nationalgrid

Stage 02: Workgroup Consultation

Connection and Use of System Code (CUSC)

CMP243

‘a fixed Response Energy Payment option for all generating technologies’

What stage is this document at?

01	Initial Written Assessment
02	Workgroup Consultation
03	Workgroup Report
04	Code Administrator Consultation
05	Draft CUSC Modification Report
06	Final CUSC Modification Report

CMP243 aims to allow all generators, regardless of technology type, the option of choosing whether their Response Energy Payment is based on the current methodology or a fixed value initially suggested at £0/MWh. The fixed value of is now suggested to be a market derived price.

This document contains the discussion of the Workgroup which formed in June 2015 to develop and assess the proposal. Any interested party is able to make a response in line with the guidance set out in Section 8 of this document.

Published on: **3rd November 2015**
Length of Consultation: **15 Working days**
Responses by: **24th November 2015**

Medium Impact:
Generators

Contents

About this document

This document is a Workgroup consultation which seeks the views of CUSC and interested parties in relation to the issues raised by the Original CMP243 CUSC Modification Proposal which was raised by Drax Power and developed by the Workgroup. Parties are requested to respond by 5pm on **24th November 2015** to CUSC.team@nationalgrid.com using the Workgroup Consultation Response Proforma which can be found on the following link: http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/CMP243/

Document Control

Version	Date	Author	Change Reference
0.1	29th September 2015	Code Administrator	Workgroup Consultation for Workgroup Comment
0.2	3rd November 2015	Code Administrator	Workgroup Consultation to Industry

Any Questions?

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1 Summary

1.1 CMP243 was proposed by Drax Power and was submitted to the CUSC Modifications Panel for their consideration on 29th May 2015.

1.2 The Proposer clarified the defect of CMP243 as being increased volatility and uncertainty around the Market Index Price (MIP) which, due to a more diverse mix of technologies on the system which have different marginal costs, drives volatility in the Response Energy Payment (REP) made to Frequency Response (FR) providers. The current methodology for payment is better suited to a time where renewable generation on the system was sparse and the marginal costs of generators were similar. However, in recent years there has been a large increase in renewable technologies connecting to the system, some of which, like wind and solar, have negative marginal costs. The diverse range of marginal costs for generators on the system is likely to drive increased volatility and uncertainty around the MIP as the MIP is determined by the marginal source of generation. This increasing price volatility risk will most likely have an effect on the Holding Prices submitted by generators which may lead to some generators pricing themselves out of the market.

1.3 The proposer originally proposed that all generators regardless of technology type should have the option of choosing whether their REP is based on the current methodology, or a REP fixed at a suggested value of £0/MWh. The Proposer was open to suggestions from the Workgroup to fix the REP at a different price if they felt it was more appropriate.

1.4 It was subsequently decided that a market based price is preferable to £0/MWh. It was clarified that this would only apply to the generators which were not covered under CMP237 'Response Energy Payment for Low Fuel Cost Generation' i.e. those WITH a fuel cost. It is also suggested that the REP is set ahead of the date where Holding Prices are submitted.

2 Workgroup Discussions

Volatility of the Market Index Price

2.1 Mandatory FR payments are currently based on the Market Index Price (MIP). This was suited to a system which was mainly dominated by gas and coal plant, however, since the methodology was agreed the system has changed significantly with more renewable generation such as wind and solar, entering the system. This change in generation mix increasingly drives volatility of the MIP. The Proposer originally presented a graph to the Workgroup which illustrated the increase of volatility in the MIP from May 2014 to January 2015. It was questioned whether the MIP volatility was a recent issue or whether the Proposer could provide a graph which shows the volatility over a longer period of time. The Proposer produced the graph below; illustrating the increase of volatility in the MIP from January 2010 to January 2015.

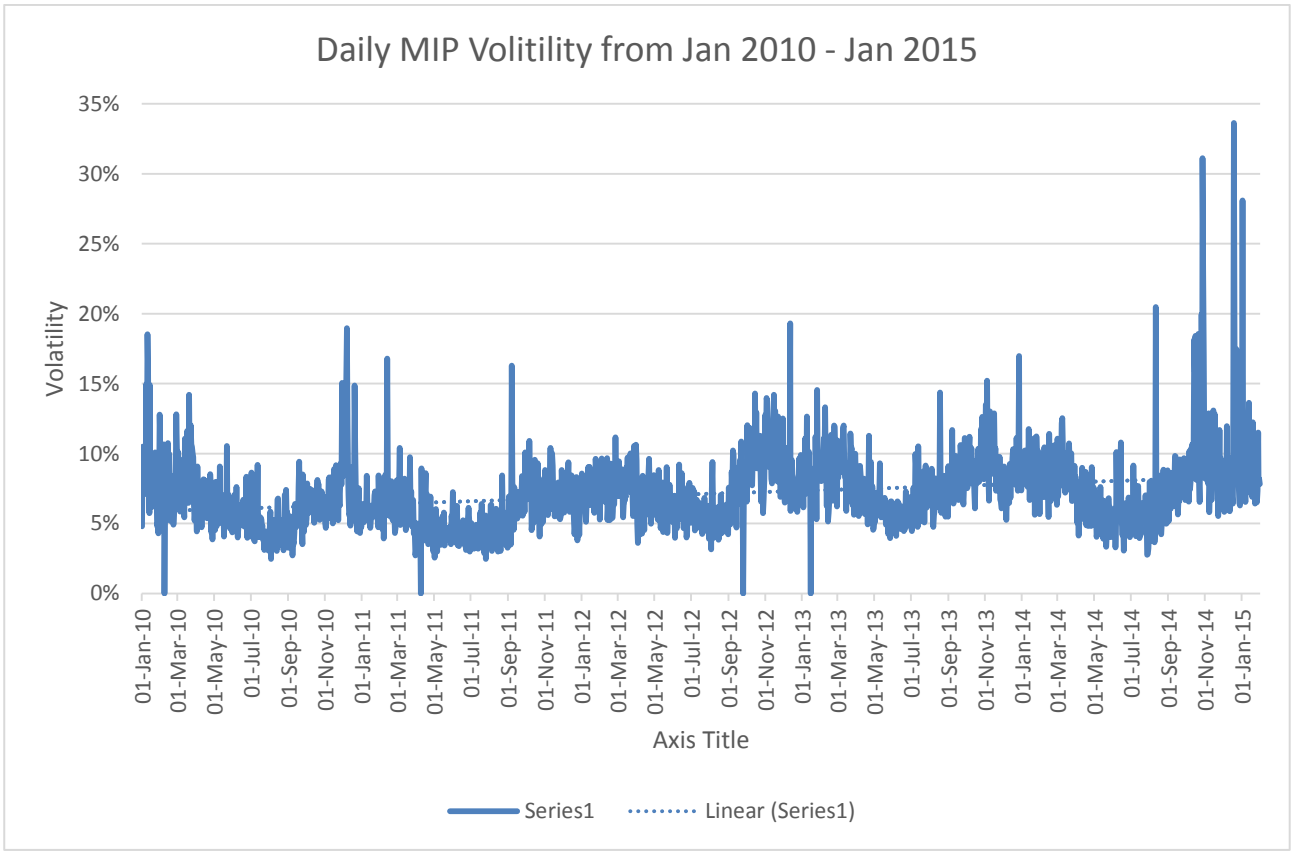


Fig.1 – Daily MIP volatility from January 2010 – January 2015

2.2 The increase in the volatility in the MIP is an issue for FR providers as they cannot predict what their MIP will be when providing FR. The Proposer noted that this creates an increase in risk for FR providers and many will factor this risk into their Holding Payments, effectively pricing themselves out of the market. This in-turn negatively impacts the System Operator (SO) and there will be less participation in the market giving them less choice of FR providers thereby driving up costs.

Original Proposal

2.3 It was suggested that there should be an option to fix the REP ahead of Holding Prices being submitted. The Proposer was not sensitive on what the price should be however suggested

a value of £0/MWh within the CUSC Modification Proposal form. It was subsequently decided that a market based price is preferable to £0/MWh. It was clarified that this would only apply to the generators which are not covered under CMP237 'Response Energy Payment for Low Fuel Cost Generation' i.e. those WITH a fuel cost. It was further clarified during the workgroup that this should also include interconnectors and demand sites. The Proposer suggested setting the REP ahead of providing Holding Prices, preferably at ten days ahead, however was open for suggestions from the Workgroup.

2.4 In June 2015, Drax Power presented at the Balancing Services Standing Group (BSSG) to sense if there was an appetite for allowing providers to choose any price for the REP. The Proposer advised that there was not much appetite for this and that they were not planning on raising a modification in addition to CMP243 to suggest this change.

2.5 The Workgroup discussed the materiality of CMP243 and the Proposer presented their initial analysis to the Workgroup on the materiality of FR through a number of graphs shown below and in Annex 4. Each graph shows the difference between the assumed marginal cost and the MIP multiplied by the high or low FR multiplier over the averaged day in May 2015. The first graph shows clean dark low response in May 2015 and shows the losses for providing low frequency response overnight which should be similar for both gas and coal (assuming that their marginal costs are similar).

2.6 The Drax representative noted that large gains and losses will be made when a generator's marginal cost deviates far from the MIP. This is a common occurrence in a market with a diverse generation mix and this issue is expected to intensify. Further, as the generation on the system continues to diversify we can envisage that the extreme periods, where the MIP deviates significantly from the average, will become increasingly more commonplace. Therefore the graphs shown may be an underestimate of future scenarios.

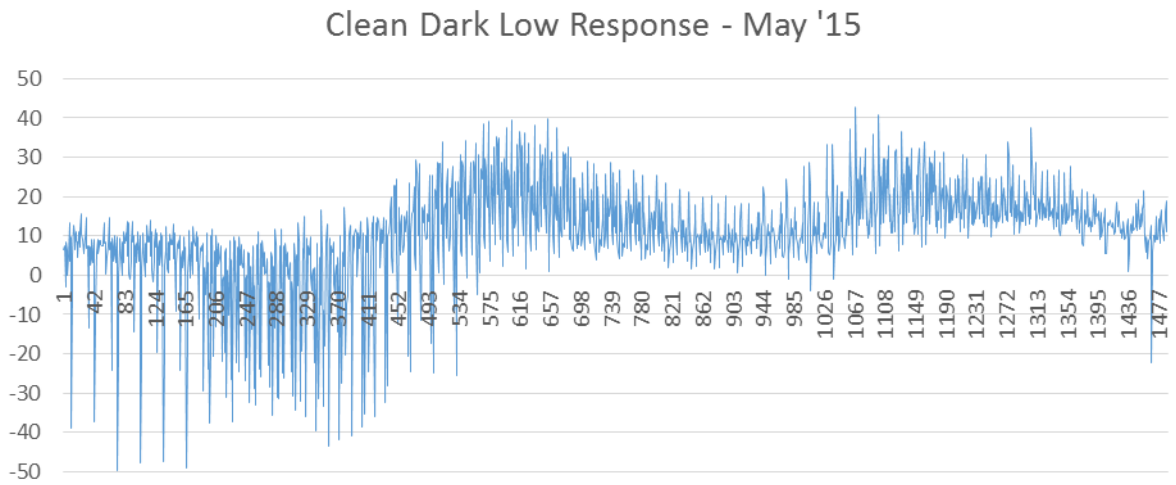


Fig.2 – Clean Dark Low Response – May 2015

2.7 It can be seen that providing high FR overnight has an increased potential of making larger profit margins than during the day. The opposite can be said for low FR where larger profit margins are more likely during the day than overnight. Providing high FR during the day could result in some generators being left out of pocket by up to £50/MWh.

2.8 Some Workgroup members noted that if Generators Physical Notification (PN) themselves on overnight they will see that they will be making a loss and will have the choice not to run.

2.9 The Proposer noted that within the second graph (for clean dark high response – shown below), there are less losses on the high FR side however there is still the potential for losses.

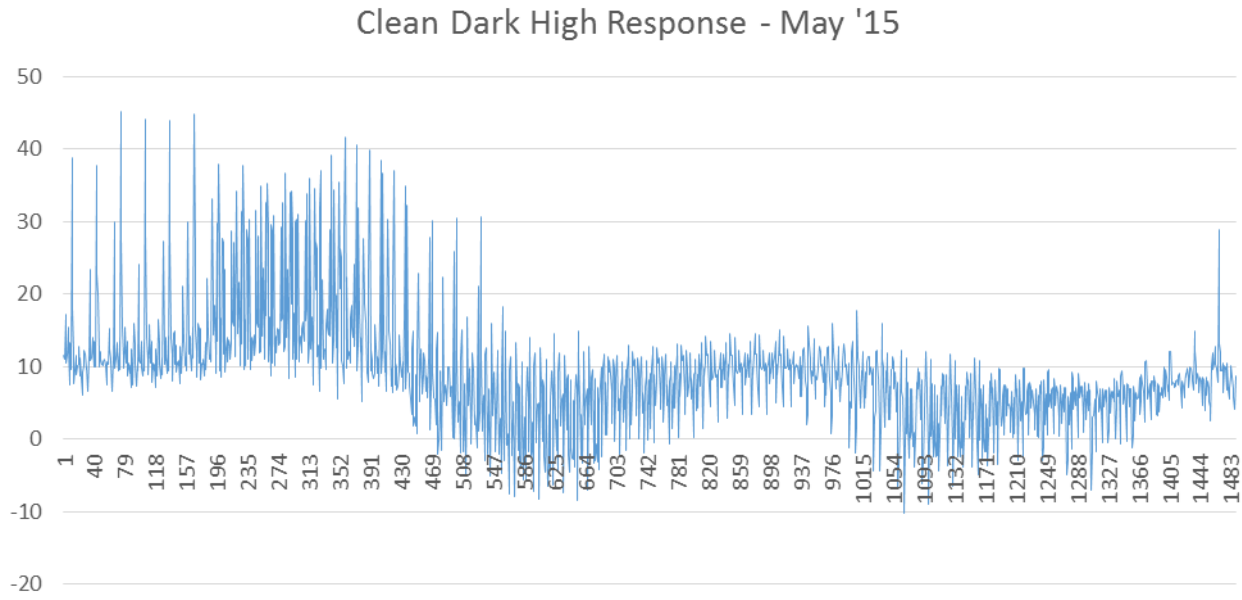


Fig.3 – Clean Dark High Response – May 2015

2.10 It was noted that there is also a large group of units who are prepared to run below their marginal costs at a loss because there would be a much greater cost with them shutting down, this is what drives the overnight prices.

2.11 The Proposer also did some analysis on how plant are being utilised and presented a graph to the Workgroup showing different generators and how much they were utilised before the first week of May 2015, simply showing the period of time they were used.

2.12 During previous industry discussions surrounding FR (CMP237 and BSSG/CBSG) it was suggested that generators do not provide equal measures of high and low FR. Therefore generators running baseload and peaking generators will not benefit equally for providing FR. Further, the Drax representative stated that their models predict that more units are utilised for FR during the night than during the day. Therefore certain plant may only be utilised for FR at certain points thereby increasing the chance of baseload and peak plant being improperly remunerated with respect to one another.

2.13 It was questioned whether there would be any disbenefit to generators that only come on for a short period if volatility is reduced. A Workgroup member noted that the original purpose of the MIP is that you would roughly get the cost of power, however this may not adequately compensate a generator if the trading price does not match their marginal cost. It was noted that there are some extreme examples where Open Cycle Gas Turbine (OCGT) plants have been brought on at around £180/MW, however when this happens the SO would look for other plants who are better designed for providing FR.

2.14 The Workgroup agreed that the Drax analysis demonstrates that there is a case for change, however advised Drax that Ofgem would probably like to see more than one month for the analysis to demonstrate this is more of a consistent issue. The Workgroup agreed that similar analysis is produced for two additional months (a typical summer month – August, and a typical winter month - November) taken from the previous year. This was subsequently produced. Please see Annex 4.

2.15 A Workgroup member presented a graph to show how and when two power stations provided FR. A lot of the time, there was very little FR provided, and the FR that is provided generally nets itself out. It was suggested that if the REP was set to one price, these generators would be indifferent to it, however the Workgroup member noted that would not be the case for all.

2.16 The same workgroup member presented an Excel chart showing that across their whole portfolio they were net 61MWh short and would need to pay back for this. He explained that day and night prices would not be so easy to calculate, and that peak and off peak would be more appropriate. Peak would be Mon-Fri 7am-7pm and off peak would be Mon-Fri 7pm-7am as well as Saturday and Sunday. It was suggested that this be used as equivalent to a day/night comparison. He advised that for their units, they deliver a lot more FR over night as demand is lower and there is more need for FR. He questioned whether the Workgroup would want to reflect the true marginal cost or a month ahead price. If the Workgroup were to look at the true marginal cost, this would need to include factors like the start-up costs etc. which would be different to the incremental marginal cost which the Proposer is looking at.

2.17 The Proposer and the Workgroup discussed the issues surrounding the defect and the proposed solution. It was clarified that the defect of CMP243 centred around three issues which should be addressed, these were;

1. FR providers do not know what price they will get paid until after the event;
2. There is volatility in the MIP; and.
3. There is a risk of extreme prices (both high and negative).

2.18 The Proposer suggested setting the REP ahead of providing Holding Prices, preferably at ten days ahead, however was open for suggestions from the Workgroup.

2.19 It was noted that due to the volatility in the MIP, many FR providers have to pay to provide the service at times of negative prices. The Workgroup agreed that this should not be the case in any instance. There are generally two options for FR providers, some decide to run after seeing that they will face negative prices, whereas other providers will be asked to run and have no choice but to pay the negative prices.

