# Workshop on connection with flexible access

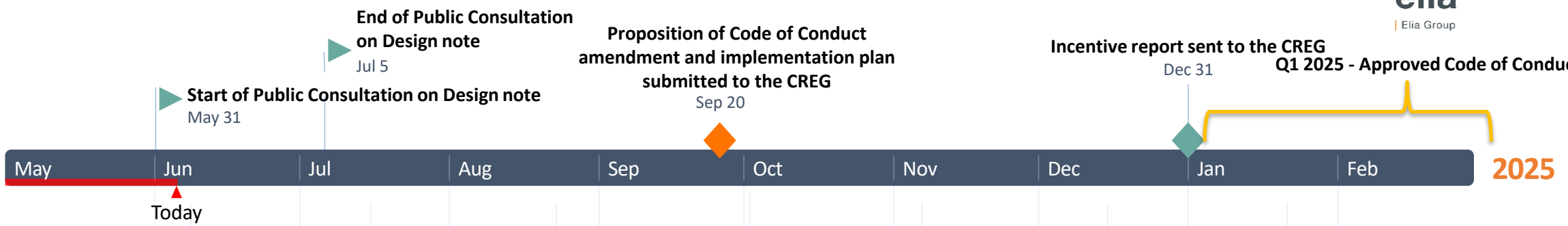
Workshop 4 – 14/06/2024

14.06.2024 | Elia

1. Timing and next steps
2. Description of operational principles for Grid Users with a connection with flexible access
3. Changes and new elements compared to previous workshops
4. To whom does the new framework apply ?
5. Implementation plan : principles
6. Q&A

# 1. Timing and next steps

# Timeline for next steps




## Mid/short term evolution

- May 31 - Jul 5: **Public Consultation on Design note**
- Jun 14: **Workshop (operational principles, Q&A design note**
- Jun - Sep: **Gap analysis of design note with federal regulatory framework, feedback public consultation and final design**
- Jul - Sep 20: **Preparation of Code of Conduct amendment**
- Jun - Sep 20: **Elaboration of implementation plan for design note**
- Oct 10: **Workshop : feedback public consultation, final design and implementation plan**
- Oct - Nov: **CREG - Public Consultation on Code of Conduct**

## Needs for further evolution

- Jun - Nov: **Pursue analysis of identified needs for further evolutions and gather additional feedback from Market Parties**
- Sep - Dec: **Establish a roadmap**
- Nov 15 / Dec 11: **Workshop : Needs for further evolutions, roadmap**

**Use cases** for flexibility welcome – especially for demand
Please contact us to organize bilateral meetings

# 2. Description of operational principles for Grid Users with a connection with flexible access

# Operational principles for GU with a connection with flexible access : Agenda

- Connections with flexible access
  - Introduction
  - Activation principles
- Redispatching & Gflex mechanism
- Operational process on security management

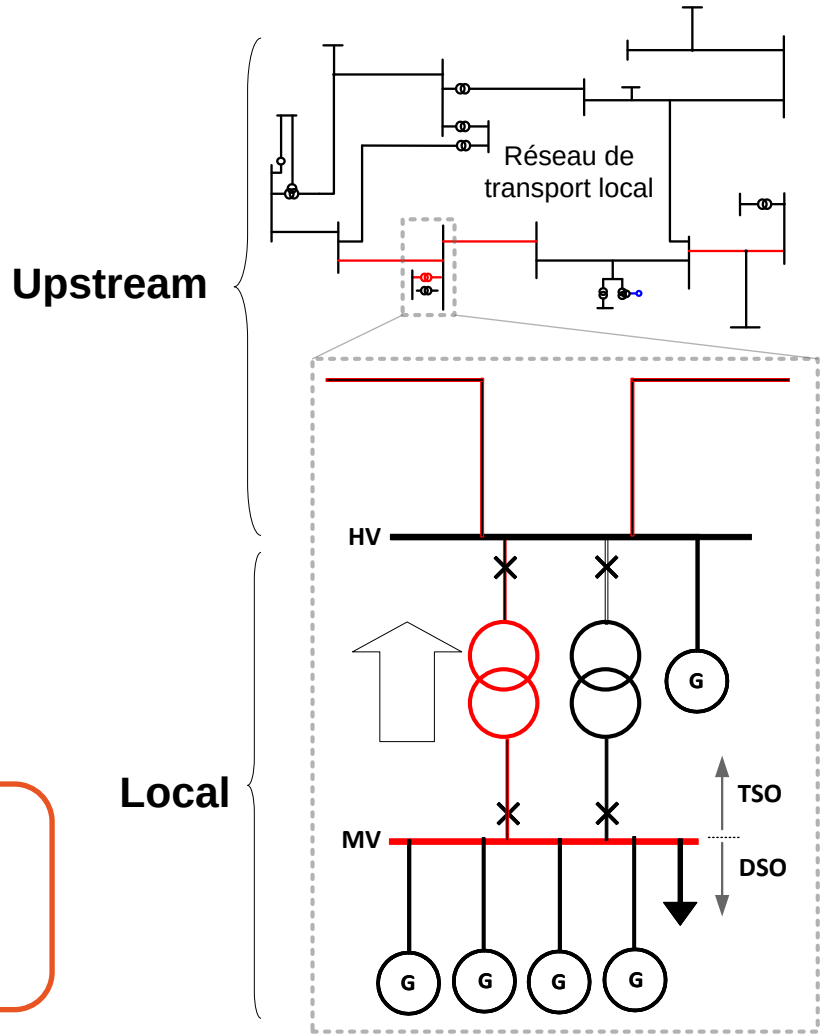
# Introduction

# Connections with flexible access

## *Introduction*

**Possible types of modulation by central management:**

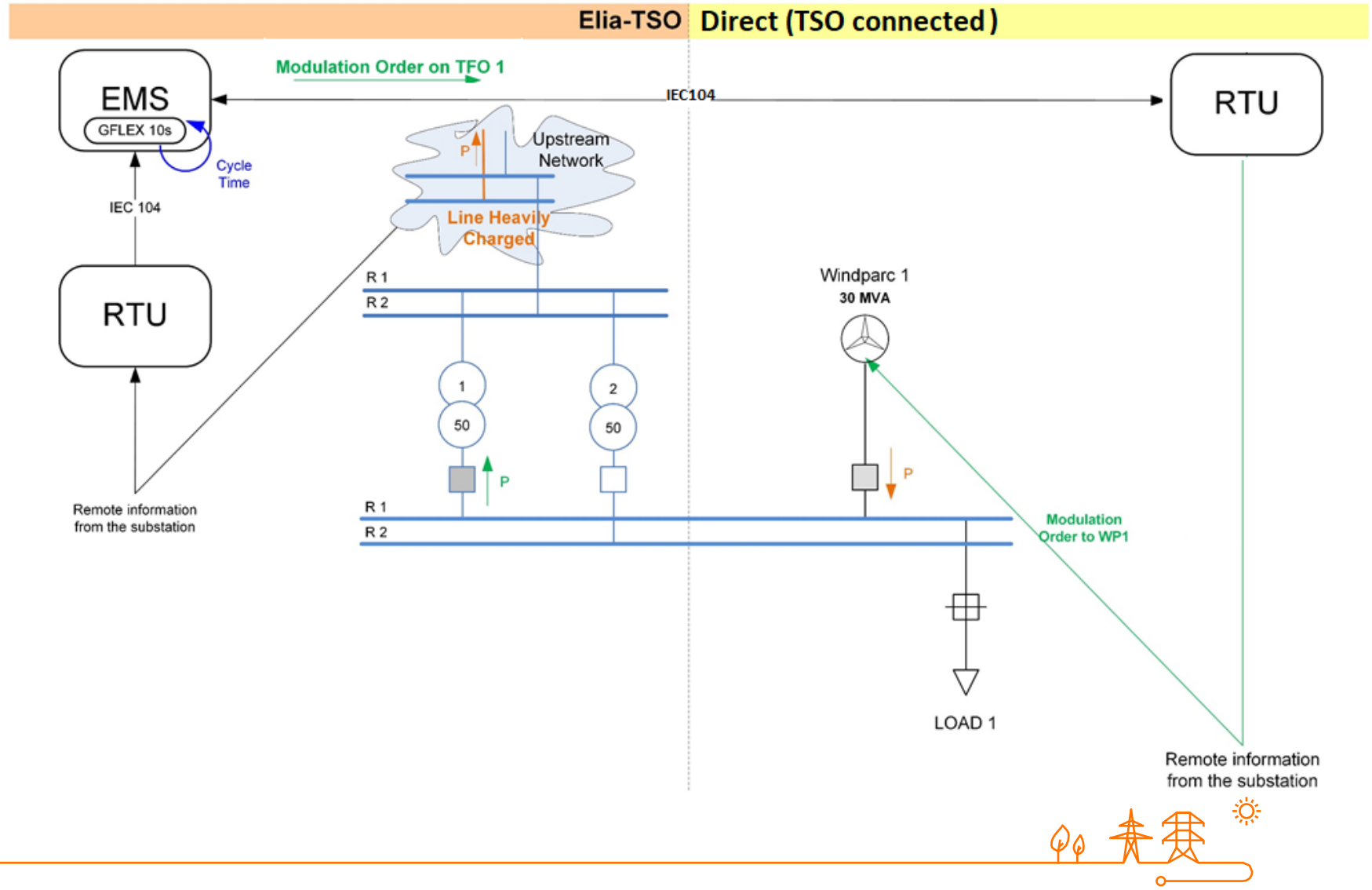
1. **Upstream modulation** for grid constraints related to high-voltage grid elements in the TSO grid for which a modulation of TSO or DSO Grid Users (via the DSO) can be requested.
2. **Local modulation** for grid constraints related to distribution transformers for which a modulation signal is sent to the DSO that sends in turn a modulation signal to DSO Grid Users;




**The processes described in the presentation only concern upstream modulation which applies to Grid Users directly connected to TSO grid.**

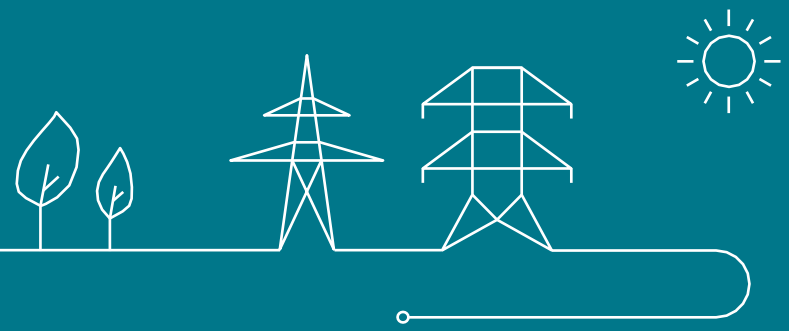
# Connections with flexible access

## *Introduction*



# Activation principles

As explained during previous workshops, Elia's proposal intends to find the right balance between the risk borne by the Grid Users and risk of socialization (impact on tariff)



# Connections with flexible access
## *Activation principles*

**Gflex*** is used for :

1. In first instance to automatically solve **real-time congestion issues detected on monitored grid elements :**
   a) Congested grid elements **identified during the grid connection study** that led to the need of flexible access
   **b) Note that,** due to evolutions of the grid in comparison to the assumptions in the grid connection study, possible additional grid elements with identified congestion caused by the connection with flexible access could also be added in the monitored elements. This would not have impact on the contractual cap.
2. As a **last resort** to solve **other congestions**, or other **operational security issues** on the local transmission network (either appearing in real-time and that have not been anticipated through other processes, or which cannot be solved by other means with the currently existing products)

When **Gflex** is **used** in case **1b** and **2**, the **contractual cap** would not **be changed**, and the **compensation** would then **start faster**

**Important notice**

- Elia must **ensure operational security at all times**
  - In case the connection with flexible access does not react properly to the setpoint, the disconnection of the GU by opening the circuit breaker may be required.

