Design fine-tuning : focus on iCAROS phase 1

Task Force iCAROS

16th June 2020

Scheduling & Redispatching

- Schedule control
- Congestion activation

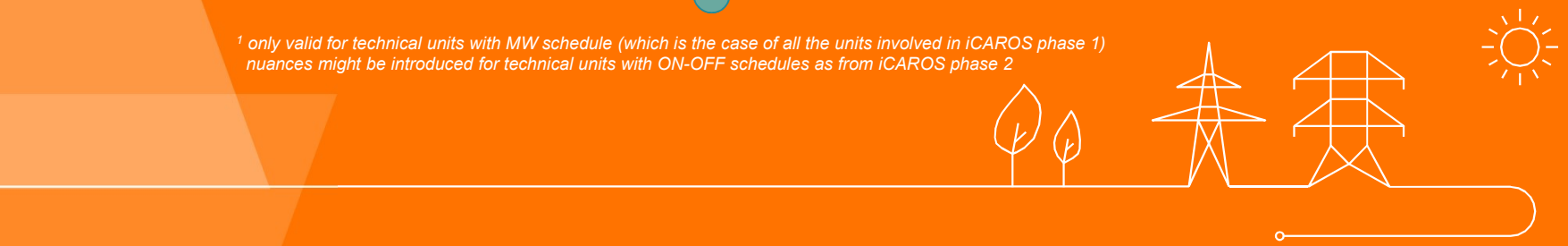
Agenda

1. Part I – Scheduling : Schedule control
2. Part II – Redispatching : Congestion activation
   - Definitions
   - BRP perimeter correction in case of congestion activation
   - Congestion activation remuneration:
     - Control of cost-reflective prices
     - Activation annulments
   - Congestion activation control

Part I – Scheduling : MW [1] Schedule control

Clarification of current design taking into account the feedback received during public consultation

[1] only valid for technical units with MW schedule (which is the case of all the units involved in iCAROS phase 1) nuances might be introduced for technical units with ON-OFF schedules as from iCAROS phase 2



Schedule obligation

DA schedule obligation

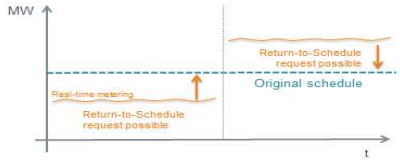
Elia requires schedules of PGM and ESD in Day-Ahead. No explicit monitoring system will be implemented on DA schedules, but a **contractual term** will be foreseen, allowing Elia to **question the SA and take actions** if abusive behaviors are observed.

ID schedule obligation

When necessary, the SA must **update the schedules in ID** before the scheduling deadline. After the scheduling deadline, the schedule may still be amended by Elia after an activation of flexibility for redispatching or balancing purposes. The **last valid schedule** is expected to be **firm** and Elia can enforce the SA to return to this schedule.

In practice, Elia will only enforce the SA to **return to the schedule** when deemed **necessary for grid security:**

- Elia might ask ***a specific unit*** to return to the schedule **if a deviation** from the schedule is observed in RT and this deviation **causes or aggravates a congestion risk**



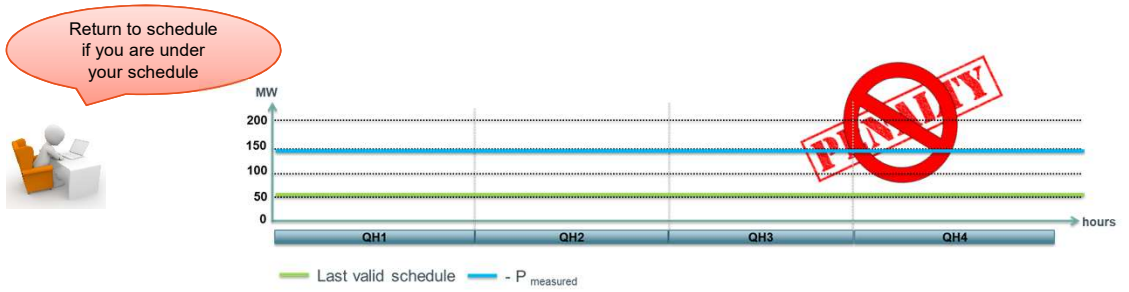
- **When an incremental (resp. decremental) risk is detected** in the zone but it cannot be associated to one specific unit (e.g. because some units are not equipped with telemetering), Elia might ask ***all the units of a zone*** to return to their schedule **if they are above (resp. under)** their last valid schedule

