

Availability Obligations & Penalties Use Case 3

Unproven Capacity Project

Task Force Implementation

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 Availability Obligations 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 *Availability Obligations* of the Functioning Rules as known at the moment of writing and shared with market parties on 31/08/2020. It also obviously follows the context set by the Electricity Law.

Use case structure



1. Capacity Provider and CMU's



2. (Partial) Declared Prices and Unavailable Capacity



3. Participation in Ancillary or Redispatching Services



4. AMT Moment Availability Monitoring



1. Capacity Provider and CMUs



2. (Partial) Declared Prices and Unavailable Capacity



3. Participation in Ancillary or Redispatching Services



4. AMT Moment Monitoring



1. Hypotheses on Delivery Period

For the previous Delivery Period

- Day-Ahead price cap is equals to **3.500 €/MWh**
- intraday reference price cap is equals to **3.500 €/MWh**
- Positive Imbalance Price cap is equals to **13.500 €/MWh**

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 Strike Price is set at **500 €/MWh** by
- Day-Ahead price cap is equals to **4.000 €/MWh**
- intraday reference price cap is equals to **4.000 €/MWh**
- Positive Imbalance Price cap is equals to **13.500 €/MWh**



1. Capacity Provider and CMUs

- **RollingEnergy.SA/NV** was prequalified to offer **50 MW of Eligible Volume** in the 2021 Y-4 Auction
- The 50 MW was divided over 3 bids (and thus 3 CMUs) in the Capacity Auction
- It concerns a **Virtual CMU** that has successfully passed to existing in the pre-delivery period monitoring over
- After pre-delivery, the following Nominal Reference Power for Availability Monitoring were confirmed:

	CMU parameters		
	CMU 1	CMU 2	CMU 3
<i>Nominal Reference Power</i>	25,00 MW	4,5 MW	5,15 MW

- CMU 1 is **energy constrained with a daily schedule obligation**
CMU 2 and 3 are **non-energy constrained without daily schedule obligation**



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

Primary Market

- In the **Y-4 Auction** in October 2021, the Capacity Provider was awarded the following bids for VCMUs:

Auction results		
Selected bids		
	Selected Bid volumes	VCMU1: 20MW VCMU2: 10MW VCMU3: 20MW
	Related Price	VCMU1: 17€/kW/year VCMU2: 18€/kW/year VCMU3: 18,5€/kW/year
	Capacity contract duration	1 year



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

Secondary Transaction

- Through transaction on the **Secondary Market** in the pre-delivery period, the following Contracted Capacities and Capacity remunerations of the CMU have been secured:

CMU		Contracted Capacity	Capacity Remuneration	Derating Factor	Transaction Period
	1	+ 20,0 MW	17 €/kW/y	0,8	01/11/2025 00:00 to 01/11/2026 00:00
	2	+ 4,5 MW	18 €/kW/y	0,6	01/11/2025 00:00 to 01/11/2026 00:00
	3	+ 5,15 MW	18 €/kW/y	0,8	01/11/2025 00:00 to 01/11/2026 00:00
	1	- 2,88 MW	17 €/kW/y	0,8	01/11/2025 00:00 to 01/11/2026 00:00
	2	- 0,27 MW	18 €/kW/y	0,6	01/11/2025 00:00 to 01/11/2026 00:00
	TOTAL				
	CMU 1	17,12 MW	17€/kW/y	0,8	01/11/2025 00:00 to 01/11/2026 00:00
	CMU 2	4,23 MW	18€/kW/y	0,6	01/11/2025 00:00 to 01/11/2026 00:00
	CMU 3	5,15 MW	18€/kW/y	0,8	01/11/2025 00:00 to 01/11/2026 00:00



3. 1. Capacity Provider and CMUs



2. (Partial) Declared Prices and Unavailable Capacity



3. Participation in Ancillary or Redispatching Services



4. AMT Moment Monitoring

2. (Partial) Declared Prices and Unavailable Capacity

(Partial) Declared Prices: on 15/09/2025, RollingEnergy.SA/NV submits the minimum required information

CMU	Associated Volume (MW)	Day-Ahead Market (€/MWh)	Intraday Market (€/MWh)	Balancing Market (€/MWh)
1	N/A	N/A	N/A	N/A
2	NRP = 4,5	520	N/A	N/A
3	NRP = 5,15	1.000	N/A	N/A



➤ This declaration is accepted by Elia, as it does not exceed the prevailing Day-Ahead market price cap

Unavailable Capacity

- **RollingEnergy.SA/NV** expects a structurally decreased heat demand for CMU 2 (CHP) from 15/12/2025 to 31/01/2026
- It translates this into an limitation on capacity which it notifies to Elia for the purpose of the CRM
- $P_{Max,Remaining}(CMU\ 2, t) = 2,3\ MW$
- The **Maximum Remaining Capacity DA** on CMU 2 is also **2,3 MW** absent a further notification before 9:00 CET the day before application

CMU ID	Remaining Maximum Capacity	Start date and time	End date and time	Reason
CMU 2	2,3 MW	15/12/2025 07:00	31/01/2026 17:00	Other: reduced heat demand



- Elia notes an Announced Unavailable Capacity of **2,2 MW**



3. 1. Capacity Provider and CMUs



3. 2. (Partial) Declared Prices and Unavailable Capacity



Participation in Ancillary and Redispatching Services

Not applicable as no notified Delivery Points



4. AMT Moment Monitoring



3. 1. Capacity Provider and CMUs



3. 2. (Partial) Declared Prices and Unavailable Capacity



3. Participation in Ancillary or Redispatching Services



4. AMT Moment Monitoring



4. AMT Moment Monitoring

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 moment**.

As the CRM has been implemented to answer this kind of moment, Availability Monitoring applies to all CMUs on these moments.

To perform the monitoring, Elia will follow these steps :

