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BSC Modification Proposal P217 'Revised Tagging Process and Calculation of Cash-out Prices

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Target audience: Generators, suppliers, customers, the system operator and other interested parties

Overview:

A modification proposal has been raised that would change the way imbalance ("cash-out") prices are calculated in the wholesale electricity market. Modification Proposal P217 was raised by RWE in October 2007 in response to concerns that cash-out prices, that are used to settle imbalances between participants' physical and contracted electricity positions, do not reflect properly the costs incurred by the System Operator in maintaining an overall energy balance on behalf of the industry. RWE stated that there are circumstances in which it remains possible for cash-out prices to be strongly influenced by system-related actions.

The proposal would also make cash-out prices more marginal by reducing the Price Average Reference (PAR) value from 500 MWh to 100 MWh. Alternative Modification P217 would retain the current 500 MWh PAR value, but is otherwise identical to P217.

We are currently minded to accept Alternative Modification P217.

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Context

The imbalance settlement or cash-out arrangements are an important part of the wholesale trading arrangements in any electricity market where companies compete to generate and supply electricity over a common transmission network. They can have a significant impact on the costs of maintaining security of supply by balancing the market, and on the competitive dynamic between companies. Complex arrangements that produce artificially high or volatile cash-out prices can act as a barrier to entry for smaller companies. They may also make it more difficult for any company, other than one of the existing large energy companies, to invest in newer or lower carbon generation technologies such as transmission connected wind, combined heat and power and distributed generation.

There have been a number of changes made to the rules used to calculate cash-out prices since the introduction of the New Electricity Trading Arrangements (NETA) in 2001.

Ofgem is very aware of the importance of effective cash-out rules to the operation of a well-functioning wholesale market. Problems with the cash-out rules harm consumers who will ultimately be exposed to the costs resulting from higher wholesale prices, contract risk premia and use of system charges. In line with one of the commitments in our Corporate Strategy, we launched the Cash-out Review in February 2007 to understand better how the current arrangements could be improved. The modification which is the subject of the Impact Assessment presented in this document relate to issues identified during this review.

Associated Documents

- P217 Modification Proposal, 'Revised Tagging Process and Calculation of Cash Out Prices'
  http://www.elexon.co.uk/documents/Change_and_Implementation/modifications/217/P217.pdf

- P217 Definition Report
  http://www.elexon.co.uk/documents/Change_and_Implementation/modifications/217/P217_Definition_Report_Documents.zip

- P217 Assessment Report
  http://www.elexon.co.uk/documents/BSC_Panel_and_Panel_Committees/BSC_Panel_Meetings_2008_-_141_-_Papers/141_05a_P217_Assessment_Report_Attachments.zip

- P217 Final Modification Report
  http://www.elexon.co.uk/documents/Change_and_Implementation/modifications/217/P217_Modification_Report_Documents.zip

- Ofgem Impact Assessment on Modification Proposals P211 and P212

http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=98&refer=Markets/WhlMkts/CompandEff/CashoutRev

- Ofgem letter deferring P211 decision
  http://www.elexon.co.uk/documents/Change_and_Implementation/modifications/211/P211_timing_decision_letter_FINAL.pdf

- Final Modification Report for Modification P211, 'Main imbalance Price based on an Ex-Post Unconstrained Schedule'
  http://www.elexon.co.uk/documents/Change_and_Implementation/modifications/211/P211_Final_Modification_Report.zip

- Decision Letter on Modification P212, ' Main imbalance price based on market reference price'
  http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=101&refer=Markets/WhlMkts/CompandEff/CashoutRev

- Decision Letter on Modification P205, 'Increase in PAR level from 100 MWh to 500 MWh'.
  http://www.ofgem.gov.uk/Markets/WhlMkts/CompandEff/CashoutRev/Documents1/15830-P205%20D.pdf

- Decision Letter on Modification P194, 'Revised Derivation of the Main Energy Imbalance Price'
  http://www.ofgem.gov.uk/Markets/WhlMkts/CompandEff/CashoutRev/Documents1/13406-P194%20D.pdf

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Summary

This document is the Impact Assessment (IA) for Modification Proposal P217 (P217) and Alternative Modification P217 (P217A). P217/P217A is the third modification raised relating to the calculation of imbalance, or cash-out, prices since Ofgem launched its Cash-out Review in February 2007. A separate IA on Modification Proposals P211 and P212[1] was published by Ofgem in December 2007. In February 2008, Ofgem issued a decision letter[2] rejecting P212 but at the same time issued a letter deferring the decision on P211[3] so that the Authority could align its decisions on P211 and P217.

RWE npower raised P217 in October 2007. The proposed modification seeks to improve the main Energy Imbalance Price calculation by introducing a methodology for identifying balancing actions that are taken to resolve transmission constraints, and replacing the price of these where they would otherwise 'pollute' the cash-out price. The other main feature of the proposal would be to make cash-out prices more marginal by reducing the Price Average Reference (PAR) value from 500 MWh to 100 MWh. P217A would retain the current 500 MWh PAR value, but is otherwise identical to P217.

The analysis presented in this IA and in the P217 Assessment Report shows clear evidence that actions taken by the System Operator (SO) to resolve system imbalances are 'polluting' cash-out prices. As a result, we estimate that the System Buy Price (SBP) when the system is short is on average 3.4% higher than a pure "energy" price, and the System Sell Price (SSP) when the system is long is on average 1.4% lower. The cost to consumers could be as high as £37m annually.

Assessment of P217/P217A

Our analysis demonstrates that the proposed flagging methodology removes the majority of constraint actions, and therefore produces a price which is more reflective of the costs of energy balancing in the vast majority of periods. We estimate that the savings for consumers could be around £19m per annum. We have some concerns about the increased complexity of calculating cash-out prices under the P217 methodology which new entrants to the market will have to invest time in fully understanding. We also consider that the procedure for removing

[1] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=98&refer=Markets/WhlMkts/CompandEff/CashoutRev
[2] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=101&refer=Markets/WhlMkts/CompandEff/CashoutRev
[3] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=101&refer=Markets/WhlMkts/CompandEff/CashoutRev

constraints is not perfect and there is a risk of unintended consequences given the associated complexity.

We believe that P217 and P217A would both further the applicable BSC Objectives by improving the economy and efficiency of the cash-out arrangments, but we are currently minded to approve P217A, leaving the PAR value unaltered at 500MWh.

In principle we are supportive of a more marginal cash-out price, as it should provide stronger incentives on parties to cover their positions. However, there is currently a discrepancy between the marginal and average cost of energy balancing actions, reflecting a large spread in the price of accepted BOAs in certain periods. As a result, aggregate imbalance charges significantly exceed the SO's balancing costs, which may be detrimental to smaller parties who typically have weaker balancing performance, and could impact competition by deterring new entry.

If P217A is approved, we plan to review the operation of the new methodology after 12 months of operation. It may be appropriate to reduce the value of PAR if we see, for example, a track record of non-polluted cash-out prices, improved access to shape and balancing energy for smaller players through increased within-day liquidity (or other mechanisms), reduced cash-out price spreads which may result from the former or an amendment to the reverse price methodology, or a combination of all of these.

We do not consider that P217A is a perfect solution. As we have stated during the course of the Cash-out Review we believe there remains scope for improving the arrangements further through improved targeting of reserve costs, reduction in the cash-out price spread and shortening of gate closure and/or extending the contract notification period.

Assessment of P211

A key issue highlighted in the RIA for P211/212 was whether reserve creation actions taken by the SO in the Balancing Mechanism (BM) should be included in the theoretical definition of “energy” balancing actions. We expressed a view that, since reserve creation actions are currently inaccurately targeted and therefore distort the cash-out price, our preference was to classify them as system actions, so that their cost is spread across all parties. On this basis, our analysis suggested that P211 would produce prices that matched closely to the cost of energy balancing. Taking into account responses to that IA and subsequent discussions and analysis, we are now of the view that it is better to include reserve creation in the theoretical definition of energy balancing, even if the costs are not correctly allocated in practice.

We believe that P211 has its merits since, in addition to removing constraints, it proposes an elegant method for separating the costs of reserve creation from the cash-out price calculation. However, since it is not currently accompanied by a proposal to re-target these costs more appropriately we are now concerned that it may underestimate the total cost of energy balancing. Hence, after further

discussion and analysis our current view is that P211 does not further the Applicable BSC Objectives and we are minded to reject.

1. Key issues and objectives

Chapter Summary

This chapter provides an introduction to the current cash-out arrangements and the modification proposal.

Question box
There are no specific questions for this chapter.

Introduction

1.1. This document is the Regulatory Impact Assessment (RIA) for Modification Proposal P217 (P217). P217 is the third modification raised relating to the calculation of imbalance prices since Ofgem launched its Cash-out Review in February 2007. A separate RIA on Modification Proposals P211 and P212[4] was published by Ofgem in December 2007. In February 2008, Ofgem issued a decision letter[5] rejecting P212 but at the same time issued a letter deferring the decision on P211[6] so that the Authority could align its decisions on P211 and P217. We include updated analysis of P211 in Appendix 2 to facilitate comparison with the results of our analysis of P217 presented in the main body of this document.

Purpose of cash-out arrangements

1.2. The current wholesale electricity market in Great Britain was created with the implementation of the British Electricity Trading and Transmission Arrangements (BETTA)[7]. Individual energy companies are primarily responsible for balancing their electricity supplies with the demand of their customers on a half-hourly basis through bilateral contracting between generators, traders, suppliers and large business consumers.

1.3. The role of physically balancing the system on a second-by-second basis is undertaken by the System Operator (SO), National Grid Electricity Transmission plc

[4] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=98&refer=Markets/WhlMkts/CompandEff/CashoutRev
[5] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=101&refer=Markets/WhlMkts/CompandEff/CashoutRev
[6] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=100&refer=Markets/WhlMkts/CompandEff/CashoutRev
[7] BETTA was introduced in April 2005 with the merging of the Scottish and England and Wales electricity markets. Prior to this, England and Wales operated under the broadly similar New Electricity Trading Arrangements (NETA) which were introduced in March 2001.

(NGET). This role has two components: 1) residual energy balancer ("energy balancing"), because for a variety of reasons including uncertainty in forecasting supply and demand companies will not usually achieve a perfect balance in each half-hour settlement period; and 2) provision of system balancing services ("system balancing"), such as frequency response, constraint management and fast reserve that are currently most cost effectively managed by a single organisation on behalf of the whole market.

1.4. The SO has two main balancing tools available: firstly, the Balancing Mechanism (BM) where energy companies and large consumers can offer spare flexibility in their generation or demand portfolios in real-time. The SO uses the BM for both energy and system balancing purposes. Secondly, the SO can contract for balancing services with energy companies and large consumers in advance, where it thinks this would lower the overall costs of energy and system balancing.

1.5. Ofgem puts in place annual commercial incentives on NGET as SO to manage and reduce the total costs of energy and system balancing through the Balancing Services Incentive Scheme (BSIS).

1.6. Cash-out prices provide important commercial incentives to companies to manage their level of imbalance or be exposed to the costs they impose on the SO to balance the system. Cash-out prices are not intended to force companies to balance. Companies can choose to be out-of-balance and will do so if they think that the cost to the SO of balancing the system is lower than the costs they would incur to balance their own position. But by reflecting the costs to the SO of energy balancing cash-out prices are designed to provide commercial incentives to maintain (or improve) reliability of generating plant over time, maintain or invest in flexible plant and maintain or improve forecasting accuracy. During periods of peak demand and/or when margins are tight cash-out prices should also signal the relative scarcity of electricity and this should encourage companies to make all generating capacity available and large business consumers to offer to receive payments to reduce their demand. The potential for suppliers to be exposed to high cash-out prices during periods of peak demand provides the incentive to contract with generators in advance to meet their customers' peak demand. Generators can potentially be exposed to high cash-out prices if they cannot meet their contracted supply, for example because of mechanical failure. This provides an incentive to maintain their plants or to contract with other plants to provide physical cover, thus maintaining the generation levels necessary to meet their contracted demand, with appropriate margin to spare.

1.7. Although the volumes of electricity settled through cash-out are low (15.5 TWh in 2007/08) compared to wholesale and contract markets (~1000 TWh/annum), the effect of cash-out prices on the market is much more significant than these figures suggest. Since the default prices for uncontracted energy consumption or production are the cash-out prices, these tend to drive prices and volatility in short term markets, which in turn impact on forward and contract markets. If cash-out prices do not accurately reflect the costs of energy balancing, this can have a knock-on effect on wholesale prices which could ultimately lead to consumers having to pay more for their electricity. The cash-out arrangements also determine the flows of

monies between competing generators and suppliers. So inappropriate rules could lead to competitive distortions and could in the longer run be detrimental to competition and consumers.

1.8. Inappropriate cash-out rules that produce cash-out prices that are unpredictable and/or unjustifiably high or volatile (for example when the overall supply and demand conditions on the system are benign) can also harm newer, lower carbon technologies. The generating output from some newer and lower carbon technologies such as renewables and combined heat and power may be less predictable/controllable than the output from more established, large scale generation such as coal and combined cycle gas turbines. Distortions in cash-out prices could put these technologies at a competitive disadvantage.

Current cash-out arrangements

1.9. The Balancing and Settlement Code (BSC) sets out, amongst other things, the ways that the SO's balancing costs are recovered from companies using the network. The direct costs that the SO incurs in energy and system balancing are charged to all BSC parties via Balancing System Use of System (BSUoS) charges that are recovered on a per MWh basis based on throughput. In addition, out-of-balance parties are exposed to cash-out prices that are designed to reflect the costs of energy balancing. The aggregated imbalance charges, termed the Residual Cashflow Reallocation Cashflow (RCRC), are rebated to all parties on a per MWh basis, offsetting the energy balancing component of BSUoS for those parties who are in balance. Hence, the net effect should be that all parties pay the costs of system balancing equally and that the costs of energy balancing are effectively recovered only from out-of-balance parties.

1.10. Cash-out operates currently under a dual price mechanism. There are two Energy Imbalance Prices: the System Buy Price (SBP) charged to short imbalances, and the System Sell Price (SSP) paid for long imbalances. There is also the concept of a "main" and "reverse" price that affects how SBP and SSP are calculated. SBP is the main price, and SSP the reverse price, when the overall system is short and vice versa when the system is long. System length is determined by the Net Imbalance Volume (NIV). The NIV is positive when the system is short overall and negative when it is long.

1.11. Further details of the current cash-out arrangement are included in Appendix 4.

1.12. Since the New Electricity Trading Arrangements (NETA) went live in March 2001 a number of modifications have been made and a number of proposed modifications rejected to the way that cash-out prices are calculated. A common theme among proposals has been concern that the rules for calculating cash-out prices did not produce prices reflecting the SO's costs of energy balancing. The most recently approved pricing modification, P205, was implemented in November 2006 and introduced the Price Average Reference (PAR) methodology (the top X MWh of the stack of actions accepted by the SO - so called "chunky marginal" pricing), for

calculating prices. A history of relevant modification proposals can be found in Appendix 4.

Cash-out Review

1.13. The Cash-out Review was launched by Ofgem in February 2007 in response to concerns raised by some participants about the current arrangements. The objective of the review is to identify a set of electricity cash-out arrangements that:

- Are simple and transparent;
- Provide appropriate economic signals and commercial incentives;
- Are non-discriminatory;
- Promote effective competition in the electricity market.

1.14. Key outputs from the Cash-out Review can be found on Ofgem's website[8].

1.15. Through the Cash-out Review, we have received a wide range of feedback from bilateral meetings with industry participants and at open industry seminars[9]. Some parties think that the current cash-out arrangements are broadly adequate and that further change is unnecessary. But a number of other parties expressed significant concerns. Most of these concerns fall into the following three areas:

- Cash-out prices designed to reflect the costs of energy imbalances are being "polluted" by the costs of the SO taking system balancing actions, such as resolving transmission constraints, in the BM;
- There is a lack of transparency in the SO's actions making cash-out prices very unpredictable;
- The arrangements are very complex and difficult to understand representing a barrier to new entrants and smaller players in the market.

1.16. In parallel with the Cash-out Review, the industry has brought forward three proposals to modify the cash-out arrangements (P211, P212 and P217). In addition, Utilita raised an issues group, "Issue 30", under the BSC to discuss some of the insights and questions summarised by Ofgem at the September 2007 industry seminar. Further details about Issue 30 can be found on Elexon's website.[10]

[8] See www.ofgem.gov.uk/Markets/WhlMkts/CompandEff/CashoutRev/Pages/CashoutRev.aspx

[9] Open industry meetings were held on 30 March 2007 and 26 September 2007.

[10] See www.elexon.co.uk/documents/issues/30/Issue_30.pdf

Modification Proposal P217

1.17. Proposed Modification P217 (herein termed P217) was raised by RWE npower in November 2007. The proposed modification seeks to improve the Main Energy Imbalance Price calculation by introducing a methodology for identifying bid/offer acceptances (BOAs) and disaggregated Balancing Services Adjustment Data (BSAD) actions that are taken to resolve transmission constraints, and replacing the price of these where they would otherwise 'pollute' cash-out price. The other main feature of the proposal is a change in the PAR value from 500 MWh to 100 MWh. Alternative Modification Proposal 217 (herein termed P217A) would retain the current 500 MWh PAR value, but is otherwise identical to P217.

1.18. The key features of P217/P217A can be summarised as follows:

- Ex-ante flagging by the System Operator of BM bids and offers that may be required to resolve transmission constraints. Flagging is the process by which the System Operator will identify prior to Gate Closure bids and offers in the Balancing Mechanism which could potentially be required for system reasons. The flagging procedure would be an entirely new part of the SO's within-day processes.
- The disaggregation of BSAD[11] (both system and energy) into individually priced actions to be included in the flagging process in the equivalent manner to BOAs.
- The inclusion of Continuous Acceptance Duration Limit (CADL) actions and Emergency Instructions in the flagging process. Under the current arrangements, actions of less than 15 minutes are tagged out and their price is excluded from the cash-out price calculation. Under P217 these CADL actions would be flagged rather than tagged and hence their price would not automatically be excluded from the cash-out price calculation.[12]
- The concept of classification, where a flagged action would retain its price if it was 'in merit'. Actions that are flagged as for a system constraint (by the SO) or CADL may also be required for energy balancing. An action is considered to be in-merit, and hence required for energy balancing, if there is at least one more expensive[13] action that has not been flagged (i.e. 'pure' energy) in its stack. The rationale for the flagged action retaining its price in this circumstance, is that it would have been required for energy balancing anyway had the constraint not existed or the sub-15 minute action not been required.

[11] Under the current arrangements, Energy BSAD is included in the cash-out price calculations as a single volume with an average price. The aggregated System BSAD volume is included (for the purposes of calculating NIV) but it is unpriced and hence the price of these actions do not influence the cash-out price.

[12] The revised CADL flagging algorithm would also resolve a known anomaly in the current CADL process. If more than one BOA is taken on a given BM Unit, the current process removes all BOAs for that BM Unit if at least one of them meets the CADL criteria. Under P217 only the BOA that meets the CADL criteria would be flagged.

[13] Higher price in the case of the Buy stack, lower in the case of the Sell stack.

- The adoption of a replacement price for flagged actions within NIV that remain unpriced following the classification process. The Replacement Price would be calculated from a volume-weighted average of the 100MWh of most expensively priced actions (highest in the case of the Buy stack, lowest in the case of the Sell stack).
- A PAR value of 100 MWh (P217) or 500 MWh (P217A)

1.19. Further details of the modification proposals can be found in the Assessment Report[14].

1.20. In its Final Modification Report[15], the Panel recommended that P217 should not be made, and that P217A should be made. The majority view of the Modification Group was that P217 would not better facilitate the achievement of the Applicable BSC Objectives (b), (c) and (d), whereas P217A would. There was a minority view of the Group that neither P217 or P217A would better facilitate the achievement of the Applicable BSC Objectives.

1.21. The Modification Group recommended an approach that would allow P217 or P217A to be implemented on 5 November 2009 if the decision by the Authority was made on or before 30 October 2008, or on 16 March 2010 if the decision was made before 25 February 2009.

Modification Proposal P211

1.22. P211 was raised by EDF Energy in April 2007. It seeks to amend the calculation of the Main Energy Imbalance Price so that when the market is short (NIV>0), SBP will be based on the least expensive offers that the SO could have utilised on an unconstrained system. Conversely, when the market is long (NIV<0), SSP will be based on the least expensive bids that the SO could have utilised on an unconstrained system. PAR tagging[16] would then be applied to the new Ex-Post Unconstrained Schedule (EPUS)[17] price stack to ensure that only the most expensive 500 MWh of submitted bids or offers are used to set the main price. The Reverse Price would be calculated in the same way as it is now.

1.23. The Panel recommended by a majority that P211 should not be made. A minority supported the view of the proposer that the modification would further Applicable BSC Objectives (b), (c) and (d). However, the majority believed that the approach would produce less cost reflective cash-out prices and would increase the

[14] http://www.elexon.co.uk/documents/Change_and_Implementation/modifications/217/P217_Assessment_Procedure_Consultation_Documents.zip
[15] http://www.elexon.co.uk/documents/Change_and_Implementation/modifications/217/P217_Modification_Report_Documents.zip
[16] See Appendix 5 and the P211 FMR for an explanation of tagging methods.
[17] See the P211 FMR for an explanation of the EPUS methodology.

cost to the SO of balancing with a detrimental effect on competition because the incentives on parties to trade out their imbalances in the forward market would be reduced. Whilst the system pollution defect was recognised for certain settlement periods[18], the majority also believed that the impact was not sufficiently material to warrant fundamental change.

1.24. Ofgem published its RIA on Proposed Modification P211 and Proposed Modification P212 in December 2007. In it we described how the case for accepting Proposed Modification P211 was finely balanced, but were minded to accept[19]. We concluded that the modification would be effective in removing the effects of constraints in cash-out prices and, on the assumption that costs associated with creating reserve are excluded from the definition, would produce prices that more accurately reflected the costs of energy balancing. However, we noted that should reserve creation costs to be included in the definition of energy balancing, P211 would significantly underestimate these costs.

1.25. Given that P217 was still in progress and mindful that the reserve creation issue was not clear cut, we decided to delay the final decision on P211 until October 2008 to align with the decision on P217.

1.26. For the purposes of this IA of P217 we have recalculated the baseline data sets used for the evaluation of the prices generated by the modification. To facilitate like for like comparison of the two modification proposals we have reassessed P211 using the same baseline data. The results of this analysis are presented in Appendix 2.