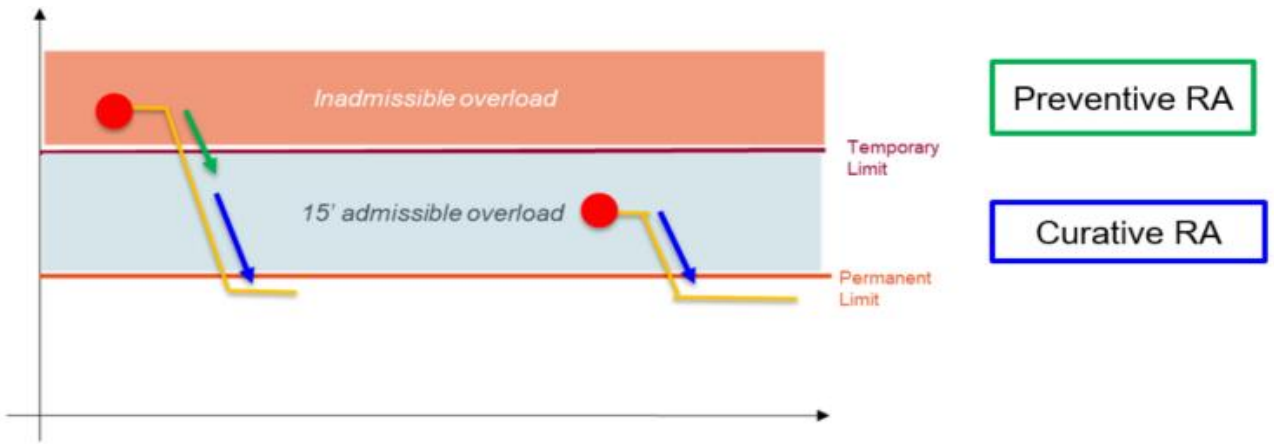


** For simplicity, the term "Gflex " will be used in the presentation to refer to the flexibility from connections with flexible access*

# Connections with flexible access
## *Activation principles*

As defined in the Rules for Coordination and Congestion Management, Elia can take **preventive and curative Remedial Actions (RAs**) to solve an operational security issue.

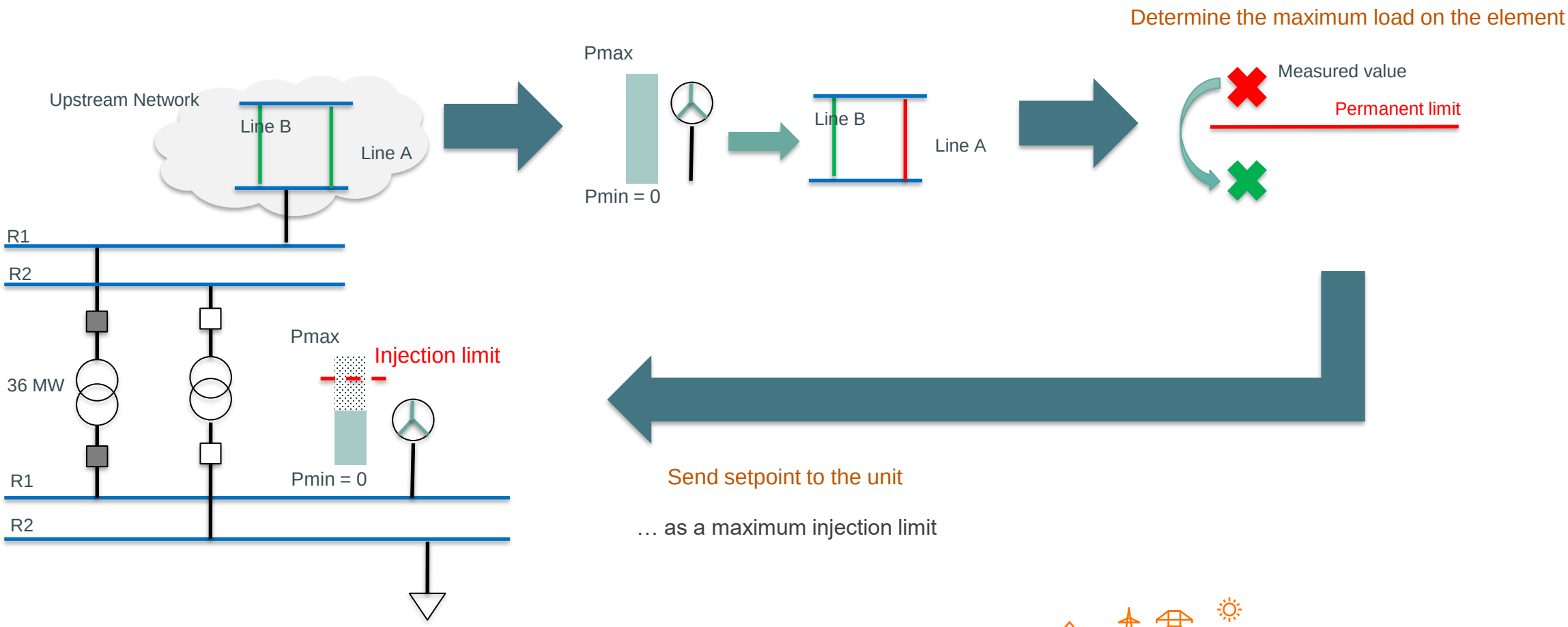
- **Preventive actions:**
  - Keep Grid Elements below their temporary limits for each simulated N-1 situation* (case 2**)
- **Curative actions:**
  - Keep Grid Elements always below their permanent limit in N-state (case 1**)
  - Actions taken when problematic situation appears in order to get back to safe state (case 2)
    - All Grid Elements should be put back below their permanent limits **within 15 min** after occurrence of N-1




* *Preventive actions are also taken when no curative actions are available*
** *See next slides*

# Connections with flexible access
## *Activation principles*

**Case 1:** keep the grid element under the permanent limit *(curative activation)*



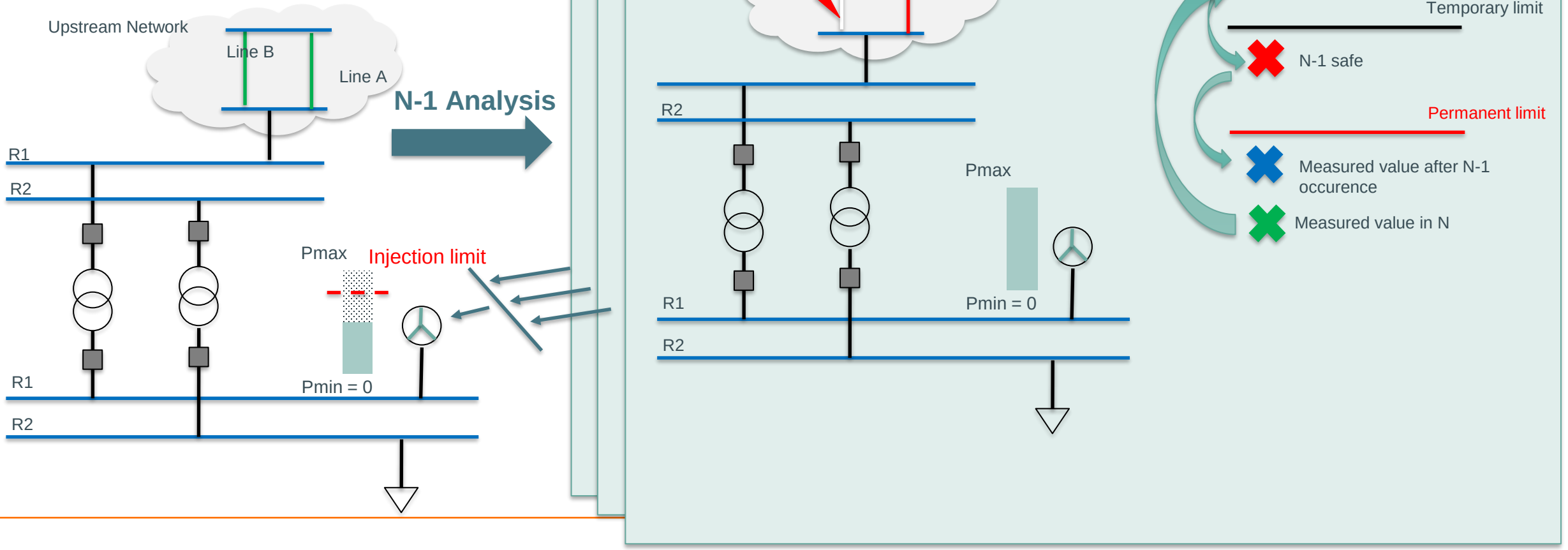
# Connections with flexible access

## *Activation principles*

**Case 2:** keep the grid N-1 safe

If outage,

- All grid elements stay under temporary limits *(preventive activation)*
- N-1 safe again within 15 min *(curative activation)*



# Redispatching & Gflex mechanism

# Redispatching vs. Gflex mechanism

## *Differences in activation*

| | Gflex | Redispatching (RD) |
|---|---|---|
| **Communication of the signal** | Real-time setpoint directly to the unit | Requested volume to the Scheduling Agent |
| **Expected reaction of the unit** | Respecting the setpoint within 5 min | Following the activation profile within full activation time (12,5min by default) |

Gflex activation modalities allow a faster reaction and the possibility to consider it as a **curative remedial action**

# Redispatching vs. Gflex mechanism

## *Differences in remuneration*

| | Gflex | | Redispatching (RD) |
|---|---|---|---|
| **Remuneration** | Flexible power | - No remuneration before reaching the cap<br>- Cost-based remuneration after reaching the cap | Cost-based |
| | Permanent power | Cost-based | |

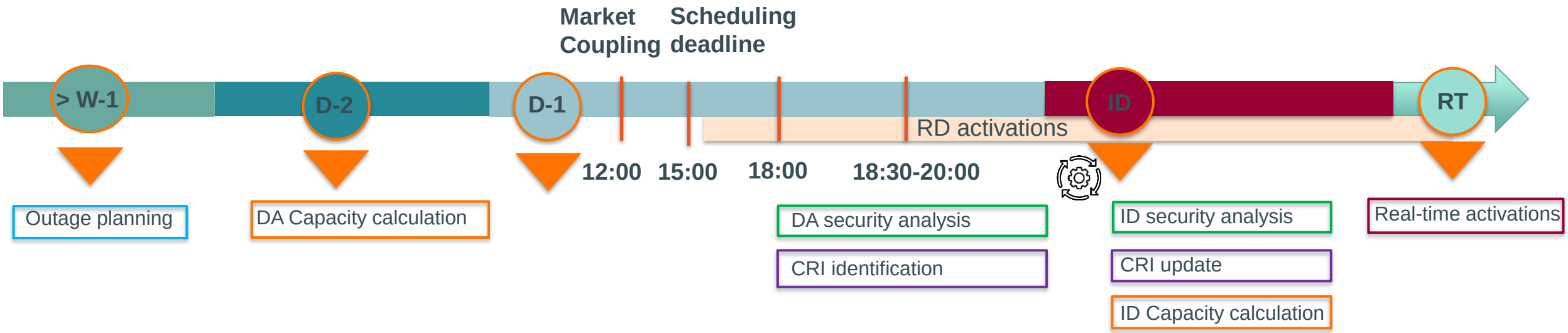
Activations via the Gflex mechanism (manual or automatic) are:

- Not remunerated for the flex power before reaching the cap
- Remunerated with similar concept as for RD in other cases (after cap or permanent power)

# Operational processes for security management

# Operational process

## *Consideration of connections with flexible access (Gflex*)*




**Abbreviations**
DA = Day-Ahead
ID = Intraday
CRI = Congestion Risk Indicator
RD = Redispatching
RT = Real-Time



** For simplicity, the term "Gflex " will be used in the presentation to refer to the flexibility from connections with flexible access*

# General Principles

## *How connections with flexible access are managed*

- **Before reaching the cap***, **connections with flexible access** are **considered in priority** (after internal Elia measures such as topological actions) to **solve congestions** on a **limited number of CNE**** ;

- **After reaching the cap**, **connections with flexible access** are **considered as connections with firm access** in the forecasts (grid model) and in the activations (Redispatching) in DA and ID. **Activations in real-time** can **still occur** for **“residual” congestions** that were **not forecasted** or where **no redispatching is available** (i.e. for local transmission network before iCAROS phase 2)

- **Activation** of connections with flexible access are **always performed in real-time**.

- When preventive **activations** of connections with flexible access are **planned in DA/ ID**, Elia intends to **inform the Grid Users** about a **possible modulation in real-time**.

