



## CONSULTATION DOCUMENT

This document is intended to provide context and supporting information on the issues being considered by the Pricing Issues Modification Group (PIMG) during its assessment of Modification Proposal P74 'Single Cost-reflective Cash-out Price' and Modification Proposal P78 'Revised Definitions of System Buy Price and System Sell Price'. It is intended that this document be utilised as a basis for responding to the attached consultations on both Modification Proposal P74 and Modification Proposal P78.

It should be noted that although the consultations and this supporting document have been provided together as a consequence of Modification Proposals P74 and P78 being considered and assessed by the PIMG in parallel, they are separate, distinct Modifications. Therefore please provide responses to each consultation, enclosed as follows:

- Consultation for Modification Proposal P74 - document reference **P074AC10**
- Consultation for Modification Proposal P78 - document reference **P078AC10**

There are a number of supporting documents available on the BSC Website ([www.elexon.co.uk](http://www.elexon.co.uk)), which provide further information on the Modification Proposals, as follows:

Modification Proposal P74 - <ftp://www.elexon.co.uk/ta/modifications/modsprops/P074/P74.pdf>

Modification Proposal P74 Annex - <ftp://www.elexon.co.uk/ta/modifications/modsprops/P074/P74a.pdf>

Initial Assessment of P74 - [ftp://www.elexon.co.uk/ta/modifications/modsprops/P074/P74\\_IWA.pdf](ftp://www.elexon.co.uk/ta/modifications/modsprops/P074/P74_IWA.pdf)

Modification Proposal P78 - <ftp://www.elexon.co.uk/ta/modifications/modsprops/P078/P78.pdf>

Modification Proposal P78 Annex - <ftp://www.elexon.co.uk/ta/modifications/modsprops/P078/P78a.pdf>

Initial Assessment of P78 - [ftp://www.elexon.co.uk/ta/modifications/modsprops/P078/P78\\_IWA.pdf](ftp://www.elexon.co.uk/ta/modifications/modsprops/P078/P78_IWA.pdf)

The following section lists the assessment criteria agreed by the PIMG in their deliberations on Modification Proposals P74 and P78. The analysis required to support this assessment is provided at the end of this section for information.

## ASSESSMENT CRITERIA

Against each issue (or set of issues, as some have been grouped due to the similarity of the issues) there is a summary of the discussion and thinking to date, presented as an argument. It should be noted that there is no implication that these statements / arguments are correct or otherwise, or provide a definitive conclusion on each of the points. They are provided as a current summary of the arguments that could be / have been made. It is expected that the PIMG will develop these further to provide the basis for the Assessment Reports for Modification Proposals P74 and P78.

- 1.1 Cost-reflectivity: The extent to which system balancing actions are (reasonably) reflected in the Energy Imbalance Prices under Modification Proposal P74 and Modification Proposal P78;

Modification Proposal P78 states that cost reflectivity in terms of P78 is that "Imbalance prices are calculated from the actions National Grid has taken to balance the system and are designed to reflect the cost that the Parties have imposed on the system by being out of balance". This is a reasonable definition of cost-reflectivity in terms of the Energy Imbalance Prices and applies to Modification Proposal P74 as well as P78.

It could be considered that energy prices in the Balancing Mechanism should fairly reflect the cost of the Transmission Company's (System Operator) balancing actions (BSAD, PGBTs and BOAs) required to correct energy imbalance. Energy prices in the Balancing Mechanism incur a 'premium' for flexibility and therefore it is expected that the Energy Imbalance Prices SBP and SSP will be higher and lower, respectively, than the forwards / spot market prices (PXP), i.e.  $SBP > PXP$  and  $SSP < PXP$ .

While the Energy Imbalance Price calculation has the potential to include system balancing actions, the resulting Energy Imbalance Prices could be considered not to be cost-reflective of energy balancing. However, the differentiation between what constitutes energy as opposed to system balancing cannot be undertaken in all circumstances and the inclusion of system balancing actions in setting the Energy Imbalance Prices could be considered to be inevitable.

It could be considered that it is the extent to which system balancing actions move the Energy Imbalance Price which is the relevant criterion, not the extent to which system balancing actions pollute the cost.

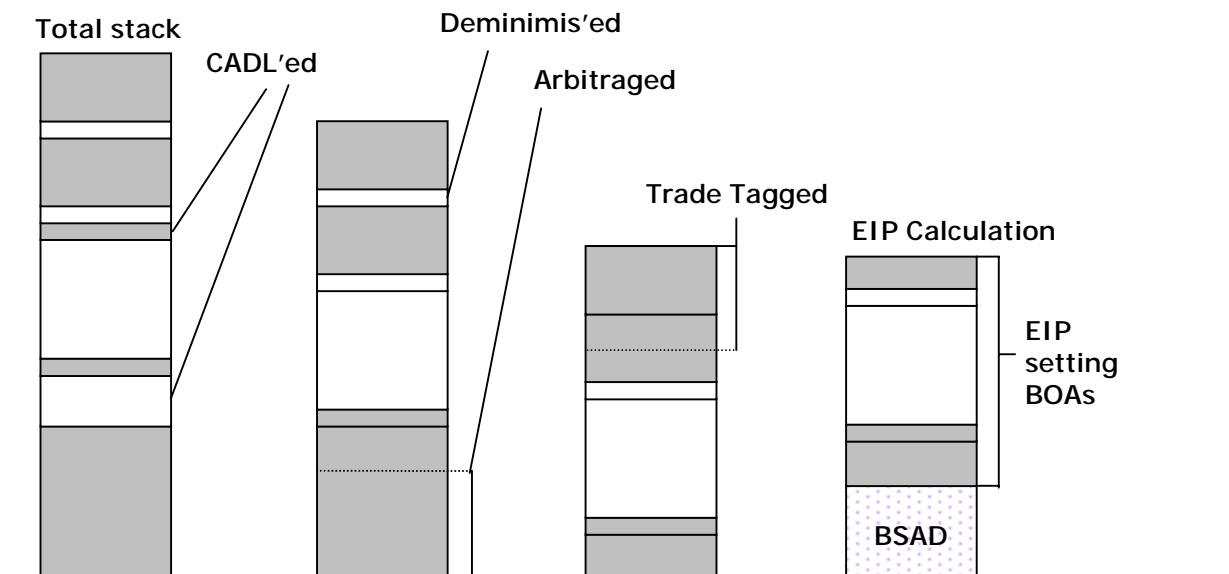
Modification Proposal P74 utilises the same mechanism as that defined currently for the calculation of the Energy Imbalance Price. Therefore the current 'tagging' of system balancing actions will be unaffected by the implementation of Modification Proposal P74. The following figure (Figure 1) shows the steps for the current mechanism, and this will be retained unchanged under Modification Proposal P74 (it should be noted that the 'reverse' stack is not included in the figure, but the same steps are undertaken on both stacks).