Issue 30

1.27. Standing Issue 30[20] was raised by Utilita on 2 November 2007 for consideration by the Pricing Standing Working Group. The Group held four meetings over a 3 month period to discuss six topics that were raised during the course of the Cash-out Review:

- Single versus Dual Pricing
- Spread (between the main and reverse price)
- Balancing Services Adjustment Data (BSAD)
- Residual Cashflow Reallocation Cashflow (RCRC)
- Timing of Gate Closure

[18] The analysis of P211 took place prior to September 2007, when further evidence emerged of constraints in Scotland impacting cash-out prices.
[19] In this document, we also stated that we were minded to reject Proposed Modification 212. This proposed modification was subsequently rejected in February 2008.
[20] Further details of the conclusions of Standing Issue 30 can be found in http://www.elexon.co.uk/documents/BSC_Panel_and_Panel_Committees/BSC_Panel_Meetings_2008_-_139_-_Papers/139_04_Issue_30_Report_V1.0.pdf

- Introduction of a Half Hourly Energy Balancing Market

1.28. The areas that the Group felt may warrant further analysis and investigation were: extension of the Contract Notification process and/or shortening Gate Closure to allow trading closer to each Settlement Period; improving the calculation of the Reverse Price to make it more reflective of trading closer to each Settlement Period; and, a review of how BSAD option fees feed into cash-out prices, plus consideration of whether to bring the BSAD methodology under the governance of the BSC.

Governance Review

1.29. The issue of system pollution and the system/energy reserve debate are not new and we have highlighted these issues through our various cash-out review initiatives and in a number of previous modification decision letters. As we set out in our letter explaining the reasons for delaying our decision on P211, we are disappointed that P217 was not raised much earlier as this would have allowed a quicker resolution to a potentially significant defect in the existing rules that the P211/P212 IA showed could impact disproportionately on renewable generators and small generators and suppliers. We think that this provides evidence of a failure in the existing industry governance process and the implications of this series of events have been considered in our review of industry governance.[21]

[21]See http://www.ofgem.gov.uk/Licensing/IndCodes/CGR/Pages/GCR.aspx

2. Economy and Efficiency and Impacts on consumers

Chapter Summary

This chapter describes the effect of cash-out on consumers, assesses the extent of the defect and analyses whether P217 would improve the cost reflectivity of cash-out prices[22].

Question box

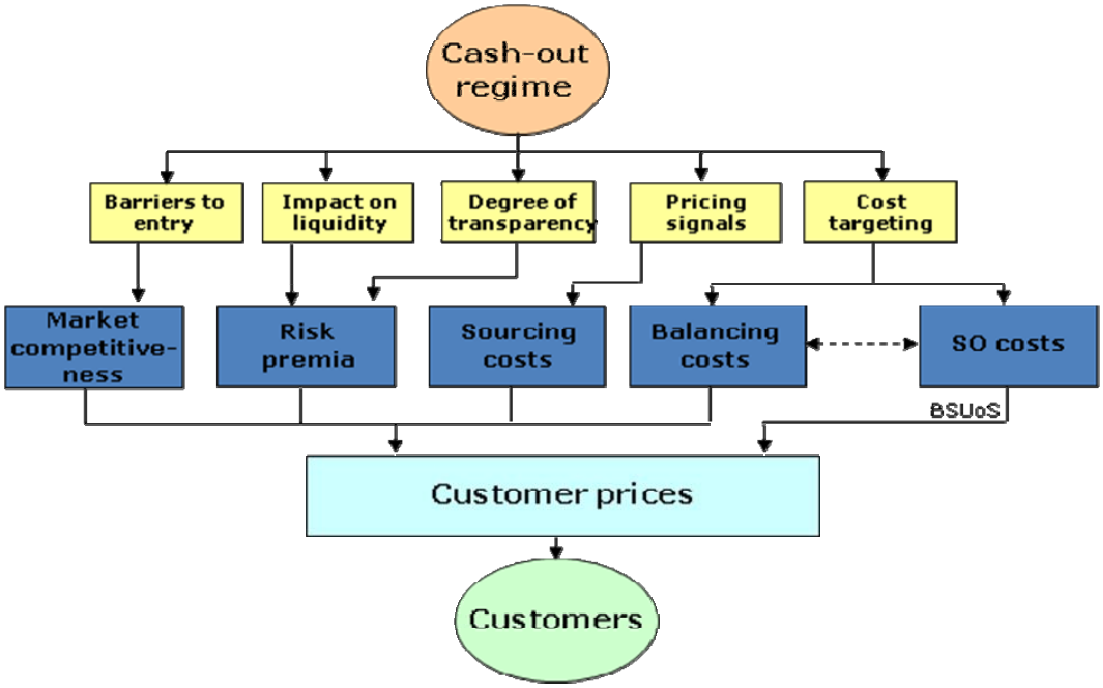
Question 1: Is our revised definition of a Proxy Energy Price for energy balancing actions appropriate?
Question 2: Should reserve creation BOAs be classified as energy actions?
Question 3: Is it of concern that the costs of reserve are not currently accurately targeted?
Question 4: Do you agree with our estimate of costs to consumers caused by "system pollution"?
Question 5: Do you think that more marginal pricing is appropriate under a P217 flagging methodology?
Question 6: Do you agree that P217A produces cash-out prices that are more reflective of energy balancing costs than the current arrangements?
Question 7: Do you consider that P217 produces cash-out prices that are more reflective of energy balancing costs than the current arrangements?
Question 8: Do you agree that disaggregation of BSAD should improve the accuracy of the cash-out price calculation?

Linkage between cash-out and consumer prices

2.1. Although consumers (other than a small number of very large consumers) are not directly exposed to cash-out prices, they will ultimately face the costs incurred in balancing the system. The following diagram demonstrates how cash-out prices feed through ultimately to consumer bills.

Figure 1 - How cash-out affects consumers

[22] Further analysis of the impact of P217 prices can be found in Attachment A of the P217 Assessment Report:
http://www.elexon.co.uk/documents/BSC_Panel_and_Panel_Committees/BSC_Panel_Meetings_2008_-_141_-_Papers/141_05a_P217_Assessment_Report_Attachments.zip



2.2. Cash-out prices feed directly into the costs of balancing the demand of different customer segments, since due to demand uncertainty it is inevitable that suppliers will face a degree of exposure to cash-out. The more extreme the cash-out prices the higher the balancing costs which will be priced into consumer tariffs. Conversely, sharper cash-out price signals strengthen the incentives on parties to balance their own positions, thus reducing the costs to the SO in its role of residual balancer and hence reducing BSUoS which should provide savings for consumers. Cash-out prices will also indirectly affect the wholesale market by driving within day volatility and affecting the risk premia applied to forward contracts which in turn will affect consumer prices. The cash-out arrangements could ultimately determine the competitiveness of the market, since arrangements which are opaque and lead to exposures that smaller suppliers find difficult to manage are likely to deter new entry.

2.3. Consumers will ultimately benefit from cash-out arrangements which allocate the costs and risks of balancing onto the market participants best able to manage them, and from arrangements which are transparent and that promote liquidity.

Assessing the impact of the system pollution defect on consumers

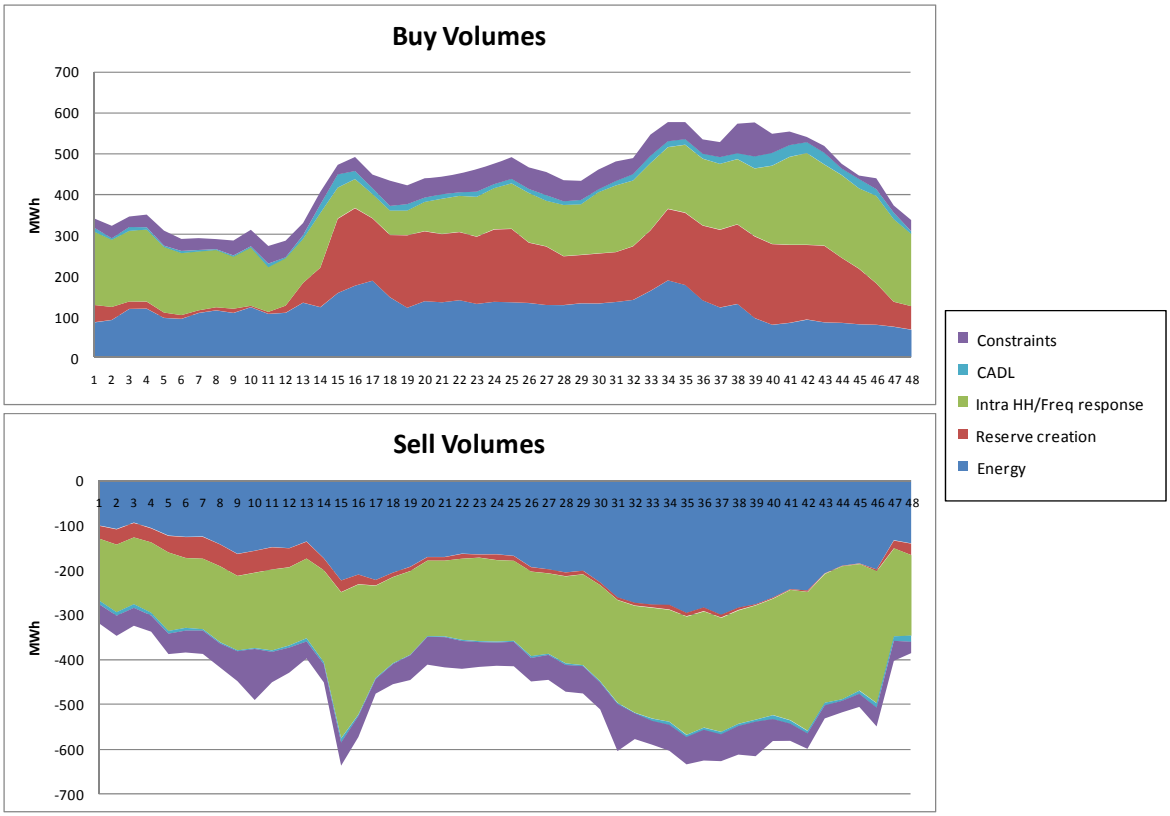
Analysis of System Operator actions

2.4. The SO uses the Balancing Mechanism to resolve both energy and system imbalances. The cash-out arrangements aim to derive imbalance prices purely from the costs of resolving energy imbalances.

2.5. As discussed in the RIA for Modification Proposals P211 and P212, this process is made more difficult since a significant proportion of BOAs taken by the SO resolve both energy and system requirements, previously referred to as 'energy plus' actions.

2.6. For the RIA for P211 and P212, NGET analysed all BOAs for the period 1 January 2007 to 30 September 2007 and labelled them according to five categories: energy only, reserve creation, intra-half hour, frequency response and constraints. The definitions of these actions are given in Appendix 8 of the P211/P212 RIA[23]. For the purposes of the P217 RIA, NGET updated this analysis for the period 1 April 2007 to 31 March 2008. The charts below show the breakdown of average BOA volumes by settlement period when the system is short (Buy Volumes - Main) and when the system is long (Sell Volumes - Main).

Figure 2 - Breakdown of BOAs according to NGET flagging analysis



[23] http://www.ofgem.gov.uk/Markets/WhlMkts/CompandEff/CashoutRev/Documents1/P211%20P212%20Appendices%20FINAL.pdf

2.7. The purple and light blue areas represent the constraint and Continuous Acceptance Duration Limit (CADL) volumes respectively which would be flagged under the P217 methodology. These volumes represent 17% of total BOAs. When the system is short, flagged constraint and CADL actions average 41 MWh in the offer stack, and when the system is long, 57 MWh in the bid stack. The green areas represent actions that NGET has identified for the purposes of intra-half hour balancing and frequency response, beyond those which have been captured through CADL flagging. The red areas are actions additionally required for creating reserve[24]. These latter two categories would not be flagged under the P217 methodology. The blue areas represent energy only actions, only making up a relatively small proportion (23%) of the total volume of BOAs.

2.8. In considering proposals to modify the cash-out arrangements since NETA Go-Live, Ofgem has consistently stated that non-energy related balancing actions should be removed from the calculation of cash-out prices. Cash-out prices are designed to be reflective of the costs incurred by the SO in balancing the supply and demand of electricity on behalf of market participants. They should provide incentives for parties to balance their own positions where it is economically more efficient for them to do so than the SO. Since a party's imbalance position is measured only on a GB-wide basis and takes no account of geography, the cost of actions taken by the SO to resolve local imbalances should not be reflected in imbalance prices. The P217 methodology is designed to remove the impact of locational balancing/constraint management from the cash-out price calculation.

2.9. As set out in Appendix 6 of the P211/P212 RIA, Ofgem has previously argued, and continues to be of the view, that the exclusion of intra half-hour balancing activities from cash-out prices is consistent with a settlement process that determines imbalance exposure on the basis of the average position over the half-hourly settlement period. This includes frequency response actions which are less than 30 minutes in duration. The NGET analysis suggests that the CADL rules only capture a relatively small proportion of the actions that it deems to be for intra-half hour and frequency response reasons. More granular targeting of balancing costs would require a shorter settlement period, as is the case in other markets such as Germany and The Netherlands.

2.10. The P211/P212 RIA outlined the arguments for and against the inclusion of reserve creation costs in the calculation of cash-out prices. Ofgem believes that the costs of reserve should be borne by out-of-balance parties since in the absence of a SO parties would need to provide their own reserve, but expressed our concerns surrounding the accuracy of the cost targeting under the current arrangements. In particular, we noted that where BOAs are used to create reserve the costs may be reflected in different settlement periods to the ones that the reserve was required for. Furthermore, the BSAD methodology for recovering the option fees for Short

[24] Note that BOAs shown for constraints, CADL, and intra-half hour/frequency response may also have resolved a requirement for reserve creation.

Term Operating Reserve (STOR) and BM Start-up were not necessarily being fully reflected in the Buy Price Adjusters (BPAs) added to cash-out prices. We believe the lack of transparency in the costs of creating reserve and the current imprecise methods for recovering these costs from out-of-balance parties are a significant shortcoming in the current arrangements. This issue would not be addressed by the P217 approach.

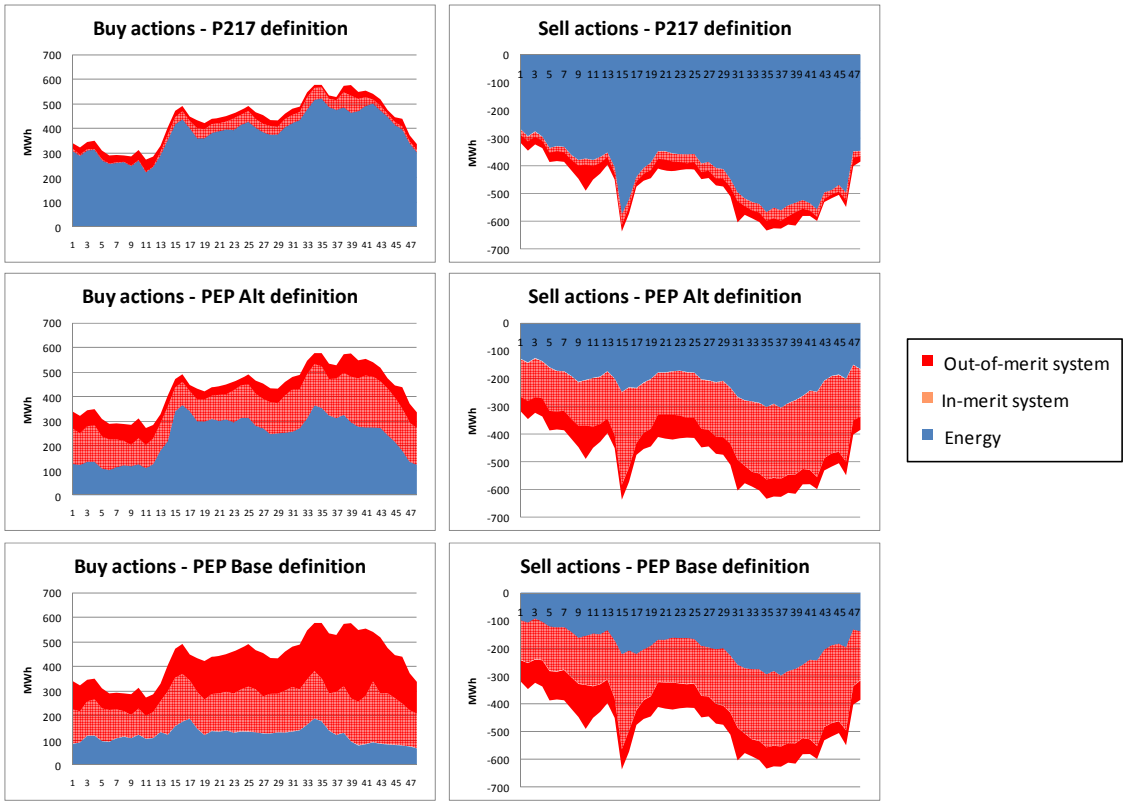
2.11. For the purposes of benchmarking the prices created by P217/P217A we have again adopted two different Proxy Energy Prices - PEP Alt which excludes constraints, CADL, intra-half hour and frequency response from the definition of energy balancing, and PEP Base which in addition excludes the costs of reserve creation. The table below summarises which actions are included and excluded in the definition of energy balancing under the three different definitions, and under the current arrangements.

Table 1 - Inclusion or exclusion of BOA types from definition of energy balancing

	Current	P217	PEP Alt	PEP Base
Pure energy	✓	✓	✓	✓
Constraints	✓	x	x	x
CADL	x	x	x	x
Other intra-HH /frequency response	✓	✓	x	x
Reserve creation	✓	✓	✓	x

2.12. These system actions only pollute cash-out prices to the extent that they were taken out of price order - the same actions may have been taken to resolve energy imbalances in the absence of a system requirement. To gauge this effect, the charts below show the proportion of BM actions taken in 2007/8 that would be classed as system actions under the three different definitions of energy balancing. The charts show for each of the three definitions the proportion of the system actions that were in-merit (pink) versus out-of-merit (red). A system action is deemed to be in-merit in a given period if there is a more expensive unflagged (i.e. pure energy) action in that period. Only out-of-merit system actions would be excluded from the cash-out price under any of the energy balancing definitions.

Figure 3 - Proportion of flagged actions in-merit and out-of-merit



2.13. Under the P217 definition, approximately 50% of flagged actions are in-merit i.e. taken in price order and may have been accepted for energy balancing purposes anyway, and approximately 50% are out-of-merit and would not have been accepted had the constraint not been active or there had not been a requirement for a sub-15 minute balancing action. To the extent that these latter actions fall within NIV they will be re-priced under the replacement price methodology.

2.14. Under the PEP Alt definition, approximately 75% of flagged actions are in-merit with a majority of the remaining actions already flagged for system constraints. This suggests that inclusion of non-CADL intra-half hour and frequency response actions in the cash-out price calculation may not necessarily pollute prices significantly, since a majority of these actions would have been required for energy balancing in any case and have not been taken out of price order. This is borne about by a fairly close match between P217 prices and PEP Alt prices as shown below. In contrast, under the PEP Base definition only about 46% of flagged actions are in merit on the buy side which explains why excluding these actions from the cash-out price calculation would have a significant impact on price as shown below. (The effect on the sell side is minimal since there are few accepted bids relating to reserve creation.)

Proxy Energy Price series

2.15. The PEP series used for the purposes of this RIA have been restated relative to those used in the P211/P212 RIA. First, we have used a different time period - 1 April 2007 to 31 March 2008 compared to 1 January 2007 to 30 September 2007. Second, we have assumed the same approach for treatment of CADL actions and disaggregation of BSAD as in the P217 methodology since we believe that this will improve the accuracy of the calculation. Third, we have adopted a different methodology for calculating the replacement price. For the purposes of the P211/P212 RIA all actions that were flagged were replaced with a price based on an ex-post unconstrained schedule of available BM bids and offers. We believe that this approach had a tendency to underestimate the costs of energy balancing since it only considered very simple plant dynamics. There are pros and cons with any replacement price methodology, but for the purposes of this RIA we have adopted the approach proposed in the P217 methodology since we believe that it is more sound: it leaves actions that are in-merit priced, and uses a replacement price, when required, based on actions in the NIV stack. Hence, plant dynamics are recognised. After reviewing analysis of different values of the Replacement Price Average Reference (RPAR), the Modification Group favoured a value of 100 MWh. We have used the same value for the purposes of calculating the PEP series, and believe that this is a reasonable value for RPAR.

2.16. The result is that the recalculated PEP series are somewhat closer to live prices (i.e. less benign), particularly on the sell side. The tables below compare the relationship between live and PEP prices (PAR500) under this RIA and the P211/P212 RIA.

Table 2- Annual average PEP prices relative to live, 2007/08

PEP Alt	**P217A**	**P211/212 IA**
SBP when short	-3.4%	-5.1%
SSP when long	+1.4%	+4.4%

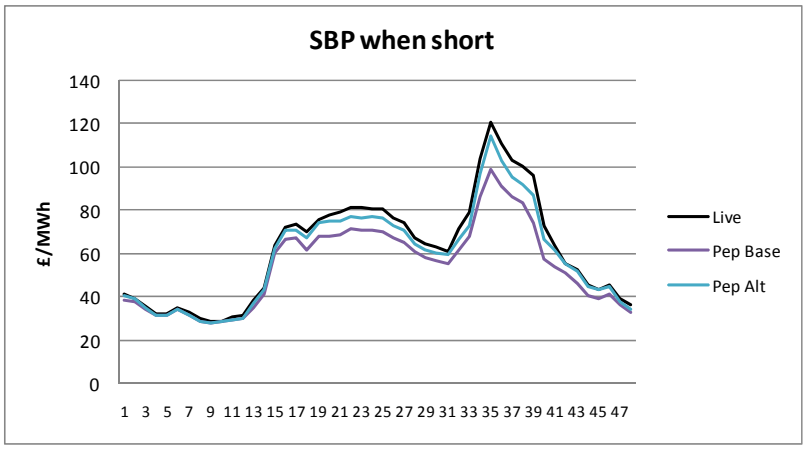
PEP Base	**P217IA**	**P211/212 IA**
SBP when short	-10.1%	-11.2%
SSP when long	+2.7%	+6.0%

Extent of constraint pollution in cash-out prices

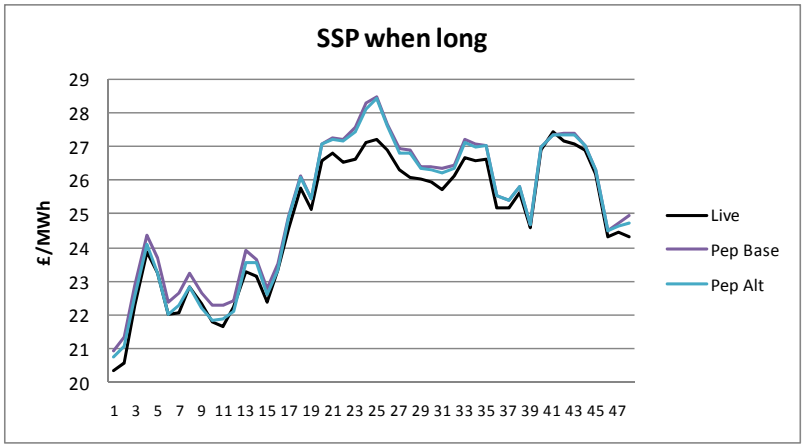
Benchmark 1: Proxy Energy Price comparison

2.17. The graphs below show the average SBP when short and SSP when long by settlement period for the PEP Base and Alt series compared to live prices[25]. By removing constraints and sub-half hourly actions (CADL, intra-half hour, frequency response), the PEP Alt SBPs are on average £2.30/MWh lower than live SBPs across the day. The effect of removing reserve creation can be seen with PEP Base SBPs significantly lower than live prices particularly during the day-time period when most reserve creation actions are taken. On the sell side the differences between live prices and the PEP series are much less, reflecting the fact that system pollution is less prevalent when the system is long. PEP Alt and PEP Base are very similar during the day-time period since virtually no reserve creation bids are taken during this part of the day.

