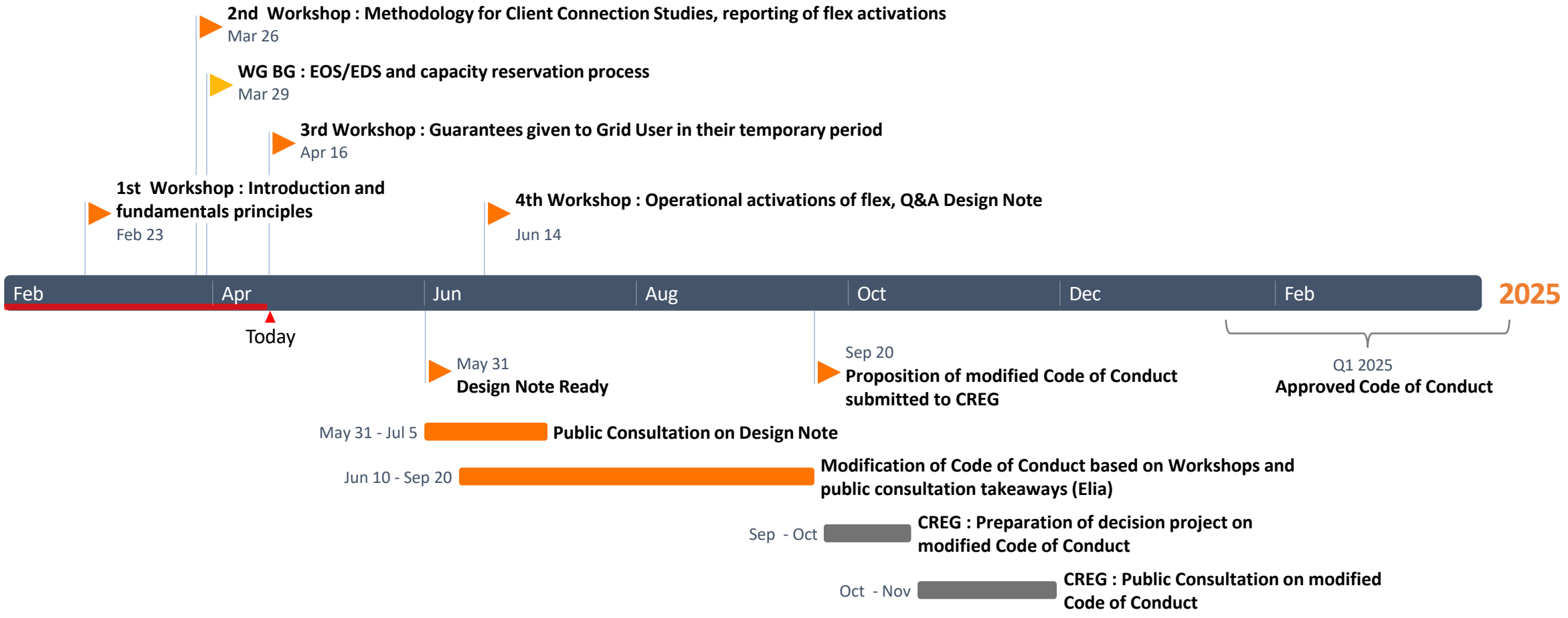
Incentive on connection with Flexible access – 3rd Workshop

Workshop 3 – 16/04/2024

16.04.2024 | Elia

Planning of workshops and public consultations



Part I : **Operational activations of flex: high-level overview of what will be described in the design note and discussed in the 4th workshop**

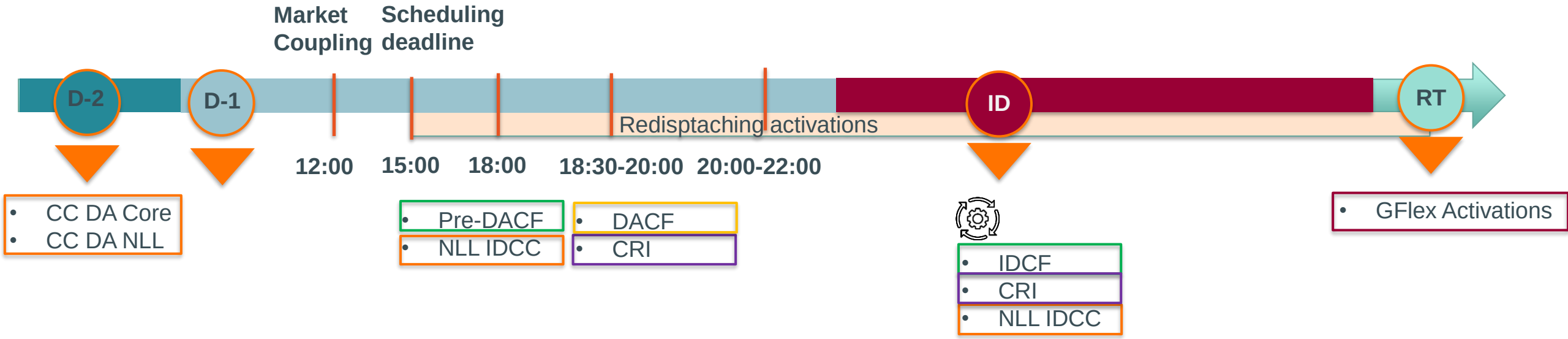
Part II : **Guarantees to the GUs**

Part I : Operational activation of flex

OPERATIONAL PROCESS

Introduction to the workshop of June

Scope of this workshop will be the consideration of the none firmed connections in all these operational process:



Legend:

- Capacity Calculation
- National Security Analysis
- Coordinated Security Analysis
- Congestion Risk Indicator
- Real time activations

- *How do the RD activations and GFlex activations coexist on the same units?*
- *How are managed GFlex activations before and after the cap?*
- *What are the links between CRI and GFlex activations?*
- *...*

Part II : Guarantees to GUs

Scope clarification

There are both long-term and short-term needs

Slide from 1st workshop (23/02/2024)

This evolving context implies a need to review the approach and design related to flexible access

- **Ambition** for a **long-term** and **future-proof Vision** on **Grid User Flexibility** for Congestion Management (**Target Model**)
- Alignment on **fundamental principles** and **design** of new **congestion flexibility products**

In the meantime, the current way to treat flexible access needs to be clarified

- **Feedback** from **Market Parties** captured through the public consultation highlighted that the **current way** to **treat flexible access needs to be clarified**. There is a need for **more transparency** and **guarantees** so that Grid Users can calculate the viability of their Business case.
- There is a **willingness from the regulator** to adapt the **regulatory framework** by end of 2024

Proposed approach

- **Focus** on **short term** needs and a **clarification** of the **current flexibility framework**…
- … **in line** with the proposed **fundamental principles** of the Long-Term Vision (first step of this journey)

Clarification of the scope of the design note

- Based on recent discussions, Elia understands there might be different interpretations of what will be included in the design note in the short term ➔ need for clarification
- The main objective of the coming amendment of the Code of Conduct is to **define the notion of flexible access**. From an operational point of view, **in the short term**, this will imply **real-time flexibility activations**, similar to the existing Gflex activations.
- Elia is aware that this doesn't cover all the needs. Therefore, we have to **collect and analyze the needs and constraints of Grid Users for whom real-time flexibility activations are not possible**. Those discussions will be initiated in June and will eventually result in the definition of **new congestion flexibility products**, which are part of the **Target Model**. Hence, it can’t yet be included in the design note in May and in the proposal of modification of the code of conduct in September.
- As a result, the discussion today will focus on the guarantees that can be provided to the GUs which have a flexible access and are activated in real-time.

What to expect in the design note?

1. Regulatory Framework
2. Fundamental principles of the Target Model on Grid User flexibility
   - ✓ Tradeoff between Grid Reinforcements and remuneration of Grid Users flexibility in LT Grid planning
   - ✓ Temporary period with costs of flexibility borne by Grid Users
3. Clarifications on connection process (studies & capacity reservation)

Workshop 1
(+ WG BG 29/3 for item 3.)

