# Availability Obligations & Penalties Use Case 1

Offtake: Industrial process on a site – Oven & Melting

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 <u>Availability Obligations aspects</u>.

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**











# 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 CMU

- IndustryOfTheFuture.SA/NA is owner of a site on which a major oven & melting process are major consumers of electricity (located in Belgium and TSO connected)
- The CMU is purely electricity consumption oriented & TSO connected (no Individual MW Schedule Obligation)
- The CMU has a Nominal Reference Power of 10,4 MW
- It is a 24h SLA hours asset, with a Derating Factor of 1
- The Unsheddable Margin is equals to 0 MW
- The CMU consists of one Delivery Point at the submeter (see next slide)
- 2 MW of the Delivery Point is prequalified in the Manual Frequency Restoration Reserve (mFRR)



# 1. Detailed view: Capacity Provider and CMU



Name of the company	IndustryOfTheFuture.SA/NA				
Geographical site	<ul> <li>Owner: IndustryOfTheFuture.SA/NA</li> <li>Location: Belgium</li> <li>Connection: TSO grid</li> </ul>				
Technology	<ul> <li>Electrical load: Oven &amp; melting process (main part of the load), Offices</li> <li>24h SLA hours asset</li> </ul>				
Prequalified CMU	Oven and auxiliaries				
CRM Capacity	<ul> <li>Type: Existing</li> <li>Nominal reference power: 10,4 MW</li> <li>Opt-out: 0,4 MW</li> <li>Reference power: 10MW</li> </ul>	<ul> <li>Derating factor: 1</li> <li>Eligible Volume: 10MW</li> <li>Grid constraints : No grid contraints as existing load</li> <li>Non-Energy Constrained CMU</li> </ul>			
Year	• 2020				
CRM auction parameters	<ul> <li>Participate to 2021 Y-4 auction or late</li> <li>Contract duration: 1 year maximum, n</li> </ul>	r o investment file submitted to CREG			



# 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	10 MW			
	Related Price	17€/kW/year			
	Capacity contract duration	1 year			

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

# **Secondary Transaction**

No transaction on the Secondary Market

The CMU has a Total Contracted Capacity of **10 MW** 







# 2. (Partial) Declared Prices and Unavailable Capacity

#### **Declared Day-Ahead Price (DDAP)**

A. IndustryOfTheFuture.SA/NA has declared on the CRM IT interface its DDAP of 400 €/MWh on 01/08/2025

#### (Partial) Declared Prices declaration and update

- 1. On 11/11/2025, IndustryOfTheFuture.SA/NA has declared **one Partial Day-Ahead Price (pDDAP)** of **350 €/MWh** with an **Associated Volume** of **9,4 MW**
- 2. On 26/12/2025, IndustryOfTheFuture.SA/NA has declared one **Declared Intraday Prices (DIDP)** of **450 €/MWh** and one **Partial Declared Intraday Price (pDIDP)** of **400 €/MWh** with an **Associated Volume** of **9 MW**
- 3. On 09/01/2026, IndustryOfTheFuture.SA/NA has updated the DDAP to 450 €/MWh and the pDDAP to 400 €/MWh

#### **Unavailable Capacity**

- IndustryOfTheFuture.SA/NA does not communicate any Unavailable Capacity throughout the Delivery Period
- Therefore, Elia considers the Remaining Maximum Capacity as equals to the NRP

 $\blacktriangleright$   $P_{Max,Remaining}(CMU,t) = 10,4$  MW

• The **Remaining Maximum Capacity DA** also equals NRP = **10,4 MW** absent to any further declarations





# A. Declaration of DDAP on 01/08/2025 - Accepted

Associated Volume	Day-Ahead Market	Intraday Market (€/MWb)	Balancing Market	
NRP = <b>10,4</b>	400	N/A	N/A	

> This declaration is accepted by Elia because DDAP does not exceed the Day-Ahead price cap at the time of submission

# 1. Declaration of pDDAP on 11/11/2025 – Accepted

Associated Volume (MW)	Day-Ahead Market (€/MWh)	Intraday Market (€/MWh)	Balancing Market (€/MWh)	
NRP = 10,4	400	N/A	N/A	
9,4	350	N/A	N/A	

This declaration is accepted by Elia because the Associated Volume is lower than the NRP and the pDDAP is lower than the DDAP