Figure 4 – Average PEP prices compared to live by settlement period



[25] Note this is shown for a PAR value of 500 MWh since live prices are calculated using this PAR value.



Benchmark 2: Annual energy balancing cost comparison

2.18. The table below compares the net total imbalance charges or RCRC for 2007/08 with those under the theoretical PEP Base and PEP Alt series (PAR500). The RCRC is calculated as the difference between the receipts for short imbalances, charged at SBP, and the payments made for long imbalances, paid at SSP. Although the volumes of long imbalances are greater than short imbalances, 8.9 TWh compared to 6.6 TWh in 2007/08, since SBP is normally significantly higher than SSP, the annual RCRC is normally positive. The RCRC represents the net monies recovered from out-of-balance parties and then redistributed to all parties based on throughput.

Table 3 - Annual Imbalance Charges

Series	Annual Imbalance Charges (RCRC)
Live	£141m
PEP Base	£100m
PEP Alt	£124m

2.19. This analysis suggests that system pollution increases imbalance charges to out-of-balance parties by around £17m if reserve creation is deemed as energy related, or by around £41m if reserve creation is deemed to be system related. Hence, the impact of reserve creation BOAs (£24m) is greater than the impact of constraints on cash-out prices. In the IA for Modification Proposals P211 and P212, we highlighted the arguments for and against including reserve creation BOAs in the definition of energy balancing. Reserve is required for both energy and system balancing, and we expressed concern that it was not clear what proportion of reserve costs were intended to be targeted at out-of-balance parties, and about the accuracy of the cost targeting. For example, where reserve is created using BOAs in the BM, the costs of these BOAs may be reflected in cash-out prices during settlement periods in which the reserve was created rather than when it was needed. Also, the

methodology used to target the availability fees for STOR and BM Start-up into cash-out prices appears to only partially reflect the costs incurred.

2.20. The issue of reserve was discussed within the P217 Modification Group, and the Group's recommendation was that the costs of reserve should be considered to be energy balancing costs, the main justification being that if the SO was not providing reserve individual parties would need to provide reserve themselves. Similar views were also advanced in responses to the P211/P212 RIA. In addition, subsequent discussions with NGET have highlighted the need for the cost of reserve creation BOAs to be reflected in cash-out prices in the long-term, even if not in individual half-hours, to provide necessary signals for parties to cover their positions particularly with the anticipated increase in the amount of intermittent renewables connected to the system.

2.21. We are persuaded by these arguments at a theoretical level. The arguments are supported by the analysis in Figure 2 which shows that the shape of reserve creation BOAs follows quite closely the pattern of NIV. This suggests that although cost targeting may be inaccurate the majority of reserve creation costs fall within periods when NIV tends to be shortest on average.

2.22. We believe that the cost of reserve creation BOAs (excluding those that get tagged or flagged for other system reasons) should be included in the definition of energy balancing, together with availability fees for STOR and BM Start-up[26], since these are generally required to provide energy for durations of half-hour or greater. In the absence of the SO, parties would need to make their own arrangements for reserve, and hence the cash-out price signals should reflect this. The costs of other forms of reserve, for example fast reserve, should be excluded from the definition of energy balancing since this type of reserve is required for sub-half hourly balancing.

2.23. In the P211/P212 RIA, we expressed a view that due to the potential inaccuracy of cost targeting of reserve creation BOAs, that these actions should be excluded from the cash-out price calculation. We now believe that this would lead to an underestimation of energy balancing costs on average, and our current view is that the PEP Alt benchmark (i.e. including reserve creation BOAs in the definition of energy balancing) is the more accurate reflection of energy balancing costs. However, we would like to see greater transparency in the costs of reserve required for energy balancing and an improvement in the way that these costs are targeted into cash-out prices.

[26] The proportion of these fees to be included in the definition of energy balancing should relate to the proportion of exercised volumes which are unflagged or untagged when the reserve is utilised.

2.24. Using the the dataset of flagged BOAs provided by NGET for 2007/08 we have calculated an estimate of the energy balancing costs[27] of £47m using the PEP Alt definition. As a comparison, in its analysis as part of the P217 Assessment Phase, NGET provided a high level estimate of net energy balancing costs in the BM of approximately £40m (including reserve creation). In addition it spent £72m on short-term operating reserve (STOR) and BM Start-up availability fees which are included in the energy imbalance charge calculation through the BSAD methodology. This suggests a total energy balancing cost in 2007/08 of around £119m (assuming that reserve related BOAs and STOR and BM Start-up are deemed to be energy related). On this basis, in 2007/08 out-of-balance parties were charged approximately £22m more than the direct costs they imposed on the system, £141m compared to £119m.

2.25. The table below breaks down this comparison further by separating out the imbalance charges relating to the Buy Price Adjusters (BPA) which are designed to target the availability fees of STOR and BM Start-up into imbalance charges. This analysis shows that the BPAs contributed approximately £37m to the imbalance charges, only just over 50% of the costs incurred by the SO in procuring STOR and BM Start-up; whereas the remaining charges (£104m) were significantly greater than the costs that the SO incurred in the Balancing Mechanism for energy balancing (£47m). This latter difference can be explained by the effect of PAR averaging (which will increase the imbalance charge above the volume-weighted cost incurred by the SO when NIV exceeds 500 MWh), and by dual pricing whereby parties with positions that help offset the system imbalance, and thus may avoid the need for an expensive balancing action, only receive the Reverse Price - the Market Index Price (MIP)[28].

[27] We have done this by calculating the volume weighted average of BOAs within the NIV stack taking into account replacement prices for unpriced flagged volumes.
[28] The MIP is currently calculated based on the volume weighted trades on the APX exchange over a twenty hour period closing 1 1/2 hours prior to Gate Closure.

Table 4 - Breakdown of energy balancing costs and imbalance charges, 2007/08 (based on PEP Alt definition of energy balancing)

	£m
Energy balancing costs	46.86
Reserve Costs (STOR/BM Start-up)	72.14
Total	**119.00**
Imbalance charges	141.44
Charges (excluding BPA)	*104.27*
BPA	*37.17*
Difference	**-22.44**
Energy balancing	*-57.41*
Reserve	*34.97*

2.26. This analysis suggests that current cash-out arrangements lead to "over-recovery"[29] of energy imbalance charges from out-of-balance parties but that the over-recovery could be reduced by the removal of system pollution.

2.27. Many respondents to the P211/P212 RIA made the point that cash-out prices are designed to create signals to balance rather than necessarily to reflect the actual costs incurred by the SO in energy balancing. Indeed economic theory would suggest that marginal pricing is required to provide the appropriate signals for parties to invest to cover their positions. This suggests that sharper cash-out prices may be required in certain periods in order to promote security of supply.

2.28. The current discrepancy between the marginal and average cost of energy balancing actions reflects a large spread in the price of accepted BOAs in certain periods. This spread can largely be explained by two factors. First, even within the definition of energy balancing there are a range of different 'products' that the SO is buying depending on the lead time of different BOAs, i.e. there is no homogeneous half-hourly energy balancing product. Second, as analysis presented in the P211/P212 IA showed, there is significant uncertainty in the size and direction of NIV which makes it difficult for parties to react to market conditions.

2.29. For these reasons we believe that it is important to consider the theoretical arguments in favour of more marginal pricing in the context of the specific

[29] The use of the term "over-recovery" here means that parties are charged more in imbalance charges than NGET incurs in energy balancing costs. NGET does not directly recover any of its costs through the imbalance charges.

characteristics of the current 'market' from which cash-out prices are being derived. Hence, we remain of the view that the comparison of annual imbalance charges to energy balancing costs is one of the relevant measures of the efficiency of the cash-out arrangements, and that having imbalance charges that on average significantly exceed energy balancing costs over a protracted period could deter new entry and be detrimental to competition. This issue can partly be addressed through removal of system pollution in cash-out prices, but it is also a result of the large spreads between SBPs and SSPs.

Estimating the additional costs that are passed onto consumers

2.30. The direct costs of system pollution, which we have estimated to be around £17m in 2007/08, are ultimately likely to be borne by consumers, as the effect of system pollution will be to increase the balancing cost component when suppliers construct their tariffs.

2.31. There are likely to be indirect costs associated with system pollution in cash-out prices due to the knock-on impact on within-day price volatility and risk premia. We calculate that the standard deviation of the main cash-out price would be at least 10% lower if system pollution was removed. If this translated into, say, a 5% reduction in short term price volatility and a 5% reduction in the average contract premia faced by suppliers of, say, £1/MWh, this would lead to an annual saving across suppliers of around £20m. On this basis, the total (direct and indirect) cost savings to consumers from removing system pollution from cash-out prices would be around £37m.

2.32. In the longer run the savings to consumers could be yet greater if the result of removing the system pollution was to encourage more new entry and increase the competitiveness of the market.

Assessing whether P217 methodology creates prices which are more reflective of the costs of energy balancing than current arrangements

Proposed Modification P217

Benchmark 1: Proxy Energy Price comparison

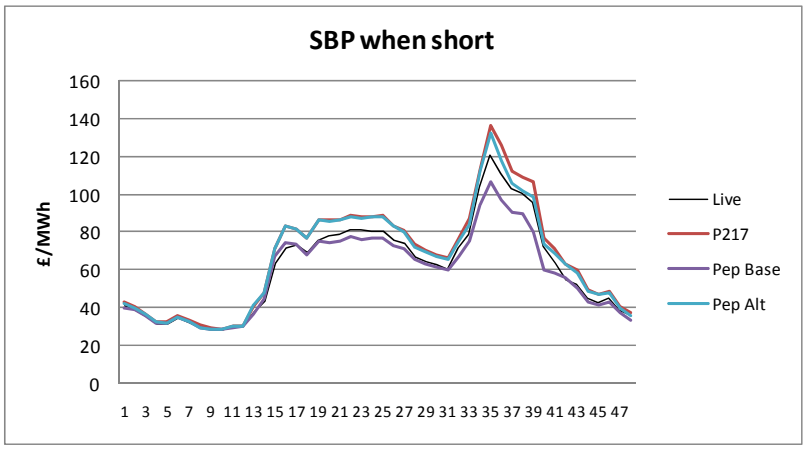
2.33. In this section we compare P217 prices to the live, PEP Base and PEP Alt price series as a measure of how closely the modification proposal would be expected to replicate “ideal” cash-out prices compared to the current methodology.

2.34. It should be noted that the P217 price series are constructed using ex-post flagging of constraint actions, whereas if P217 was implemented NGET would be flagging ex-ante. During the Assessment Phase it ran a trial period of ex-ante flagging over 5 days. The analysis from this trial suggested that the ex-ante process

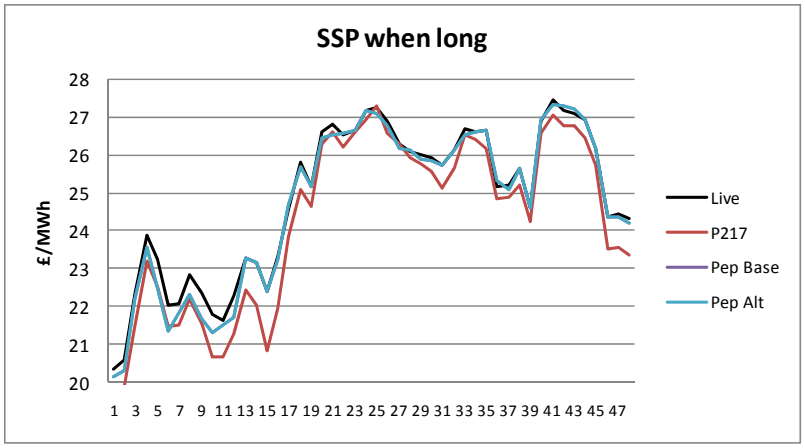
had the tendency to 'over-flag' relative to the ex-post process, namely there were certain bids and offers which were flagged as potentially being required for constraint management which were subsequently accepted for other reasons. There were a few periods when the reverse was the case, and the flagging process missed actions that subsequently turned out be for constraints. NGET estimated that the impact on price of the net 'over-flagging' was likely to be minimal. However, we might expect 'live' P217 prices to be somewhat more benign (lower SBPs, higher SSPs) than those estimated using the ex-post flagging process[30].

2.35. The following charts compare the average P217 prices by settlement period to the live, PEP Base and PEP Alt prices (PAR100). They are shown separately when SBP is the main price (system short) and when SSP is the main price (system long).

Figure 5 – Average P217 prices by settlement period



[30] See http://www.elexon.co.uk/documents/BSC_Panel_and_Panel_Committees/BSC_Panel_Meetings_2008_-_141_-_Papers/141_05a_P217_Assessment_Report_Attachments.zip



2.36. When the system is short, average P217 SBPs are higher than live in all settlement periods; when the system is long, average P217 SSPs are lower than live prices in all settlement periods. This suggests that the change in the value of PAR from 500 MWh to 100 MWh is having a stronger effect than the removal of constraint pollution and disaggregation of BSAD.

2.37. Compared to the PEP series, the P217 SBPs are equal to PEP Alt SBPs in most periods, and slightly higher over the evening peak. This suggests that the impact of not flagging non-CADL intra-half hour and frequency response BOAs has little impact on price, which is consistent with the analysis shown in Figure 3 which suggested that most of these actions were in-merit. The P217 SBPs are significantly above the PEP Base SBPs since they include the costs of reserve creation. When the system is long, P217 SSPs are generally somewhat lower than both PEP Base and PEP Alt SSPs in nearly all periods.

2.38. The table below compares the annual average SBP when the system is short and SSP when the system is long under P217 compared to live, PEP Base and PEP Alt (PAR100) for 2007/08.

Table 5 - Annual average cash-out prices under P217 compared to live and PEP Series, 2007/08

	Live	P217	% diff	PEP Base	% diff	PEP Alt	% diff
SBP	66.57	73.04	+9.7%	64.99	-2.4%	72.27	+8.6%
SSP	24.50	23.90	-2.4%	24.49	-0.1%	24.11	-1.6%

2.39. The average P217 cash-out prices are a reasonably close match with the PEP Alt prices. They are somewhat more extreme since non-CADL intra-half hour and frequency response BOAs are not flagged under the P217 methodology but are within the PEP Alt calculation. The P217 cash-out prices are significantly more extreme than the PEP Base prices since the costs of reserve creation are retained in the former.

Benchmark 2: Annual energy balancing cost comparison

2.40. In order to demonstrate how closely energy balancing costs are reflected in P217, the following table shows the impact of P217 on annual imbalance charges (RCRC) and compares these to the cost of energy balancing under the PEP Alt definition of energy balancing in 2007/08. For the purposes of this analysis we have assumed no change in participant behaviour. We present further analysis on the incentives to balance under P217 in Chapter 3.

Table 6 – P217 balancing cost comparison, 2007/08

	Live	P217	Difference
Energy balancing costs	119.00	119.00	0.00
Imbalance charges	141.44	180.86	39.42
Difference	-22.44	-61.86	

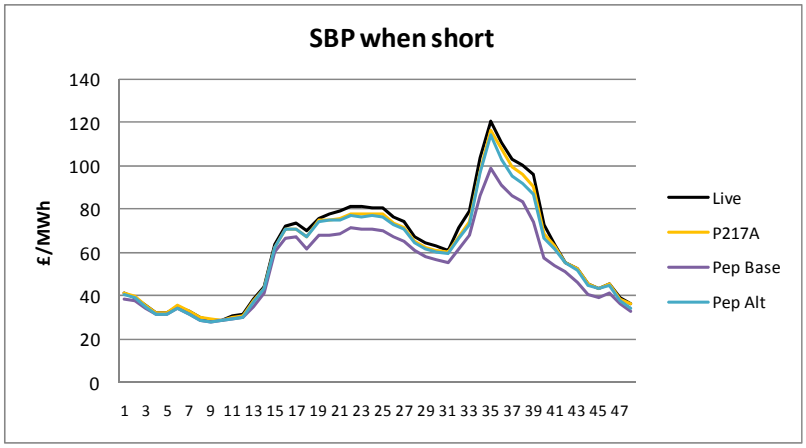
2.41. Assuming no change in behaviour, annual net imbalance charges would increase from £141m to £181m under P217 due to the more marginal cash-out price calculation using the PAR value of 100 MWh. Under P217, the annual net over-recovery of energy balancing costs through imbalance charges would increase significantly from £22m to £62m, assuming no resulting change in balancing behaviour.

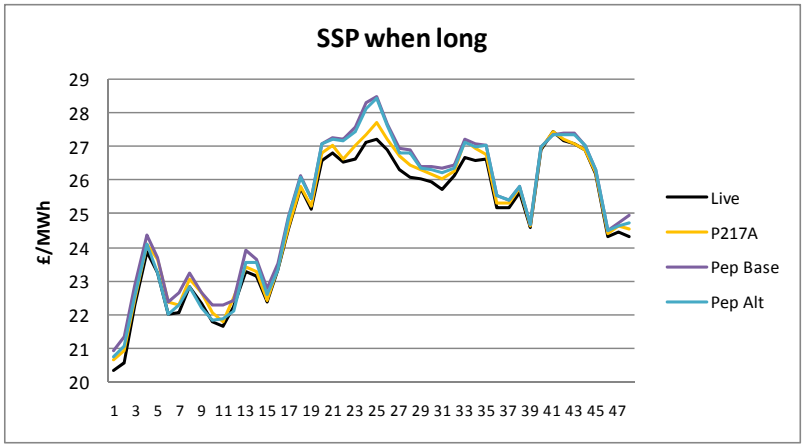
Alternative Modification P217A

Benchmark 1: Proxy Energy Price comparison

2.42. The following charts compare the average P217A prices by settlement period to the live, PEP Base and PEP Alt prices (PAR500). They are shown separately when SBP is the main price (system short) and when SSP is the main price (system long).

Figure 6 – P217A prices by settlement period





2.43. As would be expected given the same PAR value (500 MWh), P217A gives on average a slightly lower SBP when the system is short (and higher SSP when the system is long) than the current methodology due to the effects of constraint flagging and disaggregation of BSAD. As was seen for P217 the prices are a close match to PEP Alt, but more extreme than PEP Base.

2.44. The table below compares the annual average SBP when the system is short and SSP when the system is long under P217A compared to live, PEP Base and PEP Alt (PAR500) for 2007/08.

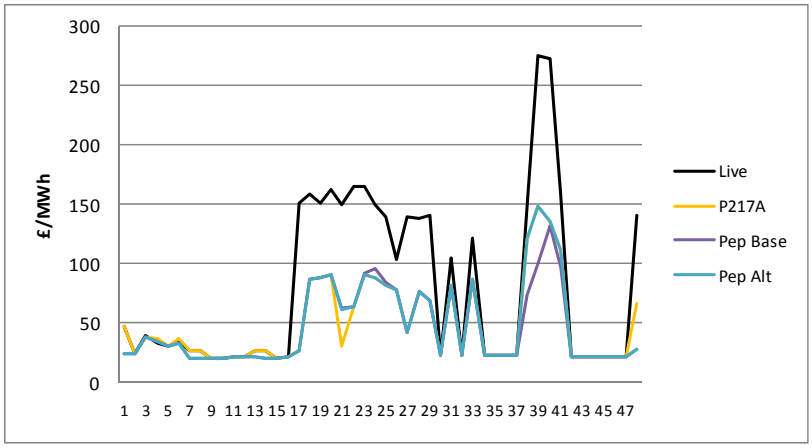
Table 7 - Annual average cash-out prices under P217A compared to live and PEP Series, 2007/08

	Live	P217A	% diff	PEP Base	% diff	PEP Alt	% diff
SBP	66.57	64.48	-3.1%	59.86	-10.1%	64.27	-3.4%
SSP	24.50	24.70	+0.8%	25.17	+2.7%	24.83	+1.4%

2.45. As was the case for the P217 prices, the average P217A cash-out prices are a reasonably close match with the PEP Alt prices. They are somewhat more extreme since non-CADL intra-half hour and frequency response BOAs are not flagged under the P217 methodology but are within the PEP Alt calculation. The P217A cash-out prices are significantly more extreme than the PEP Base prices since the costs of reserve creation are retained in the former.

2.46. The following chart examines the impact of P217 on 29 September 2007, a day which according to the NGET analysis was a day when a number of constraint actions fed through into cash-prices. In order to illustrate the impact of constraint tagging we have examined this day for P217A only with its equivalent PAR value to live.

Figure 7 – Main cash-out price, 29 September 2007



2.47. The P217A price is significantly lower than the live price in a number of periods on this day (£122/MWh lower in Periods 39 and 40) and is also very close to the PEP Alt prices, suggesting it is successful in taking out the "system" actions from cash-out in those periods.

2.48. This chart also demonstrates that the P217 methodology can produce some anomalous prices – for example in period 21, the P217A price drops significantly and is below both the PEP Alt and PEP Base prices. We discuss this in further detail in Chapter 6 when we examine unintended consequences.

Benchmark 2: Annual energy balancing cost comparison

2.49. In order to assess the energy cost reflectivity of P217A, the following table shows the impact of P217A on annual imbalance charges (RCRC) and compares these to the cost of energy balancing under the PEP Alt definition of energy balancing in 2007/08.

