CREG incentive: ‘Congestion Risk Indicator quality monitoring’

— Congestion Risk Indicator calculation methodology —

April 2025

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Introduction

In its decision (B)658E/89 on 17th October 2024 the Belgian Federal Commission for Electricity and Gas Regulation, the CREG, introduced an incentive related to **the quality of the Congestion Risk Indicator (CRI) process.**

The CRI process is a **daily operational process** run by Elia making an **explicit link between forecasted grid congestions, Balancing Energy Bids filtering and Return To Schedule instruction**.

The overall objective of the incentive is to create transparency regarding the CRI process rationale and market implications. Depending on the stakeholder there are three objectives to be fulfilled:

1. **for the CREG to monitor the CRI process**
2. **for Market Parties to understand and acknowledge the rationale of the CRI process**
3. **for Elia to enhance the process to minimize market interference while safeguarding operational security**

To achieve this, the CREG requests Elia to propose and share, on a quarterly basis as of January 2026, data and KPIs related to the CRI determination process. Extract of the CREG incentive decision mentions: 'KPI on determination of the CRI by Electrical Zone' a 'detailed analysis on the quality of the CRI calculation' and an 'analysis of the impact of the CRI for congestion management and market impact'.

This document **'Congestion Risk Indicator Calculation Methodology'** is part of the CRI incentive deliverables.

It shall serve as **a baseline to explain how the daily CRI process is run (section 1), a description of the process market impacts (section 2) and how it is implemented in operations along with the data that can be derived from it (section 3)**.

It shall be noted that this document describes the current Elia CRI process methodology and does not cover future evolutions of the process (arising from Gate Closure Time reduction for example). Additionally, this document focuses on the daily CRI level determination process which is the scope of the CREG incentive 'Monitoring of the CRI Quality' and not on the Electrical Zone identification which is a yearly process.

The CRI process is in operations since May 2024 and the iCAROS (Integrated Coordination of Assets for Redispatching and Operational Security) go live.

Executive summary

The Congestion Risk Indicator is a daily operational process run by Elia. Depending on the forecasted level of congestion in pre-defined Electrical Zones, Energy Balancing Bids might be set as unavailable in the upwards or downwards directions and a Return To Schedule be instructed.

The CRI level is set either at high, medium or low, reflecting the vulnerability of a specific Electrical Zone to grid congestions due to balancing Energy Bids activation or DP Schedule deviation. CRI levels are defined for each of the 10 currently identified Electrical Zones in Belgium, for the upwards and downwards directions and with an hourly granularity.

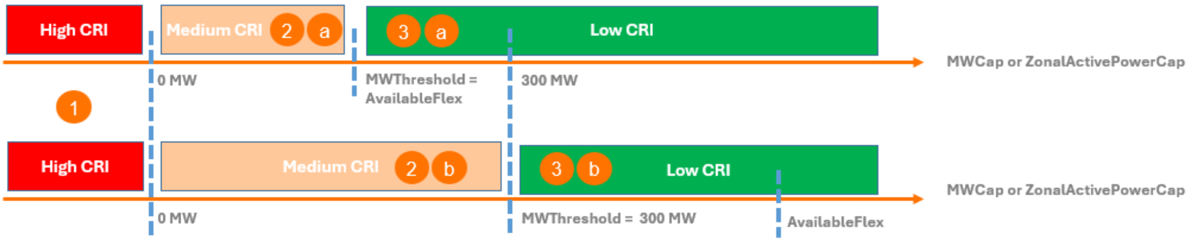
To determine the CRI level, Elia carries out an assessment where the active power net injection is gradually increased/decreased, until one of the Monitored Grid Element is overloaded in the Electrical Zone. This assessment is performed considering N and N-1 situations (no or one Continency respectively). The associated MW volume increase (up) or decrease (down) before hitting a network constraint is called the MWCap.

The CRI level depends on the MWCap comparison with the MWThreshold solely, where MWThreshold = min [300 MW; AvailableFlex].

AvailableFlex is the Electrical Zone Delivery Points' maximum active power net injection increase and decrease capability considering the difference between their Daily Schedules and their technical capacities (i.e. for AvailableFlex in the upwards direction: the volume to reach DP_Pmax_{inj} on all DP in the Electrical Zone) – 300 MW is an arbitrary threshold introduced to limit the occurrence of medium CRI levels.

Eventually the CRI level as a function of the MWCap becomes:

- **MWCap < 0** there is **no margin** to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element (1)
  → high CRI level Electrical Zone
- **0 < MWCap < MWThreshold** the **margin** to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element **is lower than the AvailableFlex (2a) or lower than 300 MW (2b)**
  → medium CRI level Electrical Zone
- **MWCap > MWThreshold** the **margin** to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element **is higher than the AvailableFlex (3a) or higher than 300 MW (3b)**
  → low CRI level Electrical Zone



The market impacts of the CRI process are outlined in the table below:

CRI level	Impact on mFRR Energy Bids	Impact on aFRR Energy Bids	Impact on Return To Schedule (RTS)
high CRI level	all mFRR Energy Bids with DP in the Electrical zone are filtered	aFRR Energy Bids with DP in the Electrical Zone are not systematically filtered.	SA with DP in the Electrical Zone will systematically receive a RTS message to indicate that a deviation from the Daily Schedule in the direction of the CRI is not allowed
medium CRI level	mFRR Energy Bids with DP in the zone might be filtered taking into account MWCap and filtering process	aFRR Energy Bids are filtered only if congestion occurs in Real Time in an Electrical Zone forecasted with a medium or high CRI level	
low CRI level	No impact		

This document details how the CRI level determination process is run, gives references to the applicable Terms and Conditions for the filtering process along with a deep dive into the operational and data aspect of the CRI process.

1 Congestion Risk Indicator determination process

The objectives of the daily CRI process are:

- **to set a limit on aFRR/mFRR Energy Bids activations** in case a risk of congestion is detected in an Electrical Zone so that balancing activations cannot create or aggravate a congestion risk. The filtering of Balancing Energy Bids is described in detail in the T&C aFRR; T&C mFRR and Balancing Rules documents.
- **to be used as an input for Elia to identify the need for Remedial Actions** to solve a congestion detected in an Electrical Zone such as topological remedial actions (non-costly) or a **request of Return To Schedule** or the activation of a **Redispatching Energy Bid**.
- **to warn grid users and their Scheduling Agents to not worsen an already stressed situation**

The CRI process hence links grid constraints with market aspects.