Identification of
AMT
Hours/Moments

Determine
Obligated Capacity

Determine
Available Capacity

Determine Missing
Capacity

Determine
Unavailability
Penalty



4. AMT Moment Monitoring

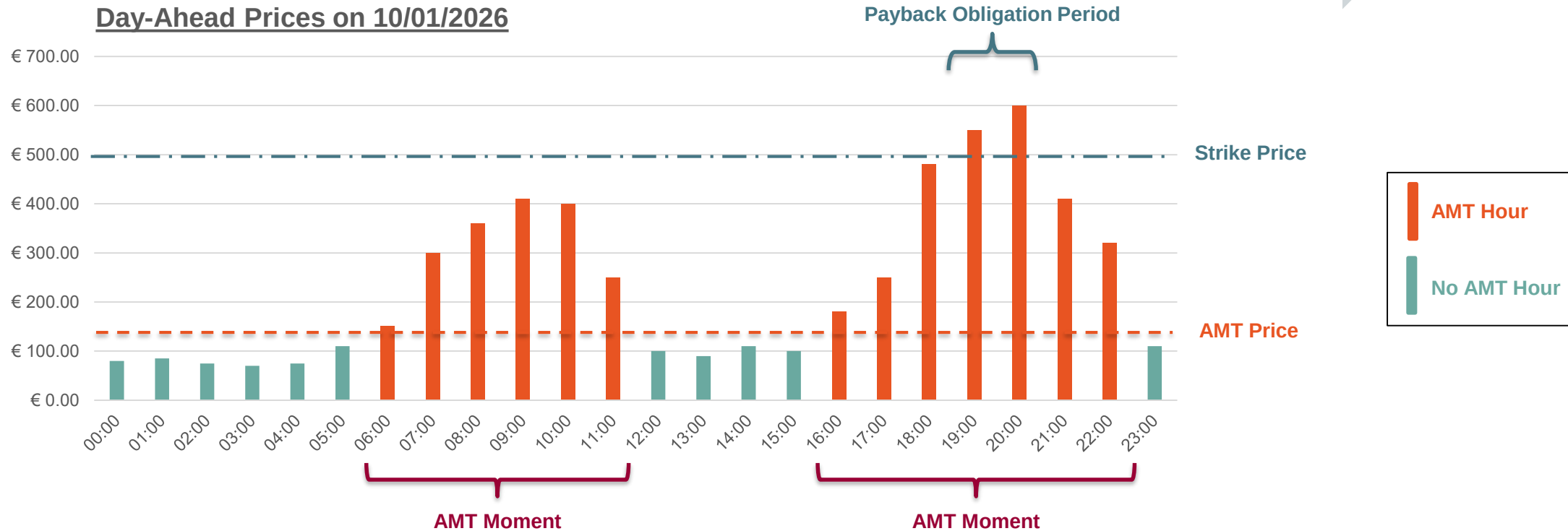
Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty



Elia identifies

2 AMT Moments:

- From 06:00 to 12:00
- From 16:00 to 23:00

1 Payback Obligation Period:

- From 19:00 to 21:00



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

	DA Price	AMT Hour	SLA Hour	Obligated Capacity	Available Capacity	Missing Capacity
AMT Moment 1	€ 150,00	06:00 -> 07:00				
	€ 300,00	07:00 -> 08:00				
	€ 360,00	08:00 -> 09:00				
	€ 410,00	09:00 -> 10:00				
	€ 400,00	10:00 -> 11:00				
	€ 250,00	11:00 -> 12:00				
AMT Moment 2	€ 180,00	16:00 -> 17:00				
	€ 250,00	17:00 -> 18:00				
	€ 480,00	18:00 -> 19:00				
	€ 550,00	19:00 -> 20:00				
	€ 600,00	20:00 -> 21:00				
	€ 410,00	21:00 -> 22:00				
	€ 320,00	22:00 -> 23:00				

Payback
Obligation
Period



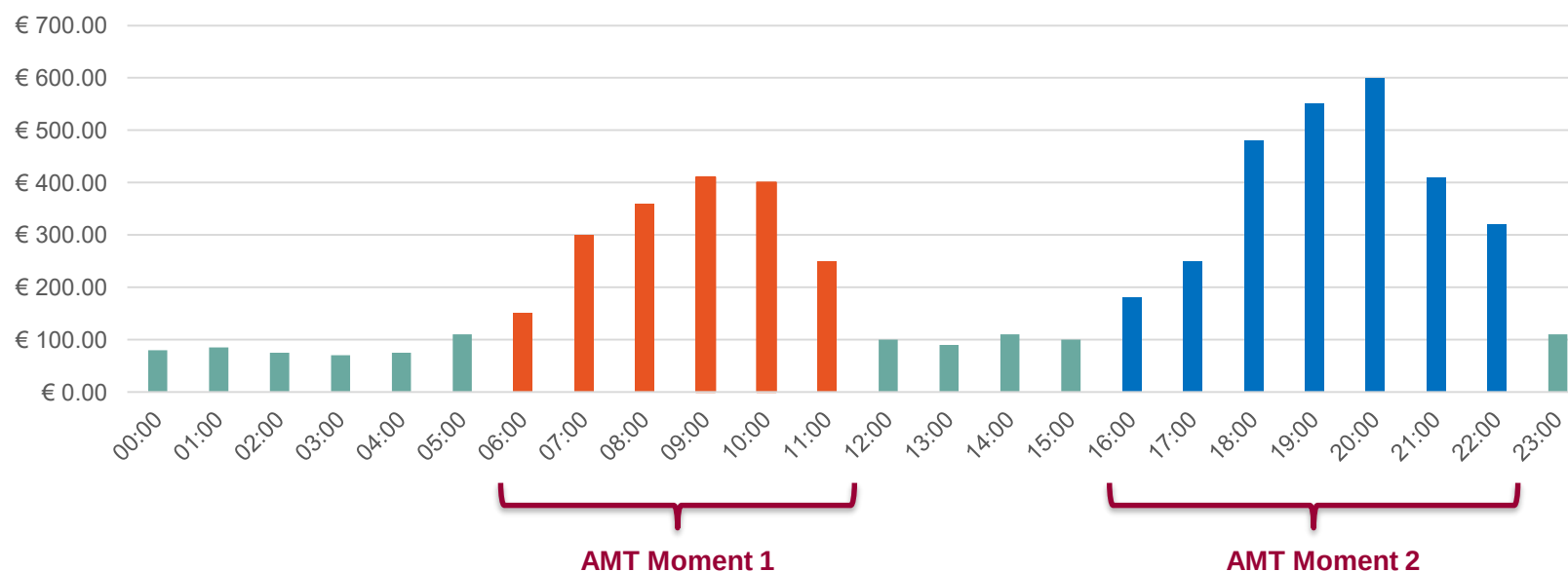
4. AMT Moment Monitoring



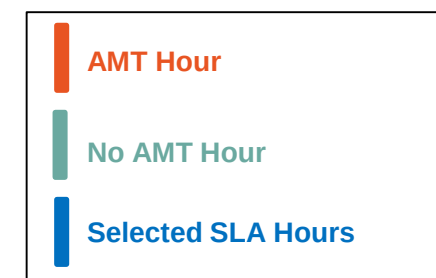
SLA Hours determination

- Elia determines ex-post which of the AMT Hours will be retained to be considered as the SLA Hours based on the **highest average Measured Power** of the CMU
- In this case, the **AMT Moment 1** has an **average Active Volume** of **0 MW** compared to the **average Active Volume** of **16,52 MW** of **AMT Moment 2**.
- Therefore, the **7 AMT Hours** between **16:00** and **22:00** are selected to be the SLA Hours of the CMU for that day

Day-Ahead Prices on 10/01/2026



*See [following slide](#)





