

Payback Obligation Use Case 2

Additional aggregated project



DISCLAIMER



This document provides different fictive examples, so-called use cases, related to the Capacity Remuneration Mechanism being developed in Belgium. It has, as sole purpose, to explain the Functioning Rules and its annexes by means of examples.

Given that the CRM process consists of several steps, and for each of these steps, several layers of information and details are relevant, it is to be understood that this document focuses on most pertinent Payback Obligation aspects.

By no means, the use cases replace the rules in the relevant Laws, Royal Decrees, and regulatory approved documents.

The choices in the examples are only made for illustrative purposes and do not imply any judgement. All the figures and numbers used for these use cases are purely fictive. These numbers nor the use cases presented should be interpreted as representing a concrete case or a concrete situation of the Belgian capacity market or an implied proposal for any CRM parameter.

The use cases developed in this document are based on the chapter *Payback Obligation* of the Functioning Rules as known at the moment of writing and shared with market parties on 28/08/2020. It also obviously follows the context set by the Electricity Law.

Use case structure



1. Capacity Provider and CMUs



2. Payback Obligation parameters

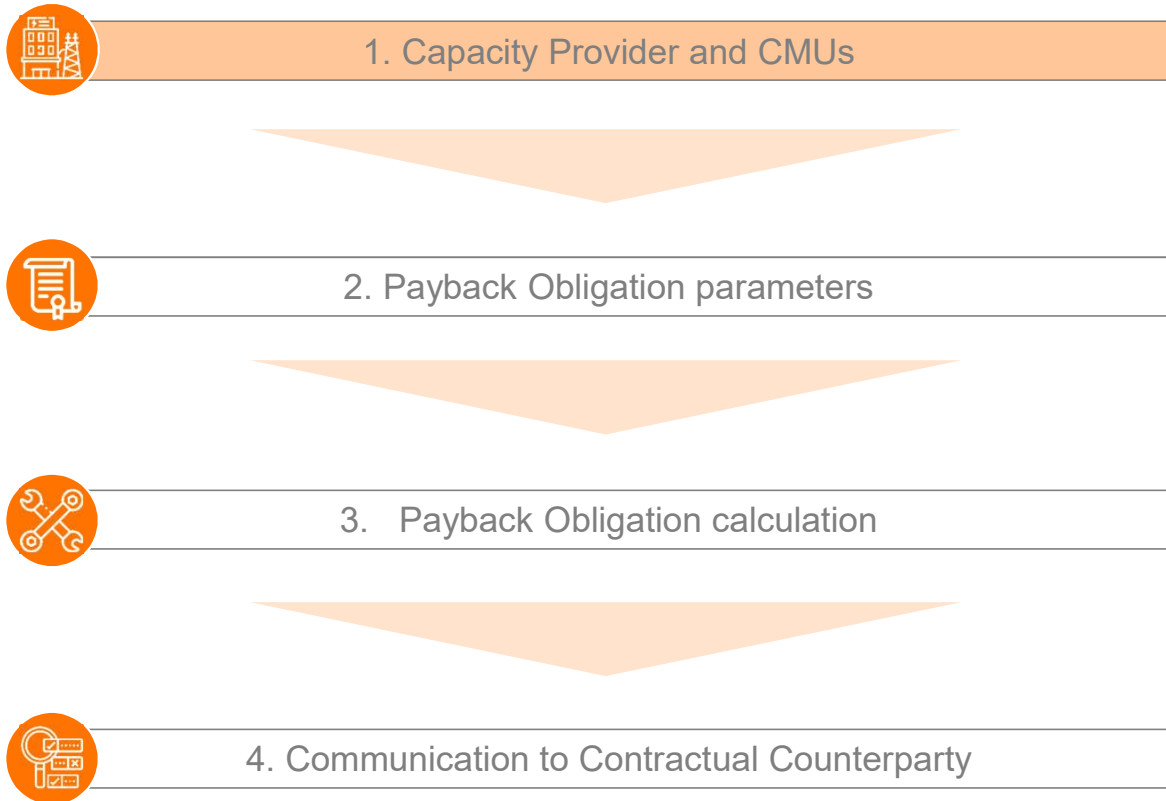


3. Payback Obligation calculation



4. Communication to Contractual Counterparty

Use case structure





1. Capacity Provider and CMU

- **AggregaTHOR** became Prequalified CRM Candidate
