Counter activations in PICASSO

Overview of the options and their implications

Contents

1 Introduction

Within the PICASSO project it has been decided that counter activations within an uncongested area of reversed priced bids will not be allowed. This document contains the considerations underlying this eventual decision.

A precondition for counter activations is reverse pricing i.e. the price of a bid for upward activation is lower than the price of a bid for downward activation. As a result, the two bids could be selected for activation by the AOF and the energy production will be shifted from one unit to a cheaper one. Price reversal can occur within both a single LFC area or between LFC areas, for several reasons including:

- Inefficiencies in bidding strategies
- Price differences in previous market to the balancing market due to congestions
- Correction of imperfect optimisation in the intraday market
- Entry barriers in previous markets
- Commitments from balancing capacity markets might impact the pricing of balancing energy

The realisation of these price reversed counter activations depends on whether they are located within an LFC area or between LFC areas, and whether there is available transmission capacity to accommodate them between the LFC areas. Most TSOs currently can only activate bids in one direction within one LFC area, hence counter activations within a LFC area would be most of the time not realised, see also section 4.2. There are different perceptions of these counter activations between participating TSOs. On the one hand, activation of reverse priced bids is considered by some TSOs to be economically efficient as it generates a surplus on the platform. On the other hand, some TSOs consider it is not the role of the TSOs and thus platforms exchanging balancing energy to facilitate energy exchanges between BSPs.

Not allowing counter activation implies that all possible netting will be performed, regardless of the bid prices. Some TSOs mean that netting should only be done when it is economically beneficial.

Although in the MARI project most of the TSOs support allowing counter activations, the situation is different for MARI and for PICASSO mainly due to the different nature of exchanges and products taking place on the platform, and due to the continuous nature of aFRR activation. For this reason PICASSO intends to formulate a specific PICASSO position and decide on counter activations within the project itself.

In the following overview PICASSO EG reflects on the consequences of selecting each option, paying attention to argumentation from both perspectives. The reflection considers market aspect, technical aspects as well as legal and regulatory aspects.

2 Options

PICASSO EG discusses three options in regards to counter activations. These three options are the following:

1. No limitation of counter activations
2. Complete avoidance of counter activations within uncongested regions (netting of demands only)

3. Limiting counter activation to a certain threshold

A more detailed description of the options is given below with a common example, which is based on the following example:

Platform consists of three TSOs and respective downward offers (DO) and upward offers (UO) as described in the table below:

	aFRR demand	Available bids
TSO 1	-100 MW	BSP 1 DO 300 MW at 50€/MW
TSO 2	-100 MW	BSP 3 UO 300 MW at 40€/MW
TSO 3	+ 150 MW	BSP 2 DO 100 MW at 30€/MW

2.1 Option 1: No limitation of counter Activation

In each optimisation cycle the AOF will select a set of bids to be activated based on the principle of cost minimization, where payment to the TSO is seen as a negative cost. In certain cases, when reverse pricing is present on the merit order list, this can lead to counter activations of aFRR even within an uncongested area in a single optimization cycle under the condition that there is available transmission capacity.

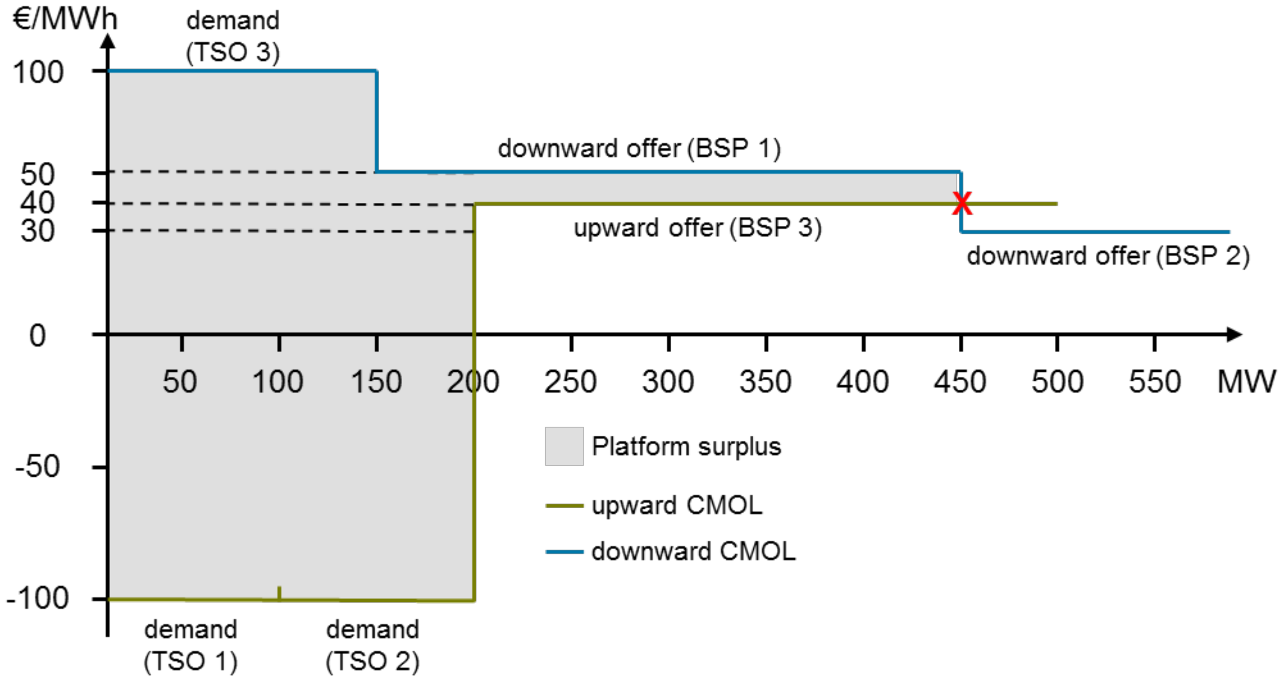

Figure 1: Example of Option 1

Counter activation happens until the intersection of the downward CMOL and the upward CMOL, where the upward CMOL includes the negative aFRR demands and the downward CMOL includes the positive aFRR demands. For illustration the aFRR demands are priced here with a price of ±100 €/MWh.

