Availability Obligations & Penalties Use Case 2

Additional aggregated 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 <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

- 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



		Information related to the project
Technology		DP1: / DP2: / DP3: / DP4: / DP5: / DP6 / DP7: / DP8: / DP9: / DP10:
CRM Capacity	Туре	DP1: Existing / DP2: Existing / DP3: Existing / DP4: Existing / DP5: Existing / DP6: Existing / DP7: Existing / DP8: Existing / DP9: Additional / DP10: Additional
		CIMU: Additional
	Nominal reference power	DP1: 1 MW / DP2: 1 MW / DP3: 1 MW / DP4: 0.672 MW / DP5: 1,7 MW / DP6: 0,8 MW / DP7: 0,6 MW / DP8: 2 MW/ DP9: 1 MW / DP10: 2 MW
		CMU: 11,72 MW
	Opt-out	DP1: 0 MW / DP2: 0 MW / DP3: 0 MW / DP4: 0.2 MW / DP5: 0,2 MW / DP6: 0,7 MW / DP7: 0 MW / DP8: 0 MW/ DP9: 0,3 MW / DP10: 0,3 MW
		CMU: 1,7 MW
	Reference power	10,02 MW
	Derating factor	0,3
	Eligible volume	3,01 MW
	Energy-Constrained CMU	Energy Constrained CMU
Requested Capacity	Contract Duration	3 years
Received Capacity C	ontract Duration	1 year





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	DP4	DP5	DP6	DP7	DP8	DP11
NRP [MW]	1	0,96	1,02	0,71	1,71	0,8	0,58	1,92	6,4
lnj/Off	Inj	Inj	Inj	Inj	Inj	Inj	Inj	Off	Off



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:



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

Secondary Transaction

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







2. (Partial) Declared Prices and Unavailable Capacity

Declared Day-Ahead Price (DDAP)

A. AggregaTHOR has declared on the CRM IT interface its DDAP of **1.000 €/MWh** on 15/09/2025

(Partial) Declared Prices declaration and update

- 1. On 15/09/2025, AggregaTHOR has declared **one Partial Declared Day-Ahead Price (pDDAP)** of **450 €/MWh** with an **Associated Volume** of **10,2 MW**
- 2. On 15/09/2025, AggregaTHOR has declared **one Partial Declared Intraday Prices (pDIDP)** of **450 €/MWh** with an **Associated Volume** of **10,2 MW**

Unavailable Capacity

- AggregaTHOR does not communicate any Unavailable Capacity throughout the Delivery Period
- Therefore, Elia considers the Remaining Maximum Capacity as equals to the NRP

 P_{Max.Remaining}(CMU, t) = 15,1 MW
- The **Remaining Maximum Capacity DA** also equals NRP = **15,1 MW** absent to any further declarations





A. Declaration of DDAP, pDDAP and pDIDP on 15/09/2025 – Accepted

Associated Volume (MW)	Day-Ahead Market (€/MWh)	Intraday Market (€/MWh)	Balancing Market (€/MWh)	
NRP = 15,1	1.000	N/A	N/A	
10,2	450	450	N/A	

- This declaration is accepted by Elia because:
 - The DDAP does not exceed the Day-Ahead price cap at the time of submission; and
 - The pDDAP does not exceed the DDAP; and
 - The pDIDP does not exceed the intraday price cap of the chosen reference at the time of submission; and
 - The Associated Volume for the pDIDP has an associated pDDAP







3. Participation in Ancillary or Redispatching Services

Redispatching Services

- AggregaTHOR notified that Delivery Points 4 and 6 are committed to redispatching services
- Elia takes into account activations for redispatching in the determination of Available Capacity.









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				
MT Moment 4	€ 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				



- As AggregaTHOR 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
 - 3. Among those hours, Elia retains only the AMT Hours comprising the AMT Moment with highest Active Volume



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Ass Vol	(p)DDAP	(p)DIDP
15,1	1.000	N/A
10,2	450	450

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- 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 1 has an average Active Volume of 12,08 MW compared to the average Active Volume of 2,8 MW of AMT Moment 2.
- Therefore, the 2 AMT Hours between 07:00 and 09:00 are selected to be the SLA Hours of the CMU for that day





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







Identification of AMT Hours/Moments Determine Capacity Determine Available Capacity Determine Missing Capacity

