Historic Analysis

P305 'Electricity Balancing Significant Code Review Developments'

What stage is this document in the process?

01 Initial Written Assessment

02 Definition Procedure

03 Assessment Procedure

04 Report Phase

Contents

About This Document

This document covers the historic analysis produced by the P305 Workgroup as part of its considerations of P305.

1 ELEXON's Historical Analysis

Executive summary

ELEXON has completed historical analysis that provides insight into the possible effects of P305 'Electricity Balancing Significant Code Review Developments' on imbalance prices and Parties' charges. This analysis was completed at the request of the Workgroup.

Our analysis focuses purely on recalculating imbalance prices and subsequent trading charges. It does not model any form of behavioural change that might be observed, should a change to the imbalance pricing arrangements be implemented.

Because of the sheer volume of output data produced by re-running imbalance calculations, this section contains a summary analysis of the key trends and does not provide a definitive view of all impacts and effects. To allow Parties to complete their own targeted analysis we have made raw data produced by our imbalance model (and used to produce the analysis below) available on the ELEXON Portal.

Key messages

As requested by the Workgroup, our analysis used 20 scenarios, which reflect different aspects of the P305 proposal (see below), to recalculate four years' worth of Settlement Period level imbalance prices and Party charges. The recalculation has used existing historical central data relating to accepted bids and offers, Short Term Operating Reserve (STOR) actions, traded volumes and system margins, and incorporated additional data produced for P305 relating to Loss of Load Probabilities.

Overall impacts on prices

Whilst our analysis recalculated four years' worth of prices and charges, because sufficiently detailed STOR data was only available for 2013, the analysis in this section focuses on the effects observed in 2013.

In summary, we found:

- Maximum Main Price calculated in 2013 was £520.56/MWh – this was produced by scenarios assuming Price Average Reference (PAR) values of 1MWh and 50MWh, and Single Price but excluding Reserve Scarcity (RS) requirements (N.B. including RS requirements would have reduced the price to £496.28/MWh)[1].
    - The highest price calculated in other years was £705.86/MWh[2], assuming PAR 1 and Single Price but excluding RS requirements[3].
- Minimum Main Price calculated in 2013 was -£78/MWh in scenarios covering PAR values of 1MWh, 50MWh and 100MWh, Single Price and including RS requirements[4].

[1] Achieved on 4 November 2013 Settlement Period 35
[2] Achieved on 20 December 2010, Settlement Period 39
[3] An equivalent price including RSP requirements is not available as sufficiently detailed STOR action details were not available for periods other than during 2013
[4] Achieved on 31 August 2013 Settlement Periods 30 and 31, 6 October 2013 Settlement Period 28, 24 October 2013 Settlement Period 3 and 4, and 27 October 2013 Settlement Period 12

- The lowest price calculated in other years was -£250/MWh[5], assuming PAR 1, Single Price but excluding RS requirements.

- Reducing PAR – consistently increases the System Buy Price (SBP) and reduces the System Sell Price (SSP), therefore widening the gap from Market Price. There also appears to be a more significant effect on prices of reducing PAR from 250 to 100. Lower PAR values also increase the occurrence of negative prices.

- Replacing Dual Prices with a Single Price – causes considerably more Reverse Price SBPs to be re-priced at SSP (than SSPs re-priced at SBP). However, the spread between extreme SBP and SSP Single Main Prices would be greater under P305 than the current spread between SBPs and SSPs with Market Price, which may have a detrimental effect on parties.

- Including Reserve Scarcity – re-pricing STOR actions to the Reserve Scarcity Price (RSP) occurred infrequently and had little impact on Main Prices. However, inclusion of non-BM STOR actions and revised Buy Price Adjusters both increased in certain periods and reduced prices in other periods.

Overall impacts on Parties

In summary we found that:

- Replacing Dual Prices with a Single Price – improved all parties Imbalance Cash Flow positions. This may be because Parties are exposed to a more frequent and lower SSP Main Price on average.

- Reducing PAR – increases SBP and reduces SSP. Consequently improved Imbalance Cash Flow positions under a single price tended to diminish as PAR reduced.

