

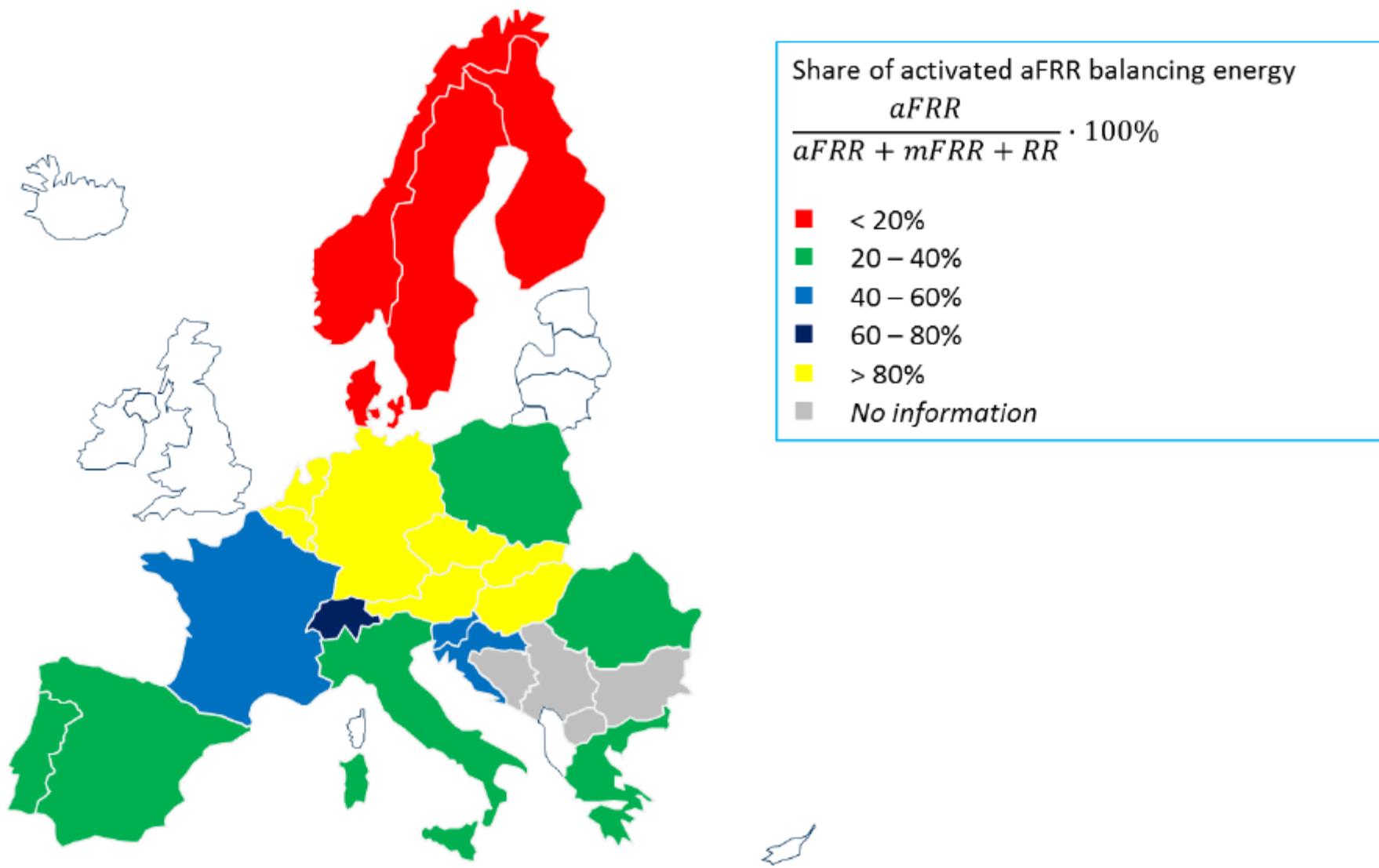
Standard products: 30th June 2016

June 2016

Agenda

- *Current situation regarding manual standard products ;*
 - List of standard products;
 - Expected usage per TSO;
 - General principles;
 - Physical and financial flows.
- *Current situation regarding automatic standard products;*
- *Next steps.*

CURRENT SITUATION REGARDING MANUAL STANDARD PRODUCTS



This is based on figures for February and June 2015

Standard products

Latest draft proposal for standard product was made up of 4 products. These are shown in the table below.

P-[DA or SCH]-[FULL ACTIVATION TIME]-[MIN DELIVERY PERIOD]/[MAX DELIVERY PERIOD]

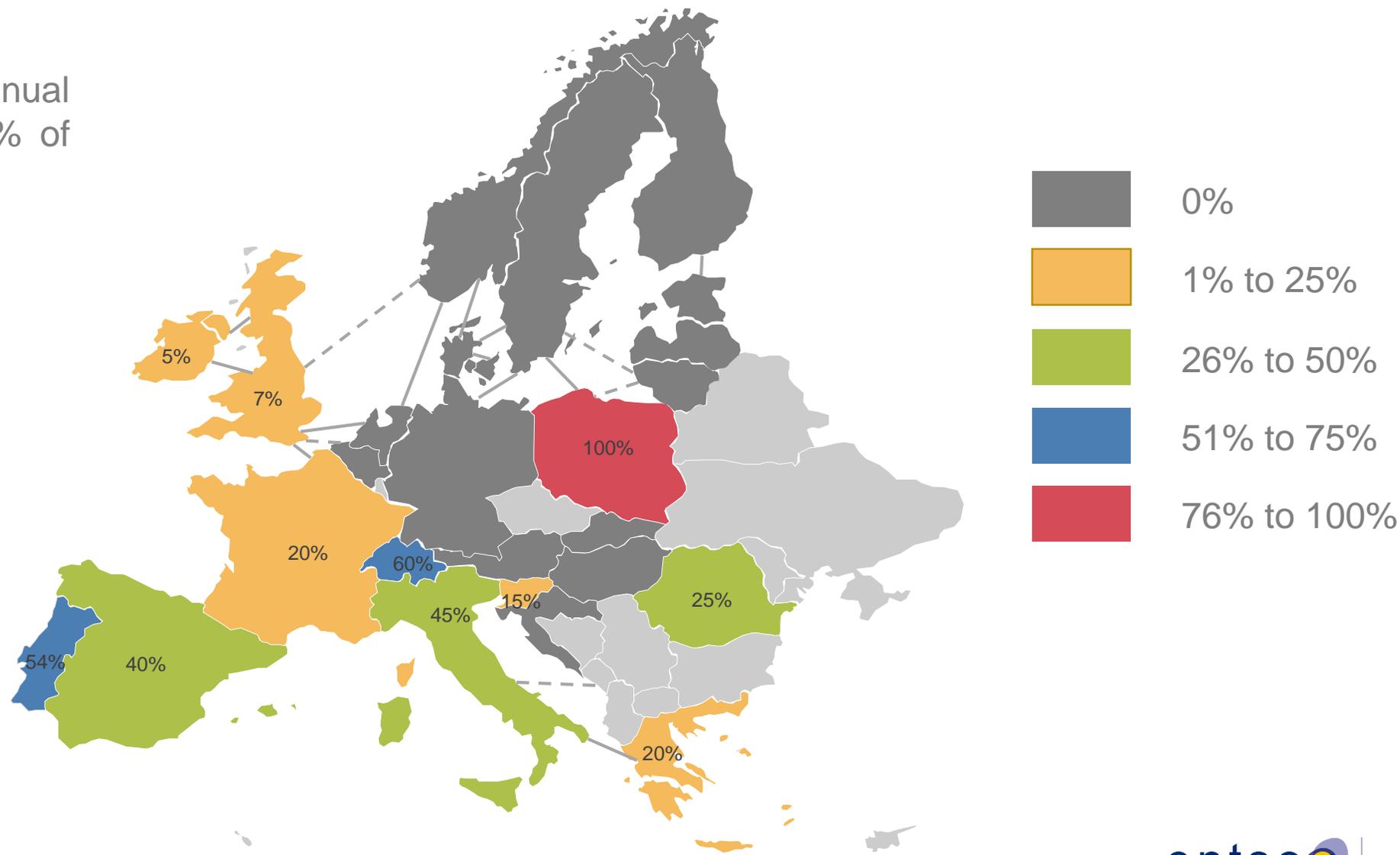
	P-DA/SCH-15-15/30 (mFRR)	P-DA-10-10/25 (mFRR)	P-DA-5-5/20 (mFRR)**	P-SCH-30-15 (RR)
FAT	15	10	5	30
Min delivery	15*	10*	5*	15
Max delivery	30*	25*	20*	15 / 60
Temporal divisibility	Mandatory yes. between min and max. Minute based resolution	Mandatory yes.	Mandatory yes.	NO
Links (temporal)	No	No	No	Yes / No
Activation method	Clearing and continuous process	Continuous process	Continuous process	Clearing
Ramps (financial settlement)	To be further discussed with stakeholders	To be further discussed with stakeholders	To be further discussed with stakeholders	No
Bid size	1 MW (tbc) to 9999 MW			



