

# STANDARD PRODUCTS

Project Team PPA

## Balancing Stakeholder Group

7<sup>th</sup> December 2016

# General overview

Since the 7<sup>th</sup> April 2016, the project team products, pricing and algorithm has refined the content of the standard products document.

This powerpoint presentation summarizes the main changes compared to the prior version.

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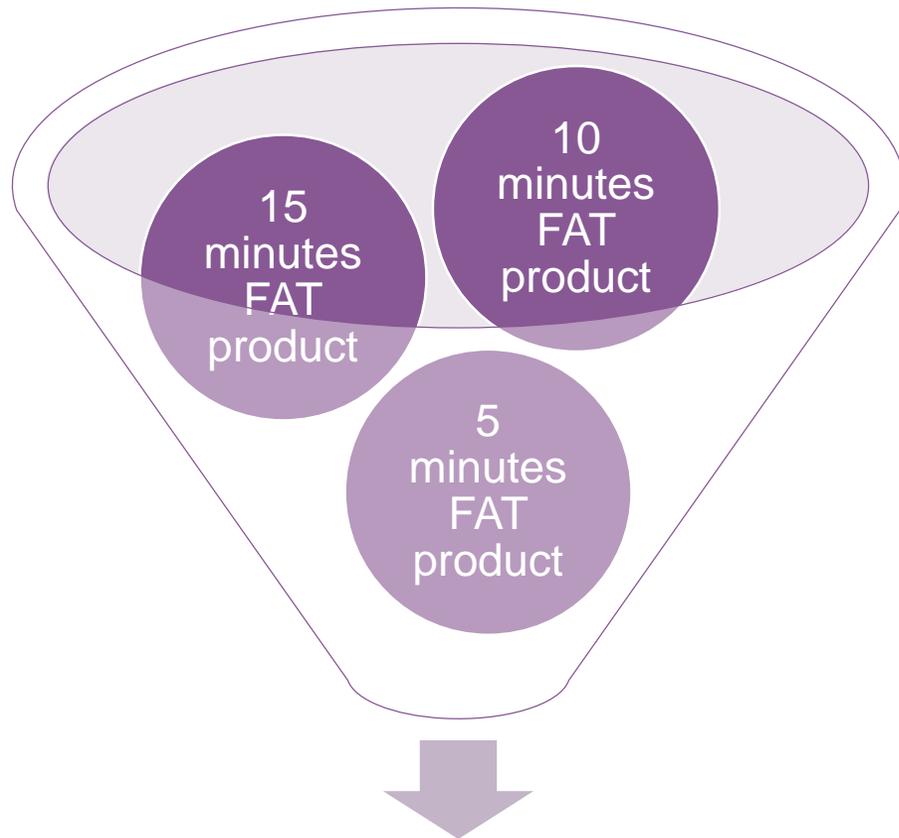
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# Manual products

# A proposal to keep only one standard mFRR product



One product with a FAT  
between 10 and 15 minutes

## Explanations:

1. The work conducted amongst TSOs has shown that the 5 minutes full activation time product would not be used at a European scale in the very short term. Nevertheless the Nordic system needs a product that is faster than 10 minutes (e.g. 5 minutes). The concerned TSOs therefore advocate for a 5 min FAT product that would not be considered as any other specific product and that could be exchanged at a regional scale.

2. A shared interest in merging the 10 and 15 full activation time products:

- By decreasing the number of products, it increases the liquidity on the chosen product;
- TSOs wouldn't have to implement a product which they do not want to use;
- FATs of 10 and 15 minutes are quite similar.

## Proposal:

TSOs did not conclude on the merged full activation time. It's proposed to detail the evaluation of the criteria affecting technical issues, especially the one regarding time to restore frequency.

# A trapezoidal shape for the XB exchange of manual products

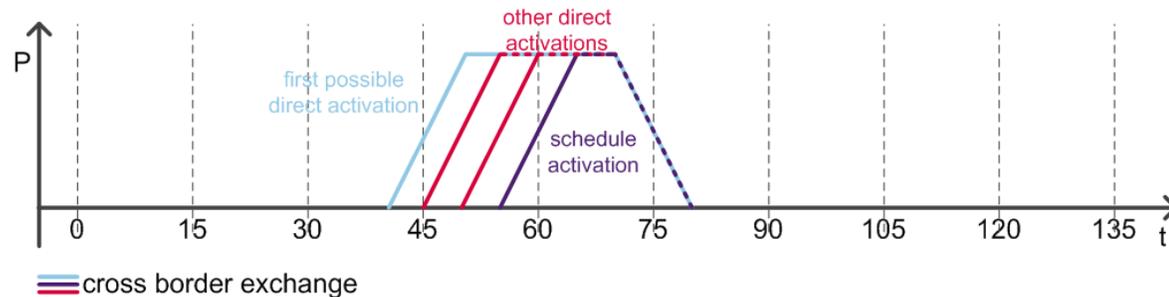
## Explanations:

Different shapes have been compared and the conclusion reached by TSOs was that a trapezoidal shape with a 10 minutes ramp was acceptable for the XB exchange.