2.2 Option 2: Complete avoidance of counter activations within uncongested areas

Counter activations within an uncongested area are fully prevented. Within an optimization cycle in each uncongested area there will only be upward or only downward bids selected for activation. All TSO demands are netted as far as possible by the AOF, without regard for the aFRR bid prices and possibly lower alternative costs.

In comparison to Option 1 that means that there are fewer bids selected for activation by the AOF; all bids that are in Option 1 solely selected due to reverse pricing on the CMOL are not selected in Option 2. The result of the example for this option is shown in Figure 2. The positive aFRR demands of TSO 3 is netted with the negative aFRR demand of TSO 1 and 2. The remaining negative aFRR demand of 50 MW is covered by the partial selection of downward offer of BSP 1.

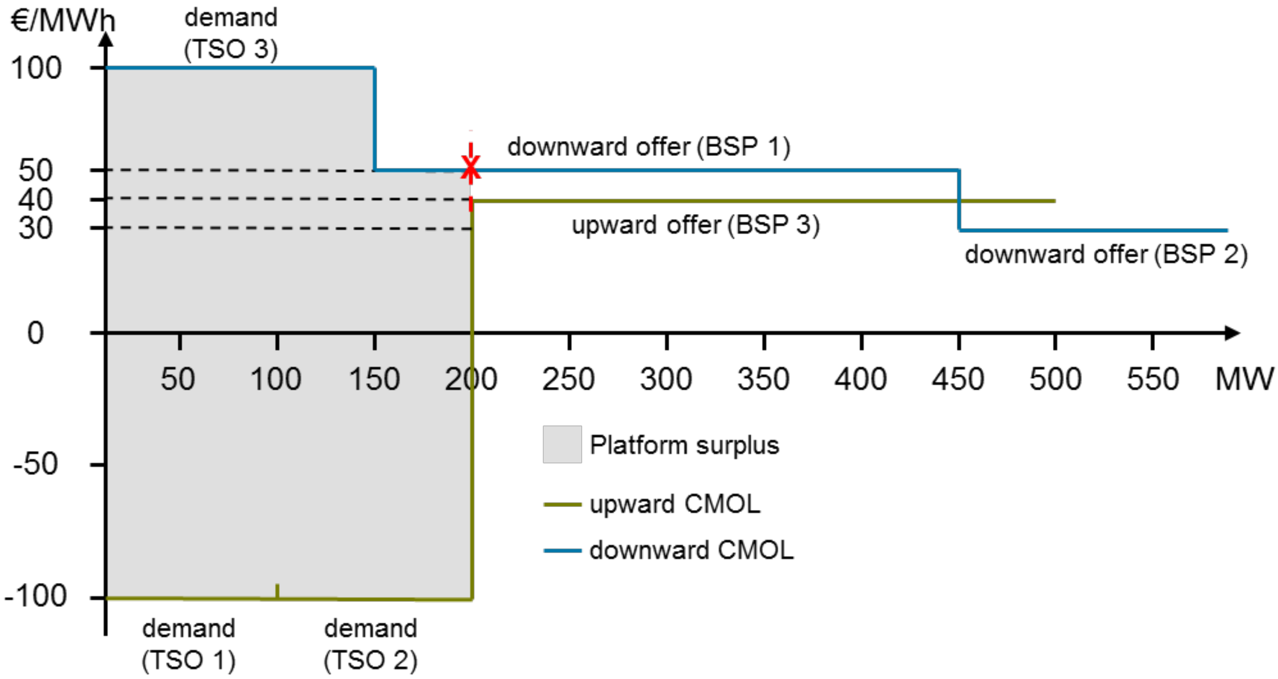

Figure 2: Example of Option 2

2.3 Option 3: Limiting counter activations to a certain threshold

In this option there is a volume based limitation on the amount of counter activations that can take place. The limit is valid for the entire platform, and is based on the maximum netted demand volume of the whole platform. The result of the example for this option is shown in Figure 3. The netted volume is 150 MW, hence the total counter activation for economic reasons is limited to 150 MW. Volume limit is based on the fact that counter activation would be a part of satisfaction of TSOs' demand. 200 MW of downward offer of BSP 1 are selected for activation. 50 MW of this selection is for covering the remaining aFRR demand and the remaining 150 MW is for counter activation of the 150 MW selection of upward offer of BSP 3.