- * : proposal for starting point of discussions. Topic is still discussions on the minimum and maximum activation duration
- ** : regional potential only

P-SCH-30-15

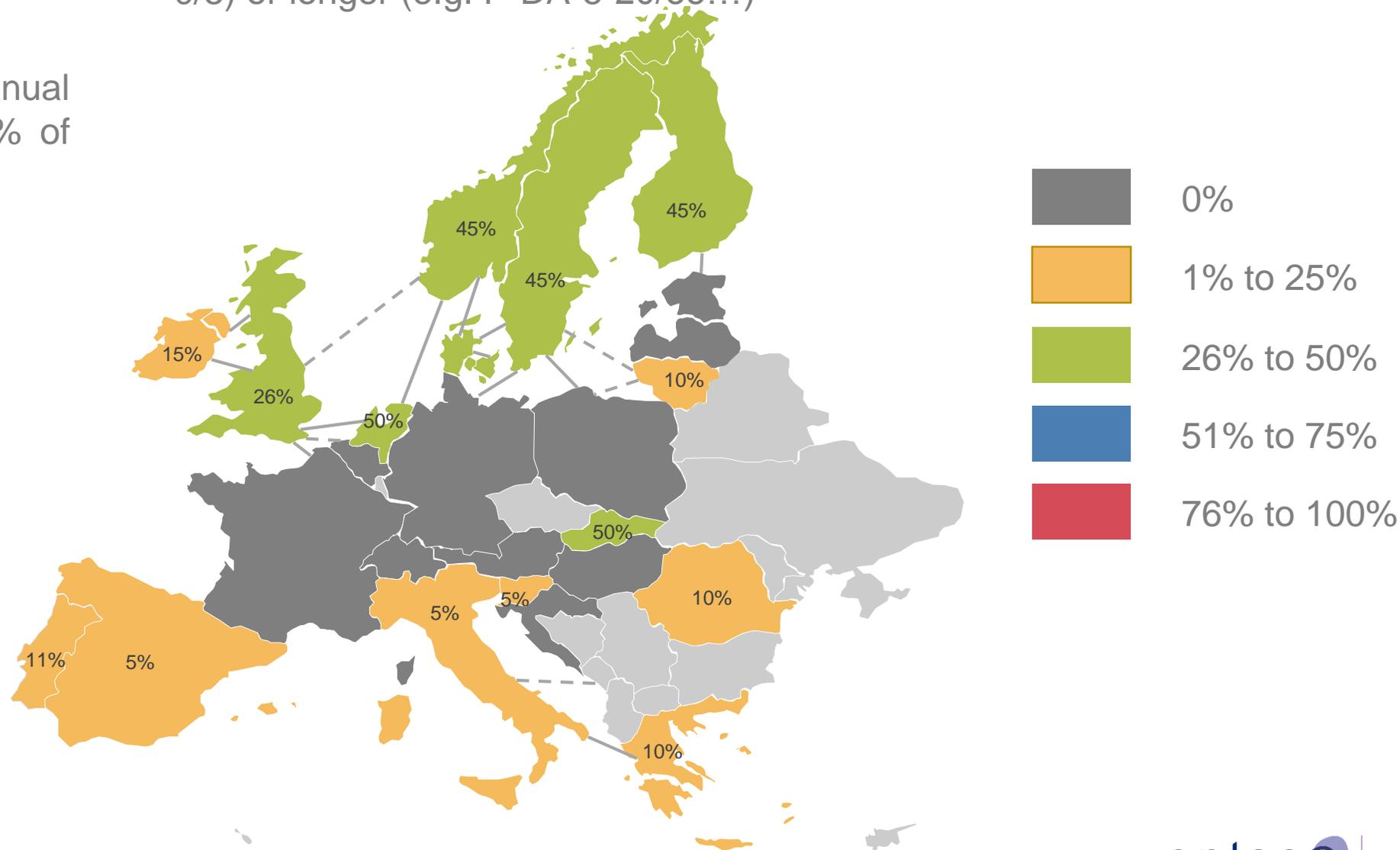
⚠ % of use of all manual products only, not as % of all balancing energy



P-DA-5-5/20

! duration still under discussions. Answer from TSOs are usually completed by modification request on the delivery period: shorter (e.g. P-DA-5-0/5) or longer (e.g. P-DA-5-20/35...)

! % of use of all manual products only, not as % of all balancing energy



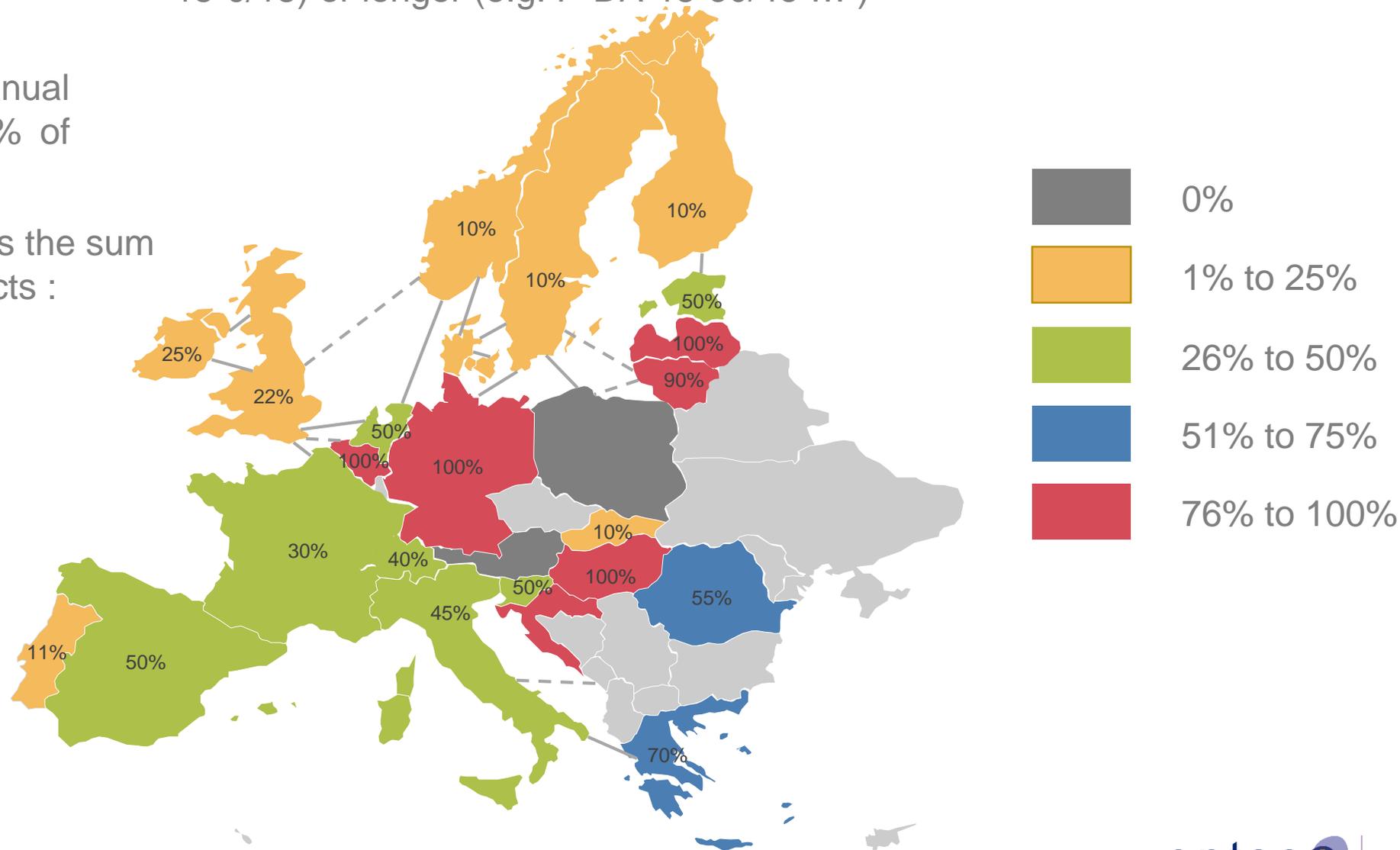
P-DA-SCH-15-15/30

!! duration still under discussions. Answer from TSOs are usually completed by modification request on the delivery period: shorter (e.g. P-DA-15-0/15) or longer (e.g. P-DA-15-30/45 ...)