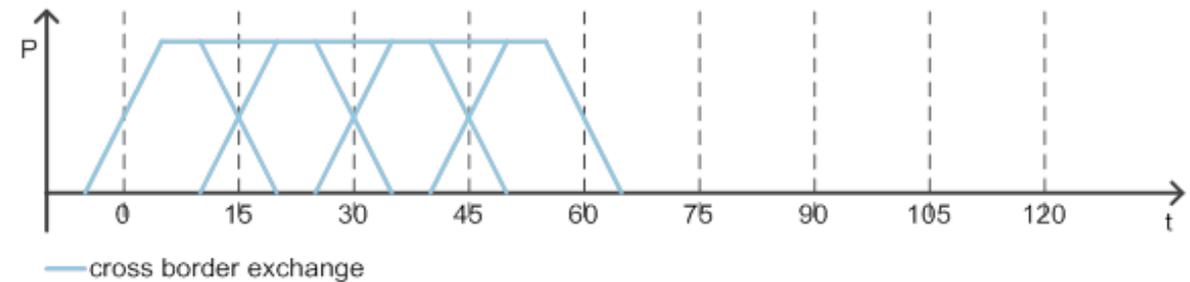
Nevertheless the definition of the cross border exchange can be adapted in the future based e.g. on the observed behavior of the BSPs.

## Proposal:

*For the mFRR product*



*For the RR product*



# A trapezoidal shape as the ideal shape expected from BSPs

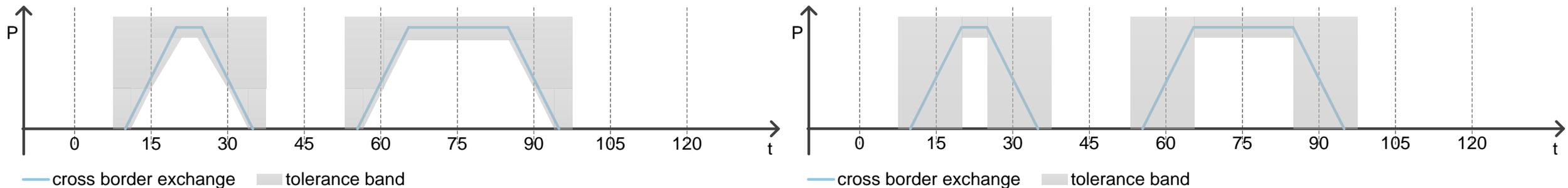
## Explanations:

In order to derive all the processes around products it's needed to put forward an ideal shape. Nevertheless BSPs will not be able to strictly deliver this ideal shape and it's therefore needed to define a tolerance band.

## Proposal:

- A delivery following the shape of the cross border exchange is considered as a perfect delivery;
- TSOs decided not to agree on a single tolerance band for now and rather define it at a national level.

## Examples:



# Summary: one mFRR product and one RR product

	mFRR product	RR product
Preparation period	From 0 to x minutes	From 0 to 30 minutes
Ramping period	From 0 to x minutes	From 0 to 30 minutes
Full activation time	x minutes, x being between 10 and 15 minutes	30 minutes
Minimum quantity	1 MW	
Maximum quantity	9999 MW	
Divisibility	Yes or No	Yes or No
Minimum duration of equivalent delivery period	15 minutes	15 minutes
Maximum duration of equivalent delivery period	30 minutes	15/60 minutes
Activation principle	DA/SCH	SCH
Links between bids	?	Yes