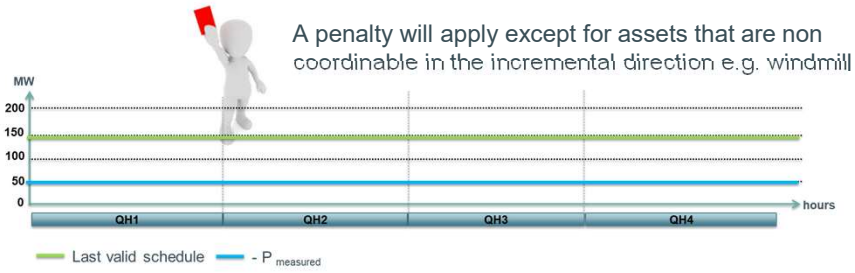
Schedule control

The respect of the **last ID valid schedule** will be verified **ex-post**, according to the following rules:

1. The last ID valid schedule will only be controlled **when Elia explicitly asked** the unit **to return to the schedule**
2. A schedule will be considered as non correctly respected **as soon as the ex-post measurement deviates from the last valid schedule** (in the direction of the congestion risk)
3. The technical units that are **non coordinable** in one direction will be **exempted** from control and penalty in case of deviation in the opposite direction

E.g. A windmill which is not coordinable in the incremental direction won't be penalized in case of deviation in the decremental direction





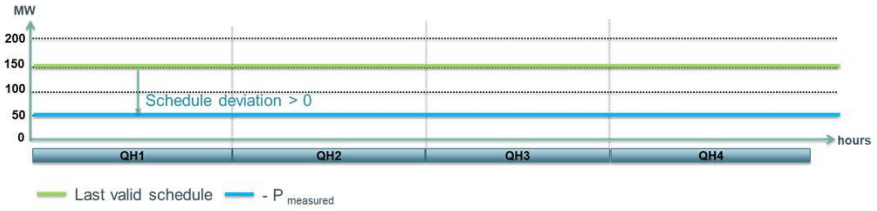
Penalty in case of deviations in the direction of the congestion risk

$$Penalty = \sum_{\substack{non\ compliant \\ time\ unit}} MAX\ (0; (time\ unit\ x\ schedule\ deviation) x\ Penalty\ price)$$

Where :

- **schedule deviation =** last valid schedule − **(**− Pmeasured[1]**)**
- **penalty price** = price of the **flexibility offered in the opposite direction** of the deviation

Return to schedule if you are under your schedule



Penalty price = price of the flexibility offered in the incremental direction (>0) = costs saved by the unit for 1MW decremental deviation

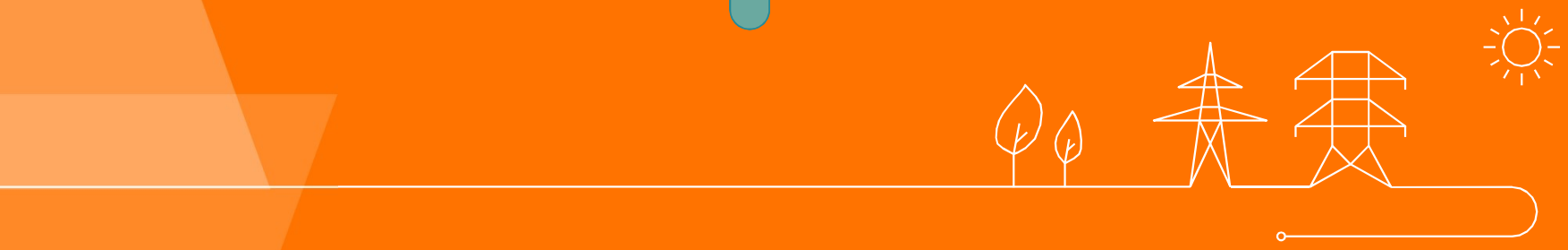
- **time unit** = 1/4h

An additional **contractual clause** will be foreseen**,** allowing Elia to **question the SA and take actions** if abusive behaviors are observed (e.g. schedule deviations in case of large imbalance tariff).