** Contractual cap on the use of flexibility as defined in previous workshops*
*** Critical Network Elements*

# Operational process

## *Outage planning – weekly process*

**Goal of this process :** assessment of the compatibility of outages for all Technical Units

**Usage of Gflex:** Forecasted RA to limit congestion on a limited set of CNE taking into account the cap

Activation order of considered RAs:

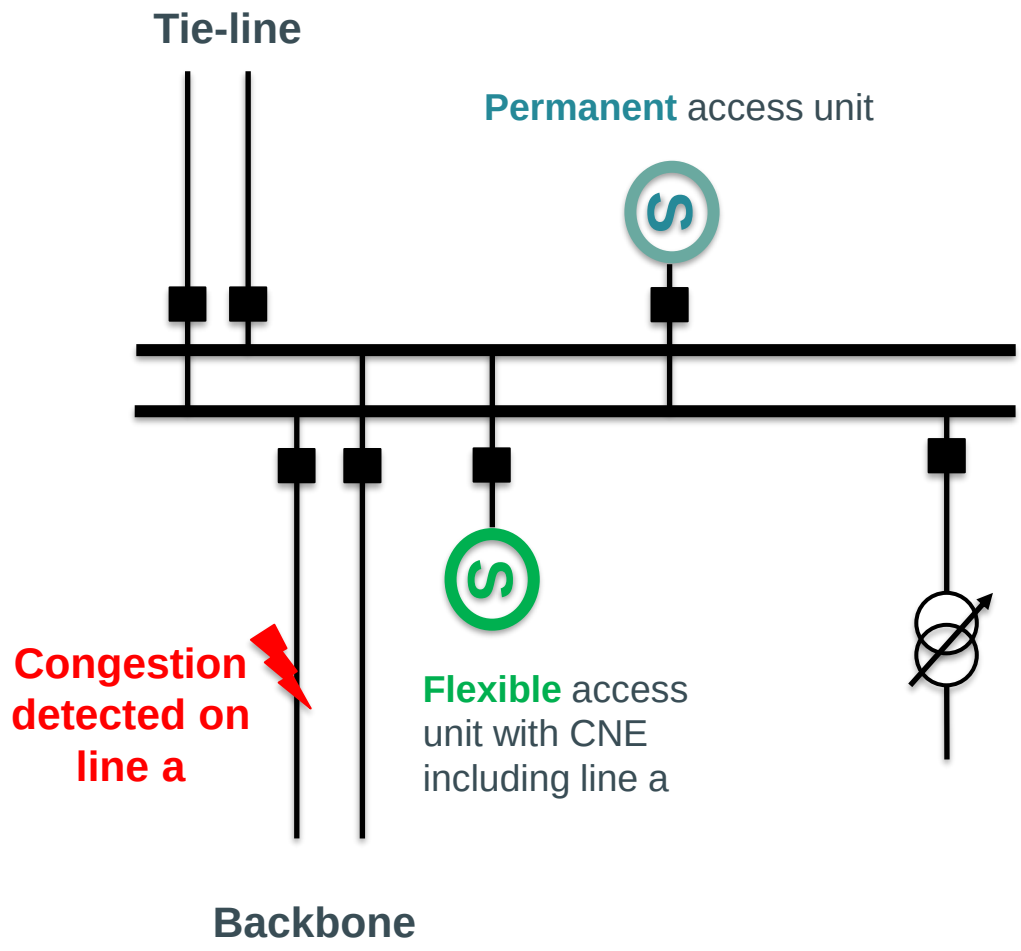
| Order | Congestion on monitored grid elements | Congestion on non-monitored grid elements or other operational security issues |
|---|---|---|
| 1 | Internal Elia RA's (topological, tap changes on PSTs*,…) | |
| 2 | Flexibility from connections with flexible access for which the **cap is not yet reached** | - |
| 3 | May-Not-Run/Must-Run activations (if probability of congestion is deemed high with regard to Elia available forecast ) or redispatching activations on units with a SA contract | |
| 4 | Automatic activation of flexibility on connections with flexible access (without an SA agreement) **beyond the cap** | Manual activation of flexibility on connections with flexible access, without an SA agreement |

*Phase-shifting transformers

# Operational process

## *Outage planning – weekly process - example*

**Goal of this process :** assessment of the compatibility of outages for all Technical Units
**Usage of Gflex:** Forecasted RA to limit congestion on a limited set of CNE taking into account the cap




In **week ahead process**, if a congestion is forecasted on line a, even after application of Elia internal RA,

- Elia will include the future Gflex activation of the Flexible access unit in the grid model when the cap is not yet reached
  - Not Gflex activation are sent at this stage
- If the cap is reached or if the congestion is not solved, Elia will request a May-Not-Run on the permanent access unit or on the Flexible access units with cap reached
  - May-Not-Run request are sent at this stage

# Operational process
## *DA & ID Capacity Calculation*

**Goal of this process :** calculation of the available cross-zonal transmission capacity that can be allocated for trades between bidding zones at day-ahead and intraday market time frames

**Usage of Gflex:** Avoiding reducing cross-zonal capacity similarly to flexibility available via redispatching

**Day-Ahead Capacity Calculation (DACC : in D-2)**

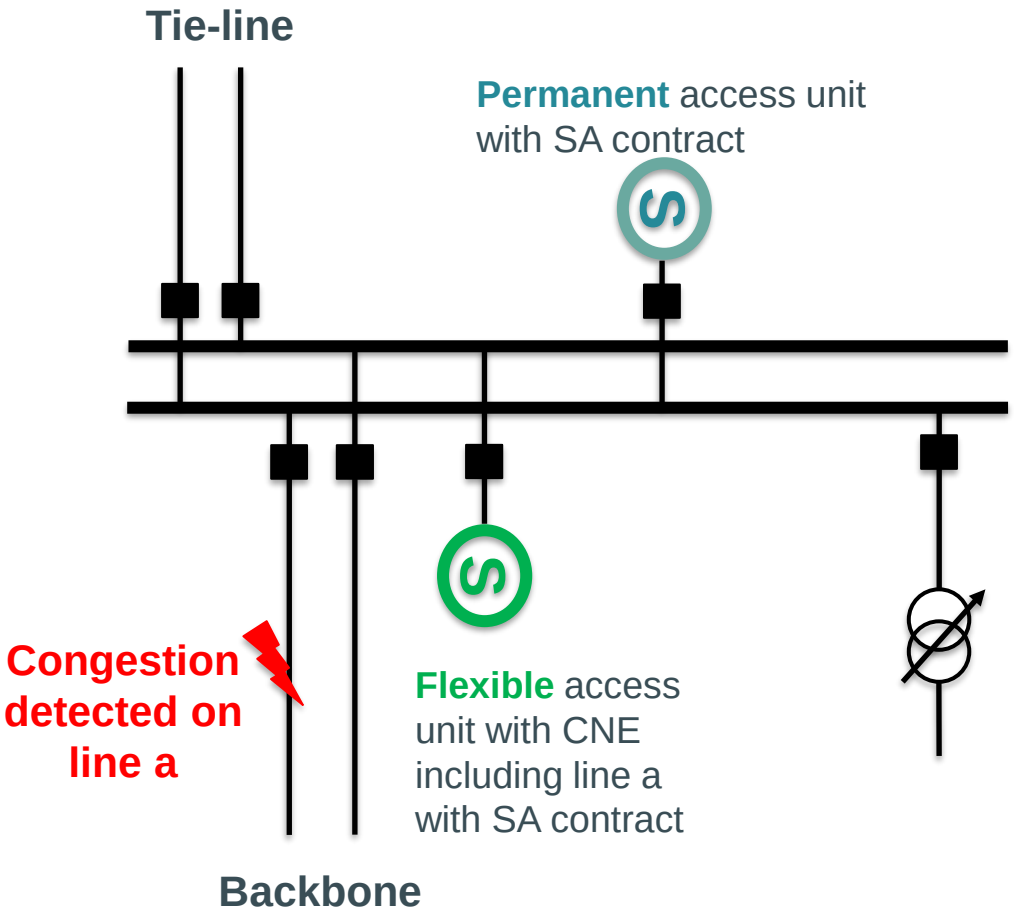
- **Creation of Individual Grid Model (IGM):** D+2 congestion forecast (D2CF) is based on best forecasts for all units
- **Validation step** (only in DACC for Core):
  - Goal of the step: calculation if the available RA are sufficient to secure the (virtual) capacity to avoid reducing them (last resort measure)
  - How: RD flexibility from units with SA contracts is considered, independently of a flexible access or not

**Intraday Capacity Calculation (ID CC : in D-1 & ID)**

- **Creation of IGM:** Day-Ahead Congestion Forecast and Intraday Congestion Forecasts (DACF and IDCF) based on schedules & best forecasts, updated after security analysis and integrating possible congestions management activations (RD & Gflex)

# Operational process
## *DA & ID Capacity Calculation*

**Goal of this process :** calculation of the available cross-zonal transmission capacity that can be allocated for trades between bidding zones at day-ahead and intraday market time frames
**Usage of Gflex:** Avoiding reducing cross-zonal capacity similarly to flexibility available via redispatching




In **DA Capacity Calculation**, if a congestion is forecasted on line a, leading to a possible decrease of the cross-zonal capacity given to the market

➔ In the validation step, Elia will analyze if the flexibility (RD) of the units **with permanent access and flexible access** can solve the congestion to avoid limiting the capacity given to the market.

- No activations are sent at this stage

# Operational process

## *DA & ID national security analysis*

**Goal of this process :** Detect potential congestions on the grid and foresee the necessary remedial actions to solve them

**Usage of Gflex:** RA to limit congestion on a limited set of CNE taking into account the cap

Activation order of considered RAs:

| Order | Congestion on monitored grid elements | Congestion on non-monitored grid elements or other operational security issues |
|---|---|---|
| 1 | Internal Elia RA's (topological, tap changes on PSTs,…) | |
| 2 | Flexibility from connections with flexible access for **which the cap is not yet reached** as preventive and curative RAs | - |
| 3 | In case flexibility from flexible access contribute to solve a congestion **as curative RA,** it keeps being considered **even if the cap is reached**.<br><br>The rest is solved with redispatching activations on units with a SA contract according to a common technico-economic merit-order" | Redispatching activations according to technico-economical merit-order on units with a SA contract |
| 4 | Cancellation or restitution of planned outages of grid elements | |

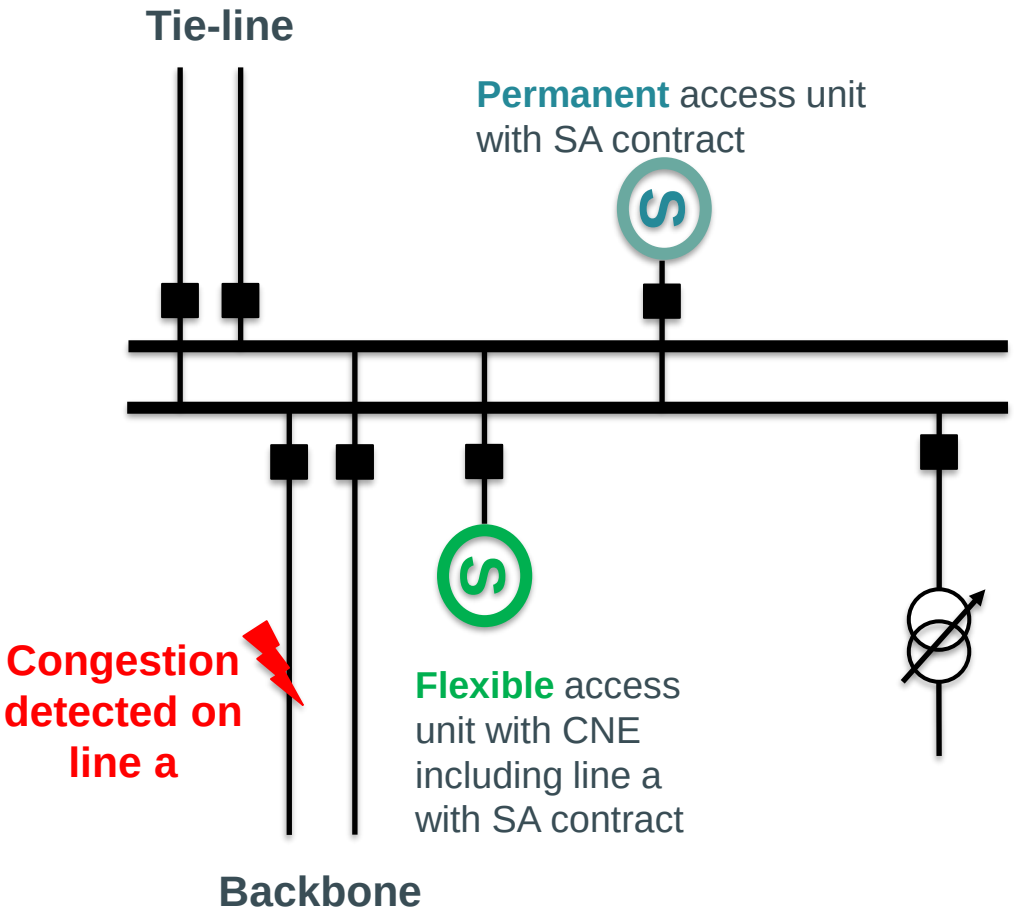
The RAs resulting from the security analysis processes are integrated in new versions of grid models (DACF, IDCF) that are used for the next operational processes