Interaction with CMP237 'Response Energy Payment for Low Fuel Cost Generation'

2.20 The Workgroup agreed that it would be sensible to have one REP rather than a choice of two or a selection of prices as this would be extremely difficult for National Grid in terms of despatch optimisation. The National Grid representative agreed that this would be simpler to implement for the SO.

2.21 CMP243 would ONLY apply to generators with a fuel cost. The CMP237 Workgroup had already categorised types of generators into 'fuel cost' and 'no fuel cost', which the respondents to the CMP237 consultations generally agreed with. The Workgroup felt that it would be best to use this categorisation of generators for CMP243 focusing on providing a solution for those with a fuel cost, not covered by CMP237. The table developed by the CMP237 Workgroup is shown below:

Fuel Cost	No Fuel Cost
Gas	Onshore Wind
Coal	Offshore Wind
Oil	Solar
Nuclear	Tidal
Biomass	Wave
Electricity Storage Technologies (inc. pumped storage, batteries)	
Hydro	
Interconnectors	
Demand	

Table 1 – Generators split into Fuel Cost and No Fuel Cost categories

The Workgroup considered whether to include interconnectors and demand within the table of generators which CMP243 applies to. It was agreed that interconnectors and demand are effectively fuel cost for FR and therefore CMP243 would apply to them and therefore these were added to the table above after CMP237 was sent to the Authority.

Potential options for change

2.22 The Workgroup expanded on the Original Proposal and discussed what potential options and alternatives could be provided for CMP243

2.23 The Workgroup agreed that it could be a possibility to collar the current REP at a certain amount (suggested at £0MW/h) to avoid negative prices. Whilst not really addressing the defect of volatility, it would negate some of the impacts of volatility. The Workgroup also noted that the issue is not just with negative prices, but high prices too, therefore suggesting a potential cap on the REP at a certain value.

2.24 It was suggested that there could be a day-time price and a night-time price as some providers are more suited to providing response at certain times of day, hence this could be more cost reflective.

2.25 The Proposer later circulated several graphs to the Workgroup which extended his analysis from the second Workgroup meeting (included within Annex 4). Each graph in Annex 4 - Appendix 1, 2, 3 and 4 shows the difference between the proxy marginal cost and the peak, baseload, and peak/offpeak energy price in Aug ’14, Nov ’14, and May ‘15. Annex 4 - Appendix 5 shows the difference between the proxy marginal cost and the REP (MIP multiplied by the high or low FR multiplier) over the averaged day in Aug ’14, Nov ’14, and May ’15 with a cap of £60/MWh and collar of £20/MWh on the MIP. The Workgroup discussed each of the graphs and how each of the options differs from each other. It was suggested that the cap and collar option would require coming up with figures for the cap and collar which would require justification. The Workgroup agreed to include this option within the Workgroup Consultation for comment from the industry however at this point felt it was not as practical an option as the others suggested. The Proposer felt that it would be difficult to decide what the cap and collar should be and did not consider this to be a practical option.

2.26 It was suggested that one option would be to have a month-ahead price which is set ten days ahead of submitting Holding Prices and is based on for the wholesale baseload month ahead power price.

2.27 The Workgroup considered a similar option where there would be a month ahead price, set ten days ahead of submitting Holding Prices, however, it would include both a peak price and an off-peak price. It was suggested that this would be more cost reflective for those plant providing FR for extended peak and overnight.

2.28 Another option the Workgroup considered was to have a single price month ahead based on a weighted average of all the periods - i.e. extended peak, overnight, baseload etc. The Workgroup asked the National Grid representative to conduct analysis to calculate how this would be weighted, however after further discussion this option was not taken forward as it was not clear what weighted average should be used, and only Peak and Baseload prices were available on a month ahead basis. The Workgroup also considered two options which would remain on the current methodology. One would set prices day ahead and the other would introduce a cap and collar to avoid extreme prices as a result of a volatile MIP. A summary of the initial five options are highlighted below;

1. Month ahead price – set on base load
2. Month ahead price – two prices, peak and off-peak
3. Month ahead price – weighted average of all periods
4. Current methodology – prices set day ahead
5. Current methodology – cap and collar.

2.29 Following discussions around each of the potential options for changes, the Proposer reiterated the defect of the modification which is that providers of FR do not know what they would be getting paid as there is volatility in the market and the risk of extreme high and negative prices.

2.30 The Workgroup considered the options and whether these should result in less volatile prices or whether they should eliminate negative prices. The Proposer clarified that they would prefer having a month ahead price and would support this option the most out of the options identified by the Workgroup, noting the benefit of this option being that it would provide more certainty of the REP.

2.31 A Workgroup member noted that even if you know what your price will be month ahead, you will have no idea whether you will get called on to provide FR or not. He doubted that this would put a generator in a more beneficial position to what they are in under the baseline. The Proposer replied that while the volume risk would remain with FR providers, the price risk would be eliminated. As such the Proposer believes this represents a significant improvement on the Baseline.

2.32 In terms of options which include optionality for generators to remain on the current MIP based REP, the Workgroup agreed that a suitable approach would be to have an option once a year to select either the current baseline REP method or the CMP243-based REP methods.

2.33 The Workgroup suggested one possible cap and collar would be +50% and -20%, however it was questioned as to how those figures could be justified to Ofgem.

2.34 The Workgroup agreed that it would be worth asking within the Workgroup Consultation whether smaller parties would prefer the certainty of the one month ahead price or the cap and collar and how these options would help them.

2.35 The Workgroup agreed on 4 potential options which they would look to do some analysis on. A Workgroup member noted that generally the more certainty a generator can have with their REP price, the lower their risk premiums within their Holding Price. If competitive pressures are removed because everyone is getting the same price, generators would be able to

reduce their Holding Prices as the risk of extreme prices is being removed. The Workgroup came up with the following options:

Option 1 – Baseload wholesale month ahead price

Option 2 – Peak and off peak wholesale month ahead price, peak in 7am-7pm weekdays and off-peak is the rest.

Option 3 – Peak wholesale month ahead price.

Option 4 – Existing MIP method with a cap and a collar. Collar is £0 and cap is 2x baseload wholesale month ahead price.

2.36 It was recognised that there is more certainty under both the baseload and the peak options as a generator would know what price they would get and they can factor this into their prices. The Proposer noted that it would be simpler to go for an option with just one price, such as baseload or peak rather than the option with two different prices (peak and offpeak). However, the Proposer still felt that the peak and offpeak option was still an improvement on the baseline.

2.37 Another Workgroup member felt that by having both peak and offpeak prices, this represents two different groups of generators.

2.38 The Workgroup generally agreed that it would be difficult to decide on figures for the cap and collar and that it may be arbitrary. The benefit of the month ahead options is that generators know what they are getting, particularly for baseload and peak and therefore can reflect this in their prices.

2.39 The Proposer noted that they would consider supporting options 1-3 because parties will no longer need to take account of the volatile and unpredictable MIP. A FR provider will only need to take a view of the quantity of high and low frequency response it expects to provide. Based on the numbers presented the Proposer would expect that FR providers would be able to submit FR Holding Prices at a discount to those currently submitted. This would represent an increase in efficiency. The peak/off-peak option would be more helpful if a generator can submit two holding prices, one for peak, and the other for off-peak. As such the Proposer considers the peak/off-peak option to be slightly inferior to the baseload and peak options.

2.40 Prices were calculated using data provided from the Intercontinental Exchange (ICE) website[1], however the workgroup discussed using other indices such as Platts and were interested in getting industry views on which index to use. Prices are shown in the table below.

£/MWh	Baseload	Peak + Offpeak		Peak	Existing MIP w/ cap & collar	
		7am-7pm weekdays	Remaining times		Cap	Collar
Nov-2014	47.56	55.71	43.49	55.71	95.12	0
May-2015	42.72	45.93	42.10	45.93	85.44	0
Aug-2015	41.53	45.68	39.55	45.68	83.06	0

Table 2 – Prices for Baseload, Peak & Off-peak, Peak and Cap & Collar

[1] https://www.theice.com/market-data/ice-indices

Offpeak prices were calculated using the formula provided by the Proposer:

Baseload value = 24 hours*days in the month*Baseload price [£/MWh] = **x**
Peak value = 12 hours*week days in the month*Peak price [£/MWh] = **y**
Off Peak hours = (weekdays in the month*12 hours)+(weekend days in the month*24 hours) = **h**
Off Peak price (£/MWh) = **(x-y)/h**

2.41 It was suggested to have a graph which showed the difference between the actual MIP as applied for the REP currently and what it would be under each of the four options to help the industry to compare the options. The Workgroup agreed that the 10th business day of the month should be used for the data when doing the analysis. This would give FR Providers notice of the REP price ahead of Holding Price submission.

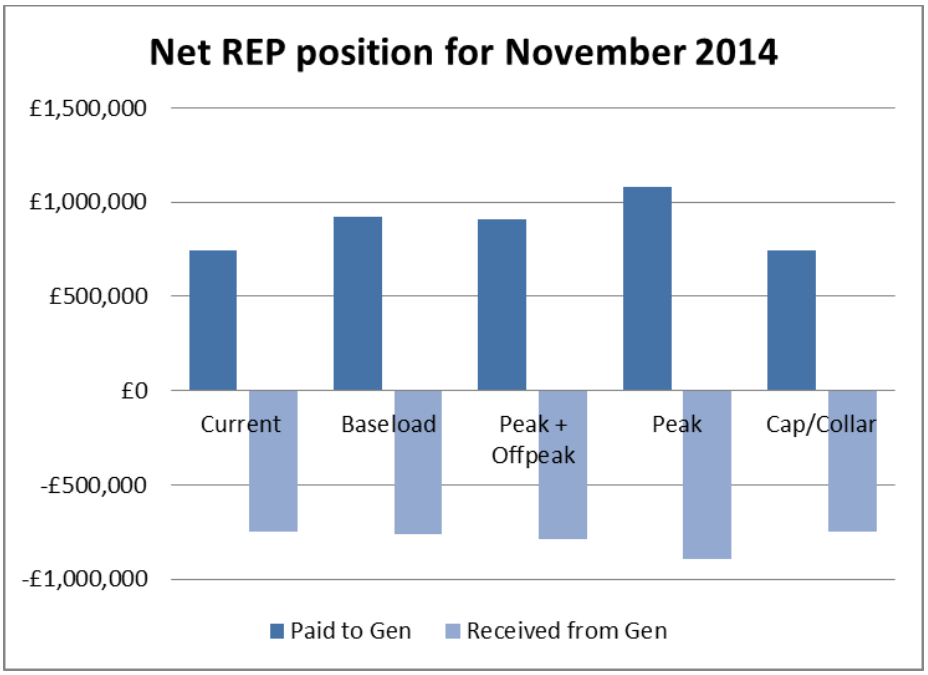


Fig.4 – Net REP position for November 2014

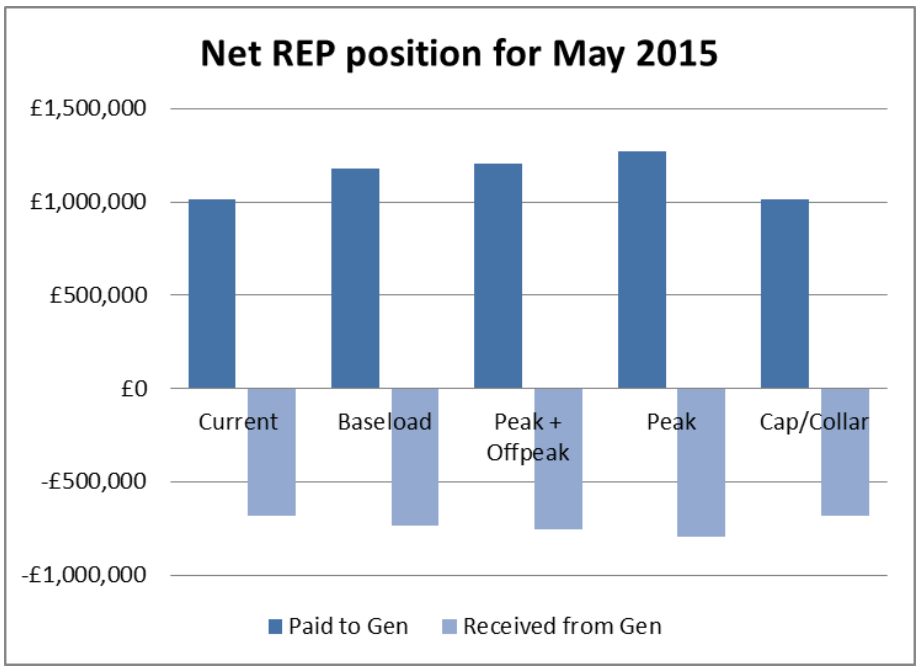


Fig.5 – Net REP position for May 2015

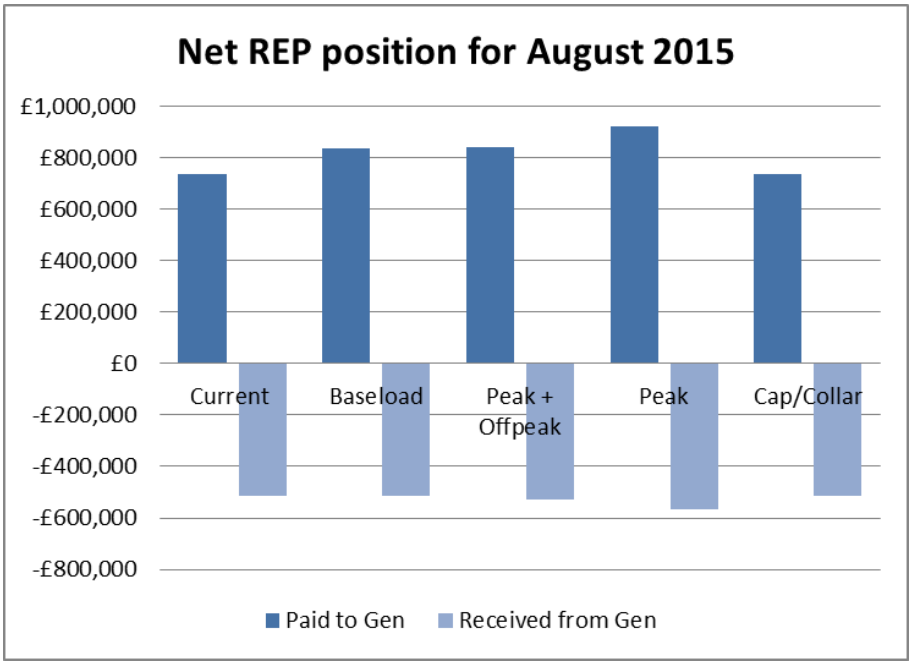


Fig.6 – Net REP position for August 2015

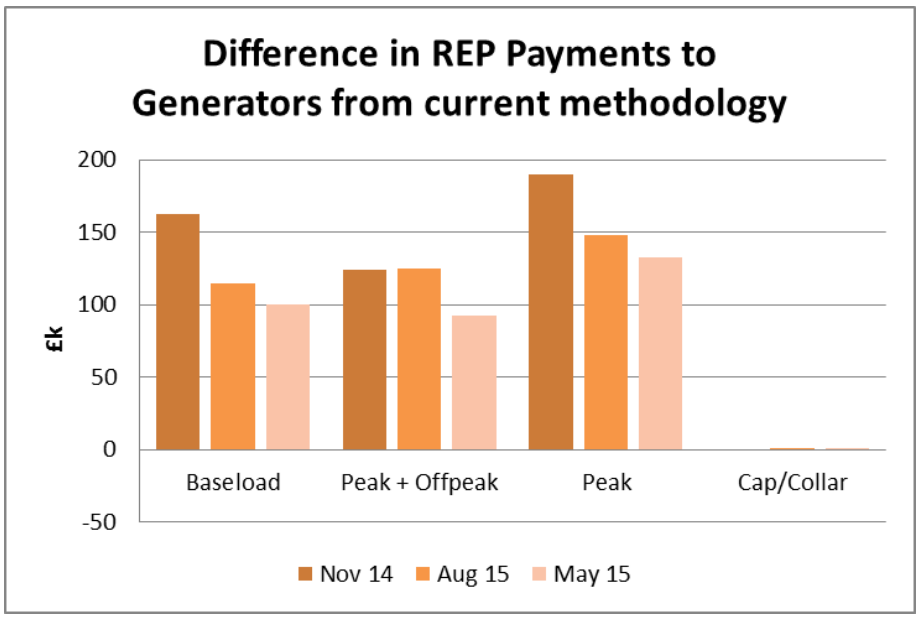


Fig.7 – Difference in REP Payments to Generators from current methodology

2.42 The National Grid representative presented his analysis. He showed the associated payments for each month in respect of the response energy volumes for mandatory frequency response, noting that the baseload, peak and peak/off-peak figures were slightly greater in terms of the amounts being paid out, and that this was also reflected in the overall net spend. He also explained that the figures related to the cap and collar option are almost identical to the current methodology as the cap and collar are rarely hit.

2.43 It was suggested that as these figures were not too dissimilar to the current methodology, that they proposed solution would not cause a significant cost to consumers. However, a net benefit would be achieved with only a very small discount in FR Providers Holding Prices. The Workgroup considered that each of the suggested options would not seem to have any detriment or benefit to consumers, although it was also noted that assessment of this effect may be undertaken through a potential Impact Assessment conducted by the Authority, rather than by the workgroup itself.