- CMU has been duly prequalified on 31/08/2021
- This Prequalified CMU is composed of 10 capacities and their associated Delivery Points (DP hereafter) on different geographical sites and different owners (next slide gives an overview of those capacities)
- 9 DPs are connected to different DSO's grids and 1DP (DP8) is connected to the TSO Elia's Grid
- The CMU has a last updated Nominal Reference Power of **15,1 MW** at the start of 2025
- It is a **4h SLA hours CMU**
- AggregaTHOR declares on 15/09/2025 that **Deliver Points 4 and 6** are committed to Redispatching Services



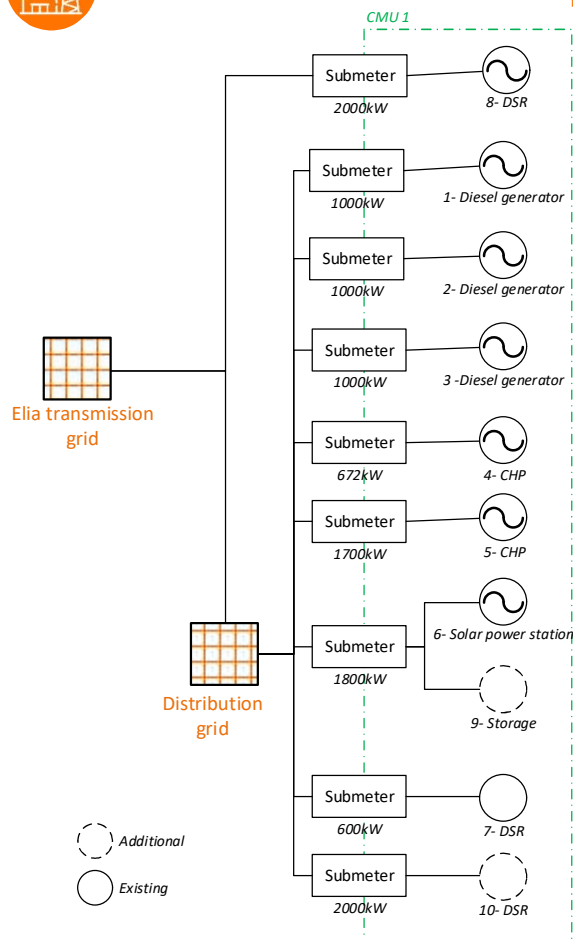
1. Detailed view: Capacity Provider and CMU

- During the **Pre-Delivery Period Monitoring**, AggregaTHOR failed to realize the capacities behind Delivery Points 9 and 10
- Slightly before the Delivery Period, the CMU added an additional Delivery Point (Delivery Point 11) with a prequalified **Nominal Reference Power of 6,4 MW**
- Delivery Point 11 is a **net off-take Delivery Point**

	DP1	DP2	DP3	DP3	DP4	DP5	DP6	DP8	DP11
NRP [MW]	1	0,96	1,02	0,71	1,71	0,8	0,58	1,92	6,4
Inj/Off	Inj	Inj	Inj	Inj	Inj	Inj	Inj	Off	Off



1. Detailed view: Capacity Provider and CMU



Technology		Information related to the project
CRM Capacity	Type	DP1: / DP2: / DP3: / DP4: / DP5: / DP6 / DP7: / DP8: / DP9: / DP10 + a new major customer acquired in the Delivery Period DP11
	Nominal reference power	CMU: 15,1 MW
	Opt-out	CMU: 1,4 MW
	Reference power	13,7 MW
	Derating factor	0,3
	Energy-Constrained CMU	Energy Constrained CMU
Received Capacity Contract Duration		1 year