[1] *Pmeasured is defined as "The difference between gross offtake and gross injection, measured at a Delivery Point." Net injection into the Elia Grid is therefore considered as a negative value.*

Part II – Redispatching : Congestion activation

Amendment of design note taking into account the feedback received during public consultation, implementation complexity & recent design changes presented during Task Force of March 11th

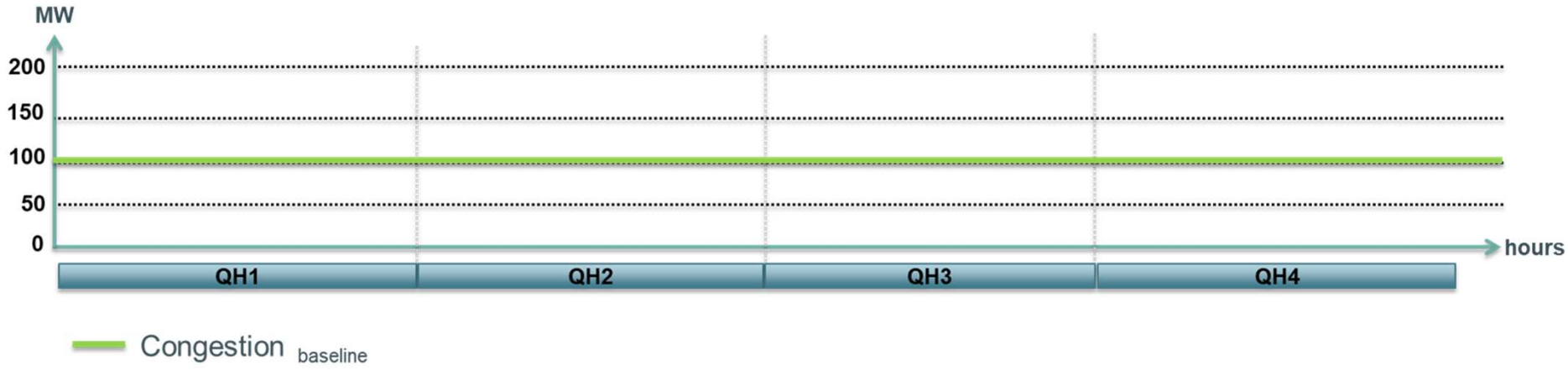


Definitions[1]

[1] only valid for technical units with MW schedule (which is the case of all the units involved in iCAROS phase 1)
nuances will be introduced for technical units with ON-OFF schedules as from iCAROS phase 2

Congestion Baseline

Congestion $_{\text{Baseline}}$ (MW) = the last valid Daily Schedule of the Delivery Point DP_{SU} for quarter hour qh, at the moment of the congestion activation (i.e. before it was amended by Elia with the value of the congestion activation)