2.44 When considering whether to include optionality within the final options, the Workgroup considered CMP243's similarity to CMP237. At the CUSC Modifications Panel on 28th August 2015, the Ofgem representative informed the Panel that they would be delaying a decision on CMP237 until the Final CUSC Modification Report for CMP243 was received. The Workgroup therefore agreed that there should be similarities between the two modifications in terms of the options provided to the Authority, therefore making sure that there is an 'optionality' option i.e. to remain and/or switch to the current MIP based REP included within CMP243. However, the Workgroup agreed to include a question within the Workgroup Consultation to ask parties if they valued the optionality.

3 Workgroup Alternatives

Potential options for change

3.1 The Workgroup have not yet formalised any Workgroup Alternate CUSC Modifications to CMP243. The Workgroup have considered options which may be alternatives to the Original solution, these are covered in paragraph 2.35.

4 Impact and Assessment

Impact on the CUSC

4.1 Changes to Section 4

Impact on Greenhouse Gas Emissions

4.2 None identified.

Impact on Core Industry Documents

4.3 None identified.

Impact on other Industry Documents

4.4 None identified.

5 Proposed Implementation and Transition

In terms of implementation and transition, the Workgroup agreed to keep CMP243 similar to CMP237 and to have 3 full months after implementation within the CUSC to introduce the practical application of the changes.

6 Responses

6.1 This Workgroup is seeking the views of CUSC Parties and other interested parties in relation to the issues noted in this document and specifically in response to the questions highlighted in the report and summarised below:

Standard Workgroup Consultation questions;

Q1: Do you believe that CMP243 Original proposal or either of the potential options for change better facilitates the Applicable CUSC Objectives?

Q2: Do you support the proposed implementation approach?

Q3: Do you have any other comments?

Q4: Do you wish to raise a Workgroup Consultation Alternative request for the Workgroup to consider? Please see 8.3.

Consultation questions specific to CMP243:

Q5: Out of the four options suggested by the Workgroup in paragraph 2.35, which is your preferred option and why?

Q6: Do you consider there to be any further analysis required for the development of CMP243?

Q7: Do you think there are any other potential options for change which the Workgroup have not considered?

Q8: What price indices do you consider the Workgroup should use for their analysis?

Q9: Does the proposed timeframe of setting the REP ten days ahead of providing holding prices gives the right balance between accuracy of price and providing sufficient time for parties to respond to the price? If not, please provide your view on a more appropriate timeframe.

Q10: Do you believe FR providers should have the option of remaining/switching to the current MIP based REP?

Q11: Do you believe that the current REP multipliers (1.25 for low FR and 0.75 for High FR) should be retained as part of a new REP methodology?

6.2 Please send your response using the response proforma which can be found on the National Grid website via the following link: http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/CMP243/

6.3 In accordance with Section 8 of the CUSC, CUSC Parties, BSC Parties, the Citizens Advice and the Citizens Advice Scotland may also raise a Workgroup Consultation Alternative Request. If you wish to raise such a request, please use the relevant form available at the weblink below:

http://www.nationalgrid.com/uk/Electricity/Codes/systemcode/amendments/forms_guidance/

6.4 Views are invited upon the proposals outlined in this report, which should be received by **5pm** on **24th November 2015.** Your formal responses may be emailed to: cusc.team@nationalgrid.com

6.5 If you wish to submit a confidential response, please note that information provided in response to this consultation will be published on National Grid's website unless the response is clearly marked "Private & Confidential", we will contact you to establish the extent of the confidentiality. A response market "Private & Confidential" will be disclosed to the Authority in full but, unless agreed otherwise, will not be shared with the CUSC Modifications Panel or the industry and may therefore not influence the debate to the same extent as a non-confidential response.

6.6 Please note an automatic confidentiality disclaimer generated by your IT System will not in itself, mean that your response is treated as if it had been marked "Private and Confidential".

Annex 1 – CMP243 CUSC Modification Proposal Form

CUSC Modification Proposal Form CMP243

nationalgrid

Connection and Use of System Code (CUSC)

Title of the CUSC Modification Proposal

A fixed Response Energy Payment option for all generating technologies

Submission Date

19 May 2015

Description of the Issue or Defect that the CUSC Modification Proposal seeks to address

All licensed generators are obliged to provide the mandatory Frequency Response (FR) service as required by the Grid Code. Currently, when instructed to provide FR, a generator is paid an hourly Holding Payment and is paid or pays a Response Energy Payment (REP) for net energy delivery per settlement period.

Generators submit individual Holding Prices on a monthly basis whilst the universally-applied REP is defined in the CUSC and is designed to reflect the energy cost incurred or saved from service provision, which includes the associated cost of fuel. The REP is based on Market Index Price (MIP) with different ratios: -0.75 for High Frequency and 1.25 for Low Frequency. The negative sign for High Frequency indicates that the REP is made by generators, as it is anticipated that the generator has saved money by not using as much fuel.

The current model for FR payment is outdated and better suited to a time where renewable generation on the system was sparse and the marginal costs of generators were similar. Presently the marginal costs of generators are very different, with some generators having negative marginal costs. For example, wind and solar generators have negative marginal costs as these technologies have no fuel cost associated with the production of electricity. In addition these types of generation receive low carbon support e.g. ROCs for every unit of electricity generated i.e. the value of a ROC represents the opportunity cost for these generators.

The increase in negative marginal cost renewable generation connected to the system will lead to increased volatility and uncertainty around the MIP. This effect will tend to increase the volatility of the MIP as the MIP is determined by the marginal source of generation. The marginal source of generation will vary throughout the day as demand fluctuates. As different technologies have significantly different marginal costs, this will drive increased volatility of within day prices. For example, during the day when demand is relatively high, a conventional generator will likely be the marginal source of generation and will set the MIP. As conventional generators have positive marginal costs, this will likely result in a positive MIP. In addition, as conventional generators will increasingly operate for a limited number of hours, the requirement to recover fixed costs in a limited number of hours will lead to increases in MIP prices, specifically at peak times. Conversely, in low demand periods (such as overnight), a wind

generator may be the marginal source of power. As this will have a negative marginal cost, the MIP will likely go negative. Indeed traded power prices have gone negative on a number of occasions in April and May 2015.

This trend of increasingly volatile MIPs will be accentuated by proposed changes to the cash-out price arrangements. By making cash-out prices more marginal, the impact of more marginal cash-out prices can be expected to impact the volatility of the MIP.

This increasing price volatility risk will most likely have an effect on the holding fees submitted by generators and some generators may price themselves out of the market. This is because generators cannot anticipate the volatility of the MIP and thus are uncertain of the costs associated with being utilised to provide FR.

As such, the current REP calculation is an inefficient way to manage this risk and will have a detrimental effect on National Grid's ability to efficiently procure FR. This increased cost will eventually be passed on to the end consumer.

Description of the CUSC Modification Proposal

We propose that all generators regardless of technology type should have the option of choosing whether their REP is based on the current methodology, or a REP fixed at a suggested value of £0/MWh. A Workgroup may wish to consider fixing the REP at a different price if they felt it was more appropriate.

We consider this modification proposal to be straightforward and of minimal cost.

We believe that all generators, regardless of technology type, should have the option of fixing the price of their REP. Allowing generators this option will allow them to better manage the risks noted above. This will also likely maximise the quantity of plant providing cost effective FR. This will both improve the SO's procurement and utilisation of FR (thus ensuring more efficient system operation), as well as maximising effective competition between providers of FR. Both impacts will benefit end consumers.

Impact on the CUSC

Changes would be required to section 4.

Do you believe the CUSC Modification Proposal will have a material impact on Greenhouse Gas Emissions? Yes / No

No

Impact on Core Industry Documentation. Please tick the relevant boxes and provide any supporting information

BSC ☐

Grid Code ☐

STC ☐

Other ☐
(please specify)

This is an optional section. You should select any Codes or state Industry Documents which may be affected by this Proposal and, where possible, how they will be affected.

Urgency Recommended: Yes / No

No

Justification for Urgency Recommendation

N/A

Self-Governance Recommended: Yes / No

No

Justification for Self-Governance Recommendation

N/A

Should this CUSC Modification Proposal be considered exempt from any ongoing Significant Code Reviews?

N/A

Impact on Computer Systems and Processes used by CUSC Parties:

Low impact on:

- Generator frequency response pricing processes

Medium impact on:

- National Grid administration of Frequency Response Price Submission process
- National Grid and Generator Settlement processes

Details of any Related Modification to Other Industry Codes

CMP237: This modification addressed the disparity between the payments received for FR for non-fuel cost generation.

It is proposed that the REP calculation be retained for conventional generators or generators that have a fuel cost (e.g. fossil fuel or biomass). For all other generators the REP would be settled at £0/MWh. This will ensure that generators are not penalised by the cost of changing their energy output in providing FR, whether that change involves a fuel cost or not. We would like to emphasise that the new modification we are proposing rectifies a separate defect to that which CMP237 is concerned with, although the solution is similar and would be compatible with solving the CMP237 defect.

Justification for CUSC Modification Proposal with Reference to Applicable CUSC Objectives:

Our proposal will better facilitate Applicable CUSC Objectives (a) and (b) for the following reasons.

Against Objective (b), allowing generators this option (£0/MWh REP) will allow them to better manage the risk associated with the volatility of the MIP. By allowing generators to eliminate the price risk associated with the MIP, generators will be able to more keenly price the provision of FR. This will maximise the quantity of plant providing cost effective FR and thus effective competition.

Against Objective (a), by facilitating effective competition for FR, the proposal will increase the number of options available to the SO for FR provision. As a result this will improve the SO's procurement and utilisation of the service, thus ensuring more efficient system operation.

Both impacts will benefit end consumers by more efficiently procuring and utilising FR.

Please tick the relevant boxes and provide justification:

☒ (a) the efficient discharge by The Company of the obligations imposed upon it by the Act and the Transmission Licence

☒ (b) facilitating effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the sale, distribution and purchase of electricity.

☐ (c) compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency.
These are defined within the National Grid Electricity Transmission plc Licence under Standard Condition C10, paragraph 1.

Objective (c) was added in November 2011. This refers specifically to European Regulation

2009/714/EC. Reference to the Agency is to the Agency for the Cooperation of Energy Regulators (ACER).

Additional details

Details of Proposer: (Organisation Name)	Drax Power Limited
Capacity in which the CUSC Modification Proposal is being proposed: (i.e. CUSC Party, BSC Party or "National Consumer Council")	CUSC Party
Details of Proposer's Representative: Name: Organisation: Telephone Number: Email Address:	 Cem Suleyman Drax Power Limited 01757 612338 cem.suleyman@drax.com
Details of Representative's Alternate: Name: Organisation: Telephone Number: Email Address:	 Joseph Underwood Drax Power Limited 01757 612736 joseph.underwood@drax.com
Attachments (Yes/No): No **If Yes, Title and No. of pages of each Attachment:**	

Contact Us

If you have any questions or need any advice on how to fill in this form please contact the Panel Secretary:

E-mail cusc.team@nationalgrid.com

Phone: 01926 653606

For examples of recent CUSC Modifications Proposals that have been raised please visit the National Grid Website at http://www2.nationalgrid.com/UK/Industry-information/Electricity-codes/CUSC/Modifications/Current/

Submitting the Proposal

Once you have completed this form, please return to the Panel Secretary, either by email to jade.clarke@nationalgrid.com and copied to cusc.team@nationalgrid.com, or by post to:

Jade Clarke
CUSC Modifications Panel Secretary, TNS
National Grid Electricity Transmission plc
National Grid House
Warwick Technology Park
Gallows Hill
Warwick
CV34 6DA

If no more information is required, we will contact you with a Modification Proposal number and the date the Proposal will be considered by the Panel. If, in the opinion of the Panel Secretary, the form fails to provide the information required in the CUSC, the Proposal can be rejected. You will be informed of the rejection and the Panel will discuss the issue at the next meeting. The Panel can reverse the Panel Secretary's decision and if this happens the Panel Secretary will inform you.

Annex 2 – CMP243 Terms of Reference

nationalgrid

Workgroup Terms of Reference and Membership
TERMS OF REFERENCE FOR CMP243 WORKGROUP

CMP243 aims to allow all generators, regardless of technology type, the option of choosing whether their Response Energy Payment (REP) is based on the current methodology or a fixed value suggested at £0/MWh.

Responsibilities

1. The Workgroup is responsible for assisting the CUSC Modifications Panel in the evaluation of CUSC Modification Proposal **243 'a fixed Response Energy Payment option for all generating technologies'** tabled by Drax Power at the CUSC Modifications Panel meeting on 29th May 2015.

2. The proposal must be evaluated to consider whether it better facilitates achievement of the Applicable CUSC Objectives. These can be summarised as follows:

Applicable CUSC Objectives

(a) the efficient discharge by the Licensee of the obligations imposed on it by the Act and the Transmission Licence;

(b) Facilitating effective competition in the generation and supply of electricity, and (so far as consistent therewith) facilitating such competition in the sale, distribution and purchase of electricity;

(c) Compliance with the Electricity Regulation and any relevant legally binding decision of the European Commission and/or the Agency.

3. It should be noted that additional provisions apply where it is proposed to modify the CUSC Modification provisions, and generally reference should be made to the Transmission Licence for the full definition of the term.

Scope of work

4. The Workgroup must consider the issues raised by the Modification Proposal and consider if the proposal identified better facilitates achievement of the Applicable CUSC Objectives.

5. In addition to the overriding requirement of paragraph 4, the Workgroup shall consider and report on the following specific issues:

a) Does CMP243 apply both to generators who are available for frequency response provision through being run by the market and those that become available to provide frequency response through being run pursuant to an offer acceptance by the SO.
b) Consider potential interaction with CMP237.
c) Implementation

d) Review draft legal text

6. The Workgroup is responsible for the formulation and evaluation of any Workgroup Alternative CUSC Modifications (WACMs) arising from Group discussions which would, as compared with the Modification Proposal or the current version of the CUSC, better facilitate achieving the Applicable CUSC Objectives in relation to the issue or defect identified.

7. The Workgroup should become conversant with the definition of Workgroup Alternative CUSC Modification which appears in Section 11 (Interpretation and Definitions) of the CUSC. The definition entitles the Group and/or an individual member of the Workgroup to put forward a WACM if the member(s) genuinely believes the WACM would better facilitate the achievement of the Applicable CUSC Objectives, as compared with the Modification Proposal or the current version of the CUSC. The extent of the support for the Modification Proposal or any WACM arising from the Workgroup's discussions should be clearly described in the final Workgroup Report to the CUSC Modifications Panel.

8. Workgroup members should be mindful of efficiency and propose the fewest number of WACMs possible.

9. All proposed WACMs should include the Proposer(s)'s details within the final Workgroup report, for the avoidance of doubt this includes WACMs which are proposed by the entire Workgroup or subset of members.

10. There is an obligation on the Workgroup to undertake a period of Consultation in accordance with CUSC 8.20. The Workgroup Consultation period shall be for a period of 3 weeks as determined by the Modifications Panel.

11. Following the Consultation period the Workgroup is required to consider all responses including any WG Consultation Alternative Requests. In undertaking an assessment of any WG Consultation Alternative Request, the Workgroup should consider whether it better facilitates the Applicable CUSC Objectives than the current version of the CUSC.

    As appropriate, the Workgroup will be required to undertake any further analysis and update the original Modification Proposal and/or WACMs. All responses including any WG Consultation Alternative Requests shall be included within the final report including a summary of the Workgroup's deliberations and conclusions. The report should make it clear where and why the Workgroup chairman has exercised his right under the CUSC to progress a WG Consultation Alternative Request or a WACM against the majority views of Workgroup members. It should also be explicitly stated where, under these circumstances, the Workgroup chairman is employed by the same organisation who submitted the WG Consultation Alternative Request.

12. The Workgroup is to submit its final report to the Modifications Panel Secretary on 17th September 2015 for circulation to Panel Members. The final report conclusions will be presented to the CUSC Modifications Panel meeting on 25th September 2015.

Membership

13. It is recommended that the Workgroup has the following members:

Role	Name	Representing
Chairman	Ian Pashley	Code Administrator
*National Grid Representative**	Adam Sims	National Grid
*Industry Representatives**	Cem Suleyman	Drax
	Andy Raffan	Scottish Power
	Simon Lord	GDF Suez
	Garth Graham	SSE
	Christopher Proudfoot	Centrica
	Guy Phillips	E.ON
Authority Representatives	Jonathan Bryson	Ofgem
Technical secretary	Jade Clarke	Code Administrator
Observers		

NB: A Workgroup must comprise at least 5 members (who may be Panel Members). The roles identified with an asterisk in the table above contribute toward the required quorum, determined in accordance with paragraph 14 below.

14. The Chairman of the Workgroup and the Modifications Panel Chairman must agree a number that will be quorum for each Workgroup meeting. The agreed figure for CMP242 is that at least 5 Workgroup members must participate in a meeting for quorum to be met.

15. A vote is to take place by all eligible Workgroup members on the Modification Proposal and each WACM. The vote shall be decided by simple majority of those present at the meeting at which the vote takes place (whether in person or by teleconference). The Workgroup chairman shall not have a vote, casting or otherwise. There may be up to three rounds of voting, as follows:

- Vote 1: whether each proposal better facilitates the Applicable CUSC Objectives;
- Vote 2: where one or more WACMs exist, whether each WACM better facilitates the Applicable CUSC Objectives than the original Modification Proposal*;*
- Vote 3: which option is considered to BEST facilitate achievement of the Applicable CUSC Objectives. For the avoidance of doubt, this vote should include the existing CUSC baseline as an option.