1. Capacity Provider and CMU – Contracted Capacity : Transaction overview

Primary Transaction

- After its participation to a **Y-4 Auction** in October 2021, the following bid of the CMU has been selected:

Auction results	
Selected bids	
Selected Bid volumes	3,01 MW 2,63 MW
Related Price	18€/kW/year
Capacity contract duration	1 year
Derating factor	0,3

Missing volume during pre-delivery period monitoring

- No bid was selected for the **Y-1 auction** as the Remaining Eligible Volume of the CMU is 0 MW

Secondary Transaction (ex-ante)

Contracted Capacity	Capacity Remuneration	Derating Factor	Transaction Period
+ 1,0 MW	25 €/kW/y	0,31	01/11/2025 00:00 to 01/11/2026 00:00
+ 0,5 MW	27 €/kW/y	0,31	01/11/2025 00:00 to 01/11/2026 00:00

The CMU has a Total Contracted Capacity of **4,13 MW**

Use case structure



1. Capacity Provider and CMUs



2. Payback Obligation parameters



3. Payback Obligation calculation



4. Communication to Contractual Counterparty



2. Payback Obligation parameters

For the Delivery Period:

- The AMT Price is set at **120 €/MWh** by Elia and published on its website by the May 15 prior the delivery period
- The Calibrated Strike Price of the Transactions of AggregaTHOR are:
 - Transaction 1 (2,63MW): **500 €/MWh**
 - Transaction 2 (1,00MW): **500 €/MWh**
 - Transaction 3 (0,50MW): **480 €/MWh**
- As it is the first year of Delivery Period and that the Contracted Capacity relies on a on-year contract, **no indexation is foreseen of the Calibrated Strike Price in the Delivery Period 2025**

For the CMU on the Delivery Period:

- The CMU is considered as an **Energy Constrained CMU with a SLA of 4 hours**
- The CMU has a **Derating Factor of 0,3.**
- The CMU is considered as **without Daily Schedule** and it has a DMP price as a result of the Availability Obligation and Penalties
 - **If the DMP price is above the Calibrated Strike Price of 500€/MWh or 480€/MWh for an hour of Payback Obligation, the maximum of both is the Transaction Strike Price in the calculation**
- The Reference Price of the CMU is the **Day-Ahead EPEX Market**



2. Payback Obligation parameters

For the CMU on the Delivery Period:

- Once a year prior the Delivery Period, a Stop Loss Amount is calculated for each Transaction of the Primary Market or ex-ante Transaction of the Secondary Market having one or several Delivery Periods as Transaction Period.

StopLoss (CMU_{id}, Transaction_{id}, Delivery Period)

$$= \sum_{t=1}^w \left(\text{Contracted Capacity (CMU}_{id}, \text{Transaction}_{id}, t) * \frac{\text{Capacity Remuneration (CMU}_{id}, \text{Transaction}_{id})}{w} \right)$$

With w as the number of hours on the Delivery Period

If applicable, the sum on all the Transaction Payback Obligations of the Delivery Period could not exceed the Transaction Stop Loss Amount.

- For AggregaTHOR, the Stop Loss Amounts are applicable on its 3 Transactions:**

Stop-Loss Transaction 1 (2,63 MW) = 2,63 MW * 18 k€/MW/Delivery Period = **47,34k€ / Delivery Period 2025**

Stop-Loss Transaction 2 (1,00 MW) = 1 MW * 25 k€/MW/Delivery Period = **25k€ / Delivery Period 2025**

Stop-Loss Transaction 3 (0,50 MW) = 0,5 MW * 27 k€/MW/Delivery Period = **13,5k€ / Delivery Period 2025**

Use case structure



1. Capacity Provider and CMUs



2. Payback Obligation parameters



3. Payback Obligation calculation



4. Communication to Contractual Counterparty



3. Payback Obligation calculation

On **10/01/2026**, the system was stressed due to **two peaks of consumption**, one in the morning and one in the evening. The Day-Ahead prices have risen to very high levels, demonstrating that the Belgian electricity market is facing an **adequacy-relevant moment**.