!! % of use of all manual products only, not as % of all balancing energy

!! % of use estimated as the sum of the 3 following products :

- P-SCH-15-0/15
- P-SCH-15-15
- P-DA-15-15/30



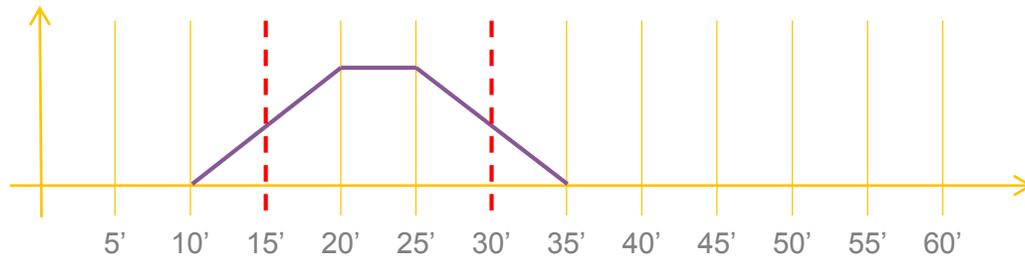
General principles

- ① What is the cross-border physical exchange ?
- ② What is the TSO-TSO settlement and what is the TSO-BSP settlement ?
- ③ What is the BRP imbalance adjustment ?

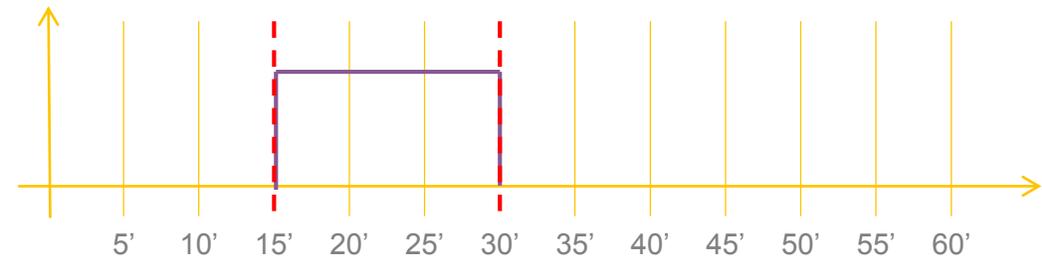
① What is the cross-border physical exchange ?

Two options are on the table : **trapezoids** or **blocks**

Option 1



Option 2

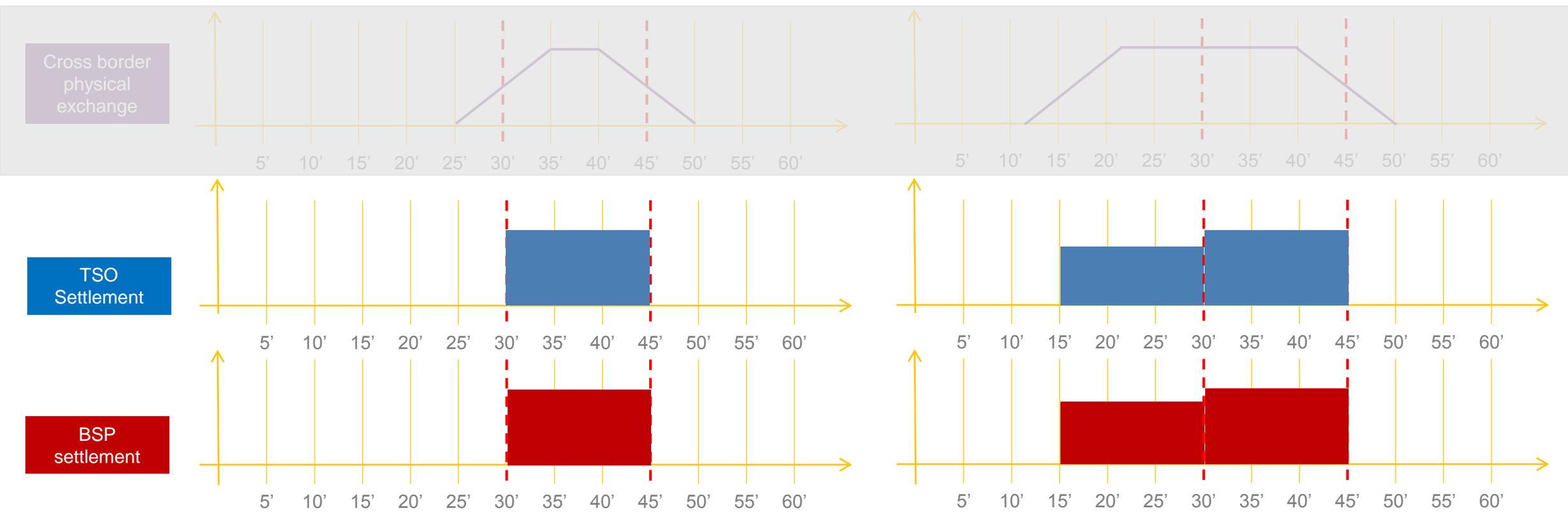


Pros of option 1 : Consistency with other market timeframes; Applicable to HVDC interconnectors; Reduction of ACE by using a realistic power profile.

Pros of option 2 : Simplicity reasons

TSOs did not reach an agreement yet on this subject.

② What is the TSO-TSO settlement and what is the TSO-BSP settlement ?

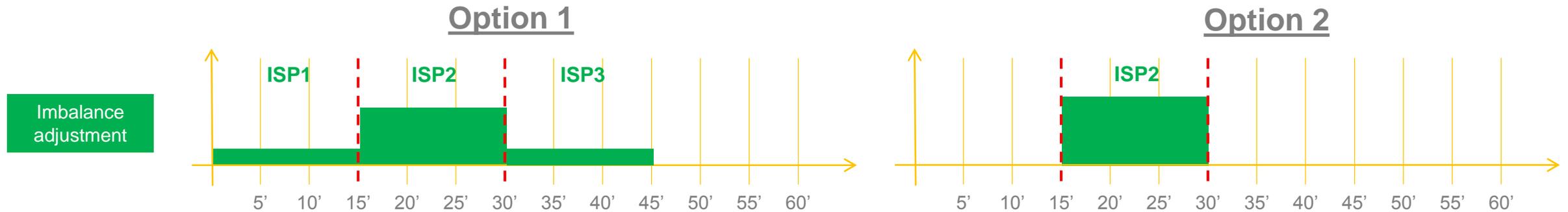


All TSOs favour settlement based on **blocks**.

③ What is the BRP imbalance adjustment ?

At least two options are on the table :

- In the first option, the balance position of BRP is adjusted such that the integral portions of the MW delivery curve residing in each ISP are allocated to the ISP in which they fall; this means that energy adjustment align with the MWh physical delivery in those affected ISPs.
- In the second option, the imbalance position of the BRP is adjusted so all ordered energy (the integral of the MW delivery curve) is allocated to the requested delivery period and this means that there will be no adjustment in ISPs in which BSPs only ramps up and down;



TSOs did not reach an agreement yet on this subject. The link between BSPs and BRPs has to be further clarified.