As Modification Proposal P74 relies on the existing calculation of Energy Imbalance Prices, it does not directly address the issue of system balancing actions included in Energy Imbalance Price setting and it could be argued that it should not, given that the current baseline has mechanisms in place for the removal of balancing actions deemed to be attributable to system balancing. On this basis it could be considered not to be relevant / appropriate to explore the detail of the current baseline, but to accept this and assess against it. It may be appropriate to determine if

changes to the current baseline give materially the same effect as either Modification Proposal P74 or P78.

In terms of Modification Proposal P74, it could be argued that a more balanced and rational market would result from the implementation of Modification Proposal P74, which would have the (second order) effect of 'damping down' system balancing actions incorporated in the Energy Imbalance Price calculations.

**Current Situation (assumes BRL used)  
 Shows larger stack**



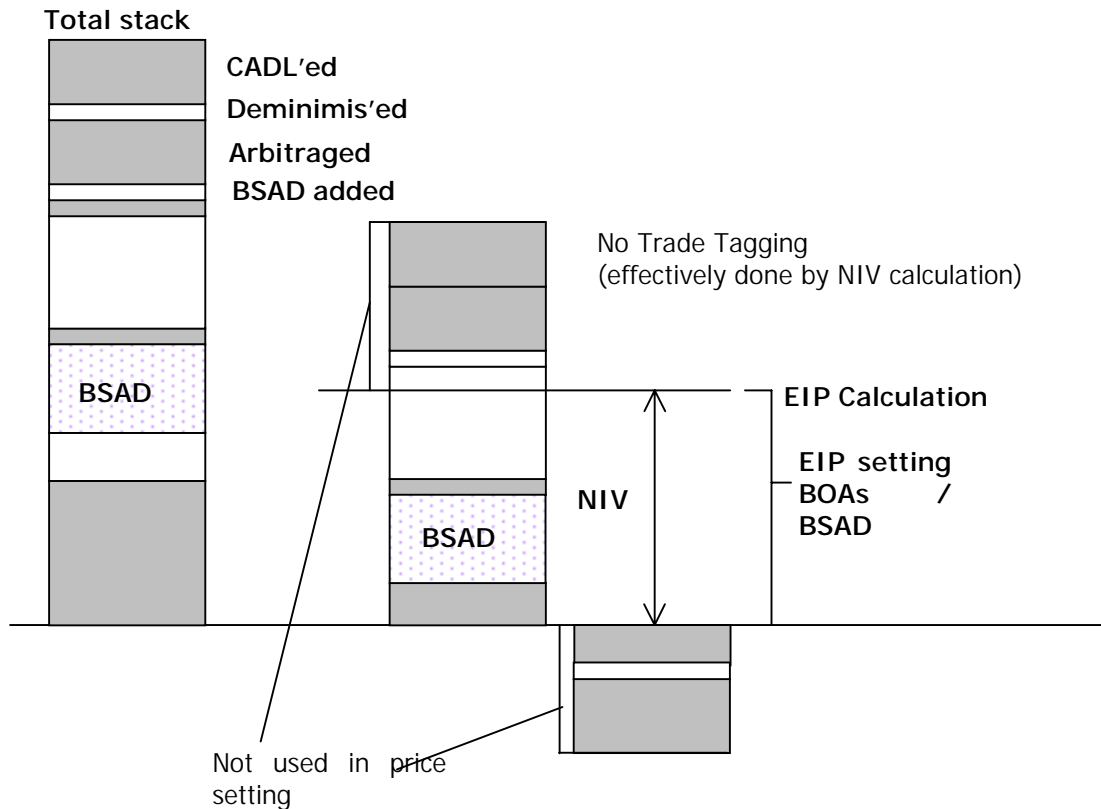
**Figure 1:** Current Energy Imbalance Price Calculation Methodology

Modification Proposal P74 utilises the existing calculation of Energy Imbalance Prices, and then applies the price associated with the larger of the two stacks, i.e. the System Buy Price, where the Offer stack was largest (and therefore the system was short), or the System Sell Price, where the Bid stack was largest (and therefore the system was long). Therefore the current mechanisms for removal of system balancing actions could be deemed to be appropriate. In terms of incorporating system balancing actions in the Energy Imbalance Price calculation, it could be argued that if the main stack is the price being utilised for cash-out, this is the least 'polluted' by system actions, on the grounds that CADL has been applied, and the stack is going with the length of the system, meaning that the effect of system actions may be 'dampened' down.

Modification Proposal P78 amends the calculation of the main Energy Imbalance Price methodology, as follows (Figure 2).

The Proposer of Modification Proposal P78 believes the methodology proposed under P78 to be relatively robust against the inclusion of system balancing actions, on the basis that the Energy Imbalance Price is calculated from those balancing actions taken to alleviate the Net Imbalance Volume (i.e. main stack less the shorter stack), and therefore this method would deem all other balancing actions to be attributable to system balancing.

**Situation for Modification Proposal P78**



**Figure 2:** Energy Imbalance Price Methodology under Modification Proposal P78.

Therefore, Modification Proposal P78 utilises a new mechanism for calculating the Energy Imbalance Price by using only those actions attributable to alleviating the Net Imbalance Volume, thus apportioning equal and opposite (volumes of) actions to system balancing.

Before the Net Imbalance Volume is created, the existing mechanism will be used to CADL out 'deemed' system balancing actions (noting that dependent upon the resolution to the definition issue identified at the end of this section 1.1, the volumes may be included in the NIV calculation, but the associated price of CADL'ed BOAs tagged out).

The approach required by Modification Proposal P78 removes the Bid - Offer Acceptances deemed to have been taken for system purposes via CADL, and then will potentially (depending upon the sizes of the stacks) remove (relatively) extremely priced Bid - Offer Acceptances, as the Bid - Offers are stacked in price order (in Figure 2, this would be indicated, on the main stack, as Offers cheapest first / at the bottom, and Bids most expensive first / at the bottom).

Therefore this approach uses the existing mechanism for removal of Bid - Offer Acceptances deemed to have been taken for system balancing (via application of CADL) and then also removes equal and opposite volumes with the more extreme (relatively) prices, to leave the actions (BOAs and BSAD (noting that the BSAD will include the volumes attributable to system actions in order to give a 'true' NIV)) attributable to alleviating the Net Imbalance Volume, and therefore deemed to have been for the purposes of energy balancing.

Both Modifications address the issue of volatile prices arising from the shorter stack (Bids when the system is short and Offers where the system is long), where low volumes in the short stack do not dampen out extremely priced Acceptances, and / or system balancing actions can still materially affect the resultant Energy Imbalance Price (as a consequence of the low volume of Acceptances). Modification Proposal P74 achieves this by applying a single price calculated from the longer stack, and Modification Proposal P78 achieves this by applying a market price (intended to reflect the cost of short-term energy).

