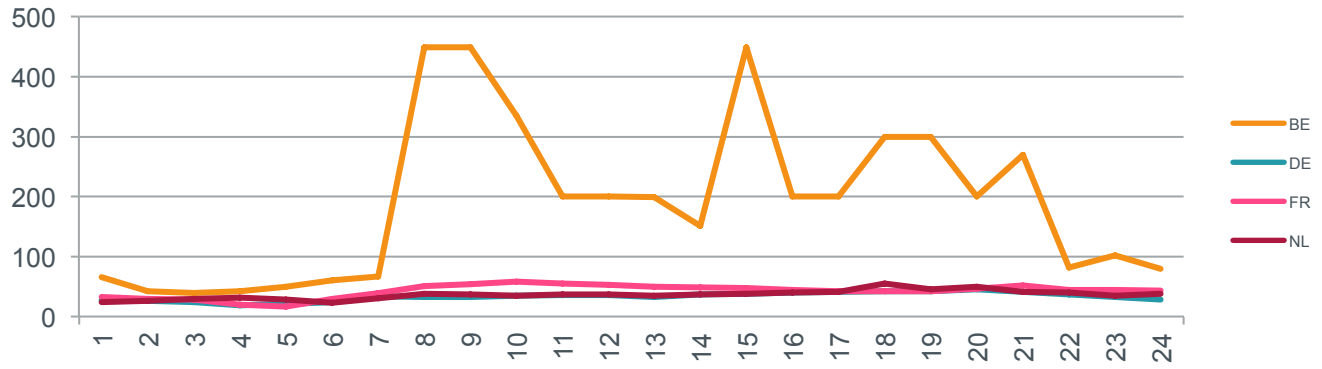

Figure 1 - BD 2015-09-22 - FBI - Prices second auction [EUR/MWh]

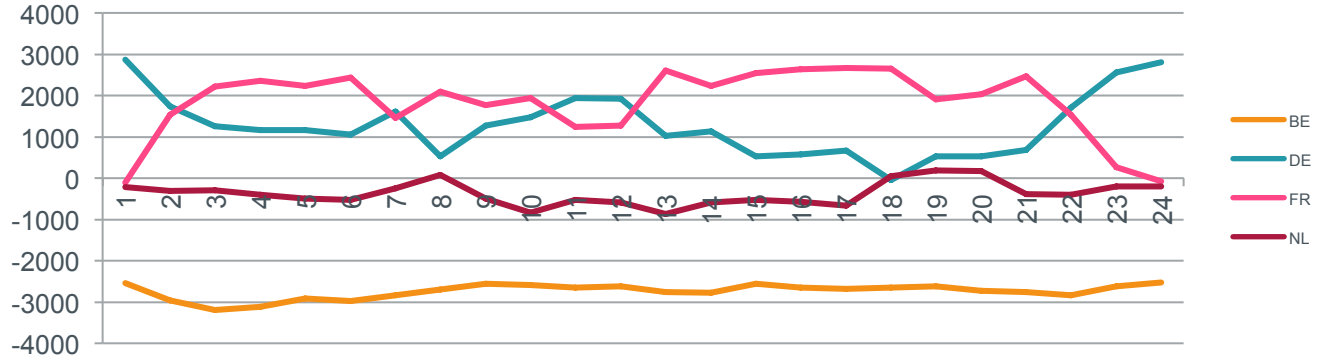

Figure 2 - BD 2015-09-22 - FBI - Net Positions second auction (incl LTnom) [MW]

2.3 Impact on market results – Belpex zoom

By observing the aggregated curves published after market coupling on the Belpex website, due to the steep offer curve, the impact on small deviation of import level for the Belgian hub can have a big impact on the day ahead prices. With a difference between 448.70 EUR/MWh and 200 EUR/MWh, there is only a difference of import of less than 50 MW (see Figure 33 & Figure 44)