4. Procedures and criteria for client-connection studies
   - ✓ Methodologies and assumptions for performing grid studies
   - ✓ Criteria to evaluate that not enough firm hosting capacity is available
   - ✓ Methodology for calculating flexible volumes / curtailed energy

Workshop 2

5. Guarantees provided to Grid Users that have a flexible access
   - ✓ The definition of the temporary period
   - ✓ The use of flexibility during this temporary period and the remuneration beyond the predefined limits

Workshop 3

6. Clarification of operational principles (based on existing products Gflex and iCAROS)

Workshop 4

Introduction

Introduction

- Currently, a GU with a flexible contract receives a non-binding estimation of the % of time where he will be “flexibilized”.
- In practice, the flexibility is activated by sending real-time modulation set points, similar to the existing Gflex for production units(*). The GU is not compensated: no remuneration of the volume not injected, no perimeter correction,…
  - ➔ This is an **uncertainty for the GU’s business case**
  - ➔ Grid users need as much clarity as possible in order to assess their business case, and this on 2 levels
    1. Clarity on the **definition of the temporary period**. This has been discussed in the 1st workshop. The feedback is under analysis and a proposal will be made in the design note
    2. Clarity on the **use of flexibility** during the temporary period
- … keeping in mind that the principle of the temporary period explained in previous workshops is that the costs for an early connection are to be borne by the Grid User

(*) for the sake of readability, the term “Gflex” will be used throughout the present slides

Introduction
Guiding principles

- **Consistency between the different processes**: calculation of required flexibility in the grid connection study, operational processes, reporting, cap “consumption” and remuneration beyond the cap
- **Balance** to be found between risk borne by the GU and risk of socialization
- **Simplicity** has a value for all
- **Robustness against gaming**

➔ The proposal presented are to be considered in the full picture

Introduction
Technologies considered

- Wind & solar
- BESS
- Conventional production
- Demand facilities:
  - ✓ Limited cases where Gflex would be acceptable
  - ✓ Wide range of possible situations for baselining, remuneration etc.

➔ Development of specific products are needed for demand facilities, which are hence are not explicitly considered in this discussion about Gflex, however:

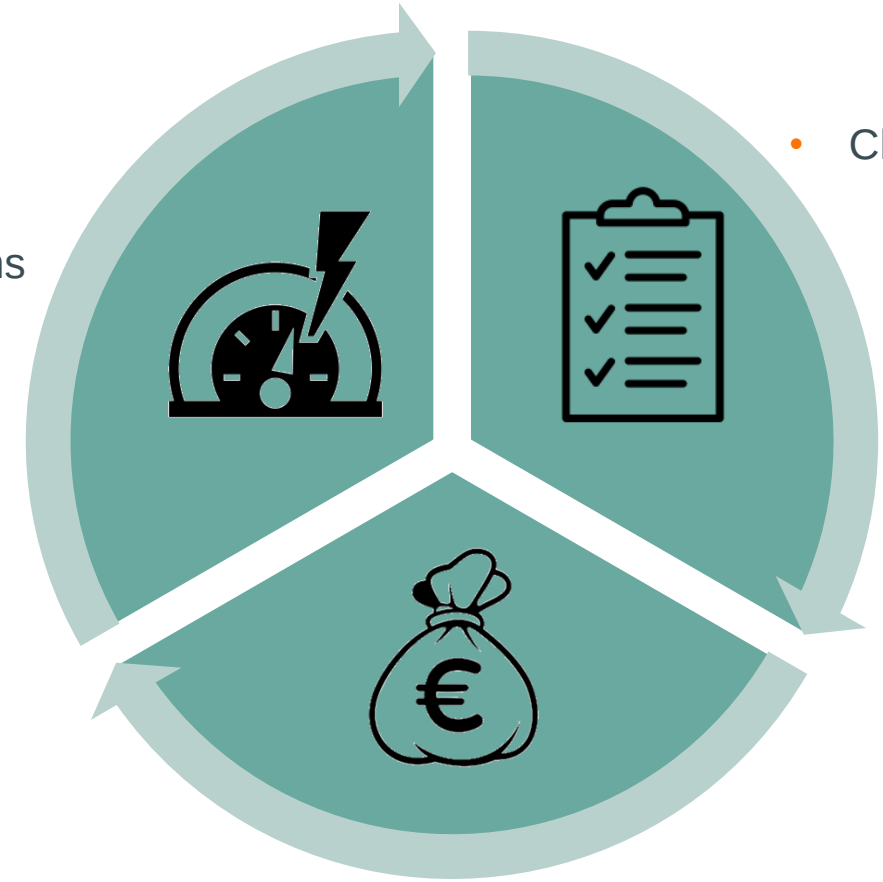
- ✓ They should be allowed to use the mechanism set in place for other technologies if they have the capability to do so (f.i. P2G)
- ✓ Reflections on participation of demand facilities are being initiated

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

Agenda

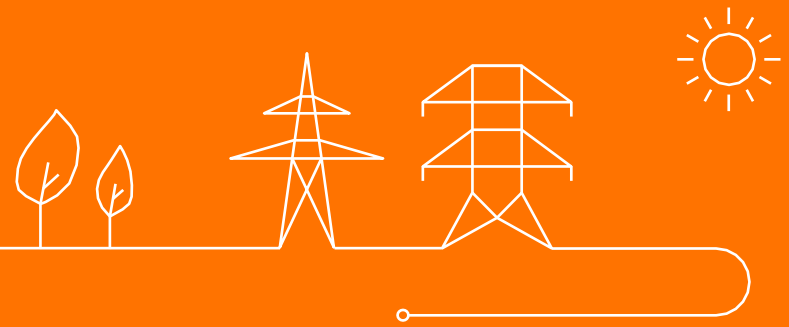
- Quantification of flexibility in operations



- Characteristics of the cap
  - ✓ Which activations are counted towards the cap?
  - ✓ Is the cap annual or multi-annual?
  - ✓ Is the cap subject to revision?

- What happens beyond the cap?
  - ✓ Are Gflex activations still possible?
  - ✓ Remuneration
  - ✓ Perimeter correction
  - ✓ Balancing obligations
  - ✓ CRM obligations

Quantification of flexibility in operations



Quantification of flexibility in operations

Introduction

There are **2 objectives** when quantifying the use of flexibility in operations

1. **Measure the use of flexibility within the cap**
   - ✓ Need to quantify the ratio of flexibility used under the “no compensation conditions” as identified during the EDS study
   - ✓ The method to determine this use of flexibility has to be consistent with the profiles used in the EDS study
2. **Determine a volume to compensate beyond the cap**
   - ✓ Need to determine the volume of flexibility activated that is not considered to be within the cap defined in the EDS study
   - ✓ In this case, a volume, expressed in MWh, has to be determined in order to be able to calculate the compensation
   - ✓ The method to determine this volume doesn’t necessarily has to be consistent with the profiles used in the EDS study

Wind & Solar

- 2 methods have been considered and already presented for reporting purposes (cf. 2nd workshop)
  - ✓ **Control group approach**. The control group consists of one or multiple reference units situated in the same area as the production unit. The power output of the control group will be scaled to calculate the potential production of the production unit. By calculating the difference between the potential production and the setpoint sent by Elia we obtain the volume of modulated energy.
  - ✓ **AAP (Available Active Power) approach**, in line with the method used for the subsidy mechanism of PEZ. The AAP baseline represents the potential production. By calculating the difference between this available active power and the setpoint sent by Elia we obtain the volume of modulated energy.
    Corrections will be taken into account for
    - The Outage Planning Agent: the AAP will be capped to the Pmax
    - Voluntary curtailment below the Gflex setpoint
- Both methods are also suited for the purpose of quantification of the flexibility to contractual ends, whether it's to measure the use of flexibility within the cap or the volume to compensate beyond the cap

Proposal:
- **Wind and solar parks use the AAP approach when available**
- **When it's not the case, they use the control group approach**

BESS

- Defining an adequate baseline for BESS is challenging
  - ✓ The precise usage of BESS can in many cases not be anticipated by Elia (and even not by the GU himself)
  - ✓ There are fast variations within the QH
  - ✓ The setpoint can have a direct impact on the SoC of the BESS, not impacting only the immediate injection/offtake, but also what the BESS will do later in time
- For BESS, Elia suggests to make the difference between the measurement of the use of flexibility within the cap, and the determination of a volume to be used for compensation beyond the cap

BESS

Approach to determine the use of flexibility within the cap

- Approaches based on volumes to determine the use of flexibility within the cap require to define **assumptions in the grid study** on the profile of the BESS, leading to **significant uncertainties in the calculation of the cap**
  - ✓ The methodology used in the grid study needs to be consistent with how the volume is measured during operation
  - ✓ Therefore, in the grid study, a market-based profile would have to be assumed.
  - ✓ BESS are however expected to have different strategies (ID spread, implicit and/or explicit balancing,…)
  - ➔ As a result, the cap would be calculated on the basis of a theoretical profile, which might lead to a significant difference between the result of the grid calculation and the actual use of flexibility
  - ➔ For this reason, the use of a flat profile + and – at nominal capacity has been proposed during the 2nd workshop of the 26th of March on grid connection studies
  - ➔ Consistently with this approach, Elia proposes to use a % of time at full power
    - ✓ Example: a 100MW battery without permanent band and with a flexibility of 5% in injection can receive a setpoint at 0MW 5% of the time or at 90MW 50% of the time
    - ✓ Only the setpoint sent to the GU is being considered. If the setpoint doesn't constraint the GU, the « counter » is increasing anyway.
    - ✓ Important note: the setpoint is sent is independently from the production / injection of the BESS