Table 8 – P217A balancing cost comparison, 2007/08

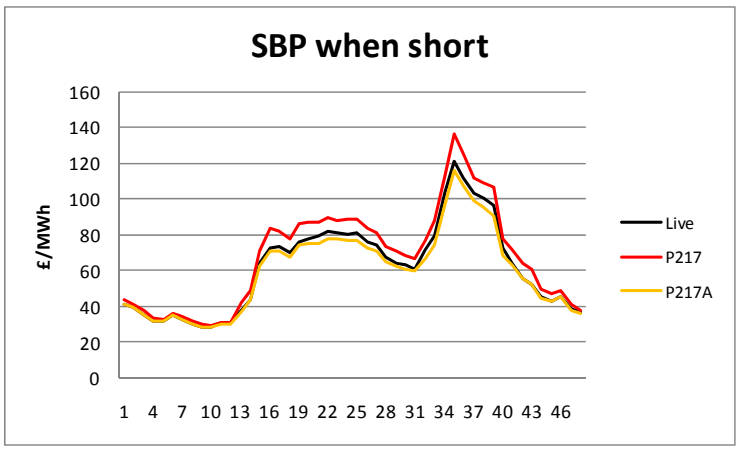
	Live	P217A	Difference
Energy balancing costs	119.00	119.00	0.00
Imbalance charges	141.44	130.71	-10.73
Difference	-22.44	-11.71	

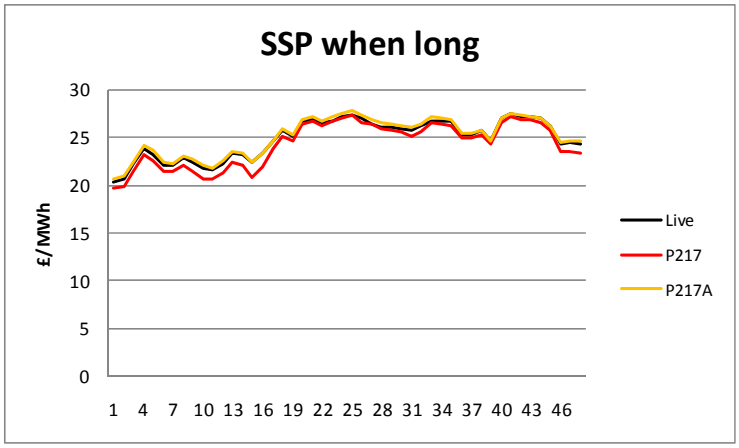
2.50. Assuming no change in behaviour, annual imbalance charges would decrease from £141m to £131m under P217A, thus removing £10m of the £17m of system pollution identified above by comparing PEP Alt prices to live prices. Under P217A, the net over-recovery of energy balancing costs through imbalance charges would decrease from £22m to £12m.

Comparison of P217 and P217A

2.51. Figure 8 compares live prices with P217 and P217A, to demonstrate the effect of the different PAR levels relative to the effect of the other aspects of the proposals.

Figure 8 - Comparison of average cash-out prices by settlement period between P217 and P217A





2.52. The dampening effect that the proposed flagging methodology has on cash-out prices is more than offset by the effect of the smaller PAR value proposed under P217. This is particularly prominent on the SBP side over day time periods (when the system is generally shorter) and on the SSP side over night time periods (when the system is generally longer).

2.53. The more extreme prices under P217 also translate into a larger average spread between SBP and SSP. For 2007/8, the live average spread was £16.51/MWh. Using P217 prices it would have been £19.39/MWh. For P217A it would be slightly lower than the live spread, at £15.52/MWh. It is this widening of the average spread under P217 that leads to the big increase in RCRC.

2.54. The table below demonstrates that the volatility of cash-out prices would increase under P217 but would be somewhat reduced under P217A.

Table 9 - Standard deviation, 2007/08

	Live	P217	P217A
SBP	39.71	47.20	37.20
SSP	20.94	21.01	20.80

2.55. If we compare the level of energy balancing costs reflected under the two approaches, P217 over-recovers energy balancing costs to a significantly greater extent than P217A. P217 would have charged out-of-balance parties £62m more than NGET spent on energy balancing in 2007/08 assuming no change in balancing behaviour; under P217A the over-recovery would only have been £12m.

Period analysis

2.56. We have analysed certain settlement periods in more detail to understand how the P217 methodology affects the cash-out price calculation. The results of this analysis can be found in Appendix 3.

2.57. The key conclusions from this more detailed analysis are as follows:

- The P217 methodology can be effective in removing the impact of constraints from cash-out prices. However, its impact is not always consistent across periods, and it may not remove all constraint pollution from cash-out prices. Hence, the transparency of the cash-out price calculation and the ability of parties to forecast them would not necessarily be enhanced by P217.
- The disaggregation of BSAD can have a significant impact on cash-out prices in certain periods, and its impact may be as great as or greater than constraint flagging. For the examples analysed, the disaggregation of BSAD appeared to create smoother profiles of cash-out prices which appears to support our view that in principle the disaggregation of BSAD should improve the cost reflectivity of cash-out prices. In certain periods, the cash-out price may be set entirely on BSAD volumes which raises a potential concern about whether these prices would be reflective of costs on the day, since the contracts underlying the BSAD volumes may have been struck by the SO well in advance of the period in question.

Benefits to consumers of P217

2.58. Through the analysis presented above we estimate that on a like for like basis (PAR remaining at 500 MWh), P217A would reduce the direct costs of system pollution to consumers by £10m, or 59% of the estimated £17m of system pollution costs. Applying the same percentage reduction to the indirect costs via reduced contract risk premia, consumers would save an additional £11m. If we deduct £2m for potential increases in BSUoS costs arising from slightly weaker incentives to balance as explained in Chapter 3 below, the annual net benefit of P217A to consumers would be around £19m[31].

2.59. For P217 we can assume similar savings for consumers although the analysis is less straightforward since the reduction in PAR value to 100 MWh has a greater effect on imbalance charges than the removal of constraint pollution, shifting some of the costs of energy balancing from the SO to BSC parties.

2.60. As a general principle, removing the effect of constraint actions from cash-out prices will create a more cost-reflective signal for short-term balancing and longer-

[31] This excludes the one off implementation costs of £1.4m discussed in Chapter 6.

term investment decisions, which will aid security of supply at minimum cost to consumers.

3. Impacts on competition

Chapter Summary

This chapter describes the effect of P217 on incentives to balance, the impact on different types of party, and the likely effect on competition.

Question box

Question 1: Do you think P217 or P217A will have an effect on the incentives on parties to balance their positions?
Question 2: Do you believe that the savings in SO costs from a lower PAR value would be greater than the costs borne by parties as a result of sharper cash-out price signals?
Question 3: Do you agree with the assessment of the distributional effects of P217/P217A? If not, please provide indications of the anticipated impact on your business?
Question 4: Will the increased transparency of the SO's actions lead to more or less competitive pricing?
Question 5: Do you agree with our assessment of the impacts of P217 and P217A on the prospects for new entry?
Question 6: Do you believe that the potential benefits of P217/P217A justify the additional complexity in the cash-out price calculation?

Impact on incentives to balance

3.1. The sharper the cash-out price signals (higher SBPs, lower SSPs) the stronger the incentive to balance. As shown above, P217 with its PAR value of 100 MWh would likely to lead to sharper cash-out prices, whereas P217A would lead to somewhat more benign cash-out prices than the current arrangements. Hence, P217 is likely to strengthen incentives to balance and P217A may slightly weaken incentives to balance.

3.2. It is difficult to quantify this effect by analysis of historical data. NGET in its analysis in support of the P217 Assessment phase[32] assumed that for every 1% increase in SBP when the system is short NIV would reduce by 0.5%, and likewise for every 1% decrease in SSP when the system is long NIV would increase (become less negative) by 0.5%.

[32] http://www.elexon.co.uk/documents/BSC_Panel_and_Panel_Committees/BSC_Panel_Meetings_2008_-_141_-_Papers/141_05a_P217_Assessment_Report_Attachments.zip

3.3. We have adopted the NGET assumption to estimate the impact of P217 and P217A on NIV, using the 2007/08 dataset[33]. The table below shows the estimated change in the average NIV when the system is short and long under P217 and P217A compared to the current arrangements for 2007/08.

Table 10 - Average NIV under P217/P217A

	Live	P217	P217A
Average NIV when short	240.45	229.32	244.67
Average NIV when long	-301.83	-298.20	-303.04
Average NIV	-85.02	-87.29	-84.05

3.4. The absolute value of NIV reduces under P217 and increases under P217A. However, reducing the magnitude of NIV does not necessarily represent the most economic outcome since we need to balance the savings made by the SO versus the additional costs parties incur in improving their balancing performance to avoid exposure to sharper cash-out price signals.

3.5. Again adopting the same approach used by NGET in the Assessment Phase we have recalculated the expected change in energy balancing costs (BOAs and reserve) under P217 and P217A for the period 2007/08. We have also attempted to estimate the change in imbalance charges by profiling the annual average NIV changes suggested by the NGET analysis such that the biggest changes in NIV occur in the periods of the greatest changes in cash-out prices.

3.6. The table below compares the change in annual energy balancing costs under P217 and P217A with the change in annual energy imbalance charges (RCRC). (The figures in brackets would be the changes in annual imbalance charges if there was no change in balancing behaviour, as presented in Table 10 above.)

Table 11 - Change in annual energy balancing costs and imbalance charges under P217/P217A accounting for changing participant behaviour

	P217	P217A
Energy balancing costs	-£5.8m	+2.3m
Imbalance charges	+£28.8m (+£39.4m)	-£9.7m (-£10.7m)

[33] Note that NGET presented its analysis of the impact on P217 on energy balancing costs for the period 1 January 2007 to 30 September 2007.

3.7. The decrease in energy balancing costs is small when compared to the increase in imbalance charges under P217. At face value this would seem to suggest a sub-economic outcome but we need to consider the effect of the RCRC rebate which to a greater or lesser extent, depending on the balancing performance of the individual parties, will offset the higher imbalance charges. If the total cost to parties in investing to reduce their imbalances to avoid the sharper cash-out prices signals under P217 is less than the £5.8m saved by the SO, this would suggest a more economic outcome than the current arrangements. Conversely, if the savings made by parties under P217A were greater than the £2.3m of additional costs borne by the SO this would represent a more economic outcome.

3.8. It is very difficult to quantify the costs for individual parties in improving their balancing performance and we have not attempted to do this here. However, we believe that as a general principle the more reflective of the costs of energy balancing the cash-out prices are the more likely an economic solution will be achieved across the whole system.

Distributional effects

Impact of system pollution on company cashflows

3.9. We estimated above that system pollution was increasing annual imbalance charges by around £17m. Although all parties are exposed to the constraint pollution in their imbalance charges, they also benefit from a higher RCRC rebate that results from these charges applying across the whole system. Weaker balancers will pay more in increased imbalance charges than they receive back in higher RCRC, and vice versa for stronger balancers. Hence, the effect of system pollution is a transfer from weaker balancers to stronger balancers.

Impact of Modification Proposal P217

3.10. We estimated above that on a like for like basis, i.e. with a PAR value of 500 MWh, P217A would remove around £10m of constraint pollution costs from annual imbalance charges.

3.11. For the purposes of this RIA, Elexon has updated its distributional analysis presented as part of the Assessment Phase[34] to cover the 2007/08 period. Elexon has identified five different party types (A-E) depending on funding share. The table below shows when imbalance charges and RCRC are taken into account, P217A leads to a transfer of funds from the larger players (bands C-E), who are generally stronger balancers, to the smaller players (bands A-B), totalling around £800,000,

[34] http://www.elexon.co.uk/documents/BSC_Panel_and_Panel_Committees/BSC_Panel_Meetings_2008_-_141_-_Papers/141_05a_P217_Assessment_Report_Attachments.zip

i.e. around 8% of the total constraint pollution costs. The column on the right shows the impact on a £ per MWh of throughput basis. (Note that under Elexon's notation a negative number represents a gain for the party type.)

Table 12 - Cashflows by party type, P217A

Alternative By Funding Share Group					
Band	**Funding Share**	**Imbalance**	**RCRC**	**Total**	**£/MWh**
A	0	-£63,639	-£104	-£63,744	-
B	0 - 0.5%	-£902,259	£188,761	-£713,498	-0.025
C	0.5 - 1.0%	-£126,999	£263,848	£136,849	0.003
D	1.0 - 3.5%	-£530,834	£859,679	£328,845	0.009
E	> 3.5%	-£8,946,089	£9,257,634	£311,546	0.001
Total		-£10,569,820	£10,569,819	-£1	0

3.12. The results in the table above show only the change in cashflows resulting directly from the removal of constraint pollution from cash-out prices. The indirect effects through reduced spot price volatility and contract premia under P217A would likely be of a similar order of magnitude.

3.13. Under P217 the change in PAR value from 500 MWh to 100 MWh more than offsets the impact of removing constraint pollution from cash-out prices in terms of the transfer between smaller and larger players. This can be seen from the table below. The transfer compared to live from smaller players (bands A-B) to larger players (bands C-E) is approximately £2.4m.

Table 13 - Cashflows by party type, P217

Proposed By Funding Share Group					
Band	**Funding Share**	**Imbalance**	**RCRC**	**Total**	**£/MWh**
A	0	£103,120	-£5,257	£97,862	-
B	0 - 0.5%	£2,900,319	-£663,443	£2,236,877	0.079
C	0.5 - 1.0%	£742,943	-£977,342	-£234,398	-0.006
D	1.0 - 3.5%	£2,287,907	-£3,309,059	-£1,021,152	-0.027
E	> 3.5%	£33,318,577	-£34,397,767	-£1,079,189	-0.004
Total		£39,352,867	-£39,352,867	£0	0

3.14. The removal of constraint pollution is clearly beneficial to competition since it removes a distortion in the current arrangements that disadvantages smaller players and new entrants. Any reduction in the PAR value to sharpen the incentives to balance during periods of system stress, whilst leaving the Reverse Price methodology unchanged and thus increasing cash-out price spreads, needs to be considered in the context of the wider impact on competition.

Impact on competition of greater transparency of constraint management requirements

Visibility of constraint BOAs

3.15. The Modification Group wanted as much information as possible to be reported via the Balancing Mechanism Reporting Agency (BMRA) in order that parties could replicate the Main Energy Imbalance Price calculation under P217. This included for each action:

- Original price (before flagging and Replacement Price);
- Volume;
- Whether it is a BOA or BSAD;
- Whether it has been flagged;
- Whether it has been tagged;
- Whether Replacement Price applied to part of all of NIV; and,
- Replacement Price.

3.16. However, a concern was also raised that this dissemination of information may allow parties to re-price bids and offers which had been flagged in subsequent periods to take advantage of their position as an essential unit to the SO. This could increase the SO balancing costs. In addition, the increased visibility of transmission constraints could give parties with larger generation portfolios the ability to move contracted generation output in or out of the transmission constraint zone and thereby exacerbate the boundary value. Such activity could require the SO to buy or sell greater levels of generation, potentially at an unattractive premium, to secure the system.

BSAD disaggregation

3.17. The group had a similar concern with respect to the disaggregation of BSAD trades. The effect of disaggregating BSAD should be to produce more accurate cash-out prices. Under the present cash-out arrangements, all BSAD actions that are taken for "energy" reasons are included in the price stack for the relevant period as one total volume, at the average price of the individual actions. System related BSAD volumes are included in the price stack and can influence NIV, but are unpriced under the current arrangements. P217 and P217A propose that all BSAD actions will be disaggregated and placed in the price stack in their individual price order. These would then fall under the flagging and classification processes. It seems likely that what were energy related BSAD items would be unflagged and what were system BSAD actions would be flagged. However, the latter are more likely to retain their price under the P217 methodology, since they would only be unpriced if there were no more expensive unflagged actions in the stack.

3.18. Disaggregation of the individual BSAD actions will increase the transparency of those actions. Currently since the volume and price of the individual actions is aggregated before publication, the details of an individual action (i.e. whether it is for system or energy reasons) cannot be determined. Under the modification proposals,

the volume and price of each BSAD action will be published shortly after each settlement period. Analysis performed for the modification group showed that in 35% of periods, only one trade makes up the entire volume of either system or energy BSAD. This increased transparency may help parties to identify when the SO is a distressed buyer, giving them greater power in negotiating balancing services contracts and pre-gate balancing transactions (PGBTs).

3.19. However, we believe that under the existing arrangements most parties are already aware when their units are being requested forward by the SO for system reasons. The increased transparency that P217 brings we believe will be beneficial to Ofgem's market monitoring, and will make it more obvious if parties are re-pricing as a result of discovering their units are essential to the SO. Increased transparency could in some circumstances even have a positive impact on competition, as it may reveal opportunities for parties to undercut competitors in offering services to the SO.

Impact on new entry

3.20. Pollution of cash-out prices by system actions means that electricity prices are not determined purely by demand and supply conditions in the market, which makes investment and participation in the electricity market more risky and unpredictable than it otherwise would be (and importantly, than investment in many other markets). By reducing the volatility of cash-out prices and indirectly the within-day market prices, P217 should be beneficial to new entrants.

3.21. However, there are other potential issues for new entrants (and also for smaller market participants) with the current arrangements which may be more significant, and are not addressed by P217 or P217A. During the course of the Cash-out Review a number of parties have expressed concerns surrounding the complexity of the current cash-out arrangements. We share these concerns since we believe complexity and lack of transparency could present a barrier to new entry and a burden on smaller players.

3.22. We believe that P217 would increase rather than decrease the complexity of the cash-out arrangements. First, the approach requires a completely new process of ex-ante flagging by the SO. This process is likely to be complex and by its nature not transparent to outside parties. Second, the P217 methodology introduces two further new stages in the cash-out price calculation - classification and the replacement price process[35]. Both of these add layers of complexity that new entrants to the market will have to invest time in fully understanding.

[35] Further details of the process can be found in the P217 Assessment Report.

3.23. During the Cash-out Review we have highlighted the concerns of certain players surrounding the large spread in cash-out prices, as discussed in Chapter 2. A larger spread will tend to increase the risk of operating in the market, particularly for smaller players, since they will be exposed on both sides of the market. At the margin, the smaller spread under P217A could encourage new entry, whereas the larger spread under P217 could deter small-scale entry.

4. Impacts on sustainable development

Chapter Summary

This chapter considers the effect of P217 on the use of reserve, and on the incentives for distributed low carbon generators

Question box

Question 1: Do you think that P217 or P217A would be likely to have a significant impact on carbon emission from electricity generation?
Question 2: Do you think P217 or P217A are likely to have a significant impact on fuel poverty or vulnerable customers?

Managing the transition to a low carbon economy

NGET reserve requirement

4.1. We discussed in Chapter 3 the potential changes in balancing behaviour under the modification proposals. We concluded that as P217 provides a stronger incentive to balance, and in particular to avoid being short, parties are more likely to go longer on average, meaning NGET has to hold less reserve overall. For P217A, we concluded that the slightly weaker signal to balance may mean parties go less long than they currently do, which would mean NGET has to increase the volume of reserve it holds.

4.2. A greater reserve requirement will generally mean that more plant is "warmed" and ready to produce at any given time but operating below its maximum efficiency and thus leading to increased carbon emissions. However, the improved balancing performance by parties under P217 may result from greater "self-provision" of reserve, and hence the total amount of part-loaded plant on the system may be unchanged. Hence, it is impossible to conclude with certainty whether P217 or P217A would have any material impact on carbon dioxide emissions.

Low Carbon Generation

4.3. Most smaller renewable and combined heat and power (CHP) generators are directly connected to the distribution networks. Such Distributed Energy (DE) generators normally participate indirectly in the wholesale market by selling their output to a third party such as a supplier or specialist consolidator. In this case, the counterparty assumes the imbalance risk on behalf of the generator, and typically incorporates a discount in the offtake purchase agreement to compensate for this exposure. DE generators tend to be in a weak negotiating position due to their small size, lack of portfolio and (for some technologies) the non-controllable output. Improvements to the cash-out regime should benefit DE generators by reducing the balancing costs associated with their variable output thus improving the terms of

their offtake agreements, and potentially allowing them to participate directly in the wholesale market.

4.4. In a document produced jointly by the Department of Business Enterprise and Regulatory Reform (BERR) and Ofgem in June 2008 to describe the issues facing DE generators, we estimated the cost of system pollution to an intermittent DE generator fully exposed to the wholesale market to be around 1.4% of the wholesale price under the current cash-out arrangements[36].

4.5. A more marginal pricing methodology (lower PAR volume) would generally be expected to increase the dual cash-out price spread, other things being equal, if the Main Imbalance price became more extreme. However, the net impact on the cash-out spread would also depend on the extent to which expectations of a more marginal Imbalance Price were reflected in the Reverse Price established in the traded market ahead of Gate Closure. A wider cash-out price spread would increase the net cash-out exposure for DE generators who are not easily able to forecast their output in any half-hour. Average spreads under the live arrangements and the modification proposals were presented in Chapter 2.

4.6. The revised flagging methodology proposed under both modifications would have a small benefit to renewable generators by reducing the effect of system pollution on cash-out prices. P217A is likely to further benefit renewable generators by reducing the average spread between SBP and SSP. However, the more marginal price under P217 is likely to offset the effect of the reduction in pollution by increasing the spread in prices.

Eradicating fuel poverty and protecting vulnerable customers

4.7. We do not expect the modification proposals to have a significant impact on any one particular customer group above any other. To the extent that the proposals improve competition, economy and efficiency, they should help to minimise overall costs of balancing and therefore reduce prices to all consumers.

[36] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=4&refer=Sustainability/Environmnt/Policy/SmallrGens/DistEng

5. Risks and unintended consequences

Chapter Summary

This chapter analyses the risks of unexpected price behaviour under P217 and looks at the impact of NGET's increased discretion in separating system and energy actions.

Question box

Question 1: Do you agree that P217 and P217A can create unexpected prices in some periods?
Question 2: Does the risk of unintended consequences outweigh the potenial benefits of P217/P217A?
Question 3: Are you concerned at the increased discretion P217 gives to NGET to determine system and energy actions?
Question 4: What do you consider would be the best way to monitor and audit NGET's performance in accurately identifying constraint actions?

Risk of unexpected prices[37]

5.1. We have shown in Chapter 2 that on average the effect of the P217 methodology in removing constraint pollution is to reduce SBP when the system is short, and increase SSP when the system is long (assuming a PAR value of 500 MWh). However, analysis of the 2007/08 period shows that in 3.8% of periods when the system is short the P217A prices would actually be higher than live with the biggest difference of £57.17/MWh. Similarly in 2.0% of periods when the system is long the P217A prices would be lower than live with the biggest difference of £12.73/MWh. This is the result of the dis-aggregation of BSAD and inclusion of System BSAD in the cash-out price calculation. The more granular treatment of BSAD volumes should improve the cost reflectivity of cash-out prices and it is perhaps not unexpected that prices could be higher or lower as a result. However, it does serve to show that the impact of P217A would not necessarily be to make cash-out prices more benign in all periods as has generally been assumed.

5.2. A perhaps more surprising result is that in a small number of periods (4) the P217 SBPs are lower, and the SSPs higher (16), than the PEP Alt and PEP Base equivalents, despite the fact more actions are excluded (flagged) from the PEP series. An example of this is Period 21 on 29 September 2007. In this period under the P217 methodology the majority of actions would be flagged as constraint

[37] The analysis of specific periods in Appendix 3 explains in more detail how the P217 pricing methodology can lead to undexpected prices.