# Operational process

## *DA & ID national security analysis*

**Goal of this process :** Detect potential congestions on the grid and foresee the necessary remedial actions to solve them

**Usage of Gflex:** RA to limit congestion on a limited set of CNE taking into account the cap




In **DA & ID national security analysis**, if a congestion is forecasted on line a, even after application of Elia internal RA,

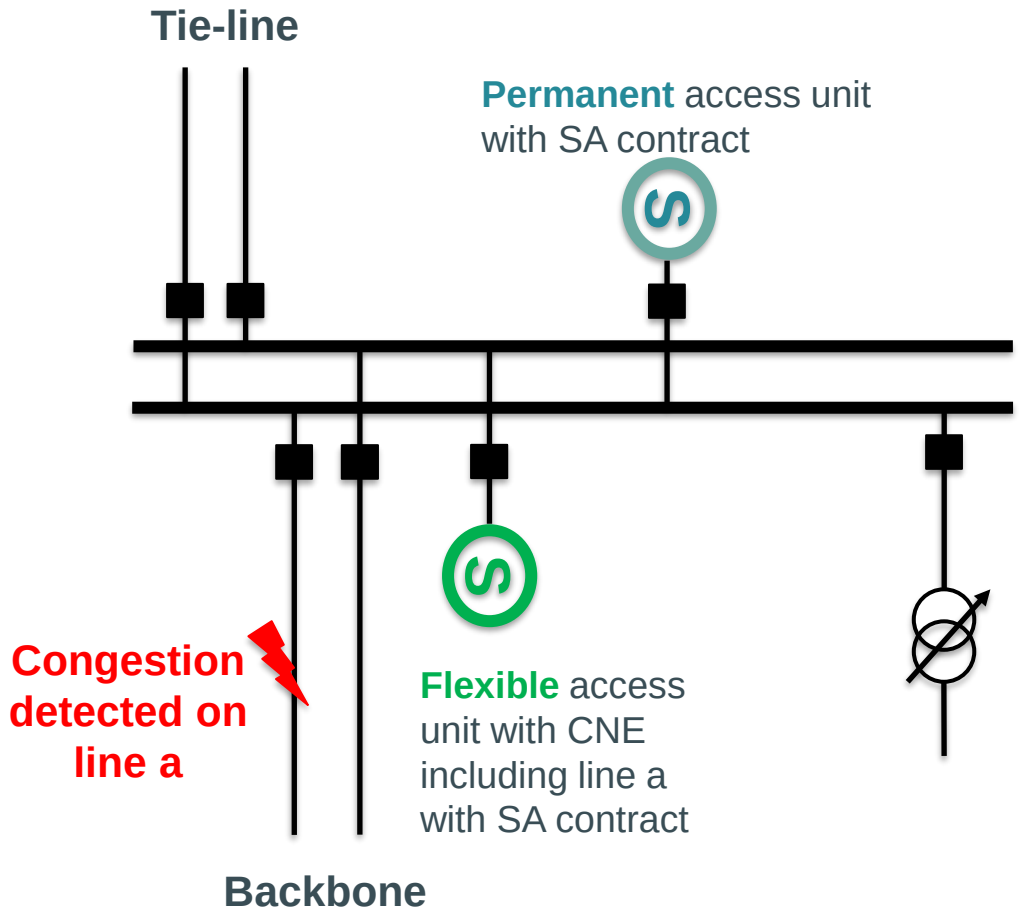
- Elia will include the future Gflex activation of the Flexible access unit in the grid model when the cap is not yet reached
  - Not Gflex activation are sent at this stage

# Operational process

## *DA & ID national security analysis*

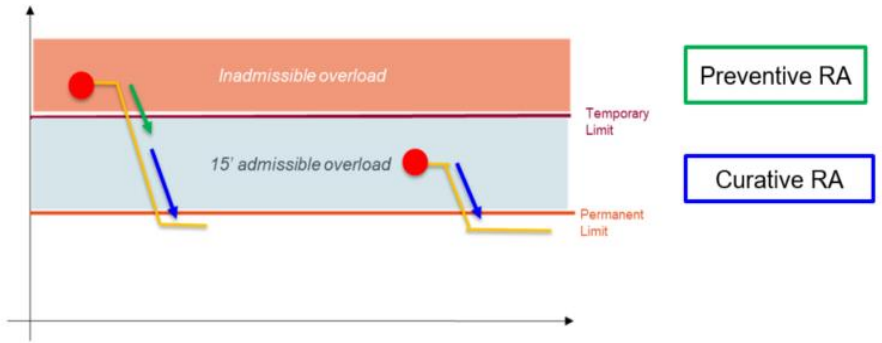
**Goal of this process :** Detect potential congestions on the grid and foresee the necessary remedial actions to solve them

**Usage of Gflex:** RA to limit congestion on a limited set of CNE taking into account the cap




In **DA & ID national security analysis**, if a congestion is forecasted on line a, even after application of Elia internal RA,

- Elia will include the future Gflex activation of the Flexible access unit in the grid model when the cap **is reached only for curative RA**
  - Not Gflex activation are sent at this stage
- Elia will activate preventive RD on units with permanent and/or flexible access based on technico-merit order
  - RD activations **are sent** at this stage

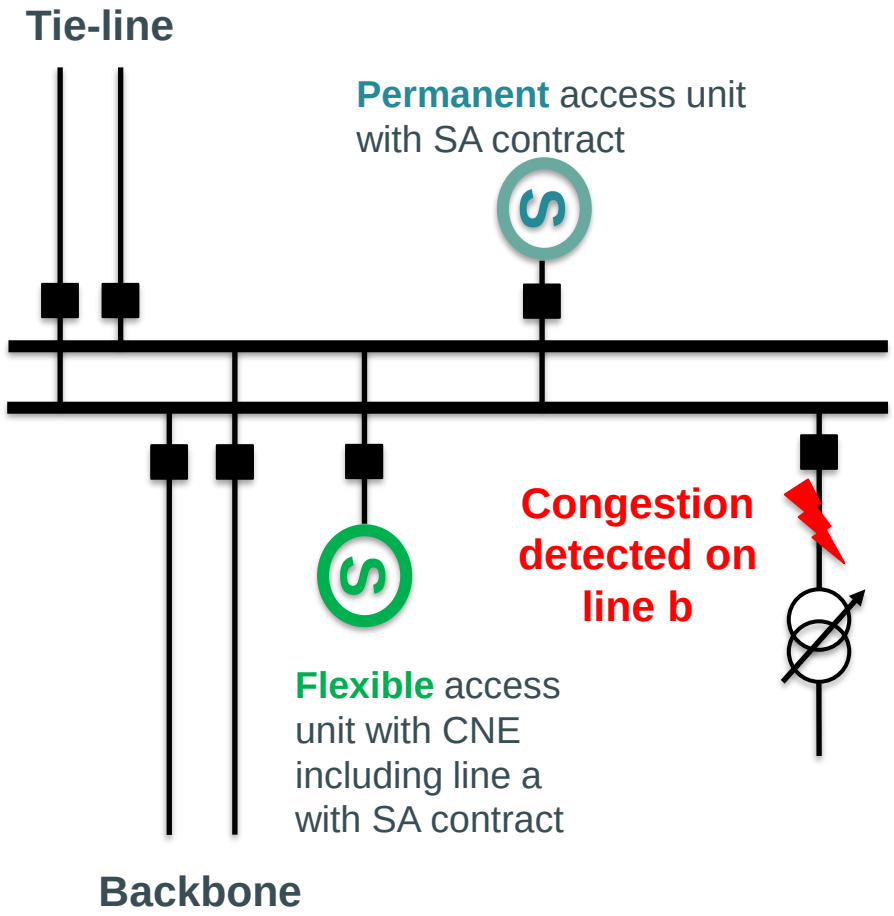


# Operational process

## *DA & ID national security analysis*

**Goal of this process :** Detect potential congestions on the grid and foresee the necessary remedial actions to solve them

**Usage of Gflex:** RA to limit congestion on a limited set of CNE taking into account the cap




In **DA & ID national security analysis**, if a congestion is forecasted on line b, even after application of Elia internal RA,

- Elia will activate preventive RD on units with permanent and/or flexible access based on technico-merit order
  - RD activations **are sent** at this stage

# Operational process
## *Coordinated Security Analysis*

**Goal of this process :** Coreso performs SA to detect potential operational security violations on the grid, at a regional level, recommends and coordinates RA for TSOs to solve them

**Usage of Gflex:** RA is not shared for coordinated security analysis or only on CORESO request (bilateral process)

Activation order of considered RAs:

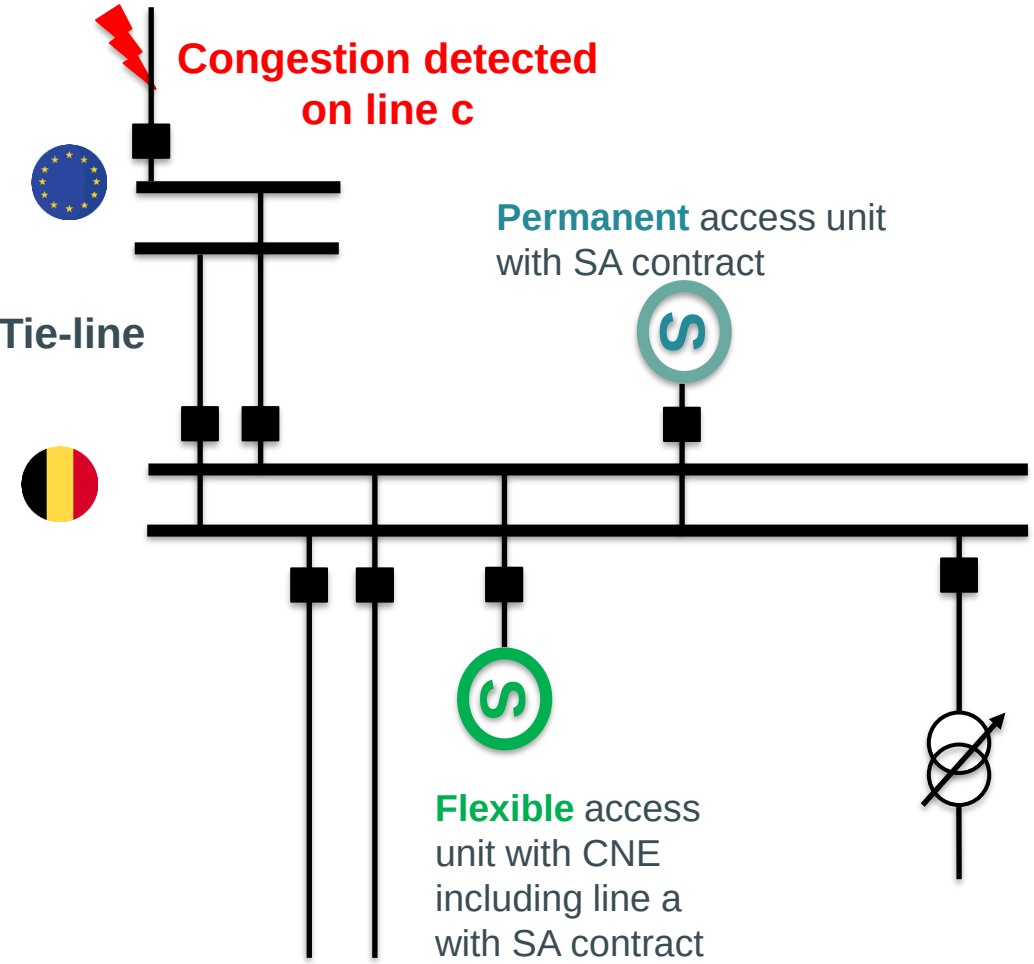
1. Internal Elia RA's (topological, tap changes on PSTs…)
2. Redispatching on units with a SA contract (independently of a flexible access or not) via technico-economic merit order

# Operational process

## *Coordinated Security Analysis*

**Goal of this process :** Coreso performs SA to detect potential operational security violations on the grid, at a regional level, recommends and coordinates RA for TSOs to solve them