The results from the vote and the reasons for such voting shall be recorded in the Workgroup report in as much detail as practicable.

16. It is expected that Workgroup members would only abstain from voting under limited circumstances, for example where a member feels that a proposal has been insufficiently developed. Where a member has such concerns, they

should raise these with the Workgroup chairman at the earliest possible opportunity and certainly before the Workgroup vote takes place. Where abstention occurs, the reason should be recorded in the Workgroup report.

17. Workgroup members or their appointed alternate are required to attend a minimum of 50% of the Workgroup meetings to be eligible to participate in the Workgroup vote.

18. The Technical Secretary shall keep an Attendance Record for the Workgroup meetings and circulate the Attendance Record with the Action Notes after each meeting. This will be attached to the final Workgroup report.

19. The Workgroup membership can be amended from time to time by the CUSC Modifications Panel.

Appendix 1 – Indicative Workgroup Timetable

The following timetable is indicative for CMP243

5th June 2015	Deadline for comments on Terms of Reference / nominations for Workgroup membership
W/C 15th June	Workgroup meeting 1
W/C 29th June	Workgroup meeting 2
6th July 2015	Workgroup Consultation issued for 1 week Workgroup comment
13th July 2015	Deadline for comment
16th July 2015	Workgroup Consultation published
13th August 2015	Deadline for responses
W/C 17th August 2015	Workgroup meeting 3
W/C 24th August 2015	Workgroup meeting 4
1st September 2015	Circulate draft Workgroup Report
8th September 2015	Deadline for comment
17th September 2015	Submit final Workgroup Report to Panel
25th September 2015	Present Workgroup Report at CUSC Modifications Panel

Post-Workgroup modification timetable

30th September 2015	Code-Administrator Consultation published
21st October 2015	Deadline for responses
26th October 2015	Draft FMR published
2nd November 2015	Deadline for comments
19th November 2015	Draft FMR issued to CUSC Panel
27th November 2015	CUSC Panel Recommendation vote
10th December 2015	Final CUSC Modification Report submitted to Authority

The Workgroup have since requested three one month extensions to the Workgroup timetable and therefore will now report back to the CUSC Panel in December 2015.

Annex 3 – Workgroup attendance register

A – Attended
X – Absent
O – Alternate
D – Dial-in

Name	Organisation	Role	03/07/2015	20/08/2015	21/09/2015
Ian Pashley	National Grid	Chair	A	A	O
Jade Clarke	Code Administrator	Technical Secretary	A	A	A
Cem Suleyman	Drax Power	Proposer	A	A	A
Adam Sims	National Grid	Workgroup member	A	O	A
Simon Lord	GDF Suez	Workgroup member	A	A	D
Garth Graham	SSE	Workgroup member	A	A	D
Andy Raffan	Scottish Power	Workgroup member	D	A	D
Christopher Proudfoot	Centrica Energy	Workgroup member	A	X	X
Guy Phillips	E.ON	Workgroup member	X	A	X
Jonathan Bryson	Ofgem	Workgroup member	A	O	O

Annex 4 – Drax Analysis on Different REP options and the Impacts on Generator Profitability

Different REP Options and the Impacts on Generator Profitability

Currently, Frequency Response (FR) energy payments are based on the Market Index Price (MIP). The analysis presented in Appendix 1 shows the within-day variation of gross profit margins made (averaged through the months of August '14, November '14, and May '15) per 1 MWh by the average coal and gas power plants providing FR. The MIP for May 2015 were retrieved from the *Elexon Portal*. A proxy for marginal cost was derived from the month ahead baseload price and clean spark and dark spreads for Aug '14, Nov '15, and May '15. This data was retrieved from *Spectrometer* reports. The variation in profit margins made for high FR were calculated by taking the proxy marginal cost for fuel and subtracting the MIP multiplied by 0.75. The variation in profit margins made for low FR were calculated by taking the MIP multiplied by 1.25 and subtracting the proxy marginal cost for fuel.

It can be seen that providing high FR overnight has an increased potential of making larger profit margins than during the day. The opposite can be said for low FR where larger profit margins are more likely during the day than overnight. Providing high FR during the day could result in some generators being left out of pocket by up to £50/MWh.

During previous industry discussions surrounding FR (CMP237 and BSSG/CBSG) it was suggested that generators do not provide equal measures of high and low FR. Therefore generators running baseload and peaking generators will not benefit equally for providing FR. Further, Drax models predict that more units are utilised for FR during the night than during the day. Therefore certain plant may only be utilised for FR at certain points thereby increasing the chance of baseload and peak plant being improperly remunerated with respect to one another.

Large gains and losses will be made when a generator's marginal cost deviates far from the MIP. This is a common occurrence in a market with a diverse generation mix and this issue is expected to intensify. Further, as the generation on the system continues to diversify we can envisage that the extreme periods, where the MIP deviates significantly from the average, will become increasingly more commonplace. Therefore the graphs in Appendix 1 may be an underestimate of future scenarios.

Appendix 2, 3, and 4 shows the gross profit margins made per 1 MWh by the average coal and gas power plants providing FR if the MIP were replaced with that month's peak, baseload, and peak/off-peak energy price respectively.

The month ahead wholesale prices used in the graphs shown in Appendices 2, 3, and 4 are taken from the Drax wholesale market price database on the 14th of the month ahead of the FR delivery month. So for example the month ahead baseload price for August 2014 is the price of this product on 14 July 2014. Peak periods are 7-7 on weekdays. The baseload, peak and off-peak prices for the three months analysed are shown in table 1 below.

Product	**May 15**	**November 14**	**August 14**
Baseload (£/MWh)	42.98	47.72	34.83
Peak (£/MWh)	46.11	55.84	39.72
Off-Peak (£/MWh)	41.38	43.66	32.33

Table 1: Shows the baseload, peak, and off-peak wholesale power prices for three months.

The off-peak power price is calculated as follows:

$$x = 24hours \times Days\ in\ Month \times Baseload\ Power\ Price$$

$$y = 12hours \times Weekdays\ in\ Month \times Peak\ Power\ Price$$

$$z = (12hours \times Weekdays\ in\ Month) + (Weekend\ days\ in\ Month \times 24hours)$$

$$Offpeak\ Power\ Price = \frac{x - y}{z}$$

Where $x, y,$ and z are the baseload value, peak value, and the off-peak hours respectively.

Of the fixed price month-ahead options (those shown in Appendices 2, 3, and 4), peak and baseload both seem reasonable as both will provide increased predictability allowing parties to price their holding price more competitively with lower risk. This is because parties will no longer need to take account of the volatile and unpredictable MIP. A FR provider will only need to take a view of the quantity of high and low frequency response it expects to provide. Based on the numbers presented Drax would expect that FR providers would be able to submit FR Holding Prices at a discount those currently submitted. This would represent an increase in efficiency. The peak/off-peak option would be more helpful if a generator can submit two holding prices, one for peak, and the other for off-peak. As such Drax considers the peak/off-peak option to be slightly inferior to the baseload and peak options.

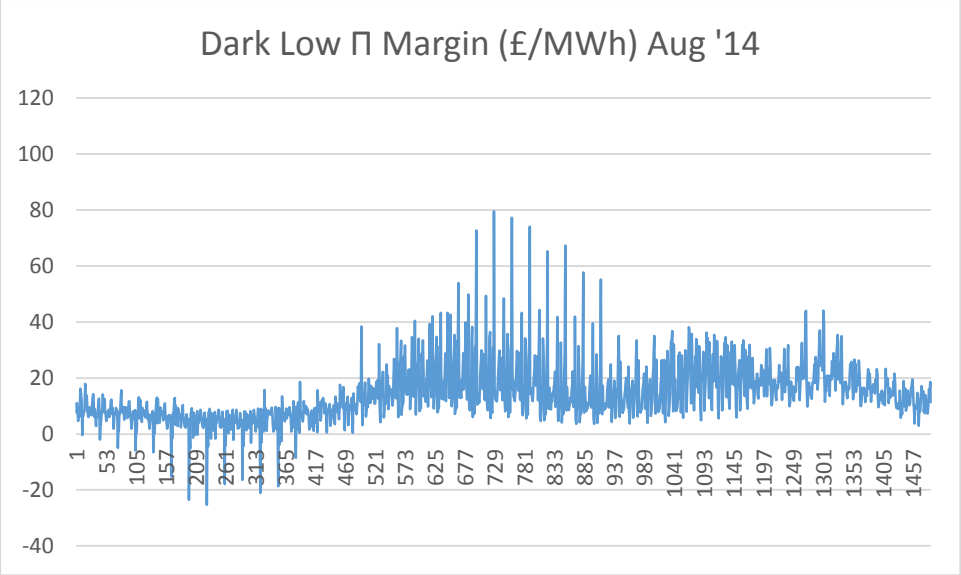
Appendix 5 shows the within-day variation of gross profit margins made (averaged through the months of August '14, November '14, and May '15) per 1 MWh by the average clean coal and clean gas power plants providing FR if a cap and collar of £60/MWh and £20/MWh had been applied to the MIP (when the 1.25 and 0.75 multipliers are applied this increases/decreases the cap and collar to £75/MWh and £15/MWh respectively).

The initial cap and collar decided by the workgroup (£0/MWh and 2*baseload power price) only captured a handful of settlement periods. It was decided that the cap and collar should be narrowed in order to capture more settlement periods (shown in Appendix 5). However, this still didn't alleviate the defect adequately. To get an adequate solution one would need to continually increase the collar and reduce the cap by which stage it makes more sense to fix the REP in line with Baseload, Peak and Peak/Off-Peak options. Overall, Drax believes this should be removed as a potential option for change going forward.

Appendix 6 shows the utilisation of 55 different generators through the first week in May '15. This comes from Drax internal models. The graphs show that there are numerous different utilisation patterns. A generator can only be assumed to be properly compensated for FR if it is utilised for FR equally through the day and night. The graphs in appendix 1 and 6 show that most generators are not properly remunerated for FR utilisation.

