

Capacity Remuneration Mechanism

General Info Session

15/03/2024

Disclaimer

This document constitutes a commercial presentation for the Belgian Capacity Remuneration Mechanism (CRM) and is to be considered as an educational document facilitating understanding of all other CRM documents that together form the official legal and operational framework. As an introduction to the CRM, the commercial presentation sets out the wide range of principles governing the mechanism as a whole, focusing on the outlook for the operational rollout for the CRM 2024 and further, based on the current regulatory framework and purposely simplifying some items to facilitate understanding. Elia refers any readers wishing to gain a complete understanding to all relevant legal and explanatory references:

- The Law and its implementing Royal Decrees
 - ▶ <https://economie.fgov.be/nl/themas/energie/bevoorradingszekerheid/capaciteitsremunatiemechanis>
- The Functioning Rules, as approved by the Royal Decree of 30th of August 2023
 - ▶ https://www.ejustice.just.fgov.be/mopdf/2023/09/15_1.pdf#Page36
- The Capacity Contract, as approved by the CREG on 31st of August 2023
 - ▶ https://www.elia.be/-/media/project/elia/elia-site/electricity-market-and-system/adequacy/crm/2023/20230929_crm-capacity-contract-approved-by-creg-on-31082023_en.pdf

This commercial presentation is based on the current understanding and state of play, which may evolve as certain regulatory (Functioning Rules, Capacity Contract) and legal (Royal Decree, Law) documents still need to be formally approved and/or adopted or might evolve over time. This document has no legal value and if it is in any way inconsistent with existing legal or regulatory documents, then the latter shall prevail. The main objective of this document is to highlight the customer's obligations and opportunities within the Capacity Remuneration Mechanism.

All illustrative cases are fictive and are meant as relatable examples. Any similarities with real market parties are coincidental and unintended.

Disclaimer

This presentation represents the current design of the Belgian Capacity Remuneration Mechanism. At this time several changes are being introduced to the regulatory framework (Electricity Law, Royal Decrees governing the CRM and where relevant EC notification). At the time of this presentation these changes have not entered into force, but are expected to do so in the coming months. Amongst others, these are:

- The introduction of the Y-2 auction in 2025 for delivery 2027-2028.
- The introduction of multi-year contracts for existing capacity.
- The exemption of the payback obligation for DSM

Where relevant, this presentation already includes these evolutions.

This presentation has been prepared targeting Belgian Market Actors and does not dive into the specificities for the Cross-Border participation to the Belgian CRM. A dedicated session is planned for foreign Market Actors to elaborate on the Cross-Border specificities.



Today's General Session

Context

What is the CRM?

Getting to a contract:

- Types of Contracts
- Eligibility & Participation Assessment
- Prequalification
- Financial Security Obligation
- Auction
- Contract

Preparing for Delivery: Pre-Delivery Monitoring

Delivery Period:

- Availability Obligation
- Payback Obligation
- Secondary Market

Final notes



Context

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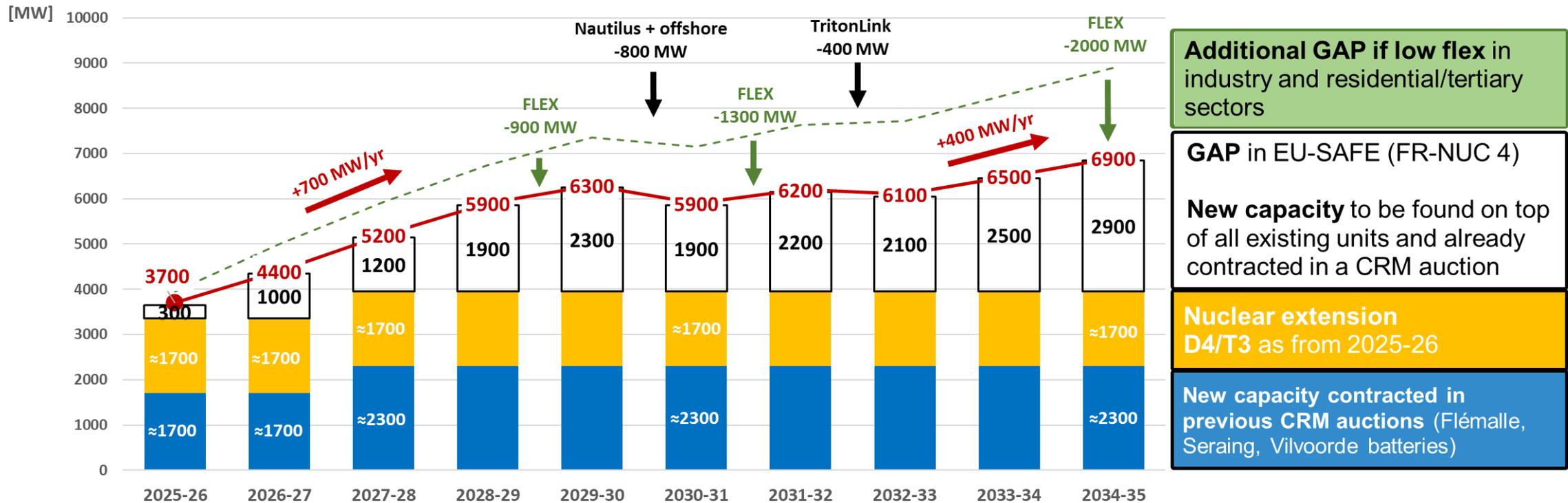


Context

The future of the Belgian energy landscape.
Why was the CRM introduced?
When was the CRM introduced & where are we today?
How can I get involved in the further development of the CRM?



Due to predicted higher energy offtake, renewables objectives and lower amounts of steerable capacity, Belgian authorities introduced the CRM with a view to maintaining the required level of security of supply for Belgium.



Based on the EU-SAFE scenario from the Adequacy & Flexibility study 2024-34 published in June 2023 complemented with the Flex LTO (keeping D4/T3 during winter 2025-26) and the results of the 3rd Y-4 auction for 2027-28. All other things equal.

Additional GAP if low flex in industry and residential/tertiary sectors

GAP in EU-SAFE (FR-NUC 4)

New capacity to be found on top of all existing units and already contracted in a CRM auction

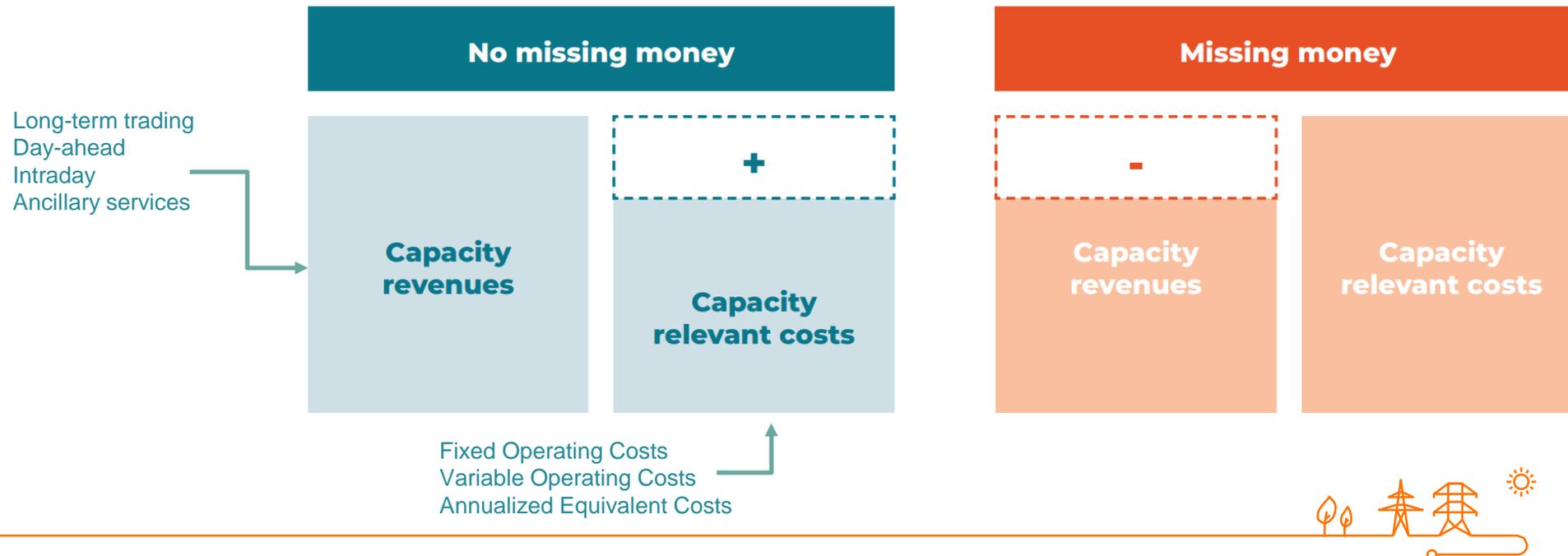
Nuclear extension D4/T3 as from 2025-26

New capacity contracted in previous CRM auctions (Flémalle, Seraing, Vilvoorde batteries)

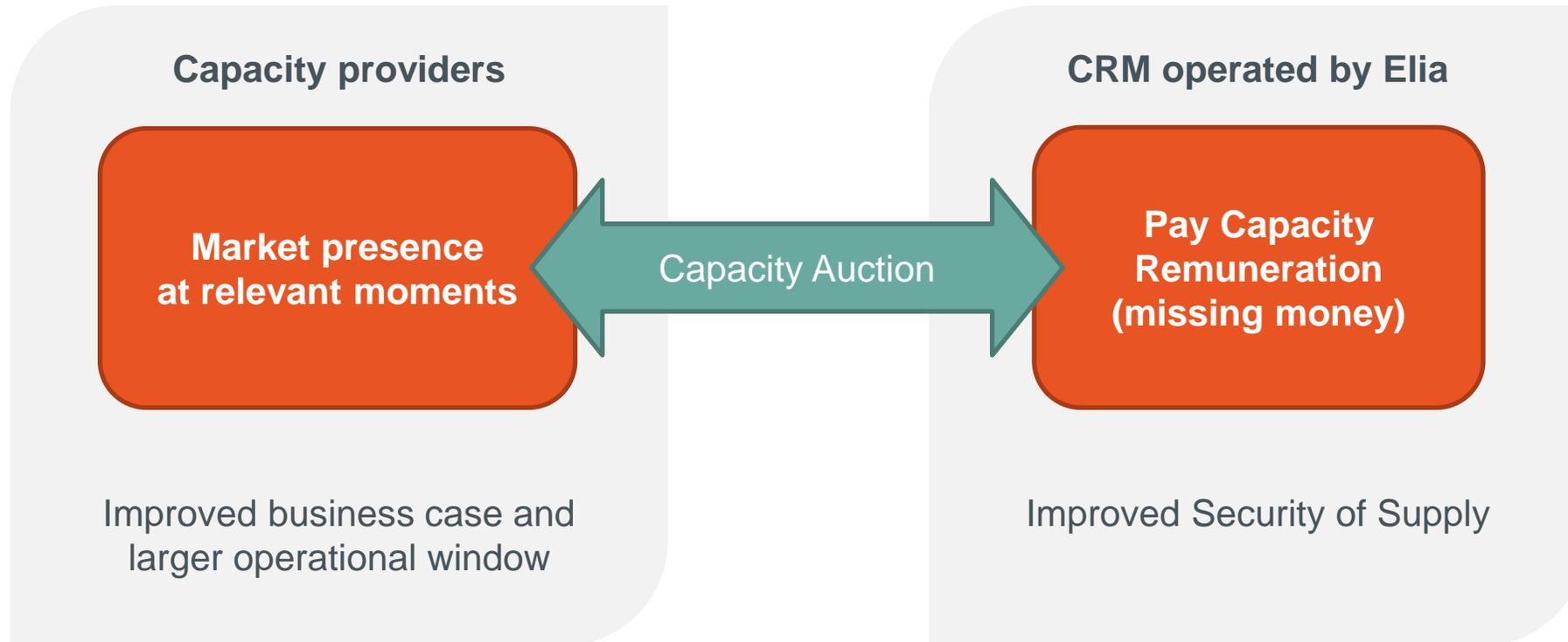
Existing capacity risks leaving the market and new capacity is not being built because of missing money issues.

Many capacity holders **lack a positive business case** to enable current and new capacities to be available on the market and to contribute to the Belgian security of supply.

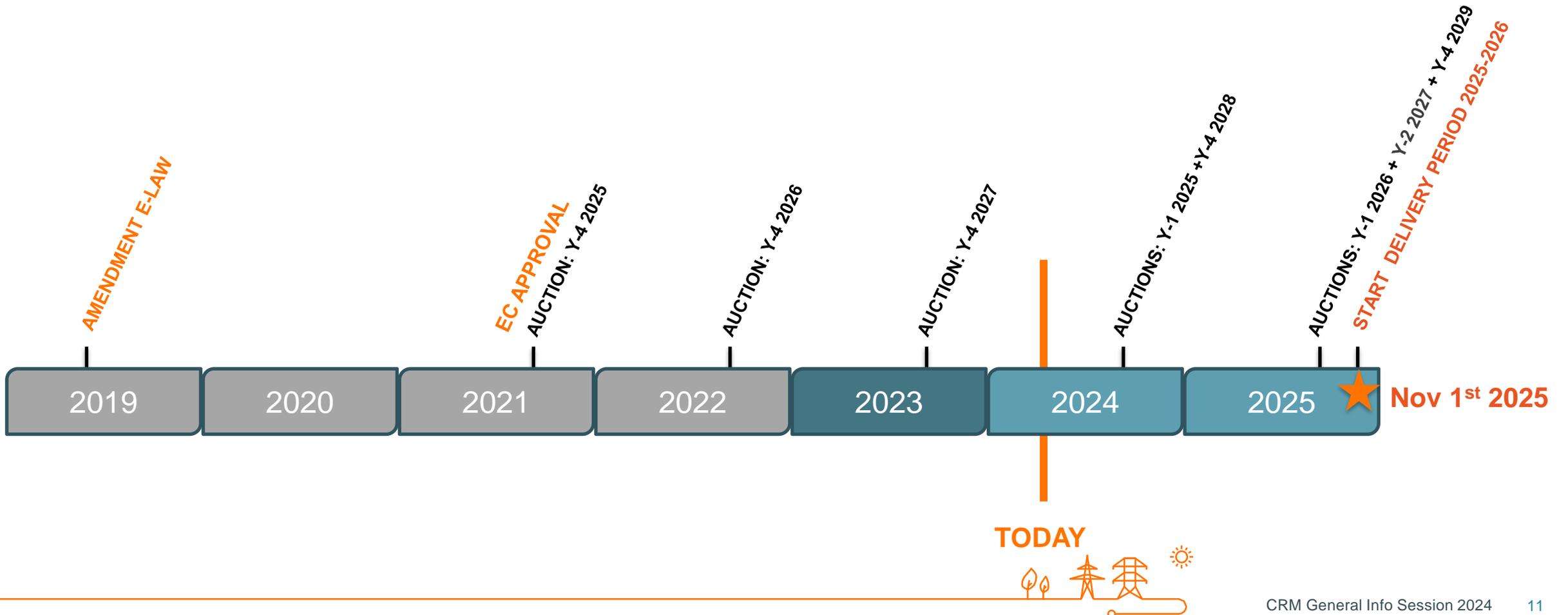
The **portion** of their capacity relevant cost that aren't compensated by their revenues is called **missing money**.



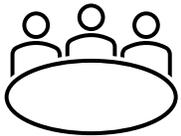
Remunerating the missing money to market parties so they can be present in the market when necessary, improves Security of Supply



The CRM was introduced by Belgian Authorities in 2019 via the Electricity Law followed by a series of Royal Decrees.



Evolutions in the CRM's modalities are discussed in Elia's Working Group Adequacy and are publicly consulted before formalisation and transfer to CREG for approval



Working Group Adequacy

Platform* where Elia, Government, CREG and Market Parties meet and discuss Adequacy Topics

<https://www.elia.be/en/users-group/adequacy-working-group>



Formal Public Consultations

Consultation of Elia's proposed changes for the CRM, open to market parties and the general public.

<https://www.elia.be/en/public-consultation>

* The platform was formerly known as 'Taskforce CRM', which can be consulted on Elia's website as well.

<https://www.elia.be/en/users-group/crm-implementation>



Context

What is the CRM?

Getting to a contract:

Types of Contracts

Eligibility & Participation Assessment

Prequalification

Financial Security Obligation

Auction

Contract

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Delivery Period:

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What is the CRM?

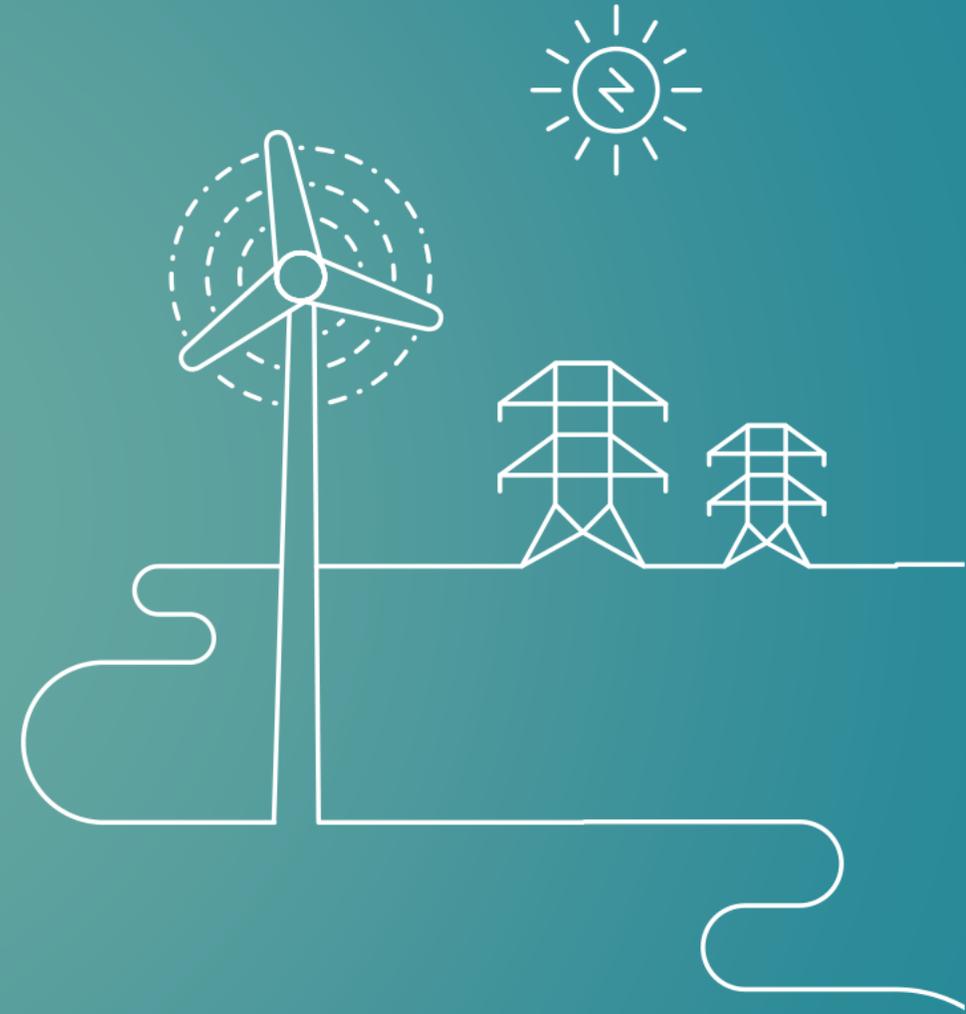
What is a CRM?

What is the goal of the CRM?

How does it fit in the energy market?

Who can participate? Are there limitations to participation?

When does it occur?