4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

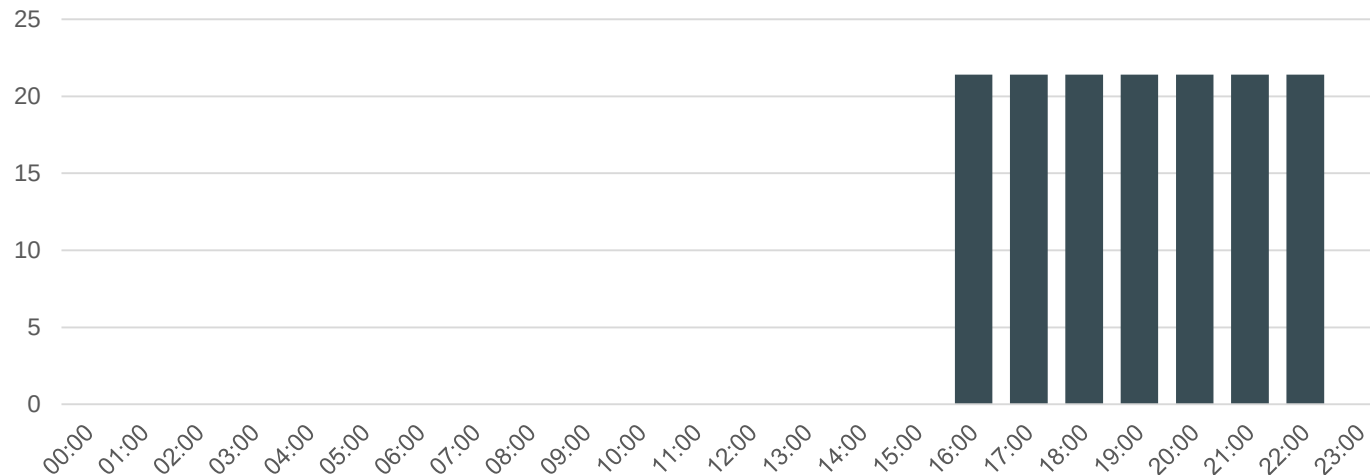
Obligated Capacity Determination

- Calculation of Obligated Capacity based on the Contracted Capacity

$$P_{Obligated}(CMU\ 1, t) = \frac{Contracted\ Capacity(CMU, t)}{Derating(CMU, t)}$$

- Thus, CMU 1 has an **Obligated Capacity** of **21,4 MW** between **16:00-23:00**

Obligated Capacity



Contracted Capacity	
Primary Transaction (MW)	17,12
Secondary Transaction (MW)	0
Derating Factor(CMU,t)	0,8
Obligated Capacity(MW)	21,4



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)
AMT Moment 1	€ 150,00	06:00 -> 07:00	NO	0		
	€ 300,00	07:00 -> 08:00	NO	0		
	€ 360,00	08:00 -> 09:00	NO	0		
	€ 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	YES	21,4		
	€ 250,00	17:00 -> 18:00	YES	21,4		
	€ 480,00	18:00 -> 19:00	YES	21,4		
	€ 550,00	19:00 -> 20:00	YES	21,4		
	€ 600,00	20:00 -> 21:00	YES	21,4		
	€ 410,00	21:00 -> 22:00	YES	21,4		
	€ 320,00	22:00 -> 23:00	YES	21,4		

Payback
Obligation
Period



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

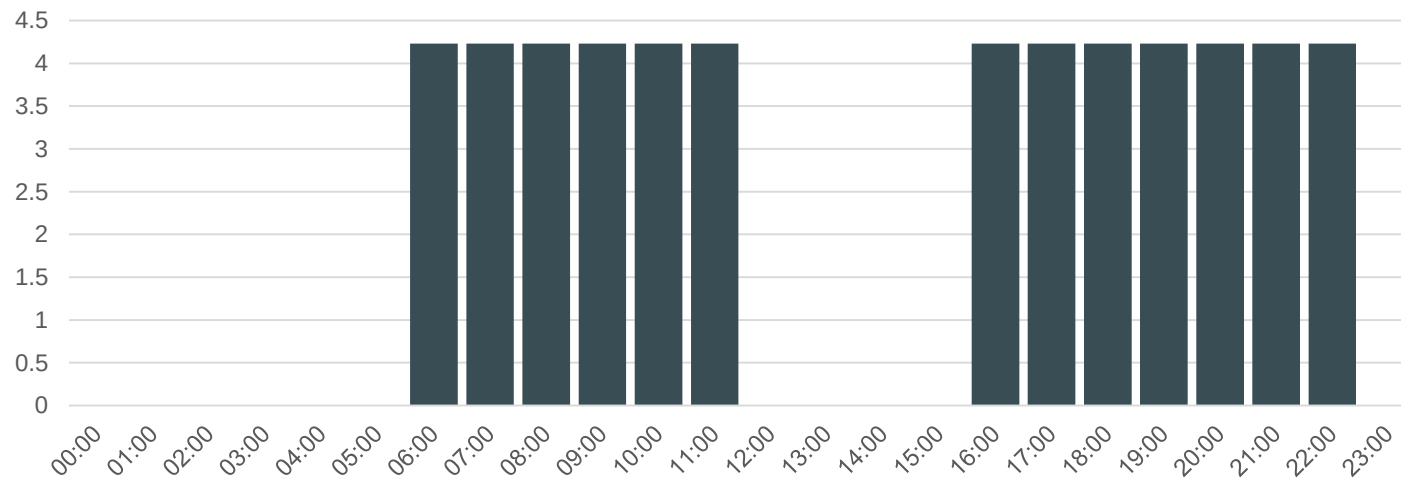
Obligated Capacity Determination

- Calculation of Obligated Capacity based on the Contracted Capacity

$$P_{Obligated}(CMU\ 2, t) = Contracted\ Capacity(CMU, t)$$

- Thus, CMU 2 has an **Obligated Capacity** of **4,23 MW** between **06:00 - 12:00** and **16:00 - 23:00**

Obligated Capacity



Contracted Capacity	
Primary Transaction (MW)	4,23
Secondary Transaction (MW)	0
Obligated Capacity(MW)	4,23



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)
AMT Moment 1	€ 150,00	06:00 -> 07:00	NA	4,23		
	€ 300,00	07:00 -> 08:00	NA	4,23		
	€ 360,00	08:00 -> 09:00	NA	4,23		
	€ 410,00	09:00 -> 10:00	NA	4,23		
	€ 400,00	10:00 -> 11:00	NA	4,23		
	€ 250,00	11:00 -> 12:00	NA	4,23		
AMT Moment 2	€ 180,00	16:00 -> 17:00	NA	4,23		
	€ 250,00	17:00 -> 18:00	NA	4,23		
	€ 480,00	18:00 -> 19:00	NA	4,23		
	€ 550,00	19:00 -> 20:00	NA	4,23		
	€ 600,00	20:00 -> 21:00	NA	4,23		
	€ 410,00	21:00 -> 22:00	NA	4,23		
	€ 320,00	22:00 -> 23:00	NA	4,23		