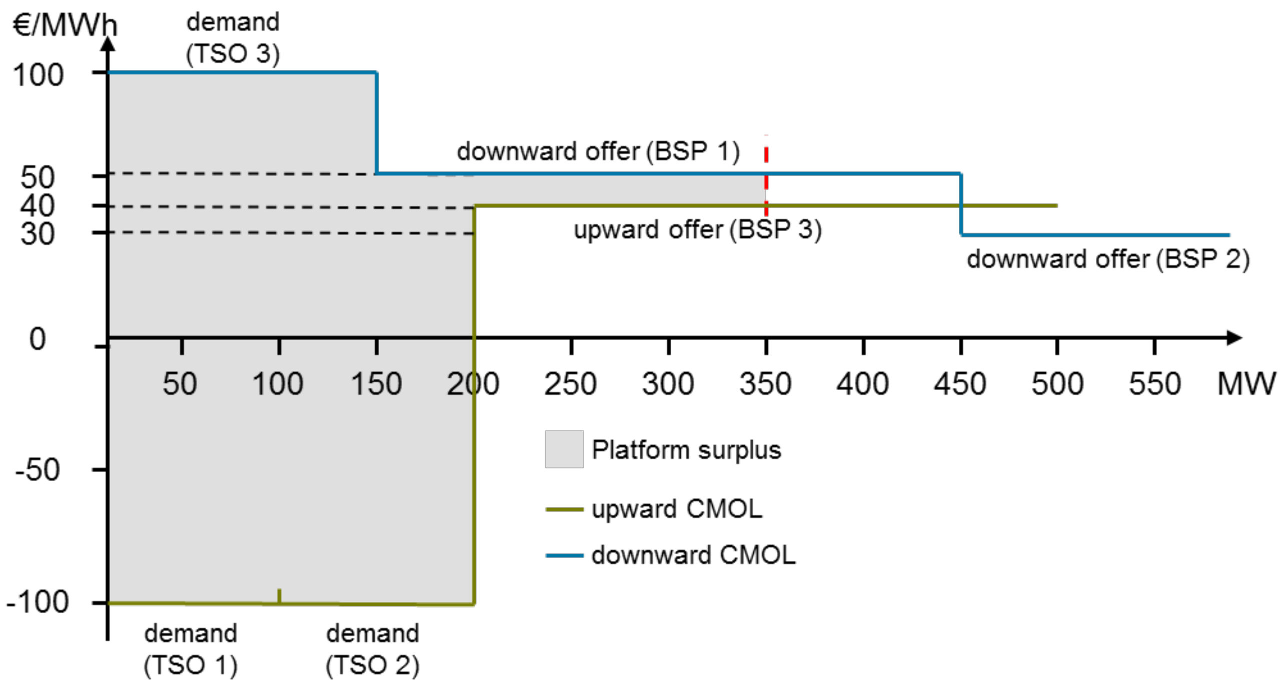

Figure 3: Example of Option 3

The difference between Option 1 and Option 3 depends on the ratio between netted volumes and volumes on the CMOL with reverse pricing. There could be a reduction in the volume of counter activations. However, since in 60 % of the time the netted volumes are expected to be higher than 500 MW, the difference between Option 1 and Option 3 could be quite limited. But, other limitations of counter activations could be defined. Figure 4 shows the ordered amount of netting and their percentage of occurrence for a simulation of one month of Continental Europe.

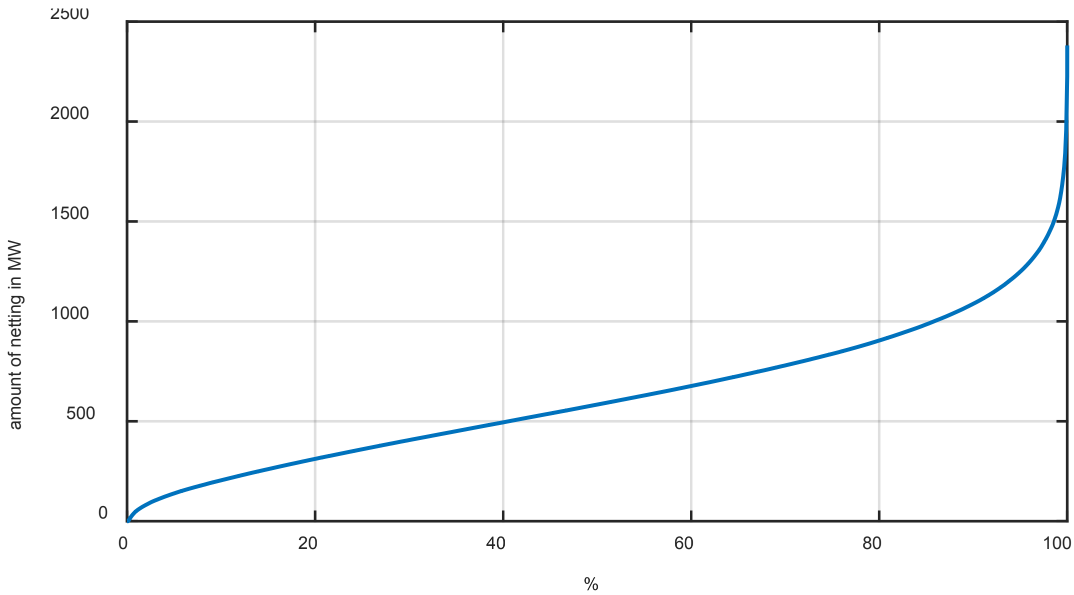

Figure 4: Ordered amount of netting based on simulation of one month for Continental Europe

3 Market considerations

PICASSO decided to use a single cross border marginal price (XBMP) for each uncongested area for the activation of bids and implicit netting of demand performed by aFRR platform. However, there are two main opposing views regarding balancing and marginal pricing:

- view A: the marginal price is defined for selected activations in both directions for each run of the algorithm or optimisation cycle.
- View B: the netted demand defines the only direction for which a price is determined for each optimisation cycle.

In case of the view A the allowance of CA (Option 1 and 3) leads to a marginal price as the intersection of the upward and downward MOLs, where the MOLs include the respective demand. In this view, every bid selected for activation in the respective uncongested area has a bid price lower or equal to the corresponding XBMP. In this view, restricting CA could lead to situations where the XBMP is higher than a bid price of a bid, which is not selected for activation as it is on the side of MOL where the demand is netted. This is seen as not intuitive and not transparent. The analysis done by N-Side for MARI had the same understanding of view A (one price per algorithm run); this marked option 2 as not transparent and not traceable.

For TSOs with the view B it is clear, that the BSP with the bid of the side of the MOL with the lower demand is not selected for activation as it does not correspond to the side of the netted demand. For this view there is for each optimisation cycle one corresponding XBMP per uncongested area. This XBMP is either valid for positive aFRR or negative aFRR depending if the netted demand is either positive or negative. By this, also solutions of option 2 are seen as intuitive and transparent to market parties.

View B is logically coupled with the option of not allowing counter activations (option 2). Combining view B with any other option naturally leads to view A since the price is defined by bids for both directions.

These main opposing views explain also the further arguments:

3.1 Pricing

3.1.1 Distribution of TSO surplus

Allowing counter activations could bring the XBMP closer to the middle between upward and downward aFRR demand leading to a better distribution of TSO surplus (note: the TSO surplus reflects the surplus of the TSOs' LFC area). This effect on prices is independent of the final volumes to be activated. Even in cases where counter activations take place within the same LFC area and some bids will finally not be activated, there is still a positive effect on prices that converge close to the middle point between the two directions.

Important note: In the Figure 5 below, the new XBMP is still acceptable by all BSPs as it does not lead to any losses.