This leads on to the issue of whether the reverse price can be considered to be cost reflective (explored in 1.4).

1.2 Any change in the level of BSUoS charges resulting from the implementation of Modification Proposals P74 or P78;

The PIMG noted that any assessment of BSUoS would be outside of the vires of the Group. However, the PIMG agreed that the effects on BSUoS from the implementation of Modification Proposal P74 / P78 should be noted in order to provide a complete view of the impacts from the Modifications.

The Transmission Company (System Operator) costs of balancing the system are recovered via Balancing Services Use of System (BSUoS) charges. Therefore it could be argued that Balancing Services Use of System (BSUoS) charges needed to be considered when assessing cost reflectivity and cost targeting, as Energy Imbalance Prices cannot be considered in isolation.

Under the current mechanism, BSUoS charges could be considered to be lower than they might be, as a consequence of the current 'long' market (effectively subsidising the System Operator, as they do not have to buy reserve). However, conversely, BSC Parties who are going 'long' are bearing the cost of acquiring that surplus energy and therefore this cost is ultimately being passed to the consumer.

It should be noted that the issue here is the allocation of the costs of holding reserve. If all the required reserve is bought by the System Operator centrally, thus providing 'centrally held insurance' for the whole system and benefiting all parties, the cost of this reserve is recovered from all parties via BSUoS, and is effectively 'competition neutral'. However, reserve resulting from a long market affects some parties more than others, as a consequence of the relative length of the parties, and this affects competition / competitiveness.

It could be argued that any material reduction in the 'long' market (which is one outcome proposed for Modification Proposal P74 (and potentially P78)) could have the effect of increasing BSUoS charges as a consequence of the increased requirement on the System Operator to buy reserve. This could be considered to be an objective of the Modification Proposals, as it places the responsibility for obtaining reserve with the Transmission Company, thus ensuring that the costs of the reserve is recovered from all parties, via BSUoS, rather than by parties going long.

Any increase in BSUoS charges could be exacerbated by the implementation of Modification P12 (Reduction of Gate Closure), as the decreased Gate Closure time places more reliance from the System Operator on Initial PNs, which can be changed up to Gate Closure and are therefore not firm, leading to the System Operator potentially holding more reserve to counter the associated

uncertainty. This effect should be noted, but is effectively an issue for Modification P12 to address.

- 1.3 Any change to Residual Cashflow Reallocation from the implementation of Modification Proposal P74 or Modification Proposal P78, and whether this is material, or a necessary side effect of the amendment to cash-out mechanism;

The Residual Cashflow Reallocation Cashflow (RCRC) is an aspect of the Energy Imbalance cash-out mechanism which could also be considered when looking at cost-reflectivity and targeting of the costs associated with Energy Imbalance.

At a high level, RCRC is the redistribution of any difference between Energy Imbalance charges and payments, levied either as a payment to, or a charge on parties. Therefore any change in the relative levels of Energy Imbalance Prices will affect the RCRC. However, this could be considered to be irrelevant, if the cash-out mechanism creates the 'correct' incentives and is sufficiently cost-reflective.

All of the Transmission Company's costs feed into BSUoS, (which itself feeds into the Transmission Company Incentive Scheme). BSUoS is then recovered from all parties, i.e. everyone pays for both system and energy balancing pro rated by metered volume. Since not all parties are liable for energy imbalance costs, RCRC seeks to recover the costs of energy imbalance from all players on the same basis that it was charged (i.e. pro rated), and then let the Settlement Calculations levy the 'correct' costs to the relevant parties.

The only measure within the BSC of the total cost of energy balancing is the total of all energy imbalance charges. Hence RCRC (or what parties have overpaid in BSUoS) is equal to Total System Energy Imbalance Cashflow (TCEI) in section T of the Code. As long as the Transmission Company is incentivised against BSUoS and BSUoS includes all of the Transmission Company's costs, RCRC will exist, in both the single and dual imbalance price worlds. This also takes into consideration the issue that a dual pricing system will tend to over-recover and that over-recovery becomes another feed into RCRC.

This is the principle behind the creation of RCRC, and there are many questions one can raise on the relationship between BSUoS, RCRC and TCEI, for example, is it safe to assume that the total cost of energy balancing is actually equal to the total of all energy imbalance charges?

Currently, with a dual Energy Imbalance Price and where BSC Party imbalance volumes change as a consequence of changes to metered volumes (at each Settlement Run), the changes in volume (primarily due to Non Half-Hourly meter readings) can have a large impact on the RCRC, as the Energy Imbalance Price spread may be high, making it unstable between Settlement Runs.

It can be asserted that Modification Proposal P74 has the potential to increase the stability of the Residual Cashflow Reallocation Cashflow (RCRC) between Settlement Runs as a consequence of the same price being applied to long and short imbalances. However, it should be noted that under Modification Proposal P74 there will potentially still be a difference between the gross imbalance payments and the System Operator costs of balancing.

- 1.4 The extent to which the single price (P74) and / or the market price (P78) can be considered to be cost-reflective of the balancing actions taken to alleviate the energy imbalance, and whether this is material, i.e. if the 'get out of imbalance price' is reflective of the cost of short – term power, this may be considered to be sufficiently cost-reflective;

Modification Proposal P74 applies a single price calculated from the longer stack to all imbalances. Modification Proposal P78 applies a main price calculated from the longer stack to imbalances in the direction of the Net Imbalance Volume and applies a market price (intended to reflect the cost of short-term energy) to all imbalances in the opposite direction to the Net Imbalance Volume.

What could be considered to be more important is the incentives that the reverse price introduces.

- 1.5 The value placed on an action (for example a Bid - Offer Acceptance or spill / top-up in the opposite or same direction to the system imbalance) by the Transmission Company (System Operator) and the extent to which the Energy Imbalance Prices under Modification Proposals P74 and P78 reflect / change this value; and
- 1.6 The extent to which the costs of (energy) balancing actions are targeted at those paying for the imbalance (noting that balancing actions are taken by the System Operator as a consequence of CVA FPN vs forecast demand, and imbalance is cashed out on a contract vs metered basis);

These two points are interrelated as a consequence of the current cash-out mechanism. The current cash-out mechanism places a 'value' on actions by 'paying as bid' for Bid - Offer Acceptances (instructed actions), and by cashing out imbalances (unnotified / notified actions, see below) at either the System Buy Price or the System Sell Price. Amendment to the application / calculation of the Energy Imbalance Price therefore has the potential to amend the 'value' placed on unnotified / notified actions, legitimately or otherwise. An assessment of the change to value is required to ensure that this does not apply 'incorrect' values to actions, thus introducing 'perverse' incentives.