 Payback
Obligation
Period



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

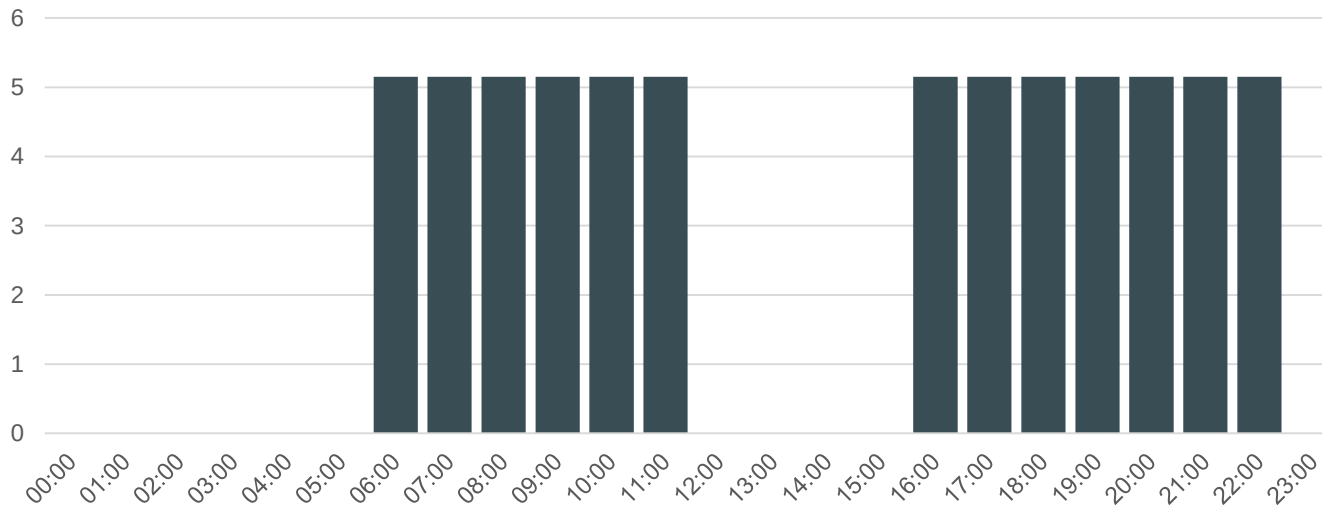
Obligated Capacity Determination

- Calculation of Obligated Capacity based on the Contracted Capacity

$$P_{Obligated}(CMU\ 3, t) = Contracted\ Capacity(CMU, t)$$

- Thus, CMU 3 has an **Obligated Capacity** of **5,15 MW** between **06:00 - 12:00** and **16:00 - 23:00**

Obligated Capacity



Contracted Capacity	
Primary Transaction (MW)	5,15
Secondary Transaction (MW)	0
Obligated Capacity(MW)	5,15



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)
AMT Moment 1	€ 150,00	06:00 -> 07:00	NA	5,15		
	€ 300,00	07:00 -> 08:00	NA	5,15		
	€ 360,00	08:00 -> 09:00	NA	5,15		
	€ 410,00	09:00 -> 10:00	NA	5,15		
	€ 400,00	10:00 -> 11:00	NA	5,15		
	€ 250,00	11:00 -> 12:00	NA	5,15		
AMT Moment 2	€ 180,00	16:00 -> 17:00	NA	5,15		
	€ 250,00	17:00 -> 18:00	NA	5,15		
	€ 480,00	18:00 -> 19:00	NA	5,15		
	€ 550,00	19:00 -> 20:00	NA	5,15		
	€ 600,00	20:00 -> 21:00	NA	5,15		
	€ 410,00	21:00 -> 22:00	NA	5,15		
	€ 320,00	22:00 -> 23:00	NA	5,15		

 Payback
Obligation
Period



4. AMT Moment Monitoring

Determination of the Available Capacity

As all of CMU 1 has a Daily Schedule Obligation, their Available Capacity is determined by their Nominated Pmax in their Daily Schedule and Remaining Available Capacity at time 't'

$$P_{Available}(CMU, t) = MIN(P_{Max, Remaining}(CMU, t); P_{Max, Nominated})$$

Therefore:

$$P_{Available}(CMU, t) = (25,00 \text{ MW}; 25,00 \text{ MW}) = 25,00 \text{ MW}$$

For all AMT Hours.

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)
AMT Moment 1	€ 150,00	06:00 -> 07:00	NO	0	0	
	€ 300,00	07:00 -> 08:00	NO	0	0	
	€ 360,00	08:00 -> 09:00	NO	0	0	
	€ 410,00	09:00 -> 10:00	NO	0	0	
	€ 400,00	10:00 -> 11:00	NO	0	0	
	€ 250,00	11:00 -> 12:00	NO	0	0	
AMT Moment 2	€ 180,00	16:00 -> 17:00	YES	21,4	25,00	
	€ 250,00	17:00 -> 18:00	YES	21,4	25,00	
	€ 480,00	18:00 -> 19:00	YES	21,4	25,00	
	€ 550,00	19:00 -> 20:00	YES	21,4	25,00	
	€ 600,00	20:00 -> 21:00	YES	21,4	25,00	
	€ 410,00	21:00 -> 22:00	YES	21,4	25,00	
	€ 320,00	22:00 -> 23:00	YES	21,4	25,00	

Payback
Obligation
Period



4. AMT Moment Monitoring



Determination of the Available Capacity

As RollingEnergy.SA/NV has a CMU without Daily Schedule Obligation, Elia will determine the Available Capacity according to **3 Methods** depending on the **Reference Price** of the concerned hour:

- **Method 1:** to be applied when the CMU's Declared Day-Ahead Price is not surpassed by its Reference Price and the CMU's Reference Price does not surpass the Strike Price

$$P_{Available}(CMU, t) = P_{Max, Remaining}(CMU, t)$$

Where $P_{Max, Remaining}(CMU, t)$ is the Remaining Maximum Capacity

- **Method 2:** to be applied when the CMU's Declared Day-Ahead Price is surpassed by its Reference Price and the CMU's Reference Price does not surpass the Strike Price

$$P_{Available} = MIN(P_{Max, Remaining}(CMU, t); V_{Act}(CMU, t))$$

Where $P_{Max, Remaining}(CMU, t)$ is the Remaining Maximum Capacity ; $V_{Act}(CMU, t)$ is the Active Volume

- **Method 3:** to be applied when the CMU's Reference Price surpasses the Strike Price

$$P_{Available} = MIN(P_{Max, Remaining}(CMU, t); MIN(V_{Act}(CMU, t); V_{req}(CMU, t)) + MIN(V_{Pas}(CMU, t); NRP(CMU, t) - V_{req}(CMU, t)))$$

Where $P_{Max, Remaining}(CMU, t)$ is the Remaining Maximum Capacity ; $V_{Act}(CMU, t)$ is the Active Volume ; $V_{req}(CMU, t)$ is the Required Volume ; $V_{Pas}(CMU, t)$ is the Passive Volume



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

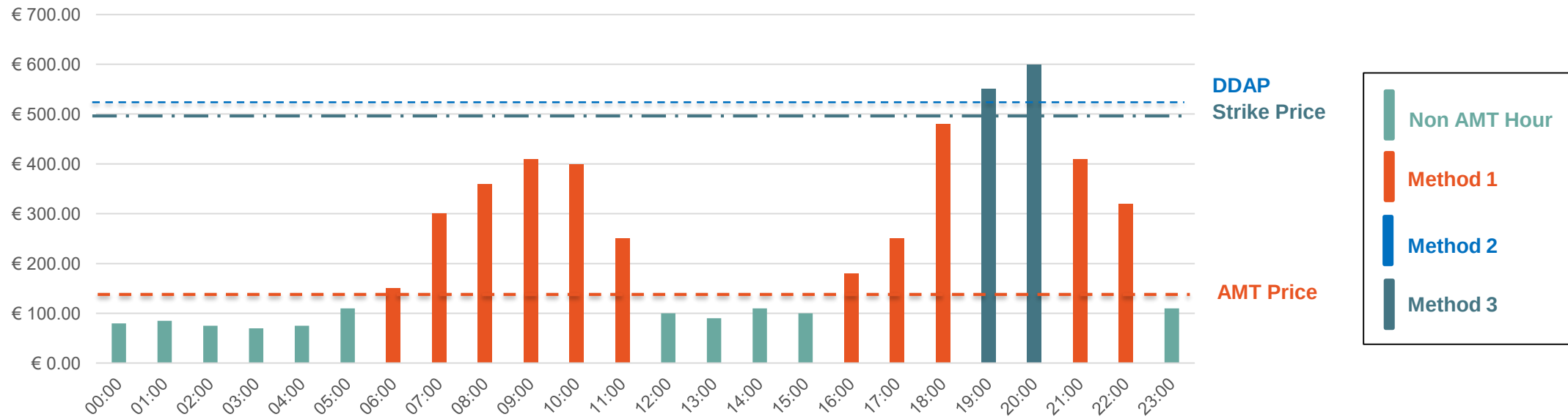
Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of Method Calculation