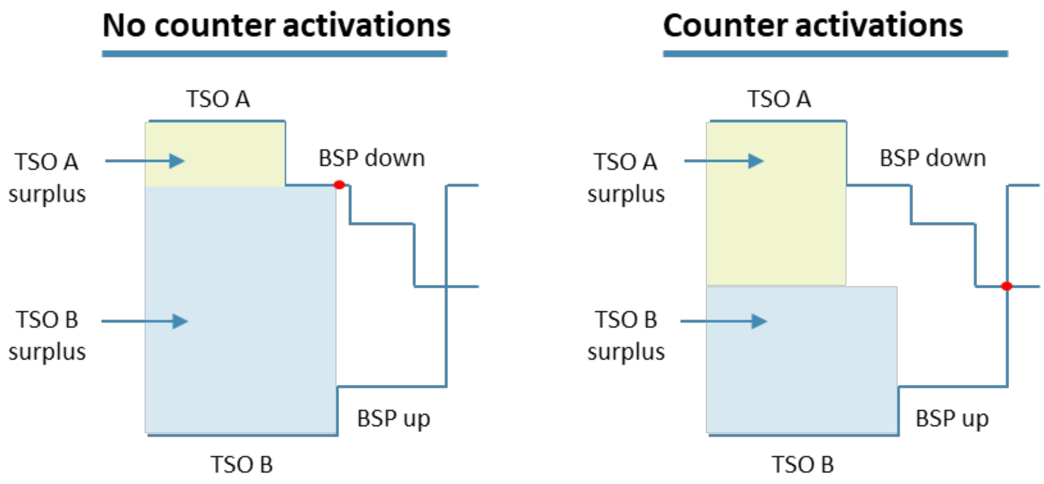

Figure 5: Effect of counter activations on distribution of TSO surplus

3.1.2 Mark-ups

TSOs in favour of options 1 and 3 fear that the non-intuitive rejection of bids with lower price than the marginal price might either lead to mark-ups or reduction of the available volume (a BSP often being rejected although his bids are below the marginal price may decide to offer its volume to other markets instead)

Other TSOs do not share this fear as it is not clear how a BSP could gain anything by putting mark-ups for such cases and by this do not think that not allowing CA have an impact on the bidding behaviour of BSPs.

3.1.3 Non-monotonic behaviour of price

TSOs with the view A (described above) are of the opinion that restricting CA lead to discontinuity in the correlation between the TSO demands of an uncongested region and the corresponding price. In particular in the moment when the netted demand of the uncongested area changes its sign and by this the marginal price of the uncongested area will result into a “jump” in the price.

These TSOs believe that according to the economic theory increasing the upward TSO demands in one side within the uncongested area (keeping all other constant), the price should be equal or greater. Respectively increasing the downward TSO demands the price should be equal or lower, and by that it reflects the relevant size of needs. When there is no price reversals, i.e. potential for CA, this occurs naturally since the upward CMOL starts at a price higher than the downward CMOL, thus when downward demand is bigger than upward demand the price is equal or lower from the case when the upward demand is bigger that the downward one, i.e. the price changes monotonically.

This is not the case when there is potential for CA and this is restricted, since the price has the behaviour described in first paragraph. There could be one small and one large aFRR demand (|upward| < |downward|) and this may lead to a higher marginal price, than the case when the size of demands is opposite (|upward| > |downward|), i.e. non-monotonic behaviour. TSOs with view A consider that by allowing CA the price will naturally have a monotonic behaviour as a function of aFRR demand and by that always the resulting price will be reflective of the size of the netted aFRR demand within an uncongested area in a monotonic manner. See further examples in Annex 2.

TSOs with the view B (described above) are of the opinion that these are two different products and hence, two different prices which could not be compared. Thus, a continuity in the relation of price and imbalance is not deemed necessary.

Additionally, they think that the price reflects always the size of the netted demand and by this gives the right signal.

3.2 BSP-to-BSP exchanges

Allowing counter activation may result in BSP bids being selected for activation without (option 1) or with only a weak link to (option 3) TSO demands. This may be seen as a BSP-to-BSP market.

Some TSOs consider allowing counter activation and thus creating a BSP-to-BSP market to be outside of the scope of TSOs. They claim that it is against the original purpose of balancing energy market, which is providing an ancillary service through activating the minimum amount of balancing energy necessary for the efficient elimination of power imbalances.

These TSOs think a BSP-to-BSP market may hinder (development of) parallel markets on a national level such as the imbalance market with freedom of dispatch and intraday markets that are open to all market participants, not just BSPs.

Some TSOs consider these BSP-to BSP exchanges to be a side-effect of the offered prices of the bids (i.e. the reverse pricing), the realisation of which is seen as necessary to have efficient pricing, see 3.1, and additionally such BSP-to-BSP exchanges may allow market participants to correct any (forecasting) errors in previous markets. Some TSOs consider that increased attractiveness of the balancing market (by allowing CA) to BSPs may result into more voluntary volume in real time, which increases operational security. On the long run increased voluntary volume available in real time, might reduce the need for pre-contracted volume of aFRR.

3.3 Economic efficiency

In case counter activations are allowed, the platform surplus is increased. This surplus is generated by the price difference between the bids for upward and downward activation when the BSP with the upward bid request a lower price for his energy than the BSP with a downward bid is willing to buy back.

In the opposite case, if counter activations are not allowed on the platform, surplus is decreased. The missing surplus will affect the BSPs with bids that are "in the money", but not selected for activation. This will also reduce the socio-economic surplus of the countries that have such bids. It may also affect other parties, depending on cost recovery arrangements in the different countries. One possibility is the imbalance price could be affected, for example in case of a weighted average imbalance price.

TSOs have differing opinions on whether allowing counter activations increases economic efficiency. This is related to a different approach towards what constitutes economic efficiency and how it is measured.

Some TSOs think that by increasing the platform surplus, the economic efficiency is increased. They see the non-matching of bids in the PICASSO timeframe as an opportunity loss that could be mitigated by the TSO. They consider that, by enabling the BSPs to shift energy production from expensive to cheaper units by activating bids through the platform according to the BSP pricing choice improves the dispatch of those units. The platform achieves this by having all the information on all the available bids including the available cross zonal capacities which is better than each BSP optimizing dispatch within its own portfolio. Their measure for economic efficiency is the platform surplus.