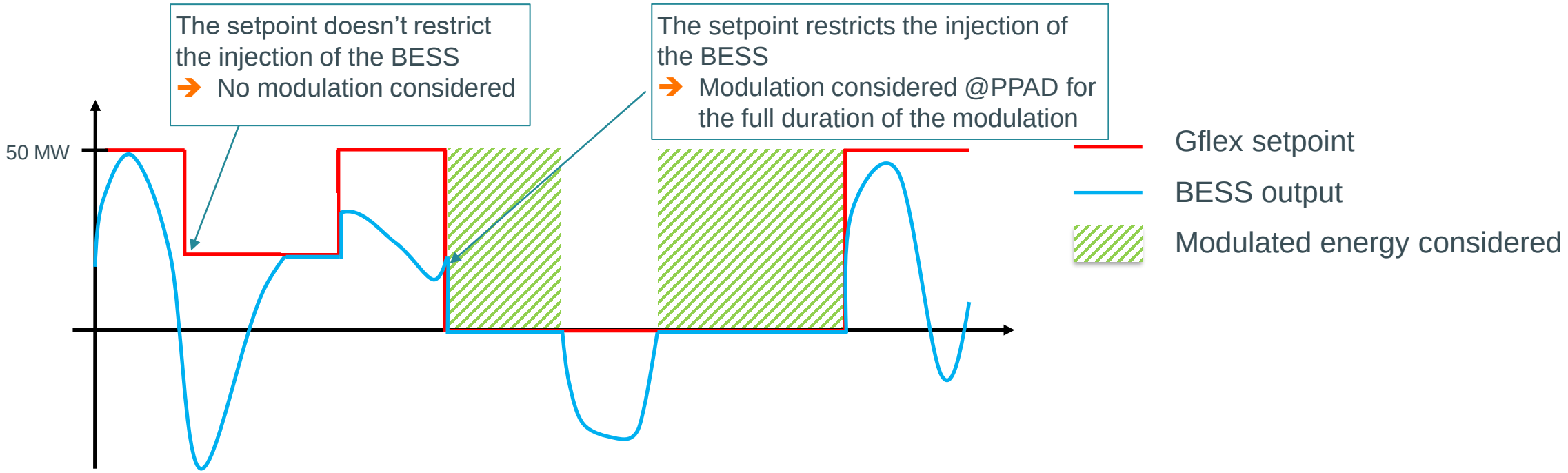
BESS

Approach to determine a volume to be used for compensation beyond the cap

- For activations that are considered not to be within the cap, it's needed to determine a volume of flexibility to be able to calculate a compensation
- Several options have been investigated and compared:
  - ✓ Baseline methods of the type "MBMA" (Measurement Before Measurement After): take a single meter reading or the average of multiple meter readings before and/or after activation of the product and compare them to calculate the flexibility activation
  - ✓ Declarative baseline
  - ✓ Historical baseline
- Based on this analysis, Elia proposes to use an historical baseline. This is explained in the next slides

BESS

MBMA type – Principle



- Principle: determine if the setpoint impacts the output based on the measurement shortly before the Gflex setpoint
- When it is the case, the energy not injected is calculated as the PPAD multiplied by the duration of the modulation
- Notes:
  - ✓ Example is taken for injection but is equally valid for setpoints in offtake
  - ✓ The "measurement after" part is not considered to avoid obvious gaming risks
  - ✓ Instead of considering the PPAD, a possible alternative would be to consider the power measured before the modulation

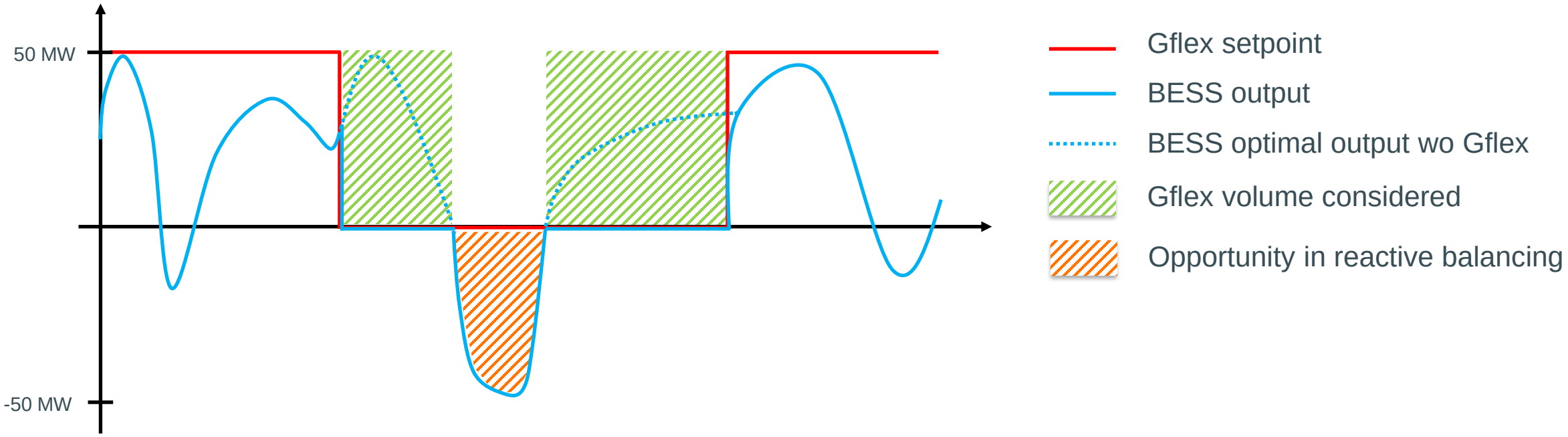
BESS

MBMA type

- Is this methodology suited for the purpose of quantification of the flexibility to contractual ends?
- The GU has an incentive to stay on the setpoint in order to use the cap or to get a compensation.
  - ➔ Possibility of arbitrage between (implicit or explicit) balancing and Gflex benefits, which should be avoided
  - ➔ This is illustrated in the next slides

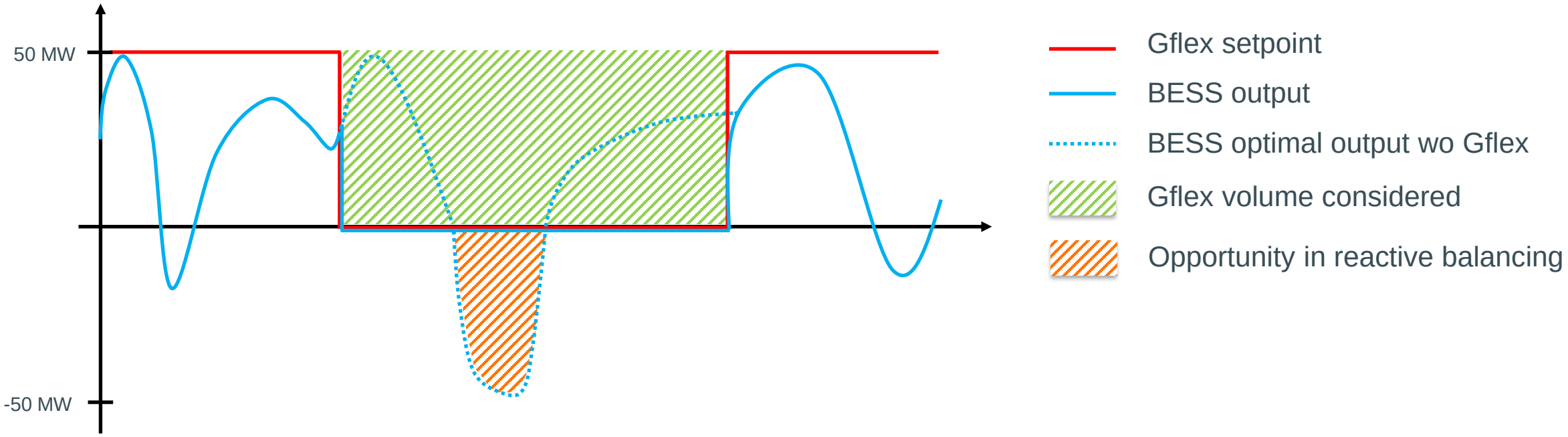
BESS

MBMA type – illustration of risk of arbitrage – expected behaviour



BESS

MBMA type – illustration of risk of arbitrage – possible behaviour



➔ This example illustrates the **risk of arbitrage between reactive balancing and Gflex benefits :** the GU has an incentive not to grasp the opportunity in reactive balancing in order to increase the Gflex volume