# 2. Declaration and Update – Acceptance (2/2)

# 2. Declaration of one DIDP and pDIDP on 26/12/2025 – Rejected

Associated Volume (MW)	Day-Ahead Market (€/MWh)	Intraday Market (€/MWh)	Balancing Market (€/MWh)	
NRP = 10,4	400	450	N/A	
9,4	350	N/A	N/A	
9	XX	400	N/A	

- > This declaration is rejected by Elia because for the Associated Volume (9 MW) of the pDIDP, there is no pDDAP
  - Beware that, as part of single declaration, the DIDP is also rejected even if it meets the acceptance criteria
- > To be accepted, the Capacity Provider has to either
  - Declare one pDDAP with an Associated Volume of 9 MW
  - Change the Associated Volume of the pDIDP into 9,4 MW
- Following the rejection of the declaration, the Capacity Provider sent back a new declaration by modifying the Associated Volume of its pDIDP into 9,4 MW

# 3. Update of DDAP and pDDAP on 09/01/2026 – Accepted

Associated Volume (MW)	Day-Ahead Market (€/MWh)	Intraday Market (€/MWh)	Balancing Market (€/MWh)	
NRP = 10,4	450	450	N/A	
9,4	400	400	N/A	

> This update is accepted by Elia because it does not violate any acceptance criteria







# 3. Participation in Ancillary or Redispatching Services

# **Prerequisites for Ancillary Services**

- IndustryOfTheFuture.SA/NA has prequalified its Delivery Point for mFRR services
- The volume prequalified on this DP is 2 MW
- IndustryOfTheFuture.SA/NA has duly notified Elia of their successful prequalification

## **Reservation and activation in Ancillary Services**

- Subsequent to the mFRR daily procurement, the Delivery Point of the CMU is reserved in a bid of 10 MW
   The amount reserved for the CRM Delivery Point is noted at 2 MW (the pregualified amount)
- This for a period covering all days between the following two days:
  - o **20/12/2025**
  - o **20/01/2026**
- The Delivery Point supplied mFRR 1 time after instruction by Elia
  - On 10/01/2026 from 06:00 to 10:00
  - For 2 MW of mFRR supplied

# **Redispatching Services**

IndustryOfTheFuture.SA/NA chooses to not participate into redispatching services









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







Identification of AMT Hours/Moments		

	DA Price	AMT Hour	SLA Hour	Obligated Capacity	Available Capacity	Missing Capacity
	€ 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				
ſ	€ 180,00	16:00 -> 17:00				
	€ 250,00	17:00 -> 18:00				
	€ 480,00	18:00 -> 19:00				
MT Moment 2	€ 550,00	19:00 -> 20:00				
	€ 600,00	20:00 -> 21:00				
	€ 410,00	21:00 -> 22:00				
	€ 320,00	22:00 -> 23:00				



# **SLA Hours determination**

- As IndustryOfTheFuture.SA/NA is Energy Constrained CMU, the first step consist in determinate its SLA Hours for the concerning day:
  - 1. Selecting all AMT Hours
  - 2. Retaining all AMT Hours for which at least one (Partial) Declared Price was surpassed
  - Among both AMT Moments, Elia retains only the AMT Hours comprising the AMT Moment with highest Active Volume 3.

Determine

Obligated Capacity



Ass Vol	(p)DDAP	(p)DIDP
10,4	450	450
9,4	400	400

#### (Partial) Declared Prices

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# **SLA Hours determination**

- Elia determines ex-post which of the AMT Moments will be retained to be considered as the SLA Hours based on the highest average Active Volume of the CMU over all potential SLA hours of the AMT Moment.
- In this case, the AMT Moment 2 has an average Active Volume of 10,05 MW compared to the average Active Volume of 9,4 MW of AMT Moment 1.
- Therefore, the 4 AMT Hours between 18:00 and 22:00 are selected to be the SLA Hours of the CMU for that day

# Day-Ahead Prices on 10/01/2026



AMT Moment	AMT Hour	Active Volume*	Average Active Volume
1	07:00 -> 08:00	9,4	
1	08:00 -> 09:00	9,4	0.4
1	09:00 -> 10:00	9,4	9,4
1	10:00 -> 11:00	9,4	
2	18:00 -> 19:00	10	
2	19:00 -> 20:00	10,4	40.05
2	20:00 -> 21:00	10,4	10,05
2	21:00 -> 22:00	9,4	