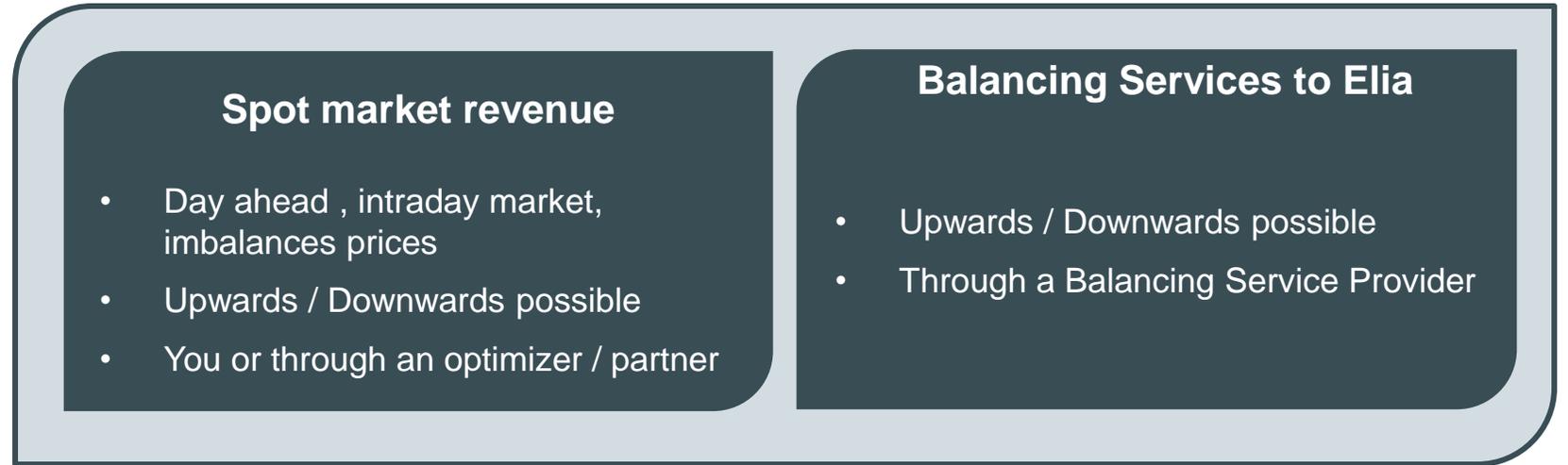


As the CRM is a support mechanism for missing money assets, it works on top of regular market operations, without impacting them.

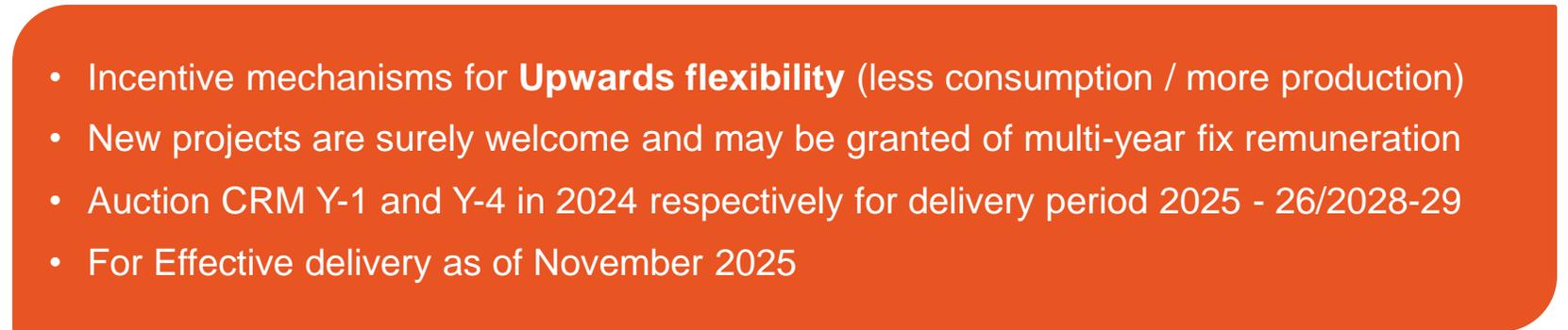
Your (upcoming) Flexibility sources



Energy Markets revenue

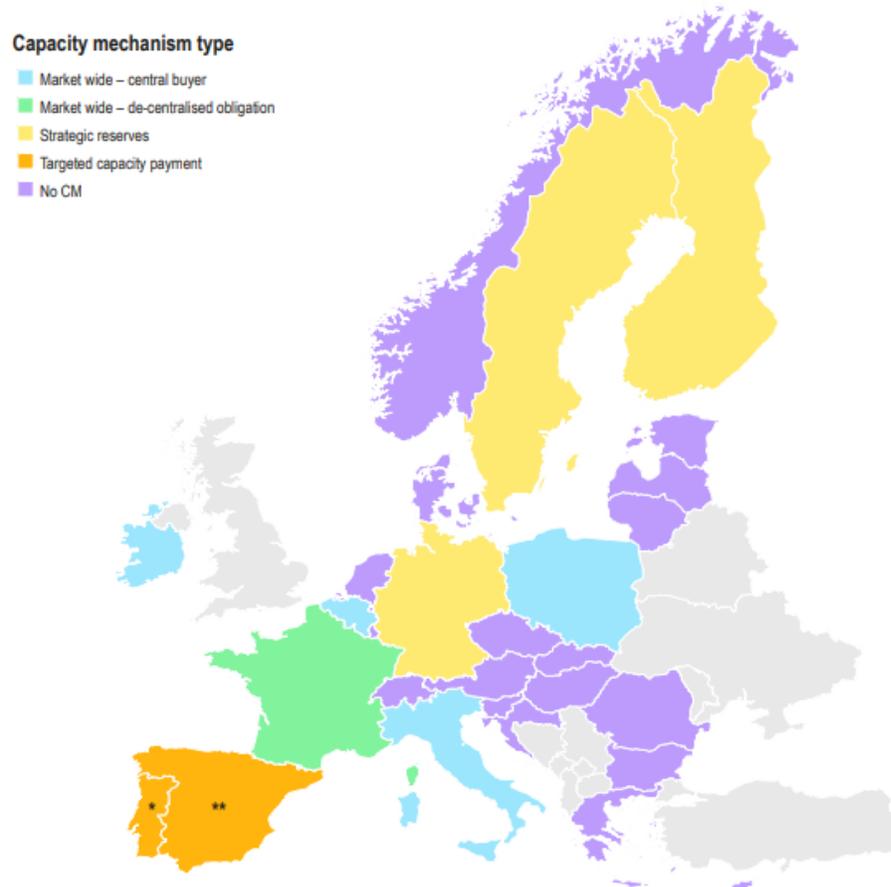


Capacity Remuneration yearly fixed revenue



Many variants of Capacity Mechanisms exist.
The Belgian CRM is a centralised support mechanism.

Capacity mechanisms in the EU-27 – 2021



Capacity Mechanisms in Europe:

UK, Ireland, Poland, France, Italy, ... each have their own variants of Capacity Mechanisms.

CRM in Belgium:

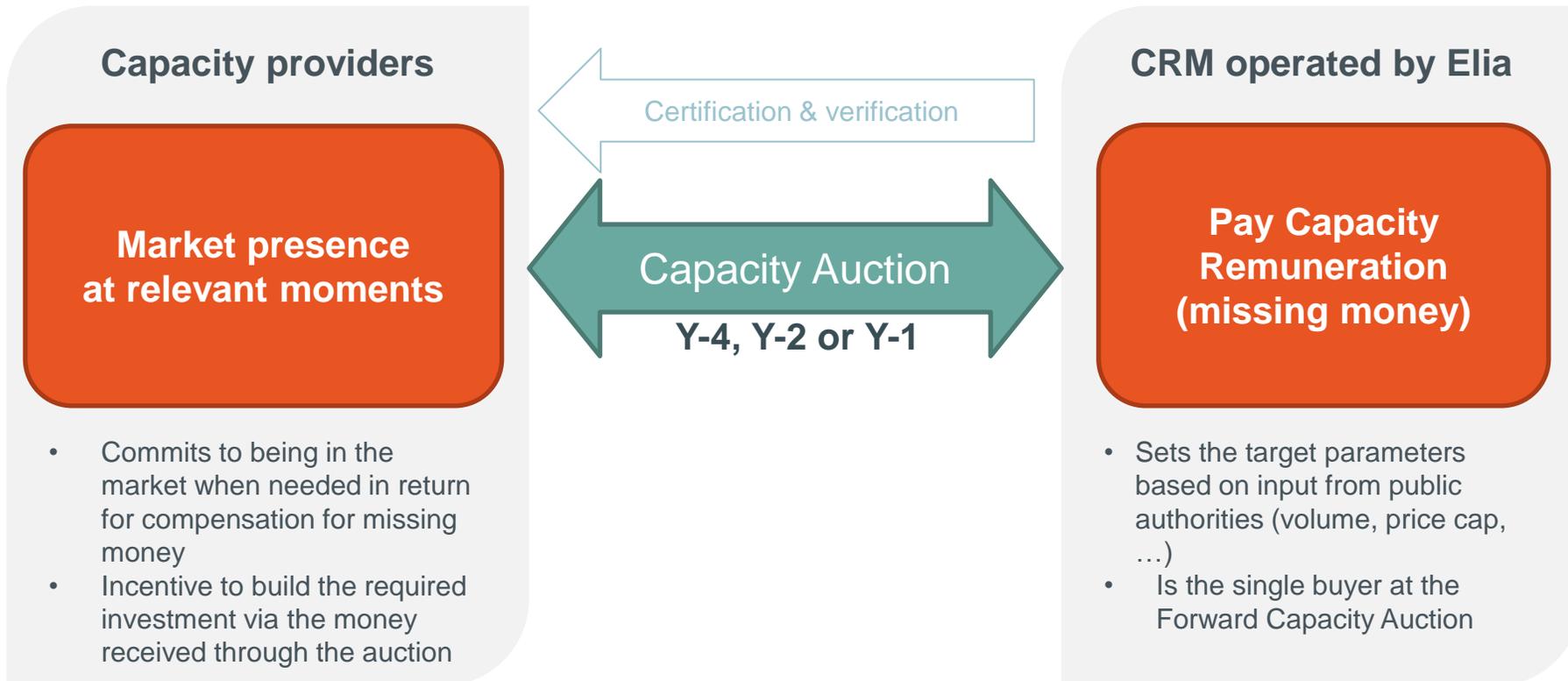
The Belgian CRM is:

- a centralized mechanism
- ran by the TSO
- that remunerates missing money



The CRM aims to support existing capacity to remain in the market and attract new capacity by supporting investments, in order to reach the SoS Reliability Standard.

Principle: TSO as 'single buyer' contracts sufficient capacity 4, 2 or 1 year(s) in advance to be available at adequacy-relevant moments. Capacity Providers get rewarded for increasing their flexibility.



The Capacity Remuneration Mechanism is based on the following 4 pillars:

Volume-based:

procures a predefined volume of derated capacity covering the legal adequacy criteria by means of a demand curve set by the minister of energy based on a proposal by CREG, for which the TSO provides several elements.

Centralized procurement:

The TSO is the contractual counterparty for all CRM contracts and issues the capacity remuneration in return for the service provided

Market-wide & technology neutral:

Open to new, refurbished or existing capacity as well as demand, storage, production and aggregated units fitting the prequalification criteria

Reliability Option:

An agreement whereby the capacity provider commits to reimburse energy revenues surpassing a pre-defined strike price



Capacity Remuneration Mechanisms 'CRM' in a nutshell

Belgian Authorities Capacity Mechanism(s)

Secure the supply/demand balance after 2025/2026

Incentive for **upwards flexibility and market presence**

- Consumption able to decrease in case of high prices
- Injection available for the market (even local)

Service to deliver in the delivery period?

A yearly commitment to **add your capacity to the energy markets (with your activation price*)**

Checks?

Only **in case of very high prices identified the day before** *or in case of test*

**Offtake points & small-scale injections (<25MW)*

Who participates?

The **grid user or mandated partner** with your projects and existing capacity

How?

By 15/06, a file submission.

By 30/09, a Bid in the Auction.

Idea of a CRM yearly fix revenue?

Max **84 800€/MW /y**

For new capacities

Max **26 000€/MW /y**

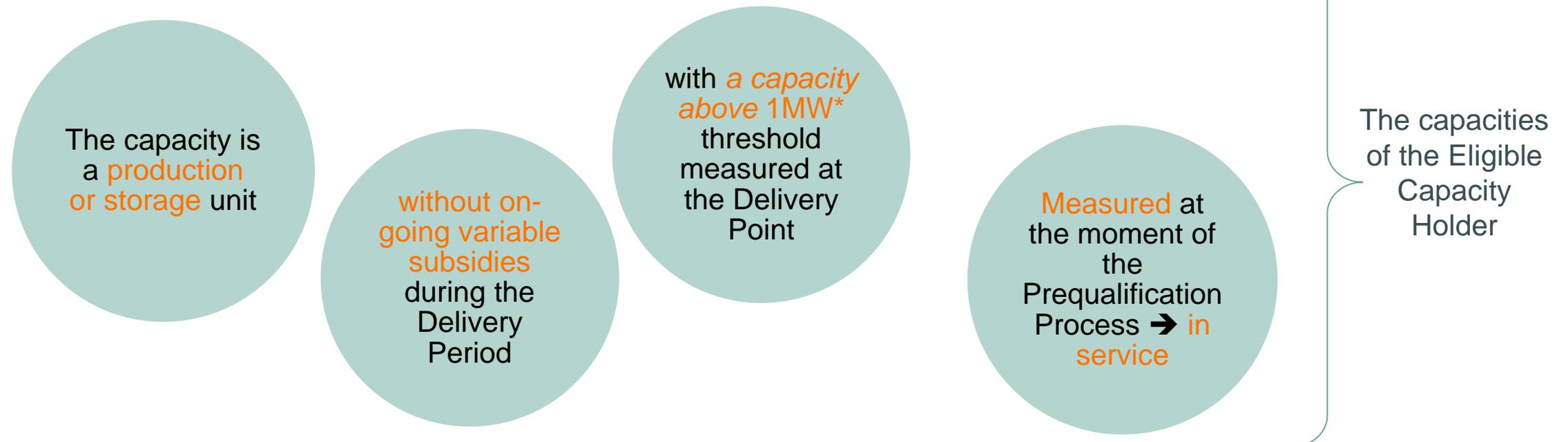
For existing capacities

(2023 figures)

Capacities that meet certain criteria are obligated to prequalify for the CRM, while others are free to join* the market-wide CRM

*provided they comply with a set of eligibility criteria, including the refusal of other variable subsidies during the delivery period and the creation of participation units of at least 1 MW of derated capacity.

→ The **Prequalification Process** is **mandatory for the capacity holder** when four conditions are simultaneously met:



→ Other projects or existing flexibilities may **want** to prequalify for the CRM on purpose but have no obligation to do so



* Such threshold is to be considered as after application of the derating factor – see later

The capacity a CMU can offer in auction (Eligible Volume) is limited by a derating factor, which represents the degree to which the technology contributes to Security of Supply.

All technologies are subject to the application of a **derating factor**.

Derating factors change in function of:

TYPE OF TECHNOLOGY

Some technologies have **external dependencies** in their contribution to adequacy.

In Belgium, adequacy relevant moments typically occur during cold and dark winter moments. As such, solar may, for example, contribute less than offshore wind during such moments and is given a lower derating factor. Consequently, a lower fraction of their nominal reference power can participate to the auction.

ENERGY CONSTRAINED CMU?

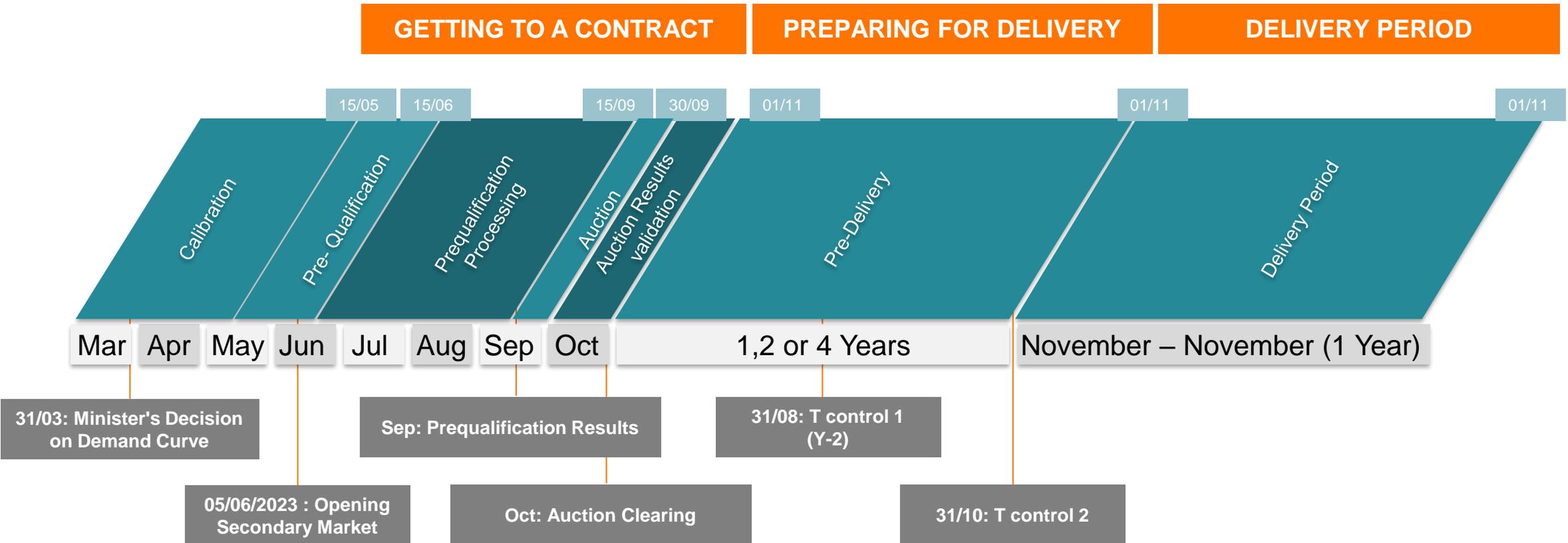
A CMU is considered **Energy Constrained** if it can only deliver energy or reduce its consumption for a **limited number of hours** per day. The available amount of hours per day during which it can deliver such service is called the Service Level Agreement-(SLA).

A smaller SLA results in **lower derating factor** and a **smaller eligible fraction** of their nominal reference power participating to the auction.

CMU WITH DAILY SCHEDULE?

Facilities with **capacities exceeding 25MW** are obligated to **report their expected delivered capacities** to Elia **daily**.





GETTING TO A CONTRACT:

- **Types of Contracts**
In what ways can I engage with the CRM?
- **Eligibility and Participation Assessment:**
Can and should I participate?
- **Prequalification:**
Administration for possible participation to the CRM
- **Financial Security Obligation:**
Financial Securities are needed to hedge for the risk of deficiency
- **Auction:**
Bidding to get selected
- **Contract:**
Formalisation of participation

PREPARING FOR DELIVERY:

- **Pre-Delivery Control**
If a Capacity Market Unit (CMU) does not exist yet, the development progress needs to be monitored to estimate the risk of deficiency.

DELIVERY PERIOD:

- **Availability Obligation**
In return for a capacity remuneration, CMU's are required to be present in the market at adequacy relevant moments. Elia will monitor (or test) CMU's to see if they live up to their part of the bargain
- **Payback Obligation**
The purpose of the remuneration is to cover missing money. If a CMU makes windfall profits, excessive captured remunerations need to be paid back.
- **Secondary Market**
The Secondary Market is a risk management tool in which CMUs can trade their capacity excesses or shortages, in order to conform to their availability obligations.



Throughout the presentation, we'll use three recurring, fictive example cases.

OCGT

- **Technology & Capacity**
Gas turbine with a capacity of **100 MW**
- **Market activity**
Commodity Markets
- **Status**
The unit has been active for the last 7 years.

DEMAND SIDE MANAGEMENT

- **Technology & Capacity**
A large factory that can shut down their processes for up to 3 hours to reduce their energy demand with up to **5 MW**.
 - **Market activity**
Ancillary services
- Status**
They have been doing DSM with 5MW for 5 years.

LARGE-SCALE STORAGE

- **Technology & Capacity**
A large-scale battery project with a capacity of **30 MW** for 2 hours.
- **Market activity**
Ancillary services
- **Status**
Intention to go live by next year.



Context

What is the CRM?