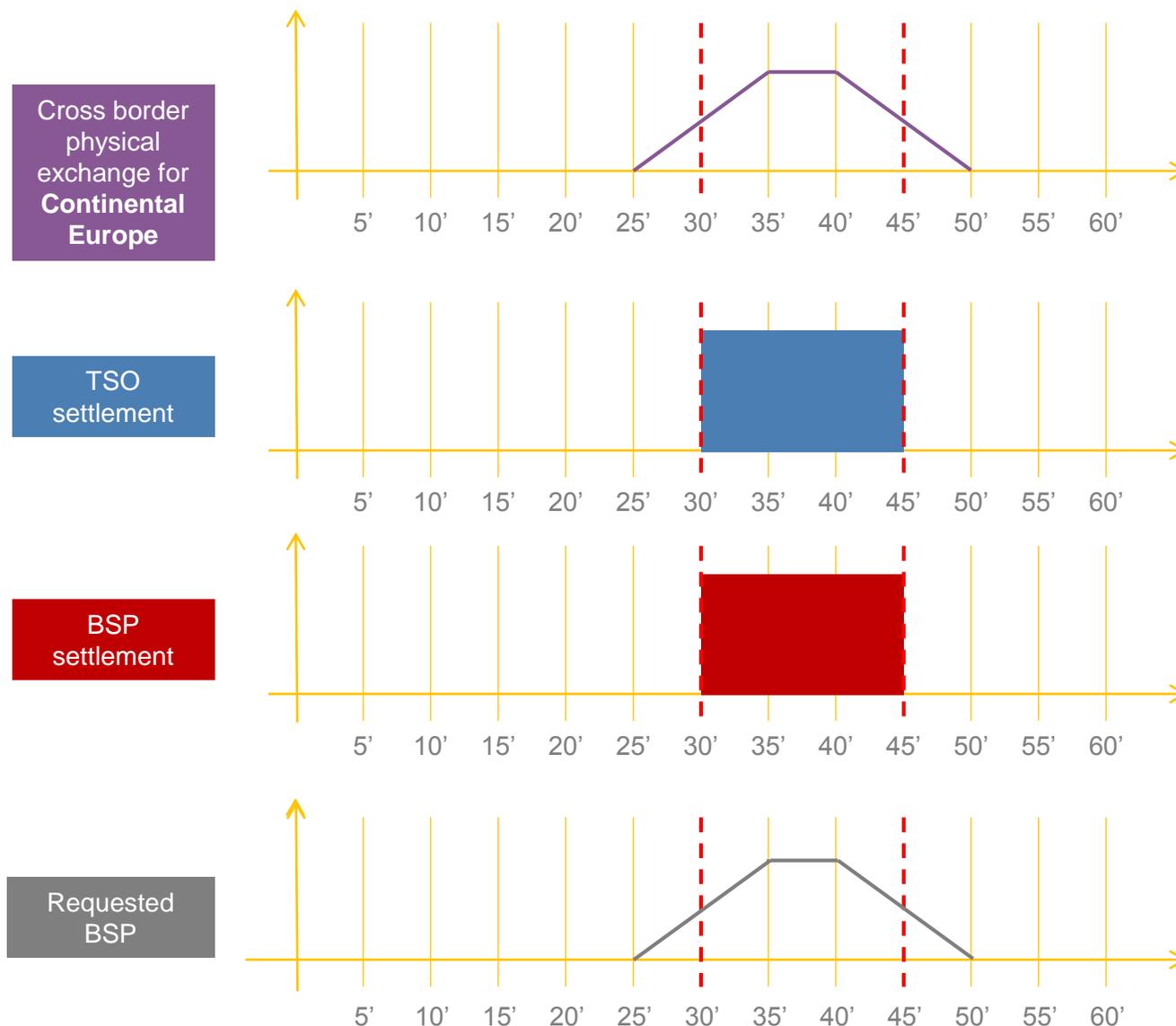
Question to stakeholders : what is your opinion on this subject?

APPENDIX

- Physical and financial flows associated with standard products

P-SCH-30-15 – example

!/\ BRP imbalance adjustment should be further discussed



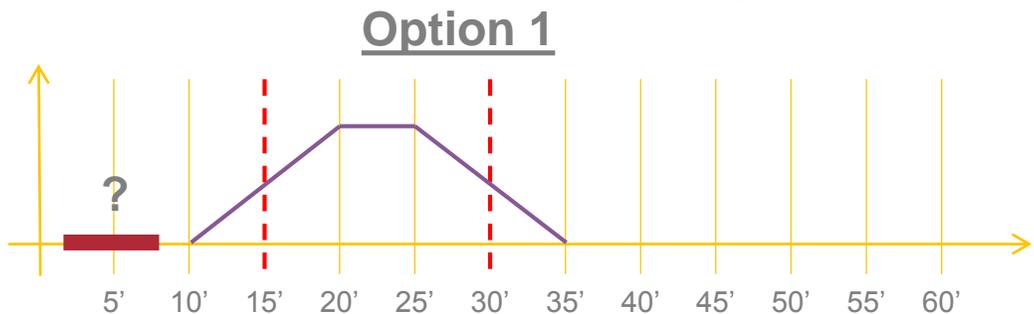
If we want to approach physical neutrality of the connecting TSO, the wished shape requested from BSP should be as close as possible to the cross border physical exchange.

A tolerance band could be defined for prequalification

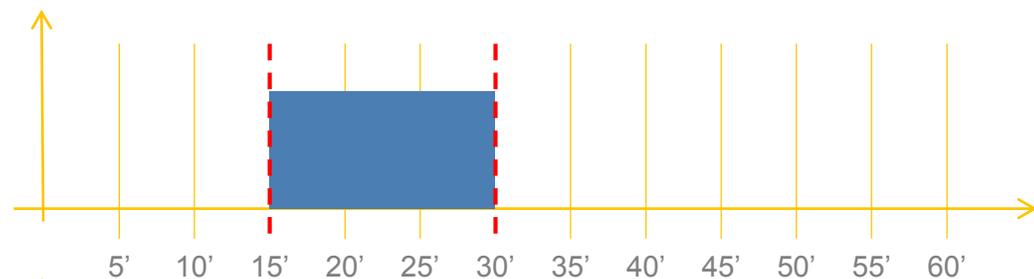
P-DA-SCH-15-15/30 – example of « scheduled activation »

Cross border physical exchange

TSO expresses its need

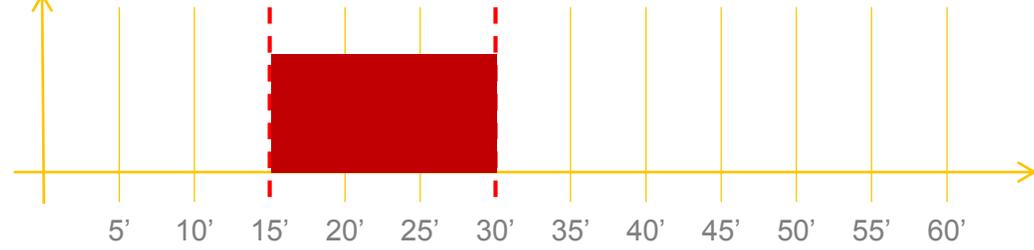


TSO Settlement



Same as option 1

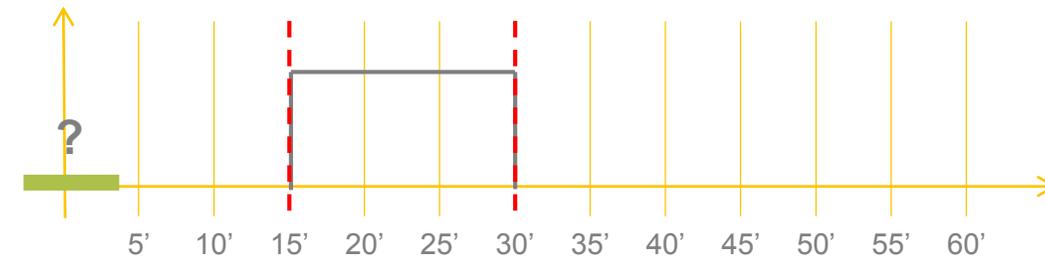
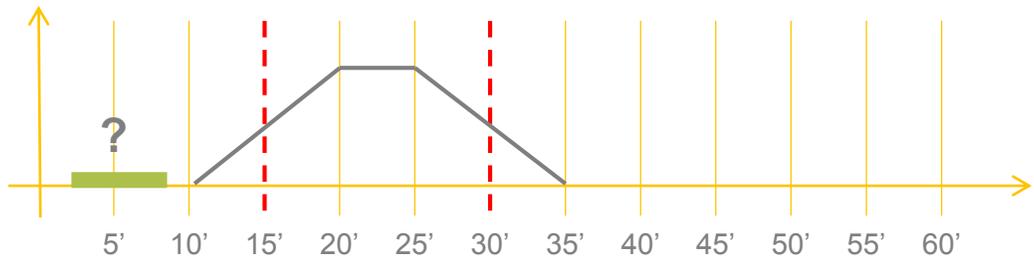
BSP settlement



Same as option 1

Requested BSP

BSP receives the order

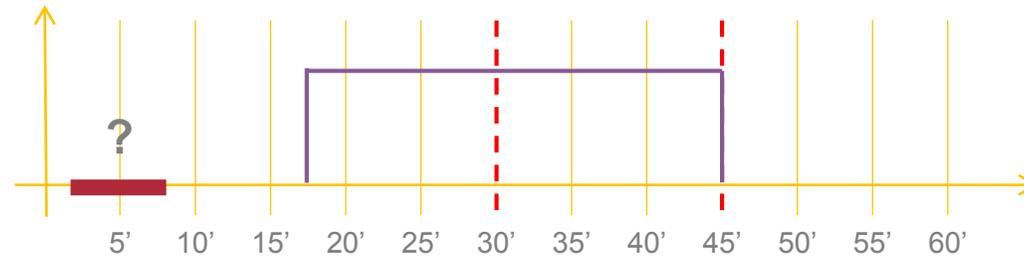
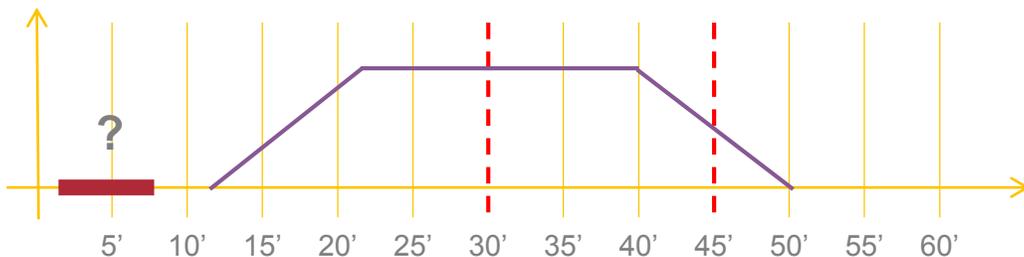