# Beyond manual standard products : TSO-TSO financial settlement

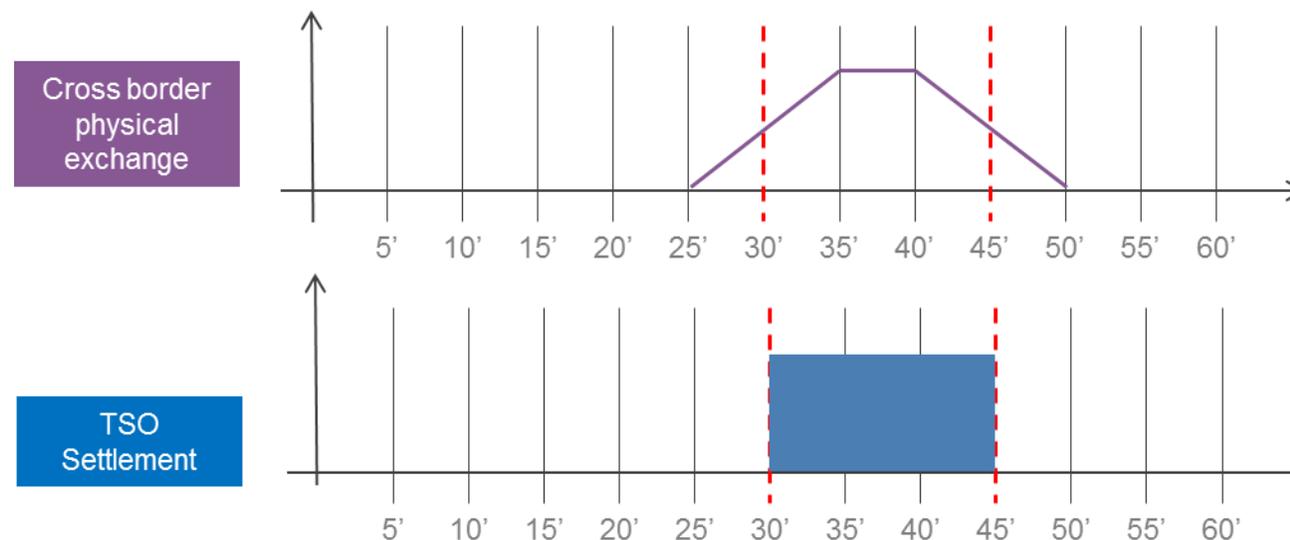
## Explanations:

Many options have been discussed between TSO for financial settlement of “exchanged balancing energy” when a bid is activated in the responsibility area of a TSO for the need of another TSO :

- use of a trapezoidal product or a block product ;
- use of requested or metered balancing energy.

## Proposal:

TSOs plan to use “block product” and requested energy for TSO-TSO financial settlement for manual products whatever the shape of the physical cross-border exchange is.



# Beyond manual standard products : other aspects

## Explanations:

Regarding the other aspects, TSOs gather all the work done so far in one single document but without putting forward one solution.

The idea is to make it easier for TSOs to grasp the remaining topics, propose solutions and get the feedbacks from stakeholders.

## Topics:

- Interactions with algorithmic design;
- BRP and BSP settlement options.



# Automatic products

# One aFRR product per synchronous area

## Explanations:

Extensive discussions within the project team PPA showed that significant differences between synchronous areas are a barrier to achieving the European target in the short term. Taking into account the time constraints for implementation it's suggested whether aiming at one aFRR product per synchronous area would be more realistic to achieve.

## Proposal:

Concentrate efforts on developing one aFRR product per synchronous area.

# Summary: one aFRR product per synchronous area

	RGCE	RG Nordic	RG Baltic	RG UK	RG Ireland
Preparation period	<= 30 s (SOGL: aFRR providing unit or FRR providing group for automatic FRR shall have an automatic FRR activation delay of at most 30 seconds)				
Ramping period	Not relevant				
Full activation time	5 minutes or 7.5 minutes	5 minutes	Not applicable	? (5 minutes)	? (5 minutes)
Minimum quantity	1 MW				
Maximum quantity	9999 MW				
Minimum duration of delivery period	Not relevant				
Maximum duration of delivery period	Not relevant				
Validity period	15 minutes, 1 hour, and 4 hours	1 hour	Not applicable	? (1 hour)	? (4 hours)

# Beyond automatic standard products : other aspects

## Explanations:

Regarding the other aspects, TSOs were not able to put forward a best option. Therefore the project team PPA did its best to list and compare the existing options.

This has been done for:

- The balancing gate closure time;
- The control signal sent to BSPs: FAT product versus setpoint product;
- The control concept : control demand, control request or control target;
- The activation principle: pure merit order activation vs deviations from a pure merit order activation.