Getting to a contract:

Types of Contracts

Eligibility & Participation Assessment

Prequalification

Financial Security Obligation

Auction

Contract

Preparing for Delivery: Pre-Delivery Monitoring

Delivery Period:

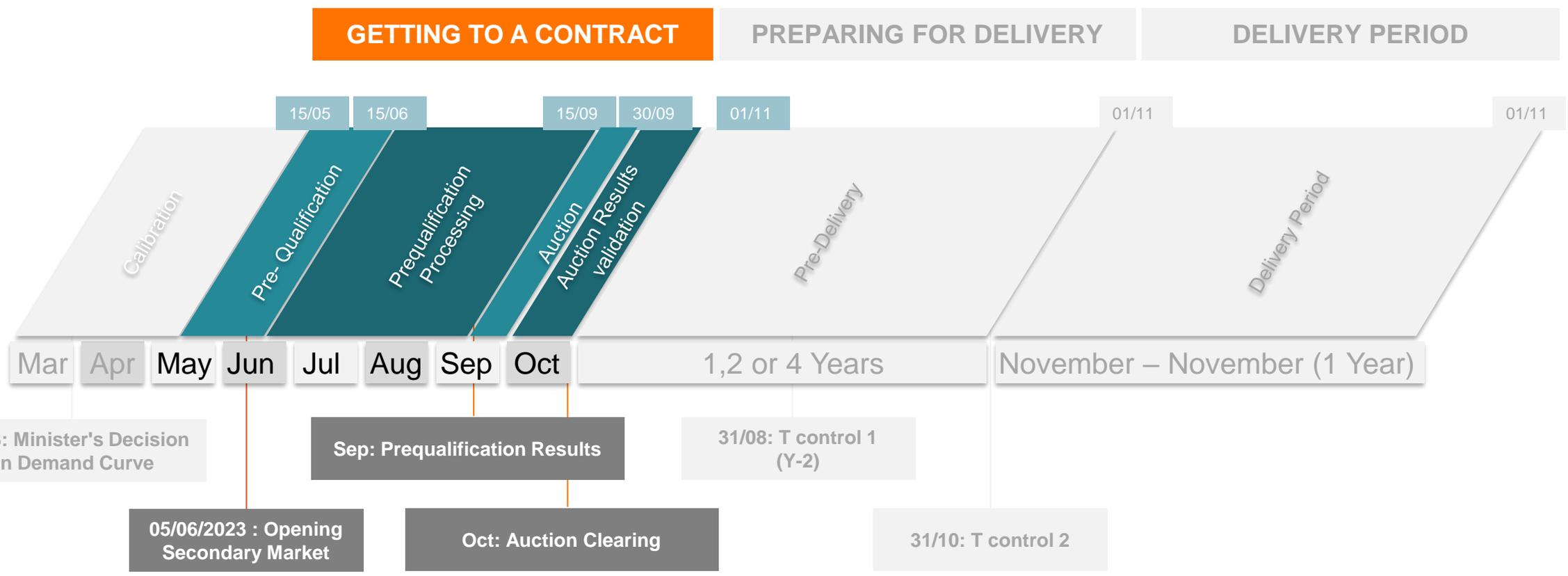
Availability Obligation

Payback Obligation

Secondary Market

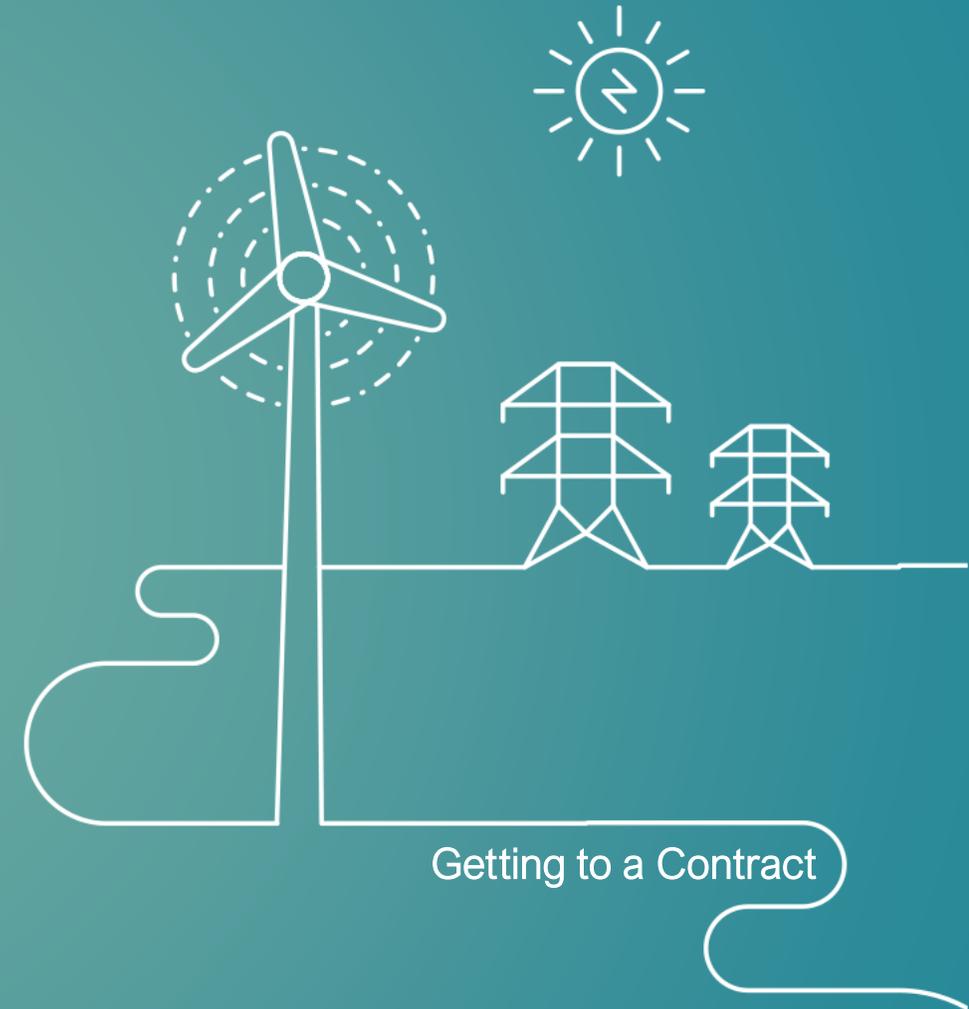
Final notes





Types of Contracts

In what ways can I engage with the CRM?



Getting to a Contract

There are multiple ways to engage with the CRM: single Year & Multi-Year contracts with Elia, or Secondary Market Contracts with other CMUs.

Primary Market

Single year Capacity Contract:

- **Contract with Elia**
- Lasts for a single delivery period November Y to October Y+1 included
- Possibility to bid up to the Intermediate Price cap
- No investment file required
- But possibility to request intermediate price cap derogation to CREG

Multi-year Capacity Contract:

- **Contract with Elia**
- Lasts for a maximum of 3, 8 or 15 delivery periods.
- Required to submit Investment file to CREG
- Possibility to bid up to the Global Auction Price Cap
- *An evolution is under discussion to allow for MY contracts for existing capacity*

Secondary Market

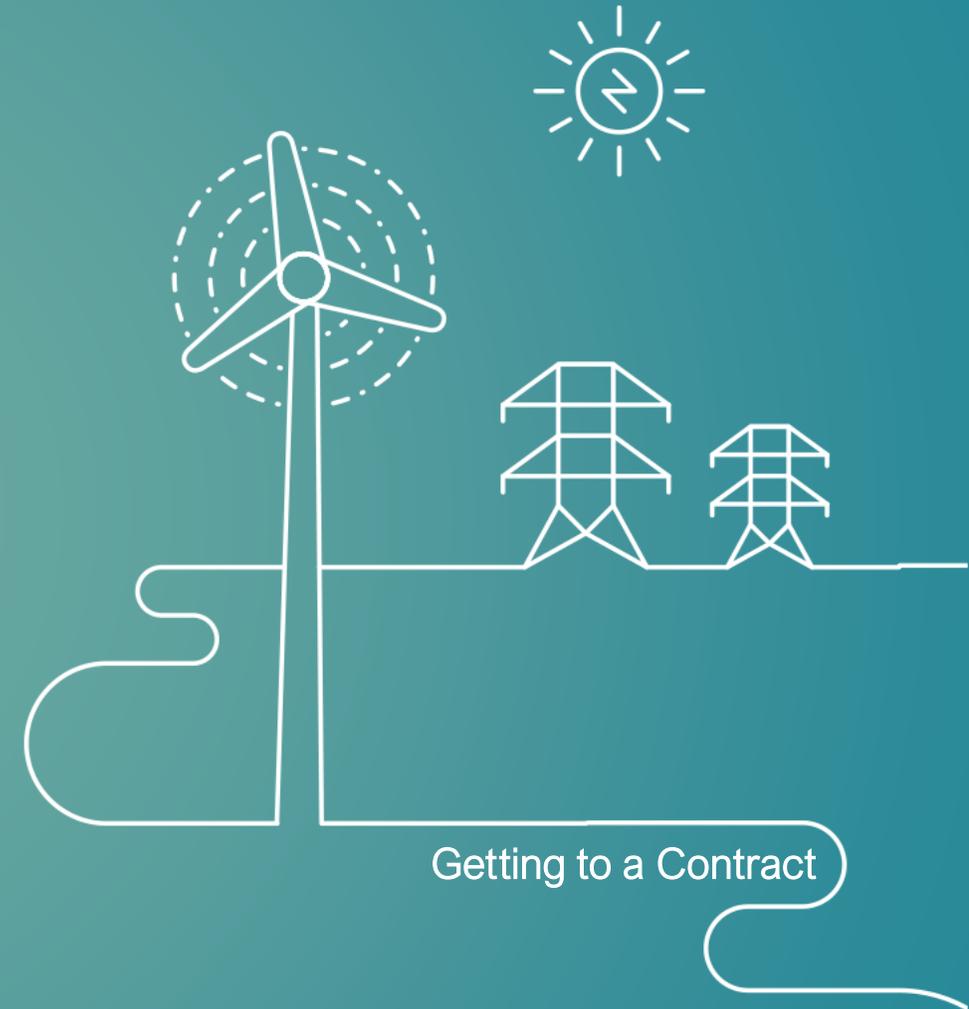
Secondary Market Contract

- **Bilateral Agreement with Capacity Providers having contracted CMUs**
- Higher granularity of contract durations (1hr up to 15 years, conditions apply)
- Extra terms & conditions can be discussed bilaterally by CMUs



Eligibility

Can I participate?



Getting to a Contract

Participation to the CRM-Auction is market wide; It's open to all TSO and DSO connected capacities over 1MW below the emission limit set for the auction.

	CRM
Minimum Capacity	Minimum volume requirement of 1 MW after derating <ul style="list-style-type: none"> ✓ Individually or aggregated with other capacities (without daily schedule obligation) ✓ Derating depends on adequacy contribution of technology: e.g. you would need 100 MW of installed solar PV ↔ 1,5 MW of 4 hour batteries to reach the threshold*
Connection	For TSO- and/or DSO-connected capacities, including low-voltage flexibility in the near future (currently WIP)
Emission limit	emission limit of 550 g CO₂/kWh Or 306kg CO ₂ /kW/y (only if <600 g CO ₂ /kWh)*
CMU status constraints	No constraint (market-wide mechanism)

Reminder: Existing production and storage units without ongoing variable subsidies during the Delivery Period with a capacity above 1MW measured at the delivery period during the Prequalification process, are **obligated to Prequalify for the CRM, not to offer in the Auction.**

*Yearly threshold is allowed to reach a limit of 350 kg CO₂/kW/y for the upcoming Y-1 auction if the limit of g CO₂/kWh > 550.



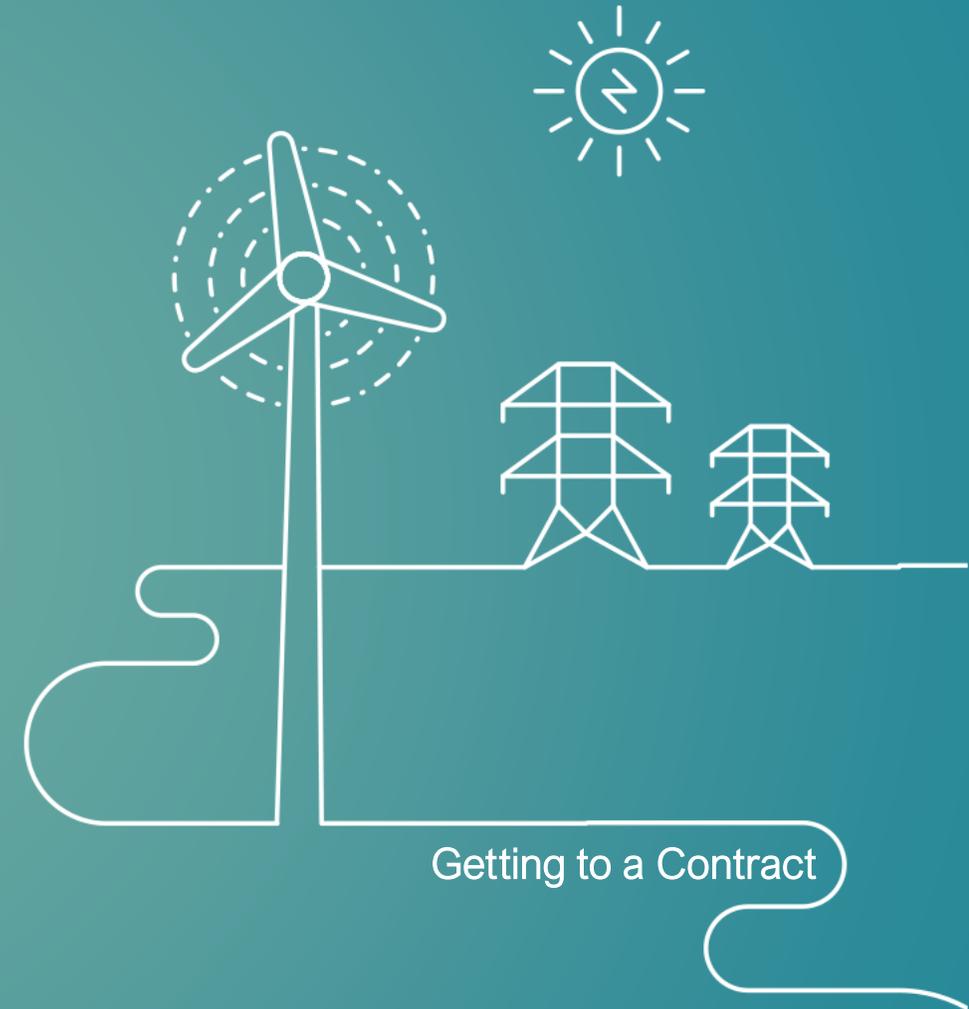
Prequalification

What purpose does Prequalification serve?

How can I participate?

What's the amount of capacity I can participate with?

What are the first administrative steps?



Getting to a Contract

During Prequalification, CMU's data is collected and processed to determine the Eligible Volume the CMU can offer in the Auctions.

The **Prequalification Process** aims to ensure, for the Capacity Holder, its compliancy with legal requirements

- Either by processing the adequate Prequalification process(es) until **the submission of an offer in the Auction**
 - Process standard, or
 - Process specific
- Or by following a **Fast Track Prequalification process to exit**

The **objectives** of the Prequalification process(es) are the following

- Collecting adequate and correct data related to each CRM Candidate capacities
- Determining the volume to be submitted by CMU during an Auction (Eligible Volume)



The way to pre-qualify depends on the CMU's engagement in the CRM.
Three different prequalification tracks exist: Standard, Specific & Fast-Track

STANDARD

- For CRM actors that are considering to **offer volume** in the auction and already have delivery points.
(Existing or Additional CMU's)
- The final decision to offer (or not) is always possible until 30 September

SPECIFIC

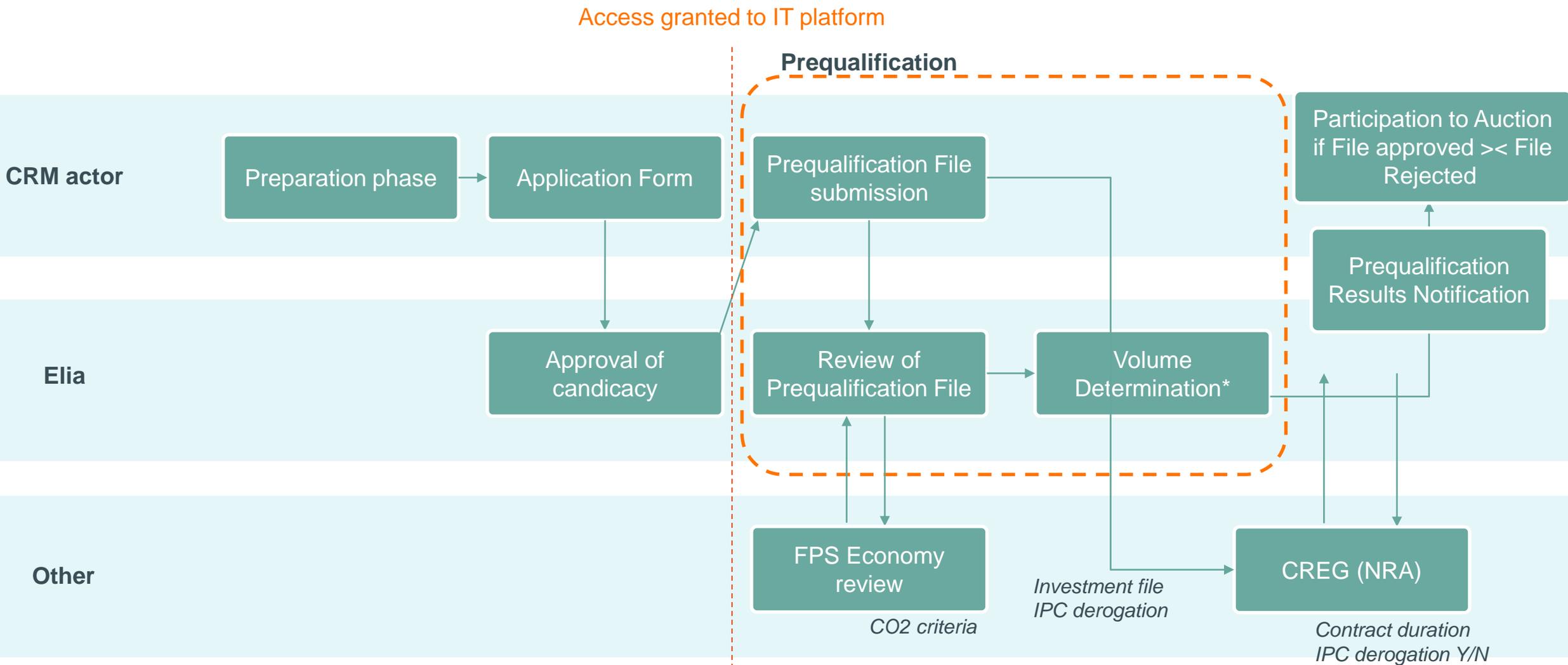
- For CRM actors that **are considering to offer volume** in the auction but have **no delivery points (yet)**. ('Virtual CMU')
- **Only allowed** in Y-4
- **Limited to X MW (e.g. 200 MW) – defined in each Ministerial Decree applicable to an Auction.**

FAST-TRACK

- For market parties who are **obligated to pre-qualify** but have **no intention of participating in the auction**
- is considered the CRM's "exit door"
- **Treatment** of Fast Track volumes (and impact on demand curve) will depend on whether the capacity already has its permits or not.



Every CMU is subject to a sequential Prequalification Process, interacting with Elia, FPS Economy and CREG.



*in case of DSO-connected points, Volume Determination is done by the DSO

The Maximum Capacity a CMU can offer in auction (Eligible Volume) is limited by a derating factor, which represents the degree to which it contributes to Security of Supply.

All technologies are subject to the application of a **derating factor** representing the degree to which the technology contributes to security of supply.

Derating factors are classified in 5 Categories:

- > whether the CMU is Energy Constrained or not,
- > has a Daily Schedule (>25 MW) or not

Split by technology are possible within a category.