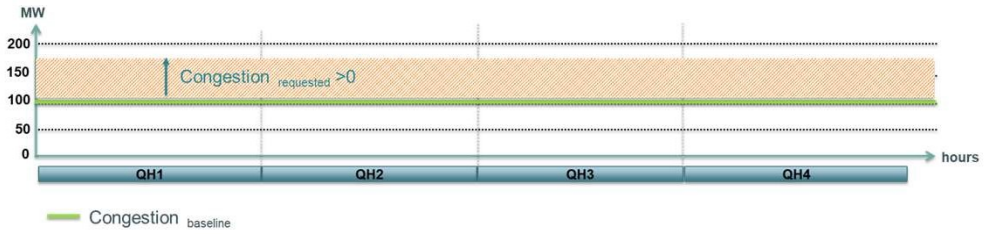


Congestion $_{\text{Requested}}$

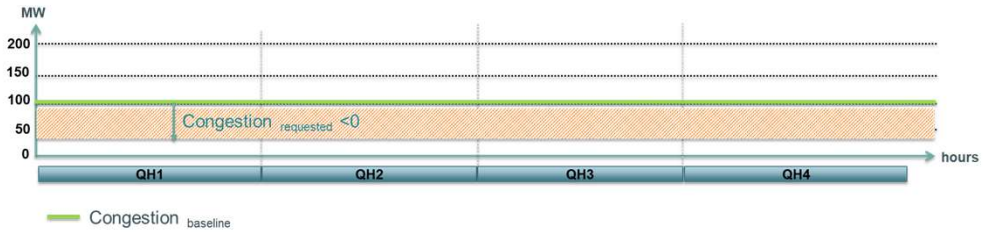
Congestion $_{\text{Requested}}$ (MW) = the value of the congestion activation:

- > 0 in case of incremental activation
- <0 in case of decremental activation

Incremental congestion activation :



Decremental congestion activation :

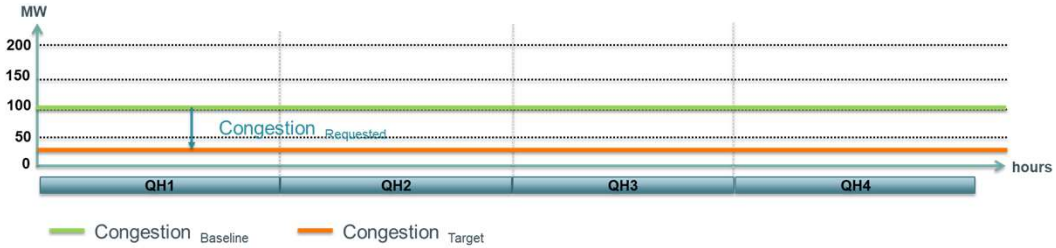


Congestion Target

Congestion Target (MW) = Congestion Baseline + Congestion requested

Incremental congestion activation :

Decremental congestion activation :



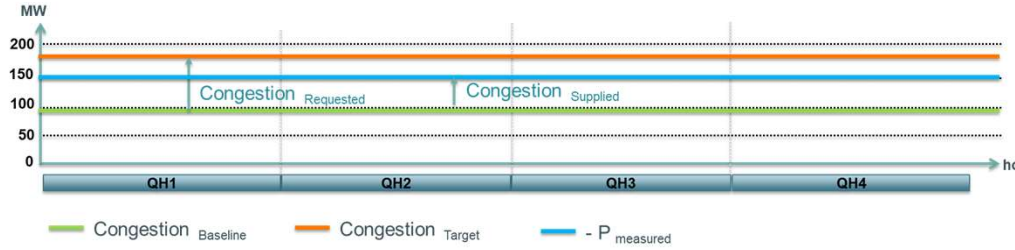
Congestion $_{\text{Supplied}}$

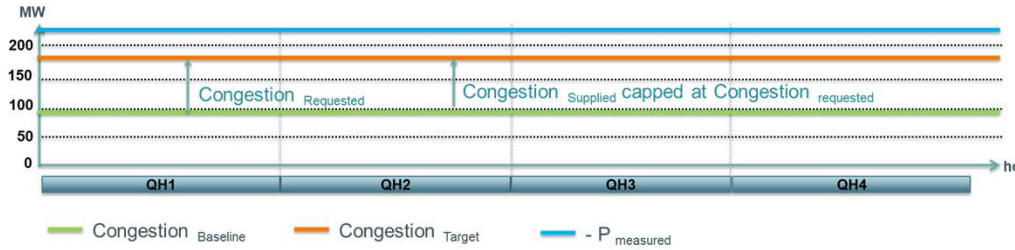
Difference between the measure and the baseline, with a cap at Cong $_{\text{requested}}$ and a floor at 0MW