BESS

Declarative baseline

- The principles would be similar to the aFRR baseline (declarative, continuously sent by the BSP close to real time or in real time), but it would not be the exact same value:
  - ✓ The aFRR baseline should reflect what the DP would do if there was no aFRR activation
  - ✓ The Gflex baseline should reflect what the GU would do if there was no Gflex constraint
- The advantage is the declarative baseline is a well known and continuous process. This makes it possible to monitor the baseline sent by the GU and match it with the market conditions in order to ensure the baseline's validity
- There are however 2 challenges identified:
  1. Need to **define the assumptions for the baseline generation**, knowing the GU's contraints with regard to its SoC
  2. A declarative baseline could be **subject to gaming** when used for that purpose

BESS

Declarative baseline

1. Need to **define the assumptions for the baseline generation**, knowing the GU's constraints with regard to its SoC

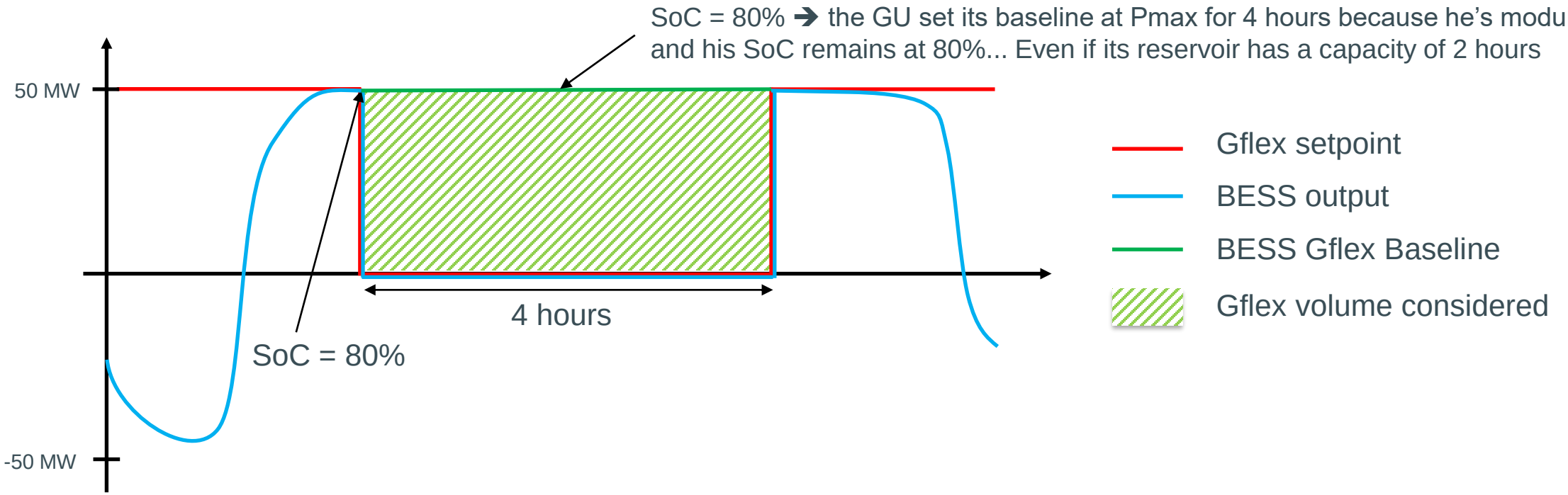
   - ✓ The setpoint has a direct impact on the SoC of the BESS
   - ✓ Therefore, sending a setpoint doesn't only have an impact on the immediate injection/offtake, but also on what the BESS will do later in time

   2 options are possible:

   - ✓ Option 1: the GU assumes the real SoC of its battery
   - ✓ Option 2: the GU assumes what the SoC would have been if no Gflex setpoint was sent

BESS

Declarative baseline – assumptions: option 1

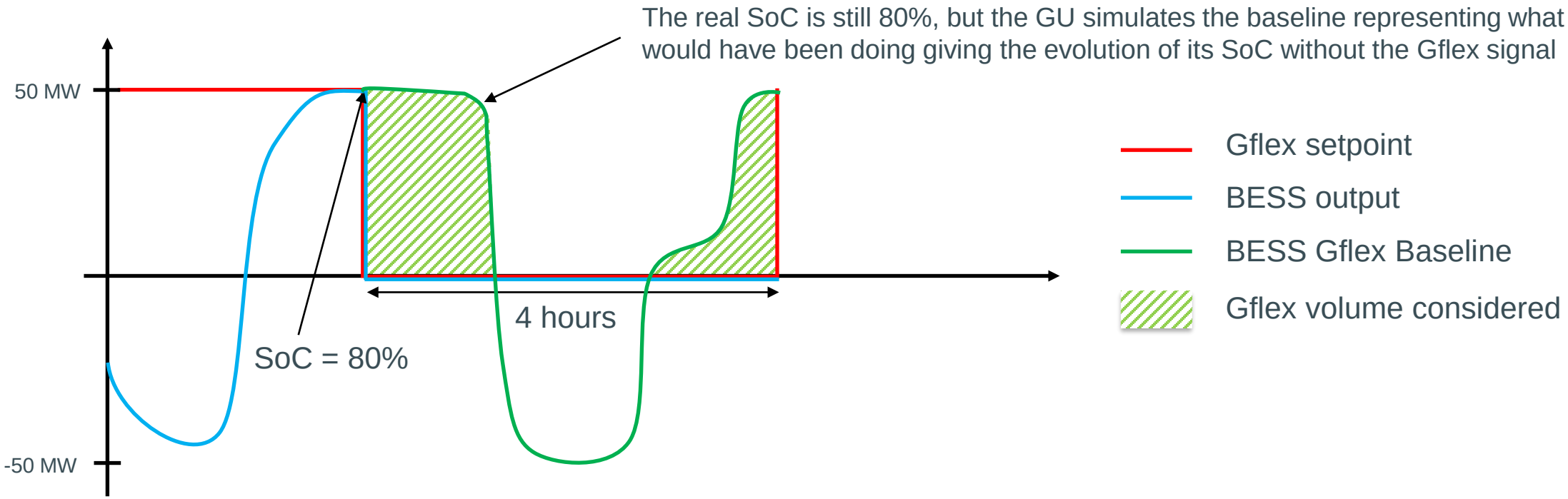


➔ The corresponding Gflex volume is significantly overestimated. The overestimation will depend on different parameters (reservoir of the BESS, profile of the activations,…)

➔ The method requires implementation by the GU of signal to be sent to Elia

BESS

Declarative baseline – assumptions: option 2

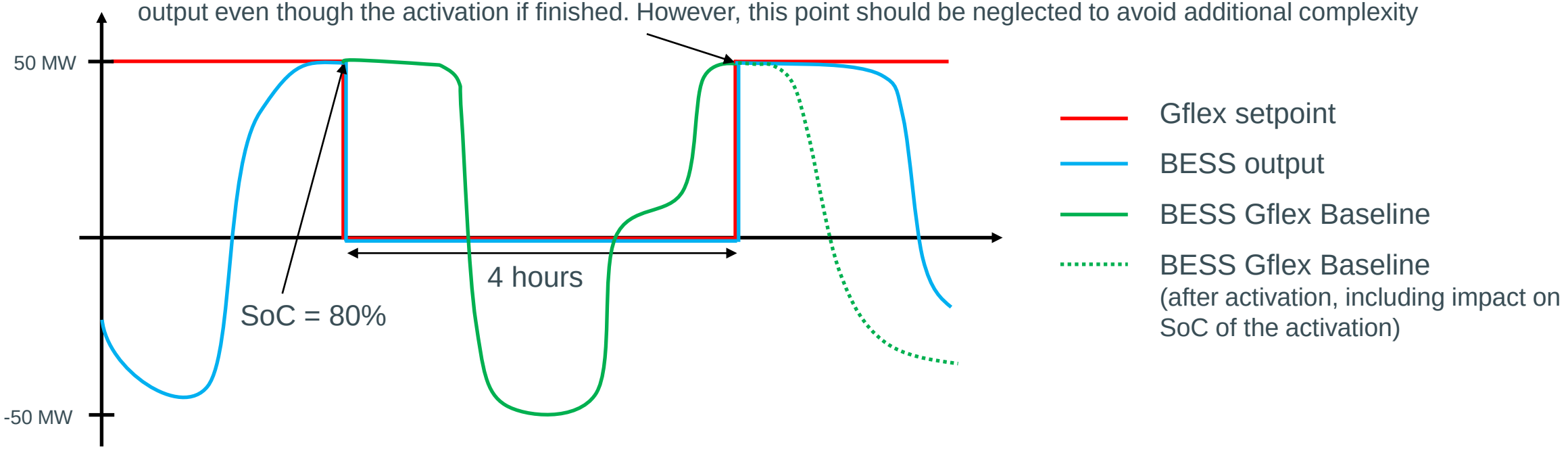


➔ The corresponding Gflex volume is correctly estimated during the period of activation