#### \*See following slide





Calculation of Obligated Capacity based on the Contracted Capacity and the Derating Factor

Thus, IndustryOfTheFuture.SA/NA's CMU has an **Obligated Capacity** of **10 MW** during 4 hours between **18:00 and 22:00** 



Contracted Capacity	Ex-Ante	Ex-Post
Primary Transaction (MW)	10	N/A
Secondary Transaction (MW)	0	0
Derating Factor	1	N/A
Obligated Capacity(MW)	10	0





Determine Obligated Capacity 

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





#### Determine sing Capacity



#### **Determination of the Available Capacity**

As IndustryOfTheFuture.SA/NA 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





#### **Determination of Method Calculation**

# Day-Ahead Prices on 10/01/2026







# **Determination of the Active Volume**

For every AMT Hour to which **Method 2 and 3** applies<sup>\*</sup>, 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<sub>Act,Initial</sub>(CMU,t)* is the **Initial Active Volume**
- *V<sub>Act,AS</sub>(CMU,t)* is the correction for **participation** in reserved frequency-related **Ancillary Services**
- *V<sub>Act,RD</sub>(CMU,t*) is Correction for **participation** in **Redispatching Services**





# **Determination of the Initial Active Volume**

As IndustryOfTheFuture.SA/NA 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:

 $V_{Act,Initial,i}(t) = P_{Measured,i}(t) - P_{Baseline,i}(t)$ 

AMT Hour	DA Price	Method	Baseline (MW)	Measured Power (MW)	Initial Active Volume
09:00 -> 10:00	€ 410,00	2	-10,4	-1	9,4
10:00 -> 11:00	€ 400,00	2	-10,4	-1	9,4
18:00 -> 19:00	€ 480,00	2	-10,4	-2,4	8
19:00 -> 20:00	€ 550,00	3	-10,4	-2	8,4
20:00 -> 21:00	€ 600,00	3	-10,4	-2	8,4
21:00 -> 22:00	€ 410,00	2	-10,4	-3	7,4



On 10/01/2026, IndustryOfTheFuture's Delivery Point is :

- **Reserved** up to 2 MW for the mFRR services
- Activated from 06:00 to 10:00 and provided an average power of 2 MW over the complete period

With the following formula, Elia is able to determine a volume related to AS to correct the Initial Active Volume:

$$V_{Act,AS}(CMU,t) = MIN(\sum_{i=1}^{n_{DP,AS}} NRP_i(t) - (V_{Act,initial,i}(t) - V_{Act,AS,i}(t)), \sum_{i=1}^{n_{DP,AS}} V_{Pas,AS,i}(t)) - \sum_{i=1}^{n_{DP}} V_{Act,AS,i}(t))$$

AMT Hour	DA Price	Method	Initial Active Volume	Volume Reserved in AS	Average power provided for mFRR	Participation in AS
09:00 -> 10:00	€ 410,00	2	9,4	2	2	Min (10,4 − (9,4 − 2) ; 2 − 2) = <b>0</b>
10:00 -> 11:00	€ 400,00	2	9,4	2	2	Min (10,4 − (9,4 − 2) ; 2 − 2) = <b>0</b>
18:00 -> 19:00	€ 480,00	2	8	2	0	Min (10,4 − (8 − 0) ; 2 − 0) = <b>2</b>
19:00 -> 20:00	€ 550,00	3	8,4	2	0	Min (10,4 − (8,4 − 0) ; 2 − 0) = <b>2</b>
20:00 -> 21:00	€ 600,00	3	8,4	2	0	Min (10,4 – (8,4 – 0) ; 2 – 0) = <b>2</b>
21:00 -> 22:00	€ 410,00	2	7,4	2	0	Min (10,4 – (7,4 – 0) ; 2 – 0) = <b>2</b>

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#### **Correction for participation in Redispatching Services**

As IndustryOfTheFuture.SA/NA\_chooses to not participate into redispatching services, the volume to be applied to the Initial Active Volume is equals to **0 MW** for each AMT Hours concerned.