With specific regards to the value placed on actions, the Transmission Company (System Operator) balances the system based upon the notified CVA FPNs and the Transmission Company Demand Forecast. Therefore in balancing the system, the System Operator has to distinguish between / account for 'known' and 'unknown' actions, and there could be considered to be a differentiation between types of action, and the associated value placed on them by the System Operator, as follows:

1. Notified action - FPN does not equal contracted volume (i.e. spill or top-up in terms of imbalance cash-out), but FPN adhered to;
2. Unnotified action - FPN does not equal actual metered volume; and
3. Instructed action - System Operator instructed the action and a Bid - Offer Acceptance is made.

The System Operator has no concept of 'notified action' as the System Operator has no sight of the contract position. Therefore in this case the participant has spilt / topped-up in terms of the imbalance cash-out, but not in terms of the System Operator, as the FPN was adhered to. Only

the unnotified action is of interest to the System Operator (as they influence the balancing actions taken) and it could be argued that these have materially less value to the System Operator than available Bid - Offers, as the Bid - Offer Acceptance is providing 'shape' and is therefore valued higher as it enables the System Operator to meeting intra half hour effects.

It could also be argued that there are other types of 'help', for example, in a long system a generator may declare an FPN considerably lower than its contract position in order to assist the balancing of the system and negate the need for the System Operator to Bid back. However, the current cash-out mechanism disincentivises this 'assistance'. It could be argued that a more reasonable / rational reverse price (a postulated outcome of both Modification Proposals P74 and P78) may incentivise this sort of 'help'. However, conversely, if Modification Proposals P74 and P78 incentivise balance, then there may be less requirement for this sort of action.

It could be argued that both Modifications incentivise Parties to balance the system. The contractual position of a trader has no effect on the overall balance of the system unless those contracts are directly linked to a physical asset.

The Transmission Company states the following in its document supporting Modification Proposal P78 "Whilst it can be argued that those who spill onto a short system, or shortfall against a long system are helping to balance the system, it has a much lower value to the System Operator than a Bid or Offer that is made available and then delivered on request. P78 reflects this difference by paying Bids and Offers at their asking price but paying market price to those whose errors happen to reduce the net system imbalance. This is a measured approach that avoids penalising those whose errors are not causing an energy imbalance problem, but does not pay a premium price that will encourage participants to spill rather than sell their output pre Gate Closure." This statement could be considered to be applicable to Modification Proposal P74, as it levies a reverse price similar in intent.

The Proposer (NGC) asserts that a feature of Modification Proposal P78 is to avoid incentivising unnotified actions (i.e. non adherence to FPN). This is to be achieved by cashing out spill / top-up (opposite to the Net Imbalance Volume) at the market price, effectively providing no benefit over contracting ahead of time (although it could be argued that parties receive a benefit in risk management by over-contracting under the current arrangements).

Where the issues documented at 1.5 and 1.6 significantly interrelate is the targeting of the costs of managing energy imbalance to those in energy imbalance, via energy imbalance cash-out. The levying of the SBP or SSP onto imbalance volumes effectively places a value on these imbalances. At a theoretical level, imbalance energy is expected to be valued such that energy is sold at a lower price than the spot /forwards markets and bought at a higher price than spot / forwards markets in order to reflect the costs of energy balancing at short notice (i.e. in the balancing mechanism), with the consequential effect of incentivising contracting ahead of Gate Closure for energy requirements.

Assuming in the case of the unnotified action that the contracted volume was equal to FPN, the imbalance cash-out would be the same for the notified action as for the unnotified action, for example:



- Generator meters 200 MW - FPN = 200, Contract = 100, cashed out at SSP for 100 MW;
- Generator meters 200 MW - FPN = 100, contract = 100, cashed out at SSP for 100 MW.

Currently the energy balancing costs are based on FPN vs. metered imbalances, and then allocated according to metered vs. contract volume imbalances, thus creating two seemingly separate mechanisms and not differentiating, in terms of value to the System Operator, between adherence and non adherence to FPN.

This approach potentially leads to the following inconsistencies:

- An accurate IPN / FPN, but no / different contracted volume, is handled easily by the System Operator. However, where there is an IPN / FPN and late imbalance (non-adherence to FPN), this causes the System Operator a problem and may potentially cause the System Operator to do more in 'corrective balancing actions'. Therefore these two scenarios have different system effects and system loads, but are cashed out at the same price; and
- A participant contracting against their position, which has an inherent forecasting error - if they contract to the 'short end' / middle of the error, and go short then SBP is levied, however, if they contract to the 'long' end of the error, then SSP is levied. However, the System Operator has taken the same actions to address the error and the cost imposed on the system by the party is the same.

Therefore it could be concluded that the cost of managing the error is absolute, regardless of the contract volume and this should be reflected in the Energy Imbalance Prices levied on parties in imbalance, which could / should, in turn, reflect the value of that imbalance to the System Operator.

With specific regards to cost targeting, responses to the small generator review undertaken by Ofgem indicated that the current arrangements were thought by some to be discriminatory as a consequence of the risk of exposure to "high" System Buy Prices. It could be considered that unpredictable players impose a cost on the system by such unpredictability, and therefore such costs should be targeted at them, although this might be viewed by some to be "penal" (as highlighted in responses to the small generator review), it could be considered to be correct cost targeting (it should be noted that Modification Proposal P74 would potentially reduce the differential between large portfolio players (where imbalance over all BM Units is netted off) and single / smaller players as a consequence of the single price cash-out).

A converse argument could be made, in that where a generator trips (post Gate Closure), rectifying actions taken by the Transmission Company (System Operator) may be costly and the tripped generator is exposed to a high System Buy Price. This could be considered to be correct cost targeting, as the cost of the trip is effectively placed on the tripped generator. However, other participants who are contractually short in the same Settlement Period(s) will be subjected to the same high SBP, effectively caused by the trip, and as such this might not be considered to be correctly cost targeting energy imbalance costs.

There are two consequential issues arising from this aspect of the assessment of the Modification Proposals. The first is to ensure that Parties are incentivised to offer flexibility to the System Operator via the submission of Bid - Offer data (explored at 1.7), and the second is to ensure

that parties are incentivised to notify an 'accurate' FPN which they can adhere to, rather than choosing / being incentivised to go into imbalance (explored at 1.9).

- 1.7 The extent to which the incentive to submit Bid – Offers into the Balancing Mechanism is increased / decreased by the Modification Proposals;

Paragraph 1.5 and 1.6 explore the value placed on different actions by the System Operator and it can be seen from this that the System Operator places a higher value on the submission of Bid - Offer Acceptances (whether this is a perception supported by the industry has not yet been assessed / concluded on). On this basis, it could be argued that a relatively important incentive would be to increase the submission of Bid - Offer Data into the Balancing Mechanism.