Day-Ahead Prices on 10/01/2026





4. AMT Moment Monitoring



Determination of the Active Volume

For every AMT Hour during which a (Partial) Declared Price was surpassed, Elia shall determine the **Active Volume** of the Delivery Point. To do so, Elia shall apply the following formula:

$$V_{Act}(CMU, t) = V_{Act,Initial}(CMU, t) + V_{Act,AS}(CMU, t) + V_{Act,RD}(CMU, t)$$

Where:

- $V_{Act,Initial}(CMU, t)$ is the **Initial Active Volume**
- $V_{Act,AS}(CMU, t)$ is the correction for **participation** in reserved frequency-related **Ancillary Services**
- $V_{Act,RD}(CMU, t)$ is Correction for **participation** in **Redispatching Services**

$V_{Act,AS}(CMU, t)$ and $V_{Act,RD}(CMU, t)$ valued at 0 MW as no Delivery Points were notified

The Active Volume is in this case thus equal to the Initial Active Volume



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of the Initial Active Volume = Active Volume (this case)

As RollingEnergy.SA/NV provides capacity by the **reduction of offtake** from electricity grid, the Initial Active Volume of the Delivery Point is calculated according to the following formula:

$$V_{Act,Initial,i}(t) = P_{measured,i}(t)$$

AMT Hour	DA Price	Method	Measured Power (MW)	Initial Active Volume
19:00 -> 20:00	€ 550,00	3	2,1	2,1
20:00 -> 21:00	€ 600,00	3	2,2	2,2



4. AMT Moment Monitoring



Determination of the Passive Volume

For every AMT Hour during a **Payback Obligation** and for which **Method 3** applies, Elia shall also determine the **Passive Volume** of the Delivery Point. To do so, Elia shall apply the following formula:

$$V_{Pas}(CMU, t) = V_{Pas,Initial}(CMU, t) + V_{Pas,AS}(CMU, t) + V_{Pas,RD}(CMU, t)$$

Where:

- $V_{Pas,Initial}(CMU, t)$ is the **Initial Passive Volume**
- $V_{Pas,AS}(CMU, t)$ is the correction for **participation** in reserved frequency-related **Ancillary Services**
- $V_{Pas,RD}(CMU, t)$ is Correction for **participation** in **Redispatching Services**

$V_{Pas,AS}(CMU, t)$ and $V_{Pas,RD}(CMU, t)$ valued at 0 MW as no Delivery Points were notified

The Active Volume is in this case thus equal to the Initial Passive Volume



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of the Initial Passive Volume = Passive Volume (this case)

As RollingEnergy.SA/NV provides capacity by the **injection** into electricity grid, the Initial Passive Volume of the Delivery Point is calculated according to the following formula:

$$V_{Pas,Initial,i}(t) = NRP(t) - P_{measured,i}(t)$$

AMT Hour	DA Price	Method	Power Measured	Nominal Reference Power	Initial Passive Volume
19:00 -> 20:00	€ 550,00	3	2,1	4,5	2,4
20:00 -> 21:00	€ 600,00	3	2,2	4,5	2,3



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of the Required Volume

For every AMT Hour during a **Payback Obligation** and for which **Method 3** applies, Elia shall also determine the **Required Volume** of the Delivery Point. This Required Volume is the highest volume that is expected to react to the different reference price signals according to the last validated Associated Volumes and (Partial) Declared Prices of the CMU.

Therefore, the Required Volume is equals to the **Highest Associated Volume** for which the DDAP or a pDDAP was surpassed by the Reference Price

Associated Volume (MW)	Day-Ahead Market (€/MWh)	Intraday Market (€/MWh)	Balancing Market (€/MWh)
NRP = 4,5	520	N/A	N/A

AMT Hour	Reference Price (DA Price)	Method	Highest Associated Volume for DA	Required Volume
19:00 -> 20:00	€ 550,00	3	4,5	4,5
20:00 -> 21:00	€ 600,00	3	4,5	4,5



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

Determination of the Available Capacity

AMT Hour	DA Price	Method	Remaining Maximum Capacity	Active Volume	Required Volume	Passive Volume	Available Capacity
06:00 -> 07:00	€ 150,00	1	2,3	N/A	N/A	N/A	2,3
07:00 -> 08:00	€ 300,00	1	2,3	N/A	N/A	N/A	2,3
08:00 -> 09:00	€ 360,00	1	2,3	N/A	N/A	N/A	2,3
09:00 -> 10:00	€ 410,00	2	2,3	N/A	N/A	N/A	2,3
10:00 -> 11:00	€ 400,00	2	2,3	N/A	N/A	N/A	2,3
11:00 -> 12:00	€ 250,00	1	2,3	N/A	N/A	N/A	2,3
16:00 -> 17:00	€ 180,00	1	2,3	N/A	N/A	N/A	2,3
17:00 -> 18:00	€ 250,00	1	2,3	N/A	N/A	N/A	2,3
18:00 -> 19:00	€ 480,00	2	2,3	N/A	N/A	N/A	2,3
19:00 -> 20:00	€ 550,00	3	2,3	2,1	4,5	2,4	2,1
20:00 -> 21:00	€ 600,00	3	2,3	2,2	4,5	2,3	2,2
21:00 -> 22:00	€ 410,00	2	2,3	N/A	N/A	N/A	2,3
22:00 -> 23:00	€ 320,00	1	2,3	N/A	N/A	N/A	2,3



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)
AMT Moment 1	€ 150,00	06:00 -> 07:00	NA	4,23	2,3	
	€ 300,00	07:00 -> 08:00	NA	4,23	2,3	
	€ 360,00	08:00 -> 09:00	NA	4,23	2,3	
	€ 410,00	09:00 -> 10:00	NA	4,23	2,3	
	€ 400,00	10:00 -> 11:00	NA	4,23	2,3	
	€ 250,00	11:00 -> 12:00	NA	4,23	2,3	
AMT Moment 2	€ 180,00	16:00 -> 17:00	NA	4,23	2,3	
	€ 250,00	17:00 -> 18:00	NA	4,23	2,3	
	€ 480,00	18:00 -> 19:00	NA	4,23	2,3	
	€ 550,00	19:00 -> 20:00	NA	4,23	2,1	
	€ 600,00	20:00 -> 21:00	NA	4,23	2,2	
	€ 410,00	21:00 -> 22:00	NA	4,23	2,3	
	€ 320,00	22:00 -> 23:00	NA	4,23	2,3	

 Payback
Obligation
Period



4. AMT Moment Monitoring



Determination of the Available Capacity

As RollingEnergy.SA/NV has a CMU without Daily Schedule Obligation, Elia will determine the Available Capacity according to **3 Methods** depending on the **Reference Price** of the concerned hour:

- **Method 1:** to be applied when the CMU's Declared Day-Ahead Price is not surpassed by its Reference Price and the CMU's Reference Price does not surpass the Strike Price

$$P_{Available}(CMU, t) = P_{Max, Remaining}(CMU, t)$$

Where $P_{Max, Remaining}(CMU, t)$ is the Remaining Maximum Capacity

- **Method 2:** to be applied when the CMU's Declared Day-Ahead Price is surpassed by its Reference Price and the CMU's Reference Price does not surpass the Strike Price

$$P_{Available} = MIN(P_{Max, Remaining}(CMU, t); V_{Act}(CMU, t))$$

Where $P_{Max, Remaining}(CMU, t)$ is the Remaining Maximum Capacity ; $V_{Act}(CMU, t)$ is the Active Volume

- **Method 3:** to be applied when the CMU's Reference Price surpasses the Strike Price

$$P_{Available} = MIN(P_{Max, Remaining}(CMU, t); MIN(V_{Act}(CMU, t); V_{req}(CMU, t)) + MIN(V_{Pas}(CMU, t); NRP(CMU, t) - V_{req}(CMU, t)))$$

Where $P_{Max, Remaining}(CMU, t)$ is the Remaining Maximum Capacity ; $V_{Act}(CMU, t)$ is the Active Volume ; $V_{req}(CMU, t)$ is the Required Volume ; $V_{Pas}(CMU, t)$ is the Passive Volume



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

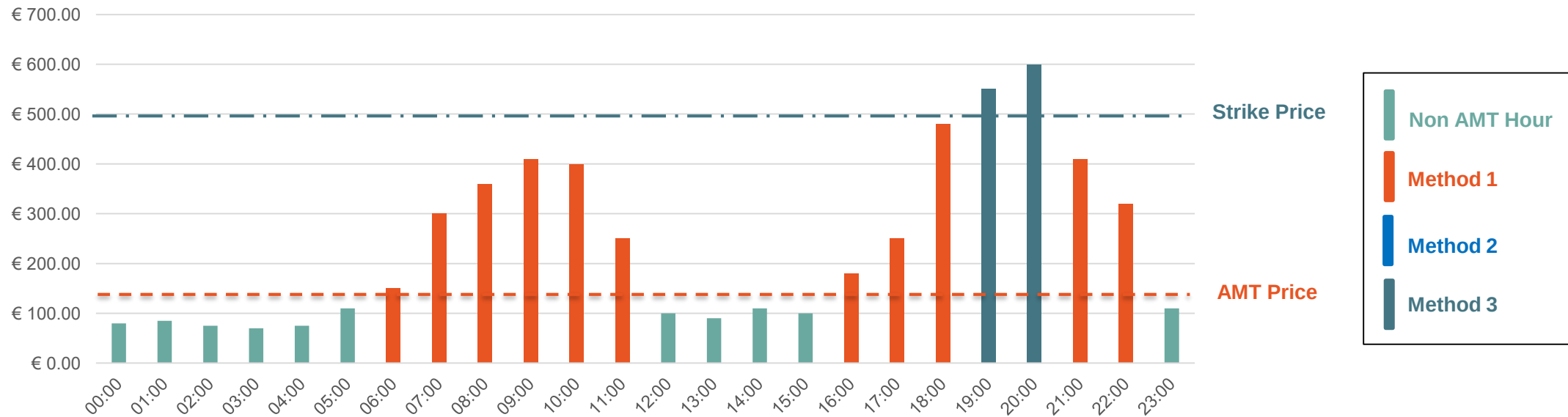
Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of Method Calculation

Day-Ahead Prices on 10/01/2026

DDAP = 1000€/MWh





4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of the Active Volume

For every AMT Hour during which a (Partial) Declared Price was surpassed, Elia shall determine the **Active Volume** of the Delivery Point. To do so, Elia shall apply the following formula:

$$V_{Act}(CMU, t) = V_{Act,Initial}(CMU, t) + V_{Act,AS}(CMU, t) + V_{Act,RD}(CMU, t)$$

Where:

- $V_{Act,Initial}(CMU, t)$ is the **Initial Active Volume**
- $V_{Act,AS}(CMU, t)$ is the correction for **participation** in reserved frequency-related **Ancillary Services**
- $V_{Act,RD}(CMU, t)$ is Correction for **participation** in **Redispatching Services**

$V_{Act,AS}(CMU, t)$ and $V_{Act,RD}(CMU, t)$ valued at 0 MW as no Delivery Points were notified

The Active Volume is in this case thus equal to the Initial Active Volume



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of the Initial Active Volume = Active Volume (this case)

As RollingEnergy.SA/NV provides capacity by the **reduction of offtake** from electricity grid, the Initial Active Volume of the Delivery Point is calculated according to the following formula:

$$V_{Act,Initial,i}(t) = P_{measured,i}(t)$$

AMT Hour	DA Price	Method	Measured Power (MW)	Initial Active Volume
19:00 -> 20:00	€ 550,00	3	3,21	3,21
20:00 -> 21:00	€ 600,00	3	3,32	3,32



4. AMT Moment Monitoring



Determination of the Passive Volume

For every AMT Hour during a **Payback Obligation** and for which **Method 3** applies, Elia shall determine the **Passive Volume** of the Delivery Point. To do so, Elia shall apply the following formula:

$$V_{Pas}(CMU, t) = V_{Pas,Initial}(CMU, t) + V_{Pas,AS}(CMU, t) + V_{Pas,RD}(CMU, t)$$

Where:

- $V_{Pas,Initial}(CMU, t)$ is the **Initial Passive Volume**
- $V_{Pas,AS}(CMU, t)$ is the correction for **participation** in reserved frequency-related **Ancillary Services**
- $V_{Pas,RD}(CMU, t)$ is Correction for **participation** in **Redispatching Services**

$V_{Pas,AS}(CMU, t)$ and $V_{Pas,RD}(CMU, t)$ valued at 0 MW as no Delivery Points were notified

The Passive Volume is in this case thus equal to the Initial Passive Volume



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of the Initial Passive Volume = Passive Volume (this case)

As RollingEnergy.SA/NV provides capacity by the **injection** into electricity grid, the Initial Passive Volume of the Delivery Point is calculated according to the following formula:

$$V_{Pas,Initial,i}(t) = NRP(t) - P_{measured,i}(t)$$

AMT Hour	DA Price	Method	Measured Power	Nominal Reference Power	Initial Passive Volume
19:00 -> 20:00	€ 550,00	3	3,21	5,15	1,94
20:00 -> 21:00	€ 600,00	3	3,32	5,15	1,83



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

Determination of the Required Volume

For every AMT Hour during a **Payback Obligation** and for which **Method 3** applies, Elia shall also determine the **Required Volume** of the Delivery Point. This Required Volume is the highest volume that is expected to react to the different reference price signals according to the last validated Associated Volumes and (Partial) Declared Prices of the CMU.