Determine Unavailability Penalty

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity	
	€ 150,00	06:00 -> 07:00	No	0			
	€ 300,00	07:00 -> 08:00	Yes	13,6			
AMT Moment 1 -	€ 360,00	08:00 -> 09:00	Yes	13,6			
	€ 410,00	09:00 -> 10:00	No	0			
	€ 400,00	10:00 -> 11:00	No	0			
	€ 250,00	11:00 -> 12:00	No	0			
	€ 180,00	16:00 -> 17:00	No	0			
	€ 250,00	17:00 -> 18:00	No	0			
	€ 480,00	18:00 -> 19:00	No	0			
AMT Moment 2 🗧	€ 550,00	19:00 -> 20:00	No	0			η
	€ 600,00	20:00 -> 21:00	No	0			ſ
	€ 410,00	21:00 -> 22:00	No	0			
	€ 320,00	22:00 -> 23:00	No	0			





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Determination of the Available Capacity

As AggregaTHOR 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

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

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





Determination of the Initial Active Volume

As AggregaTHOR provides capacity by both the **reduction of offtake from and injection into** electricity grid, the Initial Active Volume of the Delivery Point is calculated according to the following formula:

Off	V _{Act} ,	Initial,i($t) = P_{Me}$	easured,i	$(t) - P_B$	Baseline,i	(<i>t</i>)			D	P1 [DP2	DP3	DP4	DP5	DP6	DP7	DP	8 DP11
									NRP [M	W] 1	C),96	1,02	0,71	1,71	0,8	0,58	1,9	2 6,4
Inj		V _{Act} ,	Initial,i (t	$t) = P_{mo}$	easured,i	(t)			lnj/Off	In	j lı	nj	Inj	Inj	Inj	Inj	Inj	Off	Off
AMT Hour	Basel	ine (MV	V)							Meas	ured Po	ower (N	IW)						Initial Active
																			Volume
DP#		2	3	4	5	6	7	8	11		2	3	4	5	6	7	8	11	
07:00 -> 08:00	NA	NA	NA	NA	NA	NA	NA	-2	-6,3	0	0,96	1,02	0,71	1,71	0,8	0	-2	0	11,5
08:00 -> 09:00	NA	NA	NA	NA	NA	NA	NA	-2	-6,3	0	0,96	1,02	0,71	1,71	0,8	0	-2	0	11,5
18:00 -> 19:00	NA	NA	NA	NA	NA	NA	NA	-2	-6,3	0	0	0	0	0	0	0	-2	-1	5,3
19:00 -> 20:00	NA	NA	NA	NA	NA	NA	NA	-2	-6,4	0	0	0	0	0	0	0	-2	-3,3	3,1
20:00 -> 21:00	NA	NA	NA	NA	NA	NA	NA	-2	-6,2	0	0	0	0	0	0	0	-2	-6,2	0



AggregaTHOR did not notify any Delivery Points participating in frequency-related Ancillay Services

=> The correction for participation in frequency-related Ancillary Services is **0** MW for all AMT hours





Correction for participation in Redispatching Services

As AggregaTHOR notified that **Deliver Points 4 and 6** are committed to Redispatching Services, Elia will account for downward activations in determining Active Volume according to the following formula:

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

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.

Between 07:00 and 09:00 Elia instructs DP 6 to reduce the output by 0,58 MW compared to the latest scheduling information in the context of redispatching services.

AMT Hour		Average	downwar	ds activati	on for red	lispatchin	g service				Correction of Active Volume
	DP#	1	2	3	4	5	6	7	8	11	
07:00 -> 08:00		NA	NA	NA	NA	0	NA	0,58	NA	NA	0,58
08:00 -> 09:00		NA	NA	NA	NA	0	NA	0,58	NA	NA	0,58
18:00 -> 19:00		NA	NA	NA	NA	0	NA	0	NA	NA	0
19:00 -> 20:00		NA	NA	NA	NA	0	NA	0	NA	NA	0
20:00 -> 21:00		NA	NA	NA	NA	0	NA	0	NA	NA	0





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	Initial Active Volume	Participation in AS	Participation in Redispatching	Active Volume
07:00 -> 08:00	11,5	0	0,58	12,08
08:00 -> 09:00	11,5	0	0,58	12,08
18:00 -> 19:00	5,3	0	0	5,3
19:00 -> 20:00	3,1	0	0	3,1
20:00 -> 21:00	0	0	0	0