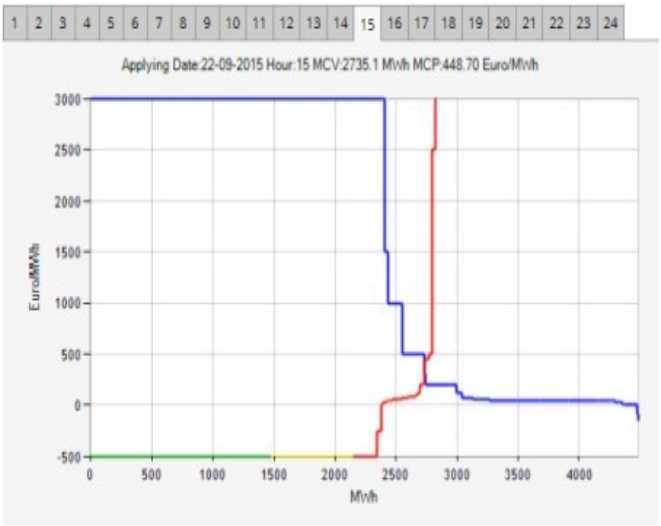

Figure 3 - BD 2015-09-22 - Belpex curves hour 15

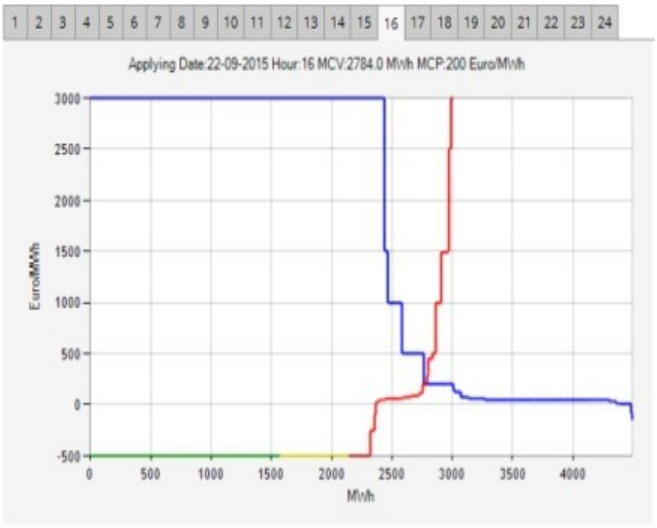

Figure 4 - BD 2015-09-22 - Belpex curves hour 16

2.4 Impact of the intuitiveness patch

The prices (see Figure 5) and net positions (see Figure 6) obtained with the intuitiveness patch deactived can be seen hereunder. More detailed analysis will be taken up in a global Flow Based Intuitive / Plain study.

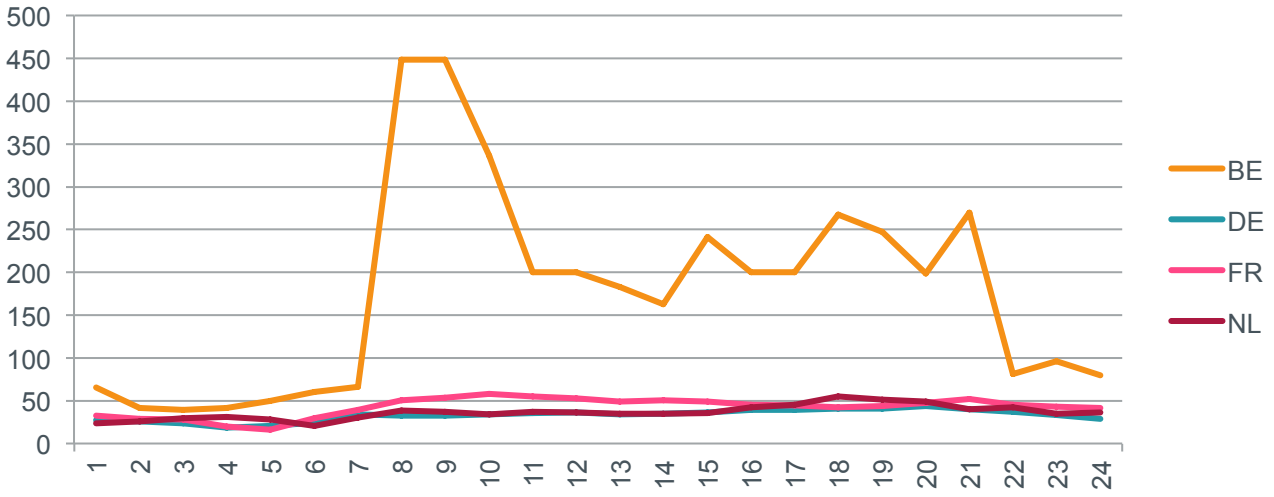

Figure 5 - BD 2015-09-22 - FB - Prices second auction [EUR/MWh]