Therefore, the Required Volume is equals to the **Highest Associated Volume** for which the DDAP or a pDDAP was surpassed by the Reference Price

Associated Volume (MW)	Day-Ahead Market (€/MWh)	Intraday Market (€/MWh)	Balancing Market (€/MWh)
NRP = 5,15	1.000	N/A	N/A

AMT Hour	Reference Price (DA Price)	Method	Highest Associated Volume for DA	Required Volume
19:00 -> 20:00	€ 550,00	3	0	0
20:00 -> 21:00	€ 600,00	3	0	0



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

Determination of the Available Capacity

AMT Hour	DA Price	Method	Remaining Maximum Capacity	Active Volume	Required Volume	Passive Volume	Available Capacity
06:00 -> 07:00	€ 150,00	1	5,15	N/A	N/A	N/A	5,15
07:00 -> 08:00	€ 300,00	1	5,15	N/A	N/A	N/A	5,15
08:00 -> 09:00	€ 360,00	1	5,15	N/A	N/A	N/A	5,15
09:00 -> 10:00	€ 410,00	2	5,15	N/A	N/A	N/A	5,15
10:00 -> 11:00	€ 400,00	2	5,15	N/A	N/A	N/A	5,15
11:00 -> 12:00	€ 250,00	1	5,15	N/A	N/A	N/A	5,15
16:00 -> 17:00	€ 180,00	1	5,15	N/A	N/A	N/A	5,15
17:00 -> 18:00	€ 250,00	1	5,15	N/A	N/A	N/A	5,15
18:00 -> 19:00	€ 480,00	2	5,15	N/A	N/A	N/A	5,15
19:00 -> 20:00	€ 550,00	3	5,15	3,21	0	1,94	1,94
20:00 -> 21:00	€ 600,00	3	5,15	3,32	0	1,83	1,83
21:00 -> 22:00	€ 410,00	2	5,15	N/A	N/A	N/A	5,15
22:00 -> 23:00	€ 320,00	1	5,15	N/A	N/A	N/A	5,15



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)
AMT Moment 1	€ 150,00	06:00 -> 07:00	NA	5,15	5,15	
	€ 300,00	07:00 -> 08:00	NA	5,15	5,15	
	€ 360,00	08:00 -> 09:00	NA	5,15	5,15	
	€ 410,00	09:00 -> 10:00	NA	5,15	5,15	
	€ 400,00	10:00 -> 11:00	NA	5,15	5,15	
	€ 250,00	11:00 -> 12:00	NA	5,15	5,15	
AMT Moment 2	€ 180,00	16:00 -> 17:00	NA	5,15	5,15	
	€ 250,00	17:00 -> 18:00	NA	5,15	5,15	
	€ 480,00	18:00 -> 19:00	NA	5,15	5,15	
	€ 550,00	19:00 -> 20:00	NA	5,15	1,94	
	€ 600,00	20:00 -> 21:00	NA	5,15	1,83	
	€ 410,00	21:00 -> 22:00	NA	5,15	5,15	
	€ 320,00	22:00 -> 23:00	NA	5,15	5,15	

 Payback
Obligation
Period



4. AMT Moment Monitoring



Determination of the Missing Capacity

- The Missing Capacity of a CMU is equal to the positive difference between Obligated and Available Capacity during an AMT Hour during Availability Monitoring
- From this Missing Capacity, Elia differentiates two types of Missing Capacity

➤ Announced Missing Capacity (AMC)

$$AMC(CMU, t) = \text{Min}(P_{\text{Unavailable, Announced}}(CMU, t) ; MC(CMU, t))$$

Where $P_{\text{Unavailable, Announced}}(CMU, t)$ is the Announced Unavailable Capacity that covers the AMT Hour and $MC(CMU, t)$ is the Missing Capacity of the CMU for the AMT Hour

➤ Unannounced Missing Capacity (UMC)

$$UMC(CMU, t) = \text{Max}(MC(CMU, t) - AMC(CMU, t); 0)$$

- RollingEnergy.SA/NA's CMU's show Announced as well as Unannounced Missing Capacity, pursuant to the Unavailable Capacity notifications



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

	AMT Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)	Announced Missing Capacity (MW)	Unannounced Missing Capacity (MW)
AMT Moment 1	06:00 -> 07:00	0	0	0	0	0
	07:00 -> 08:00	0	0	0	0	0
	08:00 -> 09:00	0	0	0	0	0
	09:00 -> 10:00	0	0	0	0	0
	10:00 -> 11:00	0	0	0	0	0
	11:00 -> 12:00	0	0	0	0	0
AMT Moment 2	16:00 -> 17:00	21,4	25,00	0	0	0
	17:00 -> 18:00	21,4	25,00	0	0	0
	18:00 -> 19:00	21,4	25,00	0	0	0
	19:00 -> 20:00	21,4	25,00	0	0	0
	20:00 -> 21:00	21,4	25,00	0	0	0
	21:00 -> 22:00	21,4	25,00	0	0	0
	22:00 -> 23:00	21,4	25,00	0	0	0



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing
Capacity

 Determine
Unavailability
Penalty

	AMT Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)	Announced Missing Capacity (MW)	Unannounced Missing Capacity (MW)
AMT Moment 1	06:00 -> 07:00	4,23	2,3	1,93	1,93	0
	07:00 -> 08:00	4,23	2,3	1,93	1,93	0
	08:00 -> 09:00	4,23	2,3	1,93	1,93	0
	09:00 -> 10:00	4,23	2,3	1,93	1,93	0
	10:00 -> 11:00	4,23	2,3	1,93	1,93	0
	11:00 -> 12:00	4,23	2,3	1,93	1,93	0
AMT Moment 2	16:00 -> 17:00	4,23	2,3	1,93	1,93	0
	17:00 -> 18:00	4,23	2,3	1,93	1,93	0
	18:00 -> 19:00	4,23	2,3	1,93	1,93	0
	19:00 -> 20:00	4,23	2,1	2,13	2,13	0
	20:00 -> 21:00	4,23	2,2	2,03	2,03	0
	21:00 -> 22:00	4,23	2,3	1,93	1,93	0
	22:00 -> 23:00	4,23	2,3	1,93	1,93	0



4. AMT Moment Monitoring

 Identification of
AMT
Hours/Moments

 Determine
Obligated
Capacity

 Determine
Available
Capacity

 Determine
Missing Capacity

 Determine
Unavailability
Penalty

	AMT Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)	Announced Missing Capacity (MW)	Unannounced Missing Capacity (MW)
AMT Moment 1	06:00 -> 07:00	5,15	5,15	0	0	0
	07:00 -> 08:00	5,15	5,15	0	0	0
	08:00 -> 09:00	5,15	5,15	0	0	0
	09:00 -> 10:00	5,15	5,15	0	0	0
	10:00 -> 11:00	5,15	5,15	0	0	0
	11:00 -> 12:00	5,15	5,15	0	0	0
AMT Moment 2	16:00 -> 17:00	5,15	5,15	0	0	0
	17:00 -> 18:00	5,15	5,15	0	0	0
	18:00 -> 19:00	5,15	5,15	0	0	0
	19:00 -> 20:00	5,15	1,94	3,21	0	3,21
	20:00 -> 21:00	5,15	1,83	3,32	0	3,32
	21:00 -> 22:00	5,15	5,15	0	0	0
	22:00 -> 23:00	5,15	5,15	0	0	0



4. AMT Moment Monitoring



Determination of the Unavailability Penalty

- RollingEnergy.SA/NA is sanctioned with an Unavailability Penalty for any Missing Capacity on their CMUs. This penalty is applicable over a complete AMT Moment and is calculated according to the following formula:

$$\begin{aligned}
 & \text{Unavailability Penalty [€]} \\
 &= \frac{1}{T * UP} \left[\sum_{t=1}^T (1 + X) * \text{Weighted Contract Value}(CMU, t) * UMC(CMU, t) + \sum_{t=1}^T (1 + X) * \text{Weighted Contract Value}(CMU, t) * AMC(CMU, t) \right]
 \end{aligned}$$