P-DA-SCH-15-15/30 – example of « direct activation »

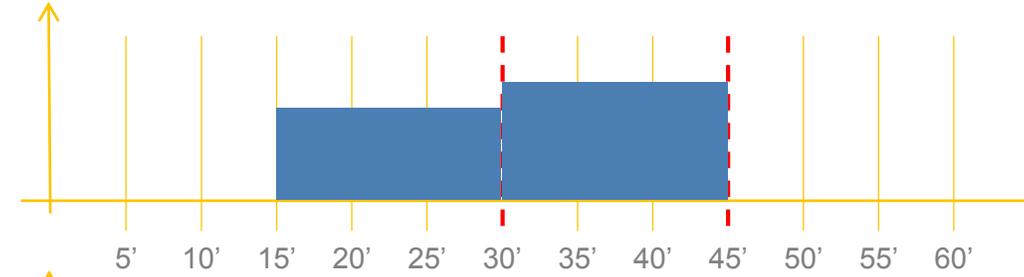
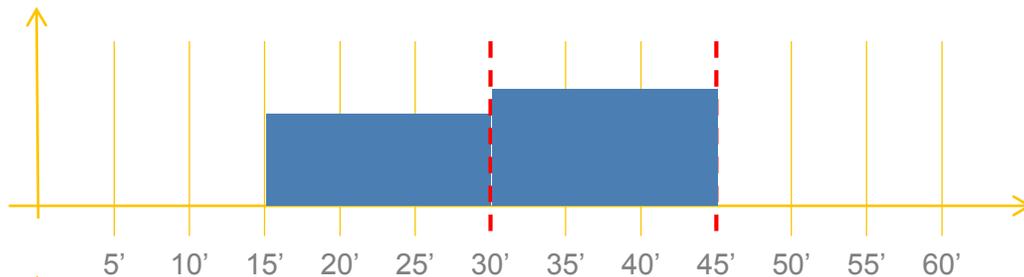
Option 1

Option 2

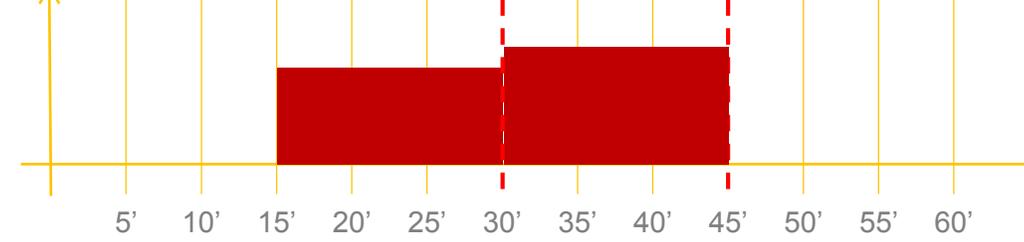
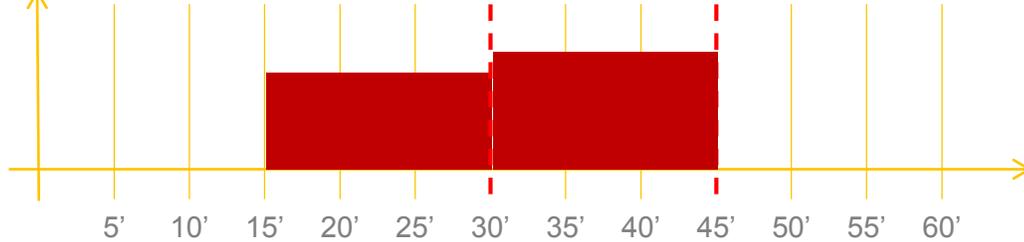
Cross border physical exchange
TSO expresses its need



TSO Settlement

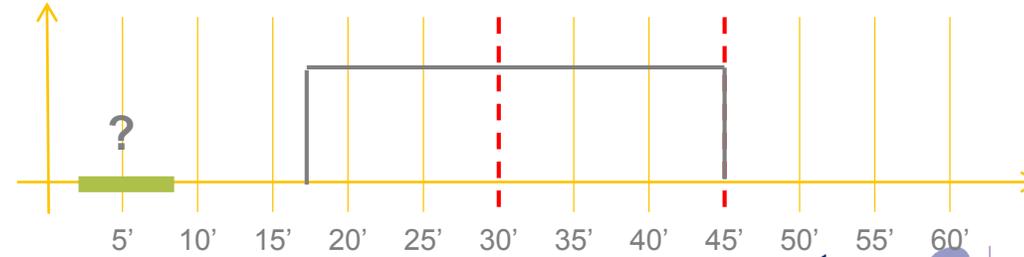
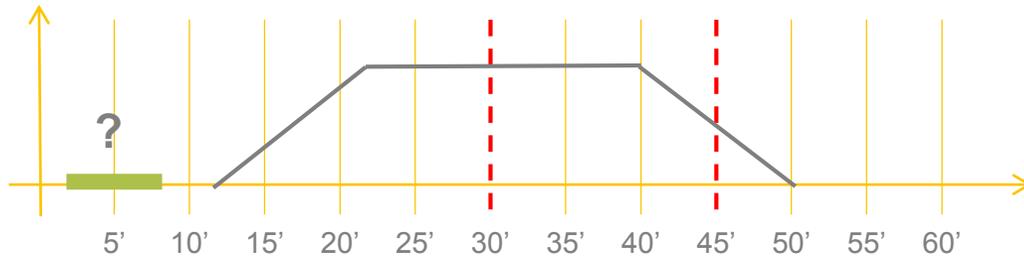


BSP settlement



Requested BSP

BSP receives the order



P-DA-10-10/25 – example

/!\ :

- Ramping period of 10 minutes
- Start of the deactivation period in order to avoid the impacts on ISP3

Cross border physical exchange

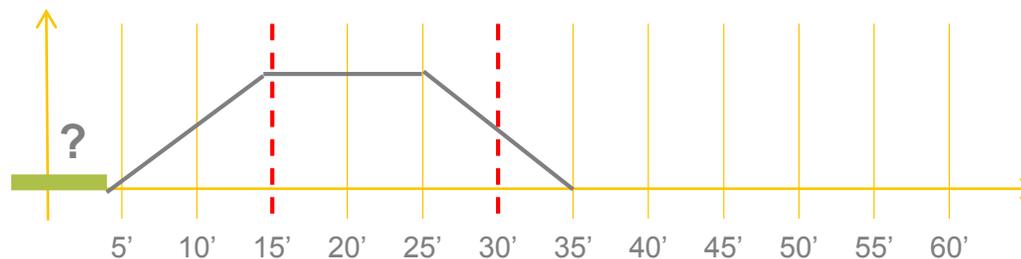
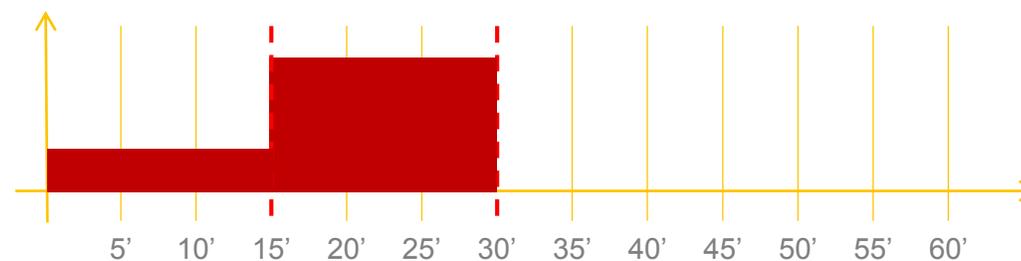
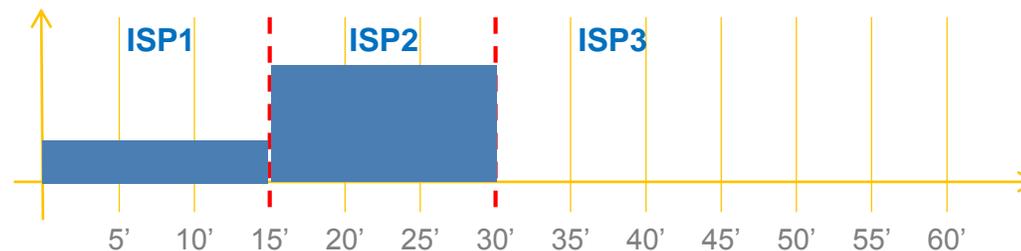
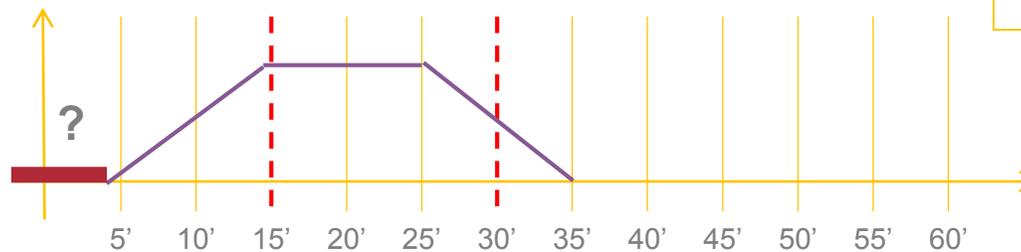
TSO expresses its need