Other TSOs consider that market participants are responsible for ensuring an efficient dispatch and have or should have freedom of dispatch to do so within each bidding zone. These TSOs conclude that when providing proper price signals through the imbalance price, the dispatch cannot be improved through TSO intervention. On each side of the border the dispatch would be optimal on the basis of the current situation. If it were more economically efficient to upward or downward regulate a unit, the market participant would already do so in practice. TSO action can only decrease the economic efficiency. These TSOs consider a smaller activated volume of balancing energy to be a measure of economic efficiency. In the view of these TSOs, the market and TSO are active side by side in real time. It is to be noted that this market for market parties is restricted by grid constraints and adheres to borders of scheduling areas.

3.4 Effect on the imbalance price

The impact on imbalance price was not fully discussed in the EG, and is therefore not discussed in this document.

3.5 Efficient use of cross-zonal capacity

Let us consider the following example:

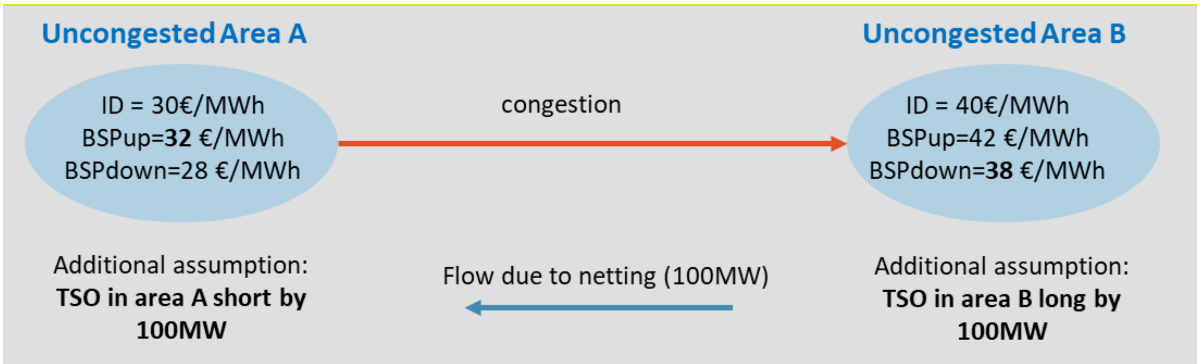

Figure 6: There was a congestion in the energy market (e.g. ID) that led to different energy prices in the two areas. However, in the balancing timeframe, due to netting of opposite TSO demands, a flow of 100 MW is observed that released the initial congestion. As a result, there is available CZC now even in the direction of the initial congestion.

Additional examples can be found in Annex 3 and Annex 4

Congestions and price differences in previous markets means that the transmission capacity on that connection has a value. This can also be a reason for having reverse pricing in the balancing market since balancing energy bid prices typically lies around the energy market price (at least for free bids. Pre-contracted bids could have a different pricing behaviour).

If the areas on each side of this connection have opposite demands in the right direction these will be netted if CA is not allowed. This will reduce the flow on the previously congested connection, and this scarce transmission capacity will not be used to move as much energy as possible. This is seen by some TSOs as inefficient use of cross-zonal capacity. Allowing CA will mean that these areas can regulate themselves in each direction and the flow can be maintained. Other TSOs see this effect as neglectable.

3.5.1 Impact on HVDC

Impact on HVDC due to allowing or restricting counter activations was not discussed in PICASSO EG.

4 Technical considerations

This chapter provides an analysis on the feasibility of the three options as well as an analysis of the impact on complexity and further technical requirements.

4.1 Feasibility and Complexity

N-side has performed analyses within MARI on the algorithmic complexity of allowing counter activations. The results are not fully applicable to PICASSO due to the absence of price elastic demand, indivisible and linked bids. It is therefore difficult to draw any conclusions from the N-side analysis in regards to PICASSO. PICASSO EG considers all three options to be technically feasible as the problem will still remain linear even after adding constrains on counter activations. It is only the performance of the algorithm that may differ.

Due to different possible ways of interaction between the IGCC and PICASSO platform it cannot clearly stated which option would lead to the most performant solution.

4.2 Counter activations within LFC area

When reverse pricing takes place on a single LFC areas merit order list, the AOF will still select these bids for counter activations, but this result will not be sent to the LFC area as only one correction value per LFC area is sent. Reverse pricing does occur on some TSOs merit order lists, which can have multiple causes. In such cases the price calculated by the AOF does not reflect the actual activation.

However, since the bids will not be finally activated, it does not have an influence on activated volumes but only on the price determination. The new price will be closer to the middle of the two price curves and is considered by some TSOs to still be acceptable to BSPs.

Some TSOs think this situation is not acceptable, some TSOs see this effect as neglectable as it will only occur rarely and it does not lead to any settlement of non-activated bids.

4.3 Activation dynamic

In PICASSO there is a mismatch between the outcome of the activation optimization function (AOF) and the volume that is really activated due the dynamics of the process. As a result, there is a discrepancy between the settled volume and the activated volumes. In case of allowing counter activations, there will be more volumes activated and as a result, this discrepancy will increase.

4.4 Interactions between IGCC and PICASSO

The effect of allowing counter activations is dependent on the interactions between IGCC or the imbalance netting function in general and PICASSO. The imbalance netting implementation framework allows pre-netting to occur within PICASSO, in which case there will be an additional netting layer in IGCC, at least as long as the geographical scopes of PICASSO and IGCC are not the same. Even when they become the same, the imbalance netting process will still take place in line with legal requirements.

In case of avoidance of counter activation (Option 2: Complete avoidance of counter activations within uncongested areas), the interaction between PICASSO and IGCC does not have an impact on the solution.

In case counter activation is allowed, the choice for the interaction between PICASSO and IGCC can impact the final solution.

Regarding counter activation there are several options possible for the interaction between PICASSO and IGCC:

A. IGCC before PICASSO
B. PICASSO before IGCC
    a) netting of previous counter activation
    b) avoid netting of previous counter activation (for all TSO or a region)
    c) Consider counter activation in the IGCC algorithm
    d) ...

In case of option A the interaction between IGCC and PICASSO is simple. After netting with all IGCC members, the aFRR optimisation determines the bids, which should be activated to satisfy the aFRR demand and the bids, which are counter activated for increasing the platform surplus. In case the netting is done before in IGCC, this heavily reduces the amount of counter activation, which would be allowed in Option 3. In case of option B, there are several sub-options possible. In sub-option B.a) all previous determined counter activation would be netted again by the IGCC algorithm. Hence, the previous allowance of counter activation would be useless.