If the Delivery Point had participated in the redispatching services, Elia would have applied the following formula to determine the volume of the correction:

 $V_{Act,RD}(CMU,t) = \sum_{i=1}^{N} V_{Act,RD,i}(t)$ 

Where  $V_{Act,RD,i}(t)$  is absolute value in MW of the average downwards supplied Activation of Redispatching Service, upon instruction by ELIA, for Delivery Point 'i' and AMT Hour 't' as described in this step

AMT Hour	DA Price	Method	Participation in Redispatching
09:00 -> 10:00	€ 410,00	2	0
10:00 -> 11:00	€ 400,00	2	0
18:00 -> 19:00	€ 480,00	2	0
19:00 -> 20:00	€ 550,00	3	0
20:00 -> 21:00	€ 600,00	3	0
21:00 -> 22:00	€ 410,00	2	0

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# **Determination of the Active Volume**

According to the value calculated previously, Elia is able to determine the Active Volume of the Delivery Point,

AMT Hour	DA Price	Method	Initial Active Volume	Participation in AS	Participation in Redispatching	Active Volume
09:00 -> 10:00	€410,00	2	9,4	0	0	9,4
10:00 -> 11:00	€ 400,00	2	9,4	0	0	9,4
18:00 -> 19:00	€ 480,00	2	8	2	0	10
19:00 -> 20:00	€ 550,00	3	8,4	2	0	10,4
20:00 -> 21:00	€ 600,00	3	8,4	2	0	10,4
21:00 -> 22:00	€ 410,00	2	7,4	2	0	9,4





# **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<sub>Pas,Initial</sub>(CMU, t)* is the **Initial Passive Volume**
- *V<sub>Pas,AS</sub>(CMU,t)* is the correction for **participation** in reserved frequency-related **Ancillary Services**
- *V<sub>Pas,RD</sub>(CMU,t*) is Correction for **participation** in **Redispatching Services**





# **Determination of the Initial Passive Volume**

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

 $V_{Pas,Initial,i}(t) = UM_i(t) - P_{Measured,i}(t)$ 

AMT Hour	DA Price	Method	Power Measured	Unsheddable Margin	Initial Passive Volume
19:00 -> 20:00	€ 550,00	3	-2	0	2
20:00 -> 21:00	€ 600,00	3	-2	0	2



On 10/01/2026, IndustryOfTheFuture's Delivery Point is :

- **Reserved** up to **2 MW** for the mFRR services
- Activated from 06:00 to 10:00 and provided an average power of 2 MW over the complete period

With the following formula, Elia is able to determine a volume related to AS to correct the Initial Active Volume:

$$V_{Pas,AS}(CMU,t) = \sum_{i=1}^{n_{DP}} V_{Act,AS,i}(t)$$

Where  $V_{Act,AS,i}(t)$  as the average power provided for mFRR in Delivery Point 'i' during the AMT Hour 't'

AMT Hour	DA Price	Method	Average power provided for mFRR	Correction Participation in AS
19:00 -> 20:00	€ 550,00	3	0	0
20:00 -> 21:00	€ 600,00	3	0	0





#### **Correction for participation in Redispatching Services**

As IndustryOfTheFuture.SA/NA chooses to **not participate into redispatching services**, the volume to be applied to the Initial Active Volume is equals to **0 MW** for each AMT Hours concerned.

If the Delivery Point had participated in the redispatching services, Elia would have applied the following formula to determine the volume of the correction:

 $V_{Pas,RD}(CMU,t) = \sum_{i=1}^{n_{DP}} V_{Pas,RD,i}(t)$ 

Where  $V_{Act,RD,i}(t)$  is the value in MW of the upwards Activation of Redispatching Service, upon instruction by ELIA, for Delivery Point 'i' and AMT Hour 't' described in this step

AMT Hour	DA Price	Method	Participation in Redispatching
19:00 -> 20:00	€ 550,00	3	0
20:00 -> 21:00	€ 600,00	3	0





# **Determination of the Passive Volume**

According to the value calculated previously, Elia is able to determine the Passive Volume of the Delivery Point,

AMT Hour	DA Price	Method	Initial Passive Volume	Participation in AS	Participation in Redispatching	Passive Volume
19:00 -> 20:00	€ 550,00	3	2	0	0	2
20:00 -> 21:00	€ 600,00	3	2	0	0	2





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## Determination of the Required Volume

€ 600.00

20:00 -> 21:00

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.