Congestion $_{\text{Supplied}}$ (MW) =

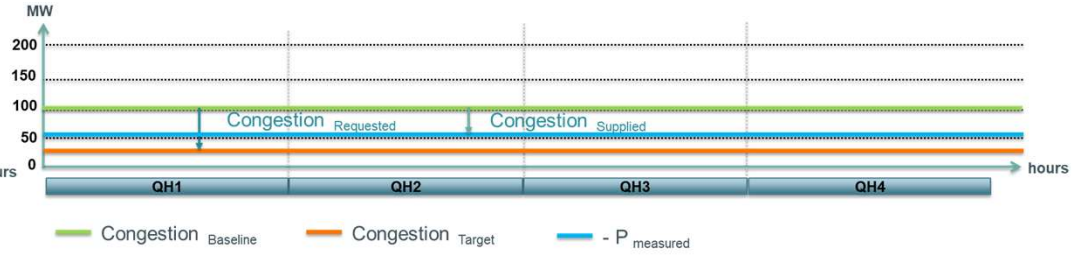
- Max (0;min(− Pmeasured[1] − Congestion $_{\text{Baseline}}$; Congestion $_{\text{requested}}$)) **in case of incremental activation**
- Min (0;max(− Pmeasured − Congestion $_{\text{Baseline}}$; Congestion $_{\text{requested}}$)) **otherwise**

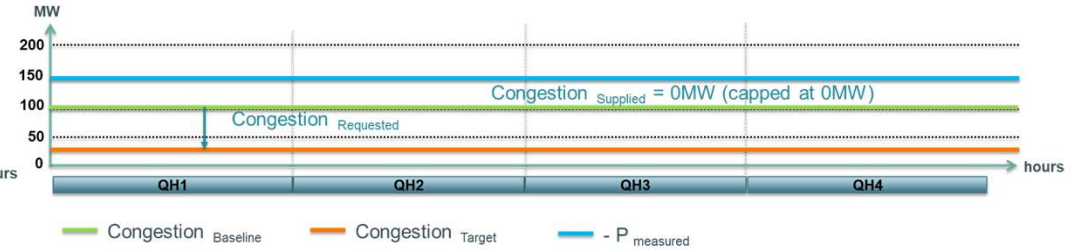
Incremental congestion activation :





Decremental congestion activation :





[1] *Pmeasured is defined as "The difference between gross offtake and gross injection, measured at a Delivery Point." Net injection into the Elia Grid is therefore considered as a negative value.*

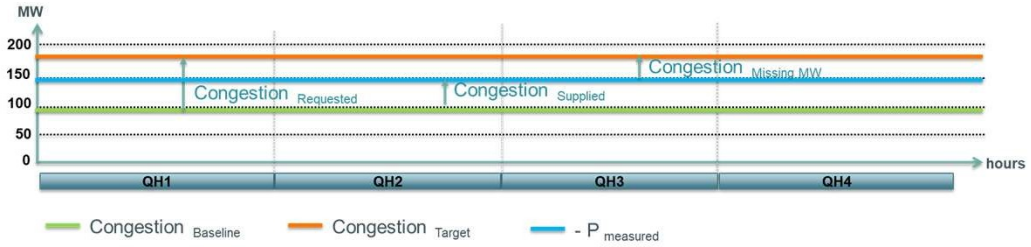
Congestion $_{\text{Missing MW}}$

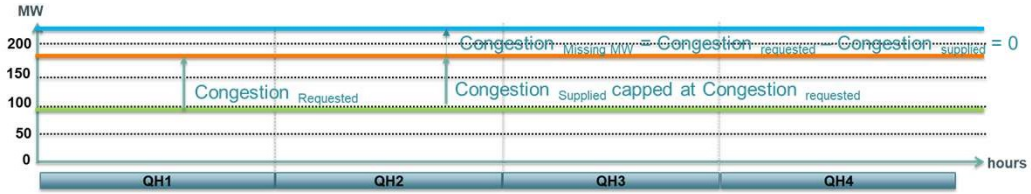
Difference between the target and the measure, with a cap at cong $_{\text{requested}}$ and a floor at 0MW