1.1 High-level CRI determination process flow

From a high-level perspective, the daily CRI process determination, which is the focus of this deliverable, can be split in three main steps. The three steps are shown in the figure below with the references to the respective sections in this document:

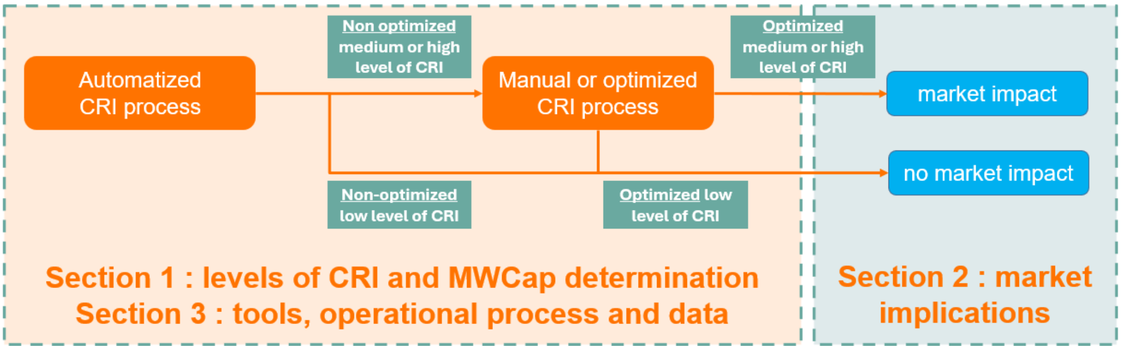


Figure 1: Simplified CRI business process

The first step is the '**automatized CRI process'** in which the CRI level is computed automatically. The high and medium cases are then assessed further through the '**manual (or optimized) CRI process'** determination step which requires the involvement of ELIA grid engineers. Output of the automatized/manual CRI process determination are hence tagged as non-optimized/optimized respectively.

Eventually comes the 3rd step where market parties are made aware of the outcome of the CRI determination process and its market implications.

1.2 CRI level determination

1.2.1 High level definition: introduction of the MWCap

The CRI level is set either at high, medium or low, reflecting the vulnerability of a specific Electrical Zone to grid congestions due to balancing Energy Bids activation or Schedule deviation. The CRI levels are defined for each of the 10 currently identified Electrical Zones in Belgium, in the upward and downward directions and with an hourly granularity.

The guiding principle for the CRI level determination is as follows: **Elia assesses the security margin, namely the Zonal Active Power Cap or MWCap in this document, to activate Energy Balancing Bids in the upward and the downward directions.**

In details this means that Elia carries out a zonal assessment where the active power net injection is gradually increased/decreased, until one of the Monitored Grid Element is overloaded (in N or N-1 situation). The MW volume increase (up) or decrease (down) before hitting a network constraint is called the MWCap.

This assessment considers the use of non-costly Remedial Actions (RA). There are 3 possible outcomes to this assessment:

- **MWCap < 0** there is **no margin** to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element
  → **high CRI level Electrical Zone**
- **MWCap > 0** there is **limited margin** to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element
  → **medium CRI level Electrical Zone**
- **MWCap = ∞** there is **an infinite margin (theoretical)** to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element
  → **low CRI level Electrical Zone**

1.2.2 Detailed definition: introduction of the MWThreshold

There is a need for a threshold to distinguish between medium and low CRI (MWCap > 0 and MWCap = ∞). The (first) threshold, called 'AvailableFlex', is defined for each Electrical Zone in the upwards and downwards direction.

The AvailableFlex up and down reflects the Electrical Zone's Delivery Points' maximum active power net injection increase and decrease capability, respectively. It is the difference between the zone's DP Daily Schedules (and forecasts for DP not subject to the SA Contract) and their technical capacities (i.e. DP_Pmax_{inj} and 0 for the AvailableFlex in the up and downward direction, respectively). This threshold is hence **not related to grid constraints.**

The AvailableFlex is relevant as (a first) threshold to distinguish between medium and low CRI. Straightforward CRI level definitions become:

- **MWCap < 0 → High CRI level**
- **0 < MWCap < AvailableFlex → Medium CRI level**
- **MWCap > AvailableFlex → Low CRI level**

Sticking to this CRI level definition leads to numerous situations for which the outcome of the CRI process is medium CRI. Indeed, considering situations with a high volume of AvailableFlex, the MWCap is likely to be lower than the AvailableFlex. This results in situations where 0 < MWCap < AvailableFlex and concludes on a medium CRI level. To cope with this case, **an arbitrary threshold at 300 MW has been pro-actively introduced by Elia on top of the AvailableFlex.**

To be explicit, **the objective of this additional arbitrary 300 MW threshold is to limit the occurrence of the medium CRI level (and its market impact) while safeguarding grid security.** This threshold of 300 MW is currently the same for each Electrical Zone and applies in the upward and the downward directions.

Eventually the CRI level as a function of the MWCap becomes:

- **MWCap < 0** there is **no margin** to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element (1)
  → **high CRI level Electrical Zone**
- **0 < MWCap < MWThreshold** the margin to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element is positive and lower than the AvailableFlex (2a) (i.e. in the upwards direction: the MW volume to be increased to reach DP_Pmax$_{inj}$ on all DP in the Electrical Zone) or lower than 300 MW (2b)
  → **medium CRI level Electrical Zone**
- **MWCap > MWThreshold** the margin to increase or decrease the net injection in the Electrical Zone before reaching an overload on a Monitored Grid Element is higher than the AvailableFlex (3a) or higher than 300 MW (3b)
  → **low CRI level Electrical Zone**

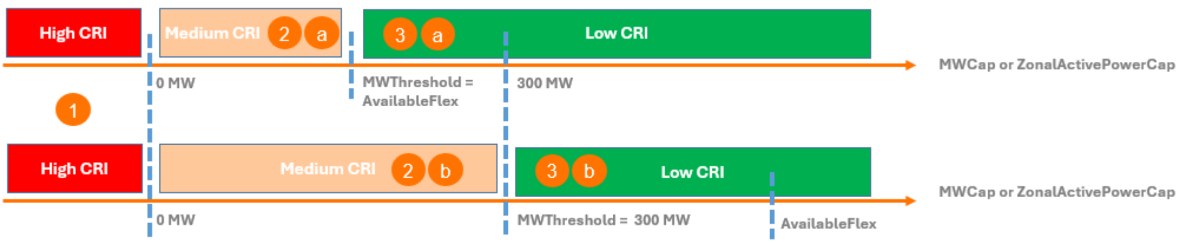


Figure 2: CRI level as a function of the MWCap

In a nutshell, considering MWThreshold = min [300 MW; AvailableFlex]:

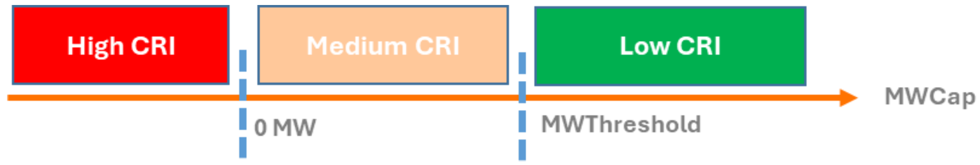


Figure 3: CRI level as a function of the MWCap and MWThreshold

CRI levels computed by Elia for each of the 10 Belgian Electrical Zones in upward and downward directions can be found on Elia's CRI webpage.[1]

1.3 MWCap determination

1.3.1 General considerations

The MWCap along with the AvailableFlex are needed to determine the CRI level.