CRM – Derating Factors* of the Capacities (1/2)

The Demand Side Response can choose their SLA (hours / day)

(the same for local thermal productions and batteries, ...) < 25MW

Category I: SLA	
Sub-Category	Derating Factor [%]
SLA-1h	19
SLA-2h	35
SLA-3h	48
SLA-4h	57
SLA-5h	65
SLA-6h	71
SLA-7h	76
SLA-8h	81
SLA-9h	86
SLA-10h	89
SLA-11h	93
SLA-12h	95
SLA unlimited	100

Applies to the 'Pmax' of the local Capacity ('NRP').
This is to be considered as a max potential in the Auction.
Could be lowered by an Opt-Out.



CRM – Derating Factors* of the Capacities (2/2)

Derating Factors of other Capacities

Applies to the 'Pmax' of the local Capacity ('NRP').
This is to be considered as a max potential in the Auction.
Could be lowered by an Opt-Out.

Category II: Thermal technologies with daily schedule	
Sub-Category	Derating Factor [%]
CCGT	94
OCGT	92
Turbojets	90
IC Gas Engines	92
IC Diesel Engines	90
CHP/Biomass/Waste	94
Nuclear	80
Coal	90
Category III: Energy-limited technologies with daily schedule	
Sub-Category	Derating Factor [%]
Storage 1h	22
Storage 2h	38
Storage 3h	50
Storage 4h	57
Storage 5h	62
Storage 6h	65
PSP	52
Category IV: Weather-dependent technologies	
Sub-Category	Derating Factor [%]
Offshore Wind	9
Onshore Wind	7
Solar	1
Hydro Run-of-River	48
Category V: Thermal technologies without daily schedule	
Sub-Category	Derating Factor [%]
Aggregated thermal technologies	64



The maximum volume that can be entered into auction (Eligible Volume) gets determined during the Prequalification, by derating the Reference Power

The **Nominal Reference Power (NRP)** gets determined using 1 year of historical data, if available.

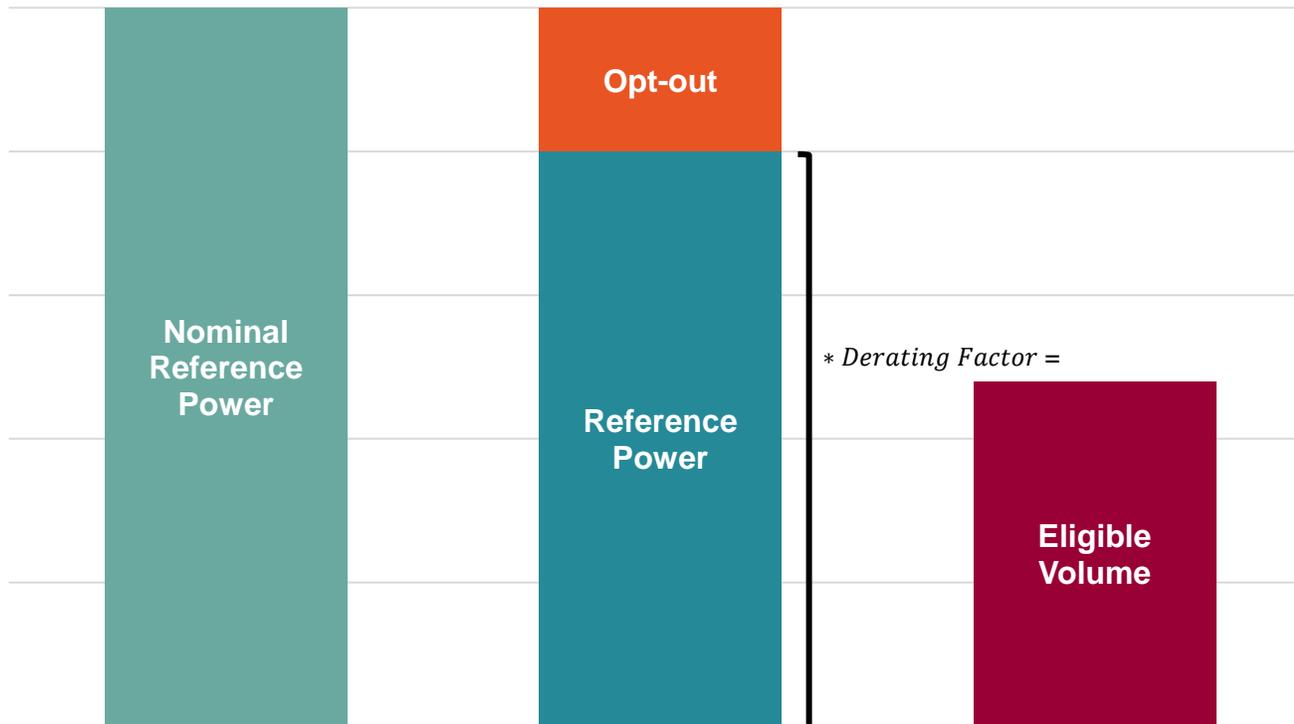
Subtracting the **Opt-out Volume** (volume the CMU does not want to enter in auction) from the **NRP** results in the **Reference Power**.

Multiplying the **Reference Power** with the Derating Factor results in the **Eligible Volume**, which is the maximum that can be bid into auction*.

* CMUs are obligated to enter their full Eligible Volume (lowering the Eligible Volume is possible via opt-out)

As a reminder:

Derating factors differ per technology and whether the CMU is Energy Constrained and/or has a Daily Schedule (~ >25 MW)



Eligible Volume Determination: Examples

OCGT

- **Not Energy Constrained**
- **Daily Schedule (>25 MW)**

- **NRP: 100MW**
- **Derating Factor: 93%**
- **Eligible Volume: 93MW**

DSM

- **Energy Constrained (SLA 3h)**
- **No Daily Schedule (<25 MW)**

- **NRP: 5 MW**
- **Derating Factor: 47%**
- **Eligible Volume: 2,35 MW**

STORAGE

- **Energy Constrained (SLA 2h)**
- **Daily Schedule (>25 MW)**

- **NRP: 30MW**
- **Derating Factor: 39%**
- **Eligible Volume: 11,7 MW**

Derating factors from Y-4 2022 (delivery 2026-2027) are used in these examples



A number of administrative files need to be presented to successfully prequalify.

The prequalification process and data requirements (according to Functioning Rules proposal & current framework) are highly dependent on the capacity features but in all cases it requires those 5 elements:

- 1 - The respect of a **max CO2 European threshold** with official documents or attestats
 - FPS Economy judges the pertinence of such data
- 2 - The **refusal of cumul with other variable subsidies** (mainly the green ones) on the Delivery Period – conditional waiver template of the FPS Economy
- 3 - Financial security valid until 2025 or 2029 (CRM '24): Each candidate to the Auction or Secondary Market provides a sufficient collateral for the CRM
 - 10k€ - 20k€ / Eligible Volume MW in **Bank Guarantee, a PCG-like**
- 4 – The **regional Permit in the last administrative instance for the construction and/or exploitation** is to be provided by the bid submission deadline
- 5 – For new built connected to Elia, a waiver of Elia grid reserved/allocated capacity in case of non-selection



Financial Security Obligation

What is the Financial Security Obligation?
Does the same Financial Security apply to everybody?
When does the Financial Security get returned?



The Financial Security is a collateral deposited by participating market parties to cover for non-payment of potential pre-delivery penalties.



1. The Financial Security **covers the pre-delivery period** and is released after the start of the delivery period, if CMU has received the status “existing” (representative NRP can be measured)
2. The Financial Security is linked to a CMU and **should cover the maximal expected contracted capacity** for the forthcoming Delivery Periods
3. Financial security **covers penalties during the pre-delivery period (if these remain unpaid)**



The amount of Financial Security to be deposited is dependent on the CMU's status.

CMU Status	FS in €/MW
Existing CMU	10k
Additional CMU (other)	11k
Additional CMU (new build with Permitting Milestone achieved or not applicable)	15k
Additional CMU (new build without Permitting Milestone achieved)	20k
Virtual CMU	20k

- Changing Statuses or getting past certain milestones/permits will result in partial releases of deposited securities.
- The purpose is to release the Financial Security in full after all Pre-Delivery Checks are passed.
- It only applies to the Eligible Capacity (after derating and potential opt-outs).
- Financial securities are bank guarantees, affiliate guarantees (e.g. PCG) or cash deposit (or a combination of them)



Financial Security Obligation: examples

OCGT 100MW

- **Not Energy Constrained**
- **Daily Schedule (>25 MW)**
- **Eligible Volume: 91MW**

- **Status:** Existing
- **FS per MW:** 10k€/MW
- **Total FS:** 930 k€
- **Type of deposit:**
Bank Guarantee

DSM 5MW

- **Energy Constrained (SLA 3h)**
- **No Daily Schedule (<25 MW)**
- **Eligible Volume: 2,35 MW**

- **Status:** Existing
- **FS per MW:** 10k€/MW
- **Total FS:** 23,5 k€
- **Type of deposit:**
Parent Company Guarantee

STORAGE 30MW

- **Energy Constrained (SLA 2h)**
- **Daily Schedule (>25 MW)**
- **Eligible Volume: 16.8 MW**

- **Status:** Additional (New Build)
- **FS per MW:** 20k€/MW
- **Total FS:** 234 k€
- **Type of deposit:**
Bank Guarantee



Auction

What are the Auctions?

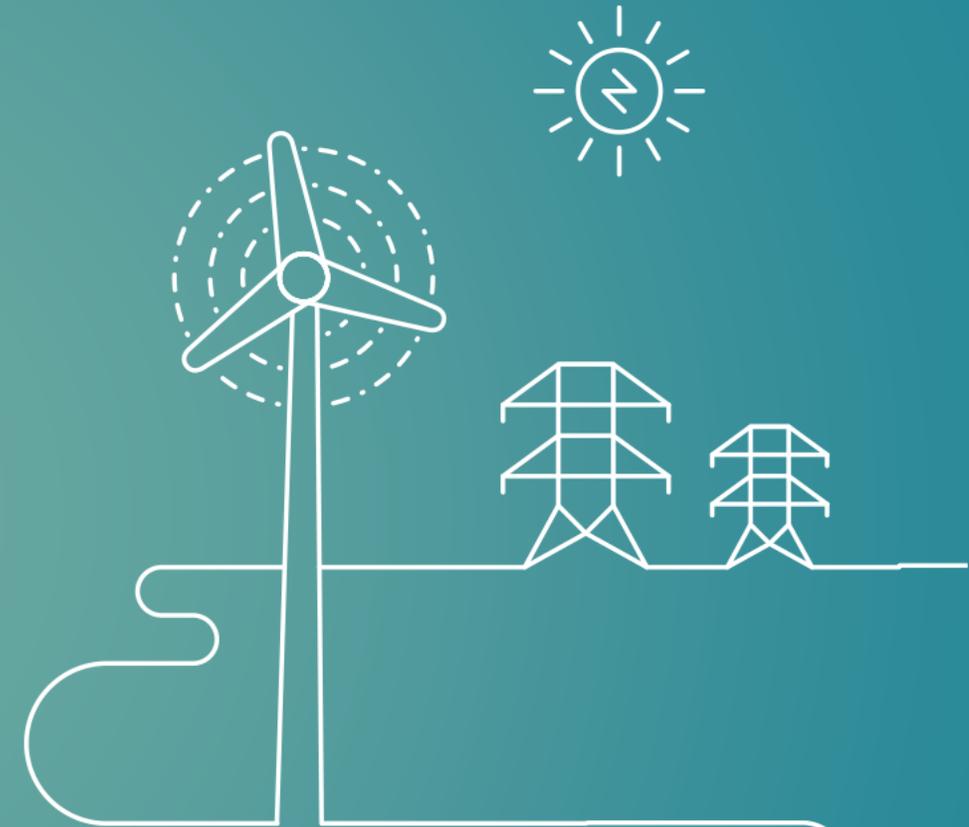
When do the Auctions occur?

How do the Auctions work?

How does is the need in the Auctions calculated?

What is expected of me in the Auctions?

What capacity is already contracted in the past Auctions?



Getting to a Contract

In the Auction, CMU's can offer Eligible Volume to the CRM at a chosen price and a contract duration (of which the maximum is determined by CREG).

→ The **access to the Auction** is granted to the CRM Prequalified Candidates CMUs

- The CRM actor enters one or more offers related to each prequalified CMUs to **bid in the Eligible Volume** as determined in the Prequalification Process
- Each offer consists of a **volume, a chosen price and a contract duration**
- The Price is limited to an Intermediate Price Cap for the 1 year capacity contract duration (Last auction: 26€/kW)
- The maximal capacity contract duration of a bid is determined by CREG (investment file of the CMU)

→ Prior the Auction:

- The CRM Candidate can still **reduce** (partially or entirely) its **Eligible Volume through an Opt-Out** (up to mid-Sept.)
- The CRM Candidate can still remove its Prequalification File and bids without consequence (if no mandatory participation, up to Gate Closure Time 6am)

→ Auction algorithm selects the bids that maximize the global welfare considering the Grid Constraints

→ The selected offers are listed in a Capacity Contract under 'transactions'



Two (Three) Auctions are organized for each Delivery Period, respectively 4 years, (2 years) and 1 year ahead


 Last Y-4 auction in 2030
 Last Y-2 auction in 2032
 Last Y-1 auction in 2033
 → delivery in 2034

2021	2022	2023	2024	2025	2026	2027	...
Y-4 2025			Y-1 2025	Delivery 2025			
	Y-4 2026			Y-1 2026	Delivery 2026		
		Y-4 2027		Y-2 2027	Y-1 2027	Delivery 2027	
			Y-4 2028		Y-2 2028	Y-1 2028	Delivery 2028

Note: a delivery year always start on 1 November 20XX and ends 31 October 20XX+1

- Obviously, a multi-year contract covers more than 1 delivery year.
- However, auctions only deal with a single delivery year.
- Hence, Contract length is not a criterion in selecting capacities.
(except in case of tie)



The Auction Process consists of setting up the Demand (need) and Supply (bids) curves and clearing at their intersection.

I. Setting the demand curve

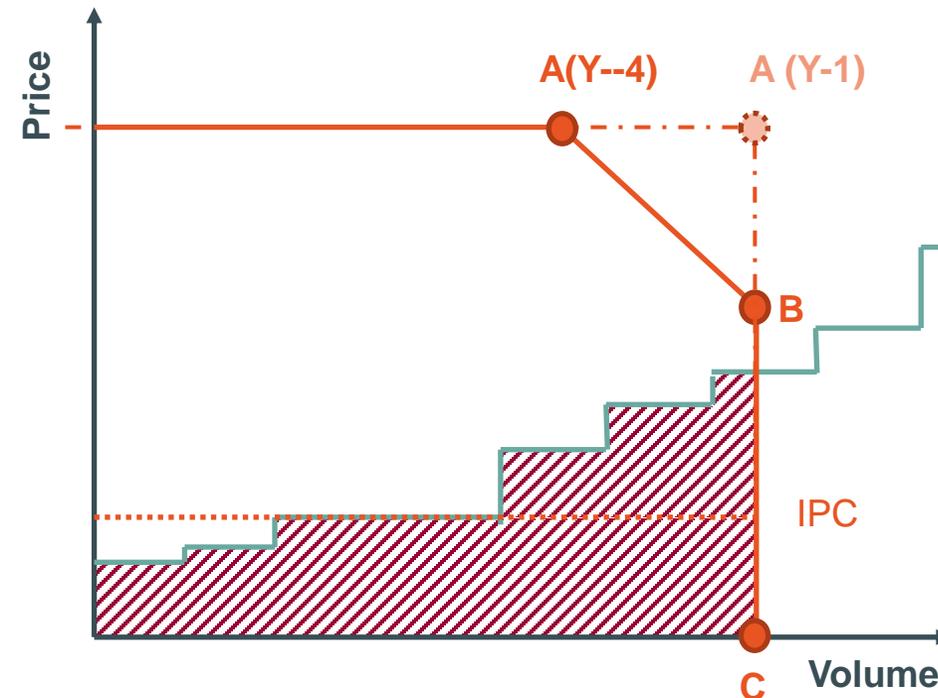
- Annual determination by Ministerial Decree
- Intermediate Price Cap (IPC) for one-year contracts
- A certain volume is reserved for the Y-1 auction

II. Setting the supply curve

- Bid price indicated by CRM participants
- Volume up to (Remaining) Eligible Volume
- Contracts non-eligible for multi-year without derogation can bid up to IPC
- Multi-year contracts can bid up to price in point A

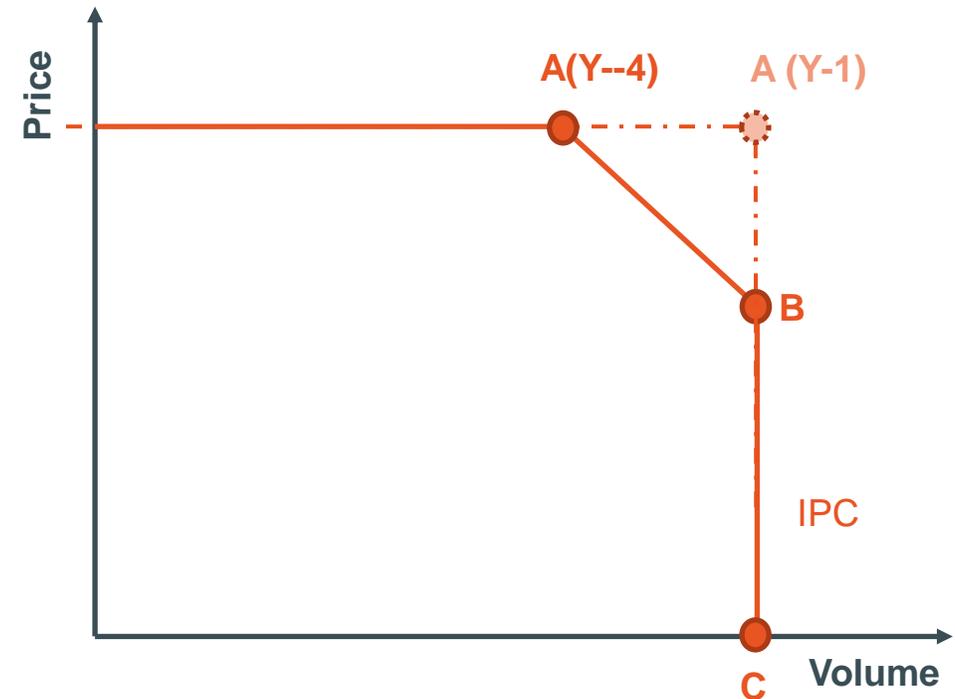
III. Auction clearing

- Maximize welfare
- Combination of bids respects grid constraints
- Optimization of selection
- Single-round, sealed-bid
- Pay-as-bid



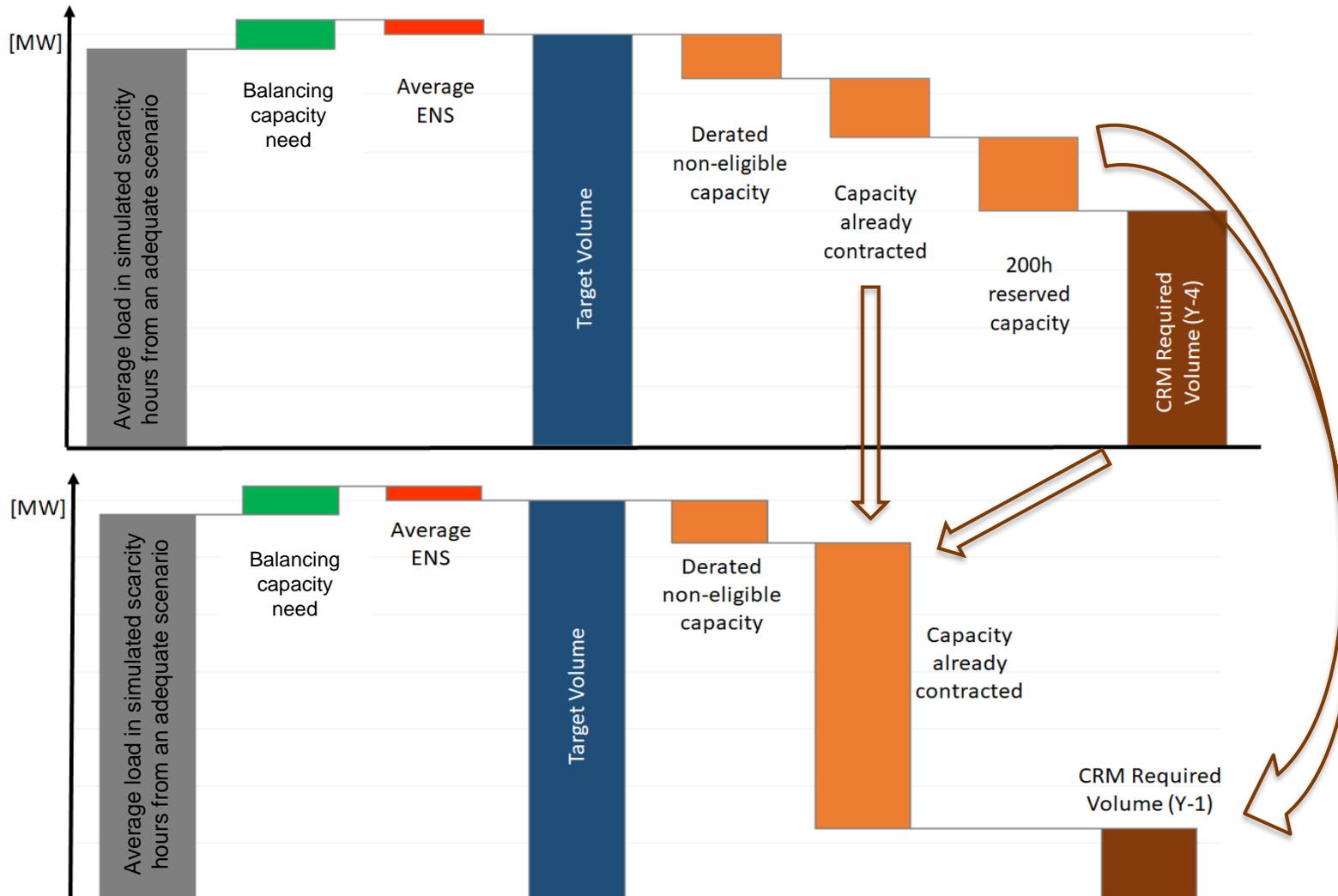
The Demand Curve represents society's willingness-to-pay for adequacy.