**Usage of Gflex:** RA is not shared for coordinated security analysis or only on CORESO request (bilateral process)



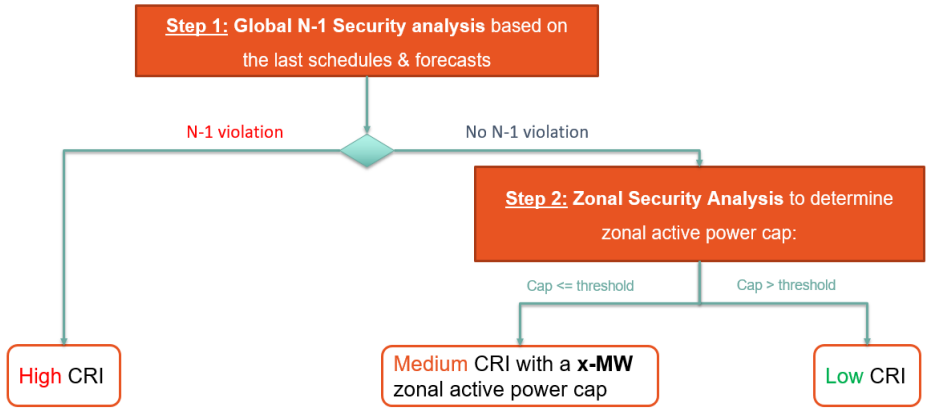

In **DA/ID during the Coordinated Security analysis**, if a congestion is forecasted on line c, even after application of TSO internal RA,

- With CORESO coordination, Elia will activate preventive RD on units with permanent and/or flexible access based on technico-merit order
  - RD activations **are sent** at this stage

Reminder

# Congestion risk indicator (CRI)

## *Principles for connections with firm access*




The CRI represents the congestion risks in a Belgian electrical zone:

- For a direction: up, down or both
- For a specific duration
- With 3 levels:
  - Low: no congestion forecast,
  - Medium with a zonal active power cap >0 : congestion forecasted in case of increase/decrease of production in the zone,
  - High: N-1 violations >= 100 % ➔ zonal active power cap =0
- Based on congestion forecasted on a limited number of lines (cross-zonal lines are the only monitored lines)

Based on the 3 characteristics, the CRI is used

- To set a limit, the zonal active power cap, on the energy allowed to be activated in the zone.
- To request a Return to schedule in real time in the direction of the risk of congestion.

**Goal: CRI is to avoid that balancing activations (implicit or explicit) generates some congestions.**

# Operational process
## *Congestion Risk Indicator (CRI)*

**Usage of Gflex:**

- Before reaching the cap, units with flexible access are set to "Pmin, flex”* to avoid increasing the number of ‘high’ CRI.
- Gflex activations are **not used to maximize the zonal active power cap** in case of medium CRI

| | Congestion on grid elements monitored by CRI and Gflex | Congestion on grid elements monitored by CRI but NOT by Gflex |
|---|---|---|
| **Before Cap is reached** | Gflex unit set to “Pmin,flex”*<br>○ If congestion remains ➔ high CRI<br>○ If no congestion ➔ normal flow to calculate medium or low CRI | Normal CRI process |
| **After cap is reached** | Normal CRI process | |

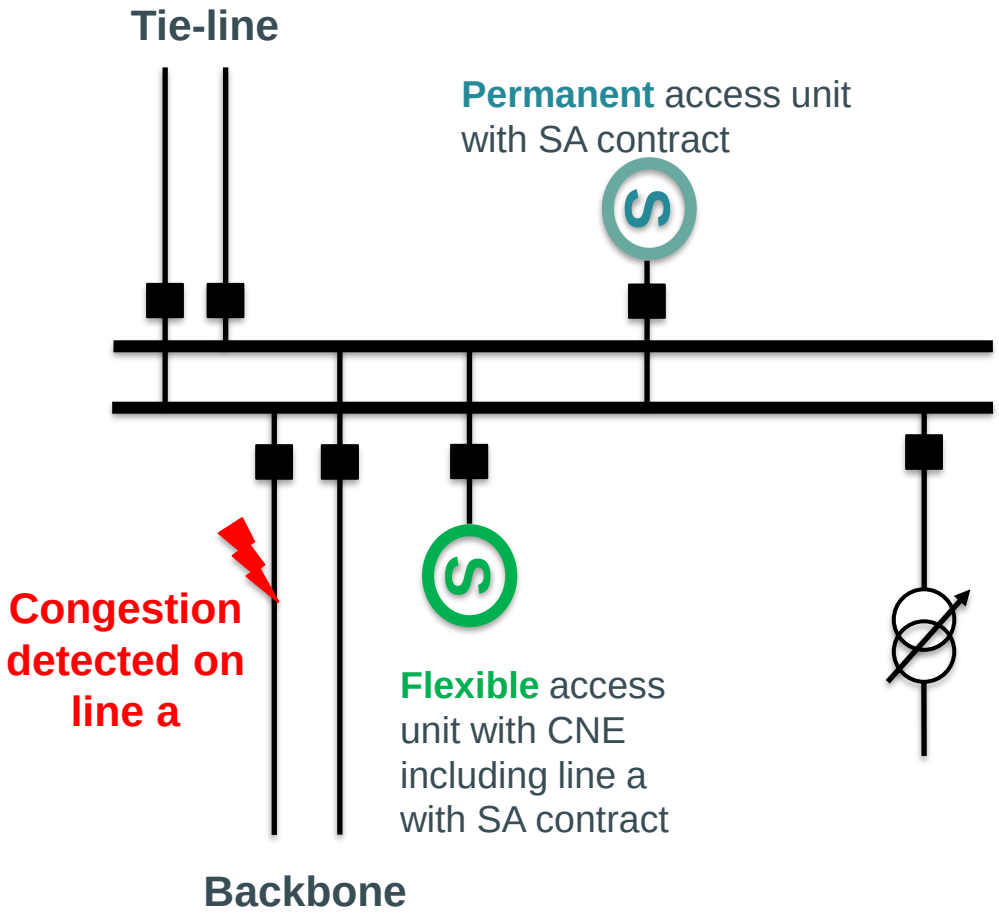


*Minimum injection/offtake power, considering the available flexible power of the unit

# Operational process
## *Congestion Risk Indicator (CRI)*

**Usage of Gflex:**

- Before reaching the cap, units with flexible access are set to "Pmin, flex"* to avoid resulting in a 'high' CRI.
- Gflex activations are **not used to maximize the zonal active power cap** in case of medium CRI




In **DA & ID CRI determination process**, if a congestion is forecasted on line a (monitored by CRI & Gflex), even after application of Elia internal RA,

- If the cap is not reached yet, Elia will set the Flexible access unit to "Pmin,flex"*
  - If congestion remains => High CRI
  - If no congestion => step 2 of CRI normal process
- If the cap is reached, normal CRI process:
  - High CRI in the zone

➔ No activations are sent at this stage

*Minimum injection/offtake power, considering the available flexible power of the unit

# Operational process
## *Gflex activation in Real-time*

**Usage of Gflex**

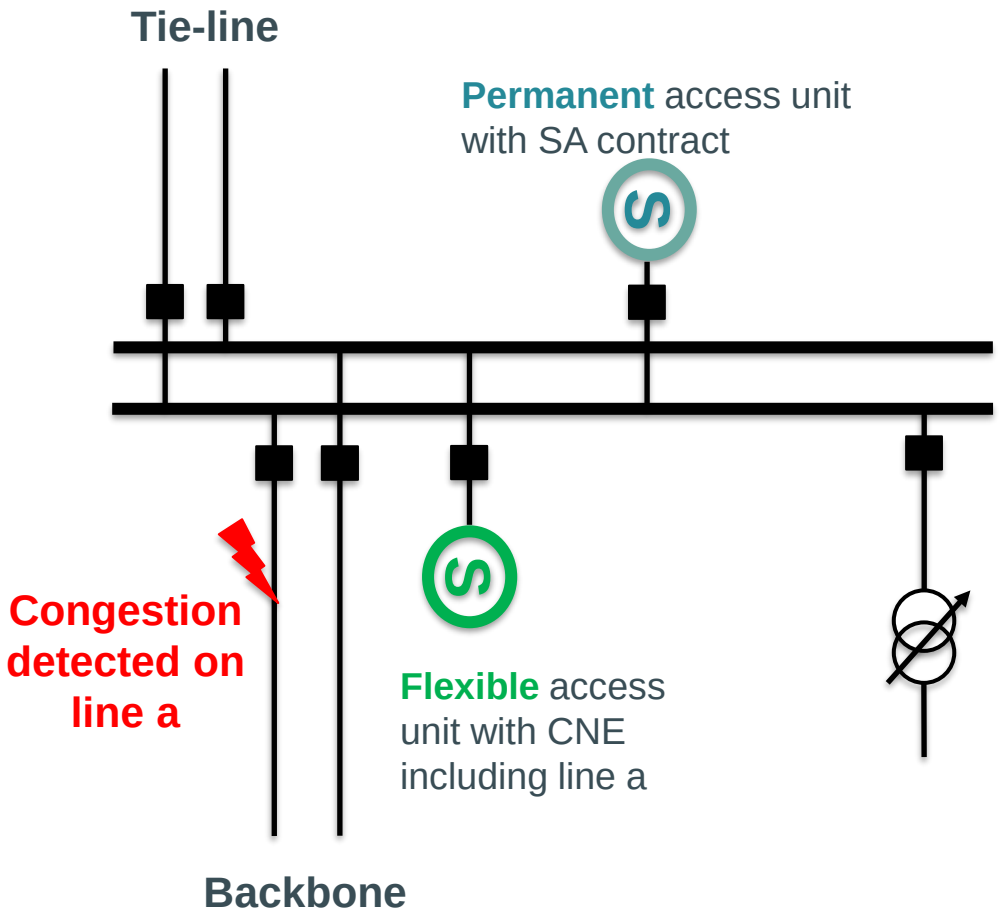
- Automatic activation in case of **congestions on monitored CNE(s) that were forecasted in ID/DA** according to activation principles used in security analysis
    - ❑ If the cap is not reached: preventive and curative activations
    - ❑ If the cap is reached: only curative activations

- Automatic activation (preventive or curative) in case of **unexpected congestions** on monitored CNE(s) that were not forecasted in ID/DA

In case of unavailability of alternatives, **manual Gflex activations** can be requested to solve some specific and non-frequent operational security issues (e.g. voltage management issues or congestions on non-monitored grid elements)

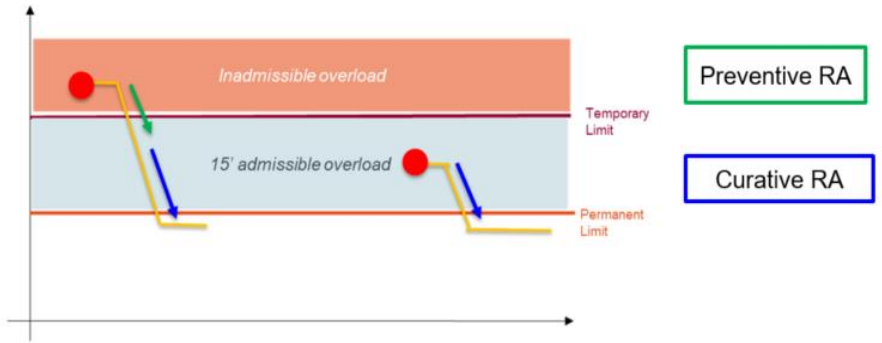
# Operational process

## *Gflex activation in Real-time*



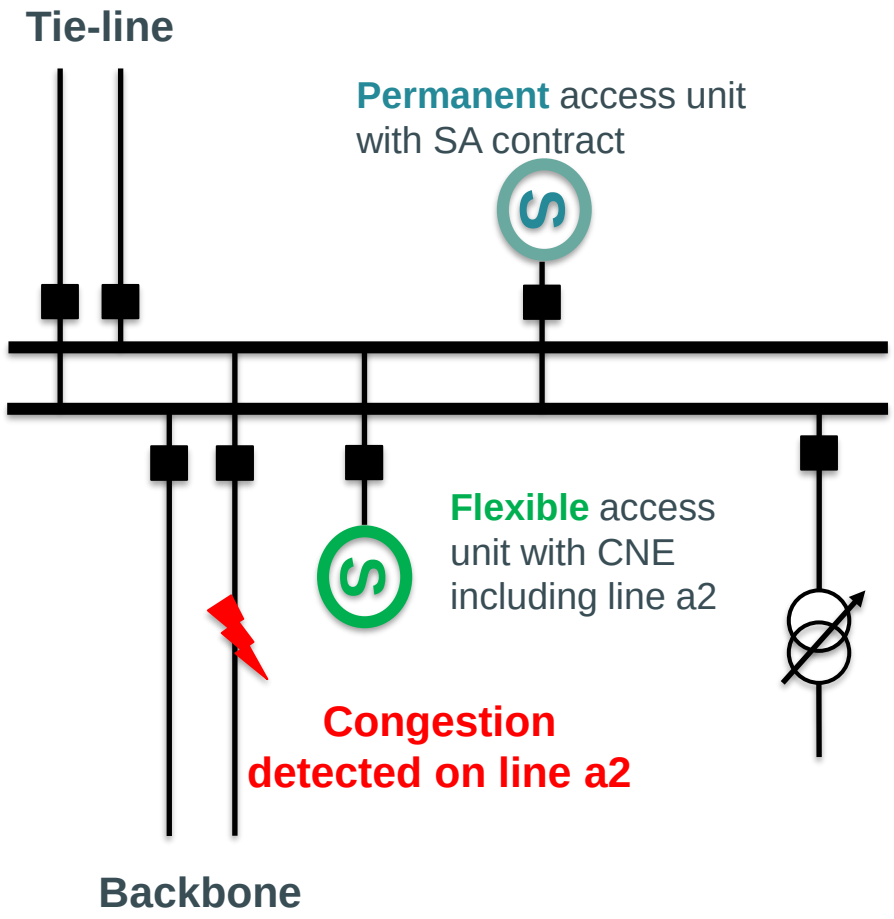

In **real-time**, if the congestion that was forecasted in DA/ID, is measured on line a,

- If the cap is not reached yet, Gflex setpoint will be sent to unit with Flexible access as a curative or preventive RA to solve the congestion.
- If the cap is reached, Gflex setpoint will be sent to unit with Flexible access as a curative RA to solve the congestion.