As the CRM implemented is a CRM with Reliability Option, the Payback Obligation applies to all CMUs and their Transactions. For a Energy Constrained CMU ex-ante Transaction, it applies at any moment of their Transaction Periods when the Reference Price exceeds the Strike Price which is an SLA Hour.

The Payback Obligation is calculated for each Transaction.

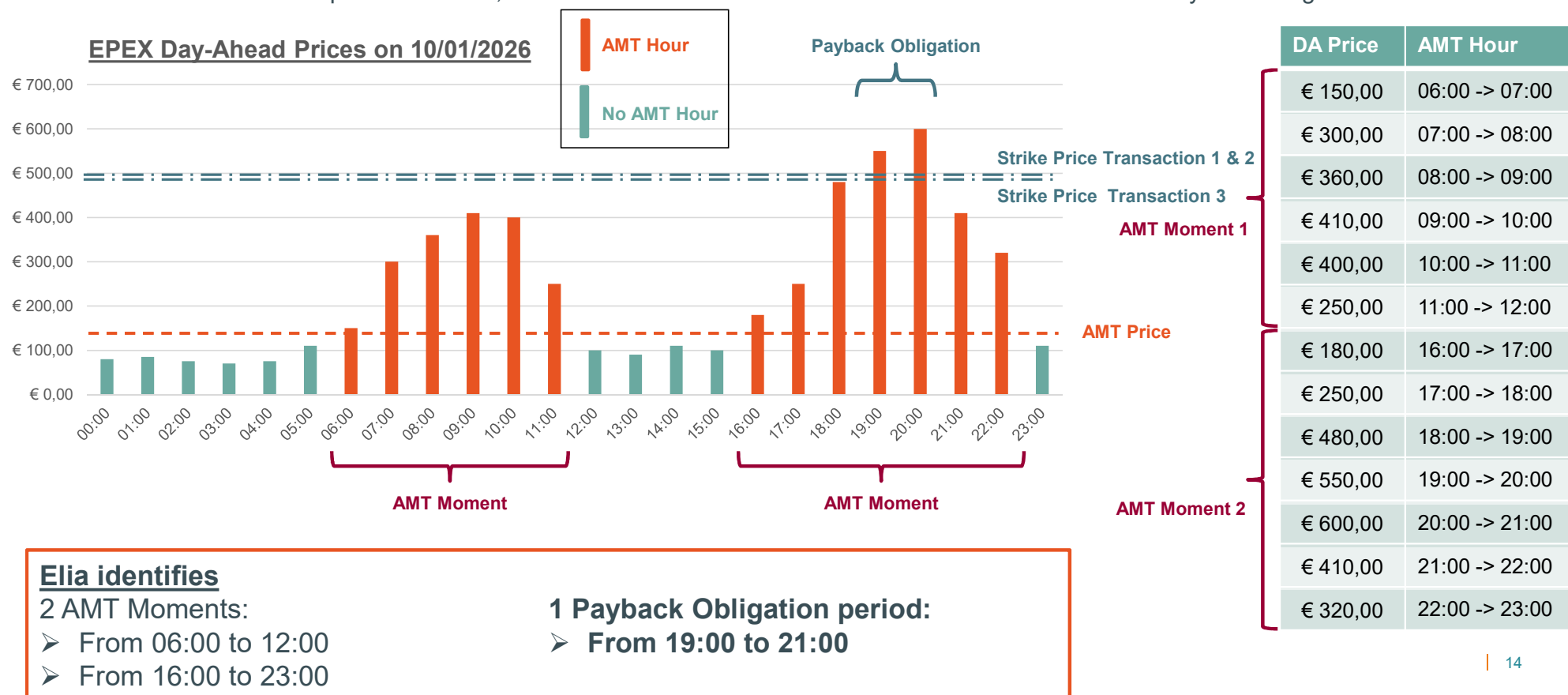
To perform the calculation of the Payback Obligation, ELIA will gather for all Transactions having a Transaction Period including the hours for which the Reference Price exceeds the Strike Price and a Payback Obligation applies, the following hourly elements:

- The Reference Price of the CMU on which the Transaction relies
- The Strike Price of the CMU's Transaction for that hour
- The Availability Ratio for the considered AMT hours
- The Transaction's Contracted Capacity for that hour
- The Transaction associated Derating Factor if the CMU on which the Transaction relies is Energy Constrained



3. Payback Obligation – Reference Price are the Day-ahead Market revenues

- The CMU selected in its Prequalification File, EPEX as the NEMO for the Reference Price definition in the Payback Obligation





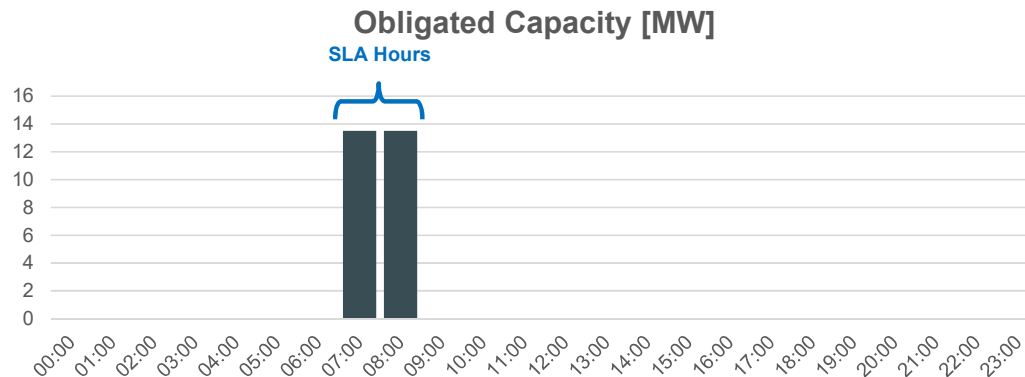
3. Payback Obligation – SLA Hours and Obligated Capacity

SLA hours and Obligated Capacity Determination

- According to Availability Obligations and Penalties Functioning Rules and Use Case 2 AggregaTHOR's CMU has an **Obligated Capacity** of **13,59 MW** during 2 hours between **07:00 and 09:00**

$$P_{Obligated}(CMU, t) = \frac{Total\ Contracted\ Capacity_{ex-ante}(CMU, t)}{Derating(CMU, t)} + Contracted\ Capacity(CMU, t)_{ex-post}$$

$$\begin{aligned} Derating(CMU, t) &= \frac{0,3 * 2,63 + 1 * 0,31 + 0,5 * 0,31}{4,13} \\ &= 0,304 \end{aligned}$$



Contracted Capacity	Ex-Ante	Ex-Post	Derating
Primary Transaction (MW)	2,63	N/A	0,3
Secondary Transaction #1 (MW)	1,0	0	0,31
Secondary Transaction #2 (MW)	0,5	0	0,31
Obligated Capacity(MW)	13,59		



3. Payback Obligation – SLA Hours and Obligated Capacity

According to Availability Obligations and Penalties Use Case 2 AggregaTHOR's CMU has **no SLA Hours when the Reference Price exceeds the Strike Price**

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity
AMT Moment 1	€ 150,00	06:00 -> 07:00	No	0		
	€ 300,00	07:00 -> 08:00	Yes	13,59		
	€ 360,00	08:00 -> 09:00	Yes	13,59		
	€ 410,00	09:00 -> 10:00	No	0		
	€ 400,00	10:00 -> 11:00	No	0		
	€ 250,00	11:00 -> 12:00	No	0		
AMT Moment 2	€ 180,00	16:00 -> 17:00	No	0		
	€ 250,00	17:00 -> 18:00	No	0		
	€ 480,00	18:00 -> 19:00	No	0		
	€ 550,00	19:00 -> 20:00	No	0		
	€ 600,00	20:00 -> 21:00	No	0		
	€ 410,00	21:00 -> 22:00	No	0		
	€ 320,00	22:00 -> 23:00	No	0		