The current mechanism is considered by some to incentivise generators to hold reserve for self balancing in the event of a trip, rather than risk exposure to imbalance cash-out (SBP). Self balancing (i.e. post Gate Closure deviation from FPN in order to balance to contractual position in the event of an unexpected event, such as a generator trip) contravenes the Grid Code, but some parties believe the risk of exposure to imbalance to be significant enough to provide this incentive. Therefore such parties holding reserve for self balancing may not submit Bid - Offers to the System Operator, as they wish to use the reserve for their own purposes, rather than for making themselves competitive in the Balancing Mechanism for the Acceptance of a Bid - Offer.

Parties are not choosing to self balance post Gate Closure (as the Transmission Company states that the occurrence of deviation from FPN for this purpose appears to be low) but are holding reserve within their portfolio to self balance ahead of Gate Closure rather than rely on the market to provide it. In a thin short-term market this is likely to be the case, as participants do not see the value of making spare capacity available to the traded market but instead offer it to the Transmission Company in the Balancing Mechanism.

Therefore it could be argued that reducing the incentive to self balance, by reducing the perceived volatility of the System Buy Price (a postulated effect of both Modification Proposals P74 and P78), may increase Bid - Offer submissions into the Balancing Mechanism as parties may use the reserve currently held for self balancing for competition in Bid -Offer Acceptances. Conversely, it may be more efficient for parties to offer the reserve in the forwards / spot market, and as such letting the market balance the system, thus relying on the Transmission Company for residual balancing. Therefore the effect could be more complex than just volatility in the SBP, for example, an increase in the spot price raises the opportunity cost of self balancing and therefore disincentivises it, or else the potential cost of imbalance, getting market price or SSP exposure rather than always SBP exposure, may have a similar effect.

Conversely the Transmission Company investigates all deviations from FPNs (above a certain tolerance) and reports that very few instances of deviation from FPN have been the result of self balancing. So the effect is not as marked as believed, or reserve was held, but not needed.

Consideration should be given as to other factors which may be influencing the decision to submit Bid - Offer Data into the Transmission Company. This could include the perceived risks of Bid - Offer submission into the current mechanism. More power may be offered after Gate Closure as the Balancing Mechanism is less risky than trading in the short term markets.

- 1.8 The extent to which part loading plant can be considered to be inefficient and the extent to which Modification Proposal P74 / P78 has an effect on the incentive to part load;

Since the introduction of NETA there has been a rise in the amount of part loading of plant.

Modification Proposal P74 asserts that the current asymmetric risk (i.e. risk of exposure to the SBP) is incentivising generators to run a number of part loaded plant (rather than individual plants at full capacity) in order to carry their own reserve for responding to the event of a generator trip (i.e. for self-balancing). In principle, balancing action instructed by the System Operator should provide the reserve for generator trip on a more efficient basis. However, as explored at 1.7 and 1.8, there may be sufficient incentives to self balance / part load. It may also be the case that carrying reserve for self-balancing, could lead to circumstances where Grid Code obligations relating to FPNs could be breached.

It could be argued that the increase in part loading of plant under NETA cannot be attributed solely to the risk of exposure to imbalance caused by plant failure. It was proposed that there are many, varied reasons for running at part load, such as part loading to offer flexibility, to be an attractive provider of frequency response, or for providing a Bid – Offer Acceptance, as a consequence of not being centrally despatched, or not at minimum generation or full output, or as a consequence of a competitive market. Therefore it cannot be stated that Energy Imbalance Prices are the definitive factor driving part loading.

- 1.9 The extent to which Modification Proposal P74 / P78 increases / decreases (financial) incentives to deviate from Final Physical Notification (FPNs). If there is sufficient incentive to deviate, can this effect be countered, and how will this be achieved;

The obligation to submit correct information (i.e. Physical Notification (PN)) is contained within the Grid Code. However, it is recognised that there may be financial incentives for parties to contravene the Grid Code and deviate from their FPNs.

As explored in 1.7, the current mechanism is considered by some to incentivise generators to hold reserve for self balancing in the event of a trip, rather than risk exposure to imbalance cash-out (SBP). Self balancing (i.e. post Gate Closure deviation from FPN in order to balance to contractual position in the event of an unexpected event, such as a generator trip) contravenes the Grid Code, but some parties may believe the risk of exposure to imbalance to be significant enough to provide this incentive.

By mitigating / reducing the exposure to the System Buy Price, this incentive to deviate may be reduced / removed. Therefore one of the postulated effects of Modification Proposal P74 and P78 could be to reduce the risk of exposure in the event of a generator trip and thus reduce the incentive to deviate from FPN in this event. It should also be noted that the implementation of Modification P12 (reduced Gate Closure to 1 hour) effectively reduces the risk by reducing the amount of time any party is potentially exposed to imbalance as a consequence of the trip.

It should be noted that an assessment of the incentives to deviate from FPN for financial gain should be undertaken for Modification Proposals P74 and P78. As suggested in Figure 4 for Modification Proposal P74 (and potentially Modification Proposal P78, dependent upon the formulation of the market price) the incentive is to go into imbalance opposite to the overall system, where cash-out could potentially be considerably more favourable than contracting

ahead of Gate Closure (although it should be noted the risks of 'getting it wrong' could effectively remove the incentive to choose to cash-out in the Balancing Mechanism).

However, following from the above point, it should be noted that parties can (deliberately) expose themselves to imbalance without deviating from FPN (as explored in 1.5 and 1.6), and potentially without placing a load on the system, by not matching their metered output to their contracted levels (assuming that their FPN matches metered output).

Another consideration, although recognised as falling outside of the scope of the Modification Proposals, is to set the Information Imbalance Charge, thus incentivising the adherence to FPN, thus creating the link between contract levels and FPN levels (explored under paragraph 1.1).

- 1.10 The extent to which Modification Proposal P74 / P78 addresses the issues of asymmetric risk, consequential from behaviour in the current arrangements;

Energy prices are asymmetrical (i.e. there is generally a floor, but no cap for prices both in the traded markets and in the Balancing Mechanism). Where there is a dual cash-out mechanism, then it would be preferable that the buy - sell spread would be relatively consistent and low in volatility, (where there is a single cash-out then the buy - sell spread is zero and the spread itself has no volatility). Under the current trading arrangements the spread between SSP and SBP is potentially wide and volatile (largely a function of potentially high and volatile SBP). Parties manage their exposure to this asymmetry by contracting to go long ahead of Gate Closure.

Low volumes of acceptances in the shorter stack increase the impact of high priced Acceptances, and this may lead to volatility in the 'shorter' stack, i.e. the stack in the opposite direction to system length (Bids when the system is short and Offers when the system is long). Currently the shorter stack is predominantly the Offer stack, resulting in volatility of the SBP, and the associated buy - sell spread.

Participants with an unpredictable demand / generation (such as Suppliers / small (renewable) generators) can choose to take a position ahead of Gate Closure, i.e. to go either long or short, in order to manage the risk associated with potential exposure to imbalance. In the current market the level and volatility of the System Buy Price (SBP) incentivises such parties to take a (very) long position in order to manage their risk and protect from the risk of exposure to the SBP.