- Net Positions – under P305 single price arrangements, Independent Suppliers and Independent Thermal generators are better off in all quarters and all PAR values. This is because imbalance charges are lower (and Residual Cashflow Reallocation Cashflow (RCRC) ends up as payments to Parties due to lower imbalance charges). Whereas Vertically Integrated parties are worse off from much higher payments for RCRC (due to large metered positions used in the RCRC calculation), even though they benefit from decreased imbalance charges.

  Under the current dual price arrangements (with decreasing values of PAR), Vertically Integrated parties' net positions are better than under single price arrangements, because whilst their imbalance cash flows grow as PAR is reduced, the size of RCRC payments they receive increases faster.

Workgroup requirements

As part of the assessment of P305, ELEXON recalculated imbalance prices and participants' historical imbalance charges between 15 February 2010 and 17 May 2014 using the different parameters and requirements being considered as part of the P305 Modification Proposal. This work has been completed at the request of the P305 Workgroup and has aimed to reproduce analysis similar to that requested as part of the development of P304 'Reduction in PAR from 500MWh to 250MWh'.

[5] Achieved on 23 September 2011, Settlement Period 44

Whilst Ofgem produced a large body of analysis to support its EBSCR Final Decision, the P305 Workgroup considered that additional analysis was necessary to better understand the effects of the specific solution (and solution options) over time and on different parties. In general the purpose of the analysis is to provide greater insight into the potential effects of the developing P305 solution by recalculating historical imbalance prices and the subsequent impacts on parties' imbalance charges/positions according to twenty scenarios that reflect the different aspects and options of the modification proposal.

The use of twenty scenarios is in response to the Workgroup's requests that (i) different values of PAR should be analysed and (ii) the different core elements of the P305 proposal should be incrementally incorporated (i.e. prices and impacts should be calculated for P305 Area A only, reduction in PAR; then Areas A+B, reduction in PAR and Single Price; then Areas A+B+C etc). Further details of the scenarios and associated assumptions are described below.

Analysis: approach, scenarios and assumptions

ELEXON's analysis has been compiled by producing a model that enables the recalculation of imbalance prices and Party charges assuming different P305 scenarios. This model is populated with historical data covering activity between 15 February 2010 and 17 May 2014.

In order to satisfy the Workgroup's requirements, 20 scenarios were defined and modelled. Each scenario relates to an 'area' of the P305 proposal, as described in the Requirements (see Section 6 of the P305 Detailed Assessment, Attachment A to the P305 Assessment Procedure Consultation):

- Area A - the introduction of a reduced value of PAR;
- Area B - replaces the dual price approach with a single price;
- Area C - incorporates a value of Reserve Scarcity into the calculation of imbalance prices; and
- Area D - adds the cost of involuntary demand disconnection into the calculation of imbalance prices.

The detailed assumptions for each scenario are set out in the table below.

It is important to note that the scenarios simply reflect proposed changes in the method for calculating imbalance charges. ELEXON's analysis assumes that the behaviour of participants remained unchanged. Therefore participants' imbalance volumes will not have changed as a consequence of changes in expectation or price brought about by the proposed P305 proposal.

Table 1

P305 Scenarios				
Scenario	Area(s)	PAR	Single/Dual Price?	BPA/SPA covers STOR?
01	A	350MWh	Dual	Yes
02	A	250MWh	Dual	Yes
03	A	100MWh	Dual	Yes
04	A	50MWh	Dual	Yes
05	A	1MWh	Dual	Yes
06	A+B	350MWh	Single	Yes
07	A+B	250MWh	Single	Yes
08	A+B	100MWh	Single	Yes
09	A+B	50MWh	Single	Yes
10	A+B	1MWh	Single	Yes
11	A+B+C	350MWh	Single	No
12	A+B+C	250MWh	Single	No
13	A+B+C	100MWh	Single	No
14	A+B+C	50MWh	Single	No
15	A+B+C	1MWh	Single	No
16	A+B+C+D	350MWh	Single	No
17	A+B+C+D	250MWh	Single	No
18	A+B+C+D	100MWh	Single	No
19	A+B+C+D	50MWh	Single	No
20	A+B+C+D	1MWh	Single	No

In all cases, the Replacement PAR (RPAR) value has been set to 1MWh, the Value of Lost Load (VoLL) value has been set to £3,000/MWh, the Continual Acceptance Duration Limit (CADL) remains at 15 minutes, the De Minimis Acceptance Threshold (DMAT) remains at 1MWh and Market Index Data has been used to calculate the imbalance price where the Net Imbalance Volume (NIV) equals zero.