Payback
Obligation
Period



3. Payback Obligation – Availability Ratio

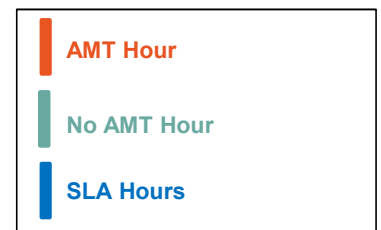
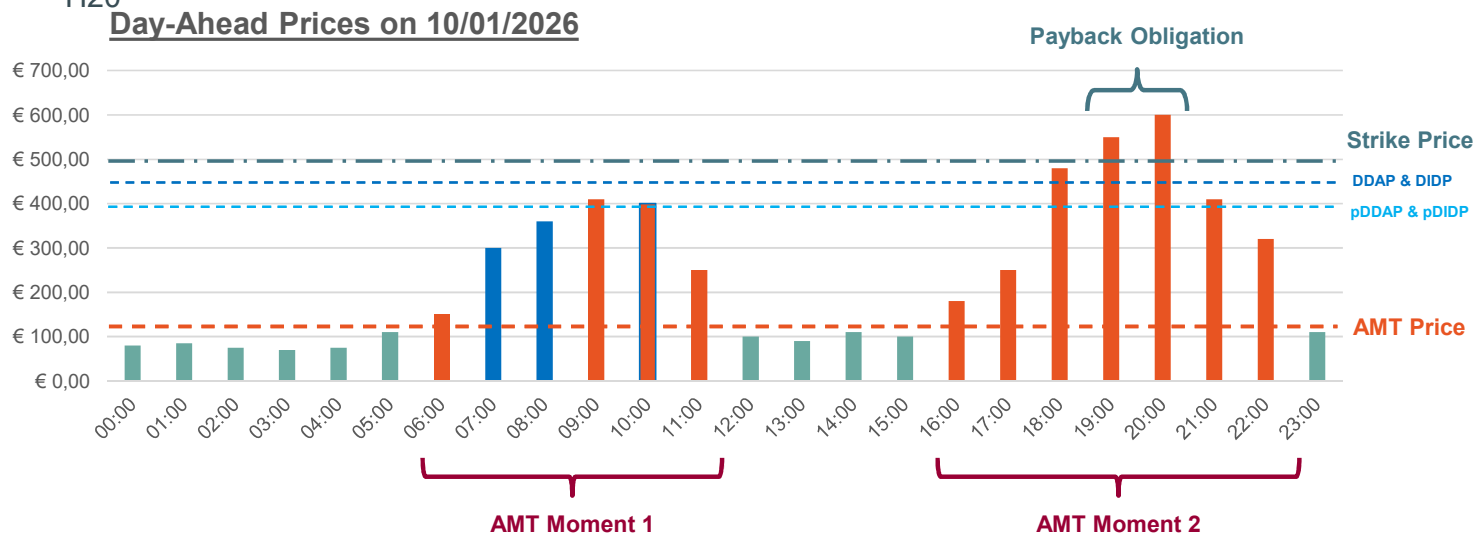
- An Availability Ratio applies in the Payback Obligation to take into account the duly communicated unavailability of the CMU.
- The Obligated Capacity and the Remaining Maximum Capacity DA are obtained in the Availability Obligations and Penalties Use Case 2 and according to the Functioning Rules.
- It equals $Availability\ Ratio\ (CMU_{id}, t) = \frac{Min(Obligated\ Capacity\ (CMU_{id}, t); Remaining\ Maximum\ Capacity\ DA\ (CMU_{id}, t))}{Obligated\ Capacity\ (CMU_{id}, t)}$ is **not calculated on the SLA hours as the Reference Price doesn't exceed the Strike Price.**