It could be proposed that in a 'normal' market, the choice would be to go long or short, with no real incentive either way. However, buying energy short-term could be considered to be always more risky than selling and therefore the incentive on participants, particularly low margin, low risk participants, would be to generally chose to go long in the forward contract markets. Consequentially, it could be argued that Modification Proposals P74 and P78 may only mitigate the asymmetric risk, without removing it entirely.

It should be noted that although Modification Proposal P74 implements a single price cash-out, it retains the risk of buy - sell spread by applying either the System Buy Price or the System Sell Price depending upon the system imbalance.

However, it could be argued that if the system is more balanced, again a postulated outcome of both Modification Proposals P74 and P78, then the actual outright Energy Imbalance Price

volatility may increase as a consequence of the 'thinner' Bid – Offer Acceptances, and the associated potential for more system balancing actions to influence the Energy Imbalance Price calculation, even in the longer stack. However, it could be argued that a more balanced market would increase the volume of Offer Acceptances, as there is still physical error to deal with.

- 1.11 The extent to which Parties are incentivised to physically and contractually balance the system as a whole, pre-Gate Closure, (even if individual parties are not) and the consequential effect from any change to the incentive to balance the system;
- 1.12 System stability – the extent to which the stability is affected by Modification Proposal P74 / P78; and
- 1.13 The extent to which the Modification incentivises parties to take a contractual, non-balanced position ahead of Gate Closure;

The mechanism proposed by Modification Proposal P74, effectively means that it would be advantageous for participants to go against the market, shown in figure 4. It is expected that to an extent this would also be true under Modification Proposal P78, as a market price is levied on imbalances in the opposite direction to the Net Imbalance Volume, potentially leading, depending upon the formulation of the market price, to the same effect as that noted in Figure 4.

Therefore a postulated effect of both Modification Proposal P74 and P78 is the incentive for Parties to take a position in the opposite direction to the indicated / apparent system imbalance before Gate Closure. This could lead to significant movement close to Gate Closure whilst participants are trying to forecast market length and associated cash-out price in order to go the opposite way. Therefore, parties may move the market by changing their position, leading to a flip-flop market with inherent volatility. This may lead to a period of volatility before participant strategies have evolved, and the arrangements become stable.

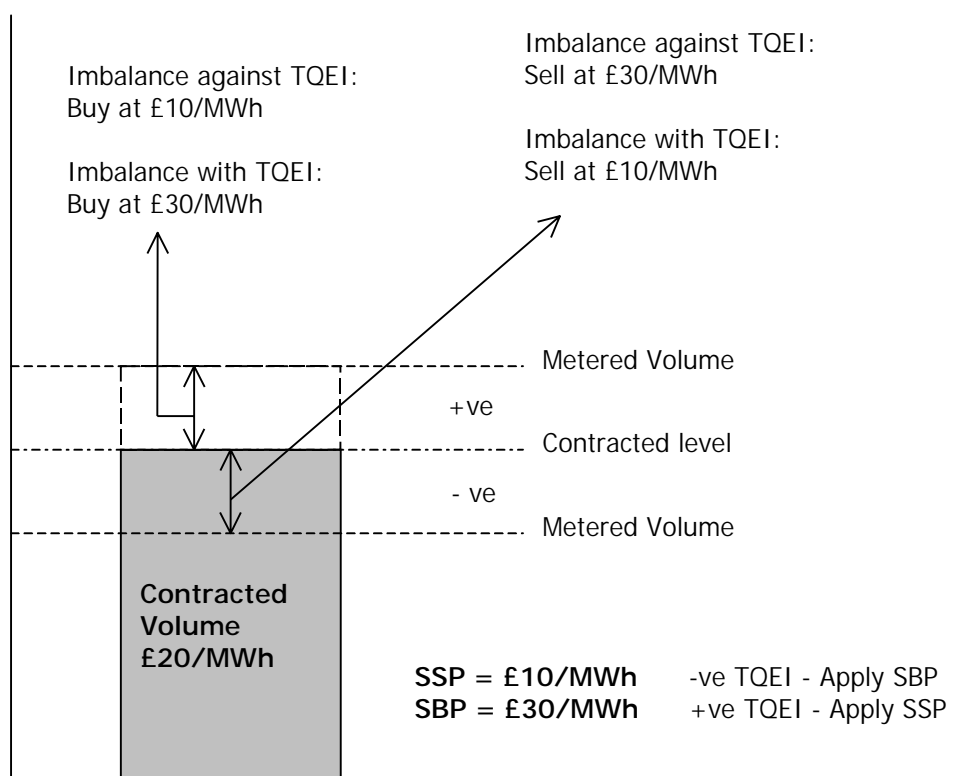
For example, a party would take a position in the opposite direction to move the market, and the rest of the market would follow, causing other parties to take the opposite position, moving the market back. Since the risks associated with 'getting it wrong' i.e. ending up with an imbalance in the same direction of the market, may outweigh the benefit of taking the risk of getting a position in the opposite direction, then it is likely that the overall incentive will be to balance individual positions. It could be argued that any (material) reduction in the risk of exposure to imbalance may lead to traders being willing to take an imbalance risk, thus potentially increasing liquidity.

The potentially increased incentive to go into imbalance in the opposite direction to the overall system under Modification Proposals P74 and P78 could lead to larger parties declaring an IPN aimed at providing signals into the market, thus affecting the perception of other participants and therefore altering the way in which they trade, in order to gain a commercial advantage. However, it is believed that sufficient FSA safeguards are in place to prevent this type of behaviour. It could also be argued that in a truly competitive market there will be little advantage to this type of behaviour.

Additionally, the incentive to trade to take an advantageous position in the Balancing Mechanism could potentially lead to an increase in frequency for PN re-declarations in the run up to Gate Closure, as parties keep their PN in step with their contract position (if this is the case), or with

their expected physical position. However, it could be argued that this is an issue introduced by a number of recent Modifications, as any change which potentially increases the level of within day trading, which a number of Modifications claim to do (P4, P12), could have the same effect.

These two factors, considered in conjunction with the increased reliance by the Transmission Company on IPNs following the implementation of Modification P12 (reduced Gate Closure to 1 hour), could lead the Transmission Company (System Operator) undertaking pre-Gate Closure balancing in anticipation of the market length indicated by IPNs, only to have to unwind them in the Balancing Mechanism. This may create instability / volatility in the Balancing Mechanism, but it could be argued that this is a 'normal' market effect.