Appendix 1

Each graph in Appendix 1 shows the difference between the proxy marginal cost and the REP (MIP multiplied by the high or low FR multiplier) over the averaged day in Aug '14, Nov '14, and May '15.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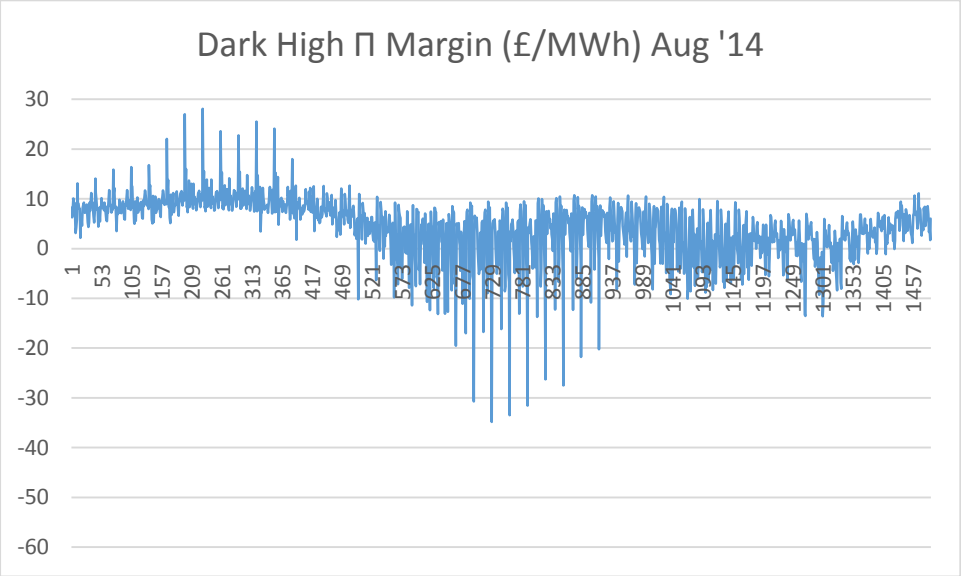
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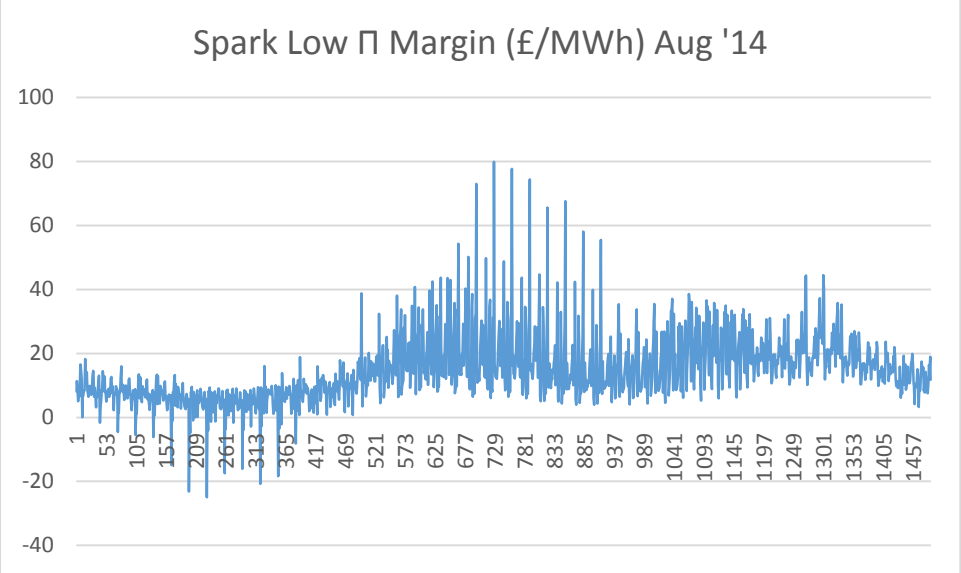
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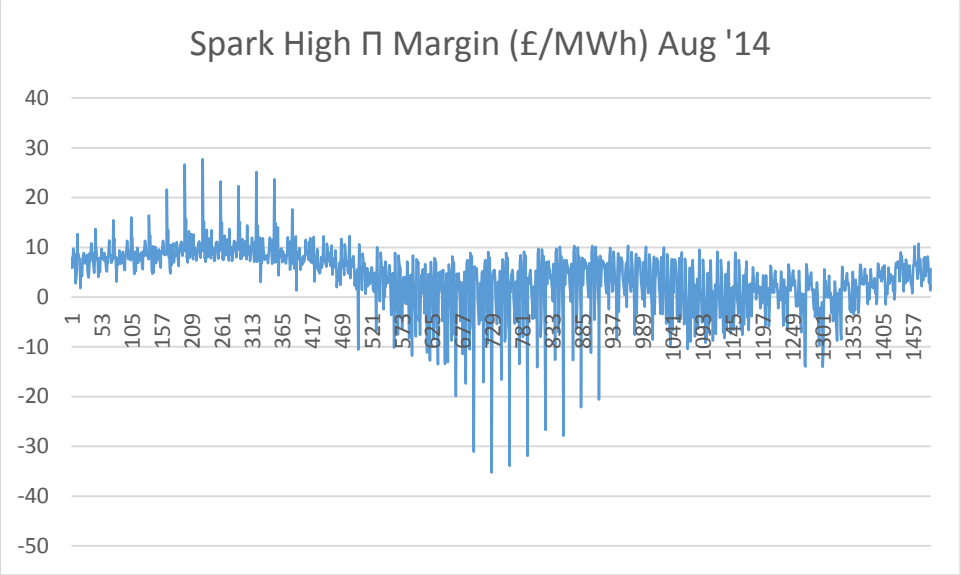
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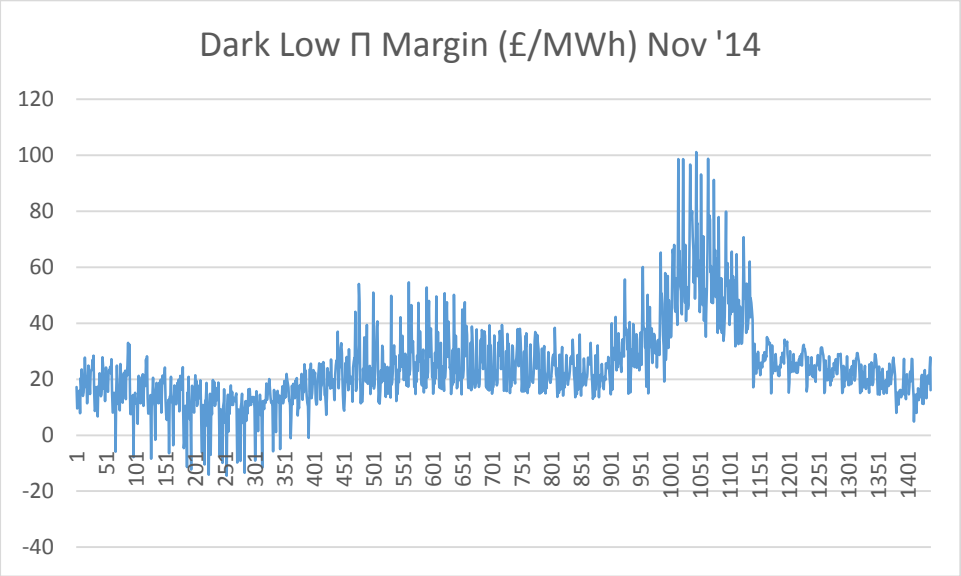
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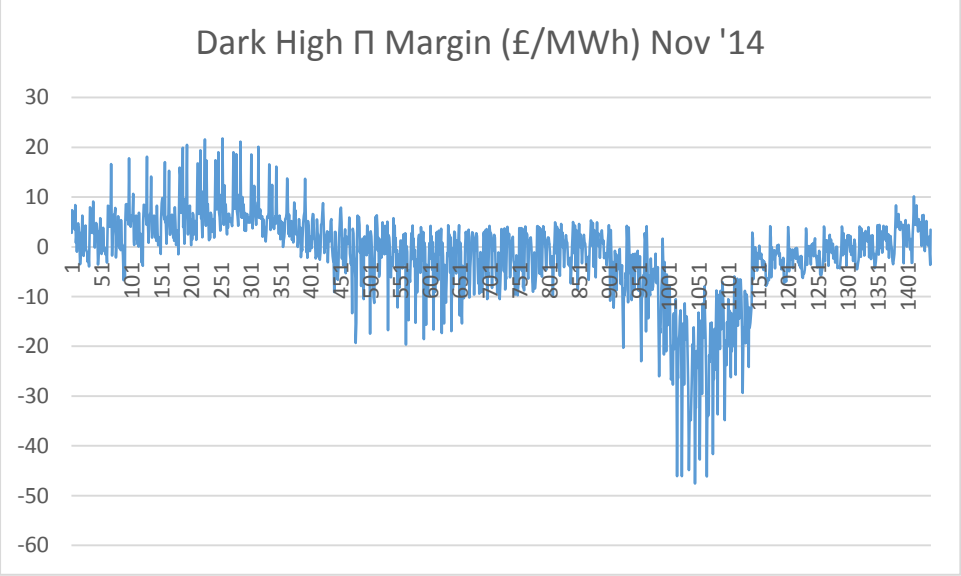
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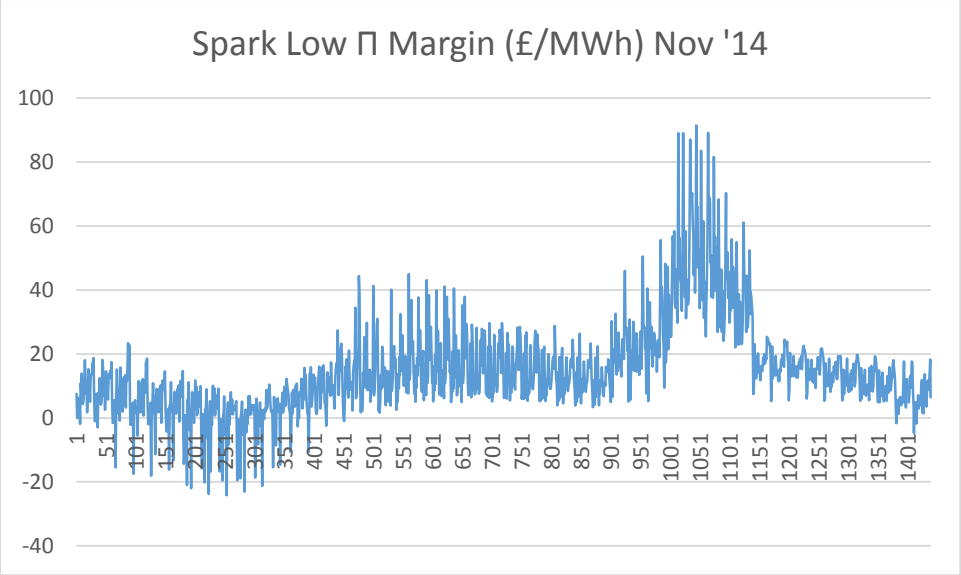
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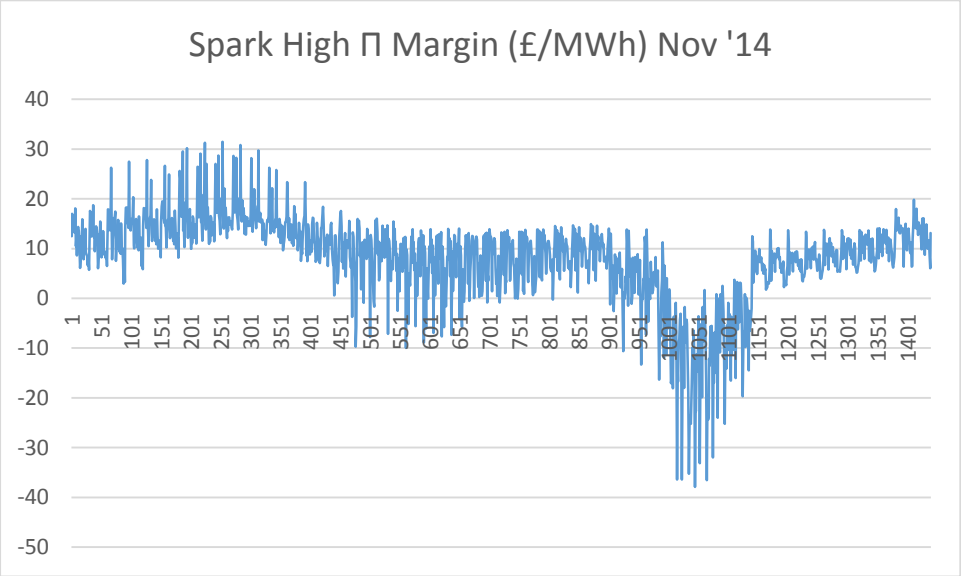
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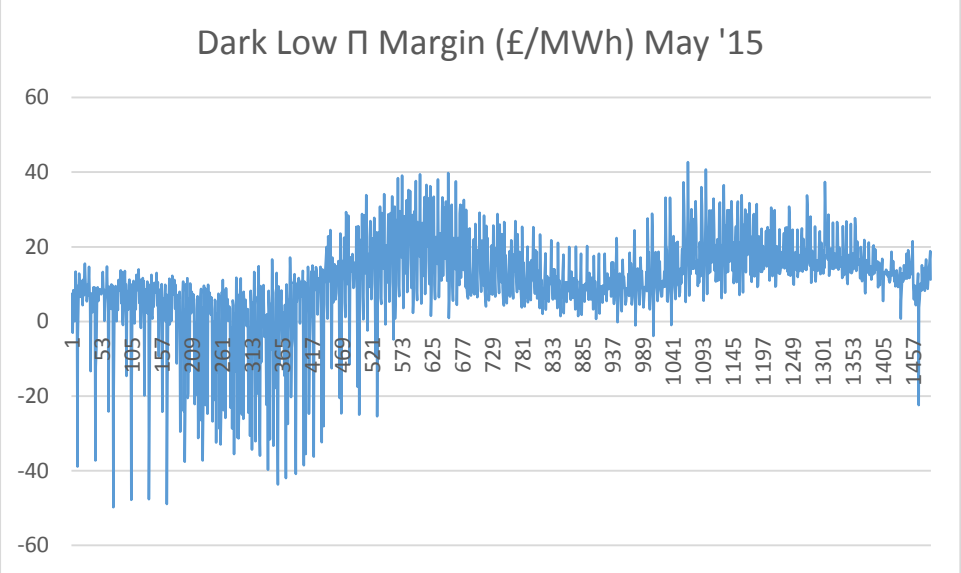
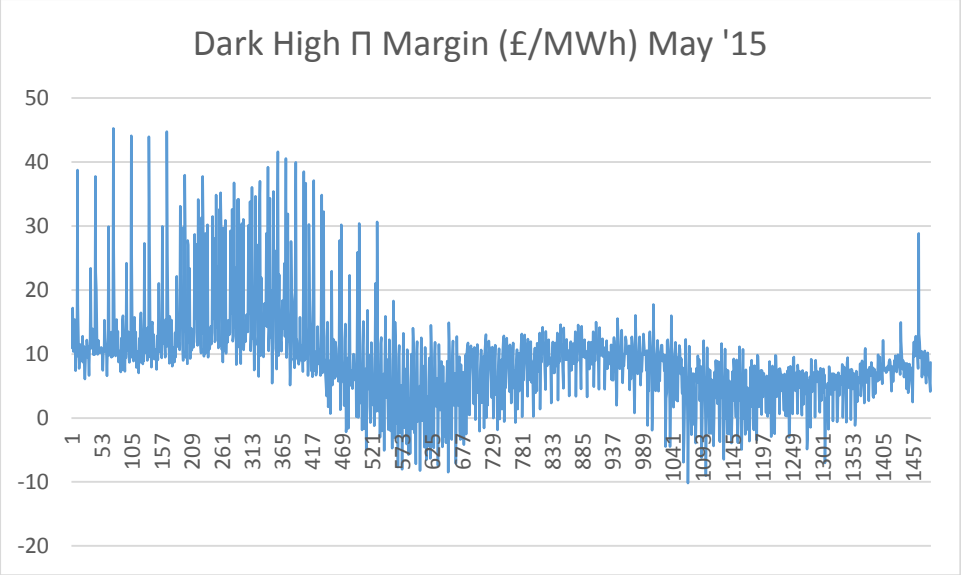
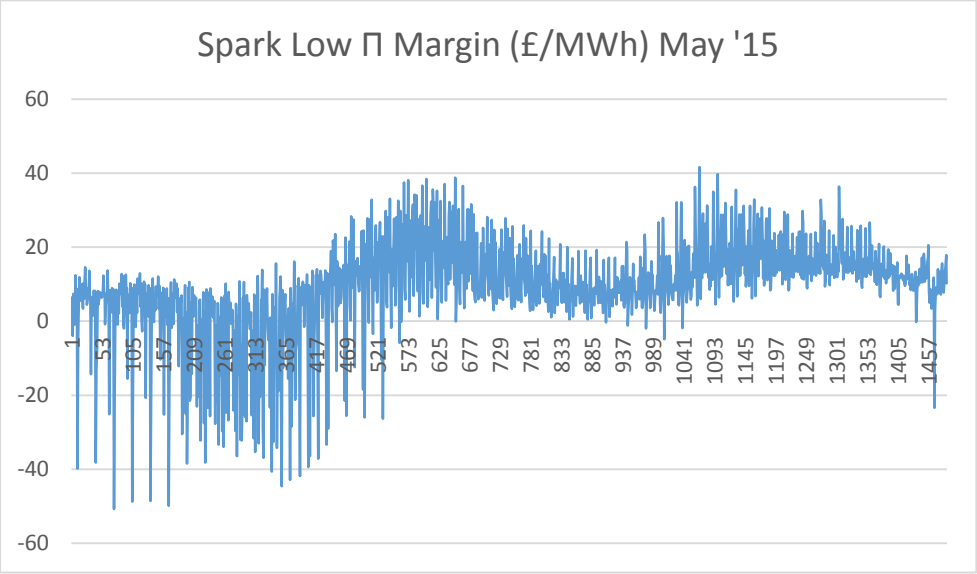
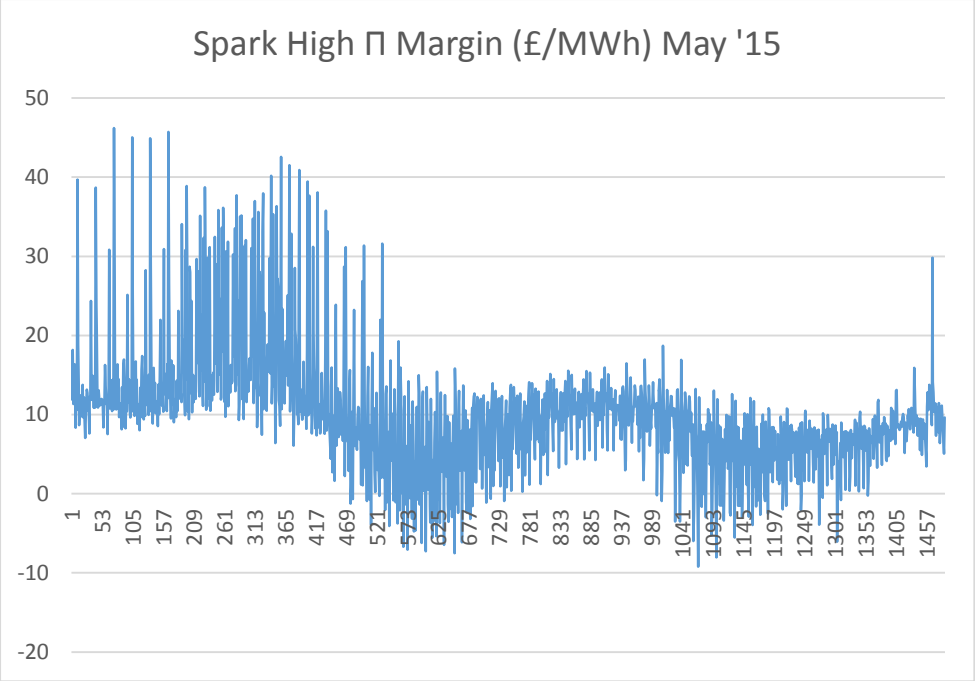

Dark Low Π Margin (£/MWh) May '15
60
40
20
0
-20
-40
-60
1
53
105
157
209
261
313
365
417
469
521
573
625
677
729
781
833
885
937
989
1041
1093
1145
1197
1249
1301
1353
1405
1457

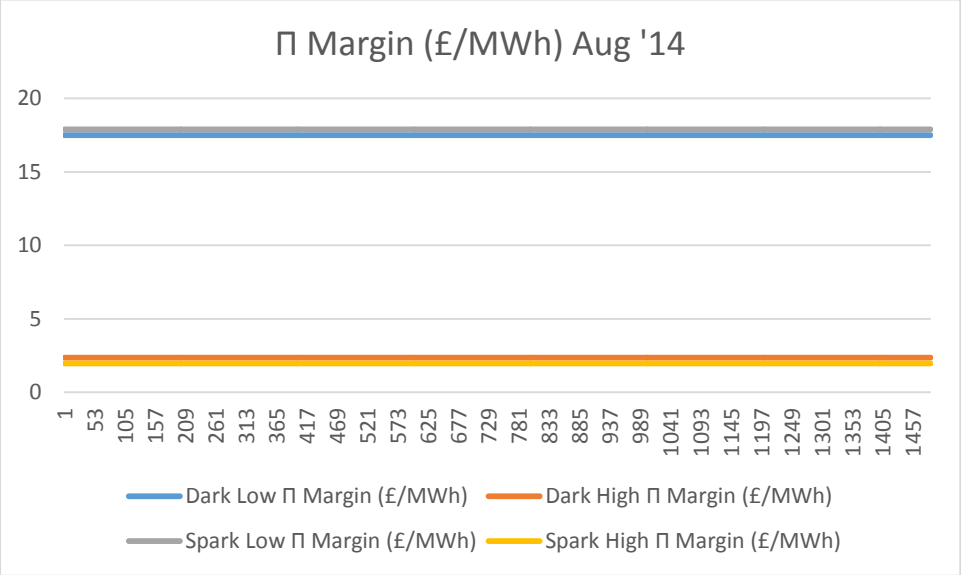

Dark High Π Margin (£/MWh) May '15
50
40
30
20
10
0
-10
-20
1
53
105
157
209
261
313
365
417
469
521
573
625
677
729
781
833
885
937
989
1041
1093
1145
1197
1249
1301
1353
1405
1457

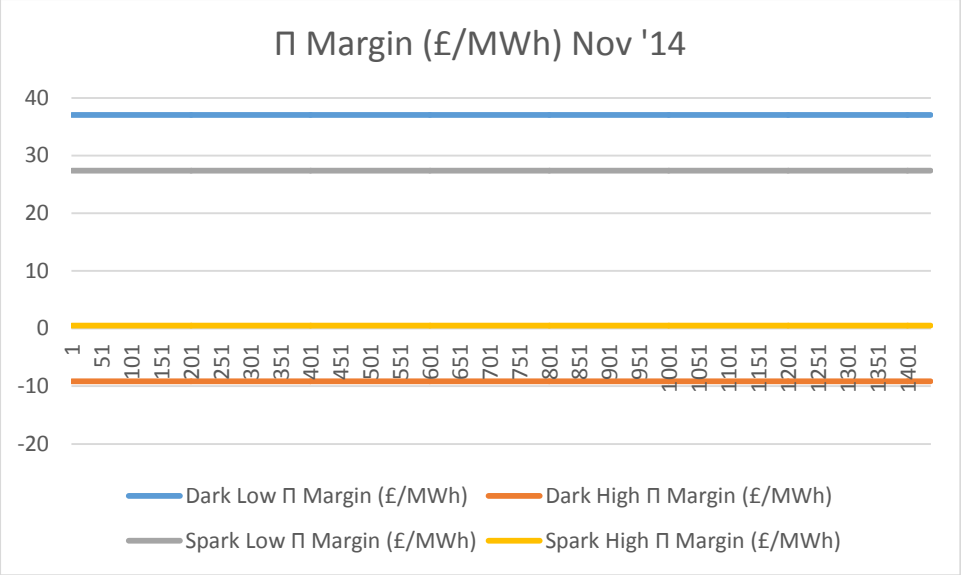

Spark Low Π Margin (£/MWh) May '15
60
40
20
0
-20
-40
-60
1
53
105
157
209
261
313
365
417
469
521
573
625
677
729
781
833
885
937
989
1041
1093
1145
1197
1249
1301
1353
1405
1457

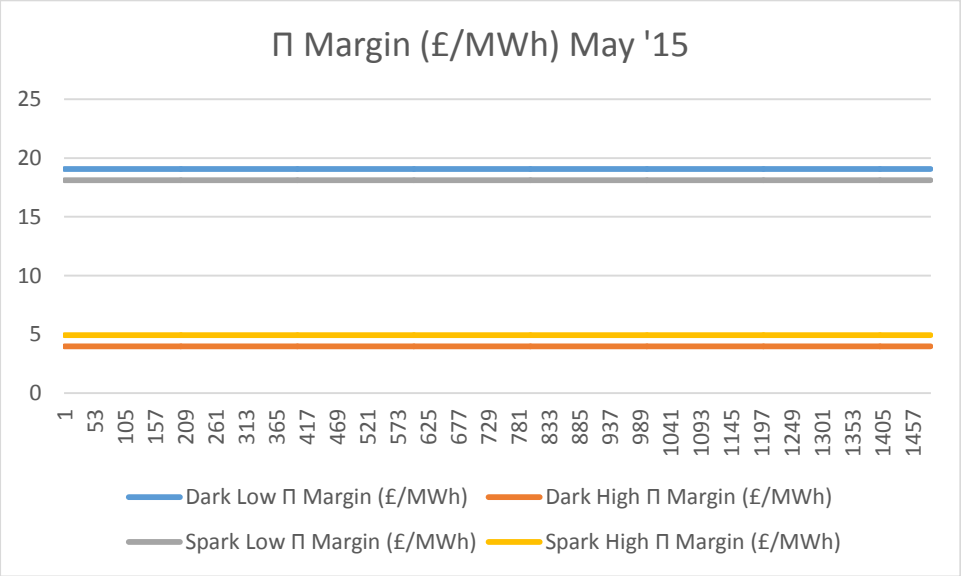


Appendix 2

Each graph in Appendix 2 shows the difference between the proxy marginal cost and the peak energy price in Aug ’14, Nov ’14, and May ‘15.

