CRM model

1. Introduction

The purpose of this document is to explain the functioning of the CRM (Capacity Remuneration Mechanism) simulation model, used in the Watts.happening website. Based on the assumptions set out below, the input provided by the user and the data of the CRM Auction Results in Belgium, the model calculates the potential remuneration for the future delivery period of an asset's participation in the CRM. These results are displayed in the "Watts.happening" simulator.

Note that the model is limited to one selected asset and does not consider the interaction with other assets or flexibility products.

2. User input

The user is required to provide information about:

- The Asset Type which will allow the model to define the technology behind the asset and thus apply the corresponding Derating Factor.
- The maximum power of its asset as well as operating limits, such as the non-flexible part and the running set-point. This information allows the model to define the Upward Capacity of the asset.
- The Activation duration represent how long can the asset deviate from normal operation to provide flexibility.
- The Asset Status which can be either Existing or Additional. The status Existing means that the asset is installed and connected to the Belgian grid, whereas if the capacity status is Additional, it means that the asset does not yet exist or is not connected to the Belgian grid.

3. Data sources

All data used in the model are publicly available. To build the model the following data have been used:

- CRM Auction Results: [CRM Auction Results (elia.be)]
  - *Weighted average price* (€/MW/year) – 2025 - 2026 / 2026 – 2027
  - *Intermediate Price Cap* (€/MW/year)
- CRM – Derating factors: [Capacity Remuneration Mechanism (elia.be)]
  - *Derating Factors* (%) - Per Category – 2021 / 2022 / 2023 /2024

4. Model

The model works in three steps:

- The **first step** is to define the size of the Capacity Bid for the Delivery Period.
  - The Capacity Bid is calculated by multiplying the Upward Capacity with the Derating Factor.
  - The Upward Capacity equals the one defined by the model based on asset information.
  - The Derating Factor depends on the Asset Type and the Activation duration.
    - All the Derating Factors are found in a table whose rows correspond to the Asset Type and whose columns correspond to the activation period. The model defines Derating Factor according to these two criteria.

- Furthermore, the Derating Factor changes every year, which means that it is necessary to select the one corresponding to the year of the auction according to the Delivery Period (see Assumption).
- The **second step** is to define the Auction Price for the Delivery Period.
    - The Auction Price is the *Weighted average price* of the corresponding auction year which depends on the Delivery Period (see assumption).
    - It also depends on the Assets Status as there is a different *Weighted average price* for Additional or Existing capacity.
- The **third step** consists in calculating the Capacity Remuneration of the asset for each Delivery Period.
    - The Capacity Remuneration is equal to the multiplication of the Capacity Bid calculated in the first step with the Auction Price defined in the second step.

5. Output

The model generates one output:

- The Capacity Remuneration as described hereabove.
    - It is expressed in €/year per Delivery Period.
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6. Assumptions

Some assumptions are made to keep the model from being too cumbersome while still giving relevant results. The model assumes:

- The asset is located in Belgium
- The Derating Factor applied by the model to the Upward Capacity corresponds to the Derating Factor in force at the time of the Auction. The model considers the most recent Auction for the Delivery Period in question.
- The Delivery Period considered in the simulation is the next Y-1 auction, i.e. 2026-2027
- In case the Derating Factors of the considered auction isn't yet known, the model considers no significant change relative to the last known values and therefore uses the values of the last known year. Of course, when the latest values are known, the model will be updated to reflect these.
- As with the Derating Factor, the Auction Price is defined by the result of the most recent auction for the Delivery Period in question
- For the Auction Prices of future years whose values are not yet known, the model considers no significant change in future years. Therefore:
    - For Existing capacity, the *weighted average bid price* for future auction is considered as the *Intermediate Price Cap*. If the *Intermediate Price Cap* should change in the following months/years for certain Delivery Periods, the *Weighted average price* of future auction results will be changed accordingly in the simulation tool.
    - For Additional capacity, the *weighted average bid price* for future auction is estimated based on previous Auction Results, as no major evolution is expected. For the moment, it is set at 37.000 €/MW/year.
- The model provide the Capacity Remuneration for the next Y-1 auction period

Some of these assumptions will change as the model evolves.