(system) actions by NGET, and would not retain their price since there would be no higher priced unflagged (energy) actions. Since these actions would still be needed to make up the NIV, they would be subject to the Replacement Price. The Replacement Price would be set at £27.45/MWh based on some low priced unflagged actions at the bottom of the NIV stack. This low replacement price would then be applied to the unpriced actions which would make up a majority of the volume in the NIV stack, and hence the relatively low SBP for that period of £31.89/MWh. Under the PEP Base and PEP Alt methodologies the entire main stack would be flagged unpriced (since NGET has identified all actions taken as for constraint, frequency response or intra-half hour reasons) and hence the SBP would default to the MIP which was £62.23/MWh for that period, i.e. higher than the Replacement Price that was heavily influencing the equivalent P217 price.

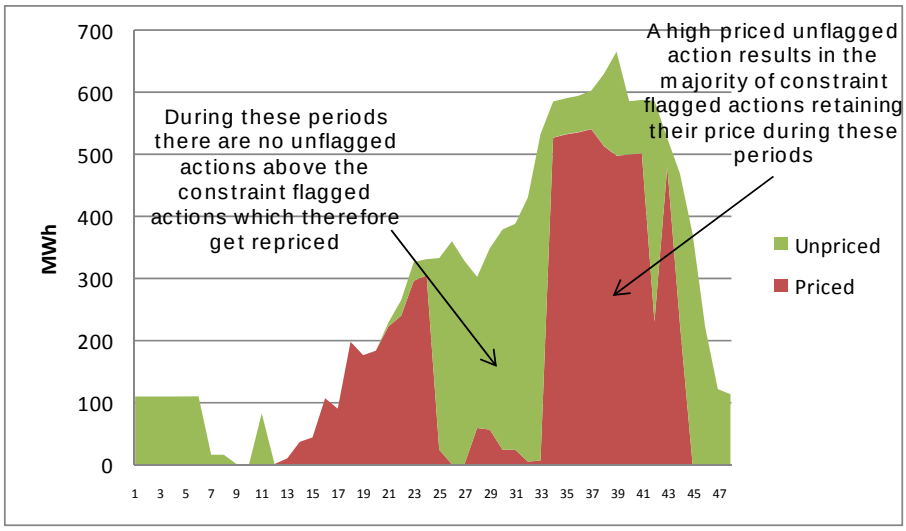
5.3. Another potential anomaly in the P217 methodology was identified by EdF Energy during the Assessment Phase[38]. It identified the example of 27 September 2007 where the impact of Scottish import constraints on cash-out prices changed during the day through a changing combination of BOAs in the stacks.

5.4. The chart below shows the volumes of buy actions flagged by NGET during the course of the day, and the proportion of these that retained their price. It can be seen that between Periods 25 and 33 the majority of flagged actions became unpriced, namely there were no more expensive unflagged actions in the stack. Hence these volumes would be repriced with the Replacement Price. However in Period 34, the SO accepts a higher priced offer from Littlebrook which it would not flag because the BOA is not in an identified constraint area, and hence the majority of actions flagged as constraints then retain their price. EdF Energy argues that since the Littlebrook BOA would subsequently be NIV tagged it should not be influencing the cash-out price[39]. It argues that the problem could be addressed by changing the order of NIV tagging (to take place prior to classification), or through using an EPUS based replacement price, or by treating flagged actions as always unpriced.

Figure 9 - Breakdown of NGET flagged BOA volumes, 27 September 2007

[38] http://www.elexon.co.uk/documents/BSC_Panel_and_Panel_Committees/BSC_Panel_Meetings_2008_-_141_-_Papers/141_05a_P217_Assessment_Report_Attachments.zip

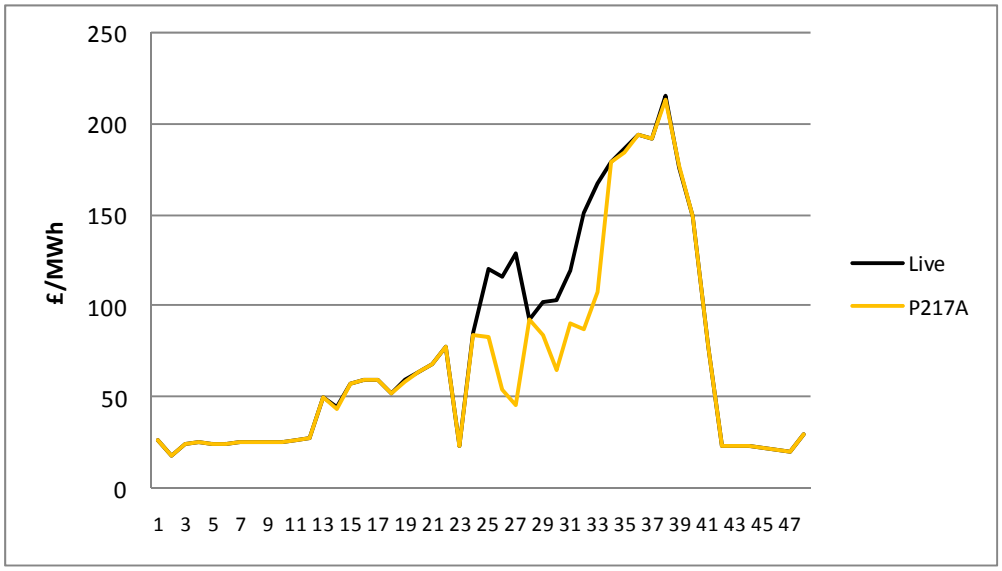
[39] In its analysis, EDF Energy also highlights a BOA from Ffestiniog but since this would be CADL flagged it would not 'validate' the price of the constraint actions in the absence of the Littlebrook BOA.



5.5. The impact of this effect can be seen in the chart below where we compare live prices and the P217A prices. Between Periods 25 and 33, the P217 methodology is removing the effect of the Scottish import constraint, but from Period 34, P217A prices revert back to live prices. More detailed analysis of Period 31 (when constraint actions are repriced) and Period 34 (when they are not) can be found in Appendix 3.

5.6. This example illustrates that there is a degree of randomness in the way that the P217 methodology removes constraints from cash-out prices. Hence, it is not a perfect solution and it may not achieve one of its potential benefits, namely making cash-out prices more predictable.

Figure 10 - Main cash-out price, 27 September 2007



5.7. The examples above illustrate a number of cases where the P217 methodology does not necessarily produce results that may have been expected during the Definition Phase of P217. We believe that the work of the Modification Group has been quite thorough, which suggests many of the potential anomalies should have been picked up. However, with a change of this nature to the cash-out arrangements there exists the possibility of scenarios that have not been envisaged occurring and hence we attach importance both to regular reporting of the accuracy of the flagging methodolodgy and to a post-implementation review should P217 or P217A be accepted (see Chapter 7 below).

Auditability of System Operator actions

5.8. The current arrangements for tagging out "system" actions taken in the BM use mechanistic processes as prescribed in the BSC to classify actions based on their size, duration, direction etc. NGET has no discretion over which BM actions are classified as "system" or "energy". It does, however, have a large degree of discretion over the classification of forward trades, which feed into BSAD. The guidelines given in its BSAD Methodology Statement demonstrate this:

5.9. "In general, energy balancing action is non-locational, and is undertaken purely to ensure the ongoing matching of generation and demand. A system balancing action will generally be used to address very short term effects (less than the Continuous Acceptance Duration Limit) or be location specific (for example resolution of transmission constraints) or provision of frequency response. For contracts covering bundled services, we will attempt to accurately identify the costs associated with each particular service. If this cannot be achieved then we will allocate the costs equally to each of the contracted services."

5.10. Under the modification proposals, NGET will have a similar level of discretion over the classification of BM actions as it currently does over forward trades. It will be required to identify in advance any areas of constraint based on an assessment of demand and supply conditions and the corresponding flows on all parts of the network.

5.11. It was agreed by NGET and the Modification Group that, if P217 or P217A is approved by Ofgem, NGET will develop an ex-ante flagging methodology statement during the 12 month implementation phase. This statement could sit either in the existing BSAD Methodology Statement, or a licence change could be raised to place a new document under Condition C16 of the Transmission Licence. Changes to the statement would then need to be raised by NGET and approved or rejected by Ofgem after consultation with industry.

5.12. NGET is clearly the best placed party to identify the reason that any particular action is taken. Given the current mechanistic tagging process has not been designed explicitly to filter out constraints, we consider that manual identification by NGET should lead to more accurate tagging of constraint actions. This is supported

by analysis in this RIA. However, increased discretion also requires increased monitoring. It is yet to be determined how NGET's performance in accurately identifying constraints will be reported and audited, but Ofgem considers it important that NGET reports regularly on its performance in identifying constraints. Possible routes for this reporting may be presenting at the regular operational forum, or publishing a monthly or annual review. If necessary, Ofgem can raise a licence modification to oblige NGET to report on the flagging methodology.

5.13. We do have some concerns in this area. During the course of the work undertaken by NGET and Elexon as an input to this RIA, errors were identified in the BSAD volumes for the 2007/08 period. We will be seeking assurances from NGET that the increasing scope and complexity of its discretionary role under P217 would not increase the risk of errors within the cash-out price calculation.

6. Other impacts, costs and benefits

Chapter Summary

This chapter looks at implementation costs of P217, and its likely effect on security of supply.

Question box

Question 1: Do the cost of implementing the proposal(s) outweigh their benefits?
Question 2: Do you consider that the proposal(s) would have a significant impact on security of supply, either in the short or long term?

Implementation costs

6.1. The table below summarises the centralised implementation costs for P217 as presented in the Final Modification Report (FMR). The largest cost would be borne by the Transmission Company in setting up and operating procedures and systems for flagging individual BM bids and offers, and balancing services.

Table 14 - implementation costs of P217/P217A

	Implementation cost	Tolerance(%)/ Contingency (£)
BSC Agent	£292,030	0%
BSCCo	£129,780	10%
Transmission Company	£658,000	£167,000

6.2. Five parties responded to the Assessment Phase impact assessment. The highest cost impact was £50,000, but most respondents forecast lower costs. If we assume an average £10,000 cost over 30 market participants, this would give a total implementation cost for parties of approximately £300,000.

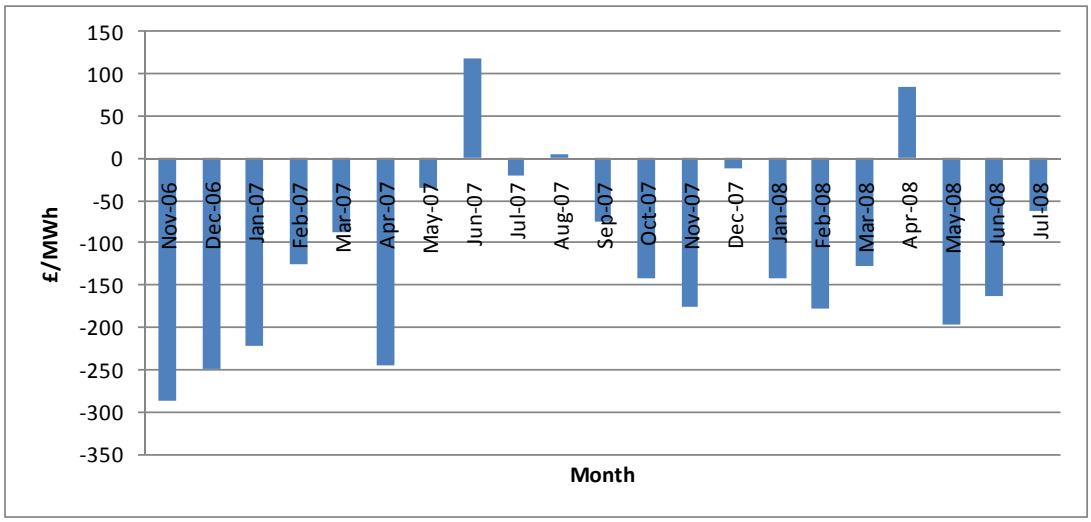
6.3. Based on these cost assumptions, the central forecast for implementation costs would be £1.4m. These costs would be the same for P217 and P217A.

Security of supply

6.4. In recent months there has been a trend in the average NIV value to become less long. This can be seen in the chart below. Whilst average NIVs are still long, the NIV during the day-time peak is consistently short. The system was significantly shorter during winter 2007/08 than in the previous winter, and April 2008 saw the

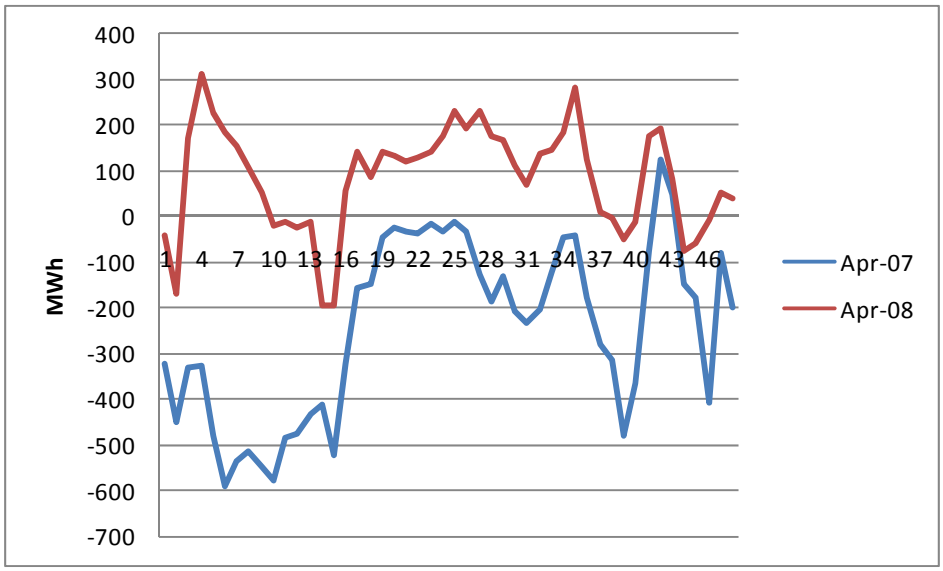
second shortest average NIV, and the shortest outside a summer month where NIVs tend to be shorter since the risk of high SBPs is less.

Figure 11 - Monthly average NIV



1.1. The average NIV by settlement period in April 2007 and April 2008 is shown in the chart below. The NIV is on average shorter in every period in April 2008 with biggest differences actually occurring overnight.

Figure 12 - Average NIV by settlement period, April 2007 and April 2008



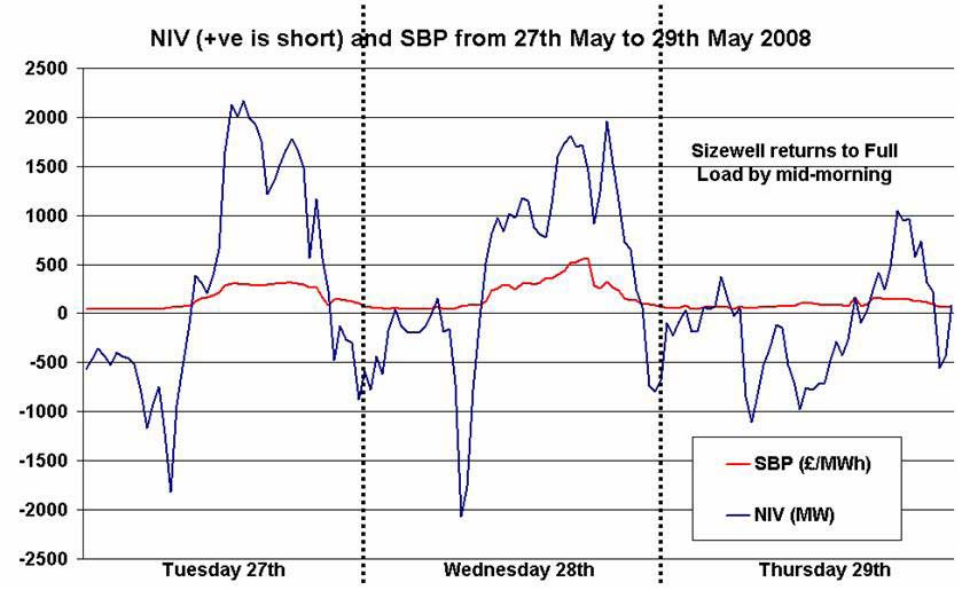
Events of 27 May 2008

6.5. This shortening of the average NIV potentially raises concerns surrounding security of supply with further evidence coming from events on 27 May 2008. On that day, NGET issued a series of system warnings after a loss of 1.6 GW of generation within 2 minutes. The resulting system tightness led to NGET issuing demand control instructions to DNOs. We look at the events here to demonstrate the response of prices to the extreme events, and implications for security of supply.

6.6. Demand levels were not unusual for the time of year. However, the loss of 2 generating units accounting for about 1.6 GW within 2 minutes in the morning reduced the margin dramatically and triggered some automatic low frequency relays, which disconnected 580 MW of demand. However, NGET reports that insufficient plant was available which was able to synchronise in time to supply the evening peak, so it had to instruct DNOs to reduce demand. In its report of the day, NGET states "there is limited evidence of the market covering its short position across the day and National Grid synchronised all feasible plant to help meet demand".

6.7. Figure 13 below shows the movement of NIV and prices on the 27th and the following 2 days.

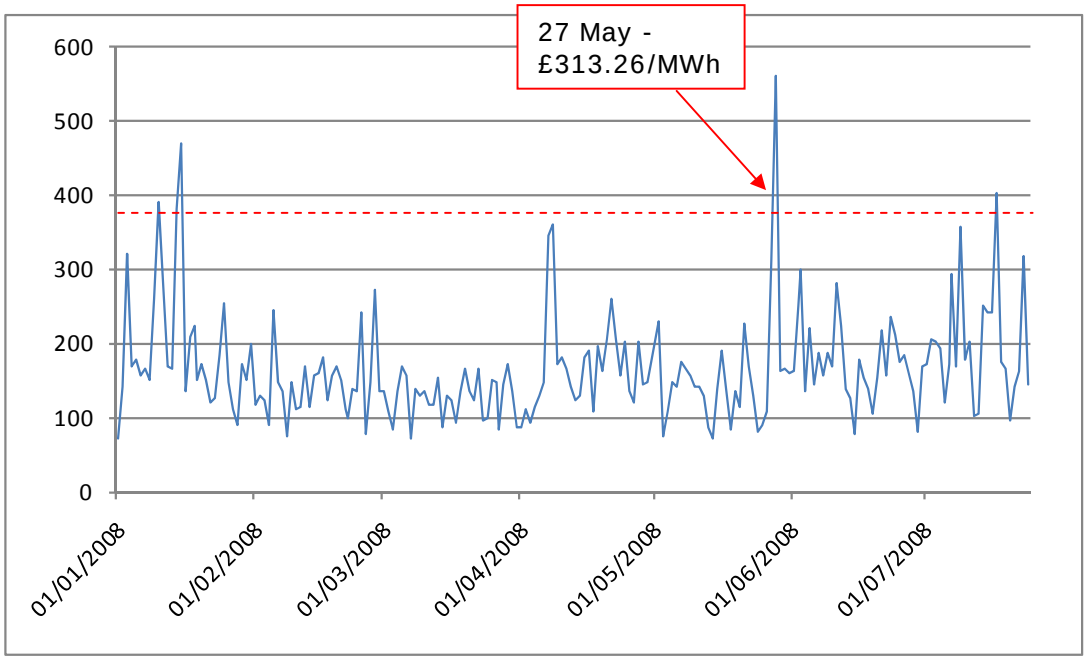
Figure 13 - NIV and SBP, 27-29 May 2008



Source: Report of the investigation into the automatic demand disconnection following multiple generation losses and the demand control response that occurred on the 27th May 2008, National Grid

6.8. Two things are particularly notable. First, the NIV follows quite closely the demand profile, suggesting there was little generator response to the increased need for power. Second, the SBP did not rise very dramatically on the day. It peaked at £313/MWh, a level which has been surpassed on 10 days since the start of 2008 (see Figure 14 below). System warnings were not issued on any of these days. Interestingly, the following day (28th May) the system was still short, indicating generators had still not covered their positions. SBP rose to its highest level of the year, £560/MWh, when the system warnings had been cancelled and the requirement for a generator response was much lower.

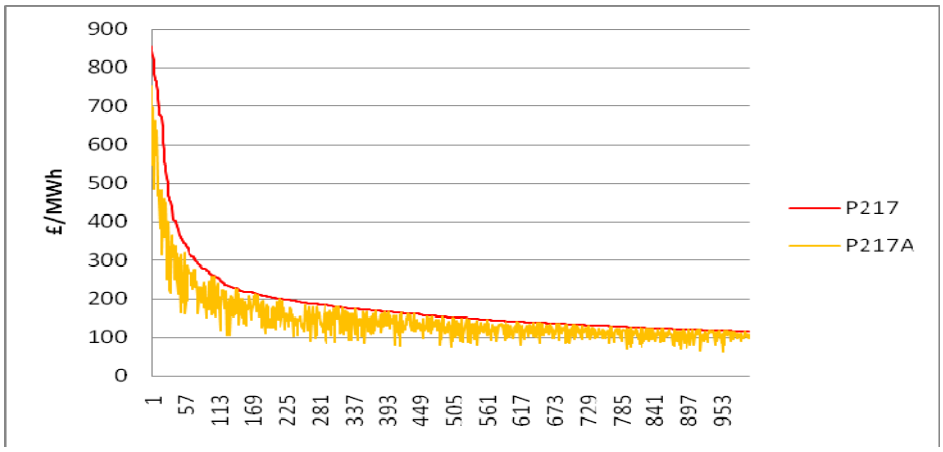
Figure 14 - Maximum daily SBP, 2008



Implications for the value of PAR

6.9. Growing concerns surrounding security of supply might suggest reducing the PAR value to sharpen cash-out price signals as proposed in P217. The chart below compares P217 and P217A for the highest 1000 SBPs in 2007/08.