BESS

Declarative baseline – assumptions: option 2

The SoC is impacted by the Gflex activation ➔ the GU could continue sending a baseline which is different than its output even though the activation if finished. However, this point should be neglected to avoid additional complexity



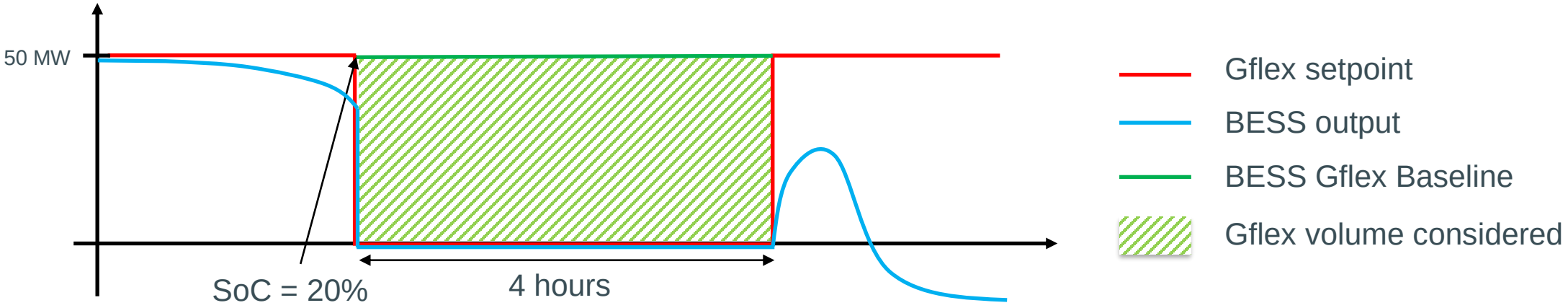
- ➔ The corresponding Gflex volume is correctly estimated during the period of activation
- ➔ There is an underestimation of the Gflex volume for the period following the activation. This could be taken into account in the rules for remuneration
- ➔ The method requires implementation by the GU of a simulated BESS behaviour to be sent to Elia

BESS

Declarative baseline – gaming risk

2. A declarative baseline could be subject to gaming when used for that purpose.

   - ✓ The GU in the same situation as 1. could artificially put its baseline at Pmax in order to maximize its benefits
   - ✓ The difference with aFRR is that the aFRR setpoint is moving every 4 seconds and is much less predictable. Hence, it requires the BSP to implement a gaming mechanism in its baseline generation.
     Note: for aFRR it has been verified in 2023 that BSPs are not gaming with the baseline



➔ Need to implement a **complex monitoring** to verify the consistency between the baseline sent by the GU and market conditions. The feasibility with regard to the SoC is quite straightforward to check, but the consistency with the market conditions is more challenging. In addition, it requires BRPs to share their strategy of the use of the BESS when questioned on the baseline

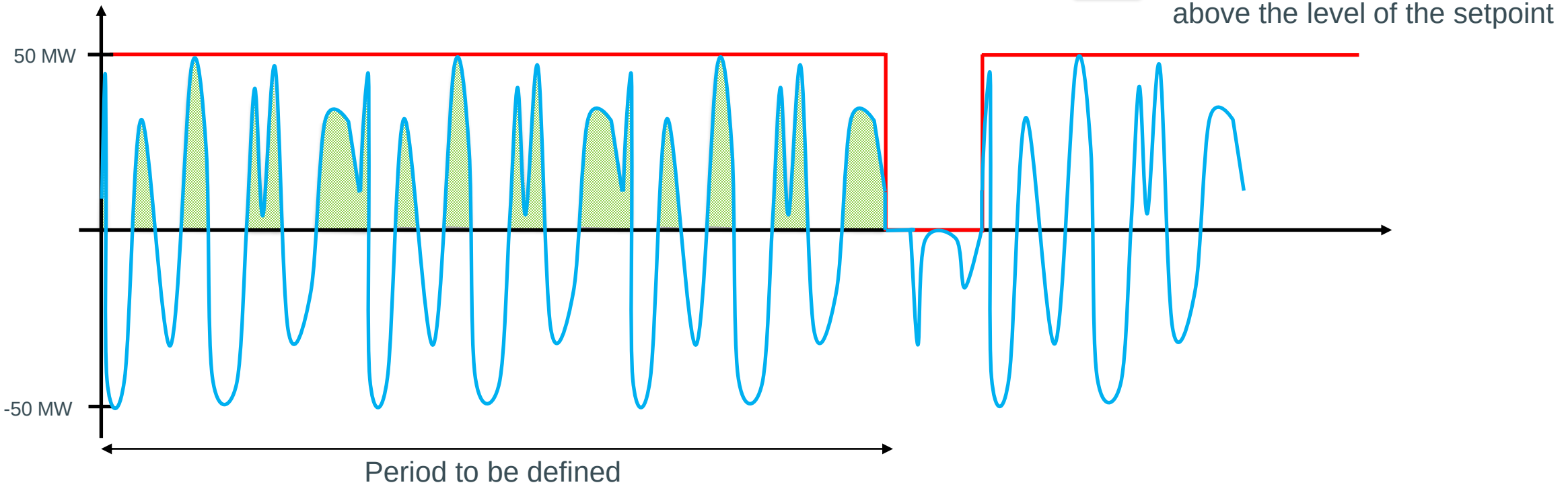
BESS

Historical baseline

- Principle: historical baseline methodologies make use of historical measurement data taken quite recently (several days up till 1 month prior to the day of activation) to calculate the baseline for the period of activation
- The method is relatively simple to define and to implement
- Following slides illustrate the approach