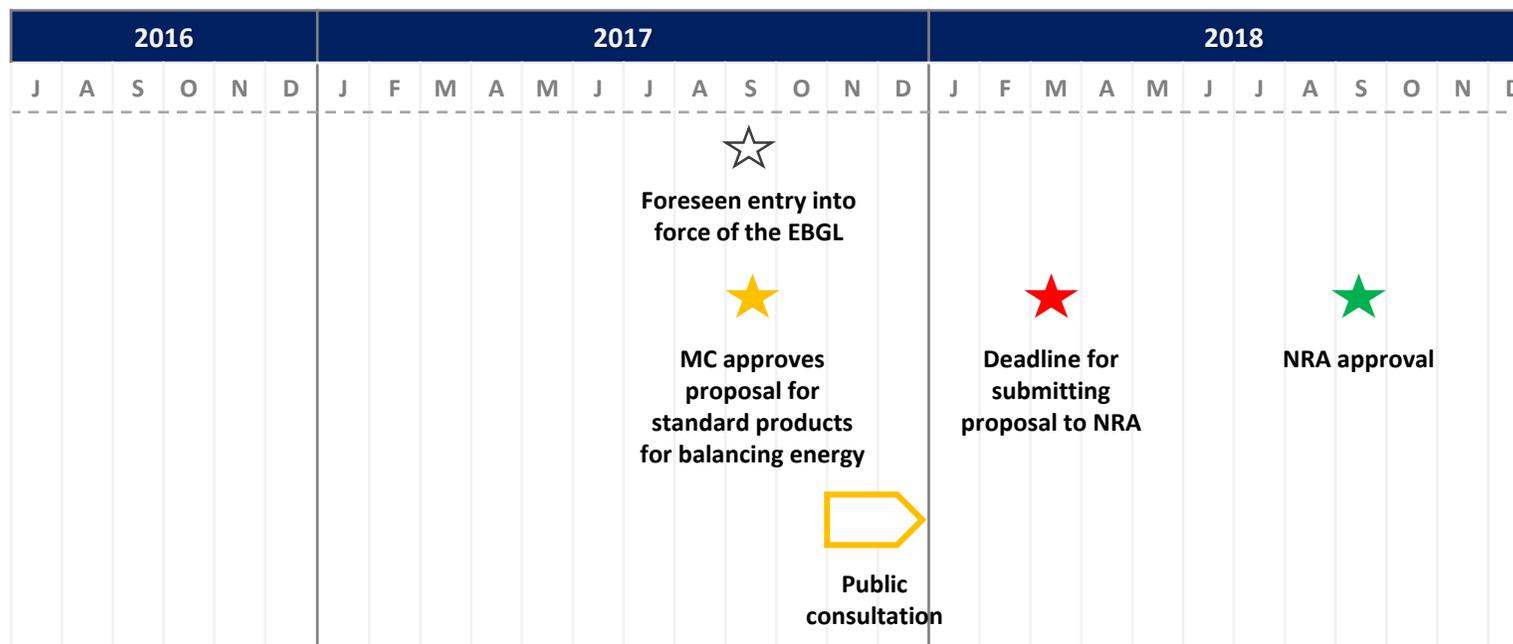
It's proposed to detail the evaluation of the criteria affecting technical issues.



# Next steps

# High level implementation plan

The following deadlines are subject to future evolutions of the content of the guideline on electricity balancing and of its date of entry into force.





# Appendices

# MANUAL PRODUCTS

# 1. Combination 15 and 10 min FAT mFRR products

## Why should the two mFRR products with different FATs (10 and 15 min) be merged?

- Reduce number of products
- Avoid TTRF discussion (if FAT smaller than ~13 min)
- TSOs wouldn't have to implement a product which they don't want to use
- FATs of 10 and 15 min are quite similar

## How should they be merged?

- There are different options which were compared based on criteria

Option / Criterion	Level playing field	Liquidity	Effort implementation	Certainty of fulfilling TTRF requirements given the two possible interpretations (1 or 2)	Shorter GCT	Reduce ACE (faster reaction BSPs and deviations to XB exchange)	sum
Option 1: 15 min FAT	1	1	0	0	-1	0	0,17
Option 2: FAT around 12.5 min	1	-1	-1	1	0	1	0,17
Option 3: Different FATs - one XB exchange	-1	0	1	1	-1	0	0,00

