**Explanatory Note (Simulation period: 2022.11.14-2023-09-03)**

For this period of simulation, the average difference between system price calculated based on EPR results and published system price is 0.55 Euro, with a maximum difference of 74.4 Euro. In this note, we explain the reasons for such differences, and take a closer look at 6 specific cases where the difference between the system prices are highest.

**Why calculated system price based on EPR results is different from (production/published) system price?**

**Change in Import/Export**

As a result of introducing a more efficient capacity calculation (flow-based) in the Nordic region, the flows (in EPR) on the external borders (the ones between the Nordic region and rest of SDAC) can be different from production (Nordic ATC based) results.

**Timing of capacity publication/ Impact of late outages**

There can be difference in production ATCs and RAM of allocation constraint due to the different deadlines for the NTC and FB process for the operators when a change is made just before capacities are applied to the algorithm. This is because of different calculation times in production today and flowbased in EPR.

For example:

FI\_EL: 11/12 difference on 348 MWh

Outage ended in 10.12 at 9.19, sooner than anticipated. At that time, the flowbased domain cannot be recalculated. An IVA cannot be applied either.

SE4\_NB: 8/1 difference on 700 MWh

In this case, flow-based and NTC had different capacities as there were a late change on NordBalt in the NTC process, which was not captured in the flow-based process.

**Closer look at the impact of change in flow of external borders on system price:**

When the flow on the external borders between the Nordic region and rest of SDAC change as a result of Nordic flow-based market coupling (in EPR), the calculated system price changes from the published value (calculated based on ATC market coupling in the Nordic). Depending on the amount of flow and shape of the curves (steepness) to which the flow is added, the impact on the system price can be different.

In the simulation period, on average the EPR based system price is 0.55 Euro higher than the published (ATC-based) system price.

The biggest change is related to November 29, 2022 when the system price based on EPR results is 24.68 Euros less than the published system price. By taking a closer look at the hourly prices, one can see that in hour 18-19 the price difference is at its maximum (74.4) when in the EPR results the flow on LT-SE4 is in the opposite direction of the published (ATC-based) flow. While the ATC-based flow of 440.5 MW on this border is from SE4 to LT, in the EPR results the flow is from LT to SE4 (559.8 MW), meaning that a total change of 1000.3 on this border which can explain the impact on the system price.

In fact, the change in the flows on the external borders is the main cause of the change in the system price, which becomes more significant when the direction of flow in flow-based (EPR) is different from than of ATC-based.