The MWCap computation relies on Elia's operational power systems tool. From a high-level perspective, required inputs for the MWcap determination are:

- **IGM**: Individual Grid Model used as best forecast for the Belgian electrical grid targeted business hour considering latest Elia load & generation & storage forecast along with grid outages, optimized topology (as per IGM creation process[1])
- **CGM**: Common Grid Model used as the best forecast for the Pan EU electrical grid state (outside Belgium) targeted business hour, delivered by Coreso
- a Contingency list: all 150-220-380kV grid element (incl. generator outages)
- **a finite set of Monitored Grid Element** per Electrical Zone (i.e. monitored elements not to be overloaded) located mainly between Electrical Zones, and all 380-220-150 kV equipments as contingencies
- **Zonal GLSK**: Generation and Load Shift Key, representing the distribution of an increase/decrease of net injection over the DPs in the zone, used to simulate potential Balancing Energy Bids activation
- **PTDF**: Power Transfer Distribution Factor computes the impact of 1 MW active power net injection increase/decrease in an Electrical Zone on a specific Monitored Grid Element. This 1 MW increase/decrease is distributed according to the Electrical Zone GLSK.
- **Fmax**: seasonal permanent limit of grid elements (considering Dynamic Line Rating for planning studies as well) as this is aligned with Elia's operational standards (i.e. N-1 simulation calculation in the Security Analysis process)

[1]Webpage

1.3.2 Automatized process step: non-optimized MWCap determination

To cope with the important number of MWCap calculation (10 defined Electrical Zone, 2 directions and 24 business hours) an automatized process is needed.

Using load flow calculations, Elia derives the PTDFs for each Monitored Grid Element (before and after Contingency). This allows to estimate the load on each Monitored Grid Element after an increase/decrease of net injection in the Electrical Zone:

$$\text{Loading}_{\text{MGE1, after inj. increase}} = \text{Loading}_{\text{MGE1, before inj. increase}} + \Delta P \times \text{PTDF}_{\text{zone} \rightarrow \text{MGE1}}$$

Per Electrical Zone, the most limiting Monitored Grid Element and its associated Contingency is derived as the one being overloaded first with a minimum ΔP increase or decrease. ΔP is the Electrical Zone MWCap.

The MWCap computed at this stage is a 'non-optimized MWCap' as the automatized process does not consider the use of the Remedial Action to relieve the congestion.

The table below provides an example of the automatized process result table for a given Electrical Zone in the up (or incremental) direction. It highlights how most limiting Monitored Grid Element and the MWCap are identified:

Monitored Grid Element loading (after COntingency) with 0 MW net injection increase in the Electrical Zone

Monitored Grid Element loading is at 100% (after COntingency) considering 120 MW net injection (ie MWCap) increase in the Electrical Zone

Most limiting Monitored Grid Element and related Contingency: a / y

Incremental		Increase in production in zone 1 [MW]												
CNE	CO	0	20	40	60	80	100	120	140	160	180	200	220	240
a	x	80%	82%	83%	85%	86%	88%	90%	91%	93%	94%	96%	98%	99%
b	x	53%	59%	64%	69%	75%	80%	85%	91%	96%	101%	107%	112%	117%
c	x	75%	76%	77%	78%	79%	80%	81%	82%	83%	84%	85%	86%	87%
d	x	60%	60%	59%	59%	58%	58%	57%	57%	56%	56%	55%	55%	54%
a	y	90%	92%	93%	95%	96%	98%	100%	101%	103%	104%	106%	108%	109%
b	y	37%	42%	47%	53%	58%	63%	69%	74%	79%	85%	90%	95%	101%
c	y	50%	51%	52%	53%	54%	55%	56%	57%	58%	59%	60%	61%	62%
d	y	75%	75%	74%	74%	73%	73%	72%	72%	71%	71%	70%	70%	69%

Figure 4: example of automatized process table result (up direction)

In this example the MWCap is set to 120 MW, as this corresponds to the MW volume increase leading to a 100% load on the most limiting Monitored Grid Element.

To go one step further and define the related CRI level, the AvailableFlex in the upwards direction needs to be computed for this Electrical Zone. This is done automatically as well. Considering a hypothetical AvailableFlex of 150 MW (meaning that if all units are set to their $DP\_Pmax_{,inj}$, the net injection increase would be 150 MW in the Electrical Zone): the CRI level would be set to medium since:

0 < MWCap = 120 MW < MWThreshold = min [300 MW; AvailableFlex] = 150 MW

The PTDF computation, most limiting Monitored Grid Element and ΔP identification are done automatically in Elia internal tools.

1.3.3 Manual or optimized process step: MWCap optimization

Introducing non-costly Remedial Action (i.e. topological RA) when Monitored Grid Element are congested during the MWCap process determination increases the MWCap. Elia assesses manually which RA are the most relevant to be applied for the cases that were identified with a high or medium CRI level during the automatized process step.

This manual RA process is carried out by the Elia grid engineers using Elia's operational power systems tool with the same inputs as the one used during the automatized process. Sole difference is that the engineer needs to open the grid situation, simulate the Contingency, assess the load on the Monitored Grid Element, seek for the most relevant RA and eventually compute the updated MWCap.

Outcome of this manual process are 'optimized MWCap and CRI levels' as all available non-costly levers have been used to increase the MWCap. These optimized figures are the only one communicated to the Market Parties by Elia.

2 Market implications

The goal of this part is to give an overview of the market impacts. Market implications depend on computed CRI level and type of balancing products.

Details on impacts are to be found in the Balancing Rules and T&C BSP for the filtering of Balancing Energy Bids and in the Terms and Conditions for Scheduling Agent (T&C SA) and Rules for Coordination and Congestion Management for the Return to Daily Schedule (RTS).

2.1 CRI impact on mFRR Energy Bids

Depending on the DP location and CRI level in the DP Electrical Zone, mFRR Energy Bids might be filtered (i.e. set unavailable for activation) **at Qh-10 min:**

- **High CRI level Electrical zone → all mFRR Energy Bids with DP in the zone are filtered**
- **Medium CRI level Electrical zone → mFRR Energy Bids with DP in the zone might be filtered taking into account MWCap and filtering process**
- **Low CRI level Electrical zone → no impact / no filtering**

For all details about the filtering process of mFRR Energy Bids for high and medium CRI level refer to Balancing Rules (article 10) and in the Terms and Conditions for the Balancing Service Provider.

2.2 CRI impact on aFRR Energy Bids

The guiding principle is that aFRR Energy Bids with DP in a high or medium CRI level Electrical Zone are not systematically filtered.

aFRR Energy Bids are filtered, set unavailable for activation, solely if <u>both</u> below conditions are met:

1. The Real-Time Security Analysis based on measurements (every 5 minutes) identifies an overload on which the aFRR Energy Bid activation has an influence
2. The Electrical Zone, in which the DP corresponding to the aFRR Energy Bid is located, is in a high or medium CRI level zone (identified during CRI Day Ahead or Intra Day runs)

Depending on <u>when</u> the overload needs to be resolved, 2 distinct processes of filtering apply:

- Immediate action required during Qh - only in exceptional situations:
    - aFRR Energy Bids of the current Qh and of Qh+1 are filtered by setting the aFRR Requested to 0 via Elia's EMS
    - aFRR Energy Bids from Qh+2 till end of high/medium CRI level period are filtered in Biple

- Action required as of next Qh:
    - aFRR Energy Bids from Qh+1 till end of high/medium CRI level period are filtered in Biple