Please note that because no Settlement Period between February 2010 and May 2014 was impacted by a Demand Disconnection event. Consequently we have not modelled the scenarios that cover the application of Area D and so there are no specific results or analysis presented in this document.

Also note that whilst our analysis recalculated four years' worth of prices and charges, because sufficiently detailed STOR data was only available for the period 1 January 2013 to 4 November 2013, the analysis in this appendix focuses on the price effects observed in 2013 only.

Method

For each scenario, the following calculations were performed.

- The price calculation engine calculates the SBPs/SSPs using the required values of PAR and RPAR, and the current values of DMIN and CADL. It also records which was the main price, which is used for the "Single" price scenarios.
- The calculated prices were compared against the prices using the live acceptances and the values of PAR and RPAR to calculate a "change" or "delta" value between the scenario and the live scenario for System Buy Price and System Sell Price.
- For each Party Account, the Account Energy Imbalance volume was multiplied by the appropriate System Price Delta (either "Buy or "Sell, depending upon whether the Account was long or short in the Settlement Period).
- The total RCRC "pot" was calculated by summing the Account Imbalance Cashflow deltas for the date and period, and this is multiplied by (-1) and by the Account RCRP to calculate the RCRC delta for the Account in the Settlement Period.

References

Throughout this analysis the following non-BSC terms may be referred to:

- Live – refers to scenarios that are based on historical Bid-Offer Acceptance (BOA) details, already used in the calculation of imbalance prices.
- RSP – in the context of analysis illustrating the effects of a scenario, refers to the use of historical BOA details and additional details relating to non-BM STOR actions, Loss of Load Probabilities, adjusted BPAs and may also replace STOR utilisation prices with Reserve Scarcity Prices
- Single – in the context of analysis illustrating the effects of a scenario, refers to imbalance prices calculated assuming the proposed Single Price methodology
- Twin - in the context of analysis illustrating the effects of a scenario, refers to imbalance prices calculated assuming the existing Dual Price methodology
- Area(s) – typically refers to one or more of the four core elements of the P305 proposal

Effects on prices

This sub-section summarises the key impacts on imbalance prices caused by the application of the P305 scenarios described above. We have concentrated our analysis on highlighting the key trends rather than providing a detailed review of the effect of all scenarios.

Please note that at the time of re-running our model we were only able to use details of STOR actions for 2013 to produce the analysis in this consultation document, we have limited the following analysis to illustrate the effects on 2013 prices only. This is to enable unbiased comparison of the effects of P305 on prices with and without Area C (i.e. re-pricing STOR actions using RSP).

Reducing PAR

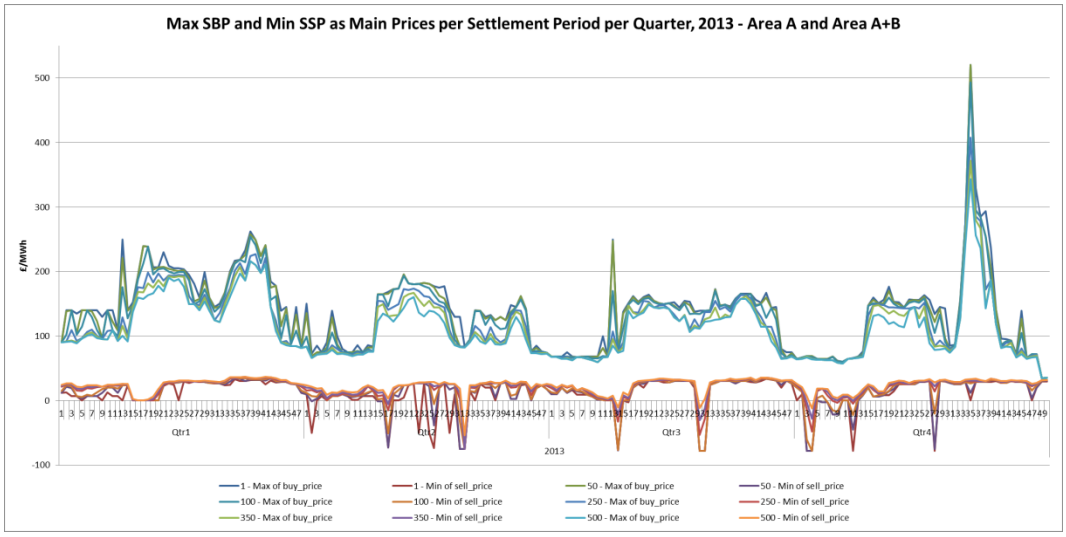
In general reducing the value of PAR had the effect of accentuating the calculation of Main Prices in two respects: reducing PAR meant i) prices were typically higher and ii) there was a wider range in prices.