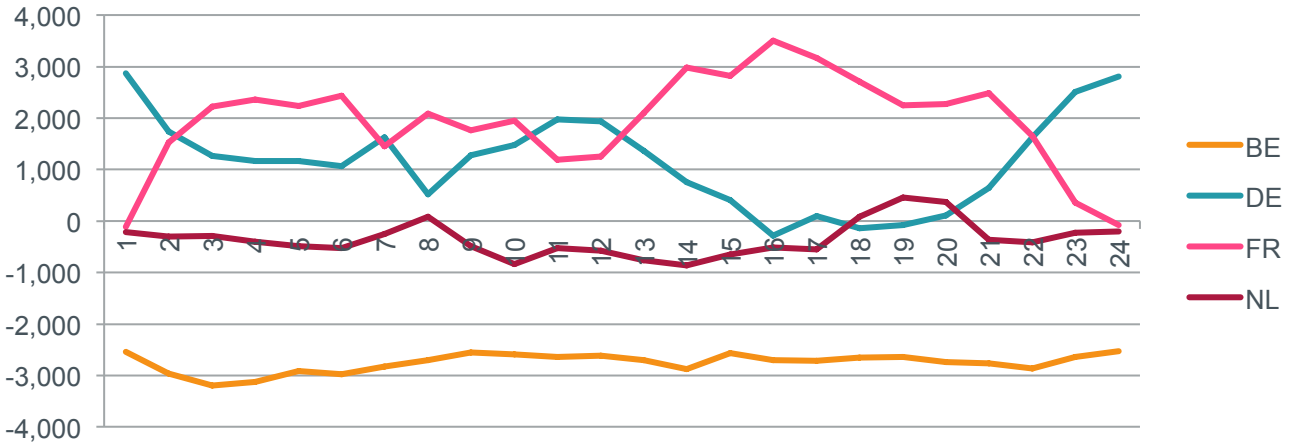

Figure 6 - BD 2015-09-22 - FB - Net Positions second auction (incl LTnom) [MW]

3. Flow based capacity calculation & allocation

3.1 Feasible technical maximum import of Belgian hub

The import of the Belgian hub after DA MC was already very close to the technical maximum feasible import of the Belgian hub. Figure 77 shows the combination of CWE net positions (LTnom included) to achieve this technical maximul feasible import.