A concrete example is shown on the below figure with a high CRI level identified during the DA CRI run for a period between 1 AM and 3 AM:

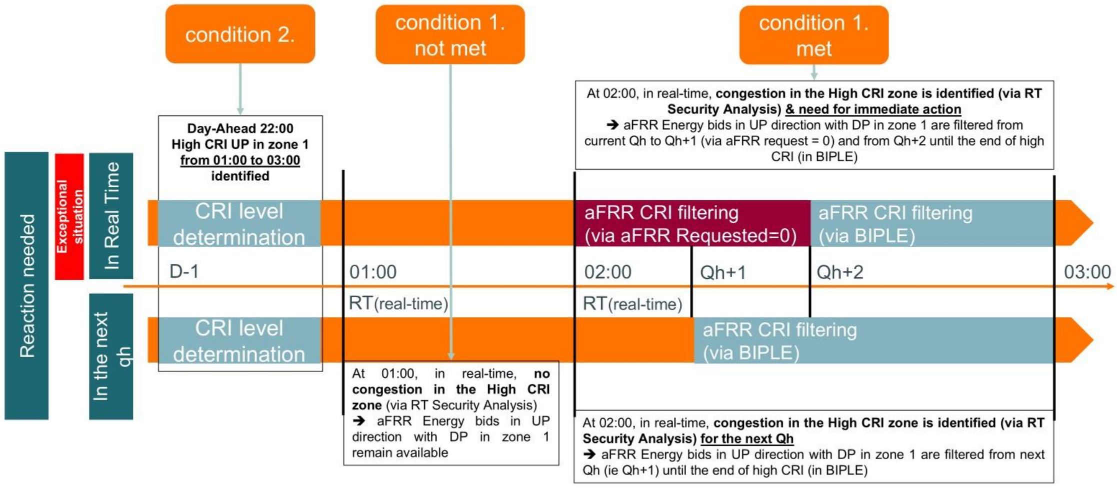


Figure 5: example of aFRR bids filtering in normal and exceptional conditions

2.3 CRI impact on FCR

There is no impact of the CRI process on the FCR Service.

2.4 CRI impact on RTS

Pursuant to article 133 of the Code of Conduct, and as the last validated Daily Schedule at Redispatching Gate Closure Time (RD GCT) is expected to be firm, Elia can enforce the SA to return to its daily schedule in real-time. Elia will only enforce the SA to return to its daily schedule when this is deemed necessary for the grid security i.e. if the deviation of the daily schedule causes or aggravates a congestion risk.

This command will be requested for all DP in a specific Electrical Zone, in accordance with the CRI level defined in this zone. The SA of the DP only needs to react if its active power injection/offtake is deviating from the daily schedule in the direction of the medium or high CRI defined in the zone (note: the authorized boundaries in which the DP is allowed to operate is indicated in the return to schedule request message).

Eventually if a DP is in a high or medium CRI level Electrical Zone for a given Qh, the SA will systematically receive a Return to Daily Schedule (RTS) message in Real Time (before the start of the Qh) to indicate that a deviation from the Daily Schedule <u>in the direction</u> of the CRI is not allowed (e.g. no reactive/self-balancing):

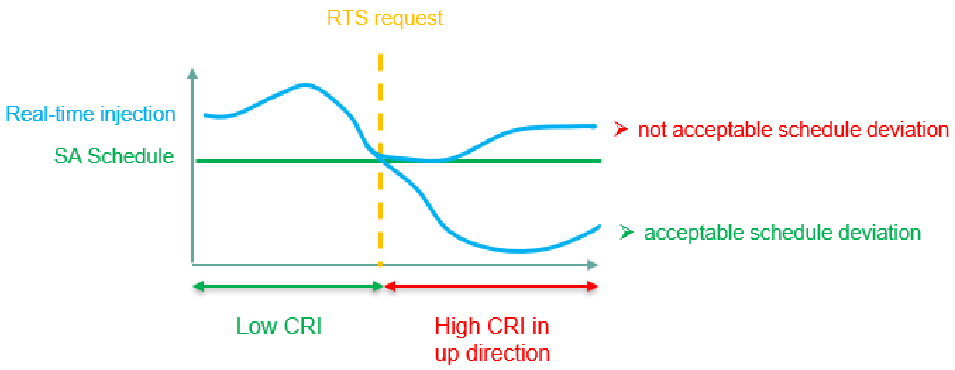


Figure 6: RTS message for High and Medium CRI – acceptable and not acceptable schedule deviations

2.5 Gates, CRI impact and messages to SA & BSP

The below figure details the different gates timings and when SA/BSP can send Daily Schedules/Energy Balancing Bids updates. It also summarizes the impacts of the CRI process and the messages sent by Elia to market parties in Day Ahead, Intra-Day and Real Time as a function of the CRI level. For example: at Qh-10minutes, in a medium CRI level Electrical Zone, Elia will filter the mFRR Energy Bids (impacting market parties), send a notification to the BSP via ECL (no action regarding aFRR bids).