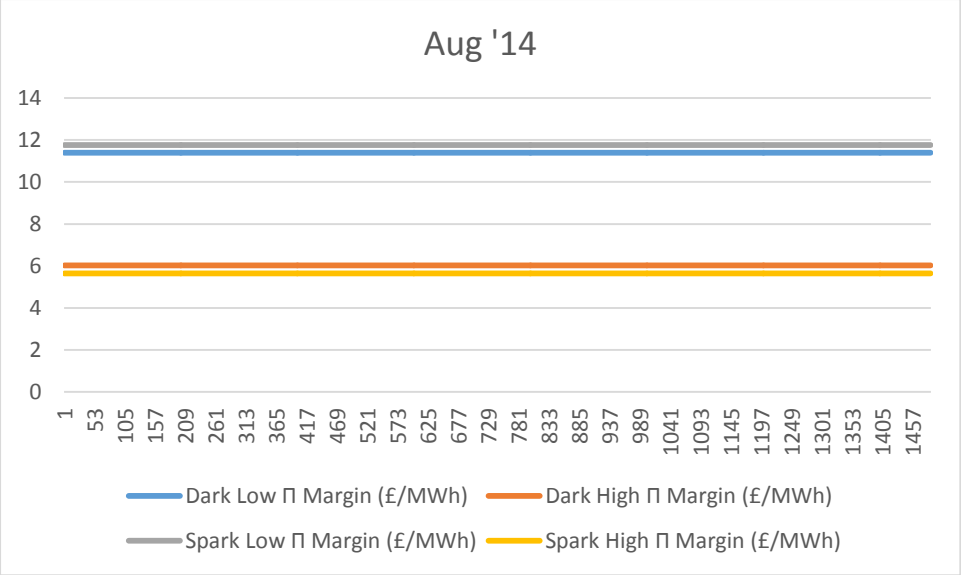


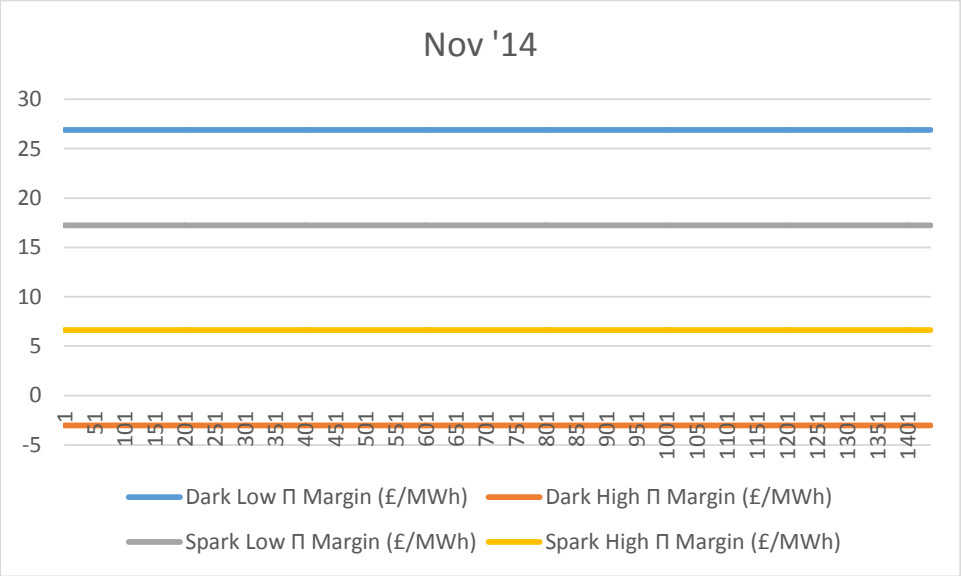


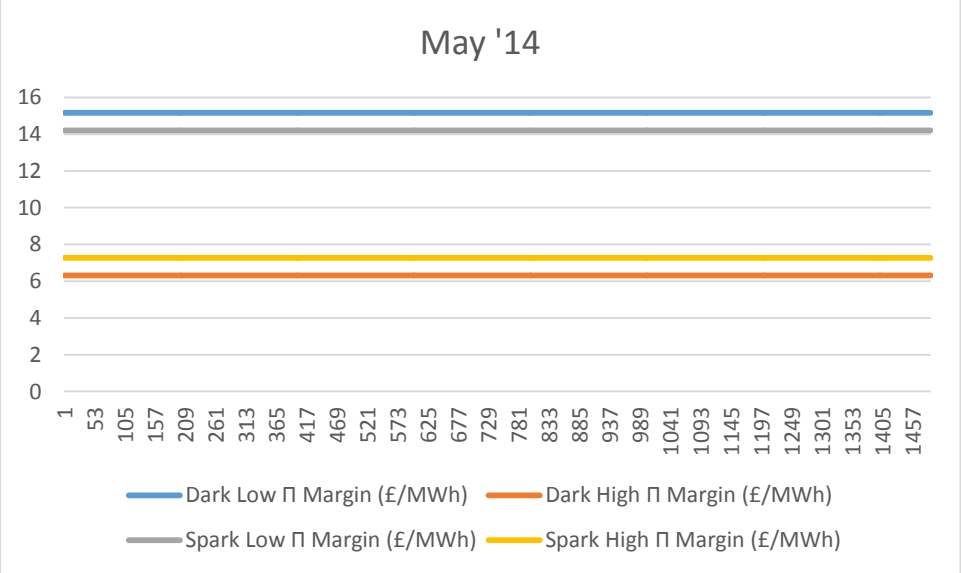


Appendix 3

Each graph in Appendix 3 shows the difference between the proxy marginal cost and the baseload energy price in Aug ’14, Nov ’14, and May ‘15.

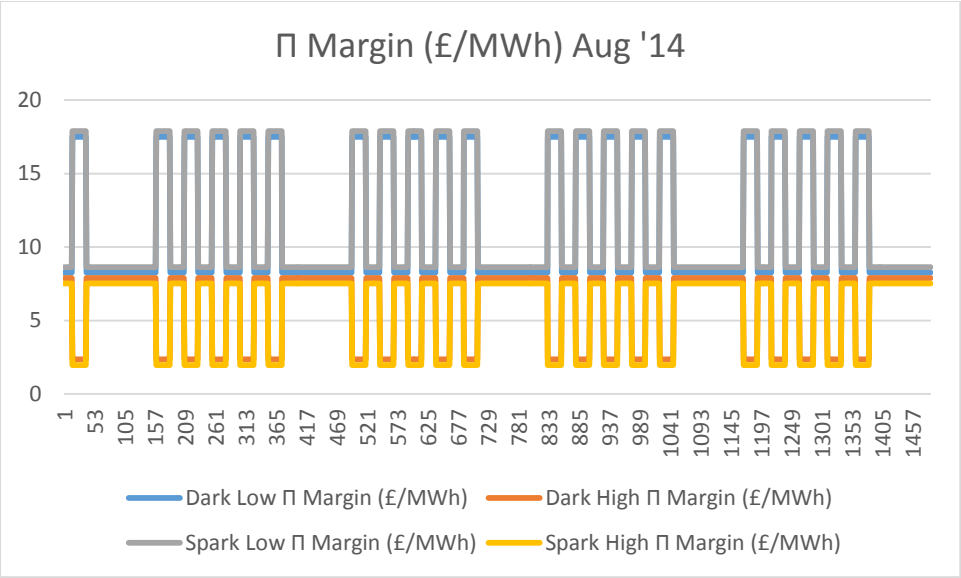

Aug '14
14
12
10
8
6
4
2
0
1
53
105
157
209
261
313
365
417
469
521
573
625
677
729
781
833
885
937
989
1041
1093
1145
1197
1249
1301
1353
1405
1457
Dark Low Π Margin (£/MWh)
Dark High Π Margin (£/MWh)
Spark Low Π Margin (£/MWh)
Spark High Π Margin (£/MWh)

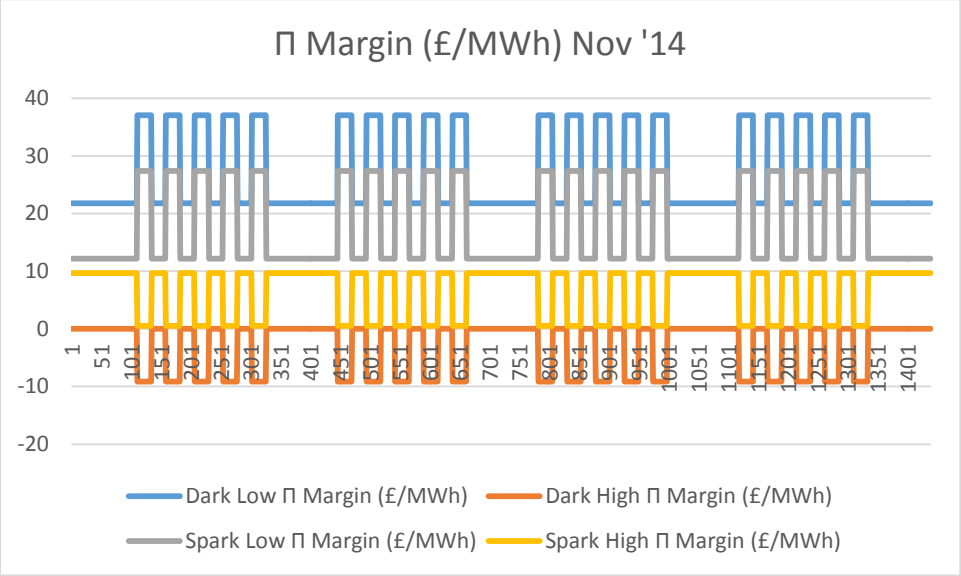

Nov '14
30
25
20
15
10
5
0
-5
1
51
101
151
201
251
301
351
401
451
501
551
601
651
701
751
801
851
901
951
1001
1051
1101
1151
1201
1251
1301
1351
1401
Dark Low Π Margin (£/MWh)
Dark High Π Margin (£/MWh)
Spark Low Π Margin (£/MWh)
Spark High Π Margin (£/MWh)

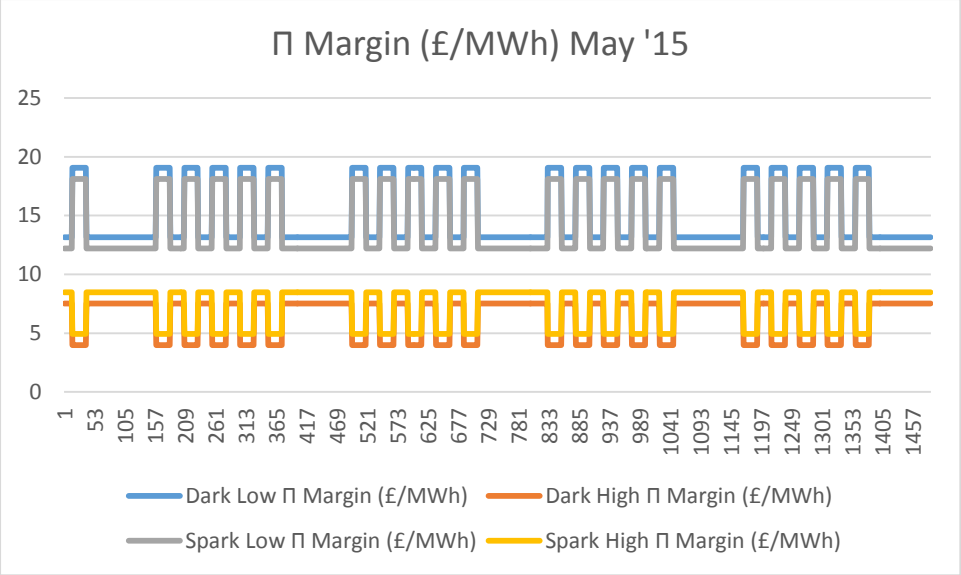

May '14
16
14
12
10
8
6
4
2
0
1
53
105
157
209
261
313
365
417
469
521
573
625
677
729
781
833
885
937
989
1041
1093
1145
1197
1249
1301
1353
1405
1457
Dark Low Π Margin (£/MWh)
Dark High Π Margin (£/MWh)
Spark Low Π Margin (£/MWh)
Spark High Π Margin (£/MWh)

Appendix 4

Each graph in Appendix 4 shows the difference between the proxy marginal cost and the peak/off-peak energy price in Aug ’14, Nov ’14, and May ‘15.