As IndustryOfTheFuture.SA/NA has declared the **same prices** for the **Day-Ahead** market and the **Intraday** market, it is not necessary to look at the Intraday Market price to determine the Required Volume.

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

10,4

10,4 <b>450</b> 450 N/A
AMT HourReference PriceMethodHighest Associated(DA Price)Volume for DA
19:00 -> 20:00 € 550,00 3 10,4

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#### **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	10,4	N/A	N/A	N/A	10,4
07:00 -> 08:00	€ 300,00	1	10,4	9,4	N/A	N/A	10,4
08:00 -> 09:00	€ 360,00	1	10,4	9,4	N/A	N/A	10,4
09:00 -> 10:00	€ 410,00	2	10,4	9,4	N/A	N/A	9,4
10:00 -> 11:00	€ 400,00	2	10,4	9,4	N/A	N/A	9,4
11:00 -> 12:00	€ 250,00	1	10,4	N/A	N/A	N/A	10,4
16:00 -> 17:00	€ 180,00	1	10,4	N/A	N/A	N/A	10,4
17:00 -> 18:00	€ 250,00	1	10,4	N/A	N/A	N/A	10,4
18:00 -> 19:00	€ 480,00	2	10,4	10	N/A	N/A	10
19:00 -> 20:00	€ 550,00	3	10,4	10,4	10,4	2	10,4
20:00 -> 21:00	€ 600,00	3	10,4	10,4	10,4	2	10,4
21:00 -> 22:00	€ 410,00	2	10,4	9,4	N/A	N/A	9,4
22:00 -> 23:00	€ 320,00	1	10,4	N/A	N/A	N/A	10,4







	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)
ſ	€ 150,00	06:00 -> 07:00	No	0	10,4	
	€ 300,00	07:00 -> 08:00	No	0	10,4	
AMT Moment 1	€ 360,00	08:00 -> 09:00	No	0	10,4	
AMI Moment 1	€ 410,00	09:00 -> 10:00	Yes	0	9,4	
	€ 400,00	10:00 -> 11:00	Yes	0	9,4	
	€ 250,00	11:00 -> 12:00	No	0	10,4	
ĺ	€ 180,00	16:00 -> 17:00	No	0	10,4	
	€ 250,00	17:00 -> 18:00	No	0	10,4	
	€ 480,00	18:00 -> 19:00	Yes	10	10	
AMT Moment 2	€ 550,00	19:00 -> 20:00	Yes	10	10,4	
	€ 600,00	20:00 -> 21:00	Yes	10	10,4	
	€ 410,00	21:00 -> 22:00	Yes	10	9,4	
L	€ 320,00	22:00 -> 23:00	No	0	10,4	

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Payback Obligation

Period





# **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)

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

Where  $P_{Unavailable,Announced}(CMU,t)$  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) = Max(MC(CMU,t) - AMC(CMU,t);0)

 As IndustryOfTheFuture.SA/NA has not communicated any Unavailable Capacity for the 10/01/2026, all Missing Capacity detected by Elia for this day will be considered as Unannounced Missing Capacity







## **Determination of the Available Capacity**

AMT Hour	Announced Unavailability (MW)	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)	Announced Missing Capacity (MW)	Unannounced Missing Capacity (MW)
06:00 -> 07:00	0	0	10,4	0	0	0
07:00 -> 08:00	0	0	10,4	0	0	0
08:00 -> 09:00	0	0	10,4	0	0	0
09:00 -> 10:00	0	0	9,4	0	0	0
10:00 -> 11:00	0	0	9,4	0	0	0
11:00 -> 12:00	0	0	10,4	0	0	0
16:00 -> 17:00	0	0	10,4	0	0	0
17:00 -> 18:00	0	0	10,4	0	0	0
18:00 -> 19:00	0	10	10	0	0	0
19:00 -> 20:00	0	10	10,4	0	0	0
20:00 -> 21:00	0	10	10,4	0	0	0
21:00 -> 22:00	0	10	9,4	0,6	0	0,6
22:00 -> 23:00	0	0	10,4	0	0	0