Maximum, minimum and average prices

Figures 1 to 3 illustrate the range of prices generated by reducing values of PAR. Under P305 historical imbalance prices could have been as high as £705.86/MWh[6] and as low as -£250/MWh[7]. In both examples PAR was 1MWh and the RSP requirements had not been applied.

In 2013, reducing PAR from 350MWh to 1MWh resulted in average single Main Prices increasing by ~£2/MWh, average SBP Main Prices increasing by £8.5/MWh and average SSP Main Prices decreasing by £-1.87/MWh. Furthermore, reducing PAR 350 to PAR 1 lead to an increase in the maximum single and SBP Main Prices of £148.50/MWh, and a decrease in minimum SSP Main Prices of ~£-2/MWh.

Figure 1



In most cases, the calculation of prices caused by reduced levels of PAR can be explained by the fact that a smaller PAR results in a fewer number of BOAs with lower variation in price being included in the calculation of the Main Price. Consequently Main Prices calculated with a smaller PAR are more sensitive to individual large positive or negative actions (in terms of volume or price).

[6] 20 December 2010, Settlement Period 39
[7] 23 September 2011, Settlement Period 44

Figure 2

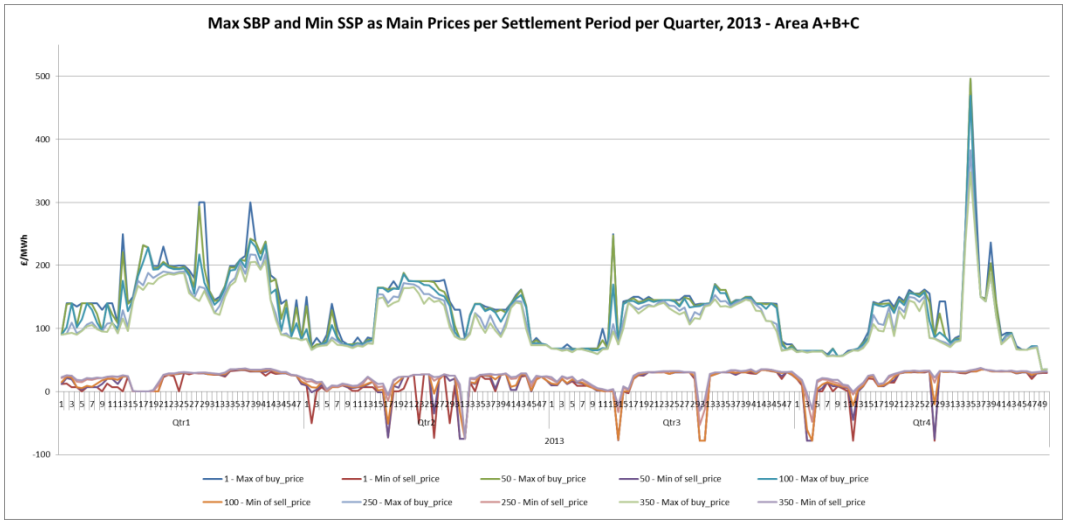
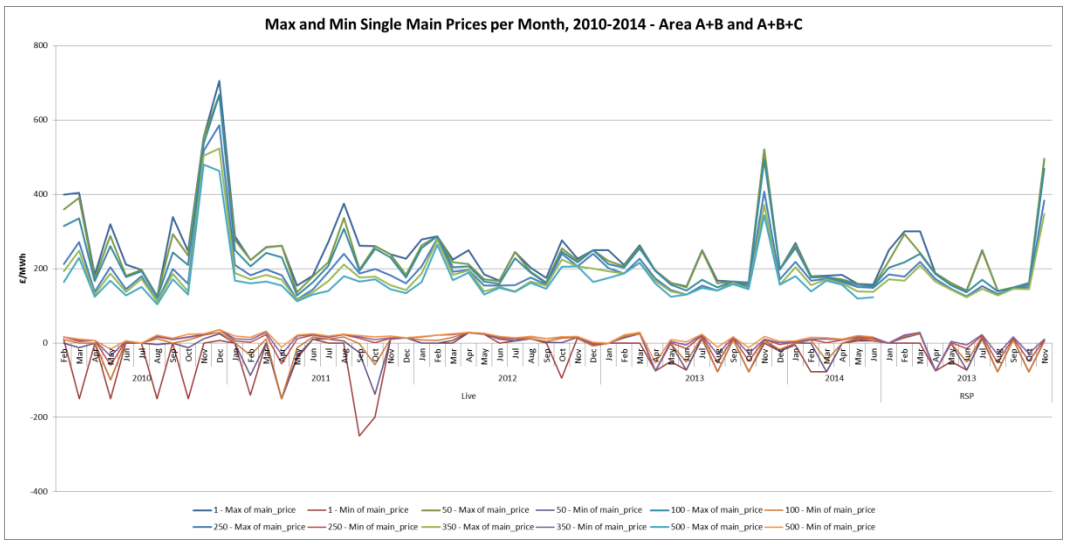