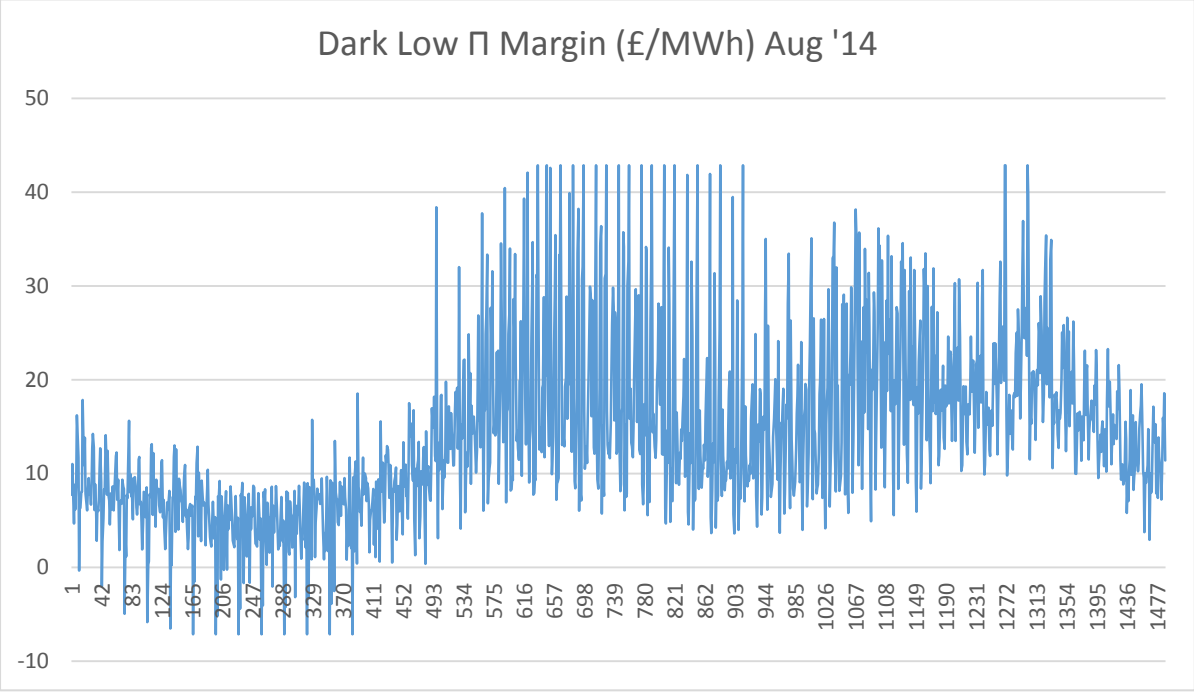


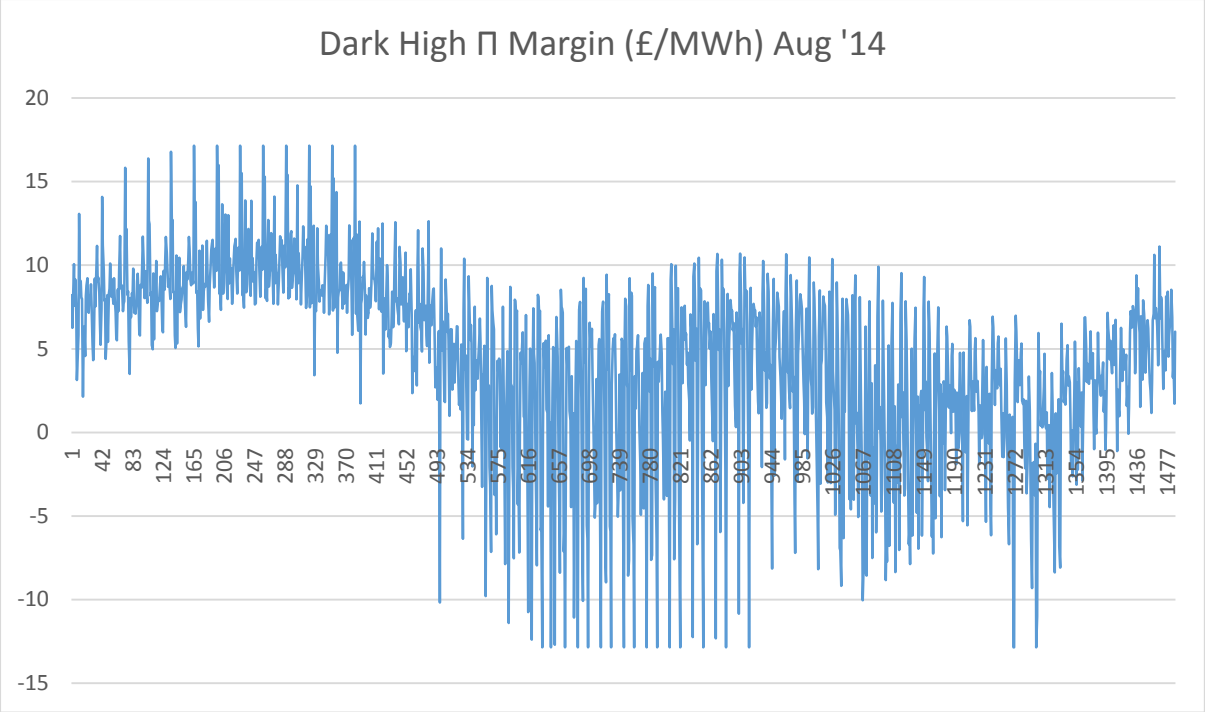


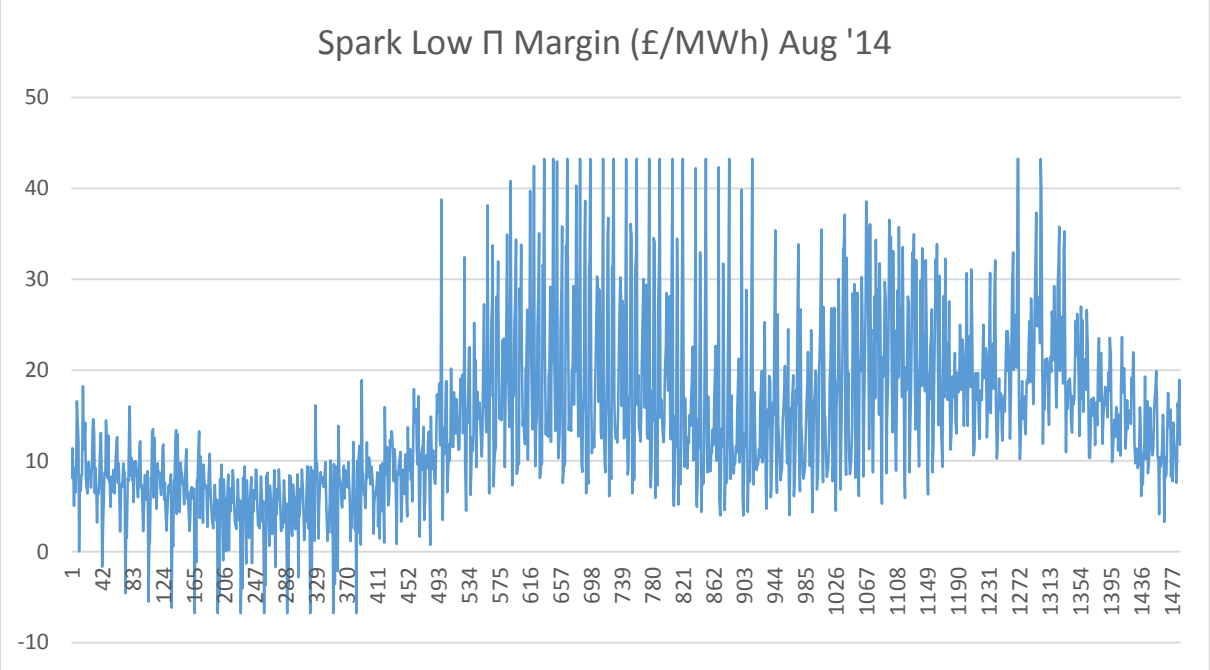


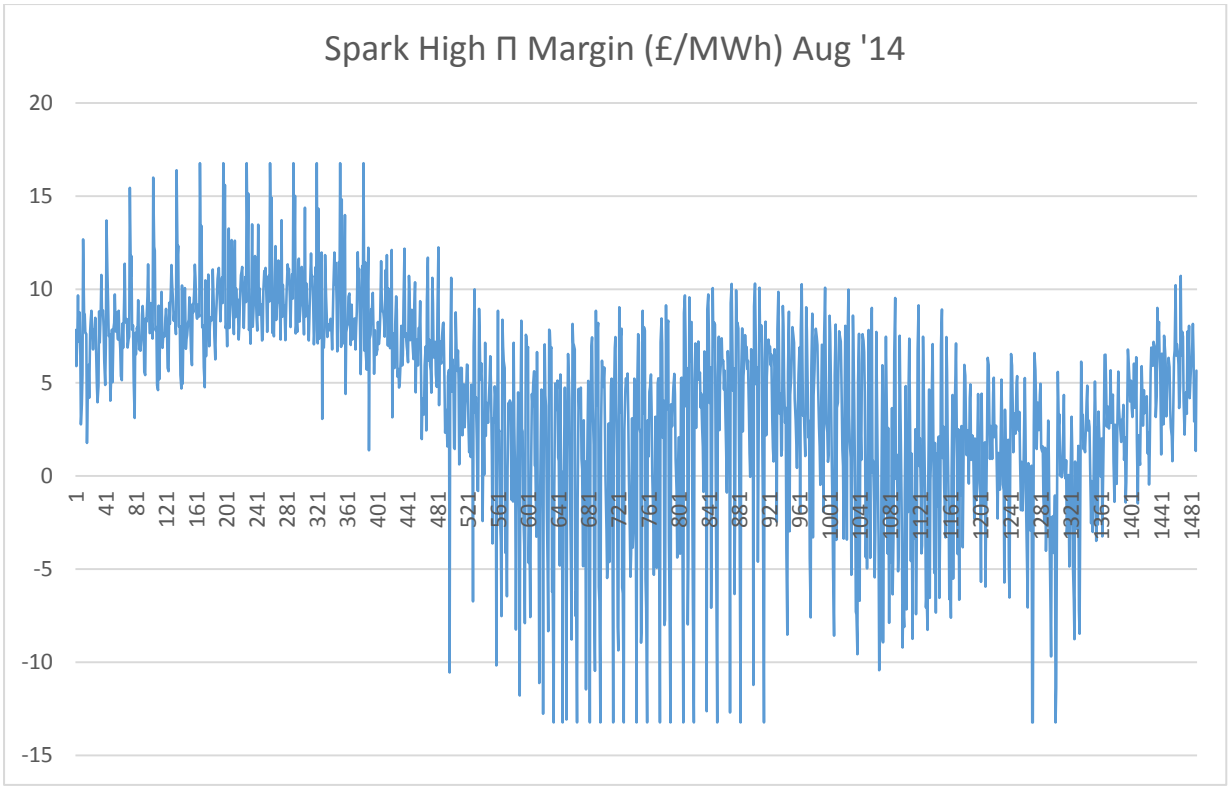
Appendix 5

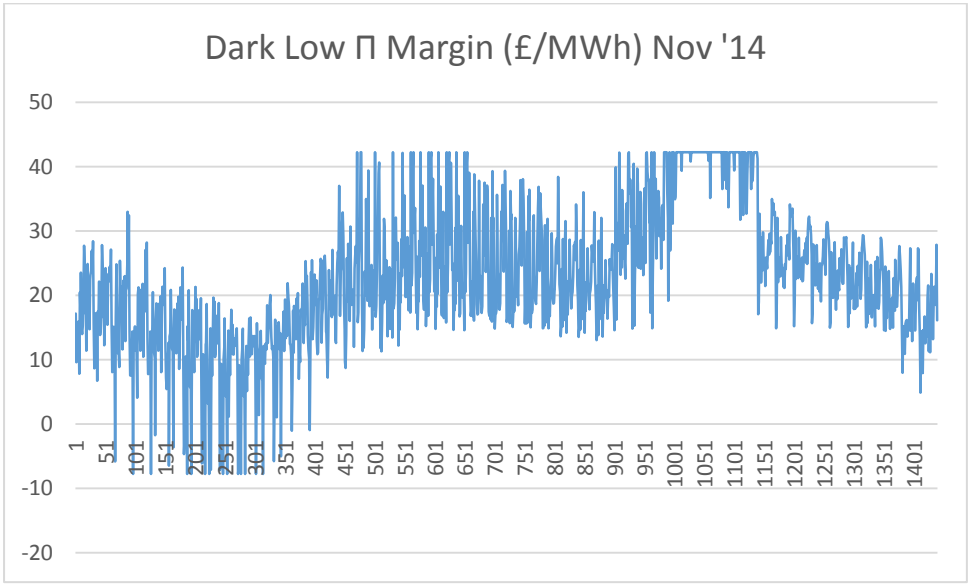
Each graph in Appendix 5 shows the difference between the proxy marginal cost and the REP (MIP multiplied by the high or low FR multiplier) over the averaged day in Aug ’14, Nov ’14, and May ’15 with a cap of £60/MWh and collar of £20/MWh on the MIP.

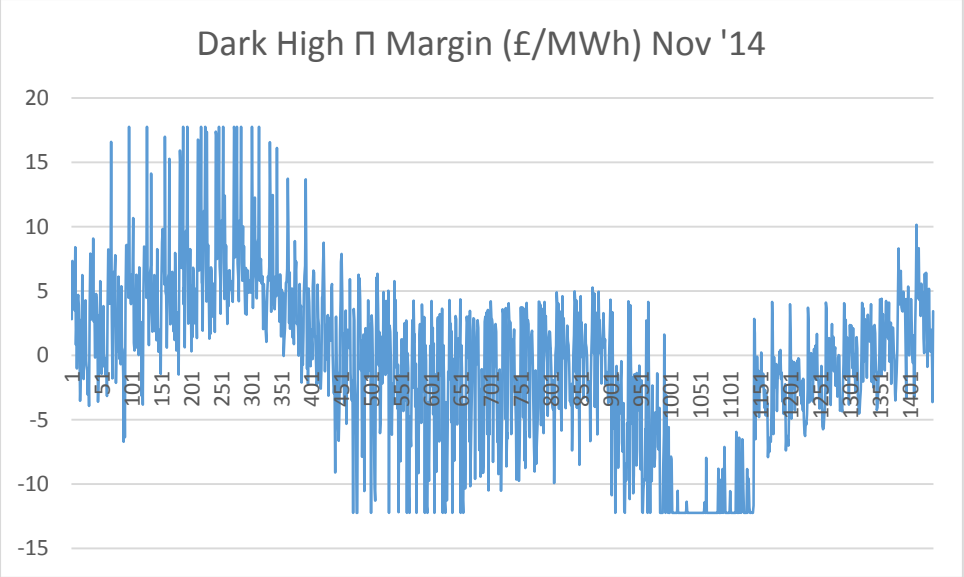


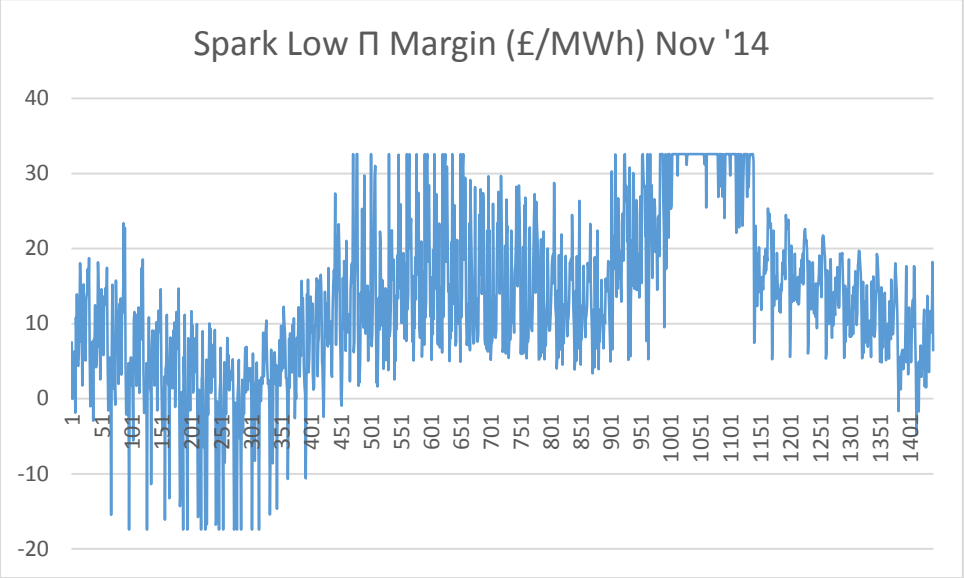

Dark High Π Margin (£/MWh) Aug '14
20
15
10
5
0
-5
-10
-15
1
42
83
124
165
206
247
288
329
370
411
452
493
534
575
616
657
698
739
780
821
862
903
944
985
1026
1067
1108
1149
1190
1231
1272
1313
1354
1395
1436
1477

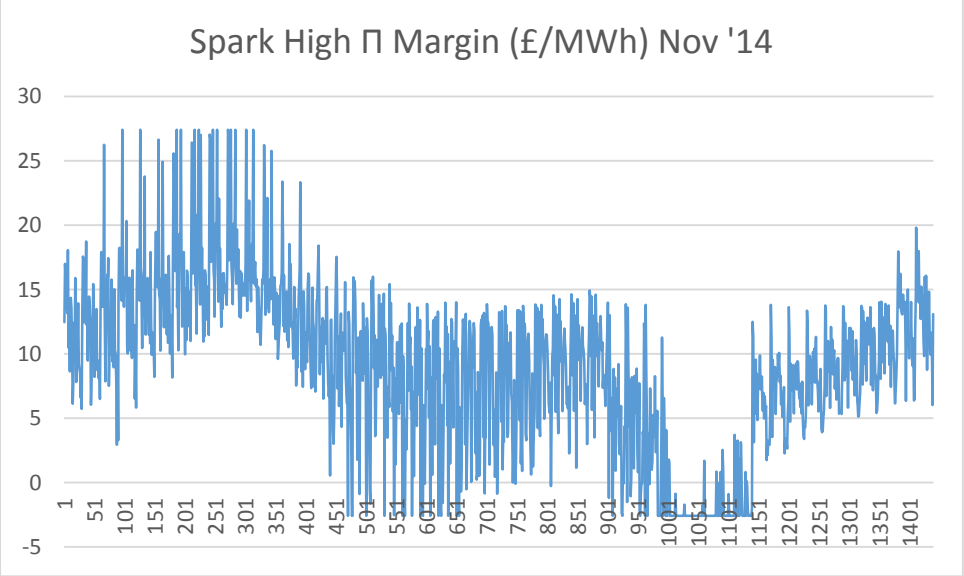

Spark Low Π Margin (£/MWh) Aug '14
50
40
30
20
10
0
-10
1
42
83
124
165
206
247
288
329
370
411
452
493
534
575
616
657
698
739
780
821
862
903
944
985
1026
1067
1108
1149
1190
1231
1272
1313
1354
1395
1436
1477

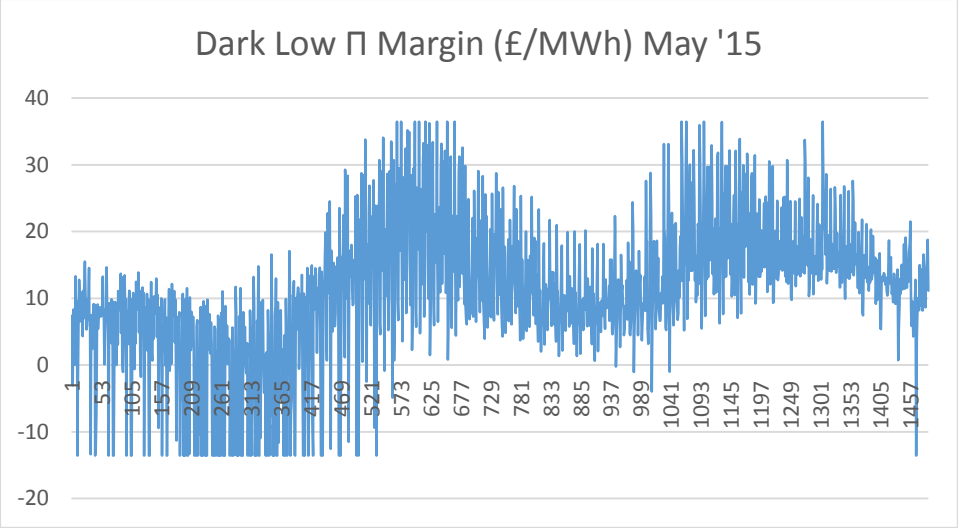

Spark High Π Margin (£/MWh) Aug '14
20
15
10
5
0
-5
-10
-15
1
41
81
121
161
201
241
281
321
361
401
441
481
521
561
601
641
681
721
761
801
841
881
921
961
1001
1041
1081
1121
1161
1201
1241
1281
1321
1361
1401
1441
1481