Congestion $_{\text{Missing MW}}$ (MW) = Congestion $_{\text{requested}}$ – Congestion $_{\text{supplied}}$

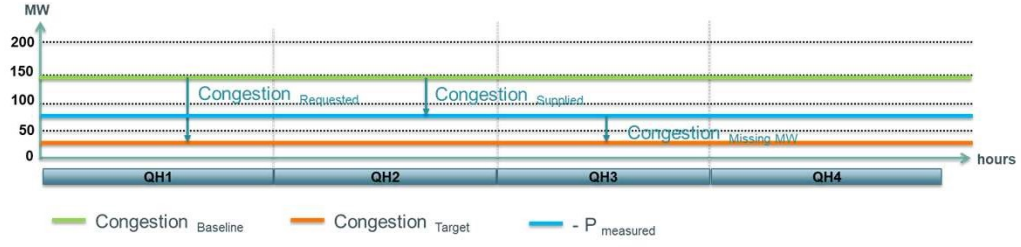
- > 0 in case of incremental activation
- <0 in case of decremental activation

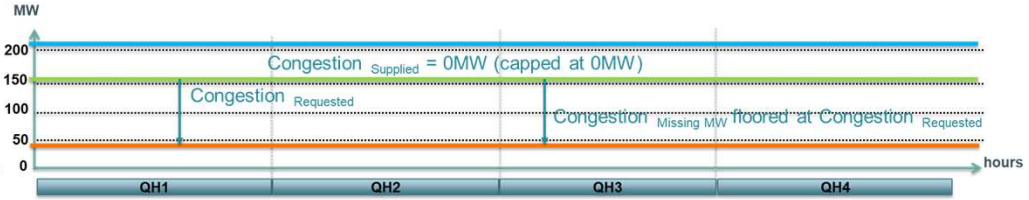
Incremental congestion activation :





Decremental congestion activation :

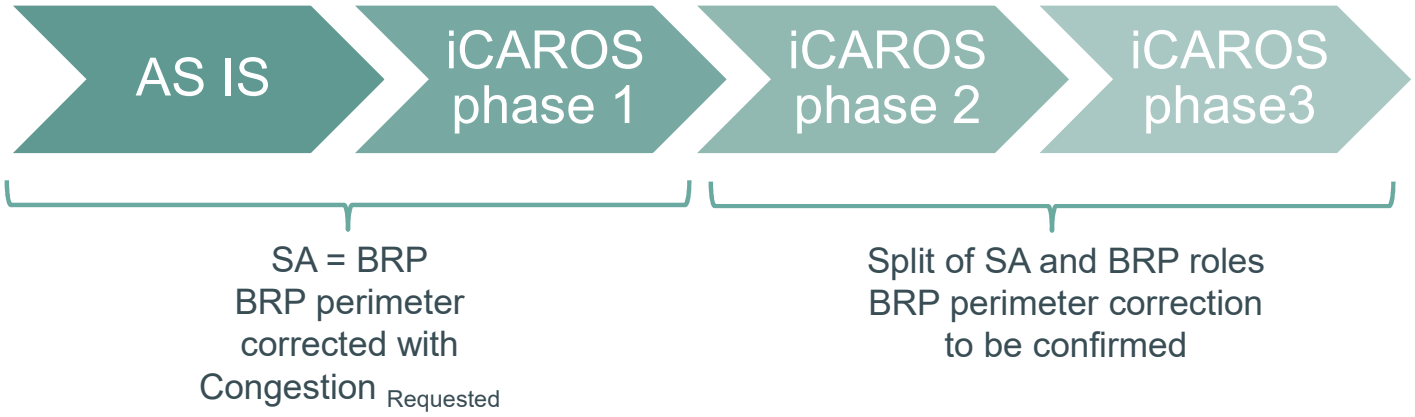




BRP perimeter correction in case of congestion activation

Phased approach - the current BRP perimeter correction will be maintained for iCAROS phase 1

Elia will continue correcting the perimeter of the BRP with the value of the requested energy (Congestion $_{requested}$) as long as the BRP and the SA are the same actor (iCAROS phase 1), instead of directly evolving towards the LT vision foreseen in the iCAROS design (i.e. correction with the value of Congestion $_{Supplied}$).