BESS

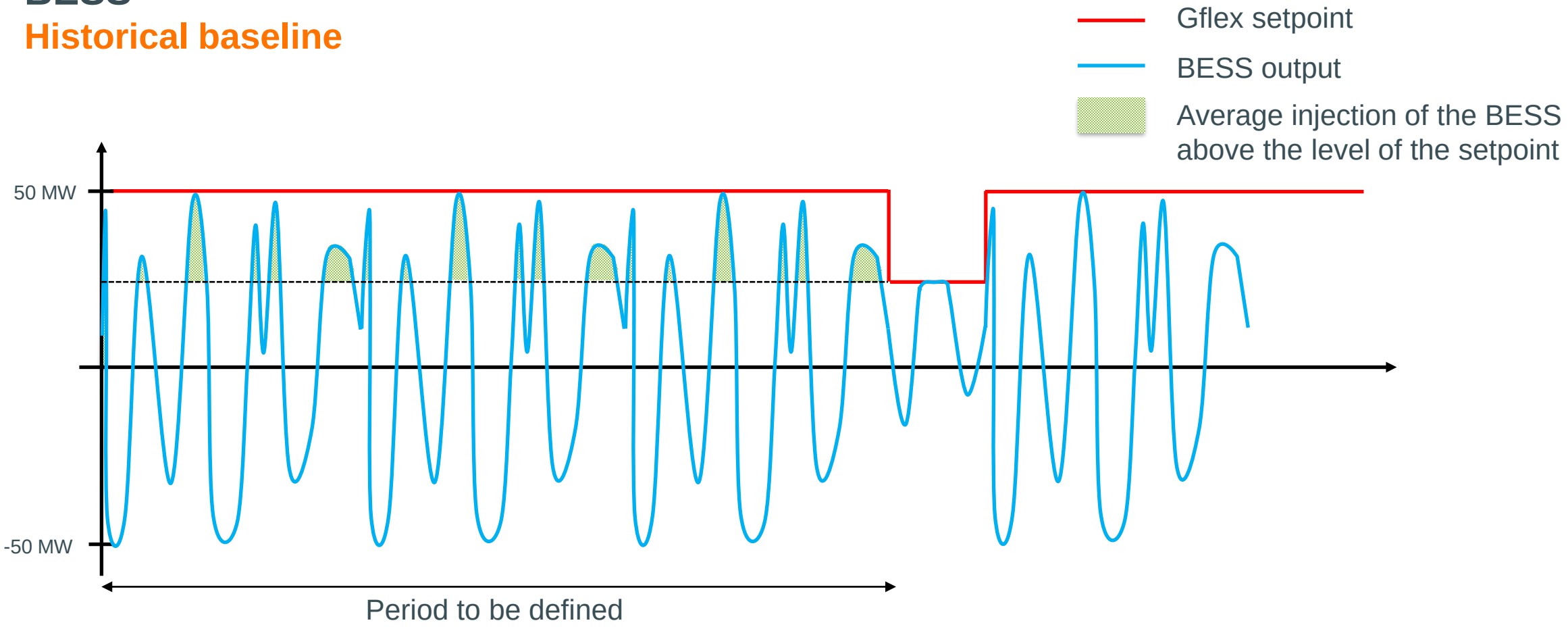
Historical baseline



➔ The injected energy over the last month is measured in % of time at full power, f.i. 30%

➔ This value is applied to the duration of the modulation to determine the volume in MWh

BESS
Historical baseline



- When the setpoint is not equal to 0MW, we measure the injected energy above the level of the setpoint over the last month, expressed in % of time at full power, f.i. 10%
- This value is applied to the duration of the modulation to determine the volume in MWh

BESS

Historical baseline

- Following aspects need to be defined
  - ✓ Duration of the period ➔ 1 month
  - ✓ What to do with moments where Gflex activations took place? ➔ those periods would be excluded from the sample
  - ✓ What to do with moments where balancing activations took place? ➔ those periods would not be excluded from the sample

BESS

Proposed approach

- To determine the use of flexibility within the cap
  - ✓ Principle: we would use a **% of time at full power**
    - Example: a 100MW battery with a flexibility of 5% in injection can receive a setpoint at 0MW 5% of the time or at 90MW 50% of the time
    - Only the setpoint sent to the GU is being considered. If the setpoint doesn't constraint the GU, the « counter » is increasing anyway.
    - Important note: the setpoint is sent is independently from the production / injection of the BESS
  - ✓ Advantages:
    - **Not up to Elia to define assumptions on how the battery will be operated in the grid study** (→ use of flat profile)
    - Is **independent of the GU's output & baseline** ➔ very simple, no gaming risk, no need for complex rules & monitoring
- Beyond the cap, we need a volume to be able to determine a compensation
  - ✓ Proposal is to use the **historical baseline**
  - ✓ Advantages:
    - Simplicity of the method
    - No implementation required for the GU
    - No gaming risk

Conventional production

- Schedules could be considered, but would lead to gaming risks in the specific case of predictable Gflex activations, especially without perimeter correction
- Therefore, it is proposed to use the last QH or High X of Y baselines, similarly to mFRR
- These methods would be applied to measure the use of flexibility within the cap as well as to determine the volume to compensate beyond the cap

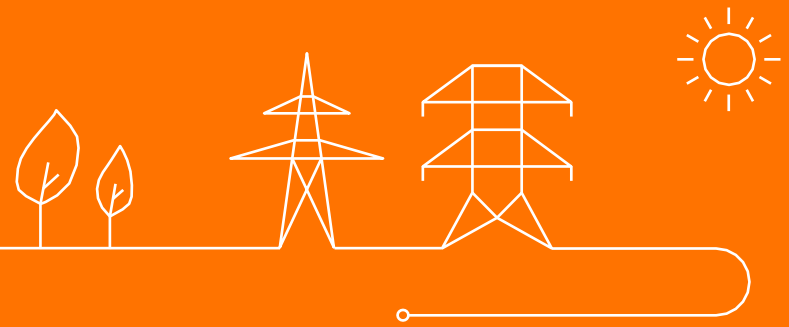
Proposal: Use of last QH or High X of Y (similarly to the mFRR baseline)

Quantification of flexibility in operations

Summary of proposals

- Wind and solar parks
  - ✓ Use the **AAP approach** when available
  - ✓ When it's not the case, they use the **control group** approach
- BESS:
  - ✓ To determine the use of flexibility within the cap: **% of time at full power**
  - ✓ Beyond the cap: **historical baseline**
- Conventional production: use of last QH or High X of Y (similarly to the mFRR baseline)
- Demand facilities (provided they are able to cope with flexibility activated in real-time): most suited method among those defined above

Characteristics of the cap



Agenda

- Quantification of flexibility in operations

- Characteristics of the cap
  - ✓ Which activations are counted towards the cap?
  - ✓ Is the cap annual or multi-annual?
  - ✓ Is the cap subject to revision?

- What happens beyond the cap?
  - ✓ Are Gflex activations still possible?
  - ✓ Remuneration
  - ✓ Perimeter correction
  - ✓ Balancing obligations
  - ✓ CRM obligations

Which activations are counted towards the cap?

- The Gflex mechanism monitors a limited number of CNEs(*) ➔ Gflex is activated automatically based on measurement of only those monitored CNEs.
- There is however a possibility that these CNEs evolve in time
- In addition, exceptional operational security issues might also lead to the need to activate Gflex
- Some contracts with a flexible access have a permanent band
- The question to be answered is the following:
  - ✓ Which activations are counted towards the cap, and are hence not compensated?
  - ✓ Which activations are considered not to be within the cap? In this case, the activations are not counted towards the cap but they are compensated even though the cap is not yet reached

(*) Critical Network Elements

Which activations are counted towards the tresholds?

Regarding the permanent band

- Elia proposes to consider possible Gflex activations as not included in the cap
- This allows the GU to have the guarantee that all activations within the permanent band will be compensated

Which activations are counted towards the tresholds?

Regarding the reasons of activations

- 2 approaches are possible
    1. Elia can use Gflex activations with no compensation up to the cap (limit in volume or in % of time) defined in the EDS study to solve any congestion in real-time
       ➔ the cap is binding, but the relations to CNEs mentioned in the EDS are indicative
    2. Elia can use Gflex activations with no compensation up the cap (limit in volume or in % of time) defined in the EDS study and only to solve congestions on the CNEs predetermined in the EDS
       ➔ the cap and the CNEs identified in the contract are binding
- As the list of CNEs monitored by the Gflex are not exhaustively described in the EDS up to now, making the distinction between the CNEs could prevent the retroactive application of the new framework (under analysis)
- In practice, the impact on the activations is expected to be limited
- Making the distinction between the network elements increases complexity

➔ As a result, Elia proposes not to make the distinction between the reasons of the activation

Which activations are counted towards the cap?

Proposal : the maximum volume / % of time at full power can be used for all needs by Elia within the flexible band defined in the contract.

Annual or multi-annual cap?

- An annual cap is preferable for the GU: no risk that its cap is fully used during the 1st years, which could jeopardize its business case
- However, the risk of exceeding the cap is higher, leading to a increased risk of socialization
  - ✓ Risks related to maintenances
    - Maintenances have different impacts from year to year
    - Works can be planned for one particular year at the moment of the grid connection study, but there's uncertainty on this planning
  - ✓ Risks related to curative activations ➔ occurrences are expected to be limited
  - ✓ Risks in case of evolving need for flexibility during the temporary period
    - Risk related to average on load and production forecast (methodology-related)
    - Risk related to effective evolution of the load and production (assumption-related)

Note: Evolution of infrastructure is taken into account by specifying different values per grid development phase

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

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)

Characteristics of the cap

Summary of proposals

The maximum volume / % of time at full power can be used for all needs by Elia within the flexible band defined in the contract.

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

Like for the temporary period, the cap is defined at the signature of the connection contract and is not re-evaluated

- This implies that flexibility activations will be compensated if 1 out of the 3 following conditions is met:
    1. The temporary period is finished
    2. The flexibility is within the permanent band
    3. The amount of flexibility exceeds the multi-annual cap of 3 years

The temporary period, the permanent band and cap being determined in the EDS study

What happens beyond the cap

Agenda

- Quantification of flexibility in operations

- Characteristics of the cap
  - ✓ Which activations are counted towards the cap?
  - ✓ Is the cap annual or multi-annual?
  - ✓ Is the cap subject to revision?