TSO Settlement

BSP settlement

Requested BSP

BSP receives the order



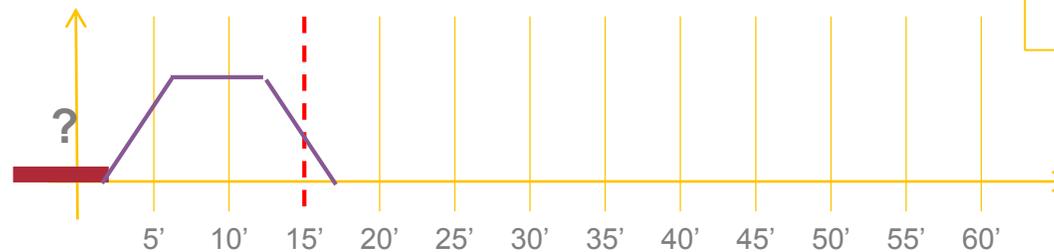
P-DA-5-5/20 – example

!/\ To be discussed :

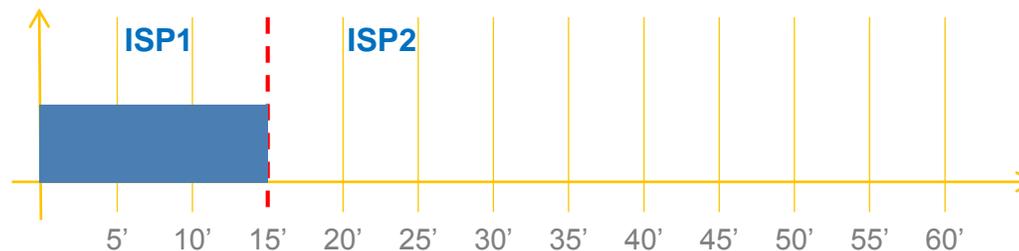
- Ramping period of 5 minutes
- Start of the deactivation period in order to avoid the impacts on ISP2

Cross border physical exchange

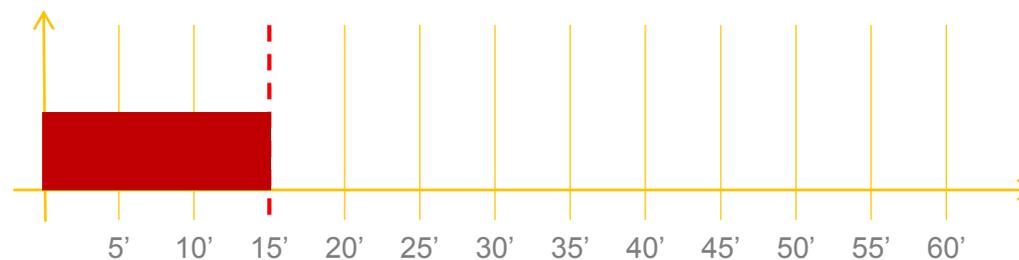
TSO expresses its need



TSO Settlement

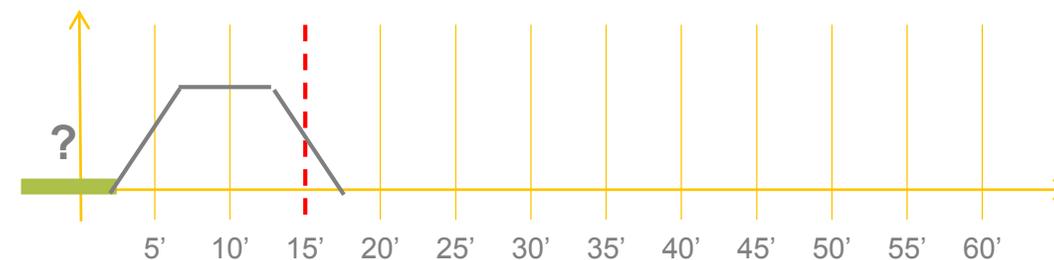


BSP settlement



Requested BSP

BSP receives the order



CURRENT SITUATION REGARDING AUTOMATIC STANDARD PRODUCTS

How to define a standard product for aFRR ?

Two criteria	At least four variables
Frequency quality	Full activation time
Overall cost for the electrical system	Activation mode (merit order, pro rata or something in between)
	Contracted volumes
	Controller settings

Target parameter for frequency : ENTSO-E considers that the aFRR standard product shall not reduce the current frequency quality

Frequency quality target parameter		CE	GB	IE/NI	Nordic
Maximum number of minutes outside the standard frequency range	Default values	15000	15000	15000	15000

For CE, the value is derived from a probabilistic risk calculation for exhaustion of FCR. It does not introduce a change from the current values.

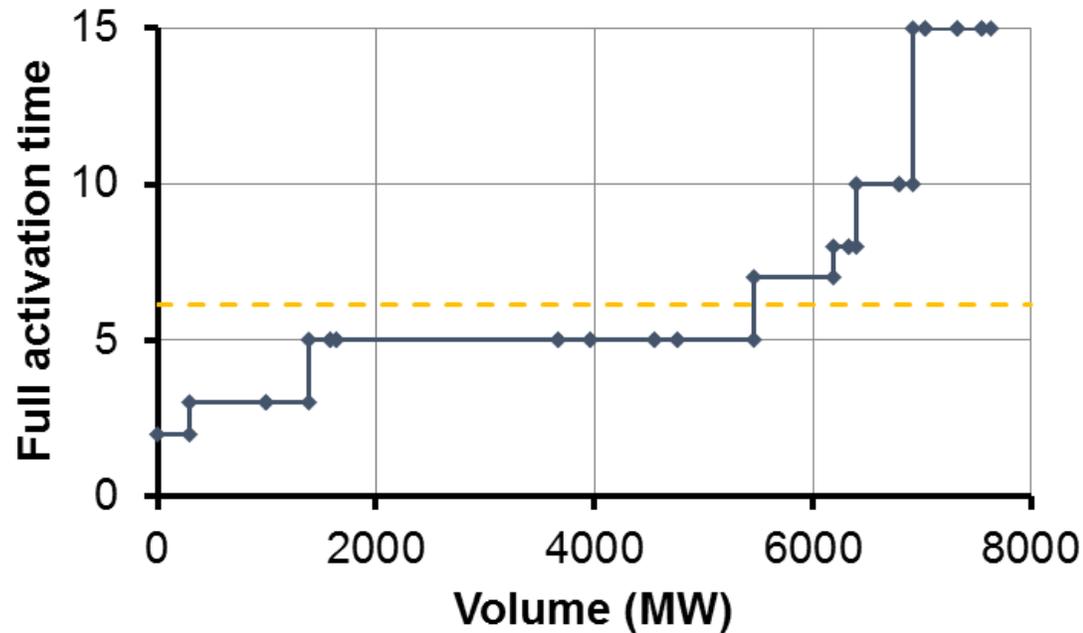
Target parameter for each TSO : ENTSO-E reminds that the aFRR standard product should also allow TSOs to respect level 1 and level 2 FRCE (Frequency Restoration Control Error) range

Ideas: reduce the variables as much as possible and then assess the choices against the two criteria ; start with the full activation time as there is already a limited number of scenarios.