Where:

- T is the number of hours or quarter hours (as applicable) for which the penalty applies
- X is the penalty factor to be applied to the Missing Capacity for time 't'
- $UMC(CMU, t)$ is the Unannounced Missing Capacity at time t
- $AMC(CMU, t)$ is the Announced Missing Capacity for time t
- UP is the anticipated number of AMT Moments where availability is verified, equal to 15
- $\text{Weighted Contract Value}(CMU, t)$ is calculated as follow

$$\text{Weighted Contract Value}(CMU, t) = \frac{\sum_{i=1}^N \text{Capacity Remuneration}_i * \text{Contracted Capacity}_i}{\sum_{i=1}^N \text{Contracted Capacity}_i}$$



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

	AMT Hour	Announced Missing Capacity (MW)	Unannounced Missing Capacity (MW)	Weighted Contract Value (€/MW)	X Factor AMC/UMC	T	Unavailability Penalty (€)
AMT Moment 1	06:00 -> 07:00	0	0	17.000	0,9/1	6	0
	07:00 -> 08:00	0	0	17.000	0,9/1	6	
	08:00 -> 09:00	0	0	17.000	0,9/1	6	
	09:00 -> 10:00	0	0	17.000	0,9/1	6	
	10:00 -> 11:00	0	0	17.000	0,9/1	6	
	11:00 -> 12:00	0	0	17.000	0,9/1	6	
AMT Moment 2	16:00 -> 17:00	0	0	17.000	0,9/1	7	0
	17:00 -> 18:00	0	0	17.000	0,9/1	7	
	18:00 -> 19:00	0	0	17.000	0,9/1	7	
	19:00 -> 20:00	0	0	17.000	0,9/1	7	
	20:00 -> 21:00	0	0	17.000	0,9/1	7	
	21:00 -> 22:00	0	0	17.000	0,9/1	7	
	22:00 -> 23:00	0	0	17.000	0,9/1	7	



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

	AMT Hour	Announced Missing Capacity (MW)	Unannounced Missing Capacity (MW)	Weighted Contract Value (€/MW)	X Factor AMC/UMC	T	Unavailability Penalty (€)
AMT Moment 1	06:00 -> 07:00	1,93	0	18.000	0,9/1	6	4.400,40
	07:00 -> 08:00	1,93	0	18.000	0,9/1	6	
	08:00 -> 09:00	1,93	0	18.000	0,9/1	6	
	09:00 -> 10:00	1,93	0	18.000	0,9/1	6	
	10:00 -> 11:00	1,93	0	18.000	0,9/1	6	
	11:00 -> 12:00	1,93	0	18.000	0,9/1	6	
AMT Moment 2	16:00 -> 17:00	1,93	0	18.000	0,9/1	7	4.498,11
	17:00 -> 18:00	1,93	0	18.000	0,9/1	7	
	18:00 -> 19:00	1,93	0	18.000	0,9/1	7	
	19:00 -> 20:00	2,13	0	18.000	0,9/1	7	
	20:00 -> 21:00	2,03	0	18.000	0,9/1	7	
	21:00 -> 22:00	1,93	0	18.000	0,9/1	7	
	22:00 -> 23:00	1,93	0	18.000	0,9/1	7	



4. AMT Moment Monitoring

Identification of
AMT
Hours/Moments

Determine
Obligated
Capacity

Determine
Available
Capacity

Determine
Missing Capacity

Determine
Unavailability
Penalty

	AMT Hour	Announced Missing Capacity (MW)	Unannounced Missing Capacity (MW)	Weighted Contract Value (€/MW)	X Factor AMC/UMC	T	Unavailability Penalty (€)
AMT Moment 1	06:00 -> 07:00	0	0	18.000	0,9/1	6	0
	07:00 -> 08:00	0	0	18.000	0,9/1	6	
	08:00 -> 09:00	0	0	18.000	0,9/1	6	
	09:00 -> 10:00	0	0	18.000	0,9/1	6	
	10:00 -> 11:00	0	0	18.000	0,9/1	6	
	11:00 -> 12:00	0	0	18.000	0,9/1	6	
AMT Moment 2	16:00 -> 17:00	0	0	18.000	0,9/1	7	2.238,85
	17:00 -> 18:00	0	0	18.000	0,9/1	7	
	18:00 -> 19:00	0	0	18.000	0,9/1	7	
	19:00 -> 20:00	0	3,21	18.000	0,9/1	7	
	20:00 -> 21:00	0	3,32	18.000	0,9/1	7	
	21:00 -> 22:00	0	0	18.000	0,9/1	7	
	22:00 -> 23:00	0	0	18.000	0,9/1	7	



4. AMT Moment Monitoring –Declared Market Price

Input for the Payback Obligation

(Partial) Declared Prices

Ass Vol	(p)DDAP
4,5	520

	DA Price	AMT Hour	Highest Associated Volume	Corresponding (p)DDAP = DMP
AMT Moment 1	€ 150,00	06:00 -> 07:00	0	NA
	€ 300,00	07:00 -> 08:00	0	NA
	€ 360,00	08:00 -> 09:00	0	NA
	€ 410,00	09:00 -> 10:00	0	NA
	€ 400,00	10:00 -> 11:00	0	NA
	€ 250,00	11:00 -> 12:00	0	NA
AMT Moment 2	€ 180,00	16:00 -> 17:00	0	NA
	€ 250,00	17:00 -> 18:00	0	NA
	€ 480,00	18:00 -> 19:00	0	NA
	€ 550,00	19:00 -> 20:00	4,5	€ 520
	€ 600,00	20:00 -> 21:00	4,5	€ 520
	€ 410,00	21:00 -> 22:00	0	NA
	€ 320,00	22:00 -> 23:00	0	NA

Payback
Obligation
Period



4. AMT Moment Monitoring –Declared Market Price

Input for the Payback Obligation

(Partial) Declared Prices

Ass Vol	(p)DDAP
5,15	1000

	DA Price	ID Price	AMT Hour	Highest Associated Volume	Corresponding (p)DDAP = DMP
AMT Moment 1	€ 150,00	€ 280,00	06:00 -> 07:00	0	NA
	€ 300,00	€ 520,00	07:00 -> 08:00	0	NA
	€ 360,00	€ 510,00	08:00 -> 09:00	0	NA
	€ 410,00	€ 300,00	09:00 -> 10:00	0	NA
	€ 400,00	€ 250,00	10:00 -> 11:00	0	NA
	€ 250,00	€ 220,00	11:00 -> 12:00	0	NA
AMT Moment 2	€ 180,00	€ 120,00	16:00 -> 17:00	0	NA
	€ 250,00	€ 160,00	17:00 -> 18:00	0	NA
	€ 480,00	€ 490,00	18:00 -> 19:00	0	NA
	€ 550,00	€ 520,00	19:00 -> 20:00	0	NA
	€ 600,00	€ 520,00	20:00 -> 21:00	0	NA
	€ 410,00	€ 450,00	21:00 -> 22:00	0	NA
	€ 320,00	€ 360,00	22:00 -> 23:00	0	NA

Payback
Obligation
Period