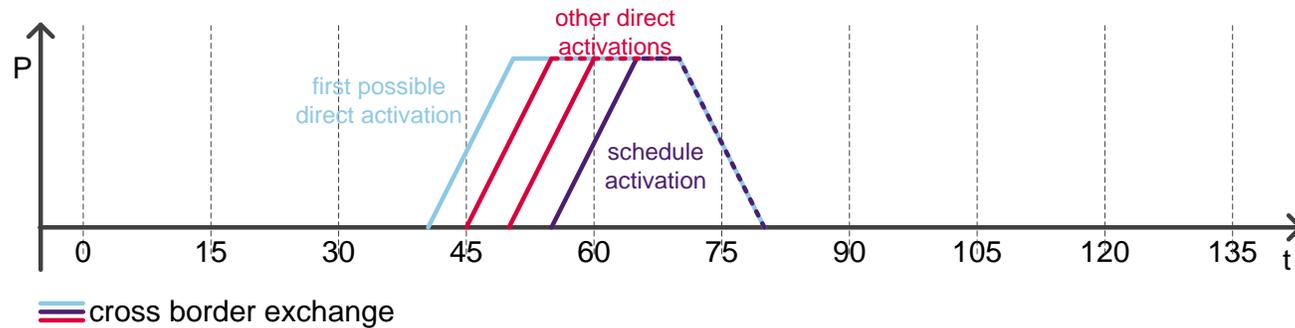
## What was the outcome of the work conducted between TSOs?

- The work showed that there is no preferred option.
- It was proposed to detail the evaluation of the criteria affecting technical issues, since the decision about the probably only mFRR product in Europe should be based on a more detailed analysis. By this the TTRF issue could be solved as well.

## 2. Shape cross border exchange merged mFRR and RR product

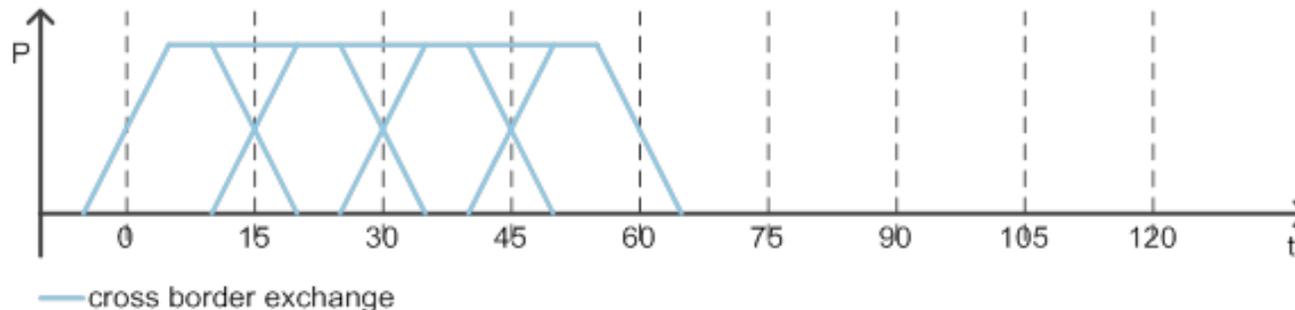
### How should the shape for the merged mFRR product look like?

- It was said, that a 10 min ramp is accepted. Nevertheless the definition of the cross border exchange can be adapted in the future based e.g. on the observed behavior of the BSPs.
- The merged mFRR product can be direct and schedule activated.



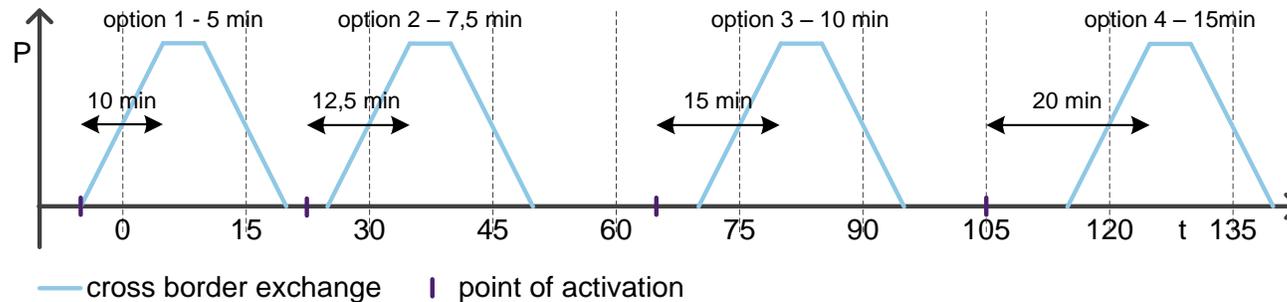
### How should the shape for the RR (Terre) project look like?