Start with the full activation time

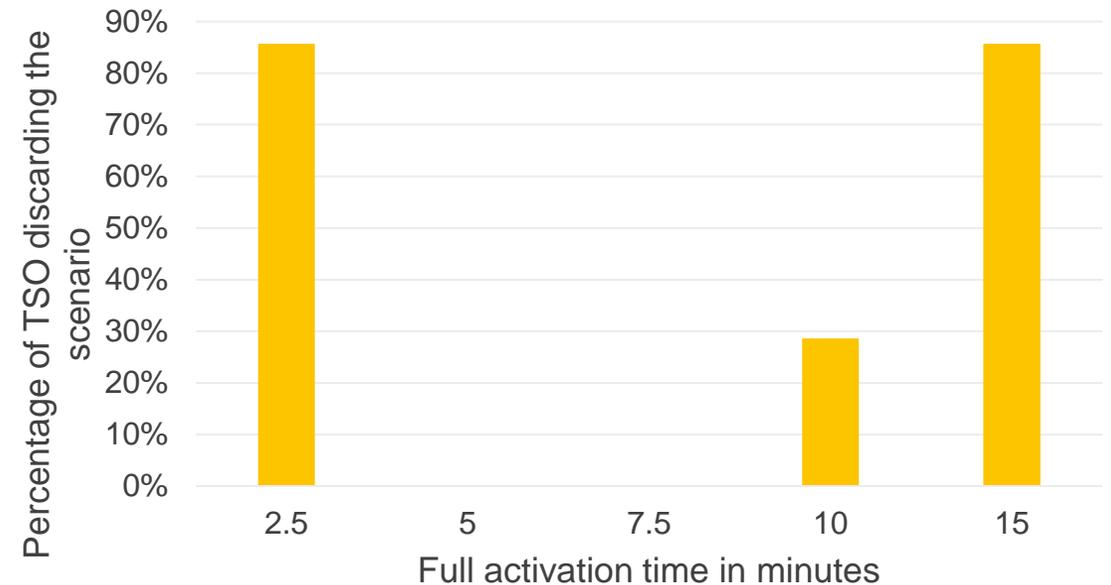
There is already a limited number of scenarios for the full activation time : 2,5-5-7,5-10-15. The final FAT should be short enough in order to respect frequency criteria

FAT used in Europe and the corresponding procured amount of aFRR



--- Average value of FAT for aFRR standard product = 6,1 minutes

Evaluation of TSOs regarding FAT scenarios



Full activation times of 5, 7,5 and 10 appear as the most likely scenarios

Summarized conclusions

It is highly likely that there will be one standard product per synchronous area. In principle, aFRR products could still be exchanged between synchronous areas.

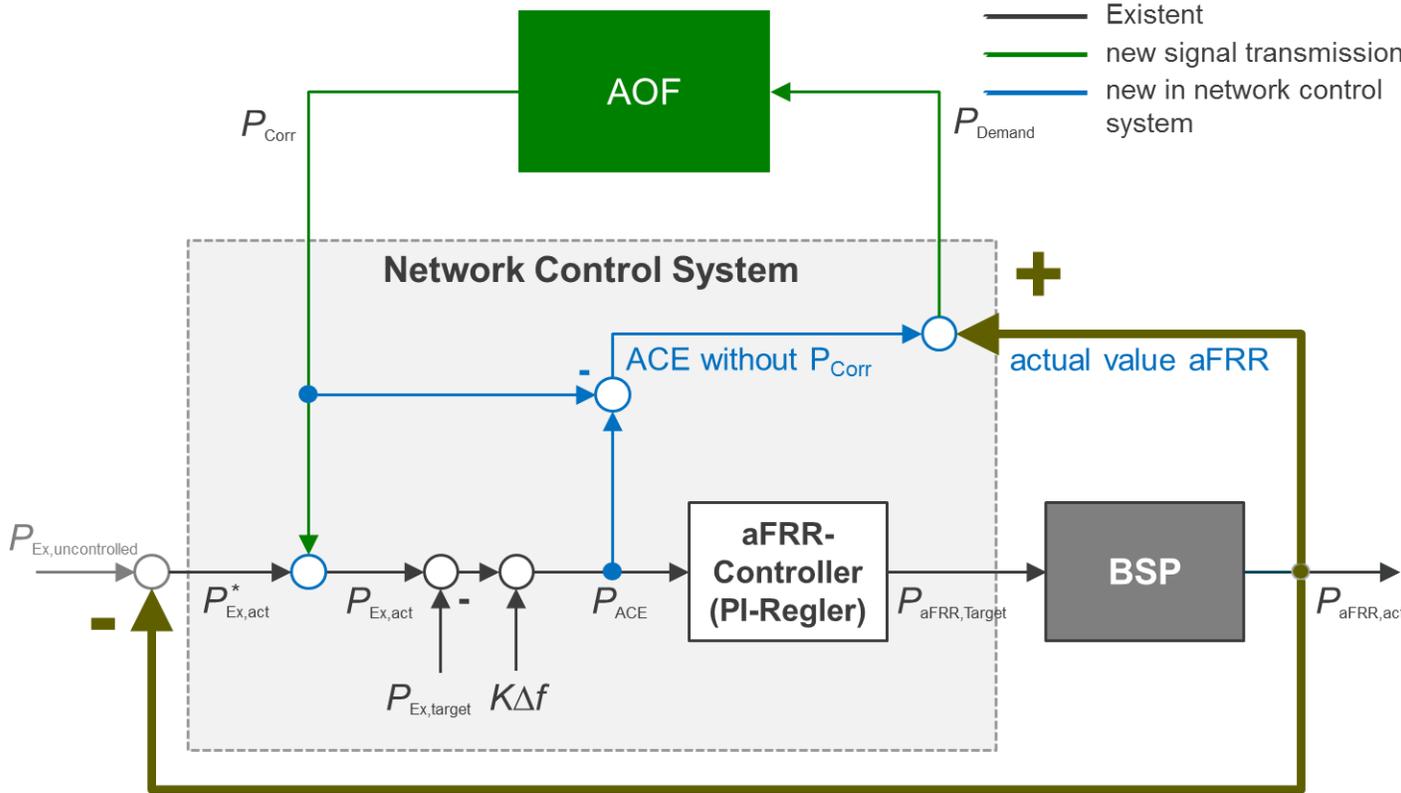
	aFRR standard product
FAT	2,5 – 5 – 7,5 – 10 - 15
Min delivery	Not really relevant
Max delivery	Not really relevant
Validity period	The effect of bid replacement should be further studied
Temporal divisibility	Mandatory yes
Links (temporal)	Not discussed yet
Activation method	<p>A simple merit order does not seem suitable : mitigation measures have to be clarified</p> <p>Activation would be done in a continuous way</p> <p>Two strategies for the merit order list operation : Control demand (Correction signal is added to the ACE and represents TSO-TSO exchange) and Control request (TSO receives the individual control request for his local BSPs from the AOF)</p>
Bid size	1 MW to x MW (this has to be further discussed)

APPENDIX

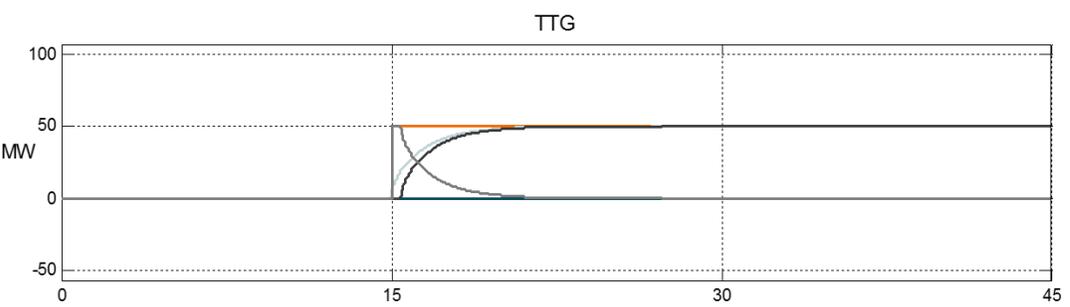
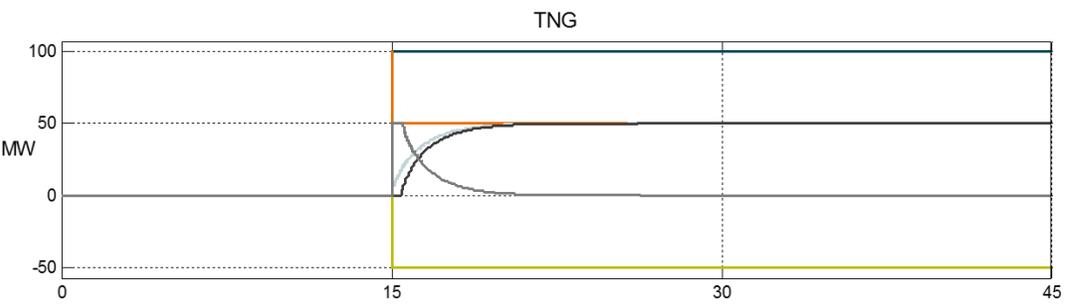
- Merit order list operation

Cross border activation : a key technical point – 2 options put forward by Explore Project

- The control demand represents the remaining disturbance after mFRR activation of each CA
- Measurement or simulation of the aFRR activation is necessary for control demand determination
- The control demand is sent to the AOF
- AOF calculates and sends a correction signal to the respective CA
- Correction signal is added to the ACE and represents the TSO – TSO exchange
- TSO-TSO exchange is done step-wise (might be also done with a ramp limitation)