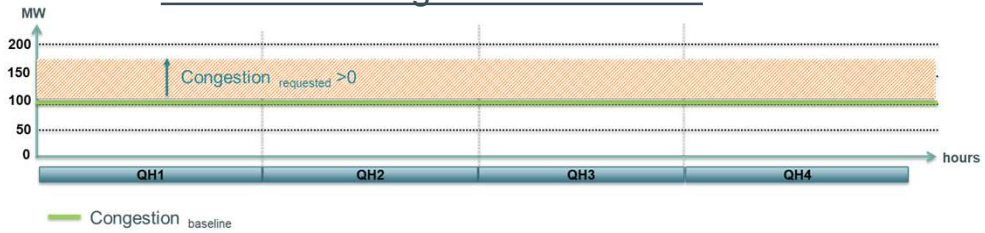
Congestion activation remuneration

Reminder - rules for congestion activation remuneration

Remuneration = $\sum_{activation\ duration}$ time unit x Congestion $_{requested}$ x Congestion bid price

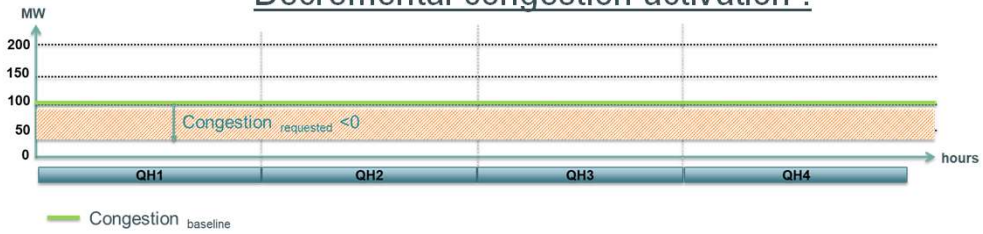
- **Incremental** activations are paid by **ELIA to the Scheduling Agent** (provided a positive bid price)
- **Decremental** activations are paid by **the Scheduling Agent to ELIA** (provided a positive bid price)
- Congestion **bid price** should **reflect the costs** for activating the flexibility and therefore be reasonable, directly related to the activation, and demonstrable

Incremental congestion activation :



- The bid price reflects the cost of production, such as the cost of the fuel, and is usually positive
- The remuneration is usually positive

Decremental congestion activation :



- The bid price can reflect the costs saved by not producing, in this case it is positive and the remuneration is negative
- But it can also include the decreased revenues from the Guarantee of Origin (Green Certificates), the bid price is then negative and the remuneration is positive

Rules for control of cost-reflective prices

- The bid prices **will be controlled** by Elia
- The control will be performed based on a **cost formula*** that will be proposed by the SA and challenged/approved by Elia at the signature of the **T&C SA**. It might be negotiated again at the request of one of the parties (e.g. in case of structural changes of the technical unit following a retrofit).
    - iCAROS phase 1 : cost formula for large PGM/ESD are already used today to compute DA congestion bid price → the concept will need to be extended to ID
    - iCAROS phase 2 and beyond : To be discussed with demand facilities, smaller producers and (C)DSOs
- Recurrent abuses (e.g. unexplained deviation from the cost formula) will be **reported to the CREG**

** The cost formula should be communicated on config level*

Congestion activation annulments

Design amendment following reactions received during public consultation

- ELIA can **revoke an earlier congestion activation** fully or partially until the **activation deadline** of the activated bid for the concerned quarter-hour. In this case, the corresponding flexibility will be available again for other products.
- The remuneration of the congestion activation will **only be canceled** if Elia revokes the congestion activation **in DA**. If the annulment is done **in ID** (and not triggered by a Forced Outage of the activated unit), **the remuneration will be maintained** (as costly actions might already have been taken on the unit and market opportunities might be lost).