In option B.b) a solution is sought to maintain the platform surplus of the PICASSO AOF. For example the corrected aFRR demand after PICASSO could be altered in a way that previous counter activation is excluded from the aFRR demand and by this from the netting within IGCC.

In option B.c) the IGCC algorithm considers the “platform surplus maximisation” in its objective function and by this would only net in case it is economically beneficial for the PICASSO region.

Option A and option B.a) do not bring added complexity to the algorithm, whereas option B.b) and option B.c) increase algorithm complexity and by this would have also an impact on the performance.

From algorithm perspective all of the combinations seems feasible. However, PICASSO EG cannot assess at this point, which of the combinations of allowance of counter activation and interaction between PICASSO and IGCC is the most performant combination.

The implicit netting in PICASSO uses more information and is able to do netting in a way that increases the platform surplus compared to the netting in IGCC. This can be seen as more economically efficient. If Option A is chosen most of the netting is done in IGCC and this efficiency gain is lost.

5 Legal and regulatory considerations

5.1 REMIT obligations

NRAs are currently discussing the application of REMIT in regards to persons professionally arranging transactions (PPATs) in the balancing market. REMIT considers balancing markets as wholesale energy markets and the TSOs as market participants according to ACER Guidance document[1]. Currently it is unclear if a TSO platform will be considered as persons professionally arranging transactions (PPAT), however in the ACER Guidance document, it seems to be considered as such in the example on page 58/79. Allowing a BSP-to-BSP market through the PICASSO platform may cause a risk that the PICASSO platform will be considered by NRAs as a PPAT for the purposes of the REMIT regulation (Regulation (EU) 1227/2011). Being considered a PPAT puts additional requirements on the platform, including the establishment within the platform of effective arrangements and procedures to identify market abuse[2]. If the TSOs were not considering having market surveillance procedures to detect such market abuses then it could increase implementation and operational costs. If the TSOs were considering to establish such market surveillance procedure, then there would be no additional costs.

5.2 PICASSO as imbalance netting function

Article 58.2 of EBGL describes the imbalance netting algorithm. Here it is stated that "This algorithm shall minimise the counter activation of balancing resources by performing the imbalance netting process (…)". Should PICASSO perform the imbalance netting function, this article would also apply for PICASSO.

Interpretations within PICASSO EG differ in regards to the requirements this places on PICASSO. Some TSOs consider that Art. 58.2 says that counter activations would only be allowed in case of congestions to satisfy local aFRR demand, as the imbalance netting function would be required to "minimise counter activations".

Other TSOs consider the description of imbalance netting in Art. 58.2 differently. The idea of imbalance netting is to reduce the inefficient counter activation of balancing reserves as was the case in Continental Europe before IGCC. These TSOs does not consider Art. 58.2 to be a requirement to mathematically minimize counter activation without regard for economic efficiency. We all agree that counter activation is desirable in case of congestions in the grid to cover the local aFRR demand, and we differ in opinion whether there could be other conditions that would also mean that counter activations are acceptable or desirable.

Some TSOs argue that an interpretation of Art. 58.2 as a strict legal requirement to only do counter activation in case of congestion to cover local aFRR demand is in conflict with other articles. For example article 29.1 states that "(…) each TSO shall use cost-effective balancing energy bids available for delivery (…)".

The TSOs that interpret the guidelines as a legal requirement that netting should not be prevented disagree with the argument presented in the section where counter activations as the prevention of unwanted netting is described as a possible benefit in the section 3.3.

5.3 NRA views

Views expressed by NRAs in relation to counter activations both for aFRR and mFRR have been taken into account when deciding not to allow counter activations for aFRR.

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[1] Guidance on the application of Regulation (EU) No 1227/2011 of the European Parliament and of the Council of 25 October 2011 on wholesale energy market integrity and transparency 4th Edition Updated 22- -March-2018

[2] This might be needed anyhow – still to be investigated

6 Annex 1: Illustrative example of options for counter activation

Example to illustrate the implication of Option 3 (limitation of counter activation):

- Spain is short (100 MW), Portugal is long (-100 MW)
- Hence, the limit for counter activation volume is 100 MW.
- At the same time in a different part of Europe, e.g. Greece and Bulgaria:
- Price for positive activation in Greece: 100 MW for 30 €/MWh
- Price the TSO receives for negative activation in Bulgaria: -100 MW for 40 €/MWh

The result would be for Option 3 (and Option 1)

- Spain receives 100 MW from Portugal (netting)
- Greece activates 100 MW for 30 €/MWh and exports them to Bulgaria
- Which activates -100 MW for 40 €/MWh.
- Additionally, there could even be an ATC limit of 0 from France to Spain and this would happen anyway.

From technical perspective this outcome is fine
From market perspective, different interpretation are possible

- More complex situation might be possible: with Portugal & Spain, France & Germany, etc.

For Option 2, the result would be:

- Spain receives 100 MW from Portugal (netting) only

Another example to illustrate the implication of Option 2 (no counter activation at all):

- Spain is short (150 MW), Portugal is long (-100 MW)
- Bid price for positive activation in Spain: 150 MW for 30 €/MWh
- Bid price the TSO receives for negative activation in Portugal: -100 MW for 40 €/MWh

The result would be for Option 2

- Spain receives 100 MW from Portugal (netting)
- Spain activates 50MW for 30 €/MWh to cover the remaining demand
- No activation in Portugal.

From technical perspective this outcome is fine, but from a market perspective, the results would not be socio-economically optimal and the pricing results would be:

- Portugal and Spain are netted. 100MW flows from Portugal to Spain.
- Activation in Spain sets the XB marginal price at 30€
- Portugal receives 30€ from Spain – 10€ less than if they had activated their own bids at 40€

In this particular example Portugal alone carries the socio-economic loss. A more complicated pricing scheme or cost sharing could be needed to implement and distribute this loss to all TSOs.