**Figure 4:** Example Cash-out under Modification Proposal P74.

It should be noted that prior to Gate Closure parties are entitled to change any of their information and the System Operator will have an idea of market length from the FPNs held at Gate Closure. However, there may be a distinction between due and undue market activity, in that it may not be efficient for parties to trade whilst attempting to forecast the market length. Contracts for Difference (CfDs) based on the expected cash-out price could be more efficient than continually trading, especially considering the transactions costs associated with such trading. However, CfDs will mainly be relevant to a single cash-out, i.e. Modification Proposal P74.

However, taking the risk of going the opposite way to the market with the market flipping, might lead to a disadvantageous cash-out for the risk taker. It could be suggested that the risk - averse strategy would be for the individual party to try to balance as closely as possible. A consequential effect in the associated improved incentive to balance could lead to more trading in the forward and spot markets in order to trade into balance, thus improving liquidity.

Another consideration is Ofgem thinking in this area. In a number of recent Modification Authority Decision letters, Ofgem have set out their views on aspects of the trading arrangements. In particular, in the Modification P12 Authority Decision letter Ofgem stated 'The ...[trading arrangements] are designed to ensure ... incentives on participants to balance their individual trading positions'.

No definitive view has been reached on the effect of Modification Proposals P74 / P78 with regards to changing such incentives, but it will be necessary to come to a view as to whether, and to what extent, these particular incentives are retained if Modification Proposals P74 / P78 are implemented, and if such incentives are reduced / removed, what the consequences will be relative to the Applicable BSC Objectives.

- 1.14 The extent to which the costs of the System Operator are affected by any increased uncertainty in the physical position of parties;

This issue has been explored at 1.11, 1.12 and 1.13.

- 1.15 If the Modification significantly weakens the incentive of participants to balance, would this have an impact on the resultant market price levels compared to competitive market price levels; and

- 1.16 The extent to which the Modification Proposal affects the Energy Imbalance Prices, and the consequential affect of this on the prices (and therefore trading) in the traded markets;

The intent of this issue is to explore the prices resulting from Modification Proposal P74 / P78 and assess whether these are comparable to the prices expected in a competitive market, or whether behaviour and incentives introduced by the Modification Proposal have 'polluted' / 'stifled' the Energy Imbalance Prices and lead to uncompetitive prices. It should be noted that the current Energy Imbalance Prices may be 'polluted' and that Modification Proposal P74 / P78 may reduce the pollution.

Modification Proposal P74 asserts that there must be a connection between spot market (i.e. power exchange) prices and expected Energy Imbalance Prices for there to be an efficient traded market. However it could be argued that this is not the case, as a consequence of there being two separate products being traded (forwards market traded electricity and electricity traded in the Balancing Mechanism). However, it could be argued that this aspect is irrelevant.

It could be argued that spot prices will be reflective of overall market balance, not individual party balance. Therefore, if the market were to come towards balance (a proposed outcome of P74 and P78), the Balancing Mechanism may better reflect the short-term value of energy, but it might not alter prices in the spot markets if the products in the two markets were perceived to be different.

The spot market price could be considered to be the 'price of avoiding imbalance price' and so it would be expected that the spot market price will sit around the expected Energy Imbalance Prices, thus indirectly driving the power exchange prices. Thus any amendment to Energy Imbalance Prices could influence the forwards and spot market prices.

Modification Proposal P74 asserts that, as a consequence of the persistently long market, the spot prices have collapsed to close to the System Sell Price. It could be asserted that 'normally'

the length of the market would drive spot market prices up as there is an excess of demand, however, conversely, as a consequence of the market being oversupplied the prices have collapsed. However, it could be proposed that the current spot market prices are just above the marginal costs and thus it could be argued that this seems to be consistent with a competitive market.

1.17 What constitutes efficiency / inefficiency in the context of traded markets (i.e. forward and spot markets);

In the context of traded markets, inefficiency could be considered to mean lack of ability to offer risk management services across the system (by parties taking imbalance positions and assuming the imbalance risk) as a consequence of the buy - sell spread. This could be deemed to be inefficient as the only effective risk management available could be described as 'behind the meter' in the form of consolidation or portfolio risk management services. In an efficient market, relatively risk - averse parties are able to exchange / mitigate their risk exposure with parties who are less risk - averse and / or who have different risk profiles.

Consolidation services are currently available, but are offered at a premium as a consequence of the risk of exposure to imbalance (specifically SBP), thus leading to a restrictive market. It could be argued that if the buy – sell spread were to be reduced, this could increase efficiency by increasing the availability of these services and thus offering financial instruments for trading risk (for example, the use of Contracts for Difference to hedge imbalance price). As explored at 1.9, currently the majority of risk management is achieved by going long.

An additional consequence of the current length of the market is the perceived lack of a market for 'shape'. It could be argued that there is no incentive for buying shape, as the probable incentive is to buy base load disproportionately in order to go long. However, it can also be argued that this is not the case, as there is no diurnal variation in the length / shortness of the market. It is apparent that power exchange prices are markedly cheaper during off-peak hours, particularly those that are less likely to experience SBP spikes. However, the analysis presented as an annex to Modification Proposal P74 indicated that there was a pattern with certain periods having a markedly greater degree of length and this was especially the case at weekends.

However, there appears to be an assumption that trading shape is an efficient thing to do. Currently, traders will not take a short position into cash-out as it is too risky. Therefore not trading shape could be considered to be efficient now, but the question should be asked as to whether more rational Energy Imbalance Prices would lead to traders choosing to trade shape and take the risk.



- 1.18 The extent to which the Modification Proposal encourages the development of risk management products;
- 1.19 What additional types of contracts may develop as a consequence of Modification Proposal P74 / P78, and the extent to which these have an impact on competition; and
- 1.20 The extent to which incentives to contract ahead of Gate Closure (in the forwards and spot markets) are increased or decreased for the Modification Proposal;

The Proposer (NGC) asserts that a feature of Modification Proposal P78 is to avoid incentivising unnotified actions (i.e. non adherence to FPN). This is to be achieved by cashing out spill / top-up (opposite to the Net Imbalance Volume) at the market price, effectively providing no benefit to under / over contracting ahead of time. However, it could be argued that, dependent upon the definition of the market price, the unnotified actions are not subject to transaction and notification costs associated with contracting ahead of Gate Closure in the forwards and spot markets and therefore this may reduce the disincentive to go into imbalance rather than contract ahead of Gate Closure. However, it is expected that the formulation of a market price should take this into consideration.

It is a postulated effect of Modification Proposal P74 and P78 that, generally, the risk associated with exposure to imbalance would be reduced, potentially increasing the incentives of individuals to balance, thus increasing trading into balance, particularly within day trading. The reduction to the risk of exposure to imbalance may also be deemed to lead to an increased incentive to offer risk management services and, as such, more innovative risk management services may develop.

The reduction to the risk of exposure to imbalance may also be deemed to lead to increased ingenuity in contracts offered and traded and CfD's have already been mentioned (at 1.10, 1.11, 1.12 and 1.17). These may have an impact on competition / affect on the market which requires assessment to ensure that there is no detrimental impact on competition. It should be noted that it is expected that increased choice is unlikely to be detrimental to competition, for example, markets where financial trades outweigh the underlying physical activity could hardly be considered to be uncompetitive.