Figure 15 - Highest 1000 SBPs stacked according to P217 methodology

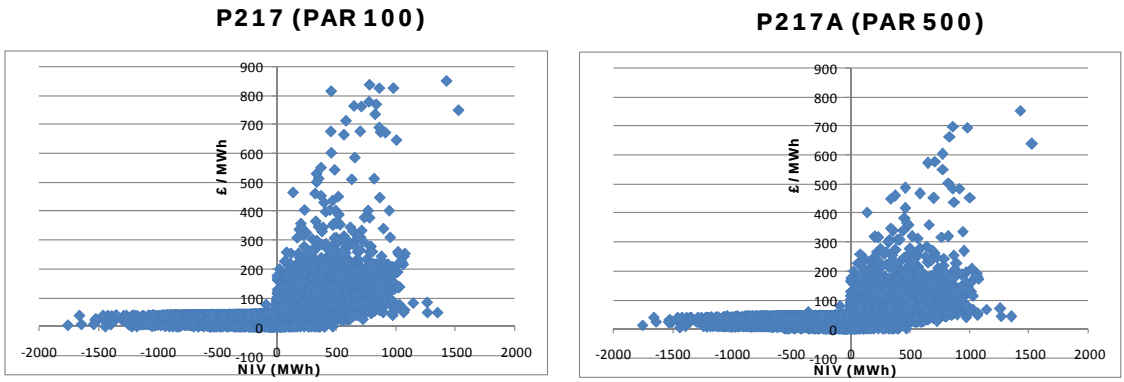


6.10. The P217 SBPs are on average 20% higher than the P217A prices in the top 1000 settement periods, and 25% higher in the top 250 settlement periods. It is interesting to note the apparent 'volatility' in the P217A prices when they are ordered according to the ranking of P217 original prices. This suggests that the choice of PAR value affects the ranking of prices in different settlement periods, i.e. the settlement period with the highest SBP under PAR100 may not be the same as under PAR500.

6.11. We believe in principle that moving to a PAR value of 100 MWh would be beneficial to security of supply, although we are not able to quantify the extent of that benefit. However, any reduction in the PAR value needs to be weighed up against the wider impacts.

6.12. The scatterplots below suggest that decreasing the PAR value could be a fairly blunt instrument for improving security of supply. These demonstrate that the relationship between NIV (a reasonable measure of system stress) and cash-out price is fairly weak. Very high cash-out prices are almost as likely to occur for small positive NIVs as for very large ones. We believe this can be explained by the fact the SO is purchasing a range of different 'products' for resolving NIV. For example, it may action some short notice (and expensive) offers to resolve a small but unexpected short NIV, whereas it may be able to synchronise large volumes of lower cost plant to resolve a large short NIV that it can anticipate.

Figure 16 - Relationship between NIV and main cash-out price



6.13. Reducing the value of the PAR to 100 MWh as under P217 does indeed increase SBPs for the periods of shortest NIV. It also increases the SBPs during periods of lower NIVs. The judgement that needs to be made is whether the relatively small increase in SBP that PAR100 would produce at times when the NIV is very short justifies also increasing SBP in periods when the system is close to balance.

7. Post-implementation review

Question box

Question 1: Do you believe that a post-implementation review for P217/P217A would be necessary if either were to be implemented?
Question 2: If so which aspects of the proposal(s) should be analysed?

7.1. NGET acknowledges that its method for flagging constraint actions under the modification proposals is not 100% accurate, and that it is likely constraints would still influence cash-out prices in some periods.

7.2. In addition, P217 and P217A propose changes to the treatment of CADL volumes, a replacement price for "energy plus" actions, a new way of adding BSAD to the price stack and (under P217) a change to the PAR value. As such, if Ofgem decides to direct implementation of either modification, we consider it would be prudent to review the operation the cash-out pricing 12 months after implementation, at which point analysis of outturn data will inform whether revisions to any of the above elements are appropriate. We will outline further detail of such a review if either P217 or P217A is approved in October 2008.

8. Conclusions

Extent of the defect

8.1. We think that analysis presented in the Assessment Report for P217 and in this RIA clearly illustrates that a defect exists associated with system related actions polluting cash-out prices. These system related actions include resolution of constraints, creation of reserve, frequency response and intra-half hour balancing. For example, we calculate that import constaints into Scotland during Septemeber and October 2007, led to SBP in certain periods being over £120/MWh higher than the underlying cost of energy balancing.

8.2. Based on our analysis of data provided by NGET in which Proxy Energy Prices have been created by manually tagging out system related actions, we estimate that system pollution is leading to an average increase in SBP of at least 3.4% when the system is short and a decrease of 1.4% in SSP when the system is long. If reserve creation is classified as a system rather than an energy action these figures rise to 10.1% and 2.7% respectively.

8.3. On this basis, we estimate that system pollution is increasing imbalance charges by at least £17m annually. This additional cost is borne disproportionately by smaller players who typically have poorer balancing performance. In effect this represents a cross-subsidy from parties with poorer balancing performance to parties with better balancing performance. We believe that the knock-on impact of system pollution in the wholesale market could be to add £20m annually to contract premia. If the full direct and indirect cost of system pollution where passed on to consumers this would add £37m to bills annually.

Modification Proposal P217

8.4. Our analysis suggests that P217 could lead to annual savings to consumers of around £19m annually, reducing the cost of system pollution by about half.

Proposed Modification

8.5. Table 15 summarises the assessment of P217 against the relevant objectives and wider statutory duties.

Table 15 - Assessment of P217 against Applicable BSC Objectives and Authority's Wider Duties

Criteria	Assessment	Comments
Economy and efficiency	✓	Effective in removing effect of constraints from cash-out prices. Lower value of PAR leads to prices that more closely reflect the marginal costs of energy balancing at times of system stress. However the lower value

		of PAR would increase SBP-SSP spreads.
Competition	x	Potentially detrimental to competition due to larger SBP-SSP spreads which tend to disadvantage smaller players and new entrants who generally have weaker balancing performance. Also the additional complexity would make cash-out price calculation less transparent disadvantaging parties which have less resource to forecast cash-out prices.
Security of supply	✓✓	The lower value of PAR would sharpen the cash-out price sigals at times of system stress which should encourage parties to cover better their positions with benefits for security of supply.
Sustainable development and environmental impacts	-	Impact likely to be minimal. Larger spreads may disadvantage renewables and distributed energy generators.
Cost of implementation	x	Would involve costs across the industry but not sufficient to act as barrier to implementation.
Overall assessment	✓	

Alternative Modification

8.6. Table 16 summarises the assessment of P217A against the relevant objectives and wider statutory duties.

Table 16 - Assessment of P217A against Applicable BSC Objectives and Authority's Wider Duties

Criteria	Assessment	Comments
Economy and efficiency	✓	Effective in removing effect of constraints from cash-out prices.
Competition	✓	Should be beneficial to competition since it lowers barriers to entry by removing constraint pollution effect. However, arrangements would be more complex.
Security of supply	-	Possibly marginally detrimental to security of supply since it dampens cash-out price signals, but effect is likely to be minimal.
Sustainable development and environmental impacts	-	Impact likely to be minimal.
Cost of implementation	x	Would involve costs across the industry but not sufficient to act as barrier to implementation.
Overall assessment	✓	

Modification Proposal P211

8.7. Ofgem published its Impact Assessment on Modification Proposals P211 and P212 in December 2007[40]. Based on the analysis presented in that document and in the Final Modification Reports, we stated a view that we were currently minded to accept P211 and to reject P212.

8.8. In February 2008 we published a letter outlining our decision to reject P212 but to defer the decision on P211 to align with the decision on Modification P217 since both modifications were attempting to address the same defect, and in recognition that the decision on P211 was finely balanced.

8.9. In order to facilitate the comparison of P211 with P217/P217A we have redone some of the analysis contained in the P211 RIA for the 2007/08 period using the updated methodologies for calculating PEP Base and PEP Alt. The results of this are presented in Appendix 2.

8.10. The key conclusions from this analysis are that P211 would produce less extreme cash-out prices than P217 and P217A with lower spreads and less volatility. P211 prices would tend to underestimate the costs of energy balancing but would produce a closer match between annual imbalance charges and energy balancing costs, if the costs of reserve creation are excluded. If the costs of reserve creation are included in the definition of energy balancing, then P211 would lead to prices that significantly underestimate these costs.

Authority's current position

8.11. All three live proposals (P211, P217, P217A) to revise the cash-out arrangements could potentially be an improvement on the current baseline, although we do not consider that any address all of the issues raised during the Cash-out Review. In making its final decision the Authority will need to address the following two key issues:

- The costs and benefits of more marginal cash-out prices
- How the costs of reserve should be reflected in cash-out prices

[40] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=98&refer=Markets/WhlMkts/CompandEff/CashoutRev

Costs and benefits of more marginal cash-out prices

8.12. The decision between P217 and P217A relates to the different PAR value, and the benefits of providing stronger incentives to balance in order to reduce SO balancing costs and enhance security of supply, versus the potential impact on competition of exposing parties less able to balance (typically smaller players and new entrants) to greater balancing costs and risks.

8.13. In previous documents we have expressed a preference for more marginal cash-out price signals to ensure that parties make sufficient arrangements to cover their positions, and to provide the necessary signals to invest in plant or demand side management. Our decision on Modification Proposal P194 (PAR value of 100MWh) reflected this view. However, we subsequently accepted P205 (PAR value of 500 MWh) due to concerns surrounding the possible impact of system pollution on prices, and analysis that suggested that a PAR value of 500 MWh would still produce strong price signals at times of system stress.

8.14. By removing the effects of constraints from cash-out prices, there is a case for reducing the value of PAR since the impact of system pollution is less. For the reasons outlined in our decision on P194 we believe that sharper cash-out price signals at times of system stress may be needed to ensure security of supply, in order to signal the investment required as the capacity mix evolves over the next few years including an expected rapid expansion of intermittent renewables.

8.15. However, the analysis in this RIA demonstrates that reducing the value of PAR would increase the cash-out price spread (not just in periods of system stress) which we believe could be detrimental to competition. Whilst we accept the arguments made by some parties in their responses to the P211/P212 RIA that cash-out is designed to target energy balancing costs rather than to directly recovery them, we would be concerned if the cash-out arrangements consistently led to imbalance charges significantly exceeding the costs incurred by the SO in energy balancing, since this is likely to disadvantage smallers players relative to bigger players who would benefit from a RCRC rebate greater than the energy balancing costs they would pay through BSUoS charges with a lower PAR value.

8.16. For this reason, combined with the fact that P217 may not remove all instances of system pollution, and that there are uncertainties with respect to the effect of the new arrangements on prices, we currently prefer retaining a PAR value of 500MWh and favour P217A over P217. However, we believe that this issue should be kept under review, and that the value of PAR should be reduced when it can be proven that this would not be detrimental to competition. The trigger for reducing PAR may be a track record of non-polluted cash-out prices, improved access to shape and balancing energy for smaller players through increased within-day liquidity (or other mechanisms), reduced cash-out price spreads which may result from the former or an amendment to the Reverse Price methodology, or a combination of all of these.

Costs of reserve

8.17. In the P211/P212 RIA, we highlighted that the case for including reserve creation BOAs in the definition of energy balancing was finely balanced, but stated a view that since the cost targeting was potentially inaccurate we favoured excluding them - the PEP Base definition of energy balancing. Since P211 produced prices which matched quite closely to the PEP Base price series we stated that we were minded to approve.

8.18. For the reasons outlined in this RIA, we are now of the view that excluding the costs of reserve creation completely from cash-out prices would underestimate the costs of energy balancing. Whilst our concerns surrounding the accuracy of reserve cost targeting remain, we believe that the PEP Alt definition of energy balancing which includes the costs of reserve creation is more appropriate than PEP Base that excludes it.

8.19. On this basis we are now of the view that P211 would underestimate the costs of energy balancing and provide insufficient signals to balance with a consequent risk to security of supply. We believe that a method for reallocating the costs of reserve creation that the P211 methodology strips out may be required. Combined with a revised BSAD methodology for targeting STOR and BM Start-up availability fees, this approach could provide an effective solution for improving the transparency and accuracy of reserve cost targeting.

Summary

8.20. In conclusion, we are currently minded to concur with the Panel's recommendations and approve P217A and reject P211. We believe that P211 has its merits since, in addition to removing the effect of constraints, it proposes an elegant method for separating the costs of reserve creation from the cash-out price calculation. However, since it is not currently accompanied by a proposal to re-target these costs more appropriately we are now concerned that it may underestimate the total cost of energy balancing. Hence, after further discussion and analysis we now consider that P211 does not further the Applicable BSC Objectives.

8.21. We do not consider that P217A is a perfect solution, and in particular we are concerned about the additional complexity involved and risk of unintended consequences, which would require monitoring. As we have stated during the course of the Cash-out Review we believe there remains scope for improving the arrangements further through improved targeting of reserve costs, reduction in the cash-out price spread and shortening of gate closure and/or extending the contract notification period.

Appendices

Index

Appendix 1 - Consultation Response and Questions

1.1. Ofgem would like to hear the views of interested parties in relation to any of the issues set out in this document. (In particular, we would like to hear from xxxx. If appropriate)

1.2. We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

1.3. Responses should be received by 5pm on Friday 19 September 2008 and should be sent to:

Ben Woodside
GB Markets
Ofgem
9 Millbank
London SW1P 3GE
020 7901 7471
Gb.markets@ofgem.gov.uk

1.4. Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website www.ofgem.gov.uk. Respondents may request that their response is kept confidential. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

1.5. Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

1.6. Next steps: Having considered the responses to this consultation, Ofgem intends to issue a final decision on modification proposals P211, P217 and P217A by 16th October 2008. Any questions on this document should, in the first instance, be directed to:

Ben Woodside
GB Markets
Ofgem
9 Millbank
London SW1P 3GE
020 7901 7471
Ben.woodside@ofgem.gov.uk

CHAPTER: One

There are no specific questions for Chapter One.

CHAPTER: Two

Question 1: Is our revised definition of a Proxy Energy Price for energy balancing actions appropriate?
Question 2: Should reserve creation BOAs be classified as energy actions?
Question 3: Is it of concern that the costs of reserve are not currently accurately targeted?
Question 4: Do you agree with our estimate of costs to consumers caused by "system pollution"?
Question 5: Do you think that more marginal pricing is appropriate under a P217 flagging methodology?
Question 6: Do you agree that P217A produces cash-out prices that are more reflective of energy balancing costs than the current arrangements?
Question 7: Do you consider that P217 produces cash-out prices that are more reflective of energy balancing costs than the current arrangements?
Question 8: Do you agree that disaggregation of BSAD should improve the accuracy of the cash-out price calculation?

CHAPTER: Three

Question 1: Do you think P217 or P217A will have an effect on the incentives on parties to balance their positions?
Question 2: Do you believe that the savings in SO costs from a lower PAR value would be greater than the costs borne by parties as a result of sharper cash-out price signals?
Question 3: Do you agree with the assessment of the distributional effects of P217/P217A? If not, please provide indications of the anticipated impact on your business?
Question 4: Will the increased transparency of the SO's actions lead to more or less competitive pricing?
Question 5: Do you agree with our assessment of the impacts of P217 and P217A on the prospects for new entry?
Question 6: Do you believe that the potential benefits of P217/P217A justify the additional complexity in the cash-out price calculation?

CHAPTER: Four

Question 1: Do you think that P217 or P217A would be likely to have a significant impact on carbon emission from electricity generation?

Question 2: Do you think P217 or P217A are likely to have a significant impact on fuel poverty or vulnerable customers?

CHAPTER: Five

Question 1: Do you agree that P217 and P217A can create unexpected prices in some periods?
Question 2: Does the risk of unintended consequences outweigh the potenial benefits of P217/P217A?
Question 3: Are you concerned at the increased discretion P217 gives to NGET to determine system and energy actions?
Question 4: What do you consider would be the best way to monitor and audit NGET's performance in accurately identifying constraint actions?

CHAPTER: Six

Question 1: Do the cost of implementing the proposal(s) outweigh their benefits?
Question 2: Do you consider that the proposal(s) would have a significant impact on security of supply, either in the short or long term?

CHAPTER: Seven

Question 1: Do you believe that a post-implementation review for P217/P217A would be necessary if either were to be implemented?
Question 2: If so which aspects of the proposal(s) should be analysed?

Appendix 2 – Evaluation of P211 using recalculated benchmarks

Background

1.1. Ofgem published its Impact Assessment on Modification Proposals P211 and P212 in December 2007[41]. Based on the analysis presented in that document and in the Final Modification Reports, we stated a view that we were currently minded to accept P211 and to reject P212.

1.2. In February 2008 we published a letter outlining our decision to reject P212 but to defer the decision on P211 to align with the decision on Modification P217 since both modifications were attempting to address the same defect, and in recognition that the decision on P211 was finely balanced.

1.3. Subsequent to that RIA we have updated our methodology for calculating the PEP series, as explained in Chapter 2. Furthermore, the period that the P211 analysis covered did not fully coincide with that used for the P217 IA. Hence, in order to facilitate comparison with P217 we have recalculated the P211 analysis for the period 2007/08. In this appendix we present the results of this updated analysis and draw comparisons between P211 and P217/P217A.

Impacts on consumers

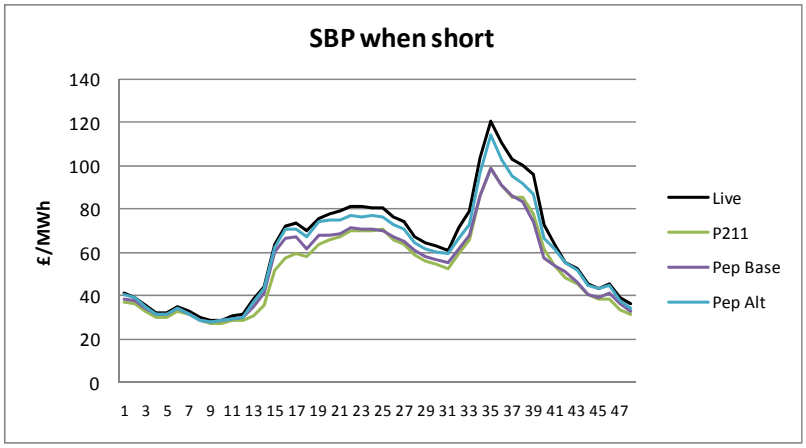
Assessing whether P211 methodology creates prices which are more reflective of the costs of energy balancing than current arrangements

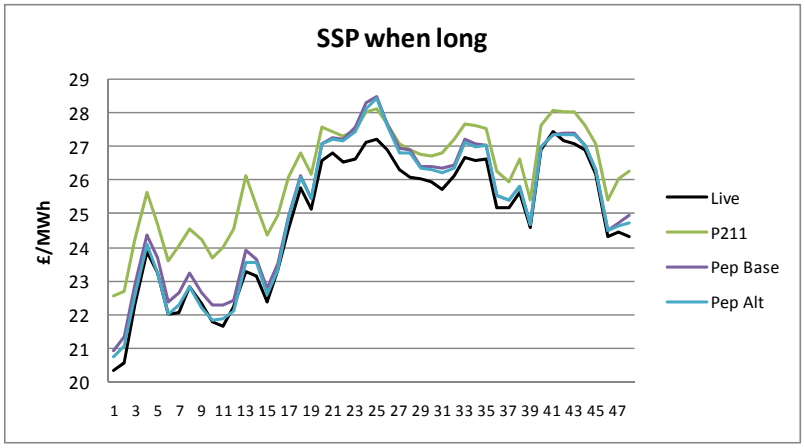
Benchmark 1: Proxy Energy Price comparison

1.4. The following charts compare the average P211 prices by settlement period to the live, PEP Base and PEP Alt prices (PAR500). They are shown separately when SBP is the main price (system short) and when SSP is the main price (system long).

Figure 17 - Average P211 prices by settlement period

[41] http://www.ofgem.gov.uk/Pages/MoreInformation.aspx?docid=98&refer=Markets/WhlMkts/CompandEff/CashoutRev





1.5. Average P211 SBPs are lower than live SBPs in all settlement periods, particulary during the day-time period. Similarly, average P211 SSPs are higher than live SSPs in all settlement periods.

1.6. There is a reasonably close match between the P211 SBPs and the PEP Base SBPs, although it is noticeable that they are lower around the morning ramp. This is explained by the fact that P211 does not consider plant dynamics in its calculation. P211 SBPs are significantly lower than PEP Alt SBPs since they effectively exclude the costs of reserve creation. P211 SSPs are generally higher than the PEP Base and PEP Alt SSPs particularly in the overnight periods.

1.7. The table below compares the annual average SBP when the system is short and SSP when the system is long under P211 compared to live, PEP Base and PEP Alt for 2007/08.

Table 17 - Annual average cash-out prices under P217 compared to live and PEP Series, 2007/08

	Live	P211	% diff	PEP Base	% diff	PEP Alt	% diff
SBP	66.57	56.70	-14.8%	59.86	-10.1%	64.27	-3.4%
SSP	24.50	25.99	+6.1%	25.17	+2.7%	24.83	+1.4%

1.8. The P211 SBPs are closer to PEP Base SBPs than live, although are lower by about 3.7%. (In the P211 RIA the SBPs were 2.7% lower than PEP Base.) The P211 SBPs are significantly lower than the PEP Alt SBPs. PEP Base SSPs are actually closer to live SSPs than P211 SSPs. This suggests that P211 produces less cost reflective SSPs than live, even under the PEP Base definition of energy balancing. This result differs from the P211 RIA when P211 SSPs were 1.9% higher than PEP Base SSPs, which were 4.0% higher than live. This change in result is a function of changing the replacement price methodology in the PEP calculations for the P217 RIA.

Benchmark 2: Annual energy balancing cost comparison

1.9. The following table shows the impact of P211 on annual imbalance charges and compares these to the cost of energy balancing under PEP Alt definition of energy balancing in 2007/08. For the purposes of this analysis we have assumed no change in participant behaviour.

Table 18 – P211 balancing cost comparison, 2007/08

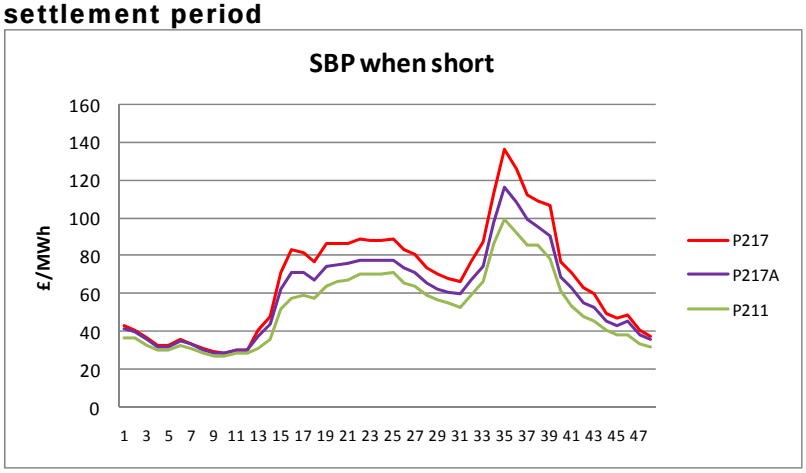
	Live	P211	Difference
Energy balancing costs	119.00	119.00	0.00
Imbalance charges	141.44	87.44	-54.00
Difference	-22.44	31.56	

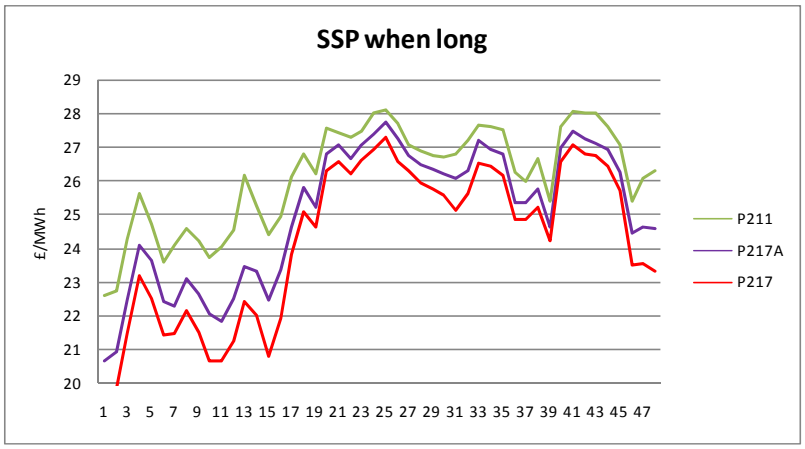
1.10. Assuming no change in behaviour, annual imbalance charges would decrease from £141m to £87m under P211 due to the less extreme cash-out prices. Under P211, the net over-recovery of balancing costs through imbalance charges of £22m under the current arrangements would change to a net under-recovery of £32m.