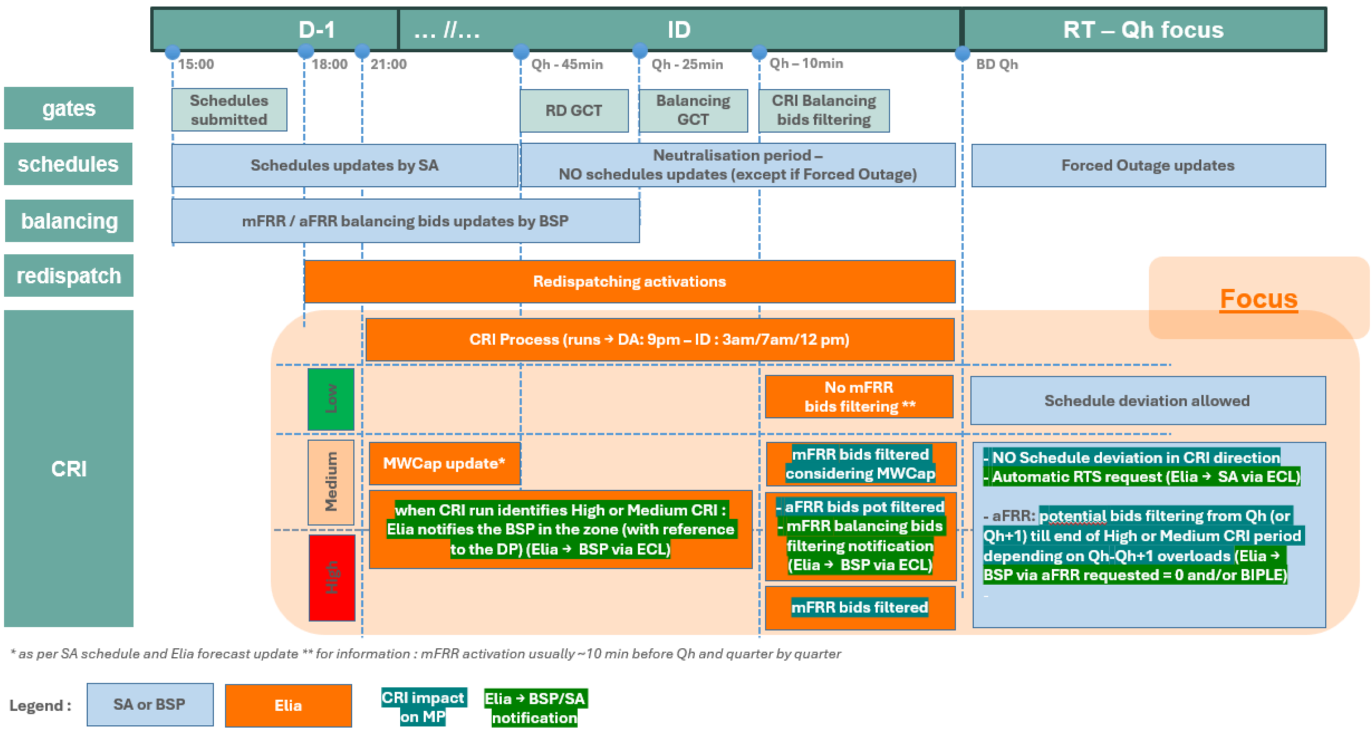


Figure 7: Gates, CRI impact and messages to Market Parties

3 CRI operational process deep dive

This section details how Elia performs the CRI process determination from an operational perspective, highlights differences with the security analysis process and identifies the main CRI process retrievable data (usable in the framework of the CREG incentive).

3.1 Operational process description and timings

To limit the CRI market impact and reflect Delivery Points' influence on Monitored Grid Element, the Belgian grid is currently split in 10 Electrical Zones. The relevance of those zones is assessed on a yearly basis, depending on local grid evolution.

3.1.1 Operational constraint

Each Electrical Zone, today 10 in total, is assessed in the up and down direction (× 2) which implies 20 studies per hour. **This requires Elia to rely partly on an automatized process for the CRI levels definition to comply with operational timings.**

3.1.2 Operational runs' timing and coverage

For the CRI levels to reflect as much as possible the future actual Real Time state of the grid but also to provide market parties with the right signals already in Day Ahead, the **CRI process comes with 4 runs**: one run in D-1 (8 PM), completed with 3 ID runs (3 AM – 7 AM – 12 PM).

Each of the 4 runs covers specific business hours with an hourly granularity, as per below table:

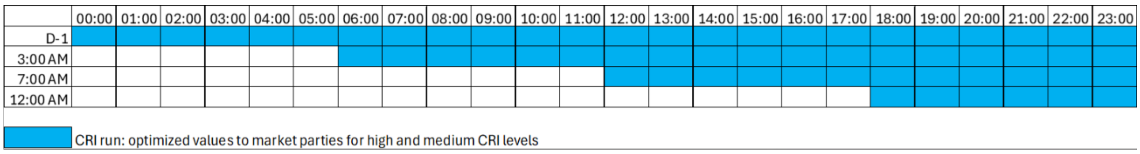


Figure 8: CRI run timings and focus hours

To ease the understanding of the above-mentioned table: in DA at 8 PM, the 24 business hours of the next business day are analyzed sharing tendency to market parties about constrained zones. At 03 AM in ID, the 18 business hours of the day are re-assessed (starting from 06 AM till 11 PM).

Each run is structured in 2 steps:

- the automatized process step described in section 1.3.2
- the manual process step detailed in section 1.3.3

3.2 Operational process applications

The CRI process relies on several internal Elia applications mentioned below and highlighted in orange in the scheme after:

- **Automatized and Manual CRI processes are run in Elia's operational power systems tool**
- **the Congestion System module is a dashboard exposing the Electrical Zones CRI levels and MWCap to Elia operator** allowing them to:
  - **validate** CRI levels and MWCap (values sent to market parties are first computed and then validated)
  - **monitor** the evolution of the MWCap in real time
- **Optiflex and Biple** which are respectively the user interface of Elia's **'scheduling tool'** and the **'energy bidding platform'**

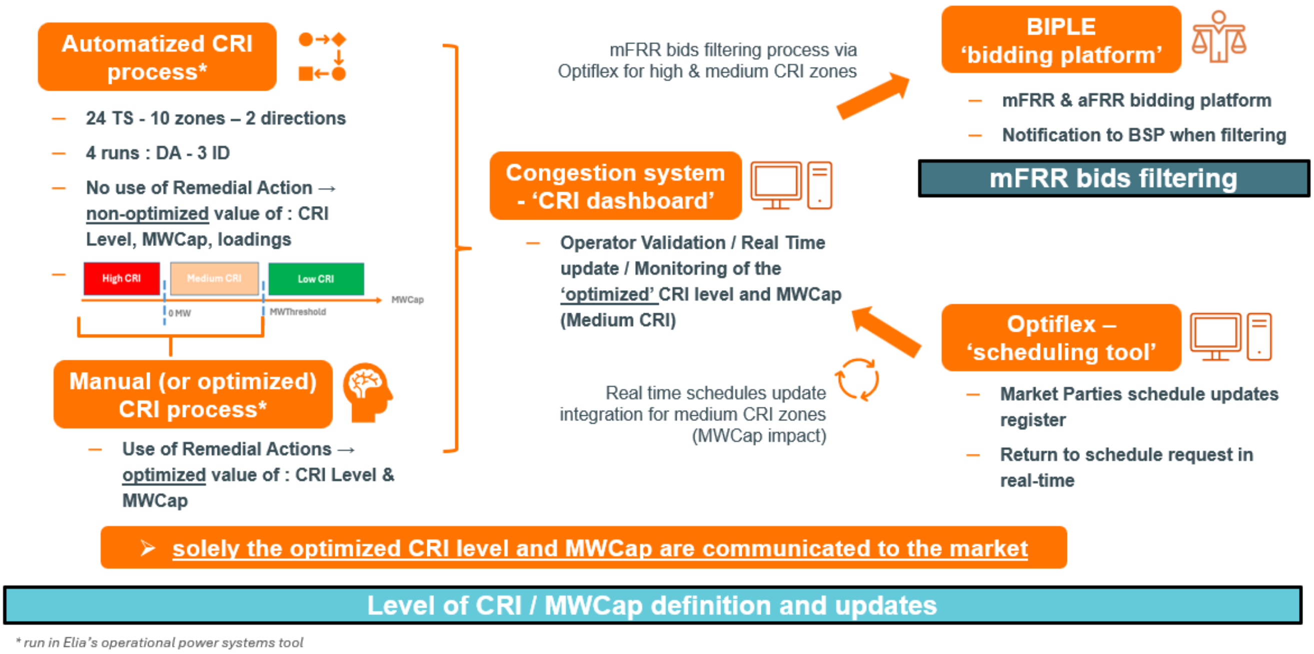


Figure 9: Elia's CRI process applications

3.3 Example of MWCap evolution for a given business day

The MWCap and thus CRI levels for a given Electrical Zone evolves solely in 2 cases:

- **Scheduling Agent sending an update of a DP Daily Schedule, as soon as a change in the Daily Schedule occurs**
  → possible anytime till Redispatching Gate Closure Time (i.e. 45 minutes before first business hour), after this time the Daily Schedules are considered as firm
- **Intra-Day CRI run determines an updated value of MWCap** (and potentially CRI level) as forecast data, schedules, topology have evolved since last CRI run
  → possible only at ID CRI run timings (3 AM, 7 AM & 12 PM)