- Set in an administrative way
- Parameters are defined in a Ministerial decree by 31/03
- The demand curve may be shaped differently in a Y-4 or Y-2 vs. a Y-1 auction
- The need (required volume in the auction) is based on studies performed by Elia:
 - Calibration Report: yearly
 - Adequacy & Flexibility Study: every two years



The demand curve is a crucial input for the auction, determining adequacy levels and the price that society is willing to pay for achieving each adequacy level

The Required Volume of Auctions is calculated in accordance with Article 11 of the Royal Decree Methodology.



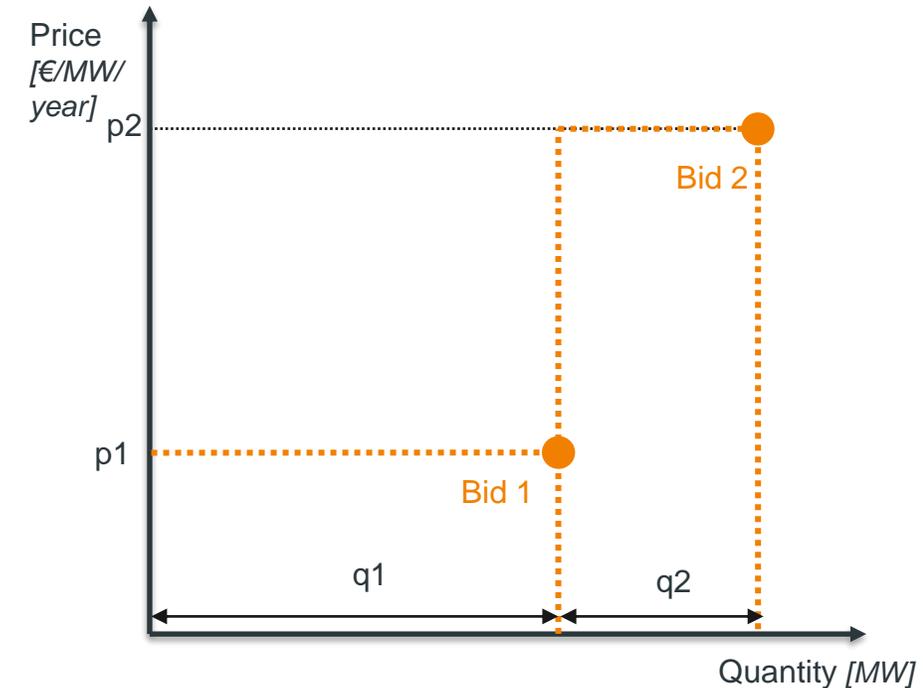
Determination of the volume parameters – Article 11 of the Royal Decree

- Proposal & simulations by the TSO (Elia)
- Proposal made by the NRA (CREG)
- Minister determines the final demand curve

The Y-2 auction has not been added to this figure since the capacity split between the auctions is under consultation

The Supply curve is formed by combining the bids of all Auction participants, which entail volume, price and duration.

- Each bid is formed by 3 components a minima:
 - **Capacity volume** (in MW), as determined during the prequalification process
 - **Price** (in €/MW/year)
 - **Contract duration** (in # years), respecting the maximum contract duration as determined by CREG
- For a CMU, a combination of bids MW should raise the Eligible Volume (otherwise, possibility to modify the EV by Optout modification)
- It is possible to create mutual-exclusivity or links between bids in specific cases



The Auction is cleared in a way that maximises social welfare and respects grid constraints.

→ Single round, sealed-bid

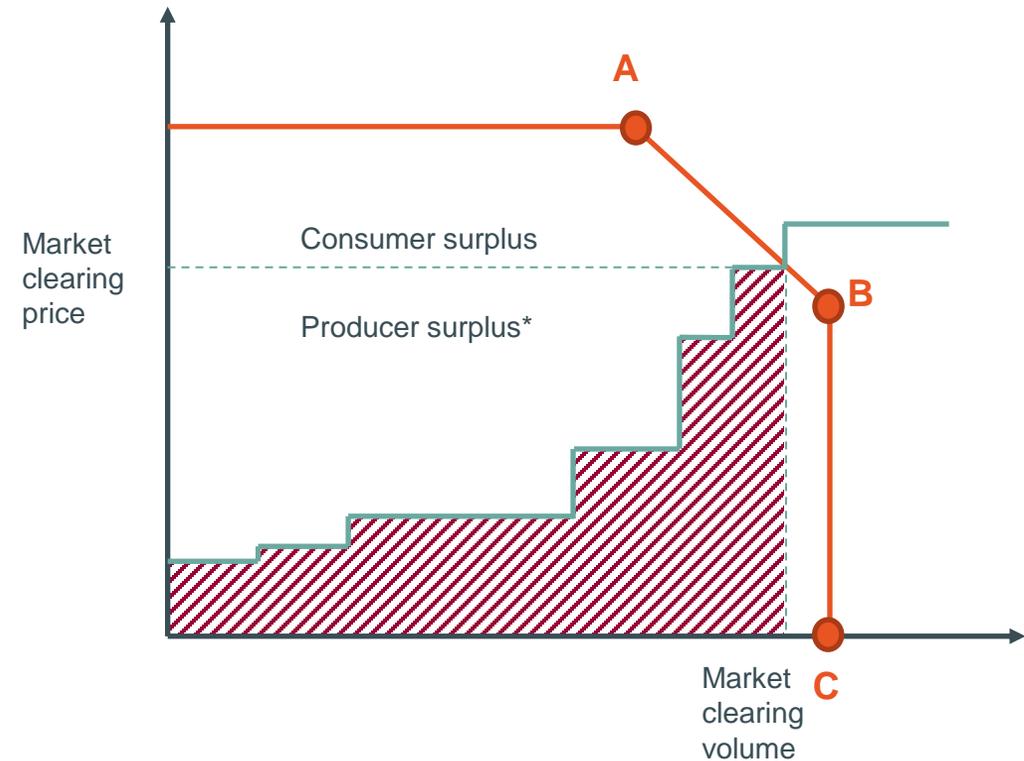
→ Pay-as-bid

Maximization of social welfare

- **Consumer surplus:** Surplus for society from satisfying demand at a price below the willingness-to-pay for capacity
- **Producer surplus:** Surplus for suppliers from the selection of their bids at a price above the bid –price

Respecting grid constraints

- Normally: connection requests handled sequentially. Here: bulk requests at the moment of the auction
 - Calculated before the CRM auction, considering all new capacity projects on a “reference” grid
- Certain combinations of capacities will be impossible, auction algorithm takes this into account



Auction: examples

OCGT 100MW

- **Not Energy Constrained**
- **Daily Schedule (>25 MW)**

- **Eligible Volume: 93MW**

BID

- **Volume: 93MW**
- **Price: 10k€/MW/year**
- **Contract Duration: 1 year**

DSM 5MW

- **Energy Constrained (SLA 3h)**
- **No Daily Schedule (<25 MW)**

- **Eligible Volume: 2,35MW**

BID

- **Volume: 2,35MW**
- **Price: 20k€/MW/Year**
- **Contract Duration: 1 year**

STORAGE 30MW

- **Energy Constrained (SLA 2h)**
- **Daily Schedule (>25 MW)**

- **Eligible Volume: 11,7 MW**

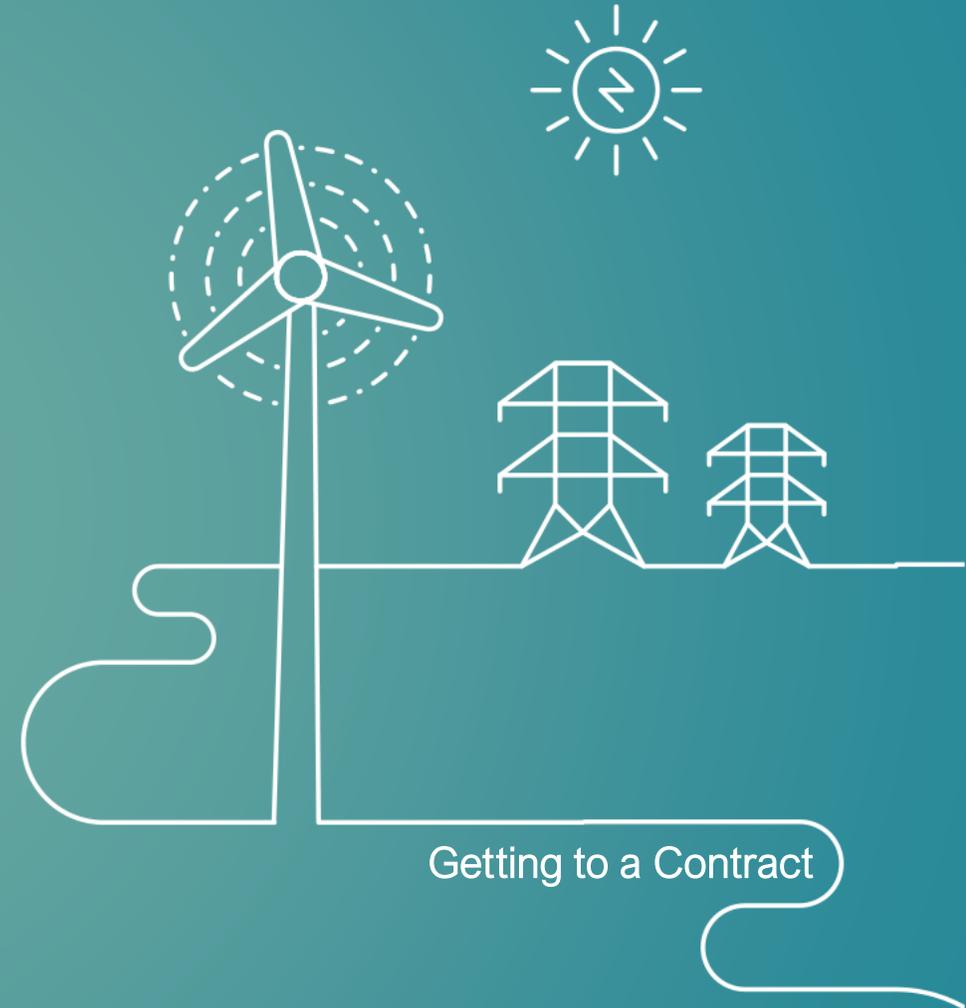
BID

- **Volume: 11,7MW**
- **Price: 30k€/MW/Year**
- **Contract Duration: 8 year**



Contract

What are the specifics of the Contract?



Getting to a Contract

The Capacity Contract is the formal agreement between the Capacity Provider and Elia. It is concluded after selection in the auction.

- Following a positive selection of the offers, a contract is concluded between the **Capacity Provider** and **Elia**:
 - Within 40 WD after the Auction results.
 - In case of Additional capacity, where applicable the Connection contract is signed within the time limits of the Grid codes (and in accordance with the Technical agreement provided in Prequalification process).
 - The Capacity Contract is signed within 20 WD right after the connection contract.
- CAPACITY PROVIDER undertakes to ELIA to provide the Service, as specified in the Functioning Rules, throughout each:
 - Transaction Period (in this case as of November 2025 (Auction Y-1 2024) or November 2028 (Auction Y-4 2024));
 - And its respective Pre-Delivery Period: between auction results and delivery period.
- Secondary market transactions also require contract signatures.



The Capacity Contract is the formal agreement between the Capacity Provider and Elia. It covers the rights, obligations and possible related penalties of the arrangement.

- The Capacity Provider is entitled to the Capacity Remuneration of the Transactions;
- After the effective Service delivery and the settlement, invoicing and payment modalities;
- Any breach of the Pre-delivery and/or Availability Obligations shall be sanctioned by one or more penalties;
- Penalties are subject of a pre-delivery activity report for the Pre-Delivery Obligations and of a delivery activity report for the Availability Obligations. The delivery activity report also contains the Payback Obligations (re-imbusement of undue market revenues).



Context

What is the CRM?

Getting to a contract:

- Types of Contracts
- Eligibility & Participation Assessment
- Prequalification
- Financial Security Obligation
- Auction
- Contract

Preparing for Delivery: Pre-Delivery Monitoring

Delivery Period:

- Availability Obligation
- Payback Obligation
- Secondary Market

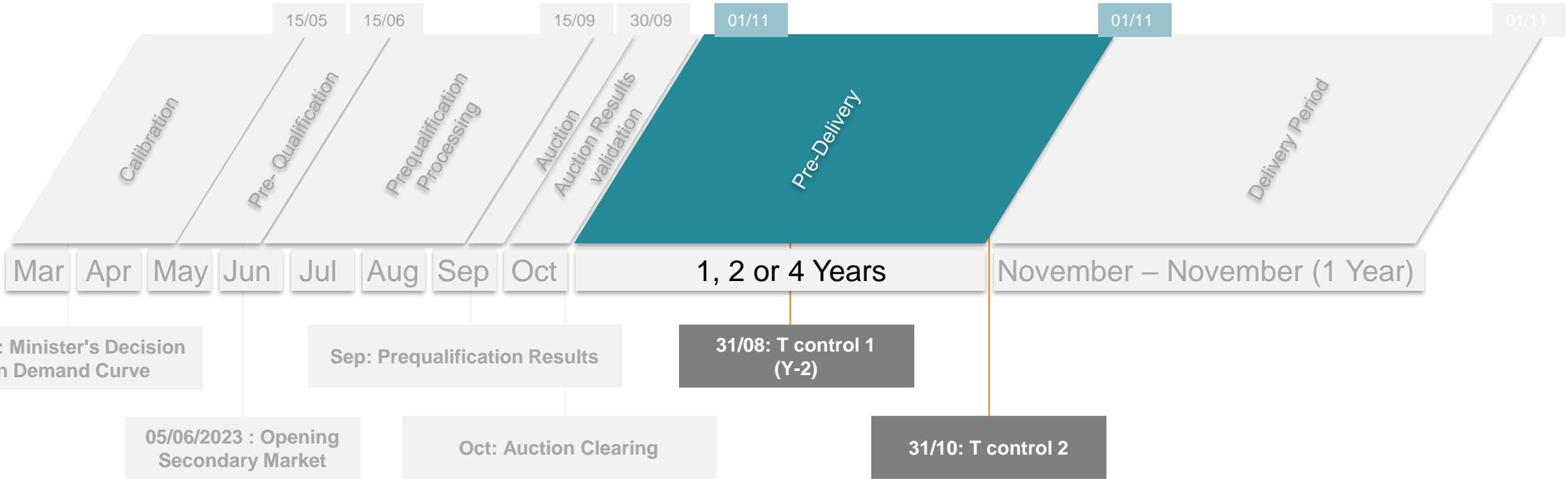
Final notes



GETTING TO A CONTRACT

PREPARING FOR DELIVERY

DELIVERY PERIOD



Pre-Delivery Monitoring

What is Pre-Delivery Monitoring and who is subject to it?

Why is Pre-Delivery Monitoring needed?

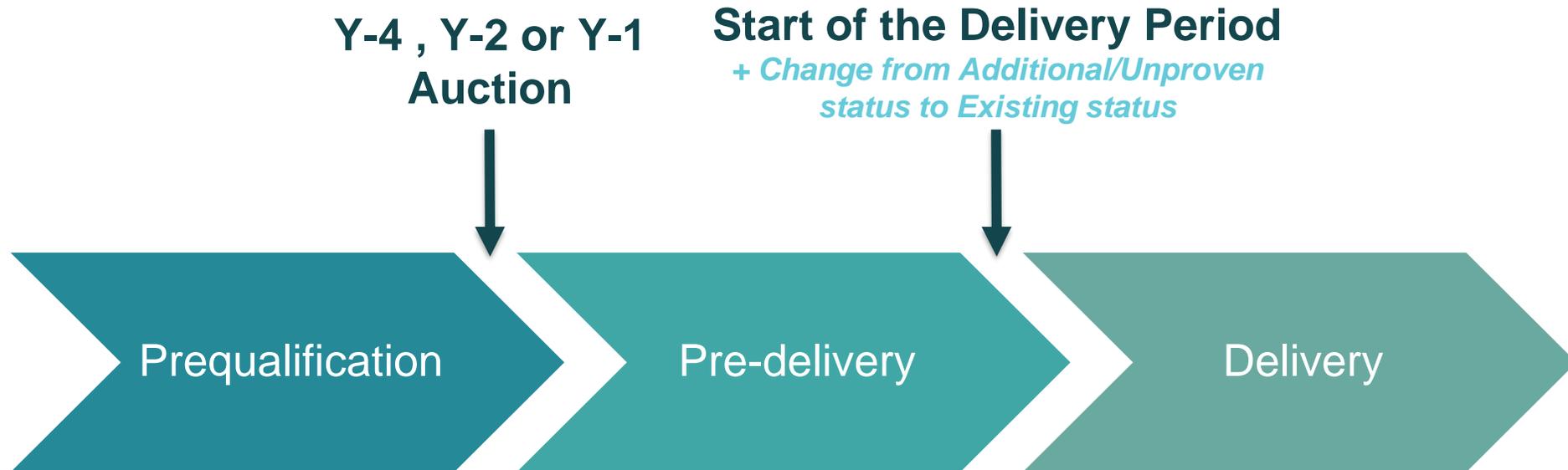
What are the Principles of Pre-Delivery Monitoring?

What is checked at the moments of control?



Preparing for Delivery

All Contracted CMUs are subject to Pre-Delivery Obligation, in which Elia verifies their ability to provide Capacity by the start of the Delivery Period.