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**





Determination of the Initial Passive Volume

As AggregaTHOR provides capacity by both the **reduction of offtake from and injection into** from electricity grid, the Initial Passive Volume of the Delivery Point is calculated according to the following formula:

$V_{Pas,Initial,i}(t) = UM_i(t) - P_{Measured,i}(t)$		DP1	DP2	DP3	DP3	DP4	DP5	DP6	
	NRP [MW]	1	0,96	1,02	0,71	1,71	0,8	0,58	1,92
$) = NPP_{i}(t) = P_{i}(t)$	Inj/Off	Inj	Inj	Inj	Inj	Inj	Inj	Inj	Off

AMT Hour Measured Power (MW)				Unsheddable Margin (MW)					Initial Passive Volume										
DP#	1	2	3	4	5	6	7	8	11	1	2	3	4	5	6	7	8	11	
19:00 -> 20:00	0	0	0	0	0	0	0	-2	-3,3	NA	0	0	12,08						
20:00 -> 21:00	0	0	0	0	0	0	0	-2	-6,2	NA	0	0	14,98						



AggregaTHOR did not notify any Delivery Points participarting in frequency-related Ancillay Services

=> The correction for participation in frequency-related Ancillary Services is **0** MW for all AMT hours





Correction for participation in Redispatching Services

As AggregaTHOR notified that **Deliver Points 4 and 6** are committed to Redispatching Services, Elia will account for upward activations in determining Passive Volume according to the following formula:

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

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 Average downwards activation for redispatching service							Correction Passive Volume	of			
DP#	: 1	2	3	4	5	6	7	8	11		
19:00 -> 20:00	NA	NA	NA	NA	0	NA	0	NA	NA	0	
20:00 -> 21:00	NA	NA	NA	NA	0	NA	0	NA	NA	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	Initial Passive Volume	Participation in AS	Participation in Redispatching	Passive Volume
19:00 -> 20:00	12,08	0	0	12,08
20:00 -> 21:00	14,98	0	0	14,98





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.

As AggregaTHOR 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 a (Partial) Declared Price was surpassed by the Reference Price

Ass Vol	(p)DDAP	(p)DIDP
15,1	1.000	N/A
10,2	450	450

AMT Hour	Reference Price (DA Price)	Intraday reference	Highest Associated Volume	Required Volume
19:00 -> 20:00	€ 550,00	€ 520,00	10,2	10,2
20:00 -> 21:00	€ 600,00	€ 520,00	10,2	10,2







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	15,1	N/A	N/A	N/A	15,1
07:00 -> 08:00	€ 300,00	1	15,1	12,08	N/A	N/A	15,1
08:00 -> 09:00	€ 360,00	1	15,1	12,08	N/A	N/A	15,1
09:00 -> 10:00	€ 410,00	1	15,1	N/A	N/A	N/A	15,1
10:00 -> 11:00	€ 400,00	1	15,1	N/A	N/A	N/A	15,1
11:00 -> 12:00	€ 250,00	1	15,1	N/A	N/A	N/A	15,1
16:00 -> 17:00	€ 180,00	1	15,1	N/A	N/A	N/A	15,1
17:00 -> 18:00	€ 250,00	1	15,1	N/A	N/A	N/A	15,1
18:00 -> 19:00	€ 480,00	1	15,1	5,3	N/A	N/A	15,1
19:00 -> 20:00	€ 550,00	3	15,1	3,1	10,2	12,08	8
20:00 -> 21:00	€ 600,00	3	15,1	0	10,2	14,98	4,9
21:00 -> 22:00	€ 410,00	1	15,1	9,4	N/A	N/A	15,1
22:00 -> 23:00	€ 320,00	1	15,1	N/A	N/A	N/A	15,1







	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)
ſ	€ 150,00	06:00 -> 07:00	No	0	15,1	
AMT Moment 1 🖃	€ 300,00	07:00 -> 08:00	Yes	13,5	15,1	
	€ 360,00	08:00 -> 09:00	Yes	13,5	15,1	
	€ 410,00	09:00 -> 10:00	No	0	15,1	
	€ 400,00	10:00 -> 11:00	No	0	15,1	
	€ 250,00	11:00 -> 12:00	No	0	15,1	
٦	€ 180,00	16:00 -> 17:00	No	0	15,1	
	€ 250,00	17:00 -> 18:00	No	0	15,1	
	€ 480,00	18:00 -> 19:00	No	0	15,1	
AMT Moment 2 -	€ 550,00	19:00 -> 20:00	No	0	8	
	€ 600,00	20:00 -> 21:00	No	0	4,9	ſ
	€ 410,00	21:00 -> 22:00	No	0	15,1	
	€ 320,00	22:00 -> 23:00	No	0	15,1	