- The shape was defined in the Terre project.
- Activations can last for 15, 30, 45 and 60 min



### 3. When shall the point of activation be for the merged mFRR product ?

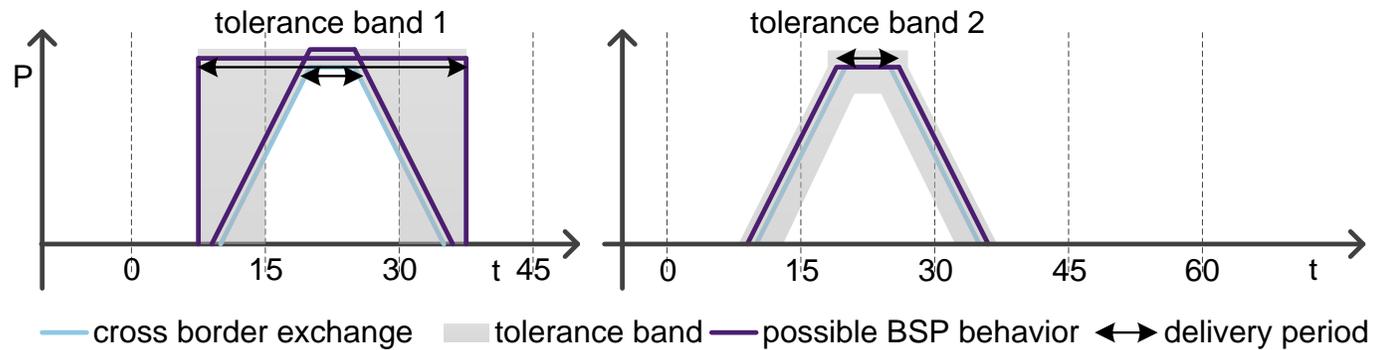
- The point of activation is the point in time when the BSP gets the activation request
- The point of activation depends on the shape of the cross border exchange
- There are different options which were compared based on a schedule activation
- Some criteria depend on the FAT of the merged product. Therefore the proposal should be made after fixing the FAT.



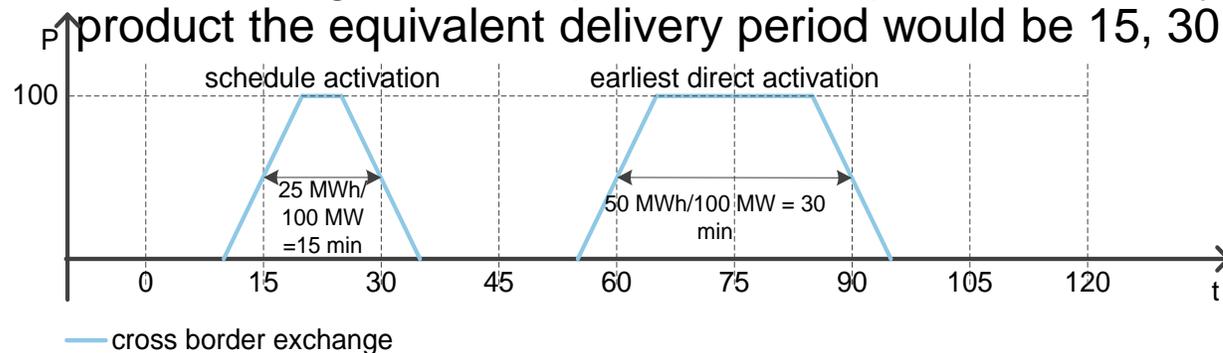
option / criterion	Volume of energy delivered within main ISP (BSP ramping > 10 min)	fast delivery	Shorter GCT	Reduce ACE (deviation from cross border exchange for BSP ramping > 10 min)	reduce risks of counteractions	available time for BSPs	sum
Option 1: 5 min	-1	1	1	-1	1	-1	0,00
Option 2: 7,5 min	1	0	0	1	0	0	0,33
Option 3: 10 min	1	-1	-1	1	-1	1	0,00
Option 4: 15 min	1	-2	-2	1	-2	2	-0,33

## 4. Do we need a delivery period?

- Definition (SO GL): It means the minimum (maximum) time period of delivery during which the BSP delivers the full requested change of power in-feed or withdrawals to the system.
- The problem is, that the delivery period depends on the tolerance band and there will not be a global tolerance band valid for all TSOs respectively all BSPs.