Comparison between P211 and P217/P217A

1.11. The charts below compare the average SBP when the system is short and average SSP when the system is long by settlement period for P211, P217 and P217A. The P211 SBPs are below the P217A SBPs since the effect of plant dynamics and costs of reserve creation are removed from the P211 prices but not from the P217A prices. The P211 SBPs are yet lower when compared to P217 SBPs since the latter are calculated using a PAR value of 100 MWh.

Figure 19 - Comparison of P211, P217 and P217 cash-out prices by settlement period





1.12. The table below compares the annual average SBP when the system is short and SSP when the system is long under P211, P217 and P217A when compared to live for 2007/08.

Table 19 - Comparison of percentage difference to live cash-out prices

	P211	P217	P217A
SBP	-10.1%	+9.7%	-3.1%
SSP	+6.1%	-2.4%	0.8%

1.13. The table below compares the difference between annual energy balancing costs and imbalance charges for 2007/08 under PEP Alt for P211 and P217, P217A, assuming no change in participant behaviour. P211 gives imbalance charges less than the costs of energy balancing. P217A provides the closest match in this case.

Table 20 - Comparison of annual energy balancing costs and imbalance charges, no change in balancing behaviour

	Live	P211	P217	P217A
Energy balancing costs	119.00	119.00	119.00	119.00
Imbalance charges	141.44	87.44	180.86	130.71
Difference	-22.44	31.56	-61.86	-11.71

1.14. The tables below present the same analysis but this time includes the estimated change in player behaviour on NIV. The conclusions remain the same.

Table 21 - Comparison of annual energy balancing costs and imbalance charges, no change in balancing behaviour

	Live	P211	P217	P217A
Energy balancing costs	119.00	126.93	113.24	121.25
Imbalance charges	141.44	95.02	170.21	131.71
Difference	-22.44	31.91	-56.97	-10.46

1.15. The table below compares the annual average spread of SBP to SSP under P211 compared to live, P217 and P217A for 2007/08. P211 would produce a significantly lower average spread than live or P217/P217A prices.

Table 22 - Comparison of average spread between SBP and SSP

(£/MWh)	Live	P211	P217	P217A
Average spread	16.51	11.86	19.39	15.52

1.16. The table below shows the standard deviation of SBPs and SSPs under P211 compared to live, P217 and P217A. P211 would produce significantly less volatile cash-out prices than live or P217/P217A prices.

Table 23 - Comparison of standard deviations

	Live	P211	P217	P217A
SBP	39.71	29.44	47.20	37.20
SSP	20.94	19.34	21.01	20.80

Appendix 3 - Period analysis

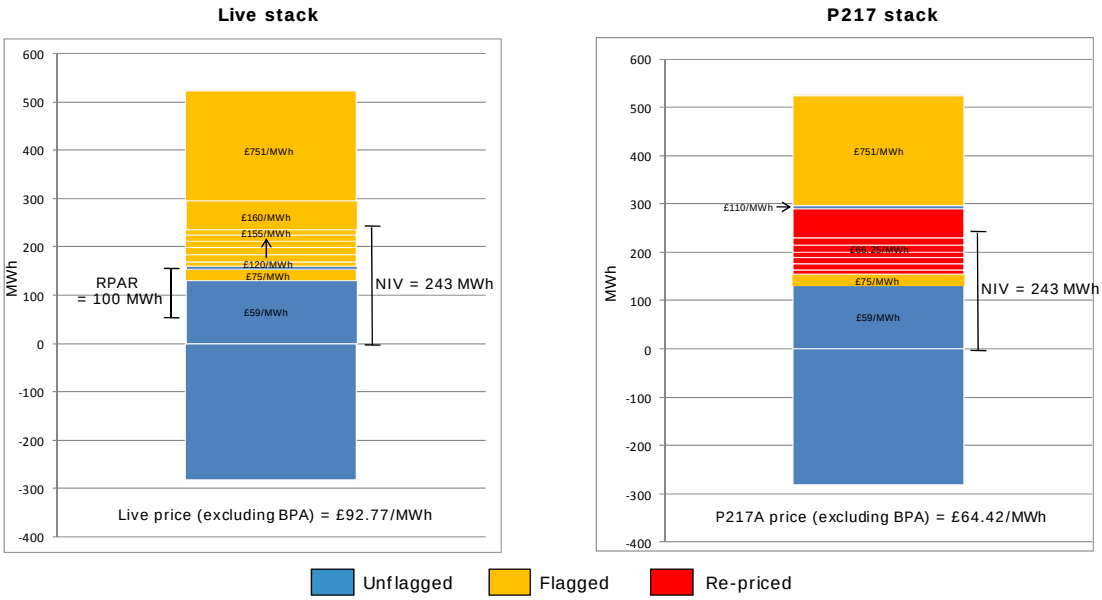
1.1. In this appendix we present the results of analysis of stacks for individual periods under the P217 methodology. We look at examples of how constraint flagging and BSAD disaggregation affect cash-out prices. To facilitate comparison with the live arrangements we have conducted this analysis using P217A, in order to maintain the same PAR value (500 MWh). The methodology of creating the price stacks would be exactly the same for P217 with the only difference the value of PAR applied in the final cash-out price calculation.

Examples of constraint flagging

27th September 2007, Period 31

1.2. The charts below demonstrate how the P217 methodology is applied to stacks of BOAs to calculate cash-out prices. In this period there was an import constraint on the transmission system between England and Scotland. The system was short (NIV = 243 MWh) which means that the volume in the offer stack (positive volumes) exceeded volumes in the bid stack (negative volumes). The chart on the left shows the buy BOAs in price order ranging from £50/MWh to £751/MWh. Since NIV (243 MWh) is less than PAR (500 MWh), under the current arrangements the SBP would simply be the volume-weighted cost of BOAs within the NIV (£92.77/MWh) plus the BPA (£26.81/MWh) = £119.58/MWh.

Figure 20 - P217 methodology, 27th September 2007, Period 31



1.3. Those BOAs that would be unflagged ('pure energy') under P217 are shown in blue, whereas those which would be flagged are shown in gold. Since there are no more expensive unflagged actions in the stack, those flagged BOAs priced in the range of £120/MWh to £160/MWh would become unpriced under the classification process. The Replacement Price would be calculated from the most expensive 100 MWh of priced BOAs remaining within the NIV shown on the left (£66.25/MWh). The unpriced flagged actions are then repriced at this level, shown in red in the chart on the right. The stack is then resorted. Somewhat ironically there is now a more expensive unflagged action (£110/MWh) sitting above the re-priced flagged actions in the stack, and although this BOA fed into the Replacement Price calculation, it has now been pushed outside NIV and will not directly be included in the cash-out price calculation. This example demonstrates some of the anomalies of the complex P217 calculation process.

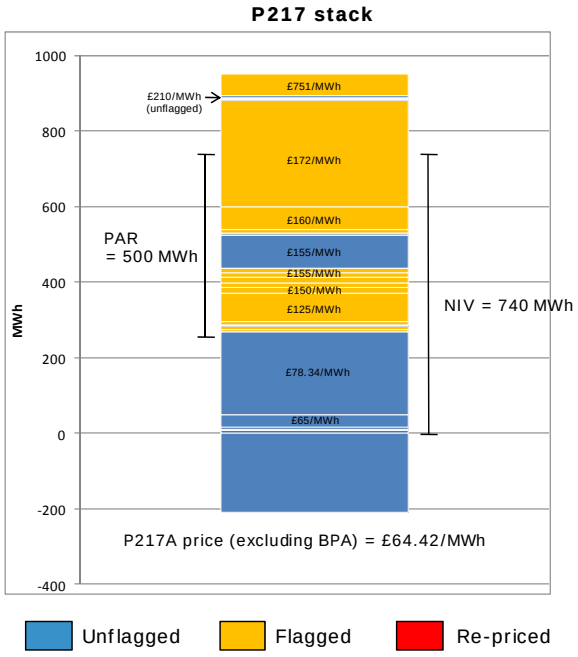
1.4. The SBP would then be calculated as the volume-weighted average price of the resorted NIV stack (£64.42/MWh) plus the BPA (£26.81/MWh) = £91.23/MWh. Hence the effect of P217A would be to remove £28.35/MWh of constraint costs from the SBP for the period in question.

27th September 2007, Period 34

1.5. Three settlement periods later (Period 34) the effect of the P217 methodology is different. The Scottish import constraint is still active, but the system is noticeably shorter (NIV = 740 MWh). The SO has accepted an unflagged action at £210/MWh from Littlebrook and hence the equivalent flagged BOAs that were repriced in Period 31, now retain their price. There is no repricing and no resorting of the stack. The P217A SBP price would be very similar to the current arrangements, £179.20/MWh compared to £179.44/MWh[42].

Figure 21 - P217 methodology, 27th September 2007, Period 34

[42] The small difference is explained by the different treatment of CADL BOAs under P217 compared to live.



1.6. Although the £210/MWh Littlebrook BOA would be NIV tagged out of the cash-out calculations, it would have an effect under P217/P217A by allowing constraint related BOAs to retain their price.

Summary

1.7. The analysis demonstrates how P217 can remove the effect of constraints from the cash-out price calculation in certain periods. However, the comparison of Periods 31 and 34 on 27th September 2007, demonstrates that the P217 methodology does not always deal with constraints in a consistent way, and therefore may not completely remove the effect of constraint pollution.

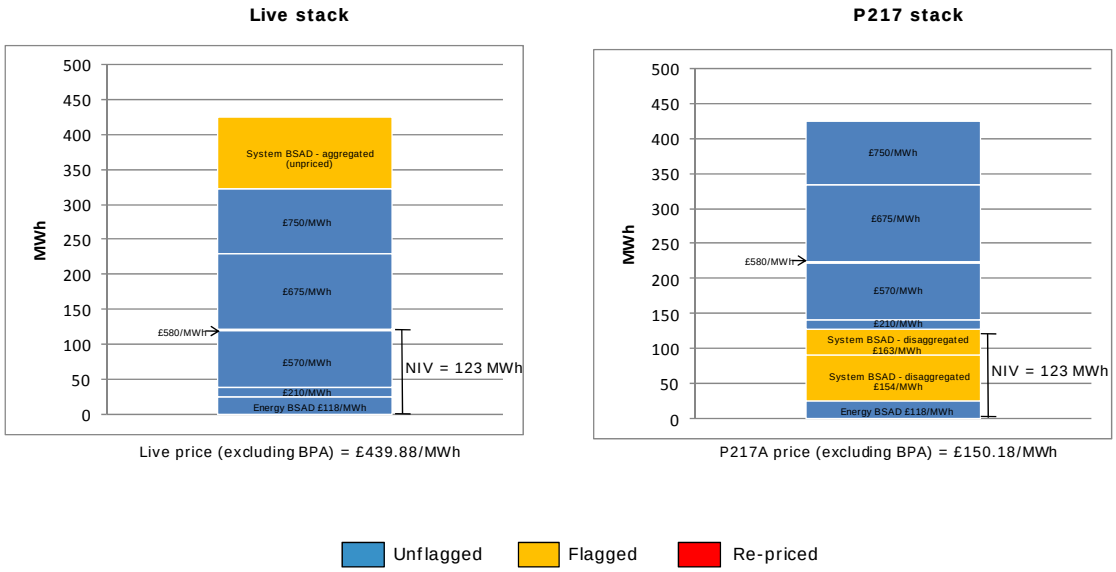
Examples of BSAD disaggregation

19th December 2007, Period 32

1.8. To demonstrate the effect of BSAD disaggregation we have examined Period 32 on 19th December 2007, which had a short NIV of 123 MWh. The chart on the left below demonstrates the calculation under the live arrangements. System BSAD is unpriced and sits at the top of the stack. The SBP is calculated as the volume-weighted average of the BOAs in the NIV stack (NIV is less than PAR) which includes an Energy BSAD volume (£439.88/MWh) plus BPA (£43.44/MWh) = £483.32/MWh.

1.9. The chart on the right below shows the calculation under P217A. System BSAD is disaggregated and is priced (£154/MWh and £163/MWh). It is flagged by the SO, shown in yellow. Since there are a number of more expensive unflagged actions in the stack the System BSAD volumes retain their price, and since these volumes have a price much lower than the unflagged actions, the resulting SBP would be significantly lower than live - £193.62/MWh compared to £483.32/MWh.

Figure 22 - P217 methodology, 19th December 2007, Period 32

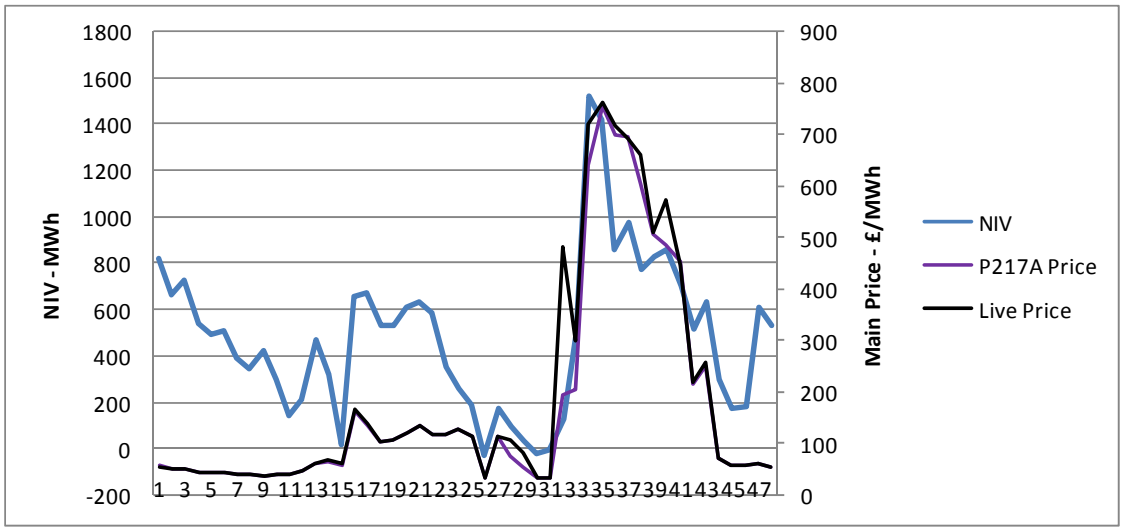


1.10. This period is the most extreme example of the effect of BSAD disaggregation on prices, but it serves to demonstrate that this feature of P217 may be as, if not more, significant than constraint flagging for its effect on cash-out prices.

1.11. In this period, the SBP was set entirely by BSAD volumes. This raises a potential concern since the price of BSAD volumes are less likely to be reflective of conditions on the day since they are associated with contracts that the SO has struck in advance.

1.12. However, for this particular period the NIV was not very short and the P217A SBP would still be well above the Market Index Price which was £111.69/MWh. The reason that the SO was accepting very high priced BOAs during a period of low NIV can be explained by the fact that it was anticipating significantly shorter NIVs in the following periods, requiring expensive oil plant to be scheduled. The chart below shows the pattern of NIV during the day and the live and P217A main prices.

Figure 23 - NIV and cash-out prices, 19th December 2007



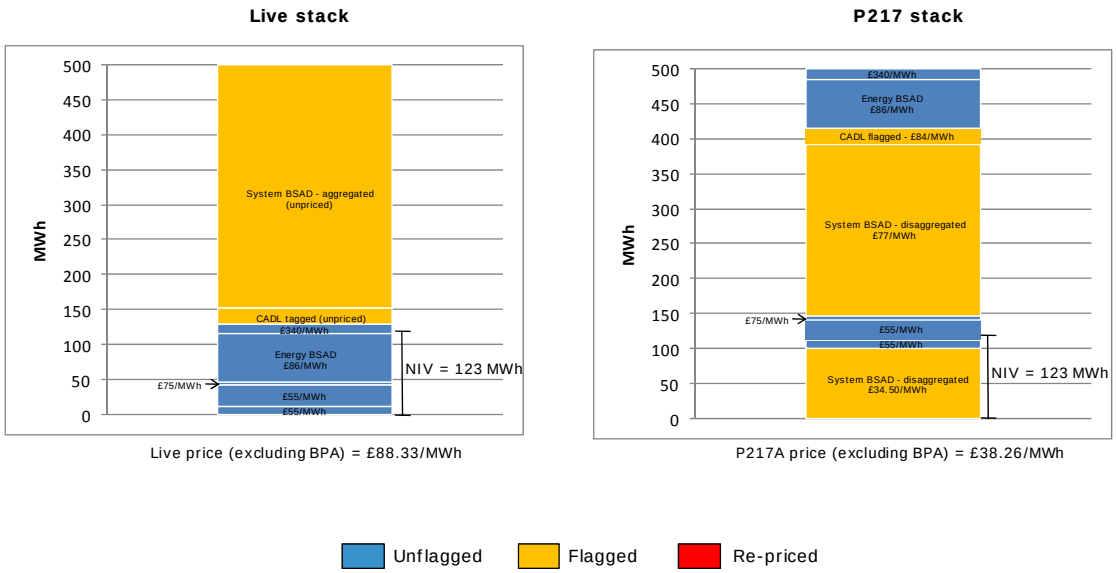
1.13. The chart shows that the P217A prices are very high and close to live prices during the periods when the NIV was shortest. During Period 32 there is a mini-spike in live prices which is not seen in the P217A prices. This suggests that the disaggregation of BSAD is helping to produce a somewhat smoother profile of cash-out prices than the current arrangements in reaction to the shortening NIV on this particular day.

1st June 2007, Period 17

1.14. To investigate this effect further, we examined Period 17 on 1st June 2007, which also had a cash-out price that was significantly affected by disaggregation of BSAD. The live and P217 stacks are shown in the charts below. In this example, some unflagged actions are included in the cash-out price calculation under P217 but again the SBP is heavily influenced by the low price (£35/MWh) of one of the System BSAD volumes[43]. The resulting SBP is £59.50/MWh under P217A compared to £109.57/MWh under the current arrangements.

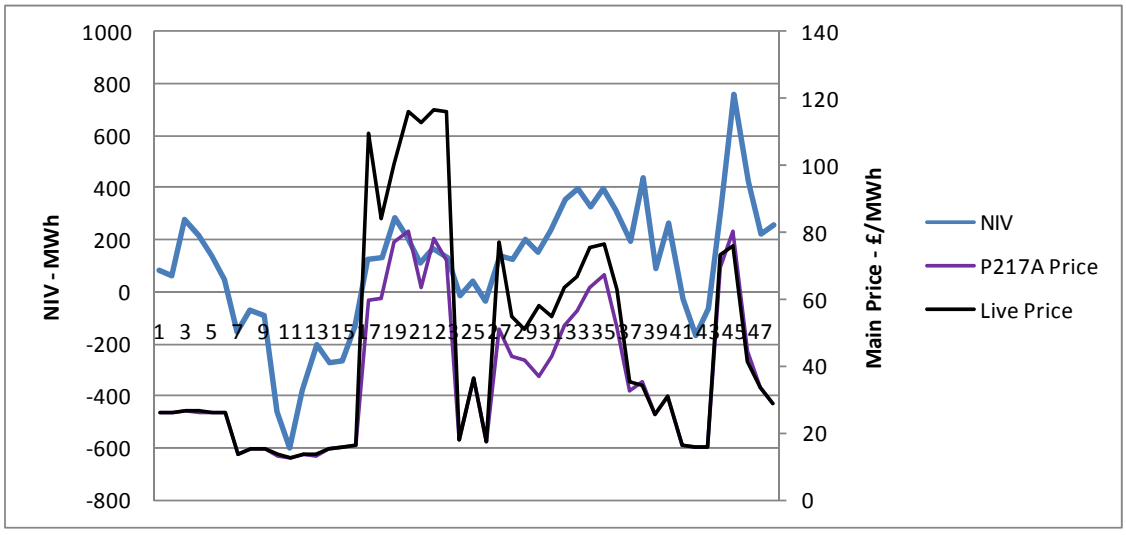
[43] This example also demonstrates the different treatment of CADL actions under P217. Under the current arrangements that CADL action is tagged and unpriced, whereas under P217 it is flagged but retains its price since there are more expensive unflagged actions in the stack. However, in both cases the CADL action falls outside of the NIV stack and hence is not included in the calcuation of the cash-out price.

Figure 24 - P217 methodology, 1st June 2007, Period 17



1.15. The disaggregated BSAD effect also influences other prices on this day. The chart below shows the NIV and main cash-out price under P217A and the current arrangements on 1st June 2007. As was the case for 19th December 2007, the effect of BSAD disaggregation under P217A seems to be to smooth out cash-out prices producing a less volatile profile.

Figure 25 - NIV and cash-out prices, 1st June 2007



Summary

1.16. The analysis of 19th December 2007 and 1st June 2007 suggests that the disaggregation of BSAD can have a significant impact on cash-out prices in certain periods. The overall effect seems to be to make cash-out price profiles smoother and in principle we believe that disaggregation of BSAD should improve the cost reflectivity of prices. There is a potential concern that the cash-out price can be set entirely by BSAD volumes, and since these contracts may have been struck well ahead of time by the SO, there is a risk that the resulting cash-out price may not be reflective of conditions on the day. This would need to be monitored should P217 or P217A be implemented.

Appendix 4 – Cash-out arrangements background

1.1. This appendix provides a high level overview of the current cash-out arrangements, and a summary of previous modifications to the cash-out arrangements.