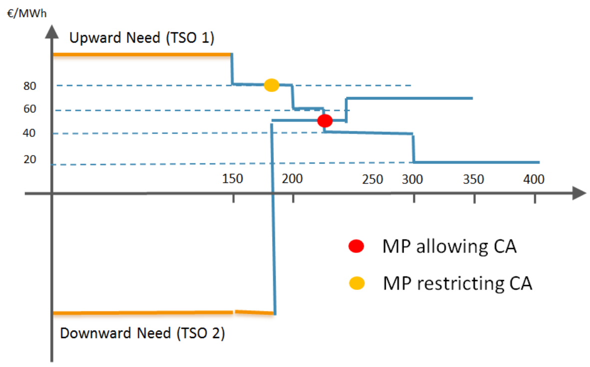
For Option 1 (and Option 3 in this case), the result would be:

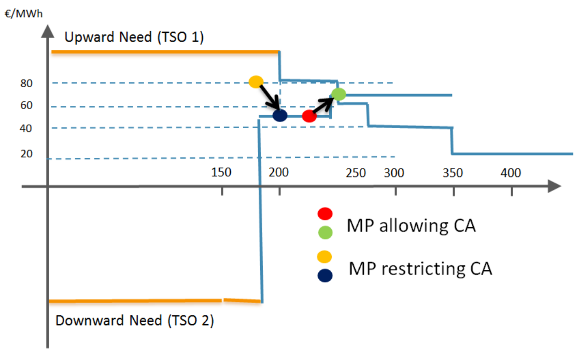
- Spain activates 150 MW with bid price 30€/MW

- Portugal activates -100MW with bid price 40€/MW
- Socio-economically optimal solution
- XB marginal price would be dependent on MOL structure and available CZC

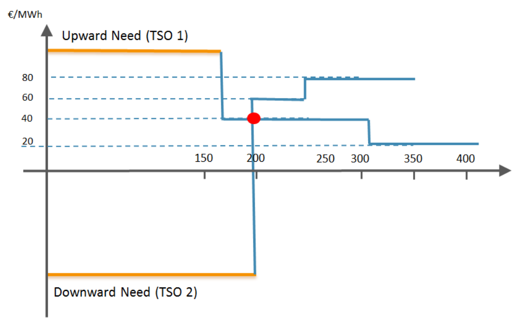
7 Annex 2: Example for non-monotonic behaviour of price

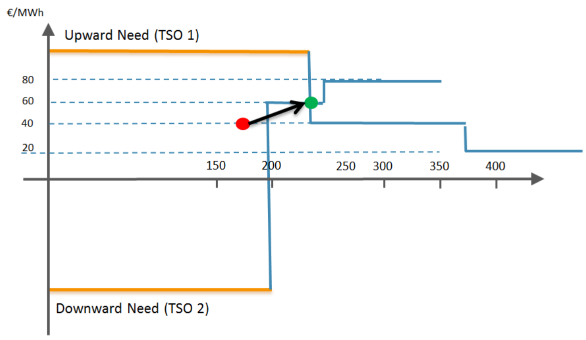
In the example below there is potential for CA based on the prices of aFRR bids. One can observe that in the scenario that the CA are allowed to be materialised, by increasing the upward demand, the marginal price increases monotonically and it actually decreases and then increases, in the scenario that the CA are restricted (non-monotonic behaviour of price). This is counterintuitive for TSOs with view A. TSOs with view B argue, that in the first case the price is valid for downward aFRR and in the second case the price is valid for upward aFRR, which are based on different CMOLs and hence do not have to be monotonic.



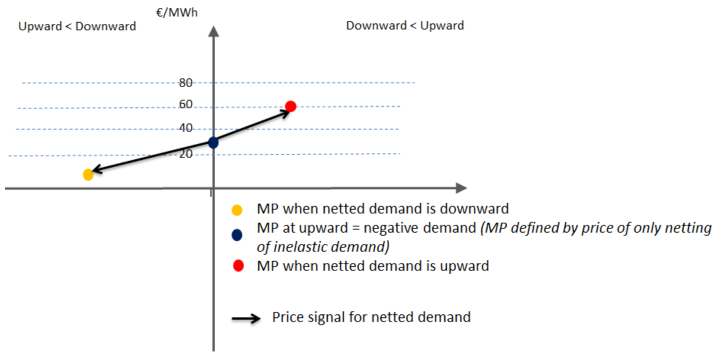


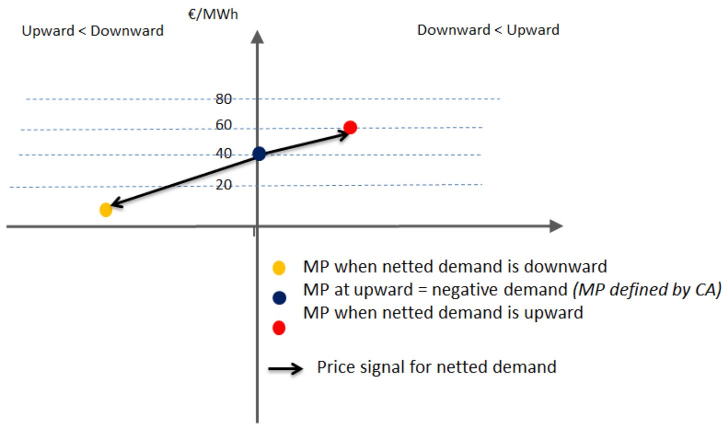
In case of no price reversals (no potential for CA), the price always increase (or remains the same) with increase of upward demand, i.e. it follows a monotonic behaviour, as it can be seen in the example below.