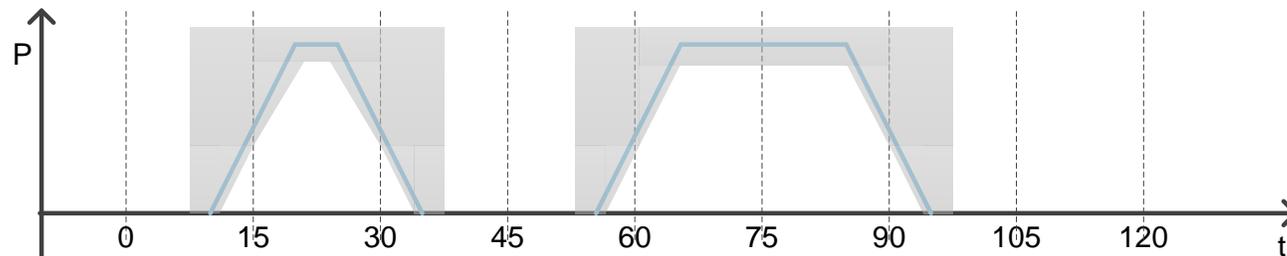


- It is proposed to use the equivalent delivery period, which is defined as the length in time of the TSO's energy request. It is obtained by dividing the energy which is requested by the TSO by the maximum power which is requested.
- For the merged mFRR product the equivalent delivery period varies between 15 and 30 min and for the RR product the equivalent delivery period would be 15, 30, 45 and 60 min.

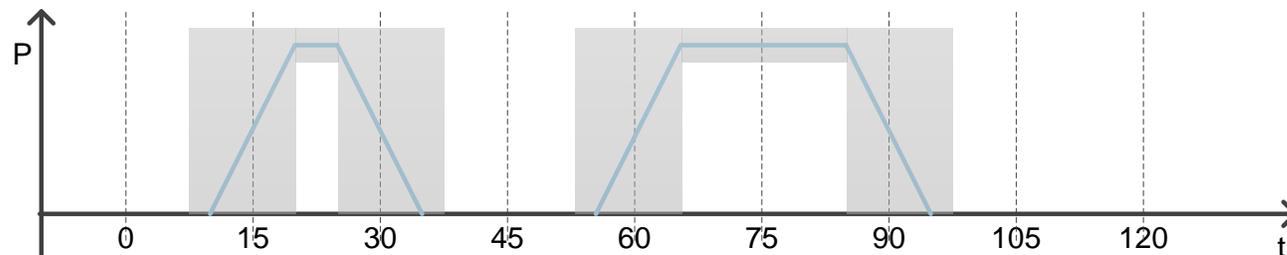


## 5. What do we expect from BSPs (merged mFRR product)?

- There is no need for a global tolerance band. Moreover a global tolerance band doesn't seem appropriate, since some TSOs will have stricter requirements than others.
- Moreover a strict tolerance band needs a strict monitoring too.
- The tolerance band should be aligned with the incentives given to the BSPs (BRP adjustment, BSP settlement).
- The figure shows different examples for tolerance bands. A delivery following the shape of the cross border exchange is considered as a perfect delivery.



— cross border exchange    ■ tolerance band



— cross border exchange    ■ tolerance band

# AUTOMATIC PRODUCTS

# 1. One aFRR product per synchronous area

## A. Background

Extensive discussions within the project team PPA showed that significant differences between synchronous areas are a barrier to achieving the European target in the short term. Taking into account the time constraints for implementation it is suggested whether aiming at one aFRR product per synchronous area would be more realistic to achieve.

## B. Options

- a) One aFRR product for Europe
- b) One aFRR product per synchronous area

## C. Analysis

One aFRR product for Europe

- + High liquidity
- It requires high harmonisation level
- More complex implementation
- Uncertainty in feasibility within timescale

One aFRR product per synchronous area

- + Trade-off between liquidity and specific aFRR needs
- + Step-by-step approach
- Lower liquidity

## D. Proposal

Concentrate efforts on developing one aFRR product per synchronous area.

## 2. Validity period

### A. Background

According to the EB GL, validity period is defined as the time period when the balancing energy bid offered by the BSP can be activated, whereas all the characteristics of the product are respected. The validity period can be also understood as the time period during which the merit order list is unchanged. Currently, TSOs use validity periods ranging from one year to 15 minutes.