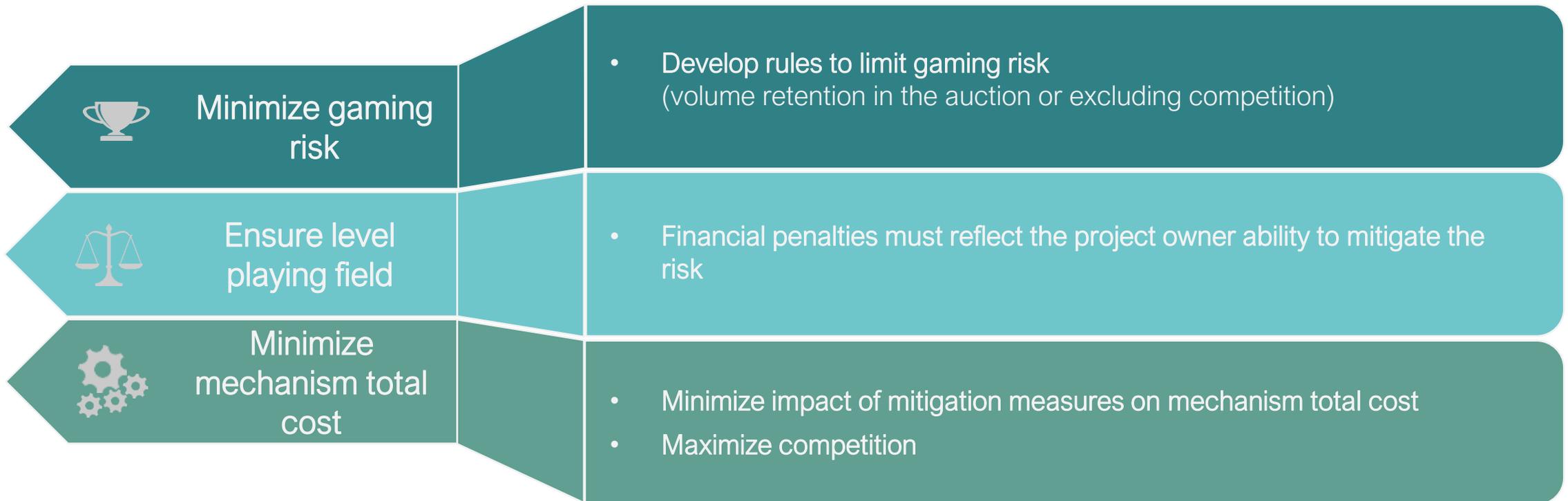


- Only concerns the obligations resulting from the Primary Market (Y-1, Y-2 and Y-4) and Secondary Market transactions validated in pre-delivery period
- Ensures the Capacity Provider's ability to provide the awarded Capacity
- Valid for Existing, Additional & Unproven Capacities

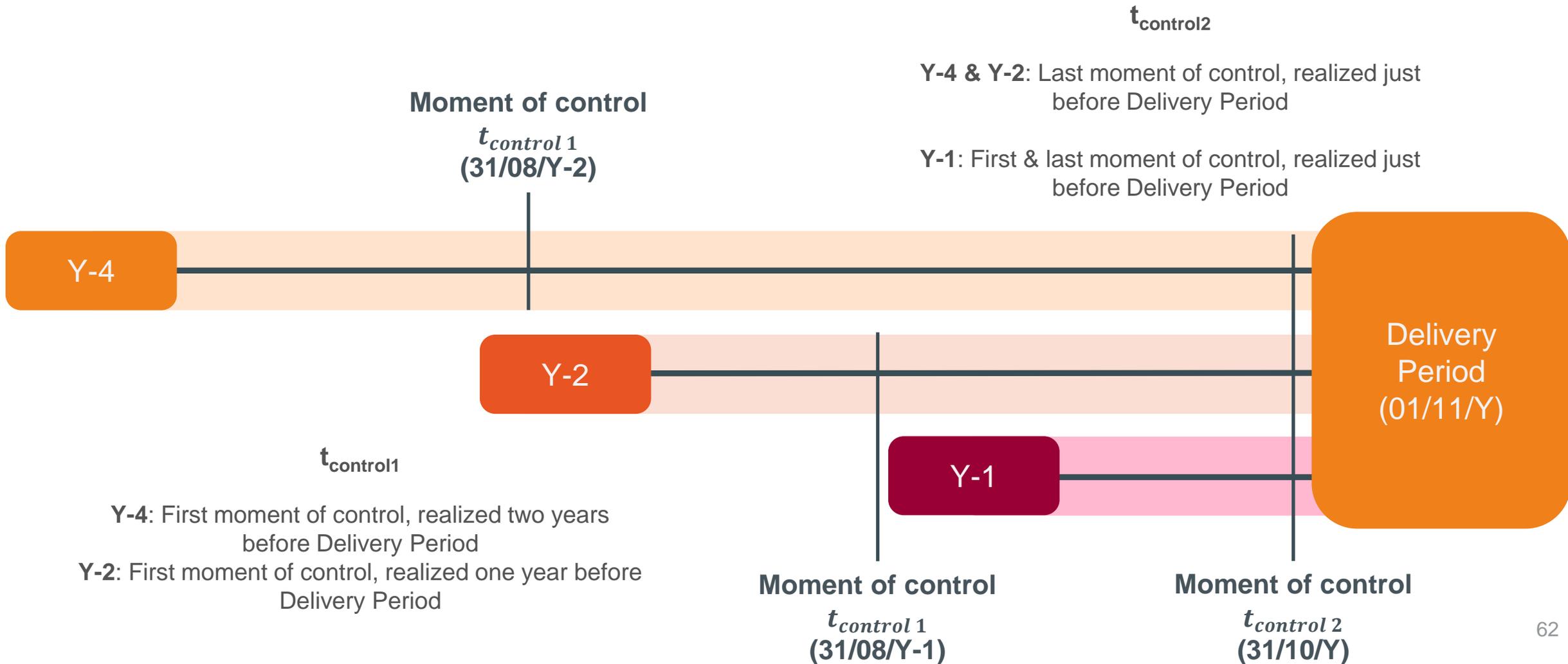


Pre- Delivery Monitoring minimizes gaming risks, allowing for a more competitive and cost-efficient CRM environment.

Monitoring process aims at verifying that the awarded capacity will effectively be there as of 1st day of delivery period for which they have been contracted



Principle #1: During Pre-Delivery Period, Elia collects information for each CMU at moment(s) of control ($t_{control}$)



Principle #2: If during a moment of control ($t_{control}$), Elia detects missing volume, it is penalized

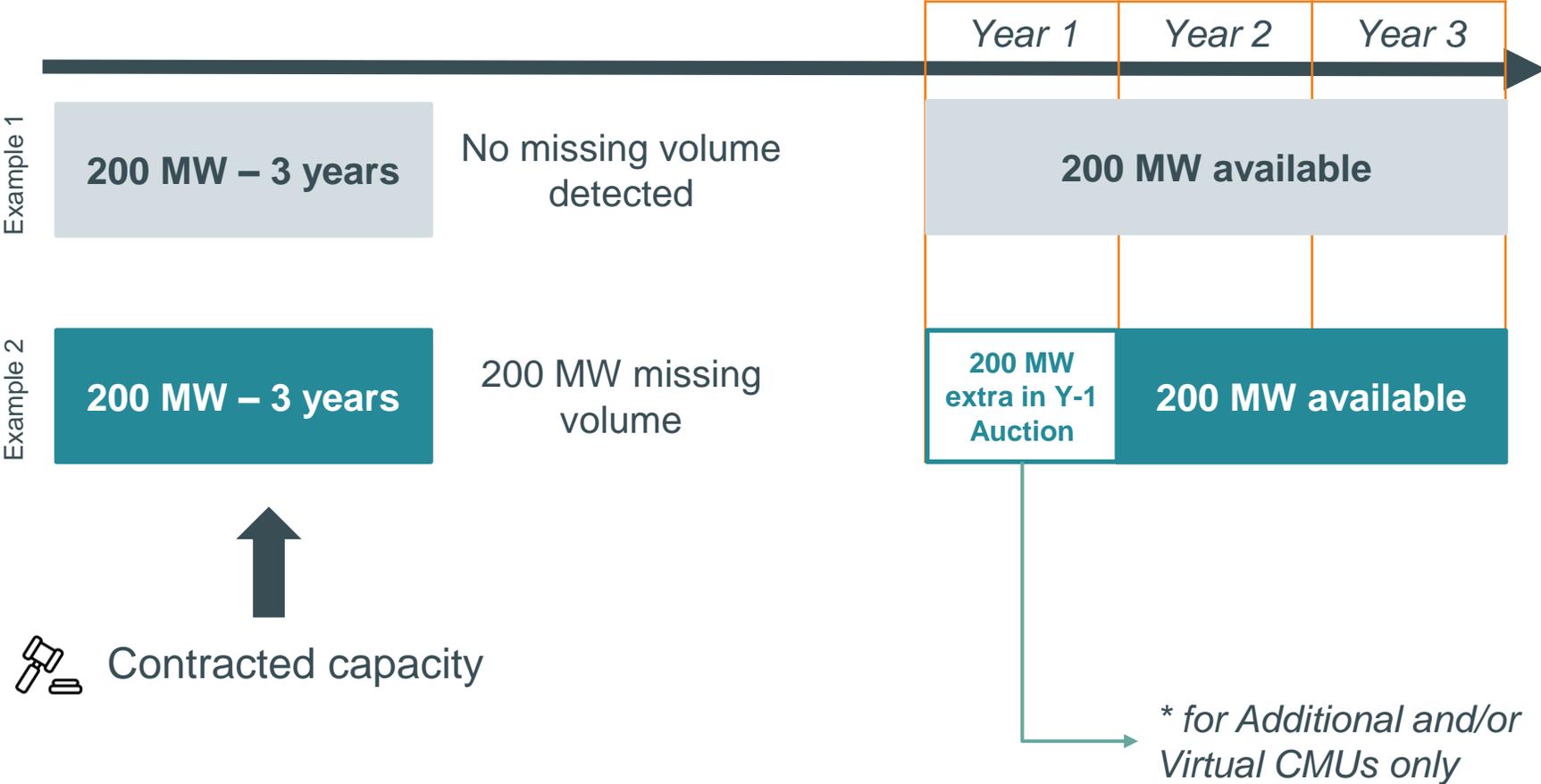
$t_{control1}$

Y-4: 31/08/Y-2
Y-2: 31/10/Y-1

Identified missing volume leads to different penalties:

- a financial penalty

(for additional and/or virtual CMUs)
- an **increase of the volume for the Y-1 Auction** to replace the initially awarded capacity for one Delivery Period (cf. examples)



Principle #2: If during a moment of control ($t_{control}$), Elia detects missing volume, it is penalized

$t_{control}$

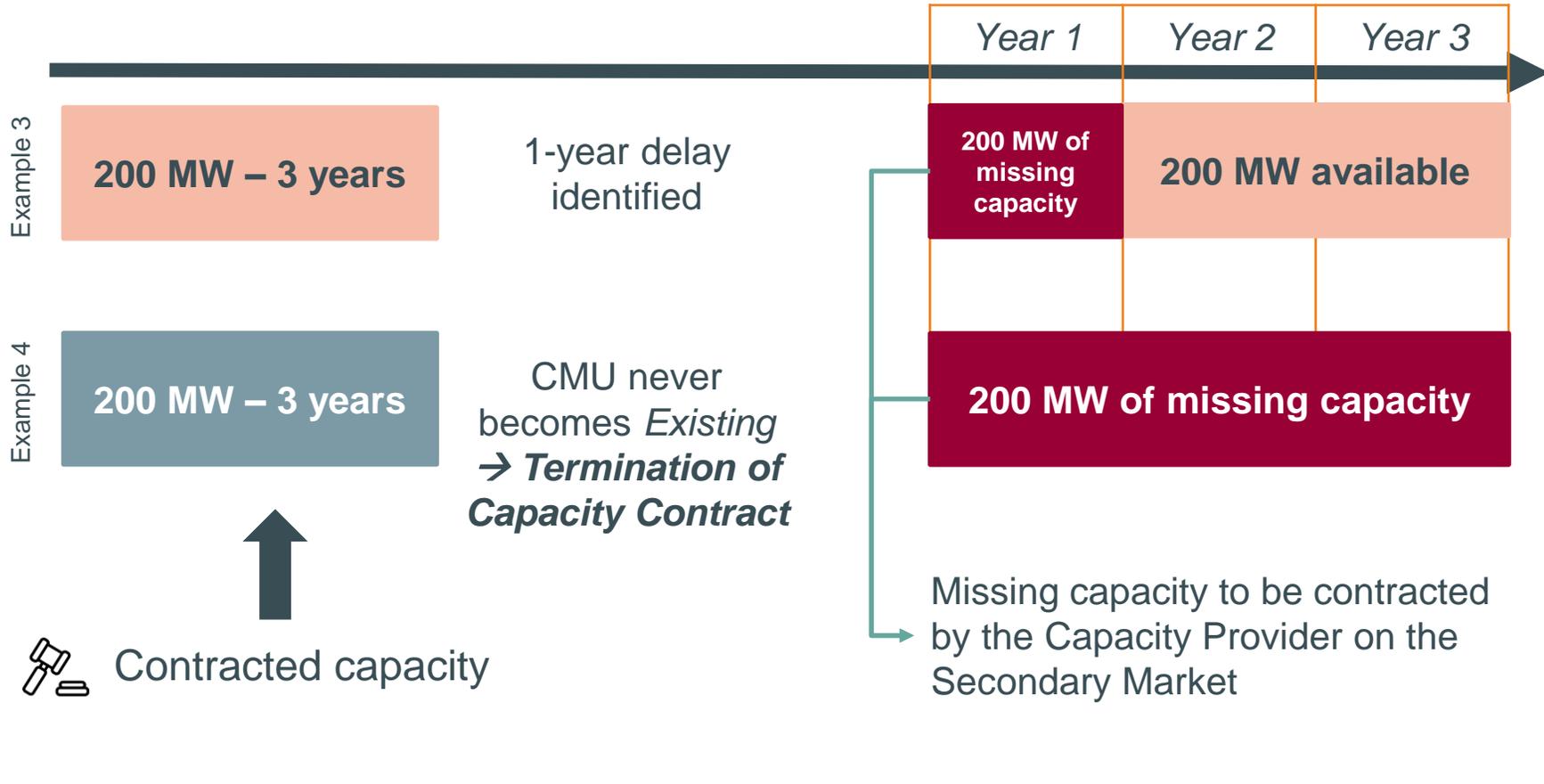
Y-4, Y-2 & Y-1: 31/10/Y

Identified missing volume leads to different penalties:

- a financial penalty

(for all type of CMUs)

- an obligation for the CRM Candidate to find an alternative solution by themselves (e.g., secondary markets)



Principle #3: The penalty must reflect the project owner possibility to mitigate related risk and must increase in time

- A penalty in case of non-compliance with the commitments can be:
 - A **financial penalty** (use of the Bank guarantee in case the Capacity Provider is unable to pay) and/or,
 - A **reduction of the Capacity Contract Duration** and/or,
 - A **suspension, exclusion or termination of the Capacity Contract.**

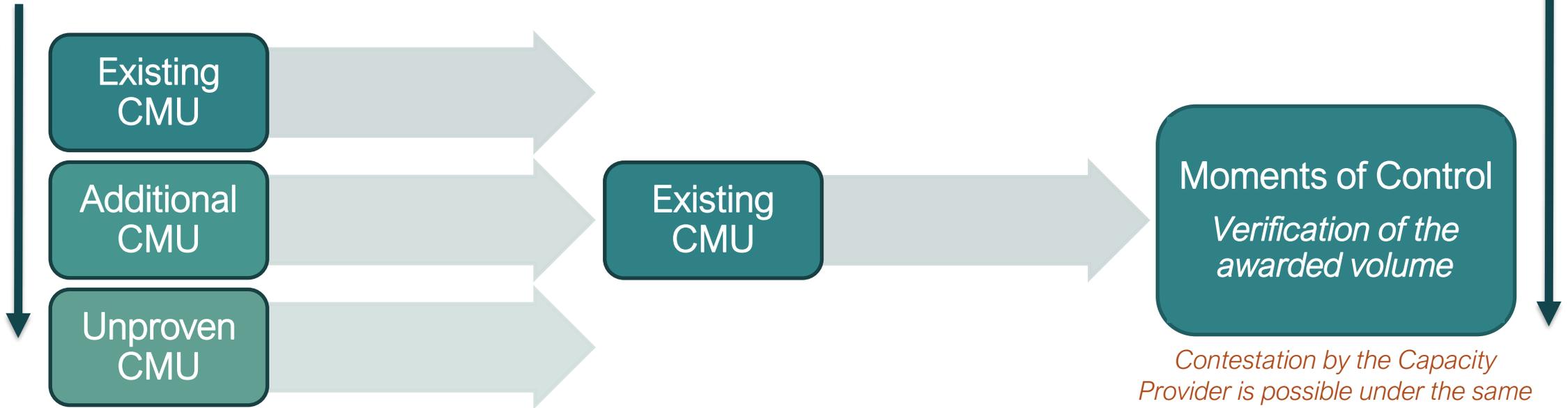
- Penalty **higher in monitoring phase 2** (limited time left to find alternative solution)

- **Additional capacities not becoming existing** prior to start of Delivery Period and for which no backup solution is found shall be considered as **unavailable in the availability monitoring**



Principle #4: Awarded Volume must be verified and confirmed at least once per pre-delivery period for each CMU

Y-4 Auction

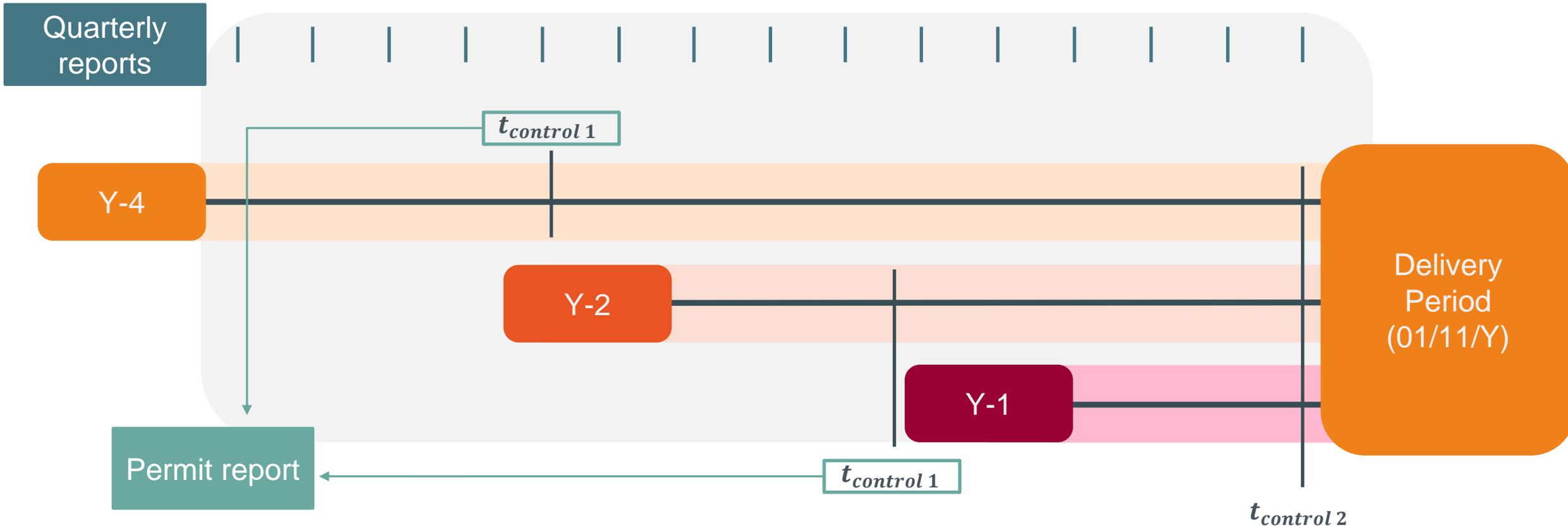


Delivery Period

Contestation by the Capacity Provider is possible under the same conditions than for the contestation of the NRP (Prequalification Process)



Additional and **Virtual** CMUs are required to provide **quarterly reports**.
Meanwhile **Existing** CMUs only have to provide **Permit reports** at the first moment of control.



Throughout the pre-delivery period, both **Additional** and **Virtual** CMUs provide **quarterly reports** to ELIA

- Contains information regarding the project execution plan, as well as potential **delays**

At $t_{control\ 1}$, all **Existing** CMUs provide a **permit report** with details on their permitting status

At the Moments of Control, missing volume is identified, using a special benchmark: the Pre-delivery Obligation

Pre-delivery Obligation:

- Reflects the amount of capacity that we expect to be present/not have delays
- The exact level can depend on the type of CMU and the moment of control:

	Existing CMU & Additional CMU	Virtual CMU
$t_{control\ 1}$	<i>Total Contracted Capacity</i>	$0.75 * Total\ Contracted\ Capacity$
$t_{control\ 2}$	<i>Total Contracted Capacity</i>	<i>Total Contracted Capacity</i>



For Energy Constrained CMUs, the Total Contracted Capacity is divided by the relevant Derating Factor to calculate the Pre-delivery Obligation

At the first moment of control, existing CMUs are examined using historical data and provided permitting reports, while additional CMUs provide quarterly reports.