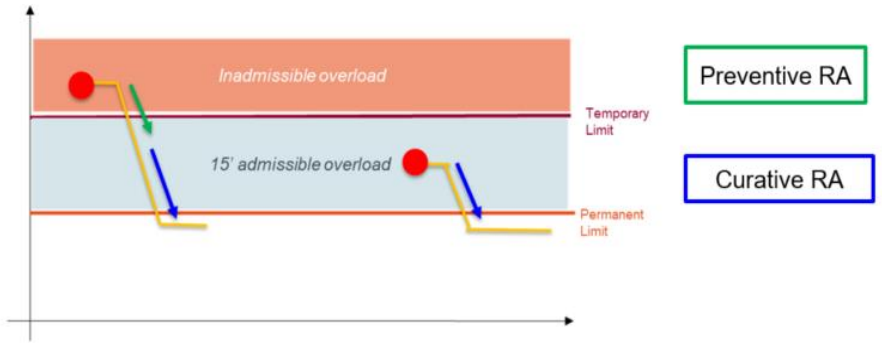
# Operational process

## *Gflex activation in Real-time*




In **real-time**, if the congestion that was not forecasted in DA/ID, is measured on line a2,

- Gflex setpoint will be sent to unit with Flexible access as a curative or preventive RA to solve the congestion.



# Connections with flexible access

## *RT Activation principles in case of multiple connections with flexible access*

- In case multiple connections with flexible access can contribute to solve a specific congestion, the following rules apply:
  1. As a first step, the **most efficient units** are identified based on a minimum expected impact (PTDF) of the modulation on the congestion.
  2. Among these units, the activation is performed based on the **type of technology**, according to the following order:
     1. Storage
     2. Grey production
     3. Green production
  3. Within each type of technology, a **LIFO-principle** (Last In First Out) is used i.e. the last unit connected to the grid is to be modulated first.

For TSO connected units, this criteria is currently sufficient

In line with **philosophy** of **regulation EU 2019/943** (CEP) and **modification** of **Electricity decree** from 2022 (Wallonia)

- Activation on connections with flexible access first considers the **flexible power.** However, in case this is insufficient a modulation of the **permanent power** may be performed (which will always be remunerated).

# Conclusions – principles for usage of Gflex

- Gflex units are **meant to be used mainly to solve predefined congestions caused by these units** (on identified CNE's and for a determined period in time) to avoid socialization of cost.

- To ensure operational security of the system, Gflex may also be used in **last resort or** when there is a **low probability** of occurrence:
  - In case no other means are available
  - In case of real-time congestions not detected in advance
  - As curative RA in occurrence in N-1 in monitored CNEs

- Gflex is **always activated in RT** and based on RT measurement, which **reduces** as much as possible the number of **activations** and modulated volume

- Gflex units are **not used** to **increase cross-zonal transmission capacity** (only the flexibility offered in redispatching is considered) and **nor** to solve congestion abroad in **coordinated security analysis**

- **No impact on the CRI process**: High CRI occurrence won't be "deteriorated" by the presence of Gflex* and in the other way around Gflex units won't be "over-used" to free up more margin for the balancing market in the CRI

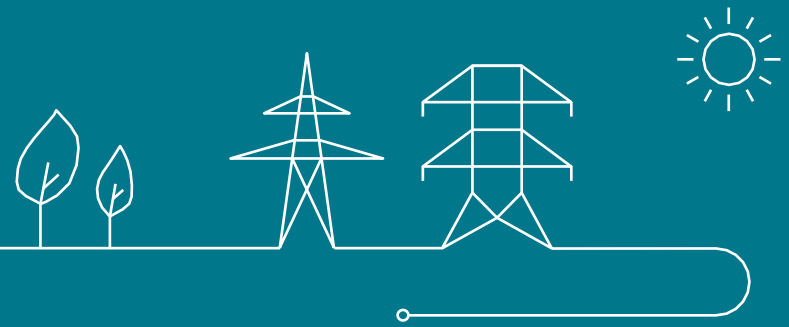
**before the cap*

# Questions

# 3. Changes and new elements compared to previous workshops

# Federal and regional regulatory framework

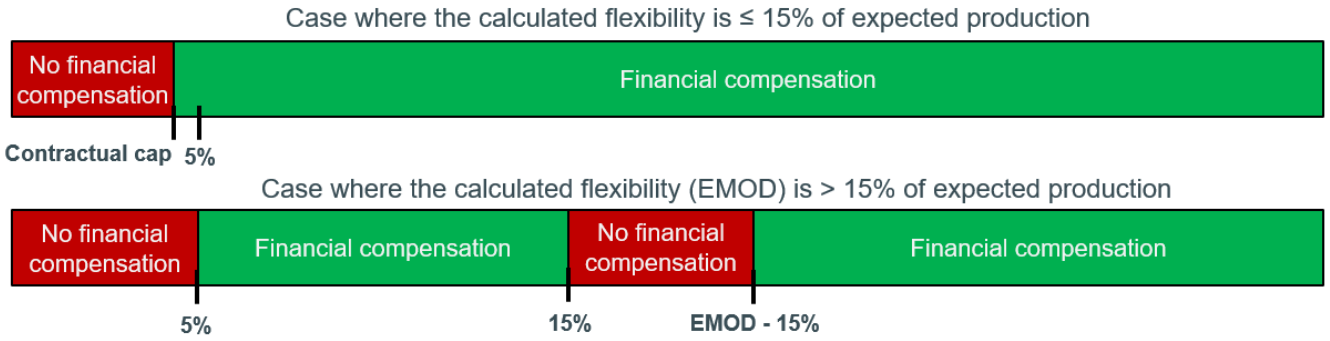
Related to connections with flexible access



# Inconsistency between the regional and federal regulatory frameworks related to connection with flexible access

Current **regulatory framework** is **fragmented** – example of compensation for Grid Users

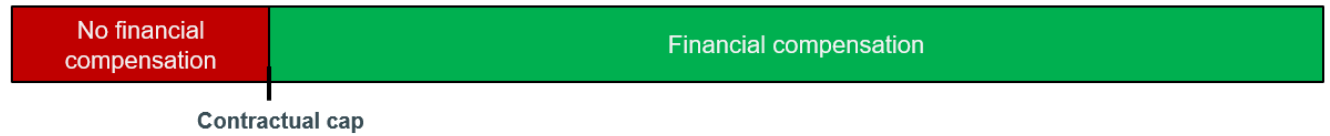
**Proposition d'arrêté du gouvernement wallon**
Applicable to green production and green storage facilities (for injection) only




Based on Elia's preliminary interpretation of the proposed TRPV by the VREG

**Future TRPV**
Applicable to green production facilities only


**Elia's proposal**
Applicable to all GUs




→ From Elia's perspective, **harmonization** is needed to avoid the following issues :

- **Complexity for Grid Users** to have different set of rules
- **No level playing field** – risk of inefficient arbitrage by grid users among voltage levels or regions
- **Complexity of design and implementation**, increasing time-to-market of solutions for Grid Users

→ **Support** from an **energy expert** consulting firm to assess the different frameworks

# Definition of temporary period

# Current provisions in the Code of Conduct

- *De flexibele toegang is beperkt in de tijd en eindigt op de datum van de ingebruikname van de nodige versterkingen van het netwerk voorzien door het ontwikkelingsplan bedoeld in het eerste lid. Op deze datum wordt het ter beschikking gesteld flexibel vermogen een permanent vermogen en wordt deze toegevoegd aan het reeds ter beschikking gesteld permanent vermogen. Deze flexibele toegang is niet beperkt in de tijd als het voornoemde ontwikkelingsplan niet de nodig versterkingen biedt*
- *Het technisch rapport bedoeld in paragraaf 1, eerste lid, specificeert de voorwaarden voor het verlenen van flexibele toegang, waaronder: [...] 3° een schatting van de gemiddelde duur en de totale duur per jaar gedurende dewelke het flexibele vermogen kan worden verminderd. Als de noodzakelijke netwerkversterkingen waarin in het ontwikkelingsplan als bedoeld in artikel 13 van de wet is voorzien, niet plaatsvinden op het geplande tijdstip overeenkomstig § 3, 1°, kan de transmissienetbeheerder de CREG verzoeken om flexibele toegang voor een bepaalde periode uit te breiden, afhankelijk van voorwaarden in dat geval*

# Initial proposal

- For the connection contracts for which the infrastructure project expected to solve the congestions is identified at the moment the connection contract is signed:
  - ✓ The temporary period ends when the infrastructure project expected to solve the identified congestions is **commissioned**;
  - ✓ An indicative, **non-binding timing** is provided to the client.
- 2 options were proposed for the case where there is no infrastructure project ongoing:
  - ✓ **Option 1**: to give an additional guarantee to the Grid Users, a maximum duration of the temporary period is defined: 15 years if the congested grid element is 220-380kV, 10 years for 150 → 36kV and 5 years for MV
  - ✓ **Option 2**: the temporary period is defined for an undetermined duration

# Feedback received from stakeholders and further reflexions

- Feedback received from stakeholders: the current provisions of the CoC and Elia's initial proposals lead to a limited commitment from the Grid User's perspective. **Grid Users need more guarantees**.
- An important pre-condition for Elia is that the proposal should ensure that the Grid User is **concerned by the permitting process**. Permits are a frequent cause of delay of infrastructure projects. If the temporary period is defined by the initially planned commissioning date, a delay in the permitting process has a limited impact on the Grid User, as he will be compensated once the temporary period has ended.