The figure below shows how the MWCap for the **business hour 03:00 PM** evolves during the day. It also outlines (3) the last ID CRI run that can possibly update the MWCap figure for the 03:00 PM business hour:

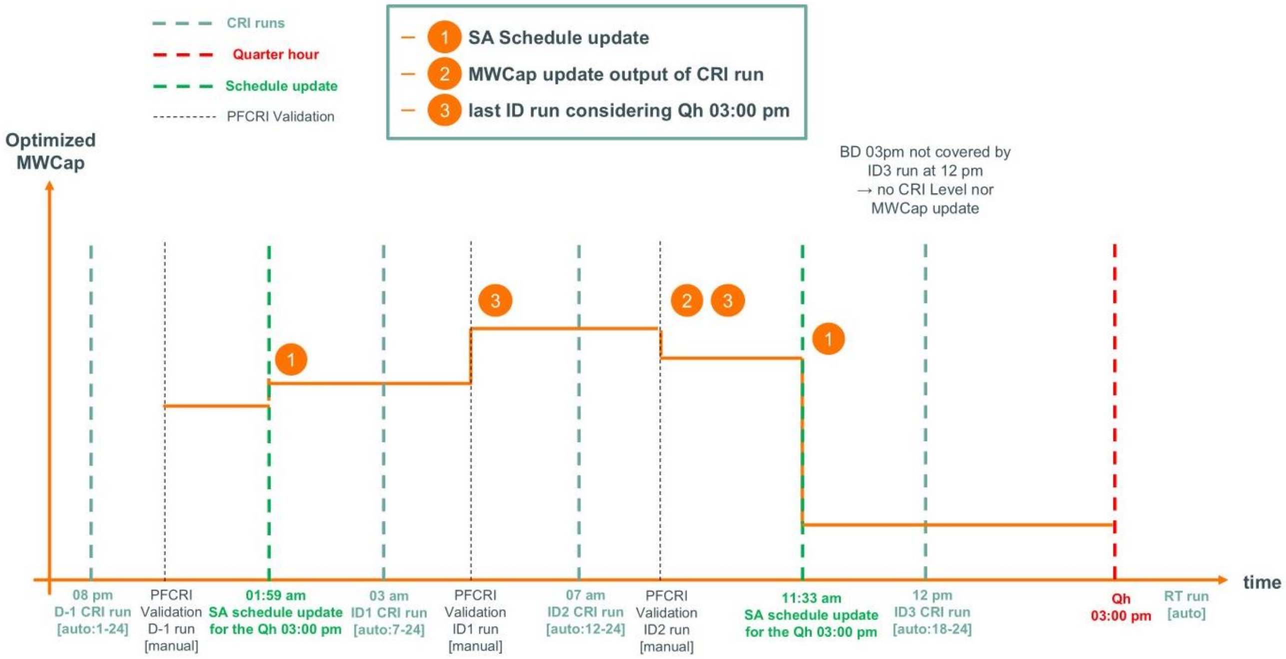


Figure 10: Evolution of the MWCap along the day for a given business hour (03:00 PM)

Concretely, taking as reference the business hour 03:00 PM, the MWCap is firstly computed in Day Ahead at 08:00 PM via the automatized and manual processes steps. After the manual process step (triggered only if the automatized step concludes on a high or medium CRI level), the Elia grid engineer validates the MWCap (and CRI level) before sharing it with Market Parties.

The MWCap is then updated at each ID CRI runs (tag 2 in figure 10) based on updated and improved closer to real time assumptions (e.g. load forecast, new topology, unplanned outage).

A SA might update a DP Daily Schedule in the Electrical Zone (tag 1 in figure 10), which is then automatically reflected as a change in the MWCap. In the example of figure 10 considering a MWCap computation in the upward direction: the DP Daily Schedule change at 01:59 AM is a decrease of its Daily Schedule, leading to more margin/MWCap in the Electrical Zone. The Schedule change at 11:33 AM on the other hand is a big increase in the DP's Daily Schedule. The last moment in time when the SA could update the Daily Schedule would be 02:15 PM, 45 minutes before the 03:00 PM business hour.

Eventually figure 10 showcases that the MWCap can be quite volatile along the day.

3.4 CRI process available data and introduction of an ex-post RT CRI run for reporting purpose

For each of the 4 CRI runs, **'non-optimized' and 'optimized' figures** can be derived from the **automatized calculation and manual optimization processes steps respectively.** The raw data list along with the timings when the data can be retrieved from the automatized and manual process steps respectively are detailed in the figure 11 below (tag 1 on figure 11 - e.g. from the manual CRI process step, 2 data can be extracted: the optimized MWCap and CRI level).

From an **operational perspective it is impossible to run the CRI process in (close to) real time** since the manual process step is time consuming and not compatible with operational timings.

In the framework of this incentive, for the sake of exhaustive reporting and identification of relevant CRI process KPIs, **an additional CRI run computed <u>ex-post</u> will be introduced <u>based on Real Time data</u>.** The objective of this ex-post Real Time CRI run is to be able to compare the forecasted (DA and ID) CRI runs' results with the actual Real Time (RT) CRI results (as if the CRI level would be computed in Real Time).

For the ex-post RT CRI run the manual CRI process step will not be computed, only the automatized CRI process step will be computed. The ex-post RT CRI run will thus give access to 'non optimized' data (tag 2 on figure 11).

Building on figure 10, figure 11 below outlines CRI process retrievable data and introduces the ex-post RT CRI run:

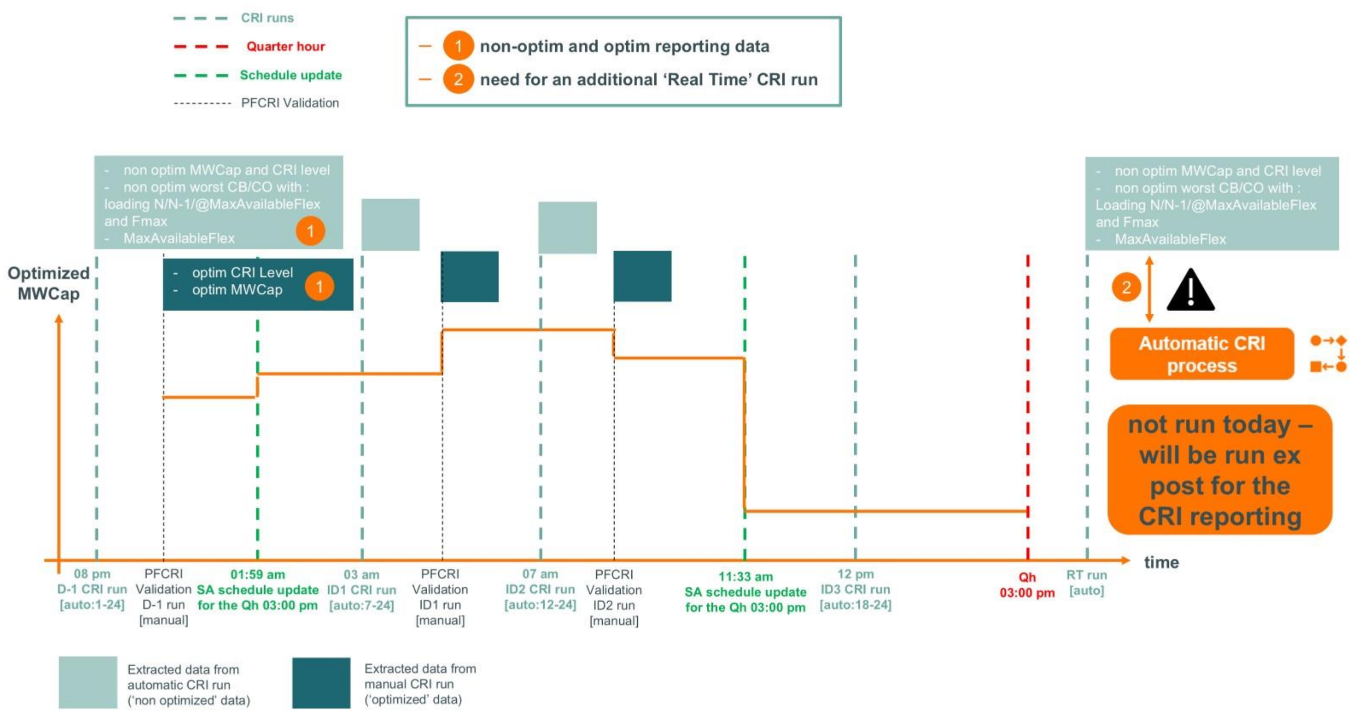


Figure 11: CRI process available data – introduction of a ex-post Real Time CRI run for reporting purpose

3.5 Main differences with the security analysis process

The CRI and security analysis are two core processes related to Elia's congestion management. Both may impact market parties depending on their outcome, though there are some key differences between them.

The **CRI process** considers a **limited set of cross zonal Monitored Grid Element** and the **entire 150-220-380kV network as contingencies** as detailed on the figure below:

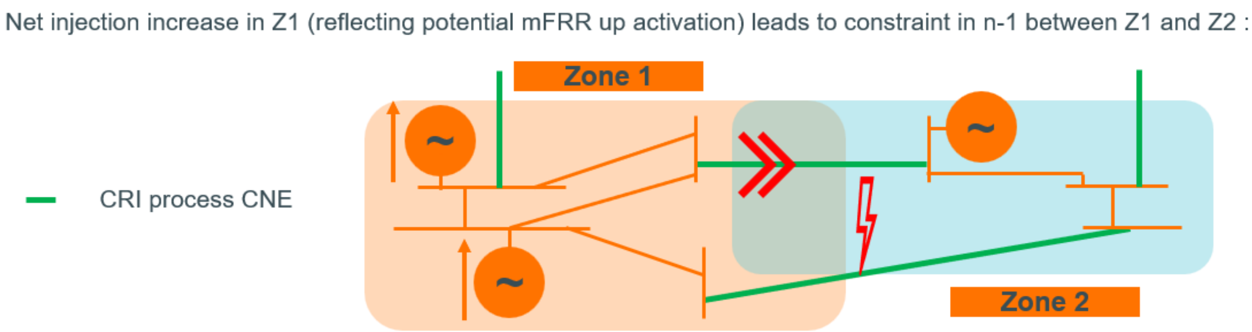


Figure 12: CRI process Monitored Grid Elements

The below table highlights the main differences between the 2 processes:

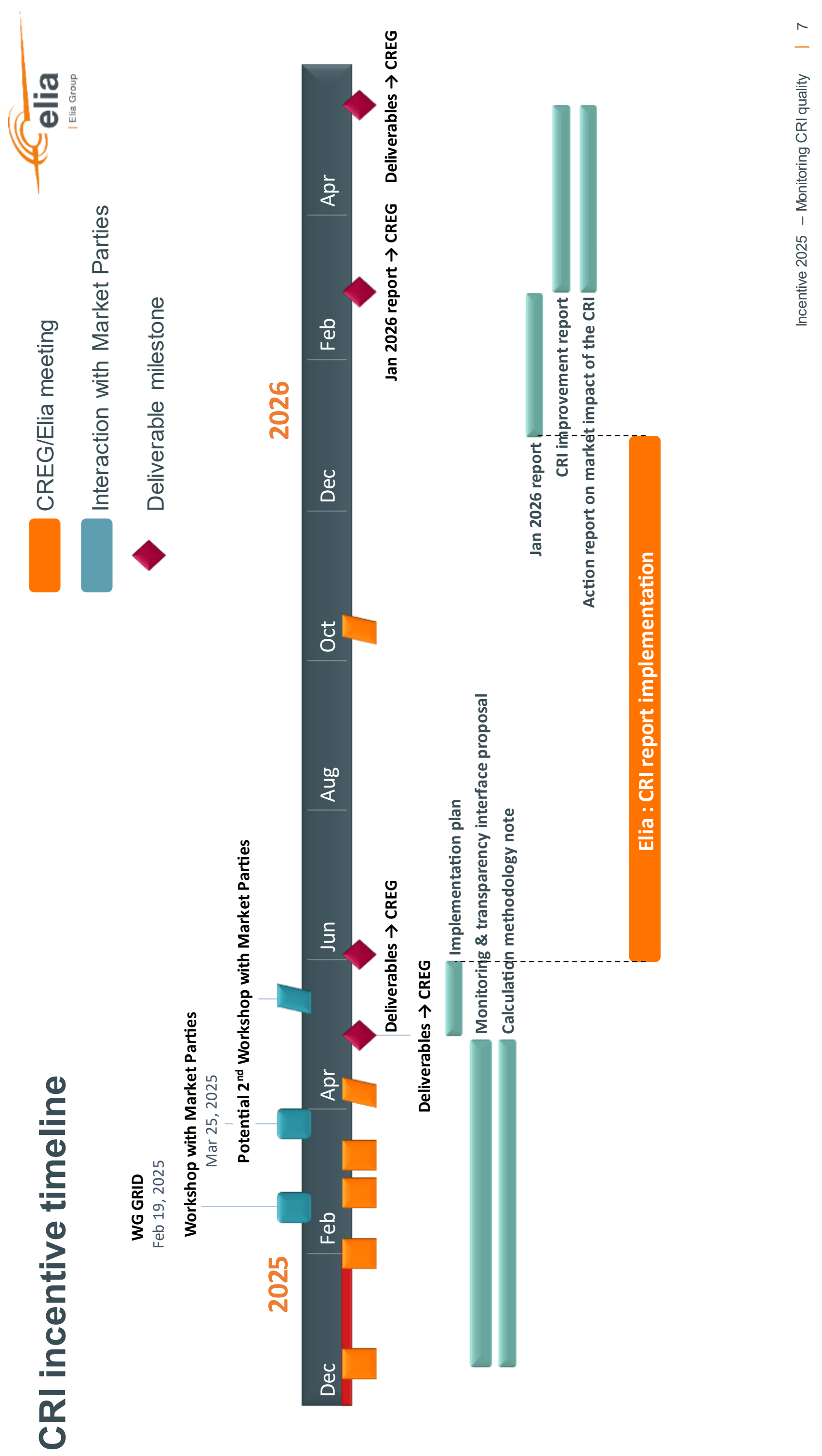
	CRI process	Security analysis
Process timings	- DA: one run - ID: 3 runs - RT: no run but ex-post CRI run introduced for the 'CRI quality reporting'	Forecasts: - In DA: once for all 24 hours - in ID: hourly process for remaining hours In RT: each 5 minutes
Focus	Assess **Balancing Energy Bids activation impact** on specific 150-220-380kV cross zonal lines	Assess **security of supply on the entire BE grid**, considering no change in the Daily Schedules
Contingency	all 150-220-380kV grid element	all voltage level grid element
Monitored Grid Element	specific 150-220-380kV cross zonal lines	all voltage level grid element
Grid scope	Process run for each Electrical Zone	Process run at Belgium level
Potential Market Impact	After use of all available non-costly Remedial Actions (in preventive and curative)	
	Filtering of aFRR/mFRR Energy Bids and/or Return To Schedule	Activation of Redispatching Energy Bids