- What happens beyond the cap?
  - ✓ Are Gflex activations still possible?
  - ✓ Remuneration
  - ✓ Perimeter correction
  - ✓ Balancing obligations
  - ✓ CRM obligations

Are Gflex activations still possible beyond the cap?

- Beyond the cap, Gflex activations might still occur but they will be limited to following situations
  - ✓ In case the security analysis identifies that a Gflex activation could solve a curative event ➔ counting on the Gflex activation allows to very significantly decrease the volume of flexibility to be activated
  - ✓ In case of unexpected evolution on the grid, leading to a value measured on a monitored CNE which reaches the threshold
  - ✓ In case of unexpected operational security issue in real-time
  - ✓ For some congestions, there are no alternatives to the Gflex activation
- As a result, this should generally decrease the occurrences of Gflex activations
- This will be explained in detail in the design note and in the workshop in June

Remuneration

- The proposal is to **use the iCAROS remuneration scheme for Gflex activation beyond the cap**
  - ✓ Consistency of the products
  - ✓ Limit the impact for the GU if the activation is via RD or via Gflex
- In iCAROS, the redispathcing (RD) energy bid price
  - ✓ Reflects the costs for activating the flexibility and therefore is reasonable, directly related to the activation and demonstrable
  - ✓ Is based on a **cost formula proposed by the SA** and challenged / approved by Elia at the signature of the T&C SA
    - Elia can, in agreement with the CREG, **request a revision of the formula** if cost reflective conditions are not respected
    - The cost formula can be adapted based on mutual agreement between SA and Elia

Remuneration

Reminder: iCAROS activation price formula – Non exhaustive list of components

Accepted components	Not accepted components
Fuel costs	Loss of opportunity related to e.g. no volumes sold on ID/balancing market
CO2 related costs	Investment costs (for developing tools, for enabling the provision of the service etc)
Loss of subventions (e.g. green certificates)	Costs related to risk-taken e.g. integrating possible penalties for non-delivery
Start-up/shut-down costs (for specific relevant situations)	
Impact on industrial processes directly related to the activated Operating Mode	
The costs to restore the state of charge change due to the activation, in case a Technical Facility with limited energy reservoir was used for the activation	
Operational costs (impact on life cycle, additional maintenance etc)	

- For each cost, the proportionality to the RD Power and the unit cost are defined by supporting information of a reliable source (invoices, contracts, reference prices, …)
- Components in the formula is either possible to compute based on data accessible to Elia (such as reference prices) or is indicated as an explicit amount in €/MWh

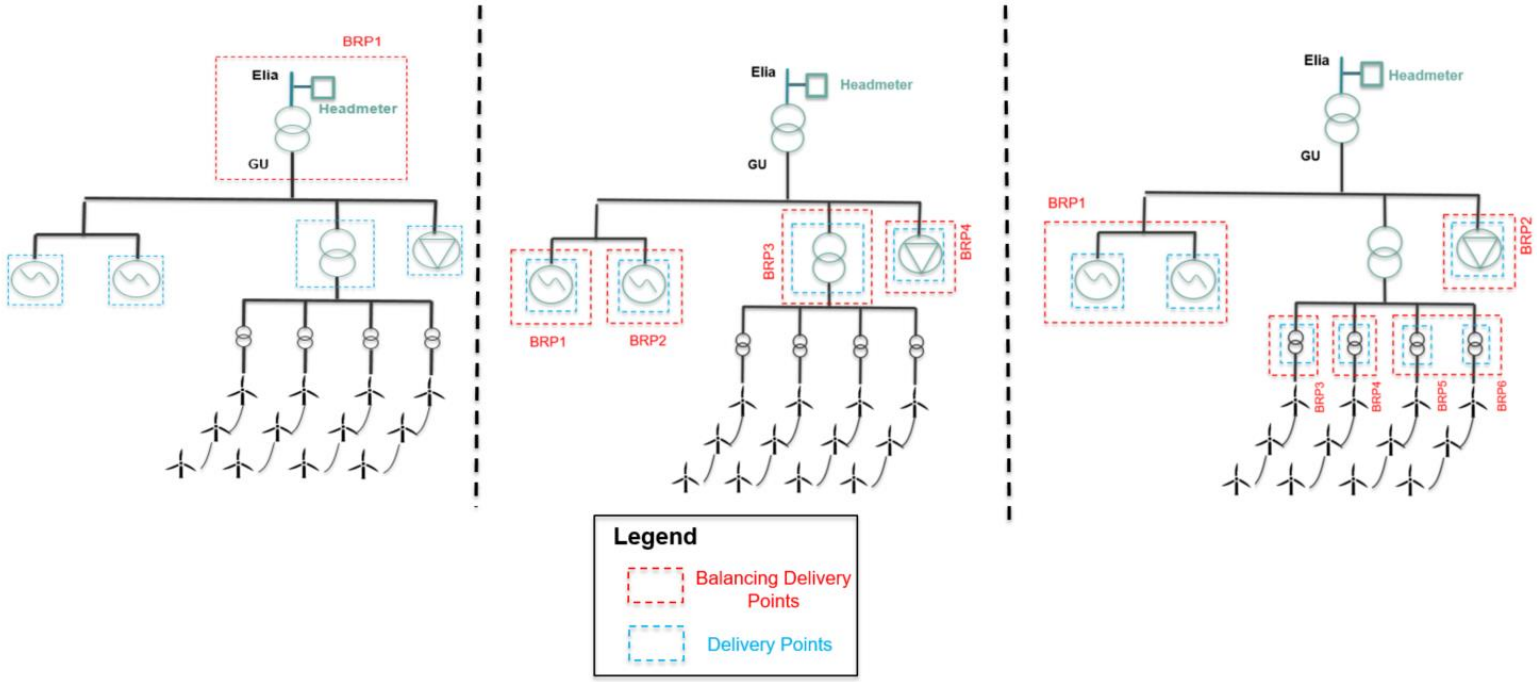
Perimeter correction

- Should we correct the perimeter beyond the cap?
- Below the cap, this would lead to a socialization of costs, which is not consistent with the notion of temporary period (costs related to the flexibility borne by the GU). In addition, the GU has the possibility to take the impact into account in its business case, even though it increases its uncertainty on the impact of the flexibility.
- Beyond the cap, if we only compensate the activations on a cost-based basis and we don't correct the perimeter, the BRP(s) of the GU will be exposed to the imbalance price
  - ➔ We don't provide appropriate guarantees to the Grid User.
  - ➔ We create a significant discontinuity when using RD instead of Gflex activations

➔ **Proposal is to correct the perimeter only beyond the cap**

Perimeter correction

- Gflex is activated at access point level, but there are cases with several BRPs behind the access point
  ➔ how to perform the perimeter correction in this case?
- Feasibility has been evaluated and confirmed. Several options are being analyzed
- The proposed principles will be described in the design note and detailed in the BRP Contract



Impact on balancing and CRM obligations

How does it work in the RD and CRM frameworks

- How are the balancing obligations covered by the RD framework
  - ✓ RD activation with the contracted balancing volume of DP occurs in the framework of the balancing contracts ➔ BSP not exposed to penalties
  - ✓ RD activation with the volume of a DP different than the contracted balancing volume occurs most of the time before balancing gate closure time(*), so that the BSP has the time to update its balancing bids ➔ BSP not exposed to penalties if appropriate actions are taken In case of CRI leading to bid filtering
    - DPs with contractual obligation that are filtered out but were entered before indication of CRI high of medium are considered as compliant with their contractual obligations ➔ BSP not exposed to penalties
    - The BSP is required to make a best effort to reallocate its volume to other DPs ➔ The BSP is exposed to contractual breach if he doesn't implement the necessary processes to do so

- RD activations are taken into account in the availability control of the CRM

➔ **The framework for RD allows the BSP/GU to avoid most negative consequences related to their balancing / CRM obligations** (for the BSP: at the condition he has implemented the necessary processes)

(*) Except in the case of a direct activation

Impact on balancing and CRM obligations

- The balancing and CRM products rely on 3 pillars
    1. The **dimensioning process**
    2. The **auction process**
    3. The **activation process**
- Taking Gflex activations into account in the controls related to the activation processes will have an impact on the 3 pillars. Concrete consequences if we compensate the obligations:
    - ✓ In the **activation process** for balancing, the BSP has no incentive to use other DPs to deliver the service
    - ✓ In the **auction process**:
        - The GUs doesn't need to take the Gflex activation risk into account ➔ no incentive to connect (CRM) / use DPs (Balancing) at an adequate location on the grid. For assets with high activation costs, there is even an incentive to be in a congested area
        - Gaming risk for balancing in case of predictable congestions
    - ✓ The **dimensioning process**: in any case, an increase of Gflex activations leads to the need to take this flexibility into account in the dimensioning process. However, removing the obligations further increases the risk not to have the adequacy / balancing volumes available when needed