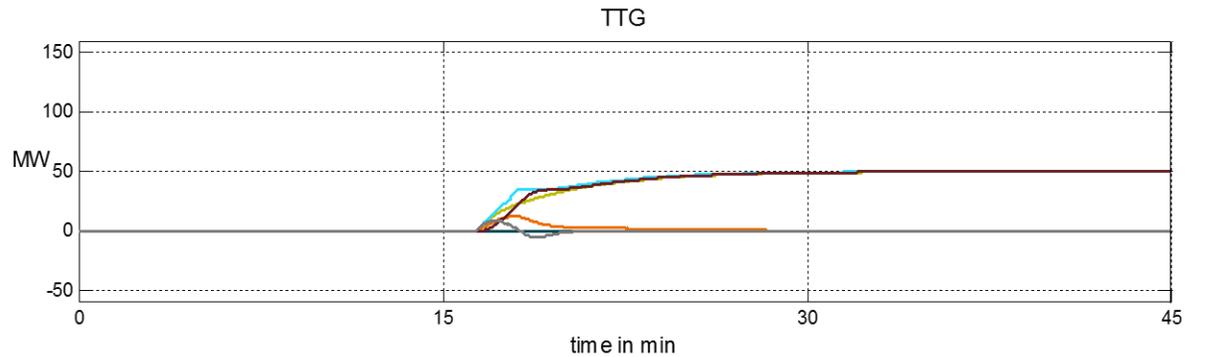
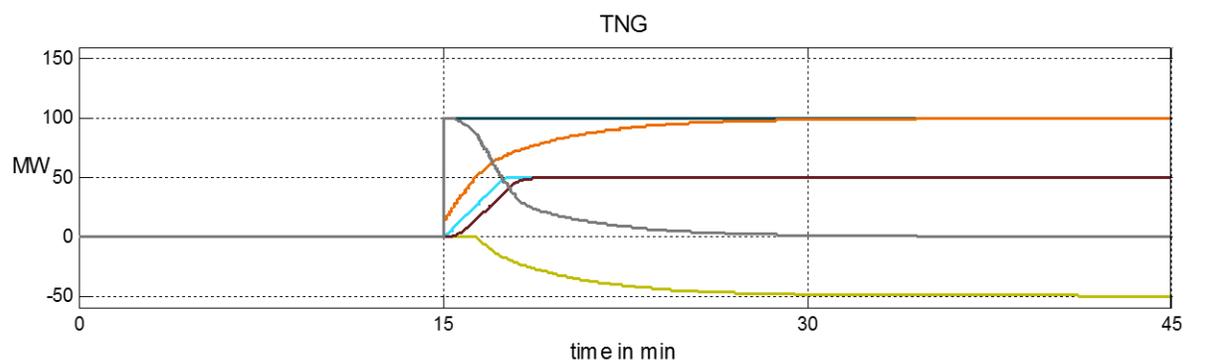
Control demand



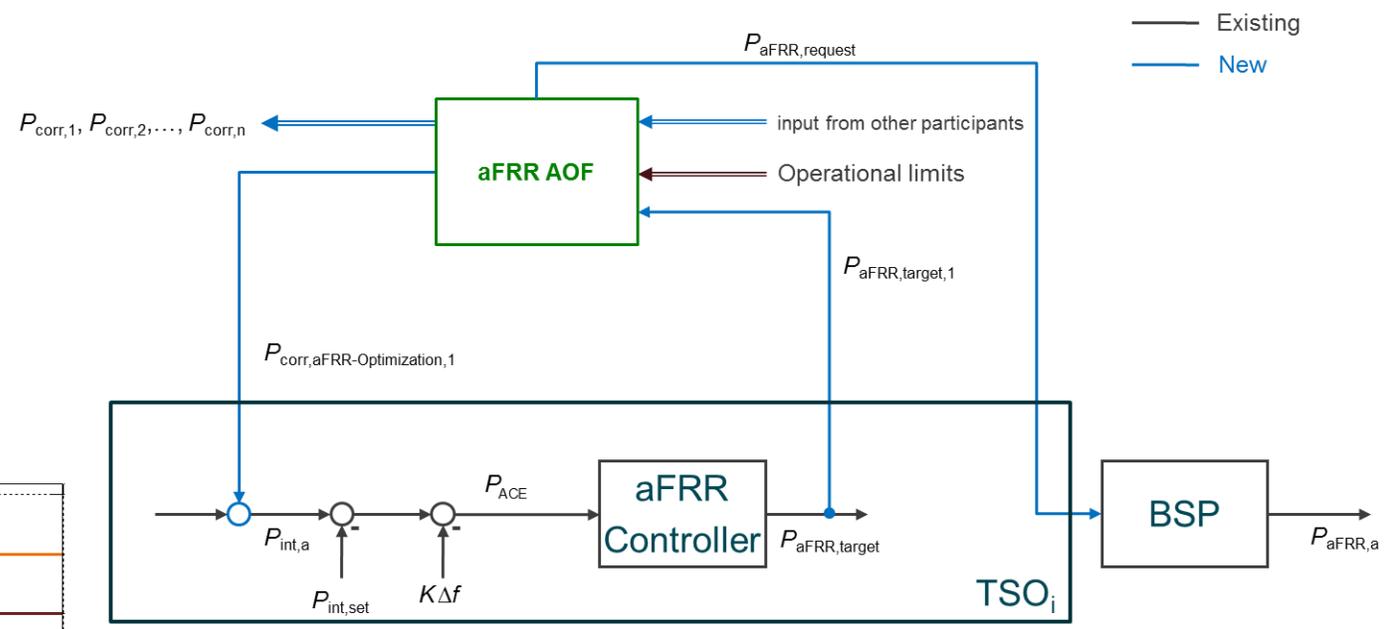
— aFRR Demand — Correction — Corrected Demand — Control Target — aFRR activation — ACE

Cross border activation : a key technical point – 2 options put forward by Explore Project

- Control target of each CA is the input of the AOF
- AOF calculates the control request based on nominated ramp limitations to the respective BSP via the related TSO
- The TSO receives the individual control request for his local BSPs from the AOF and passes the value to the BSPs
- The AOF sends a correction signal to each CA representing the TSO-TSO exchange
- A fallback solution for the determination of control request and connecting the local controller with the local BSPs



— aFRR Demand — Correction — Control Target — aFRR activation due to AOF — aFRR activation — ACE

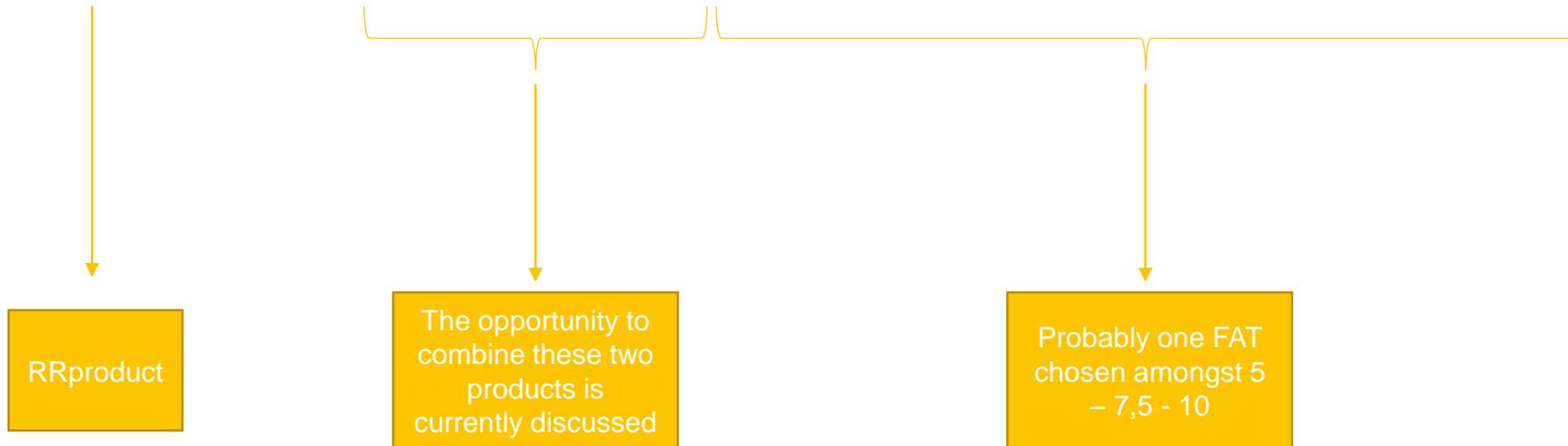


Control request

NEXT STEPS

Standard products : next steps

	RR	mFRR			aFRR				
FAT	30	5	10	15	2,5	5	7,5	10	15
SCH/D A	SCH	DA	DA	DA or SCH	DA	DA	DA	DA	DA



entsooe



Reliable Sustainable Connected