Table 1: CRI and SA processes

Two concrete examples highlighting the differences between the CRI and security analysis processes:

- A high CRI level is an indication that a redispatching bid activation might be necessary in the Electrical Zone. However, the actual assessment of the redispatching volume required to solve the congestion will be done in an ad hoc security analysis run (and not based on the latest CRI defined MWCap which might be run some hours ahead of the actual congestion). This security analysis is done as close as possible to the real time congested Qh to be as accurate as possible in the redispatching volume estimation
- Elia might activate a redispatching Energy Bid with a DP located in a low CRI level Electrical Zone. This is the case, for example, when the 70 kV grid is congested and solely the security analysis process covers this voltage level

Annex 1: CRI CREG incentive timeline



Annex 2: Glossary

Term	Abbreviation details
aFRR	automatic Frequency Restoration Reserve: as defined in article 3(99) of the SOGL
aFRR Requested	The aFRR Power requested (in MW) by ELIA to a BSP at a certain Time Step for activation. In case the aFRR Requested is an activation of aFRR Up (aFRR Down), this value is positive (respectively negative);
Balancing Energy Bid	means mFRR Energy Bid or aFRR Energy Bid as defined in respectively the Terms and Conditions for the Balancing Service Provider mFRR and the Terms and Conditions for the Balancing Service Provider aFRR
BD	business day – see Day
Bh	Business hour
BIPLE	Energy bidding platform
BSP	Balancing Service Provider - as defined in Article 2(6) of the EBGL
BRP	Balance Responsible Party: as defined in article 2(7) of the EBGL and listed in the register of Balance Responsible Parties
C2RT	Close to Real Time
CGM	Common Grid Model means common grid model as defined in point (2) of article 2 of the CACM
CMOL	Common Merit-Order List - A list of balancing Energy Bids received by the aFRRPlatform (respectively mFRR-Platform) from all participating LFC Areas, sorted in order of their bid prices and used by the aFRR-Platform (respectively mFRR-Platform) to optimise the selection of the balancing Energy Bids;
Contingency	trip of one single or several network elements, as defined in point (10) of article 2 of the CACM
CRI	Congestion Risk Indicator - As defined in the Rules for Coordination and Congestion Management - represents the status of an Electrical Zone regarding the risk of congestion associated to the increase or decrease of the active power net injection in the Electrical Zone
DA	Day Ahead
Day (business day)	Period of one Day starting at 00:00 CET morning until 24:00 CET

Daily Schedule	The set of values (in MW), on a quarter-hourly basis, representing the most accurate expected Injection and/or Offtake by a Delivery Point for a considered Day, without considering any participation of the Delivery Point in the provision of Balancing Services or RD Service
DP	Delivery Point - A point on an electricity grid or within the electrical facilities of a Grid User, where a service is delivered
DP_Pmax_{inj}	The maximum power, represented as a positive value (in MW), that can be injected into the ELIA Grid by the Delivery Point
DP_Pmin_{inj}	The minimum regulating power, represented as a positive value (in MW), that can be injected into the ELIA Grid by the Delivery Point
ECL	External Communication Layer is a technical document drafted to facilitate the IT implementations needed in the framework of the BSP Contract (aFRR and mFRR), the SA Contract and the OPA Contract
Electrical Zone	CRI Electrical Zones (currently 10 defined for the Belgian system) - The Elia Grid is divided in a number of electrical zones. At the moment the number of zones is ten: 380, Hainaut East, Hainaut West, Langerbrugge East, Langerbrugge West, Ruien, Merksem, Stalen, Liège and Schaerbeek
Energy Bid	Energy Bid A combination of a volume (in MW) and a price (in €/MWh), submitted by the BSP to ELIA for activation
EMS	Energy Management System
Fmax	Permanent limit on Elia's equipment (overload threshold)
RD GCT	Redispatching Gate Closure Time - the point in time after which submission or update of a Daily Schedule or RD Energy Bid is no longer permitted, except in case of FO. The RD GCT is 45 minutes before the beginning of the concerned quarter-hour
RTS	Return to (Daily) Schedule - a request by ELIA, for one Delivery Point, to comply with the last validated Daily Schedule and applies instantly until the end of the third quarter-hour after the request (T&C SA)
ID	Intra Day
IGM	Individual Grid Model means individual grid model as defined in point (1) of article 2 of the CACM.
LMOL	Local Merit Order List - A list of balancing Energy Bids submitted in ELIA's LFC Block and sorted in order of their bid prices, used for the activation of those bids
mFRR	manual Frequency Restoration Reserve - Frequency Restoration Reserve (FRR), as defined in Article 3 (7) of the SOGL, that can be

	activated manually
mFRR Requested	The mFRR Power requested (in MW) by ELIA to a BSP for a certain quarter-hour. In case that mFRR Requested is an upward (respectively downward) activation of the mFRR Service, this value is positive (respectively negative);
Monitored Grid Elements	Monitored Grid Elements are elements for which Elia has identified a relevant Congestion risk and that will be monitored during the process of CRI level determination
MWCap	See Zonal Active Power Cap
Optiflex	Platform on which the OPAs update their availability plan and the SAs submit and update their daily schedules
PTDF	Power Transfer Distribution Factor
Qh	Quarter hour
RA	Remedial Action - as defined in point (13) of article 2 of the CACM.
RT	Real Time – the actual Qh in Real Time
RTS	Return to (Daily) Schedule – as per T&C SA - a request by ELIA, for one Delivery Point, to comply with the last validated Daily Schedule and applies instantly until the end of the third quarter-hour after the request. The request is sent by means of an electronic message to which the SA should at all time be able to respond.
SA	Scheduling Agent - As defined in article 3(90) of the SOGL, and identified on the first page of the SA Contract
Technical Unit	A device or aggregation of devices connected directly or indirectly to the electrical grid that produces and/or consumes electricity
Zonal Active Power Cap	Maximum increase or decrease of active power net injection allowed in an Electrical Zone with a medium CRI level without creating a Congestion