It could be argued that any mechanism should incentivise participants to contract ahead of Gate Closure and to balance after Gate Closure. This can be achieved by the risk of the buy – sell spread in an imbalance cash-out mechanism incentivising contracting ahead of Gate Closure. However, contracting ahead of time is typical of commodity trading, so incentives to forward contract could have an arguable effect.

Appropriate incentives to forward contract are required, but it should be noted that there is a trade off between such incentives and efficiency. For example, setting the SSP to - £1 million and the SBP to £1 million would incentivise forward contracting and balance, but could not be considered to be efficient.

- 1.21 The impact from Modification Proposal P74 / P78 on the risk profiles of different types of participant, and the consequential effect / impact on competition;

The following lists the high level types of participant:

- Small Suppliers;
- Large Suppliers;
- Licence Exemptable Generators;
- Unpredictable generators;
- Non portfolio generators;
- Portfolio generators;
- Vertically integrated players;
- Non Physical Traders; and
- Transmission Company.

The impacts from Modification Proposal P74 / P78 should be assessed.

- 1.22 The extent to which Modification Proposal P74 / P78 affects prompt price reporting and market transparency;

The industry responses to consultations undertaken in respect of Modification Proposal P18A and Modification Proposal P38 indicate the importance of accurate, prompt price reporting to parties. Therefore it is expected that the solutions to the Modification Proposals P74 /P78 will be robust with regards to the ability to report the Energy Imbalance Price(s) promptly and with a sufficient degree of accuracy.

Under Modification Proposal P78, Balancing Services Adjustment Data (BSAD) will be net reported to give a net purchase or sale pre-Gate Closure. Currently, system actions are tagged out (i.e. removed) from BSAD before it is notified and used in the Energy Imbalance Price calculation. Modification Proposal P78 proposes that volumes (but not the associated prices) of system actions be incorporated into BSAD prior to netting, in order to get a true Net Imbalance Volume.

There are potentially two concerns in this area. The first relates to the reduction in transparency resulting from reporting only a net volume and price. A preferred approach could be to incorporate the net volumes and prices in the calculation of imbalance prices and continue to report the gross BSAD figures and the new net figures separately. The second relates to the potentially spurious effect on the BSAD, and consequentially on the resultant Energy Imbalance Prices, from small volumes and high prices (the effect that Modification P3 attempted to address). However, these issues fall outside of the vires of the PIMG.

The market price proposed for Modification Proposal P78 is intended to be an Energy Imbalance Price reflective of the cost of short term energy. The expected market price would be a price derived from power exchange trading. However, the formulation of the market price will have to be such that it enables prompt price reporting.

With regards to Modification Proposal P74, it should be noted that TQEI (utilised by the Modification Proposal to derive the system imbalance) is not calculated in real time, and cannot

therefore be published promptly. Therefore it is likely that an alternative to Modification Proposal P74 will be developed that has an alternative which utilises a mechanism other than TQEI to derive the system imbalance and could be very similar to the formula proposed for P78 to establish the same thing.

- 1.23 The extent to which any Alternative Modification Proposal better facilitates achievement of the Applicable BSC Objectives than the original Modification Proposal.

The alternatives for Modification Proposal P74 / P78 should be identified and assessed.

For example, Modification Proposal P74 has an alternative which utilises a mechanism other than TQEI to derive the system imbalance, as TQEI is not calculated in real time, and cannot therefore be published promptly.

### **ANALYSIS REQUIRED TO SUPPORT THE ASSESSMENT OF MODIFICATION PROPOSALS P74 AND P78**

1. The mechanisms proposed for Modification Proposal P74 and P78 can be applied to the current Settlement BSAD and Bid - Offer Acceptance stack in order to obtain an idea of the prices resulting from these Modifications and the consequential impact on the Settlement Calculations (for example RCRC).

For Modification Proposal P78 it may be appropriate to obtain from the Transmission Company (System Operator) an assessment of the additional volumes of BSAD required for system balancing to undertake the most appropriate analysis.

For Modification Proposal P78 it may be appropriate to define an appropriate market price to enable calculation and application in the Settlement Calculations.

It should be noted that both of these Modifications will change the behaviour of Parties, however, an idea of the consequential prices resulting from the Modification Proposals will enable an assessment of the relative cost-reflectivity of each Modification Proposal (both in terms of system vs energy balancing actions in the 'main' price and in terms of the cost-reflectivity of the reserve price) and will enable additional consideration of some of the other assessment criteria detailed.

It should be noted that some analysis was undertaken to support Modification Proposal P18A, with regards to the incorporation of system balancing actions in the Energy Imbalance Price calculation. This may be useful to consider.

2. An indication of the likely Energy Imbalance Prices, as undertaken above, will enable an indicative view of the likely buy - sell spread and the likely volatility of the buy - sell spread, which will assist in an assessment of the likely incentives to balance / take a (contractual) position before Gate Closure.
3. An indication of the likely Energy Imbalance Prices will enable an assessment of the likely incentives introduced by Modification Proposal P74 / P78. Analysis of the opportunity cost of deviation from FPN may also be undertaken, i.e. if there is a value of spill far in excess of the spot price then the likely incentive is to deviate from FPN, but if the spot price is high then the incentive to spill rather than contract ahead is reduced. Similar arguments can be applied to shortfall.

4. An indication of the likely Energy Imbalance Prices will enable further analysis to be undertaken to determine if amendments to variables used in the existing Energy Imbalance Price calculation gives materially the same effect as either Modification Proposal P74 or P78.
5. An analysis of the source of imbalances can be undertaken by analysis of the composition, shape and direction of Information Imbalances for demand and generation.
6. An historical analysis of 'player behaviour' vs Energy Imbalance Price, i.e. a comparison of net imbalance volumes against Energy Imbalance Prices could be used to give an indication of likely behaviour.
7. An historical comparison of contract volume vs FPN could be used to provide an indication of whether there is a link between contracted volume and FPNs. However, this may be difficult, as FPNs are at BM Unit level (and are not mandated for all types of BM Unit) and contract volumes are at Energy Account level.
8. A historical comparison of the Total System Energy Imbalance Volume (TQEI) to the Net Imbalance Volume (NIV) could be undertaken to determine whether they are different and why.
9. The extent of self balancing reserve held could be assessed by analysis of Maximum Export Limit (MEL) vs Final Physical Notification (FPN) pre Gate Closure, to determine what level of reserve is being taken into the Balancing Mechanism by Parties.

A comparison of MEL vs actual metered volume ( $QM_{ij}$ ) could be undertaken to determine what the level of reserve is after Transmission Company (System Operator) actions.