*Note : the annulment of a congestion activation is a needed option for **exceptional circumstances** implying large unexpected changes in the grid. However, this option **shouldn't be used frequently** by Elia as congestion bids are typically activated once the need is confirmed.*

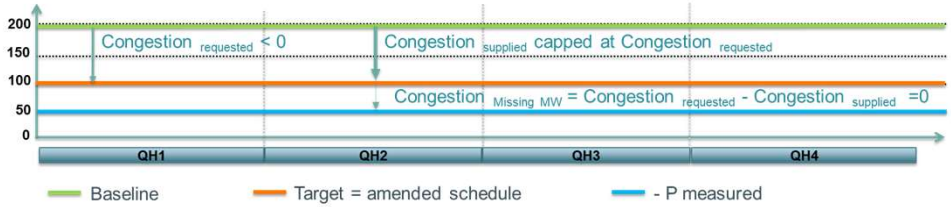
Congestion activation control

Rules for congestion activation control

1. All the congestion activations will be controlled
2. A congestion activation will be considered as **non-compliant** as soon as **Congestion $_{\text{missing MW}} \neq 0$** (without any margin – *contrary to what the design note foresees*).

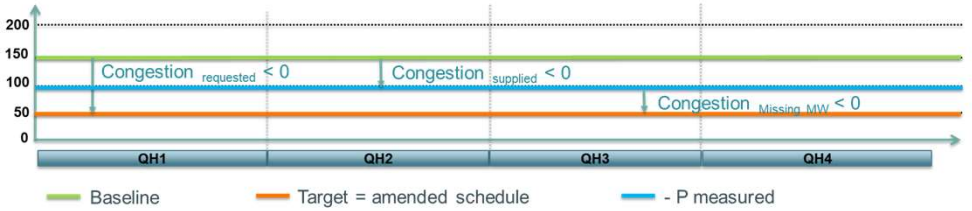
   ➔ This means the congestion target is ***strict*** in the **direction of the congestion risk**

Compliant decremental activation:



Deviation from target is tolerated in the decremental direction (direction of the congestion activation)

Non compliant decremental activation:



Deviation from target is forbidden in the incremental direction (direction of the congestion risk)

3. The activation of bids will be controlled **at 'config' level** :

Amendment of design due to design change presented in Task Force of March 11th

- Most of the time, the 'config' level is the same as the PGM level at which information regarding schedule & measurement is exchanged
- In some situations, several 'configs' are defined for the same PGM (GT, GT+ST,…) and used for congestion bidding, whereas the information regarding schedule & measurement is exchanged at PU level. In these cases, the schedule and measurement need to be summed at config level to perform the activation control of the congestion (config) bid.

Penalty for non-compliant congestion activation

$$Penalty = \sum_{\substack{non\ compliant \\ time\ units}} MAX\ (0; time\ unit\ x\ Congestion_{\ missing\ MW}\ x\ Penalty\ price)$$

Where

- **Penalty price** = k x price of the congestion bid which is not correctly activated
- k = a **penalty factor** aiming at covering the (average) costs of the additional actions taken by Elia in response to a non-compliant activation (e.g. k=1,3)

(*evolution in comparison with what the design note foresees : "Strong penalities need to be applied", "The penalty price will be equal to a fixed rate per MWh or, if higher, a multitude of the imbalance price at the concerned quarter-hour"*)

- Time unit = 1/4h

An additional **contractual clause** will be foreseen**,** allowing Elia to **question the SA and take actions** if abusive behaviors are observed (e.g. target deviations in case of large imbalance tariff).

Design evolution : congestion target is strict, but penalty price is sized on bid price

Next steps

Feedback and follow-up

Feedback, comments and suggestions on presented design fine tunings are kindly requested by sending it to caroline.bosschaerts@elia.be by 1st July 2020.

Follow-up via next iCAROS taskforce on October 7th 2020.

iCAROS Program Manager **Viviane Illegems**
Design architect outage planning, scheduling, congestion **Caroline Bosschaerts**

Thank you.