  ➔ Based on this, Elia analyzed possible improvements

# Updated proposal

- For the connection contracts for which the infrastructure project expected to solve the congestions has a planning which is sufficiently robust at the moment the connection contract is signed:
  - ✓ The planning of the project is mentioned in the connection contract.
  - ✓ A **standard margin of 1 year** is applied to the end of the temporary period of the connection contract.
  - ✓ In addition, **Elia has the possibility to, once** for each connection contract, extend the temporary period or postpone a phase within the temporary period. Elia shall motivate the modification based on **elements which are not under its control** and shall inform the CREG.
  - ✓ In any case, the temporary period automatically ends when the infrastructure project is commissioned.
- To cover the cases where there is no infrastructure project with a sufficiently robust planning and to give an additional guarantee to the Grid Users, a maximum duration of the temporary period is defined: 15 years if the congested grid element is 220-380kV, 10 years for 150 → 36kV and 5 years for MV

# Definition of the cap

# Annual or multi-annual cap?

- Option 1: The cap covers the full temporary period
  - ✓ Avoids the risk of socialization due to the spread of the need for flexibility over time
- Option 2: Annual cap
  - ✓ Simple and safest approach for the GU: no risk of having all flexibility used in the 1st year
  - ✓ The values defined in the contract could vary along the temporary period to take the grid development phases into account
  - ✓ High risk of socialization, especially in case of significant maintenances and evolving need for flexibility
- Option 3: Multi-annual cap over a certain period
  - ✓ Remains simple
  - ✓ Mitigates the risk to socialize the costs by partly covering maintenances and evolving need for flexibility

**Proposal: Multi-annual cap of 3 years, as a balance between the risk for the GU and the risk to socialize costs**

# Feedback received from stakeholders

- Feedback from stakeholders: the cap should be an annual cap. A multi-annual cap only limitedly contributes to reducing the risk in a business plan. In particular, there's a need for the Grid Users to not exceed the annually calculated values of flexibility shortly after the connection.
- On the other hand, Elia reminds that there is a high risk of socialization if an annual cap is implemented

  ➔ Based on this, Elia analyzed possible improvements

# Updated proposal

- In the design note, in addition to the option “multi-annual cap of 3 years” presented in the workshop, Elia proposes a 2nd option: **annual cap carrying unused flexibility over to subsequent years**
- Example: a 40MW Grid User connects on the 1st of May 2026 and the EDS resulted in the following flexibility levels

| | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|
| **Perm power [MW]** | 0 | 0 | 0 | 10 | 10 | 15 | 15 | 15 |
| **Flexibility [MWh]** | 12.000 | 12.000 | 12.000 | 6.000 | 6.000 | 2.500 | 2.500 | 2.500 |

# Updated proposal

01/05/2026

| | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|
| Perm power [MW] | 0 | 0 | 0 | 10 | 10 | 15 | 15 | 15 |
| Flexibility [MWh] | 12.000 | 12.000 | 12.000 | 6.000 | 6.000 | 2.500 | 2.500 | 2.500 |

Cap for the 1st year is defined prorata
➔ 8 out of the 12 months
➔ 8/12 of 12.000MWh = 8.000MWh

# Updated proposal

01/05/2026

| | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|
| **Perm power [MW]** | 0 | 0 | 0 | 10 | 10 | 15 | 15 | 15 |
| **Flexibility [MWh]** | 12.000 | 12.000 | 12.000 | 6.000 | 6.000 | 2.500 | 2.500 | 2.500 |

Cap for 2026 = 8.000MWh
If volume activated between 01/05/'26 and 31/12/'26 is 10.000MWh

➔ Cap exceeded by 2.000MWh

➔ Grid User will be compensated for these 2.000MWh

➔ Equivalent to an annual cap

# Updated proposal

01/05/2026

| | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|
| Perm power [MW] | 0 | 0 | 0 | 10 | 10 | 15 | 15 | 15 |
| Flexibility [MWh] | 12.000 | 12.000 | 12.000 | 6.000 | 6.000 | 2.500 | 2.500 | 2.500 |

Cap for 2026 = 8.000MWh
If volume activated between 01/05/'26 and 31/12/'26 is 7.000MWh
➔ 1.000MWh unused in 2026
➔ This volume is transferred to 2027
➔ Cap in 2027 is 13.000MWh (12.000MWh + 1.000MWh)

# Updated proposal

01/05/2026

| | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|
| Perm power [MW] | 0 | 0 | 0 | 10 | 10 | 15 | 15 | 15 |
| Flexibility [MWh] | 12.000 | 12.000 | 12.000 | 6.000 | 6.000 | 2.500 | 2.500 | 2.500 |

Cap for 2027 = 13.000MWh
If volume activated in 2027 is 9.000MWh
➔ The cap in 2028 will be 16.000MWh
(12.000MWh + 1.000MWh from 2026 + 3.000MWh from 2027)

# Updated proposal – advantages of the 2nd option proposed

| | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|
| Perm power [MW] | 0 | 0 | 0 | 10 | 10 | 15 | 15 | 15 |
| Flexibility [MWh] | 12.000 | 12.000 | 12.000 | 6.000 | 6.000 | 2.500 | 2.500 | 2.500 |

- The Grid User has a guarantee in the 1st year and the guarantee that the maximum volume of non compensated flexibility that could happen is to have the entire annual cap used each year. If, for a given year, the cap is not fully used, the Grid User has the possibility to make provisions for the subsequent years.
- The risk of exceeding the cap (➔socializing costs) in the 1st year is limited, as Elia has a quite clear view on the occurrence of major works shortly after the Grid User's connections.
- The risk of major works or maintenances being delayed is covered. If a high need for flexibility has been identified for this reason in 2030 but that works are postponed to 2031, no costs are socialized.
- The risk of delays in infrastructure projects that lead to a change of phase reducing the need for flexibility is partly covered, as each year in which the cap is not used provides a margin for the following years.
- The principle remains fairly simple in terms of design and implementation.

# Updated proposal – request for input

- In case of option 2, Elia is open to discuss additional rules aiming to avoid that flexibility volumes keep summing up to unnecessarily high levels after several years. A possibility could be to limit the carrying over of volumes to 3 years. This would mean that an unused volume in 2026, if not used in the period 2027-2029, would not be considered anymore in the cap for 2030.

| | 2026 | 2027 | 2028 | 2029 | 2030 | 2031 | 2032 | 2033 |
|---|---|---|---|---|---|---|---|---|
| **Perm power [MW]** | 0 | 0 | 0 | 10 | 10 | 15 | 15 | 15 |
| **Flexibility [MWh]** | 12.000 | 12.000 | 12.000 | 6.000 | 6.000 | 2.500 | 2.500 | 2.500 |

# Revaluation of flexible power and cap

# Is the cap subject to reevaluation?

- Should the cap be recalculated in some situations
  - ✓ Approval of a new regulatory framework
  - ✓ Approval of a new development plan
  - ✓ Evolution of the situation on the grid: other GU (dis)connecting, unused reserved capacity, market evolution,…
- In case of re-evaluation, there would be 2 options:
  - ✓ We only look at a possible reduction of the cap ➔ **risk of socialization is unbalanced**. Elia is already committing on a maximum use of flexibility, meaning part of the risk is borne by the tariffs
  - ✓ We look at both a possible reduction and a possible increase of the cap ➔ **uncertainty for the GU**, while the objective is precisely to give as much guarantees as possible
- In case of re-evaluation, it should be performed periodically for each GUs in its temporary period

**Proposal: like for the temporary period, the cap is defined at the signature of the connection contract and is not re-evaluated**

- Note: in case the infrastructure project is commissioned ahead of schedule, Elia's proposal is to put an end to the temporary period (➔ cap = 0)

# Feedback received from stakeholders

- Elia understands that revaluation is important for Grid Users in the situation where requests “ahead in the queue” are cancelled
- Elia understands that revaluation is important for Grid Users at different moments
  - ✓ At the moment of financial closure
  - ✓ During operations, to reduce the probability of activations by lowering the cap in case the operational conditions are different from the ones assumed during the connection study
- Elia also understands that a best-estimate evaluation of the activations, considering only a part of the reserved capacities in the calculation, would be useful for some Grid Users

# Revaluation of flexible power and cap

- Elia proposes to **analyze the possibility** to **revaluate the cap** in specific circumstances and a limited number of times
- Several parameters have to be considered in the discussion:
  - ✓ The **precise needs of the Grid Users**;
  - ✓ The **impact of the proposed changes** in the **capacity reservation process**, which is expected to reduce the reserved capacities;
  - ✓ The expected **impact of the operational principles** on the added value of a revaluation;
  - ✓ The **impact of the increase of the amount of studies** to be realized, at the detriment of the efficient and timely realization of the initial EOS/EDS studies during the connection request process.
- Elia is of the opinion that, in case a revaluation is performed, the results should always be taken into account. The implies that the revaluation can lead to a decrease but also to an increase of the flexibility levels.

# Revaluation of flexible power and cap

- Possible options:
  - ✓ Provide the possibility to Grid Users to request Elia, once for each grid connection study with a flexible access, to perform an update of the timing of the identified phases and the volume of each phase.
  - ✓ Automatic update when another Grid User with the same technology, in the same local zone of network influence and with a similar PTDF, receives an EDS with lower flexibility levels.
  - ✓ Provide, in addition to the contractual values, a best-estimate calculation of the flexibility levels in the EDS.

Grid Users are invited to provide their needs as an answer to the public consultation in order for Elia to be able to make a proposal, in which following elements will be taken into account:

- The expected impact of the proposed capacity reservation process described in section 4 on the added value of a revaluation / best-estimate calculation;
- The expected impact of the operational principles described in section 7 on the added value of a revaluation;
- The impact of the revaluation / best-estimate calculation on the efficient and timely realization of the initial EOS/EDS studies during the connection request process.

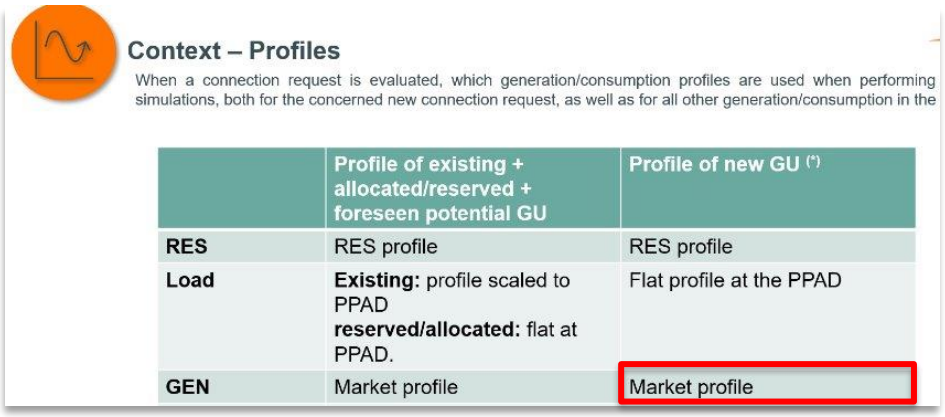
# Flat profile for conventional generation

# Maintain current approach of connection studies performed with a flat profile for conventional generation

- Currently and since many years the appendix 3 of EOS or EDS includes the following:

> A l'exception des raccordements d'unités de production à partir d'énergie renouvelable pour lesquelles un profil de production spécifique est appliqué et sauf mention explicite lors de la demande, le projet de raccordement sera considéré comme fonctionnant en permanence à sa puissance maximale et sous toutes les consignes réalistes de puissance réactive. Pour les unités de stockage, un profil constant est utilisé à pleine capacité et dans les deux directions sans tenir compte de la capacité de stockage de l'unité, sauf indication contraire explicite dans la demande.

- A change of approach was incorrectly introduced in the workshop…

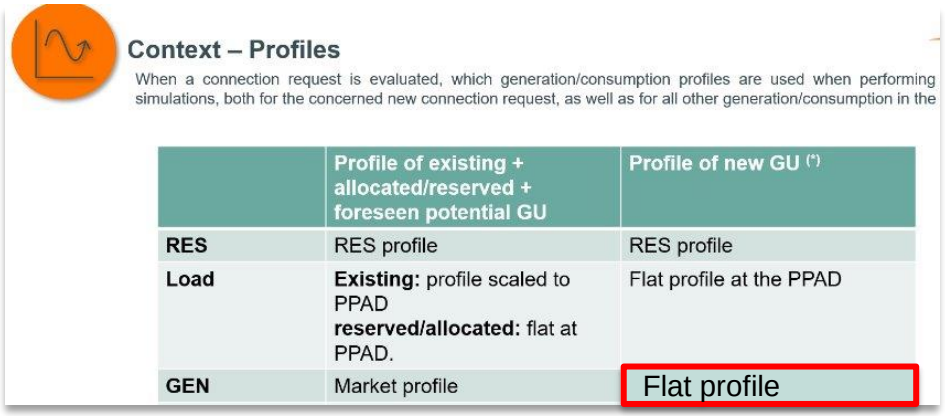


**Context – Profiles**

When a connection request is evaluated, which generation/consumption profiles are used when performing simulations, both for the concerned new connection request, as well as for all other generation/consumption in the

| | Profile of existing + allocated/reserved + foreseen potential GU | Profile of new GU (*) |
|---|---|---|
| **RES** | RES profile | RES profile |
| **Load** | **Existing:** profile scaled to PPAD **reserved/allocated:** flat at PPAD. | Flat profile at the PPAD |
| **GEN** | Market profile | Market profile |