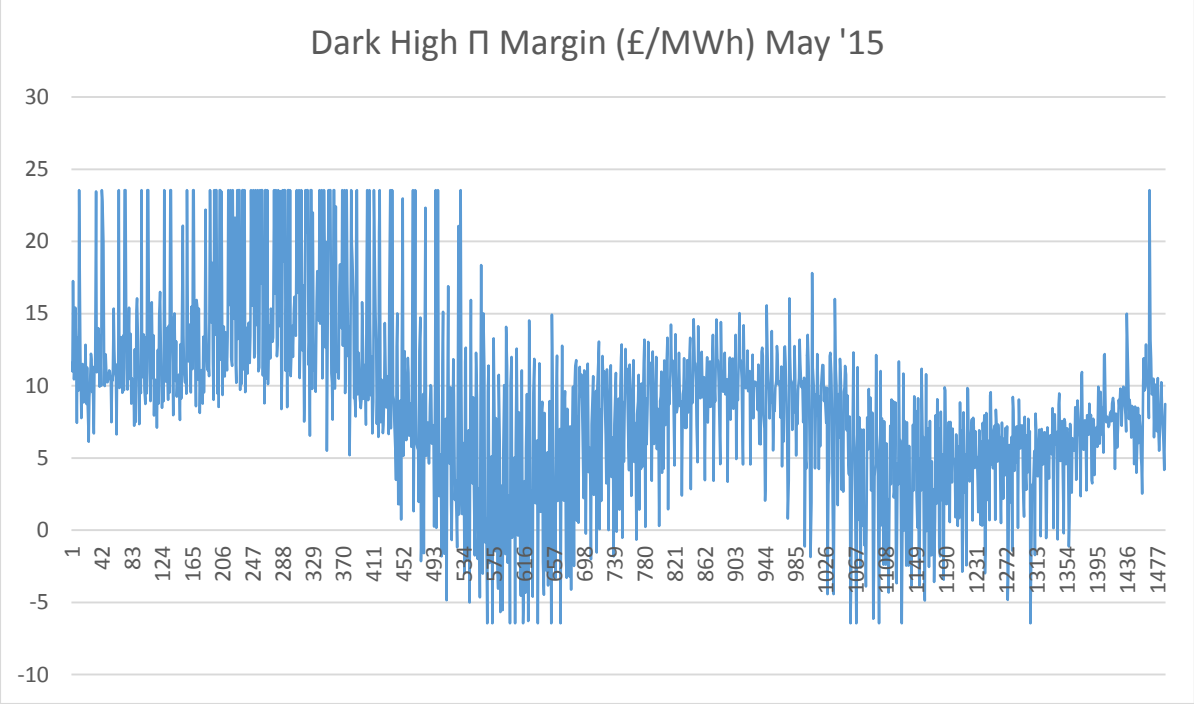

Dark Low Π Margin (£/MWh) Nov '14
50
40
30
20
10
0
-10
-20
1
51
101
151
201
251
301
351
401
451
501
551
601
651
701
751
801
851
901
951
1001
1051
1101
1151
1201
1251
1301
1351
1401


Dark High Π Margin (£/MWh) Nov '14
20
15
10
5
0
-5
-10
-15
1
51
101
151
201
251
301
351
401
451
501
551
601
651
701
751
801
851
901
951
1001
1051
1101
1151
1201
1251
1301
1351
1401


Spark Low Π Margin (£/MWh) Nov '14
40
30
20
10
0
-10
-20
1
51
101
151
201
251
301
351
401
451
501
551
601
651
701
751
801
851
901
951
1001
1051
1101
1151
1201
1251
1301
1351
1401


Spark High Π Margin (£/MWh) Nov '14
30
25
20
15
10
5
0
-5
1
51
101
151
201
251
301
351
401
451
501
551
601
651
701
751
801
851
901
951
1001
1051
1101
1151
1201
1251
1301
1351
1401


Dark Low Π Margin (£/MWh) May '15
40
30
20
10
0
-10
-20
1
53
105
157
209
261
313
365
417
469
521
573
625
677
729
781
833
885
937
989
1041
1093
1145
1197
1249
1301
1353
1405
1457


Dark High Π Margin (£/MWh) May '15
30
25
20
15
10
5
0
-5
-10
1
42
83
124
165
206
247
288
329
370
411
452
493
534
575
616
657
698
739
780
821
862
903
944
985
1026
1067
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1149
1190
1231
1272
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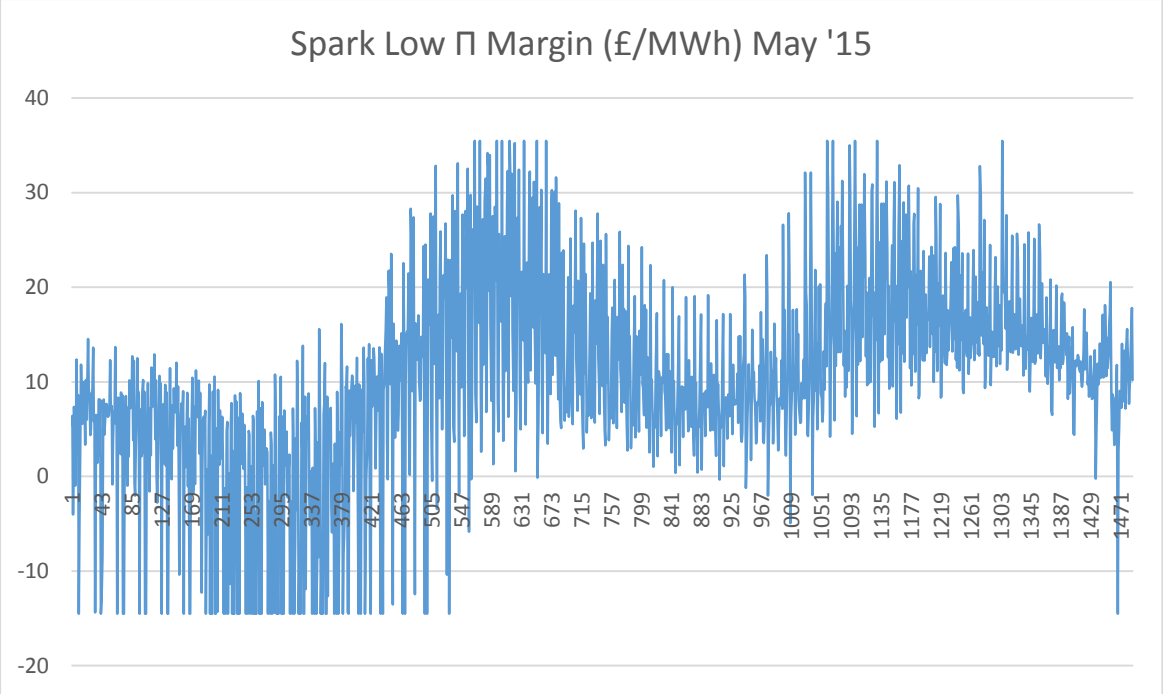
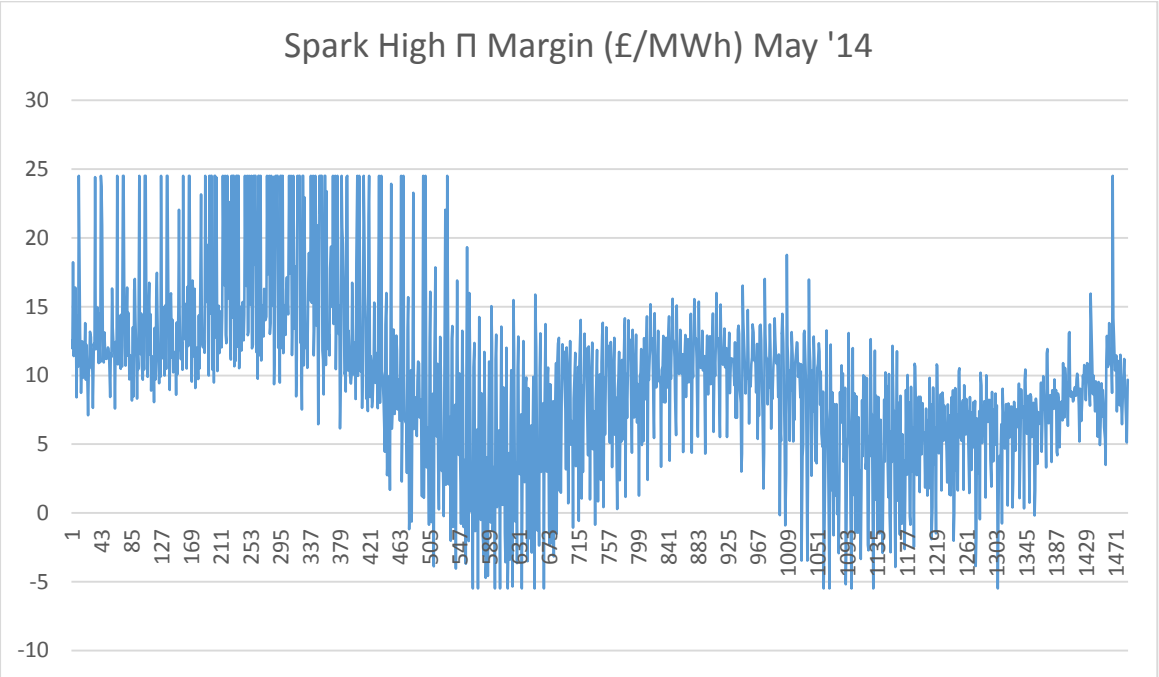
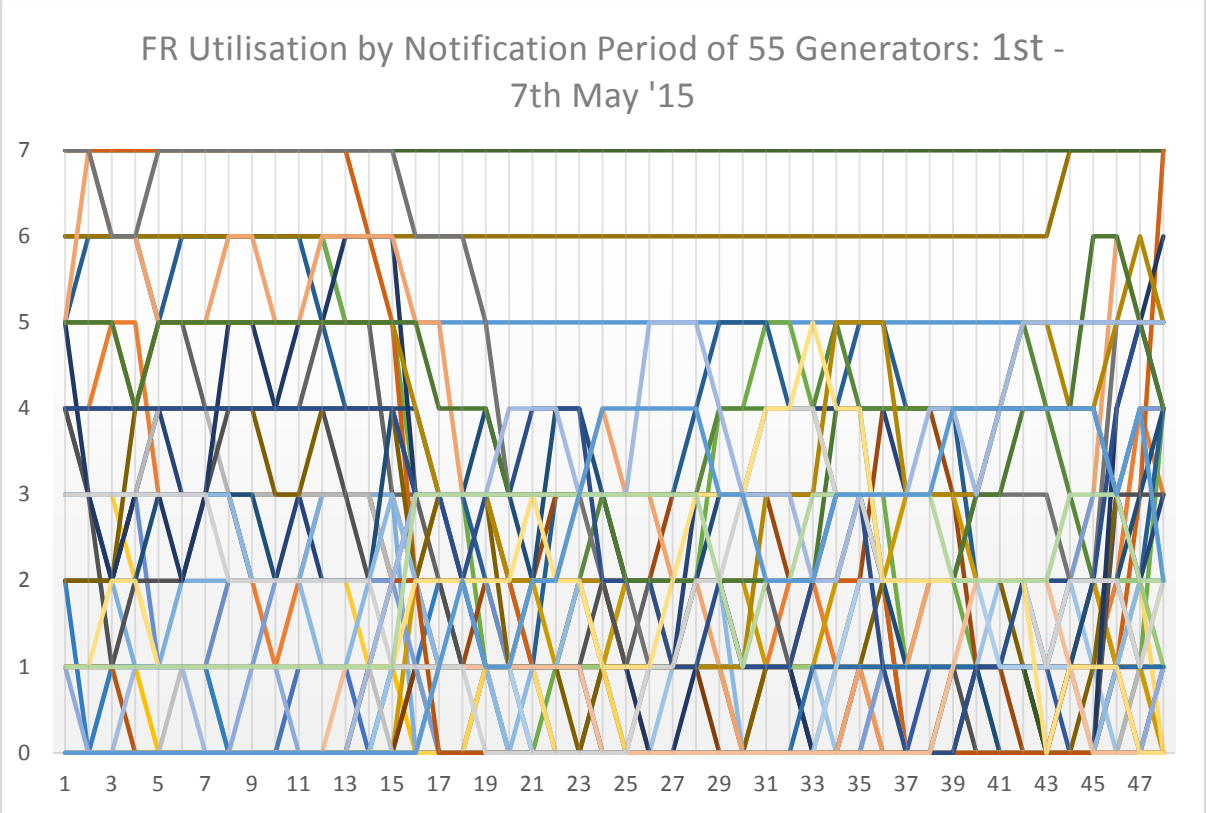
1354
1395
1436
1477

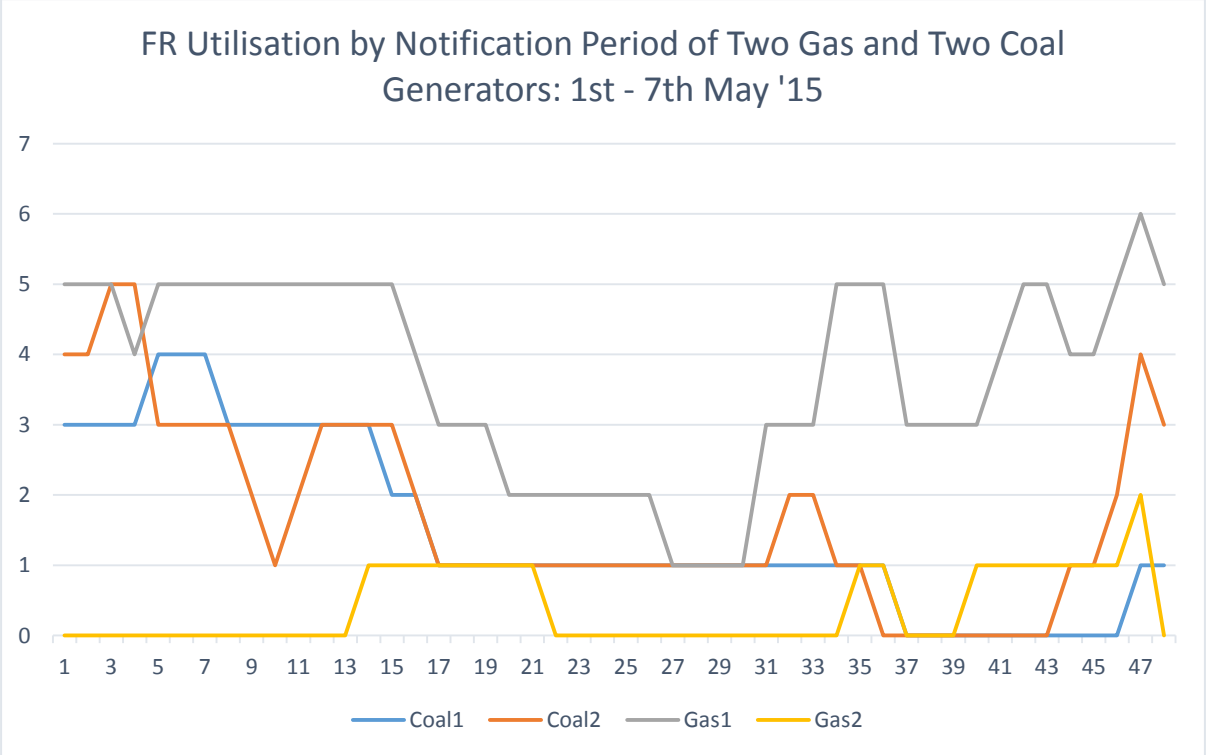




Appendix 6

The graphs below show how often a generator (each line represents a generator) is used in a particular settlement period over a week (i.e. a maximum of 7 times during a week).


FR Utilisation by Notification Period of 55 Generators: 1st - 7th May '15
0
1
2
3
4
5
6
7
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47


FR Utilisation by Notification Period of Two Gas and Two Coal Generators: 1st - 7th May '15
0
1
2
3
4
5
6
7
1 3 5 7 9 11 13 15 17 19 21 23 25 27 29 31 33 35 37 39 41 43 45 47
Coal1
Coal2
Gas1
Gas2

Annex 5 – Workgroup process

CMP243 was proposed by Drax Power Ltd and submitted to the CUSC Modifications Panel (the Panel) for their consideration in May 2015. A copy of this Proposal is provided in Annex 1. The Panel decided to send the Proposal to a Workgroup to be developed and assessed against the CUSC Applicable Objectives. The Workgroup is required to consult on the Proposal during this period to gain views from the wider industry (this Workgroup Consultation). Following this Consultation, the Workgroup will consider any responses, vote on the best solution to the defect and report back to the Panel at the September 2015 Panel meeting.

The Workgroup first met on 3rd July 2015. A copy of the Workgroup Terms of Reference is provided in Annex 2. The Workgroup have considered the issues raised by the CUSC Modification Proposal. As part of their discussions the Workgroup has noted that there are number of potential solutions to the defect CMP243 seeks to address. These potential options for change are highlighted within the Workgroup Alternatives in Section 5 of this document.