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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 AggregaTHOR 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	15,1	0	0	0
07:00 -> 08:00	0	13,5	15,1	0	0	0
08:00 -> 09:00	0	13,5	15,1	0	0	0
09:00 -> 10:00	0	0	15,1	0	0	0
10:00 -> 11:00	0	0	15,1	0	0	0
11:00 -> 12:00	0	0	15,1	0	0	0
16:00 -> 17:00	0	0	15,1	0	0	0
17:00 -> 18:00	0	0	15,1	0	0	0
18:00 -> 19:00	0	0	15,1	0	0	0
19:00 -> 20:00	0	0	8	0	0	0
20:00 -> 21:00	0	0	4,9	0	0	0
21:00 -> 22:00	0	0	15,1	0	0	0
22:00 -> 23:00	0	0	15,1	0	0	0





Determine Missing Capacity

	DA Price	AMT Hour	SLA Hour	Obligated Capacity (MW)	Available Capacity (MW)	Missing Capacity (MW)	
ſ	€ 150,00	06:00 -> 07:00	No	0	15,1	0	
	€ 300,00	07:00 -> 08:00	Yes	13,5	15,1	0	
AMT Moment 1 🚽	€ 360,00	08:00 -> 09:00	Yes	13,5	15,1	0	
	€ 410,00	09:00 -> 10:00	No	0	15,1	0	
	€ 400,00	10:00 -> 11:00	No	0	15,1	0	
	€ 250,00	11:00 -> 12:00	No	0	15,1	0	
ſ	€ 180,00	16:00 -> 17:00	No	0	15,1	0	
	€ 250,00	17:00 -> 18:00	No	0	15,1	0	
	€ 480,00	18:00 -> 19:00	No	0	15,1	0	
AMT Moment 2	€ 550,00	19:00 -> 20:00	No	0	8	0	Γ P
	€ 600,00	20:00 -> 21:00	No	0	4,9	0	
	€ 410,00	21:00 -> 22:00	No	0	15,1	0	
l	€ 320,00	22:00 -> 23:00	No	0	15,1	0	





Determination of the Unavailability Penalty

 AggregaTHOR is <u>not</u> sanctioned with an Unavailability Penalty for any Missing Capacity on their CMU(s). If there would have been Missing Capacity, this penalty 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 in accordance with the next slide





Determination of the Unavailability Penalty

Elia determines the **Weighted Contract Value** according to the following formula:

Waighted Contract Value(CMILt) -	$\sum_{i=1}^{N} Capacity Remuneration_i * Contracted Capacity_i$
W eighted contract V at $ue(CMO, t) =$	$\sum_{i=1}^{N} Contracted Capacity_i$

And since:

Transaction	Contracted Capacity	Capacity Remuneration
Primary Transaction (MW)	2,63	18 €/kW/y
Secondary Transaction #1 (MW)	1,0	25 €/kW/y
Secondary Transaction #2 (MW)	0,5	27 €/kW/y

Then:

Weighted Contract Value(CMU, t) =
$$\frac{18 * 2,63 + 25 * 1 + 27 * 0,5}{4,13} = 20,78 \frac{\notin}{kW}$$



4. AMT Moment Monitoring –Declared Market Price

Input for the Payback Obligation

(Partial) Declared Prices

Ass Vol	(p)DDAP	(p)DIDP
15,1	1.000	N/A
10,2	450	450

	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	10,2	€ 450	
	€ 360,00	€ 510,00	08:00 -> 09:00	10,2	€ 450	
	€ 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	10,2	€ 450	
	€ 550,00	€ 520,00	19:00 -> 20:00	10,2	€ 450	Pay
	€ 600,00	€ 520,00	20:00 -> 21:00	10,2	€ 450	
	€ 410,00	€ 450,00	21:00 -> 22:00	10,2	€ 450	
	€ 320,00	€ 360,00	22:00 -> 23:00	0	NA	