Current cash-out arrangements

1.2. Under the rules of the BSC, a company, or Party, is in a position of imbalance if its notified contract volume does not match its metered volume, i.e. the Party is producing (or consuming) electricity which has not been sold (or bought) and is therefore not covered by contracts. Imbalance settlement, or cash-out, is designed so that any electricity produced or consumed that is not covered by contracts is paid (or charged) for at a price that reflects the costs incurred by the SO in rectifying the resultant energy imbalance. The arrangements are designed to target the costs that the SO has incurred in buying and selling electricity to balance generation and demand on the system onto those Parties with an imbalance, i.e. those Parties on behalf of whom the SO has taken energy balancing actions.

1.3. The main cash-out price is calculated using a volume weighted average of the 500 MWh[44] of most expensive eligible "energy balancing" actions taken by the SO to alleviate the NIV. The reverse price is set equal to the Market Index Price (MIP) based on within-day trades undertaken on energy exchanges (currently only APX). Thus, when the system is short, SBP is based on the 500 MWh highest priced accepted offers from energy balancing actions required to resolve the positive NIV, and SSP is set to MIP, whereas when the system is long, SBP is set to MIP and SSP is based on the 500 MWh lowest priced accepted bids from energy balancing actions required to resolve the negative NIV. For certain periods a Buy Price Adjuster (BPA) is added to the SBP, and in others a Sell Price Adjuster (SPA) is subtracted from SSP, to reflect the availability fees on certain balancing services, such as reserve, that the SO has contracted to cover those periods.

1.4. The rationale for the main/reverse price approach is that Parties are only exposed to the costs of the SO's energy balancing actions if their imbalances are in the same direction as the overall system imbalance. If their imbalances are in the opposite direction, and hence are helping to alleviate the system imbalance, they receive or pay a market related price (MIP) for their imbalances.

[44] 500 MWh is the current value for the Price Average Reference (PAR).

1.5. The cash-out price is intended to reflect only the costs of energy imbalance, which is caused by individual Parties' imbalance. Since the BM is used by the SO for both energy and system balancing[45], and indeed some actions are taken that resolve both energy and system imbalances, a set of rules are required to derive an energy balancing cost from the total balancing cost. These rules seek to remove the costs of system balancing by 'tagging' certain actions as follows:

- **De Minimis:** Individual accepted bid and offer volumes below 1 MWh are excluded from the price calculation. This is intended to remove any 'false' actions which are created because of the finite accuracy of the systems used to calculate bid and offer volumes.
- **Arbitrage:** Overlapping accepted bids and offers, where the price of an accepted offer is less than the price of an accepted bid, are excluded from the price calculation. No net energy has been delivered to the system, but an overall financial benefit to the system has been provided.
- **CADL:** Volumes associated with acceptances of short duration are treated as un-priced volumes[46]. The Continuous Acceptance Duration Limit (CADL) defines the short duration threshold and is currently set to 15 minutes. This is designed to remove the impact of intra half-hourly balancing actions from cash-out prices.
- **BSAD:** The Balancing Services Adjustment Data (BSAD) methodology, which is defined by the SO, determines how the costs of exercised forward contracted balancing services feed into the imbalance price calculation. Energy balancing volumes would normally be included as priced, and system balancing volumes as unpriced.
- **Emergency Instructions:** The SO can determine whether accepted bid and offer volumes should be unpriced in the main price calculation if they are associated with Emergency Instructions.
- **NIV Tagging:** This is applied following the application of the above rules. In any one settlement period, the SO may be taking actions in both directions. The NIV is calculated by subtracting the smaller stack of actions (bid stack if NIV is positive, offer stack if NIV is negative) from the larger stack of actions. Where this occurs, the NIV Tagging rules work on the assumption that only the least expensive actions required to resolve the NIV are energy related. Hence any action when stacked in price order that exceeds the NIV is deemed to be system related and tagged out[47].

1.6. Following the application of the tagging rules the Price Average Reference (PAR) methodology is applied to calculate the volume weighted average of the most expensive 500 MWh of remaining actions in the stack. Where there is less than 500 MWh remaining in the stack, the main price is calculated based on the volume

[45] In contrast, Balancing Services contracts, signed in advance, are designated as being for either an energy or system purpose.
[46] Unpriced volumes are included in the calculation of NIV but the costs of these actions are not included in the imbalance price calculation.
[47] Since the summed volumes of buy and sell actions equal the NIV, the volume of NIV Tagged actions will equal the volumes of the smaller reverse stack.

weighted average of all actions in the stack. If there are no priced volumes remaining in the stack the main price defaults to the MIP.

1.7. Imbalance payments and revenues to and from parties who are out of balance are made into a central fund. These do not match exactly and consequently an imbalance cashflow surplus or deficit is created. This net surplus/deficit is then returned to or recovered from all market participants via Residual Cashflow Reallocation Cashflow (RCRC) payments, which are weighted by participants' metered volumes.

1.8. The SO is incentivised to minimise the costs of energy and system balancing through the Balancing Services Incentive Scheme (BSIS). This is currently agreed annually between NGET and Ofgem. The SO is set an annual cost target for the financial year, which combines both energy and system balancing. Where its outturn costs are below the target, the SO is able to keep a proportion of the savings subject to a cap, whilst where it spends more than the target it is liable to a share of these additional costs subject to a floor. The BSUoS charges paid by all parties based on their throughput are modified accordingly.

History of modifications to the cash-out arrangements

1.9. Modification P10, implemented in May 2001 introduced the De Minimis Tagging rules, removing bids and offers of less than 1MWh from determination of the SBP and the SSP. This was accepted in order that price spikes caused by limitations in the settlement systems could be reduced and therefore cash-out prices could be more cost reflective. The CADL Tagging rules were introduced under Modification P18A in September 2001, whereby all bids and offers of less than 15 minute duration would be unpriced for the purposes of calculating cash-out prices.

1.10. Prior to Modification P78, SBP and SSP in each settlement period were both derived using accepted offers and bids respectively, together with balancing services actions. In March 2003, Modification P78 introduced NIV Tagging and the current main/reverse price methodology, whereby parties who are out of balance pay the "main" price if their imbalance is in the same direction as the system, and the "reverse" price if their imbalance is in the opposite direction to the system (as determined by NIV). The market index price, MIP, was introduced to set the Reverse Price. This mechanism was intended to ensure that parties would continue to be exposed to the SO's energy balancing costs where they were exacerbating the system imbalance, but not be unduly penalised where their imbalance was helping to alleviate the system imbalance.

1.11. Modification Proposals P136 and P137 sought to introduce a fully marginal methodology for the calculation of the main cash-out price. The Authority rejected P136 and P137 based on concerns that a very small volume of energy accepted by the SO, or a 'system' balancing action, could set the cash-out price. Ofgem was also concerned that a fully marginal cash-out regime could increase the risk that companies could manipulate cash-out prices. This would lead to cash-out prices that did not reflect the costs of energy balancing.

1.12. The most recent approved pricing modifications have been P194 and P205. Modification P194, raised by NGET in August 2005, proposed an alternative calculation for a 'chunky' marginal price based on a volume weighted average of a pre-defined maximum volume of the most expensive balancing actions. This eligible volume, known as PAR, was originally set at 100MWh. This modification was approved by the Authority on the grounds that more marginal price signals were required to ensure that parties were taking the necessary actions to balance their positions, particularly at times of system stress. Before P194 was implemented, Modification P205 was raised and subsequently approved by the Authority, revising the level of PAR to 500 MWh. P205 was accepted since accompanying analysis demonstrated that a PAR value of 500 MWh could lead to pricing signals similar to a PAR value of 100 MWh during periods of system stress, and yet would be less susceptible to distortions associated with 'system pollution', the incomplete tagging of system actions from the price stack.

1.13. P212 was raised in April 2007 by Bizz Energy, and was designed to address the same defect as P211 and P217 - the high level of pollution of the energy price from costs that relate to maintaining the system balance. P212 sought to base cash-out prices on market prices rather than SO actions, with SBP set at a 5% premium to the Market Index Price (MIP) when the system is short, and SSP set at a 5% discount to the MIP when the system is long. Ofgem rejected the proposal on the grounds that it would significantly under-estimate the SO's costs of energy balancing since the Market Index Price used as the basis of cash-out prices does not accurately reflect the real-time supply/demand energy balance.

Appendix 5 – The Authority's Powers and Duties

1.1. Ofgem is the Office of Gas and Electricity Markets which supports the Gas and Electricity Markets Authority ("the Authority"), the regulator of the gas and electricity industries in Great Britain. This Appendix summarises the primary powers and duties of the Authority. It is not comprehensive and is not a substitute to reference to the relevant legal instruments (including, but not limited to, those referred to below).

1.2. The Authority's powers and duties are largely provided for in statute, principally the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Act 2004, as well as arising from directly effective European Community legislation. References to the Gas Act and the Electricity Act in this Appendix are to Part 1 of each of those Acts.[48]

1.3. Duties and functions relating to gas are set out in the Gas Act and those relating to electricity are set out in the Electricity Act. This Appendix must be read accordingly[49].

1.4. The Authority's principal objective when carrying out certain of its functions under each of the Gas Act and the Electricity Act is to protect the interests of consumers, present and future, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the shipping, transportation or supply of gas conveyed through pipes, and the generation, transmission, distribution or supply of electricity or the provision or use of electricity interconnectors.

1.5. The Authority must when carrying out those functions have regard to:

- The need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met;
- The need to secure that all reasonable demands for electricity are met;
- The need to secure that licence holders are able to finance the activities which are the subject of obligations on them[50]; and
- The interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas.[51]

[48] entitled "Gas Supply" and "Electricity Supply" respectively.
[49] However, in exercising a function under the Electricity Act the Authority may have regard to the interests of consumers in relation to gas conveyed through pipes and vice versa in the case of it exercising a function under the Gas Act.
[50] under the Gas Act and the Utilities Act, in the case of Gas Act functions, or the Electricity Act, the Utilities Act and certain parts of the Energy Act in the case of Electricity Act functions.
[51] The Authority may have regard to other descriptions of consumers.

1.6. Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:

- Promote efficiency and economy on the part of those licensed[52] under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems;
- Protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity;
- Contribute to the achievement of sustainable development; and
- Secure a diverse and viable long-term energy supply.

1.7. In carrying out the functions referred to, the Authority must also have regard, to:

- The effect on the environment of activities connected with the conveyance of gas through pipes or with the generation, transmission, distribution or supply of electricity;
- The principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed and any other principles that appear to it to represent the best regulatory practice; and
- Certain statutory guidance on social and environmental matters issued by the Secretary of State.

1.8. The Authority has powers under the Competition Act to investigate suspected anti-competitive activity and take action for breaches of the prohibitions in the legislation in respect of the gas and electricity sectors in Great Britain and is a designated National Competition Authority under the EC Modernisation Regulation[53] and therefore part of the European Competition Network. The Authority also has concurrent powers with the Office of Fair Trading in respect of market investigation references to the Competition Commission.

[52] or persons authorised by exemptions to carry on any activity.
[53] Council Regulation (EC) 1/2003

Appendix 6 - Glossary

A

Arbitrage tagging

Removal of overlapping accepted bids and offers from the energy stack, where the price of an accepted offer is less than the price of an accepted bid. No net energy has been delivered to the system, but an overall financial benefit to the system has been provided.

Applicable BSC objectives

The objectives of the BSC trading arrangements are set out in Standard Condition C3 of NGET's Transmission Licence, and are used to evaluate proposed modifications.

B

Balancing and Settlement Code (BSC)

The Balancing and Settlement Code (BSC) contains the governance arrangements for electricity balancing and settlement in Great Britain.

The energy balancing aspect allows parties to make submissions to NGET to either buy or sell electricity from/to the market at close to real time in order to keep the system from moving too far out of phase.

The settlement aspect relates to monitoring and metering the actual positions of generators and suppliers (and interconnectors) against their contracted positions and settling imbalances when actual delivery or offtake does not match contractual positions.

Balancing Mechanism (BM)

The Balancing Mechanism is the principal tool used by the SO to balance the electricity system on a second-by-second basis. Generators and consumers with spare flexibility in their portfolios submit offers (to increase generation or decrease demand) and bids (to decrease generation or increase demand) to the SO via the Balancing Mechanism. The SO uses the Balancing Mechanism for energy balancing and for system balancing, for example frequency response.

Balancing Mechanism Unit (BMU)

The basic unit of participation in the Balancing Mechanism, describing one or more generation or demand units which import or export electricity onto the electricity system.

Balancing Services

The SO supplements the Balancing Mechanism with forward contracts for a range of Balancing Services. The SO will enter into these agreements where it believes that it cannot source the service through the Balancing Mechanism, or it wishes to reduce the costs of Balancing Mechanism actions by guaranteeing the availability of certain units. These include services related to frequency response, reserve, reactive power and system security as well as energy products procured in advance of gate closure.

Balancing Services Adjustment Data (BSAD)

Balancing Services Adjustment Data (BSAD) is used to incorporate the costs of the SO's Balancing Services contracts into the calculation of Energy Imbalance Prices. This is laid out in the BSAD Methodology statement which the SO is required to produce under Standard Condition C16 of the Transmission Licence.

Balancing Services Use of System charges (BSUoS)

Balancing Services Use of System charges (BSUoS) are the mechanism by which the costs that the SO incurs in the Balancing Mechanism and in procuring Balancing Services are recovered from parties using the system. They are charged on a half-hourly basis based on throughput.

Bid/Offer Acceptances (BOAs)

Acceptances by the SO of Balancing Mechanism offers to increase electricity on the system, or bids to reduce electricity on the system. The prices of BOAs form the basis for the calculation of the Energy Imbalance or cash-out prices.

BM Start-up

A Balancing Service giving the SO access to additional generation BMUs that would not otherwise have run and which could not be made available in Balancing Mechanism timescales due to their technical characteristics and associated lead times.

BSC Party

All licensed electricity companies are required to accede to the BSC. Other market participants may choose to become BSC Parties, for example, in order to notify bilateral contract volumes.

Buy Price Adjuster/Sell Price Adjuster (BPA/SPA)

The Buy Price Adjuster (BPA) and Sell Price Adjuster (SPA) are defined in the BSAD methodology. They capture the availability fees that the SO incurs on certain Balancing Services such as Short Term Operating Reserve and BM Start-up. The BPA for each half-hour is added to SBP, and the SPA subtracted from SSP.

C

Classification

The process by which actions taken by the SO are re-ordered to create a price stack for each settlement period. An action would retain its price if it were less expensively priced than the most expensive unflagged action in its stack (Buy or Sell). A flagged action which is more expensively priced than the most expensive unflagged action would be classified as unpriced (and may be subject to the Replacement Price).

Continuous Acceptance Duration Limit (CADL)

Volumes associated with acceptances of short duration (less than 15 minutes) are flagged by the SO, and classified as unpriced volumes (and may be subject to the Replacement Price). This is designed to remove the impact of sub half-hourly balancing actions from cash-out prices.

Contracted position

Parties must notify their contracted position to the SO for each settlement period through the process of Contract Notification. A long contracted position indicates that a party has contracted more supply than demand and a short contracted position vice versa.

Constraints

There are various parts of the transmission network where import or export capacity is limited. Constraints can become active when this capacity limit is reached. This may require the SO to take 'sub-economic' balancing actions to reduce generation behind the constraint, and increase generation or reduce demand elsewhere on the network to maintain the energy balance.

Costs of System Operator in the Balancing Mechanism (CSOBM)

Costs incurred by the SO in accepting Bids and Offers in the Balancing Mechanism.

D

De Minimis tagging

Individual accepted bid and offer volumes below 1 MWh are excluded from the price calculation. This is intended to remove any 'false' actions which are created because of the finite accuracy of the systems used to calculate bid and offer volumes.

E

Elexon

Elexon is the Balancing and Settlement Code company which manages the BSC on NGET's behalf.

Energy Imbalance Prices (or cash-out prices)

Energy Imbalance Prices are applied to parties for their imbalances in each half-hour period – SBP is charged for short contracted positions, SSP is paid for long contracted positions.

Energy plus

The term 'energy plus' describes actions taken by the SO that combine an energy balancing dimension with one or more other purposes such as frequency response, reserve creation or constraint management.

Energy stack

The energy stack comprises of Bid Offer Acceptances in price order and is used to calculate the main energy imbalance price, once relevant tagging has been applied.

EU Emissions Trading Scheme (EU ETS)

The EU ETS is the cap and trade scheme for the reduction of carbon dioxide emissions across EU member states, which was introduced in January 2005.

Ex-Post Unconstrained Schedule (EPUS)

The stack of Balancing Mechanism bids or offers available to the SO to resolve the outturn energy imbalance in a settlement period, ignoring transmission and other system constraints.

F

Final Modification Report (FMR)

The final report produced by the industry group who define and then assess any proposed modification. This report is presented, alongside a recommendation to accept or reject the modification, to the BSC Panel and then to the Authority.

Final Physical Notification (FPN)

The Final Physical Notification (FPN) is the level of generation or demand that the BMU expects to produce or consume. It is submitted to the SO as a ramped profile prior to gate closure.

Flagging

SO identification of balancing actions deemed as potentially being impacted by a transmission constraint.

Frequency response

The SO has a statutory obligation to maintain system frequency between +/- 1% of 50 hertz. The immediate second-by-second balancing to meet this requirement is provided by continuously modulating output through the procurement and utilisation of mandatory and commercial frequency response.

G

Gate closure

The point in time by which all Contract Notifications and Final Physical Notifications must be submitted for each settlement period. Parties should not change their positions other than through instruction by the SO after gate closure. It is currently set at one hour before the start of the relevant settlement period.

H

High Risk of Demand Reduction (HRDR)

The SO may issue a HRDR warning at times when there is inadequate system margin and there is an increased risk of the SO instructing parties to reduce their demand. An HRDR specifies which parties may receive instructions and the period in which instructions may be required.

I

Imbalance

The difference between a party's contracted position and metered position measured on a half-hourly basis.

IMBALNGC

The difference between the sum of all Physical Notifications for exporting BMUs (i.e. indicated Generation) and NGET's demand forecast. This information is provided by the SO for the day ahead and current day.

Impact Assessment (IA)

Impact Assessments (IAs) are undertaken by the Modification Group as part of the modification evaluation process, and by Ofgem prior to a decision on accepting or rejecting a modification, including when required under the Utilities Act 2000.

L

Large Combustion Plant Directive (LCPD)

An EU Directive placing restrictions on the levels of sulphur dioxide, nitrogen oxides and dust particulates which can be produced by combustion plants with a thermal output greater than 50MW. The implementation of the LCPD in the UK requires coal and oil plant to fit flue gas de-sulphurisation (FGD) equipment or have their total running hours restricted to 20,000 between 1 January 2008 and 31 December 2015 before closing.

M

Main price

There are two Energy Imbalance Prices, "main" and "reverse". The main price is charged to parties out of balance in the same direction as the system. When the system is long, long parties receive the main price (SSP), whilst when it is short, short parties pay the main price (SBP).

Market Index Price (MIP)

The Market Index Price (MIP) is used to set the reverse Energy Imbalance Price. It is calculated based on short term trading activity on exchanges. Currently the MIP is set based on trades undertaken on the APX over a period of 20 hours finishing half an hour before gate closure.

Market Index Definition Statement (MIDS)

The Market Index Definition Statement (MIDS) defines the methodology for calculating the MIP. It is periodically reviewed by the BSC Panel.

Maximum Export Limit (MEL)

The maximum level at which a BM Unit may export to the System.

Metered Volume

The actual volume of electricity imported or exported at each BMU.

Modification Proposal

A proposal to modify the Balancing and Settlement Code (BSC). Modifications can be raised by any Party to the BSC. Modifications are then defined and assessed by a Modification Group formed of BSC Parties in conjunction with Elexon. The BSC Panel will recommend whether a modification should be approved or rejected. The final decision is made by the Authority.

N

Net Imbalance Volume (NIV)

The overall energy imbalance on the system as determined by the net volume of actions taken by the SO in the Balancing Mechanism and under Balancing Services contracts.

NGET

National Grid Electricity Transmission plc (NGET) is the system operator (SO) for the electricity transmission system in Great Britain (GB), with responsibility for making sure that electricity supply and demand stay in balance and the system remains within safe technical and operating limits.

Notice to Deviate from Zero (NDZ)

The notification time required for a BM Unit to start importing or exporting energy from a zero level of import/export, in minutes.

P

Price Average Reference (PAR)

The volume of electricity from the main stack (taken in descending price order) included in the calculation of the main price. PAR is currently set to 500 MWh. The PAR volume is always the most expensive 500 MWh of available electricity in the main stack.

R

Replacement Price

Applied to any unpriced balancing actions that enter into the Net Imbalance Volume (NIV). The Replacement Price would be calculated from a volume-weighted average of the 100MWh of most expensively priced actions remaining in the NIV.

Reserve

Additional capacity available to the SO in order to manage uncertainty in the supply/demand balance.

Reserve creation

The use of BOAs in order to create sufficient flexibility and responsiveness to meet variations in the supply/demand balance.

Residual Cashflow Reallocation Cashflow (RCRC)

The net cashflow received by Elexon through energy imbalance charges and which is reallocated amongst participants based on throughput on a half-hourly basis.

Reverse price

There are two Energy Imbalance Prices, “main” and “reverse”. The reverse price is charged to parties out of balance in the opposite direction to the system. When the system is long, short parties pay the reverse price and vice versa. The reverse price is currently set to the Market Index Price.

S

Sell Price Adjuster/Buy Price Adjuster (SPA/BPA)

The Sell Price Adjuster (SPA) and Buy Price Adjuster (BPA) are defined in the BSAD methodology. They capture the availability fees that the SO incurs on certain Balancing Services such as Short Term Operating Reserve and BM Start-up. The BPA for each half-hour is added to SBP, and the SPA subtracted from SSP.

Short Term Operating Reserve (STOR)

A contracted Balancing Service, whereby the service provider delivers a contracted level of power when instructed by the SO, within pre-agreed parameters. The SO makes two kinds of payments for use of STOR, availability payments, and utilisation payments.

Stable Export Limit (SEL)

The minimum value at which a BMU, under stable conditions, may export to the System.

System Operator (SO)

The entity charged with operating the GB high voltage electricity transmission system, currently NGET.

System Buy Price (SBP)

The price which imbalanced parties pay for a short energy imbalance.

System Sell Price (SSP)

The price which imbalanced parties receive for a long imbalance.

T

Tagging

The process by which bids and offers are removed from the energy stack, either completely or leaving only volume, so that remaining actions determine energy imbalance prices.

Transmission system

The national high voltage electricity network, operated by the SO.

U

Unpriced volume

Bids and offers which have their price removed and so do not feed into the cash-out price calculation but remain in the energy stack to be included in the determination of NIV.

Appendix 7 - Feedback Questionnaire

1.1. Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

1.2. Please send your comments to:

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