	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	10,4	0
	€ 300,00	07:00 -> 08:00	No	0	10,4	0
	€ 360,00	08:00 -> 09:00	No	0	10,4	0
	€ 410,00	09:00 -> 10:00	Yes	0	9,4	0
	€ 400,00	10:00 -> 11:00	Yes	0	9,4	0
l	€ 250,00	11:00 -> 12:00	No	0	10,4	0
ז	€ 180,00	16:00 -> 17:00	No	0	10,4	0
	€ 250,00	17:00 -> 18:00	No	0	10,4	0
AMT Moment 2 🗖	€ 480,00	18:00 -> 19:00	Yes	10	10	0
	€ 550,00	19:00 -> 20:00	Yes	10	10,4	0
	€ 600,00	20:00 -> 21:00	Yes	10	10,4	0
	€ 410,00	21:00 -> 22:00	Yes	10	9,4	0,6
	€ 320,00	22:00 -> 23:00	No	0	10,4	0





## Determination of the Unavailability Penalty

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



#### 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
- Weigthed Contract Value(CMU, t) is calculated as follow

Waighted Contract Value(CMILt) -	$\sum_{i=1}^{N} Capacity Remuneration_i * Contracted Capacity_i$
W eighted Contract V and (CMO, t) =	$\sum_{i=1}^{N}$ Contracted Capacity <sub>i</sub>





## Determination of the Unavailability Penalty

1. Elia first determines the **value of the Missing Capacity** for every SLA Hours of the CMU. Thus, Elia will only monitored hours between 18:00 and 22:00.

AMT Hour	Announced Missing Capacity (MW)	Unannounced Missing Capacity (MW)	Weighted Contract Value (€/MW)	X Factor AMC / UMC	Unavailability Penalty (€)
18:00 -> 19:00	0	0	17.000	0,9 / 1	
19:00 -> 20:00	0	0	17.000	0,9 / 1	240
20:00 -> 21:00	0	0	17.000	0,9 / 1	340
21:00 -> 22:00	0	0,6	17.000	0,9 / 1	

 $\sum_{t=1}^{T} (1+X) * Weighted Contract Value(CMU, t) * UMC(CMU, t) + \sum_{t=1}^{T} (1+X) * Weighted Contract Value(CMU, t) * AMC(CMU, t)$ 

2. Then, Elia determines the terms to relative the amount of penalty. UP is a constant common to all CMU and T, in this case, is equals to the number of selected SLA hours of the CMU on that day.

1	Т	4
$\overline{T * UP}$	UP	15





#### Unavailability Penalty and Penalty Cap

IndustryOfTheFuture.SA/NA has **failed** to meet its **Availability Obligation** on the AMT Moments 2 and therefore is **sanctioned** with **340** €. As there were no SLA hours on the AMT Moment 1, Elia does not monitor these hours and therefore, no Unavailability Penalty is applicable.

- > AMT Moment 1 = 0 €
- > AMT Moment  $2 = \frac{20.400}{4*15} = 340 €$

As, this is the first penalty for the CMU and the Unavailability Penalty does not exceed the monthly or yearly penalty Cap, the penalty of 340 € will be applied on the monthly remuneration of IndustryOfTheFuture.SA/NA

Monthly penalty cap	34.000€
Yearly penalty cap	170.000€

Where **Monthly penalty cap** is limited 20% of the sum of the awarded Capacity Remunerations in the Auctions for the Delivery Period multiplied with their respective Contracted Capacities in the Auctions.

Where **Yearly penalty cap** is limited **to the sum** of the awarded Capacity Remunerations in the Auctions for the Delivery Period multiplied with their respective Contracted Capacities in the Auctions.



# 4. AMT Moment Monitoring –Declared Market Price

Input for the Payback Obligation

#### (Partial) Declared Prices

Ass Vol	(p)DDAP	(p)DIDP
10,4	450	450
9,4	400	400

	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	10,4	€ 450
	€ 360,00	€ 510,00	08:00 -> 09:00	10,4	€ 450
	€ 410,00	€ 300,00	09:00 -> 10:00	9,4	€ 400
	€ 400,00	€ 250,00	10:00 -> 11:00	9,4	€ 400
	€ 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	10,4	€ 450
	€ 550,00	€ 520,00	19:00 -> 20:00	10,4	€ 450
	€ 600,00	€ 520,00	20:00 -> 21:00	10,4	€ 450
	€ 410,00	€ 450,00	21:00 -> 22:00	10,4	€ 450
	€ 320,00	€ 360,00	22:00 -> 23:00	0	NA