By the second moment of control, additional CMU's should have received the 'existing' status.

Missing Volume is determined by comparing the Pre-delivery Obligation with the capacity the CMU can 'proof' already exists

- Reflects the amount of capacity that will likely not be present during the Delivery Period
- The exact method for determining this capacity depends on the type of CMU as well as the timing

	Existing CMU	Additional CMU	Virtual CMU
$t_{control\ 1}$	Based on <ul style="list-style-type: none"> • Historical data • Pre-delivery test 	Based on info from latest quarterly report	Capacity that has already been transferred to a corresponding Existing CMU
$t_{control\ 2}$	Based on <ul style="list-style-type: none"> • Historical data • Pre-delivery test 	Based on <ul style="list-style-type: none"> • Historical data • Pre-delivery test 	Capacity that has already been transferred to a corresponding Existing CMU

At this point, the CMU must have already become Existing to prove its capacity!

Pre-Delivery Monitoring: examples

OCGT 100MW

- **Not Energy Constrained**
- **Daily Schedule** (>25 MW)
- **Status:** Existing

T1 (31/08): historical data/test +
provide permit report

T2: historical data/test

DSM 5MW

- **Energy Constrained** (SLA 3h)
- **No Daily Schedule** (<25 MW)
- **Status:** Existing

T1 (31/08): historical data/test +
provide permit report

T2: historical data/test

STORAGE 30MW

- **Energy Constrained** (SLA 2h)
- **Daily Schedule** (>25 MW)
- **Status:** Additional (New Build)

T1: provide Quarterly Report

T2: historical data/test



Context

What is the CRM?

Getting to a contract:

- Types of Contracts
- Eligibility & Participation Assessment
- Prequalification
- Financial Security Obligation
- Auction
- Contract

Preparing for Delivery: Pre-Delivery Monitoring

Delivery Period:

- Availability Obligation
- Payback Obligation
- Secondary Market

Final notes





Availability Obligation

What is the Availability Obligation?

What are the consequences if I don't live up to the agreement?

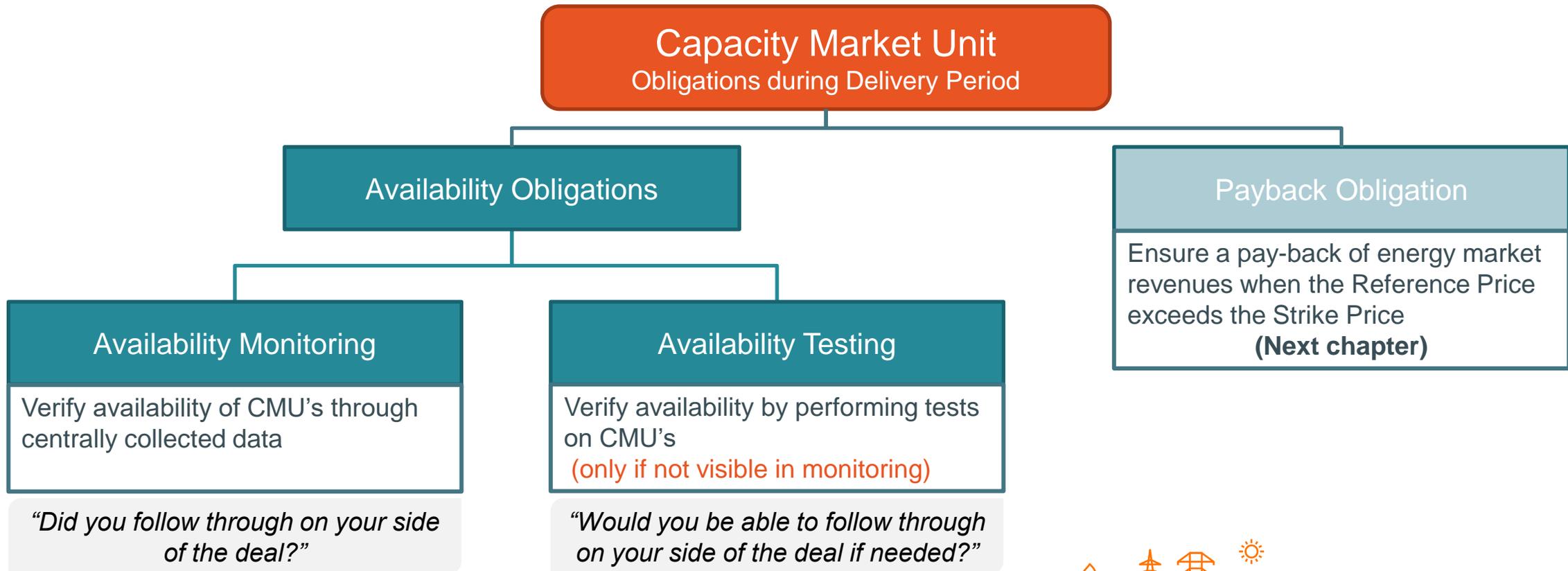
How and when will Elia check my market presence?

How much capacity should be present?

What if my required volumes are far Out of the Money?



During Adequacy-relevant moments and tests, a CMU is expected to have their Obligated Capacity available.



In Availability Monitoring, Elia checks the market presence of CMUs.
Unavailability at adequacy relevant moments will result in a Financial Penalty.

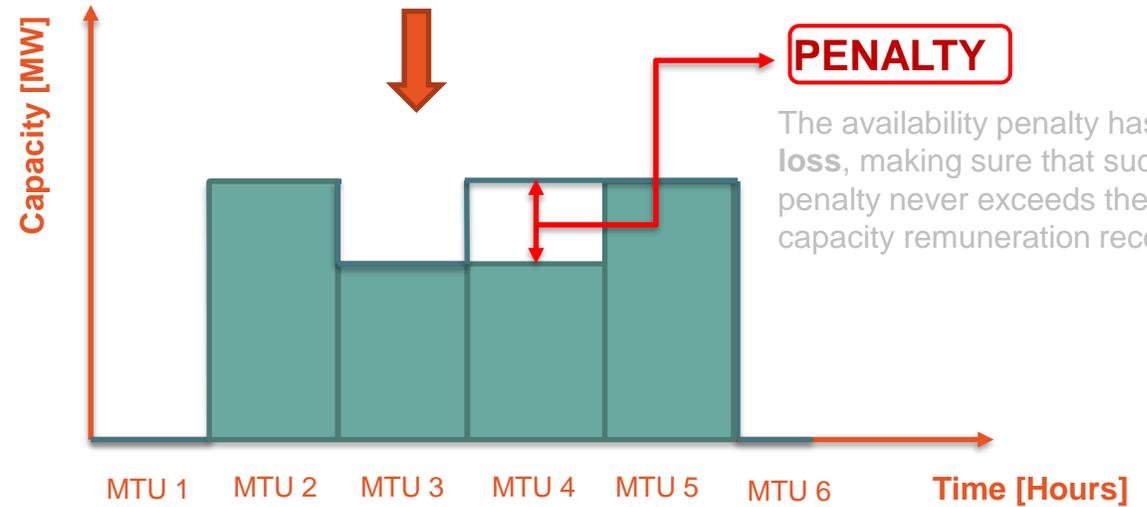
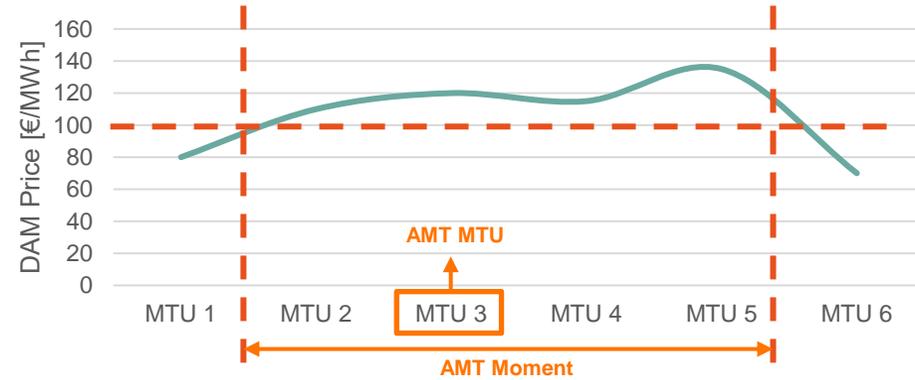
“Did you follow through on your side of the deal?”

I. Identify adequacy relevant moments

II. Establish Obligated Capacity

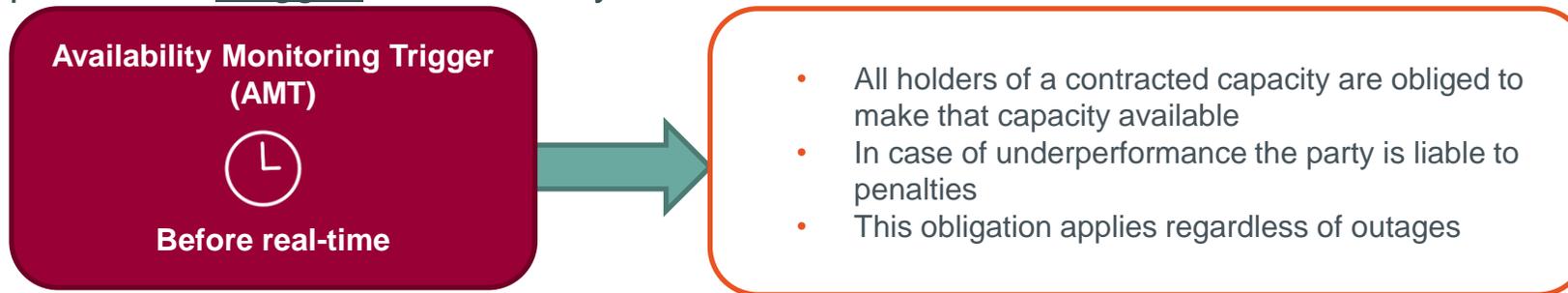
III. Establish Available Capacity

IV. Availability Penalty (if needed)



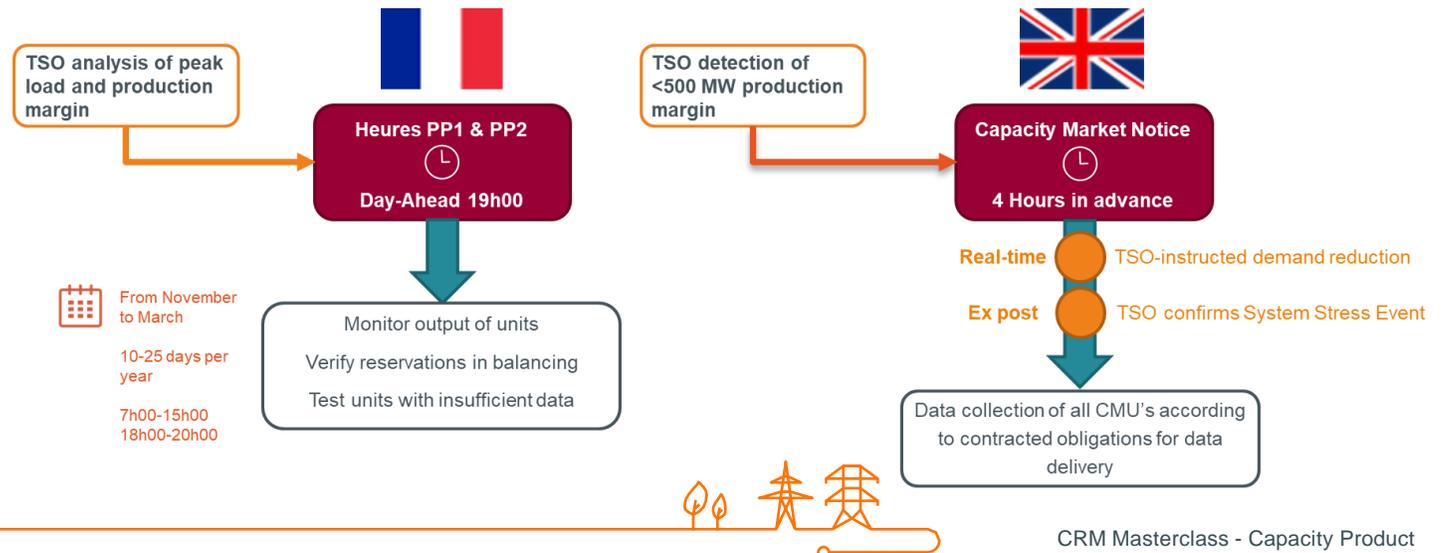
The Availability Monitoring Trigger (“AMT”) identifies moments when CRM capacity should be available

A predefined ‘Trigger’ could identify such moments:



Other EU CRM’s use this approach:

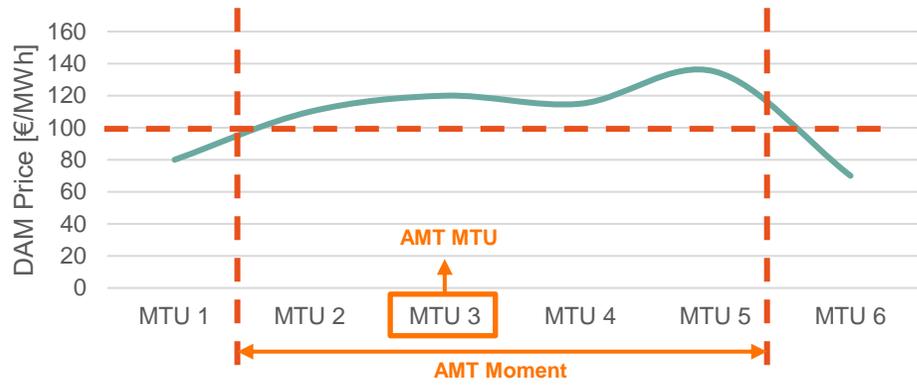
- France:** PP1 and PP2 days
- UK:** System Stress Events
- Poland:** Similar to UK



The Day-Ahead Market Price was chosen as the indicator for the trigger

- Most relevant for structural adequacy issues
- Transparency (e.g. contract applications)
- Liquidity (25-30% of BE total load)
- Technology-open (slow-ramping)

⇒ Defined single “AMT-price” leading to an Availability Monitoring Trigger when surpassed in DAM



AMT
↕
No AMT

- AMT is announced at 15h00 CET in Day-Ahead
- For each AMT Hour, Capacity Market Units will have an Obligated Capacity
- The Availability Monitoring Mechanism will assess Available Capacity
- Elia can issue Availability Tests to prove availability of capacity



During AMT Moments, Elia can verify the Obligated Capacity

- The Obligated Capacity depends on the amount of Total Contracted Capacity
- The Obligated Capacity can't simply be calculated the same way for all type of technologies
E.g. a battery can only supply for a limited set of hours
- Need to make a distinction between Energy Constrained and Non-energy Constrained CMUs



The Availability Obligation has a specific design for Energy Constrained vs Non-Energy Constrained CMU

Energy Constrained

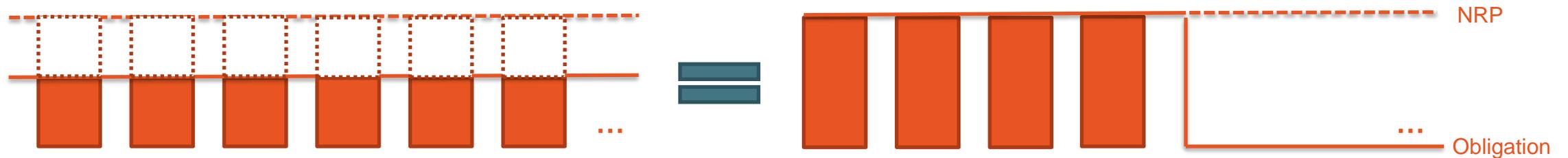
- ✓ At the level of **non-derated** capacity
- ✓ For a **limited set of MTUs**
- ✓ For **1 activation** of consecutive MTUs per day
- ✓ Derating based on the availability of the energy reservoir during scarcity moments

Non-Energy Constrained

- ✓ At the level of **derated** capacity
- ✓ For an **unlimited set of MTUs**
- ✓ For an unlimited amount of activations per day
- ✓ Derating based on outage rates or estimated production levels during scarcity

Principle of equivalence with respect to adequacy by derating

A CMU with an SLA of 4 hours has a derating of 57%



- Whether a CMU provides the product on the left or the right is equivalent for adequacy
- The product on the right is estimated to better fit the reality of an Energy Constrained CMU
- The energy constraint is chosen by the operator of the asset
 - The availability is according to the dispatching of the energy reservoir: almost certain unavailability as the AMT Moment gets longer



+ degrees of freedom in defining CMU:

- SLA Duration
- Self-derating (partial opt-out)

For an Energy Constrained CMU Elia determines the **SLA MTUs** as a subset of the AMT MTUs

- Only during SLA MTUs does Elia impose Obligated Capacity
- Total duration of SLA MTUs is limited to the SLA and one activation per day
- Determination of SLA MTUs captures the MTUs during which the CMU contributes the most

Availability obligation: examples

OCGT 100MW

- **Not Energy Constrained**
- **Daily Schedule (>25 MW)**

- **Contracted Capacity: 93MW**

- **Obligated Capacity during AMT-hours or tests:**
93 MW as OCGT is Not Energy Constrained

DSM 5MW

- **Energy Constrained (SLA 3h)**
- **No Daily Schedule (<25 MW)**

- **Contracted Capacity: 2,35MW**

- **Obligated Capacity during AMT-hours or tests:**
5 MW during SLA MTUs.
0 MW outside SLA MTUs.

STORAGE 30MW

- **Energy Constrained (SLA 2h)**
- **Daily Schedule (>25 MW)**

- **Contracted Capacity: 11,7MW**

- **Obligated Capacity during AMT-hours or tests:**
30 MW during SLA MTUs.
0 MW outside SLA MTUs.



During AMT Moments, the Obligated Capacity is compared to the Available Capacity

MW schedule obligation

- ✓ Capacities > 25 MW
- ✓ Available Capacity equal to the information as submitted to Elia
 - ✓ In the Availability Plan
 - ✓ In the Daily Schedule

No MW schedule obligation

- ✓ Capacities < 25 MW
- ✓ **Declare a Price** (DAM, ID, BAL) at which they will deliver
 - ✓ Can be revised at any time to follow marginal cost of the plants
- ✓ Only obligation to deliver when DAM > DDAP



Availability Testing is used when Availability cannot be directly monitored, when capacity is unproven.



Objective of Availability Tests:

- ✓ Complementary to Availability Monitoring
- ✓ For “Unproven” capacity
- ✓ Capability to react to surprise signal in day-ahead

“Would you be able to follow through on your side of the deal if needed?”

Availability testing is not meant to be “on top of” monitoring, but rather as a **last resort**.



Principles for selection:

- ✓ Low Proven Availability in monitoring
- ✓ Previously failed Availability Tests
- ✓ Missing Capacity in monitoring
- ✓ Poor correlation between (Partial) Declared Prices and measured output in the delivery Point
- ✓ Avoid days with particularly low risk on adequacy

The final selection procedure for testing moments is designed to accurately measure availability, but is not disclosed publically to ensure market parties cannot specifically prepare for them



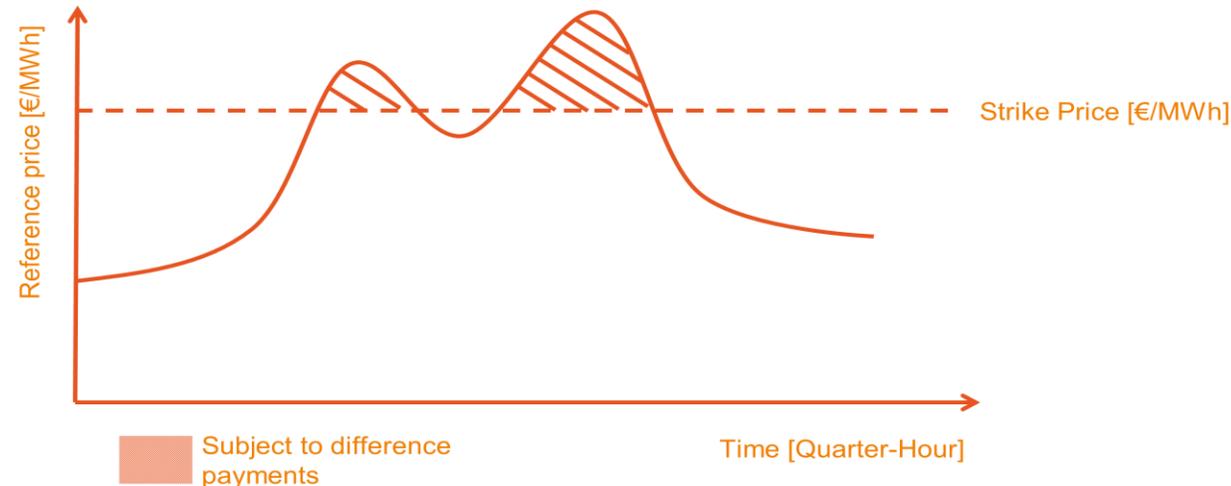
Payback Obligation

What is the Payback Obligation & why does it exist?
To whom does the Payback Obligation apply?