Impact on balancing and CRM obligations

- Elia is not willing to forbid units that have a flexible access to participate to the balancing and CRM markets
  - ✓ In particular, for the delivery of aFRR with DPs with Limited Energy Reservoir (LER), it's not requested to BSPs to take the risk of Gflex activations into account in the Energy Management Strategy (EMS)
- It's however important that the BSP / GU bears the financial risk related to simultaneous activation of Gflex and balancing activations / CRM availability control. The related penalties should provide the right incentives to take the risk into account, f.i. by adapting the offered volume in the auction process or (for balancing markets) to foresee support providing assets.
- This principle allows to:
  - ✓ Avoid providing wrong incentives on service delivery and on location
  - ✓ Avoid gaming risk for balancing
  - ✓ Mitigate the risk of loosing significant balancing volumes (possibly the full aFRR volume for 1 single asset)
  - ✓ Avoid to increase the impact of Gflex activations on the dimensioning
- Important note: the Gflex signal is always prevalent to any other signal

Impact on balancing and CRM obligations

- As part of the target model, reflections will take place on the interactions between congestion management products and balancing and CRM products. These reflections will require a holistic approach, tackling the 3 pillars together.

Conclusions

Conclusions
Guiding principles

- **Consistency between the different processes**: calculation of required flexibility in the grid connection study, operational processes, reporting, cap “consumption” and remuneration beyond the cap
- **Balance** to be found between risk borne by the GU and risk of socialization
- **Simplicity** has a value for all
- **Robustness against gaming**

➔ The proposal presented are to be considered in the full picture

Conclusions

- Quantification of flexibility in operations
  - ✓ Wind and solar parks
    - Use the AAP approach when available
    - When it's not the case, they use the control group approach
  - ✓ BESS:
    - To measure the "consumption" of the cap % of time at full power
    - Beyond the cap: historical baseline
  - ✓ Conventional production: last QH or High X of Y
  - ✓ Demand facilities: most suited method among those defined above

- Characteristics of the cap
  - ✓ The maximum volume / % of time at full power can be used for all needs by Elia within the flexible band defined in the contract
  - ✓ Multi-annual cap of 3 years
  - ✓ The cap is defined at the signature of the connection contract and is not re-evaluated

- What happens beyond the cap?
  - ✓ Gflex activations are still possible, frequency generally reduced
  - ✓ Remuneration of non injected energy according to iCaros framework
  - ✓ The perimeter is corrected
  - ✓ BSPs/GU remain accountable for the risks related to balancing and CRM obligations

Next steps

Next steps

- You can send your questions or feedback to guflex@elia.be. Please do so by **25/04/2024** so the feedback can still be analyzed and considered in the design note
- The public consultation on the design note is planned to start on 31/05/2024
- Next workshop planned on the 14/06/2024 (13:00-17:00) on
  - ✓ Operational activations of flex
  - ✓ Q&A Design Note

Thank you.

Back-up slides

Illustration of control group approach
Slide presented in the previous workshop

Reporting proposal for the flexibility activation of Solar & Wind

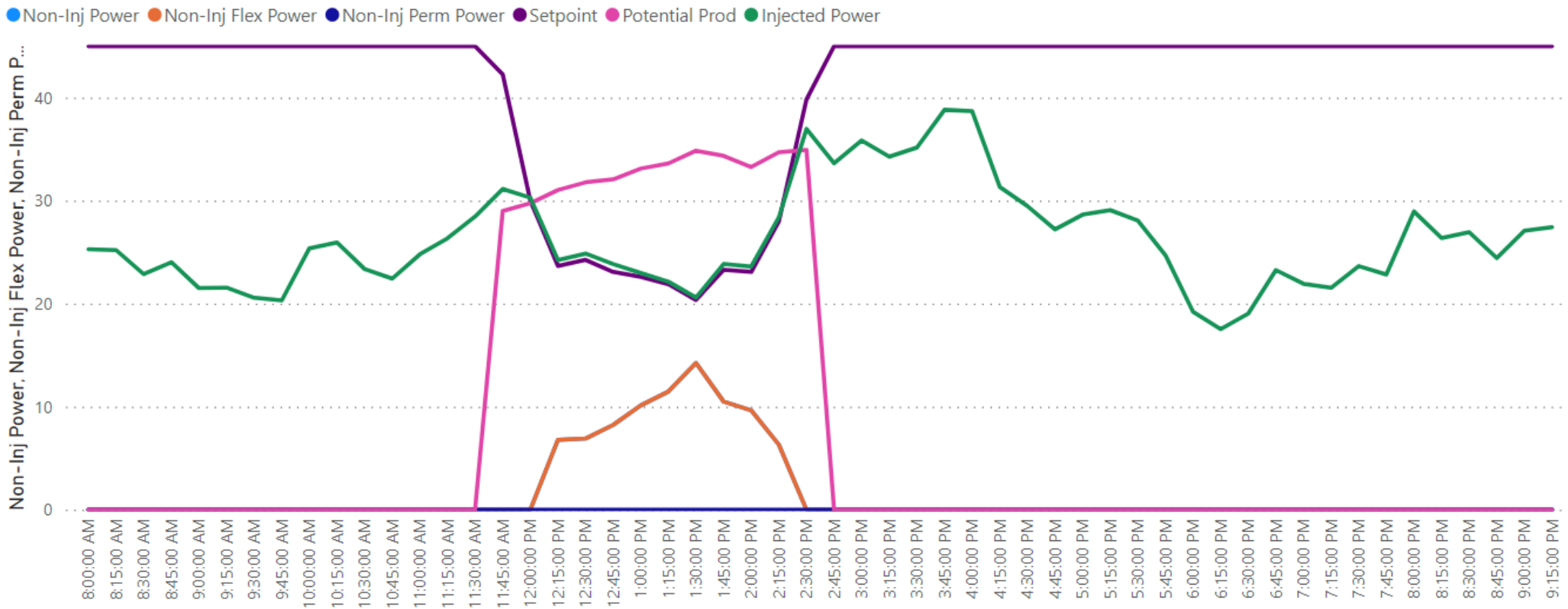
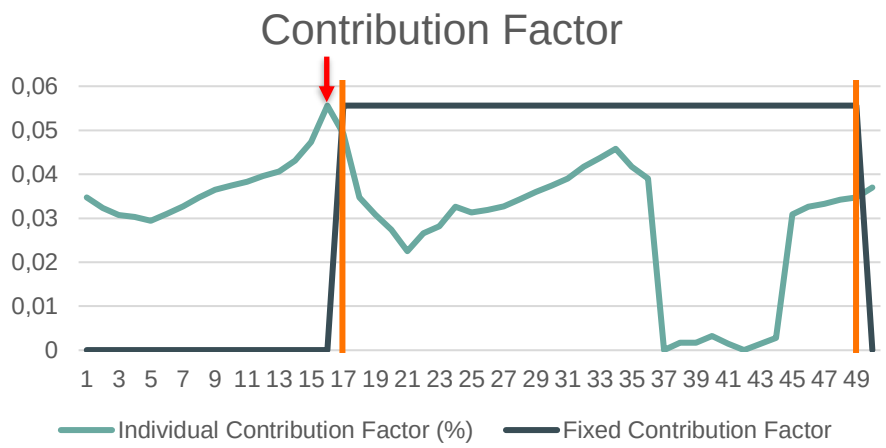


Illustration of control group approach
Slide presented in the previous workshop

Reporting proposal for the flexibility activation of Solar & Wind

- (*) Control region:
  - As soon as a flexibility activation (~ FA) starts, the "Individual Contribution Factor" (~ICF) of the production unit to the total production of the region is being calculated based on the values of the previous qH.
  - The ICF is fixed during the entire activation period.
  - This ICF is used then to calculate the potential production of the production unit.
  - By calculating the difference between the potential production and the setpoint send by Elia we obtain the volume of modulated energy.



Context – Profiles

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

	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
Batteries	Market profile in the same direction on the congestion, 0 if the market goes in the opposite direction.	Flat profile + and – at nominal capacity

(*) The profiles used to define the flexible volume are consistent with the measurement of the use of the flexibility – see next workshop