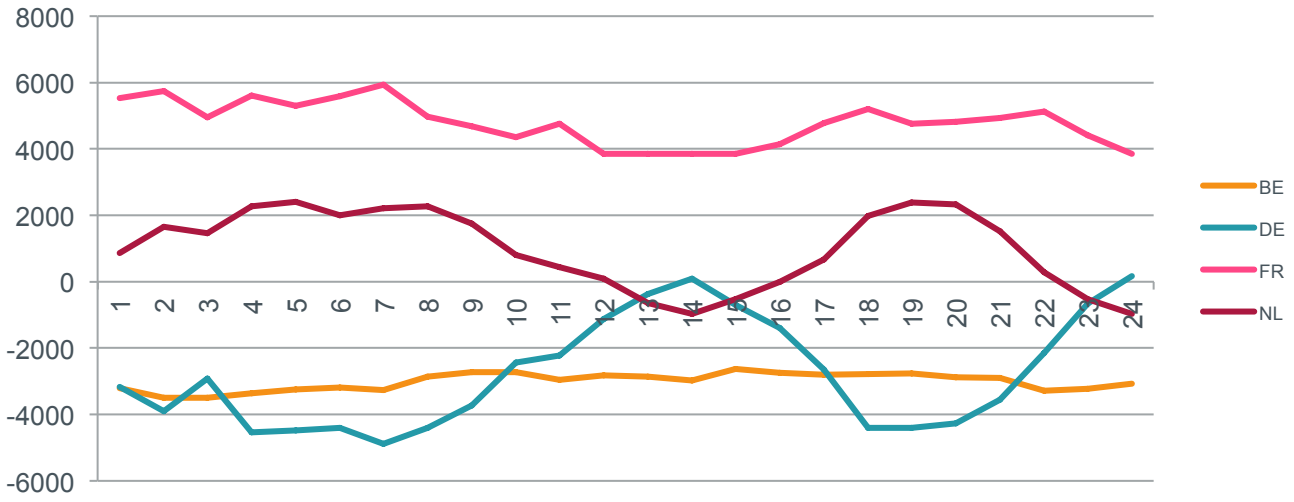

Figure 7 - BD 2015-09-22 – Required CWE NP's to achieve maximum technical import of Belgian Hub [MW]

In order to obtain this technical feasible maximum import, a big shift from the other CWE hubs was required. A way to visualize the needed shift, the difference between the real market clearing point and the net positions linked with the maximum Belgian technical feasible import is computed (see Figure 88).This shift was especially against the market trend for the German hub which exported in reality, but need to export less and even import to achieve this point.

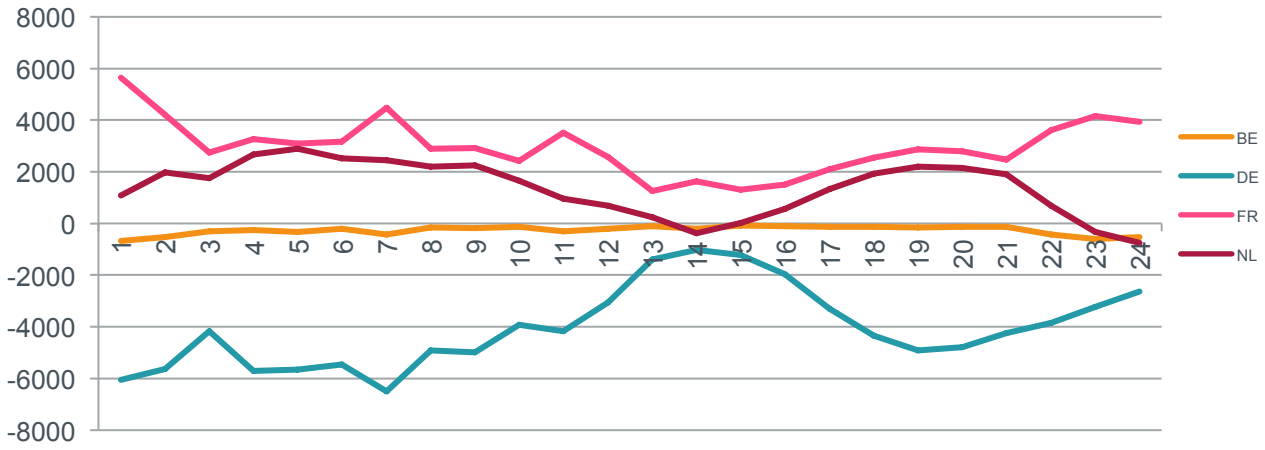

Figure 8 - BD 2015-09-22 - Needed shift from each CWE Hub from DA Clearing to support max import Belgian hub [MW]

3.2 Actions during qualification

All the operational procedures were correctly executed by the different TSOs and Coordination Centers. Due to the simultaneous different locations of the limiting branches, it was not possible to find an outcome in the PST coordination phase to releave the constraints in a part of the CWE area without aggravating other parts.

For the Belgian South border, the combination of maintenance works in the transmission grid and also local maintenance works led to a limitation of the operational acceptable actions which the operators can take.

3.3 Actions taken in real-time

The following actions were taken by the Belgian TSO in order to create more margin to the market in the days after the 22nd.

Belgian South border:

- Cancellation of maintenance works on the interconnector Achène (BE) – Lonny (FR)

Belgian North border:

- Preventively change the grid topology in the Doel (BE) and Mercator (BE) substations. These stepswere only possible due to the unavailability of a big number of nuclear units.