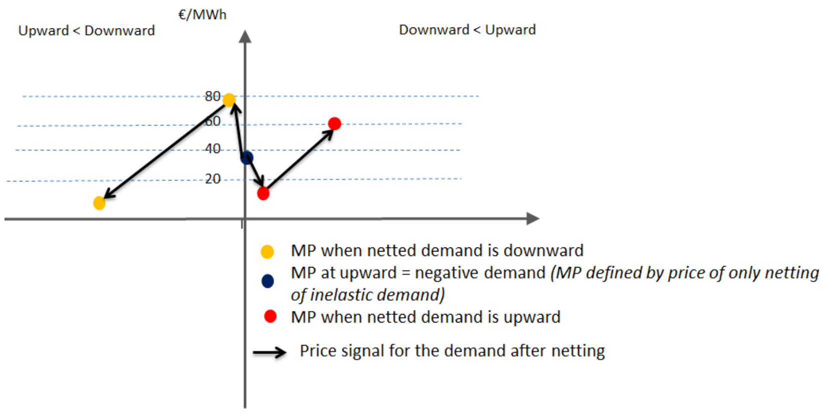




In the following figures the price as a function of the netted demand is presented, in the case without CA potential (upper), with CA potential allowed (centre) and restricted (lower):


€/MWh
Upward < Downward
Downward < Upward
80
60
40
20
MP when netted demand is downward
MP at upward = negative demand *(MP defined by price of only netting of inelastic demand)*
MP when netted demand is upward
Price signal for netted demand


€/MWh
Upward < Downward
Downward < Upward
80
60
40
20
MP when netted demand is downward
MP at upward = negative demand *(MP defined by CA)*
MP when netted demand is upward
Price signal for netted demand

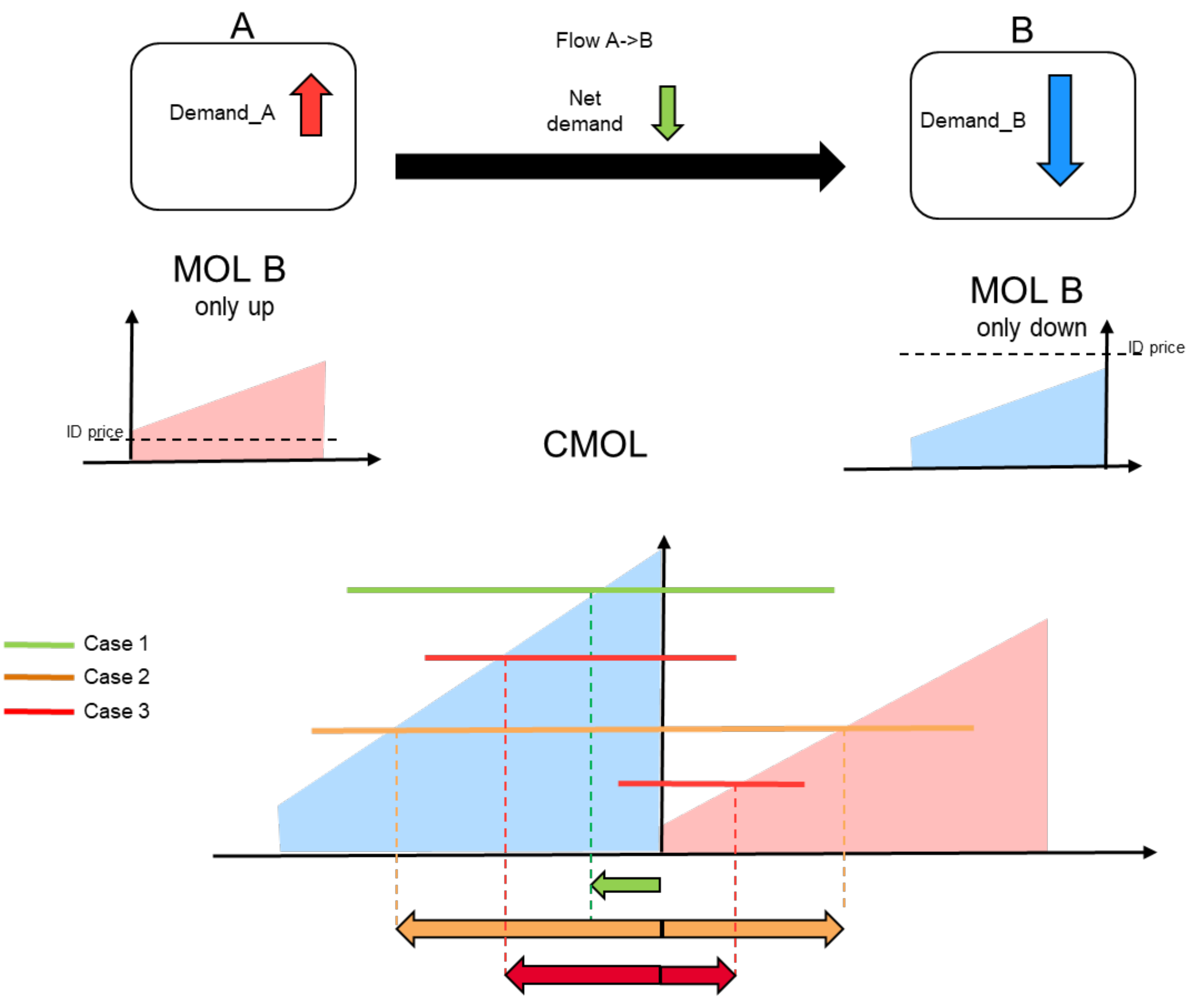

€/MWh
Upward < Downward
Downward < Upward
80
60
40
20
MP when netted demand is downward
MP at upward = negative demand *(MP defined by price of only netting of inelastic demand)*
MP when netted demand is upward
Price signal for the demand after netting

8 Annex 3: Reverse pricing between two areas

This example shows the price and flow with and without CA, and with and without congestion.

Area A is a low price area and area B is a high price area. Reverse pricing exist, and this could be because of a congestion on the line between A and B. Prices of CMOLs could also be lower than the ID market, when considering pre-contracted bids.

The example shows that if we allow CA the price will either converge or we will get a congestion also in PICASSO and the two areas will split into two separate uncongested areas with different prices.



8.1 3 scenarios

Case 1 – no CA

- Flow A->B is reduced
- Net volume is activated down in B
- Price for both areas is set by B

Case 2 – CA allowed, available ATC

- Flow increased on A->B
- Activation down in B
  > *demand_B*
- Activation up in A > *demand A*
- Price convergence of up and down bids

Case 3 – CA allowed, no available ATC

- Flow unchanged on A->B
- Congestion – two separate uncongested areas
- Activation down in B
  = demand_B
- Activation up in A
  = demand_A

9 Annex 4: Inefficient netting

Example of netting considered by some TSOs to be inefficient.

In this case there is a congestion in earlier time frames that leads to reverse pricing in the balancing markets. This examples assumes there are no pre-contracted bids with prices independent from the ID market.