Remunerations have to be paid back if energy reference prices exceed the strike price, to avoid double remunerations.

In a **reliability option**, the capacity provider receives a capacity remuneration but is obliged to payback money to society whenever the reference energy spot price (e.g. day-ahead price) exceeds a pre-defined strike price.

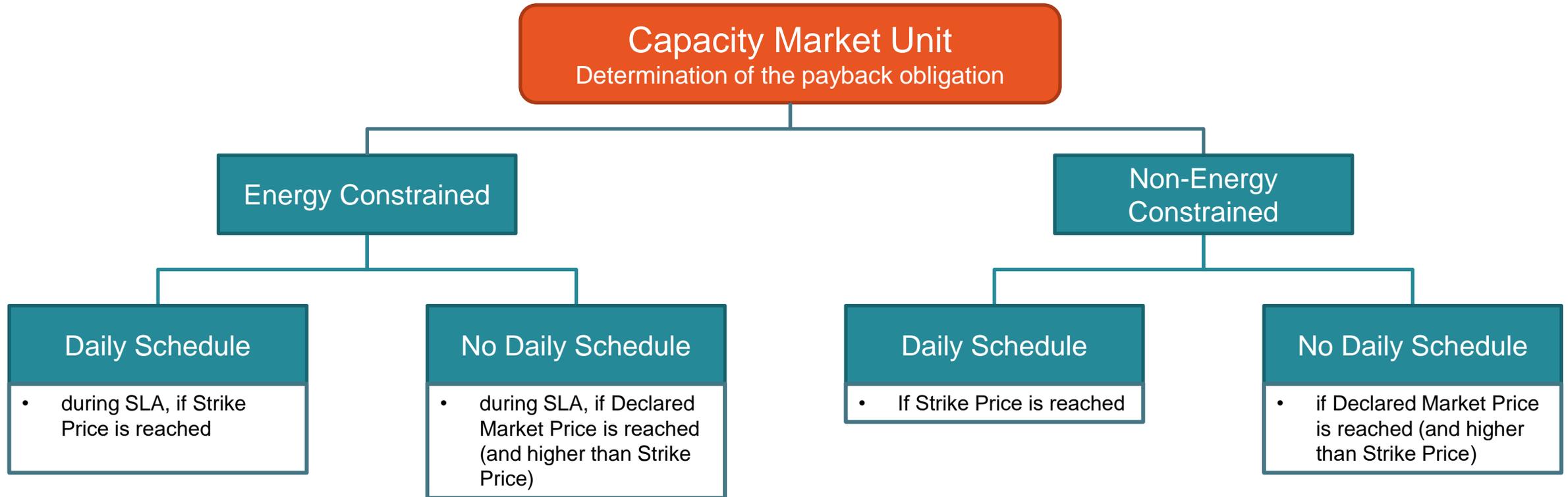


Such approach has two advantages for society:

- **Avoiding windfall profits:** as the capacity provider already receives a capacity remuneration on top of its 'normal' energy market revenues which should cover all its costs, extreme energy prices would provide him with an extra, double remuneration. This would constitute a windfall profit. The Payback Obligation has a stop-loss, making sure the amount to be paid back never exceeds the initial capacity remuneration received.
- **Strengthening incentive to deliver on SoS-obligations:** as capacity providers are obliged to payback when the energy price exceeds the strike price and those moments are strongly correlated with moment of (near-)scarcity, there is an extra incentive for capacity providers to be available in the system at such moments.



The application of the payback obligation differs per type of CMU



Important notes:

1. The strike price is determined during the calibration of the auctions, but is actualized based on the average monthly price of the DA market
2. For DSM, an exemption to the payback obligation is under discussion

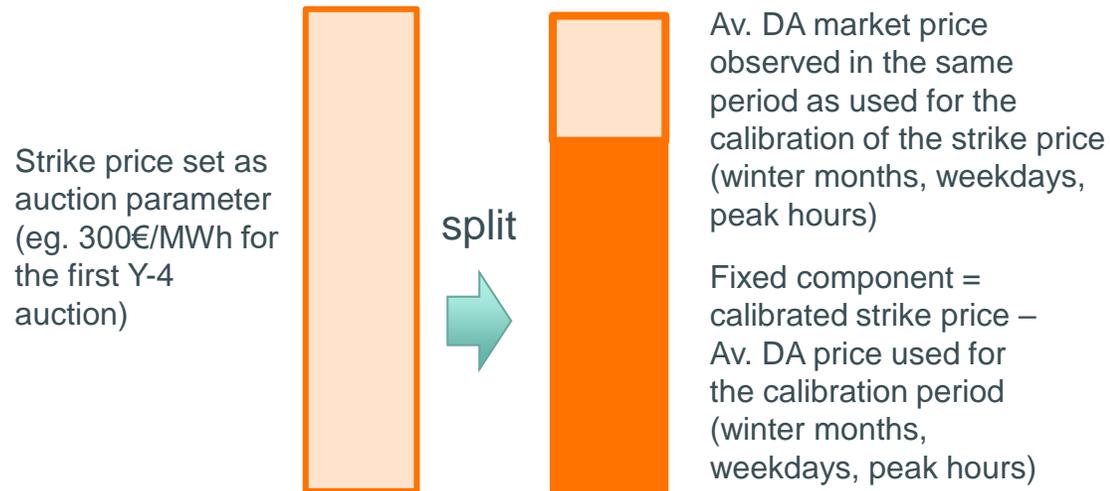


The actualization mechanism for the strike price evolved in 2022-23 to become more dynamic

- A **monthly** ex-post actualization of the strike price based on monthly DA prices (i.e. strike price of September is set by DA prices of September).
- This actualization would apply from **the first delivery year** and to **single & pluriannual contracts**.

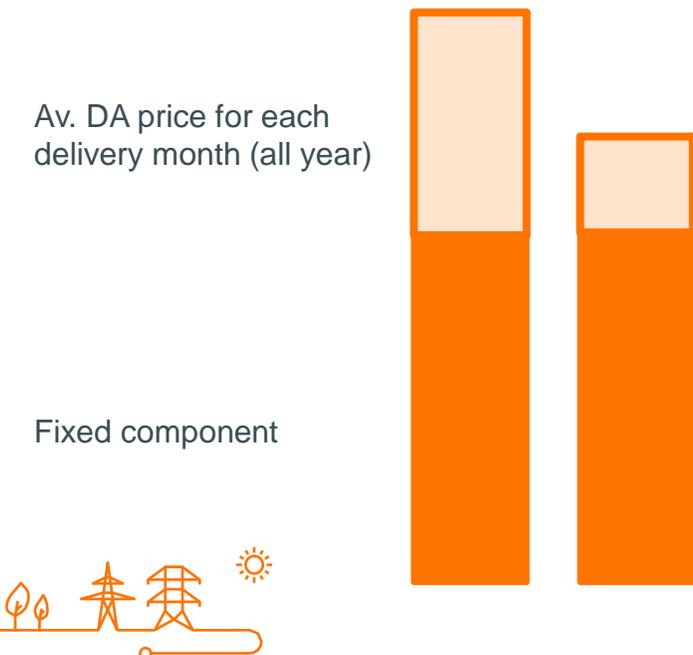
At the time of the auction

Fixed component
 = calibrated strike price
 – average DA prices for the calibration period



During delivery

Actualized Strike Price =
 (fixed component + average DA price for month m)



Payback Obligation: examples

OCGT 100MW

- **Not Energy Constrained**
- **Daily Schedule (>25 MW)**

- **Required to pay back:** Always if DAM price exceeds strike price €/MWh (value may evolve based on the evolution of DAM prices given the indexation foreseen)
- **For its entire Contracted Capacity**

DSM 5MW

- **Energy Constrained (SLA 3h)**
- **No Daily Schedule (<25 MW)**

- **Required to pay back:** Potentially exempted from Payback Obligation (under the condition that Payback exemption becomes effective for DSM)

STORAGE 30MW

- **Energy Constrained (SLA 2h)**
- **Daily Schedule (>25 MW)**

- **Required to pay back:** if DAM price exceeds strike price €/MWh (max up to its SLA)
- **For its entire non-derated Capacity during its SLA MTUs**



Secondary Market

What is the Secondary Market & why does it exist?
Who can participate in the Secondary Market?



CMUs can trade capacity obligations on the Secondary Market. This allows CMUs to sell their excess capacity or to cover their capacity shortages.

The purpose of a Secondary Market is:

- To allow Capacity Providers to be able to **transfer** their CMU Contracted Capacities and related obligations to another CMU in order to allow them to **manage their risks** better
- To contribute to **enhance competition** in the Primary Market (Auction) of all participating technologies ensuring SoS within the CRM
- To **decrease the risk** of the Auction bidders, and therefore **decrease the overall CRM cost**



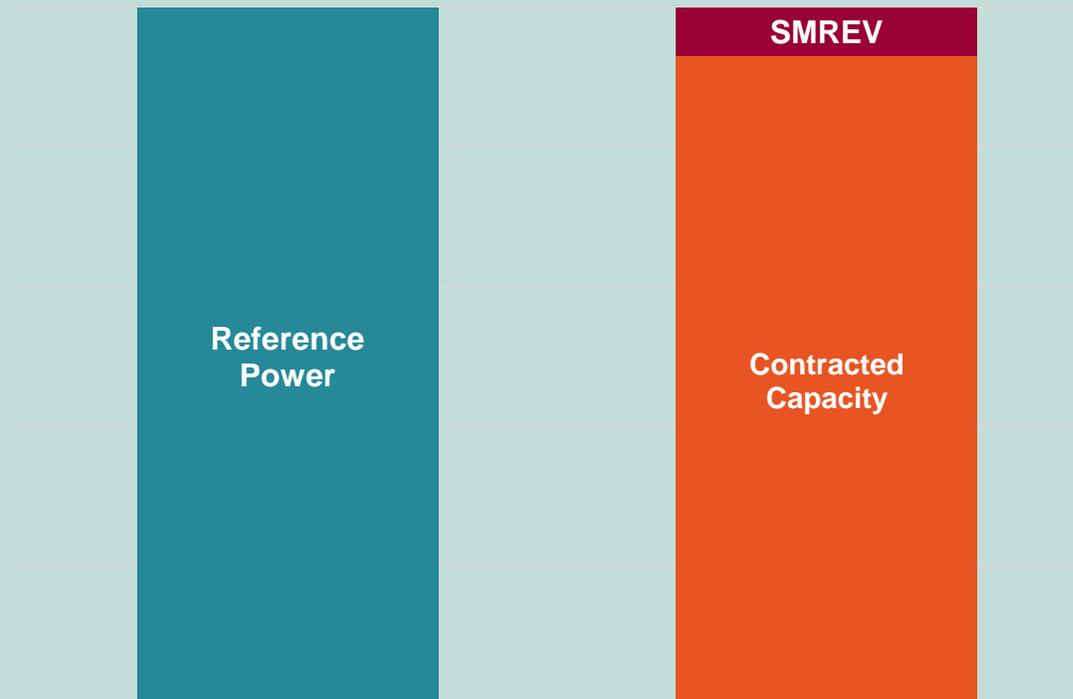
Any Prequalified CMU can trade on the secondary market, provided the offered volume is not considered contributing to adequacy yet.

The way the Secondary Market Remaining Eligible Volume is calculated depends on whether the CMU is Energy Constrained or not.

OCGT 100MW

- **Derating Factor:** 93%
- **Contracted Capacity:** 93 MW
- **Opt-out:** 0 MW

There is 7 MW of Non Derated Capacity. They are free to trade this available volume to other parties in the CRM. This volume is called the Secondary Market Remaining Eligible Volume (SMREV)



Context

What is the CRM?

Getting to a contract:

- Types of Contracts
- Eligibility & Participation Assessment
- Prequalification
- Financial Security Obligation
- Auction
- Contract

Preparing for Delivery: Pre-Delivery Monitoring

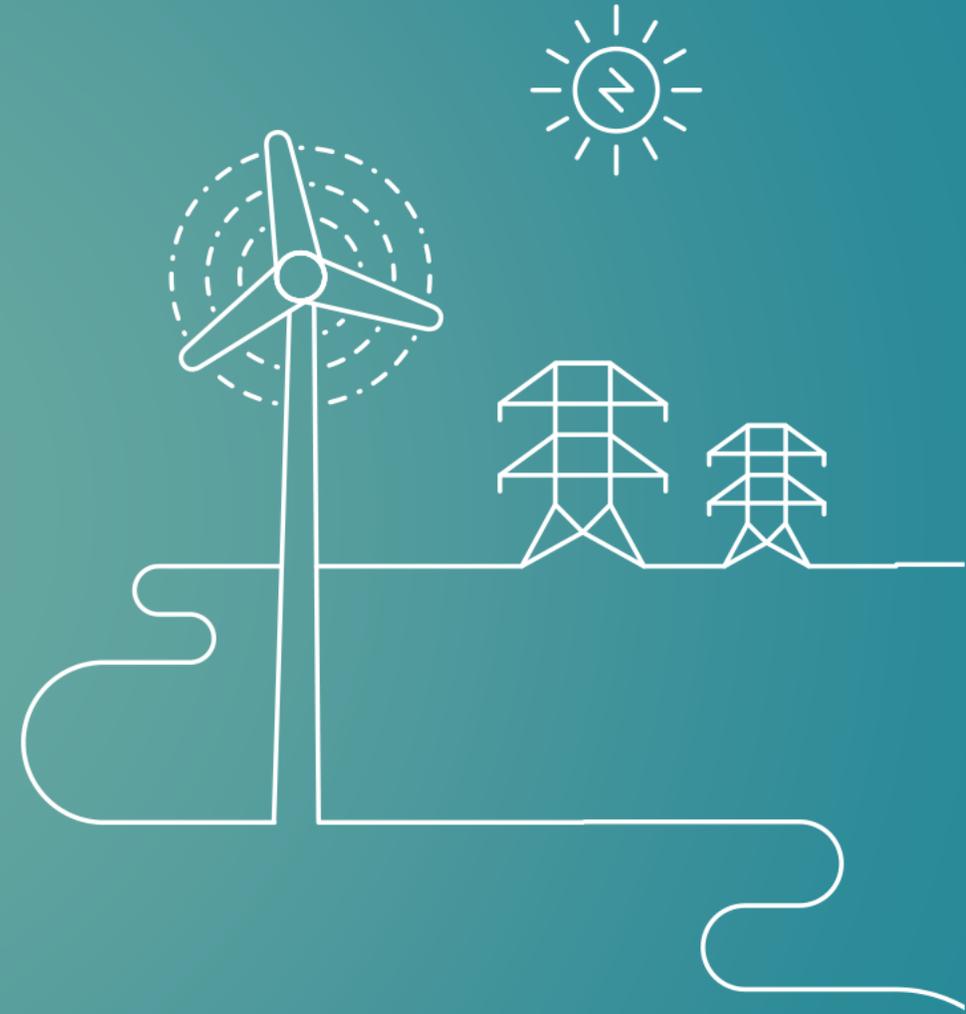
Delivery Period:

- Availability Obligation
- Payback Obligation
- Secondary Market

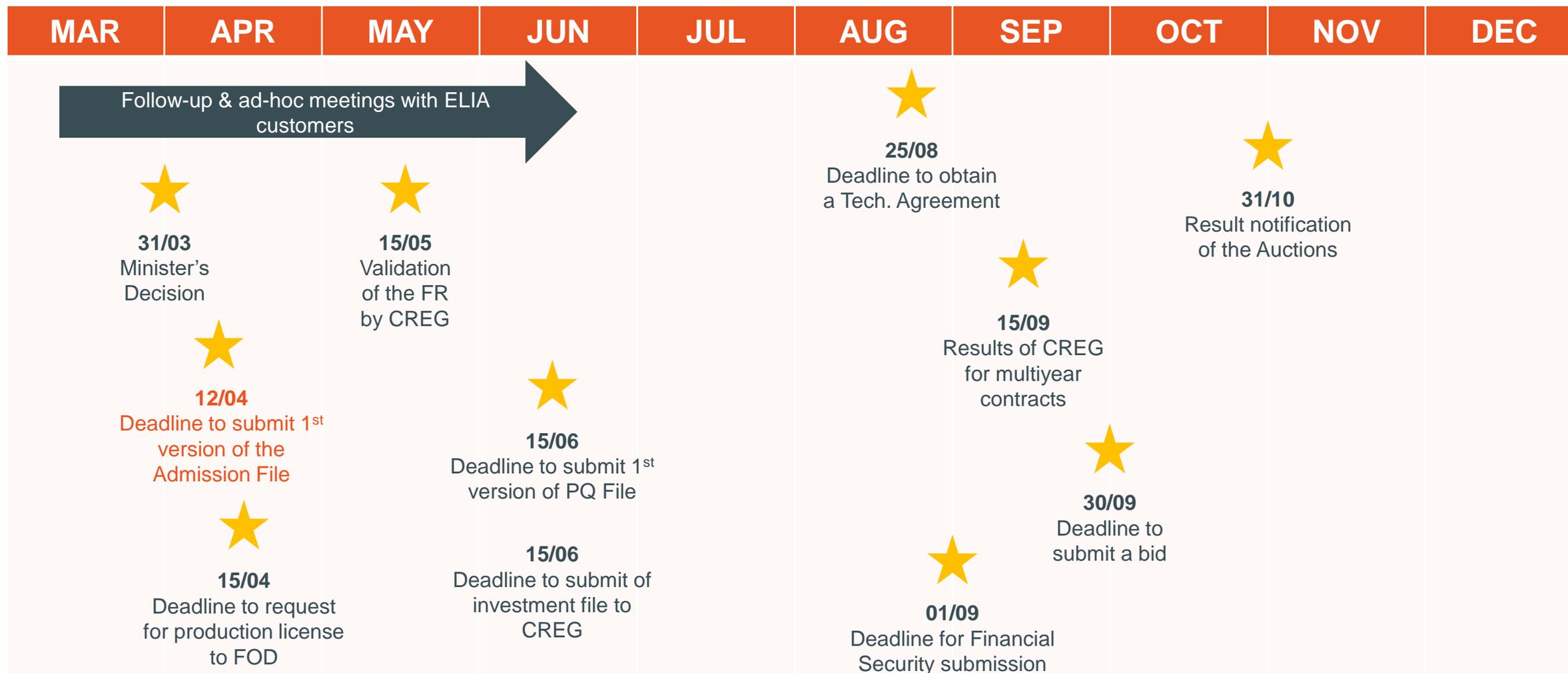
Final notes



Final notes



CRM auction - key dates in 2024



Your participation in the Y-1 / Y-4 Auction

Now to Q2 2024 'Preparation'

Flex revenue
estimation with Elia on
demand / in the 'Road
Shows'

By 15 June 2024 'Submission'

Prequalification File to
Elia

Multi year contract
possible via CREG

Sept 2024 'Bidding'

Elia feedback on MW

Your offers for the
Auction by 30/09

as of Oct 2024

Results
&
Contracts

Your Elia KAM guides you through your flexibility valorization supported by:

- CRM dedicated support (customer.crm@elia.be)
- Balancing products dedicated support (contracting_AS@elia.be)

You can also find [here](#) the list of "Balancing Services Providers"

Thank you