… and has been replaced in the design note by



**Context – Profiles**

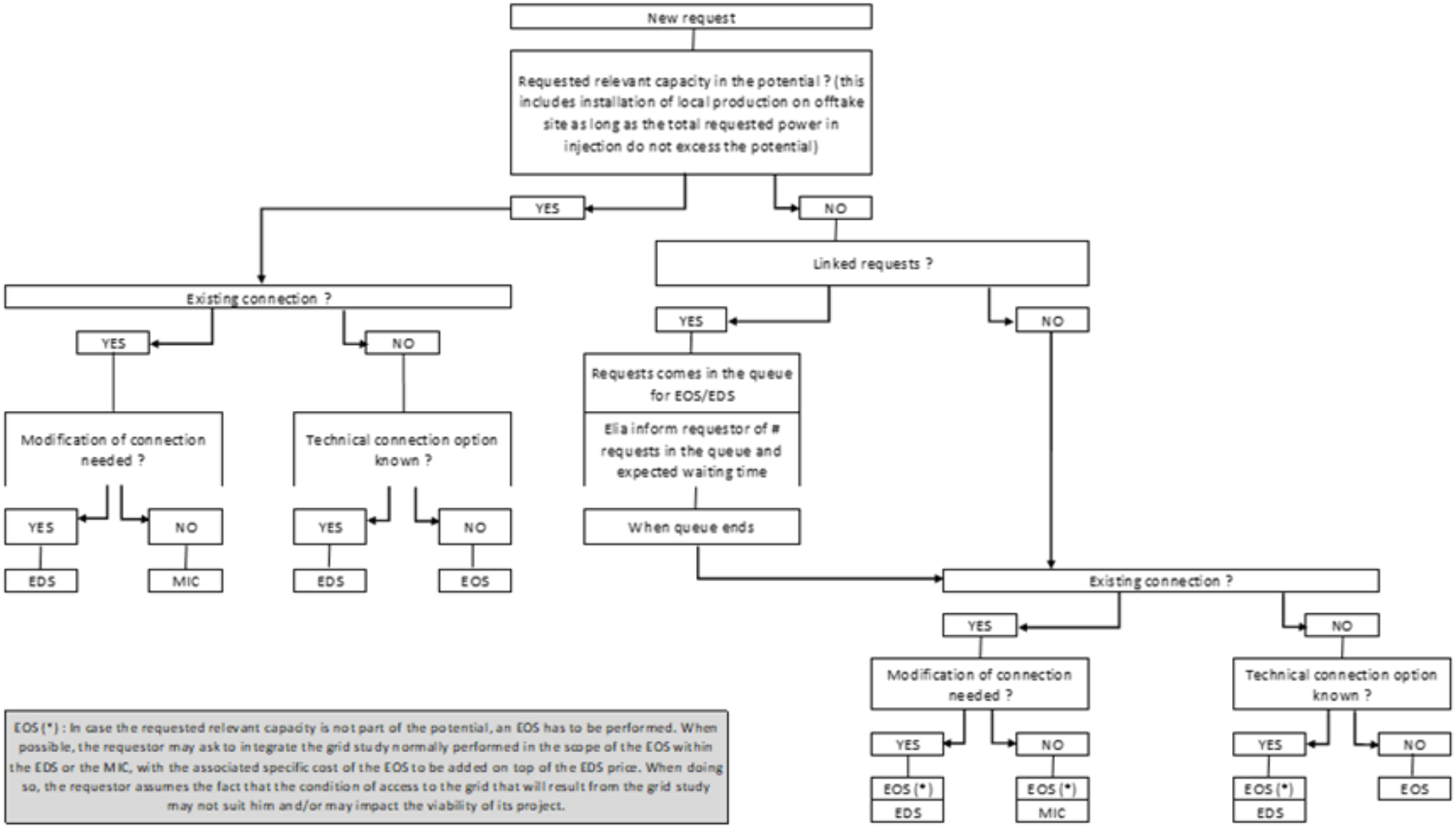
When a connection request is evaluated, which generation/consumption profiles are used when performing simulations, both for the concerned new connection request, as well as for all other generation/consumption in the

| | Profile of existing + allocated/reserved + foreseen potential GU | Profile of new GU (*) |
|---|---|---|
| **RES** | RES profile | RES profile |
| **Load** | **Existing:** profile scaled to PPAD **reserved/allocated:** flat at PPAD. | Flat profile at the PPAD |
| **GEN** | Market profile | Flat profile |

- Coherently, the proposal to use a last QH or High X of Y baselining methodology in case of modulation of flexible conventional generation has been changed for the comparison of the activated flexibility with the CAP

# Connection process

# Orientation study: obligatory except in case of fast track



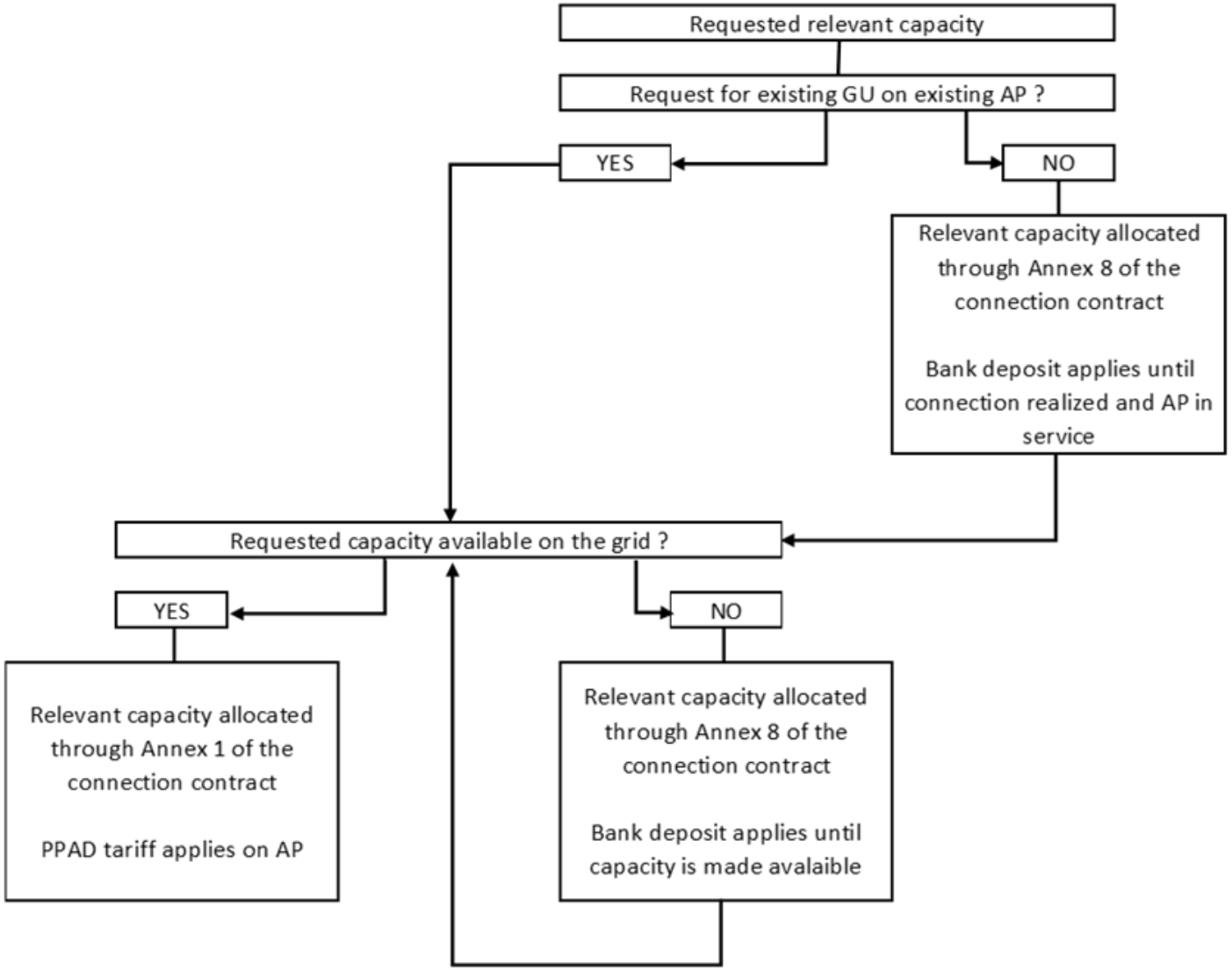
# Capacity reservation and allocation

The following **adaptations** are proposed in order to **avoid "sleeping" reserved capacities :** :

- For **EDS** sent to the **candidate Grid User : limit** the **prolongation of the reservation** to a **single period of 120 WD**
  - Today, the initial capacity reservation of 120 WD can be **prolonged with 60 WD** and after this period, there is a **possibility to prolong as long as the conditions do not change**

- When the Grid User has **signed his connection contract** : introduction of a **bank deposit** for the **allocated capacity**
  - Today, there is **no payment for the allocation of the relevant capacity** before the related access point **comes in service** and the **allocated capacity is invoiced** based on the **tariff** for Power-Put-At-Disposal (PPAD)
  - This makes that **large capacities** can be **allocated for a long time** having a **large impact on network development** and **other studies** without any consequences if ultimately the realization is canceled
  - Elia believes that a **financial incentive is necessary** and therefore propose to request a **bank deposit** that has to be paid by the (candidate) Grid User **as from the allocation of the capacity**
  - The initial proposal for the bank deposit is to **reflect** the **number of years** during which there is **no payment for the relevant capacity**, the **number of MVA's** of the relevant capacity and **the tariffs** applied for the power put at disposal (amount of the deposit = Number of years x MVA x yearly tariff PPAD)
  - The (candidate) Grid User is **fully reimbursed** if his **connection commissioning happens as planned**. In case of **delay** or **abandon** of the **project**, the (candidate) Grid User is **only partially reimbursed**
  - → **Elia is open to discuss the modalities and calibration of the bank deposit with the Market Parties** (will be further discussed with market parties during next WG Belgian Grid on 27/6)

# Application of bank deposit



# 4. To whom does the framework apply ?

# Introduction

## To whom will the new framework apply?

- Does the new framework apply retroactively to GUs who have already received their EDS / signed their connection contract?
- This question is under analysis and will be discussed in detail during the 4th workshop, a.o.:
  - ✓ Legal aspects
  - ✓ Methodological aspects
  - ✓ Contractual aspects: are the data needed to apply the new framework available in the existing contracts?
  - ✓ …
- Important note: retroactivity means that the rules apply on existing contracts, not that the use of flexibility and possible remuneration will be corrected for the period preceding the entry into force of the new GUFlex contractual modalities

# To whom will the framework apply?

- Basic principle: a new regulatory framework should be applied to already existing contracts, but the impact on the business case should be taken into account
- The question is relevant for 2 specific topics:
  - ✓ Providing guarantees to the Grid User that have a contract with a flexible access (chapter 6 of the design note)
  - ✓ The capacity reservation process (chapter 4 of the design note)

# To whom will the framework apply?
## Guarantees

- The question is relevant for the Grid Users that have signed a contract with a flexible access
  - ✓ Candidate Grid Users that have received their EDS but have not yet signed their connection contract at the moment the framework enters into force will in any case sign their contract under the updated framework
- Intention is to apply the cap to connection contracts that are already signed
- This implies to
  - ✓ Adapt the contract to include the data necessary to apply the guarantees. This data results from the grid connection study realized in the past and is in possession of Elia (but was not explicitly mentioned in the contract as these guarantees were not applicable)
  - ✓ Define practical implementation detailed. F.i. to determine the cap in MWh per year based on the phases, one needs to define which planning of the infrastructure projects to use ➔ need to define clear rules to avoid handling contracts case-by-case

➔ The practical implementation will not be straightforward and will be further analyzed if there's a general agreement on the principle

# To whom will the framework apply?
## Capacity reservation process

- EDS is sent but connection contract is not yet signed:
  - ✓ Proposal is to allow only one extra prolongation as of the date the framework is applicable
- Connection contract is signed:
  - ✓ New bank deposit would be requested as of the date the framework is applicable
  - ✓ There would be no retroactive costs for the period between the signature of the connection contract and the entry into force of the framework



Note: the amount of the bank deposit = Number of years x MVA x yearly tariff PPAD

# 5. Implementation plan principles

# Implementation plan

- While Elia has strived for simplicity in the proposed design, the implementation in Elia's tools and processes will still require development time, f.i.
  - ✓ The activation of Gflex at Access Point level (compared to Redispatching at Delivery Point level) requires to define a specific data model and apply it consistently in all processes & tools
  - ✓ The activated flexibility needs to be quantified – depending on the technologies and on whether or not the cap is reached – and the links must be ensured with operational processes, settlement and perimeter correction
- In addition, not only the Code of Conduct but also other regulated documents will need to be adapted. The "gap analysis" will identify the needed evolutions, for consideration in the implementation plan

➔ **An implementation plan for the entry into force of the Code of Conduct will have to defined**

➔ This implementation plan will consist of **different phases**
F.i. the capacity reservation process requires less implementation time than the guarantees

# 6. Q&A

# Thank you.

# Appendix