### B. Options

According to the survey results, over 80% of the TSOs would be in favour of a validity period shorter than four hours and almost half of the TSOs prefer a validity period of one hour.

### C. Analysis

Shorter validity period

- + May increase liquidity and market efficiency
- + Flexibility
- + Participation units with limited storage
- More complex to implement

Longer products

- + Reduce operational risks
- Overlap with ID-Markets
- Less flexibility

### D. Proposal

Options for the validity period: 4 hours, one hour or 15 Minutes.

## 3. Balancing Gate Closure Time

### A. Background

According to the EB GL, balancing energy gate closure time is defined as the point in time when submission or update of a balancing energy bid for a standard product on a common merit order list is no longer permitted. Article 24 of the EB GL requires that this time should be as close as possible to real time, be no longer than sixty minutes before real time and ensure sufficient time for the necessary balancing processes. Pursuant to Articles 27 and 24(5) each TSO applying central dispatching model shall use integrated scheduling process bids with gate closure, which may be up to 8 hours before real-time.

### B. Options

According to the work conducted, around 50% of the TSOs would be in favour of a BGCT of one hour and almost 30% prefer a shorter BGCT. However it is worth to note that about 20% of the TSOs did not provide a preference for this topic.

### C. Analysis

BGCT and validity period are closely interlinked and other aspects have to be factored as well: national ID-Markets, liquidity of the short-term markets. Implementation of BGCT shorter than one hour may increase liquidity and market flexibility. Nevertheless, the operational implementation and the time needed for the balancing processes have to be considered as well. Results from the EXPLORE project suggest a common BGCT for aFRR and mFRR not prior to 30 minutes before real time.

### D. Proposal

Options for the BGCT: One hour, 45 Minutes and 15 Minutes. Take the EXPLORE results into account and eventually detail the evaluation of the criteria affecting technical issues. Integrated scheduling process gate closure time will be defined by each CDS TSO independently.

## 4. FAT product and Set-point Product

### A. Background

FAT is not the only criteria for the definition of the aFRR product. Further prequalification requirements have to be considered. Minimum ramp requirements, compliancy area and ramp limitations have a big impact on the aFRR activation.

### B. Options

FAT Product

Setpoint product

Mixture

### C. Analysis

FAT product

- + Low prequalification requirements
- + High flexibility for BSP
- + On average higher speed than prequalified FAT (in case incentivized, experience DE / AT)
- + No ramp limitation needed
- Measurement for settlement favorable

Set-point product

- + Activation equals almost requested signal
- + Requested value can be used for settlement
- Ramp limitation needed
- /+ (?) Higher prequalification requirements needed (might lead to lower liquidity)

### D. Proposal

Options for the Product: TBD.

# 5. Control demand, control request, control target

## A. Background

Different concepts for exchanging aFRR were discussed in the Explore project (control demand / request), additionally the control target concept is considered as compromise between the two concepts. Choice of the concept impacts several interconnected topics (ACE, aFRR activation, settlement, stability, technical harmonization).

## B. Options

Control demand  
Control request  
Control target

## C. Analysis

Control demand  
+ Low complexity  
+ Stability  
+ Operational experience  
+ Local responsibility (and possibility to take into account local specificity )  
- CMO deviatons  
- Impact on local ACE  
+ Implementation effort

Control request  
+ No CMO deviations  
+ No impact on local ACE  
- High complexity  
- Impact on overall ACE  
  
- Stability not proven  
- Harmonization of controllers needed

Control target  
+ No CMO deviations  
○ less impact on local ACE  
○ complexity  
+ Local responsibility  
  
- Stability not proven  
- Harmonization of controllers needed

## D. Proposal

Options for the Control concept: TBD.

## 6. Pro-rata activation vs merit order activation

### A. Background

Currently a majority of countries in Europe use pro-rata activation, which has proven to deliver high quality results in terms of restoring and maintaining the system frequency. There is concern that by moving to the merit order activation speed will decrease and geographic distribution will be limited which both may affect the frequency quality negatively.

### B. Options

Pure merit order activation

Deviations from a pure merit order activation

### C. Analysis

**Discussion still in an early stage, issue to be addressed in a more comprehensive way.**

Pure merit order activation

+ Economic efficiency

...

Deviations from a pure merit order activation

+ better response for small imbalances

...

### D. Proposal

Options for the activation scheme: TBD.

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Reliable Sustainable Connected