3. Payback Obligation – Strike Price

DMP of the without Daily Schedule CMU

- As AggregaTHOR is a without Daily Schedule CMU, a check occurs on its DMP value in comparison with the Calibrated Strike Price (500€/MWh) of the Transaction
- $Strike\ Price(CMU_{id}, Transaction_{id}, t) = \max(DMP(CMU_{id}, t); Calibrated\ Strike\ Price(CMU_{id}, Transaction_{id}, t))$
- According to UC2 of Availability Obligation & Penalties, as none of the DMP constituting elements are above the 500€/MWh Calibrated Strike Price, **the Strike Price is 500;500;480€/MWh** for the 3 CMU's Transactions respectively on all Payback Obligation hours H19 and H20





3. Payback Obligation formula

For each ex-ante Transaction of the Energy Constrained CMU:

The formula of the Payback Obligation is not applied on each of the two SLA hours (H7 and H8) because the Reference Price doesn't exceed the Strike Price.

The formula of the Payback Obligation is also not applied on each of the two hours (H19 and H20) where the Reference Price exceeds the Strike Price, **because those are not SLA Hours on which the ex-ante Transactions Service is expected.**

$$\begin{aligned}
 & \text{Payback Obligation } (CMU_{id}, \text{ Transaction}_{id}, t) \\
 &= \text{Max}(0 ; \text{Reference Price } (CMU_{id}, t) - \text{Strike Price}(CMU_{id}, \text{ Transaction}_{id}, t)) * \frac{\text{Contracted Capacity } (CMU_{id}, \text{ Transaction}_{id}, t)}{\text{Derating Factor } (CMU_{id}, \text{ Transaction}_{id}, t)} * \text{Availability Ratio } (CMU_{id}, t)
 \end{aligned}$$

For all 3 Transactions of AggregaTHOR, no Payback Obligation is due for that day.

Use case structure



1. Capacity Provider and CMUs



2. Payback Obligation parameters



3. Payback Obligation calculation



4. Communication to Contractual Counterparty



4. Report to the Contractual Counterparty

Prior the creation of the report (at latest the 15th of the month M+2 for the related month M of the Delivery Period), ELIA checks the Transaction cumulated Payback Obligations already paid for the Transactions on which a Stop Loss principles applies:

For the 3 Transactions of AggregaTHOR, the Stop Loss Amounts are

- Transaction 1 (2,63 MW): 47,34k€ / Delivery Period 2025
- Transaction 2 (1,0 MW): 25k€ / Delivery Period 2025
- Transaction 3 (0,5 MW): 13,5k€ / Delivery Period 2025

The Payback Obligation on the Delivery Period up to the month M (January 2026) included doesn't reach the Stop Loss amount of the Transaction, so that:

$$Effective\ Payback\ Obligation\ (CMU_{id},\ Transaction_{id}, M) = \sum_{t=1}^m Payback\ Obligation\ (CMU_{id},\ Transaction_{id}, t)$$

Where m are the hours of the month M.

➔ The Capacity Provider has to re-imburse the complete Payback Obligations of the month M (Effective) which is 0€.



4. Report to the Contractual Counterparty

At latest the 15th of the month M+2 for the related month M of the Delivery Period, a report is sent to the Contractual Counterparty and includes:

The Capacity Provider Id

The CMU identification Id

The Transaction identification Id

The total Payback Obligation of the month M for that Transaction

The Effective Payback Obligation value of the month M (after Stop Loss principle on the Delivery Period if applicable) for that Transaction

And for all hours of the month for which the Reference Price exceeds the Strike Price and a Payback Obligation applies:

- The Availability Ratio
- The Obligated Capacity
- The Reference Price
- The Strike Price value
- The Payback Obligation value

→ The report is sent with 0€ as Payback Obligation for the month M (without hourly data as not applicable)