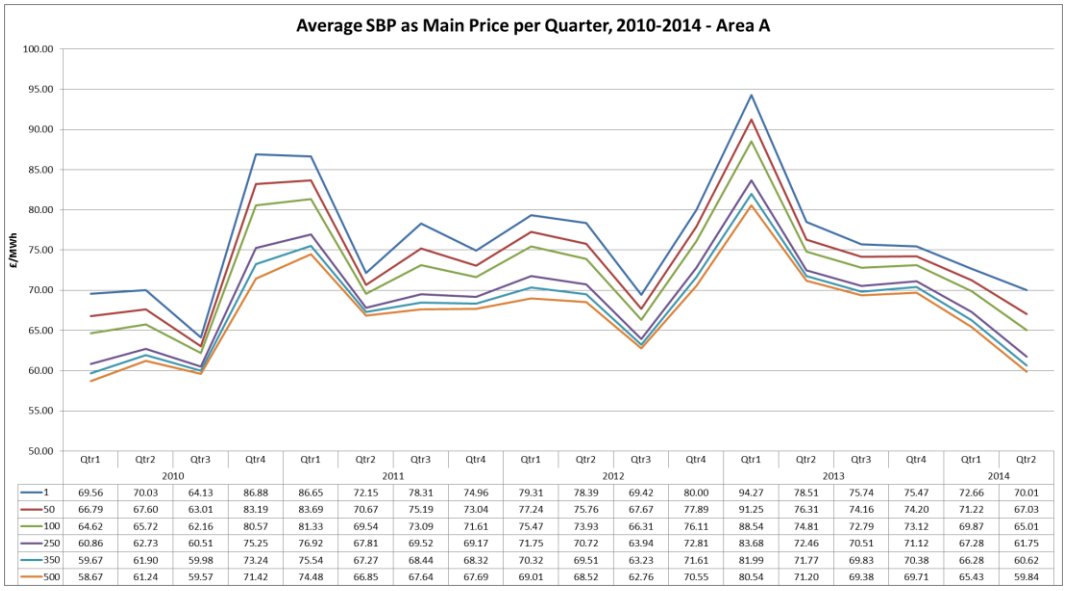
Figure 3



The change in price from one value of PAR to another appears to show that in a number of instances the reduction from PAR 250 to 100 results in a typically higher increase in prices than any other step change in PAR. This is most noticeable in Figure 4 below which demonstrates that that the average SBP per quarter between 2010 and 2014 shows a noticeable non-linear gap between prices set using PAR 250 and 100 compared to any other PAR, including 500. Figures 8, 10 and 11 also show that this tends to be most noticeable during the morning peak and evening peak hours during quarters 1 and 4, and in some cases the differences between PAR 350 and 250, and between PAR100 and 1 are very small by comparison.

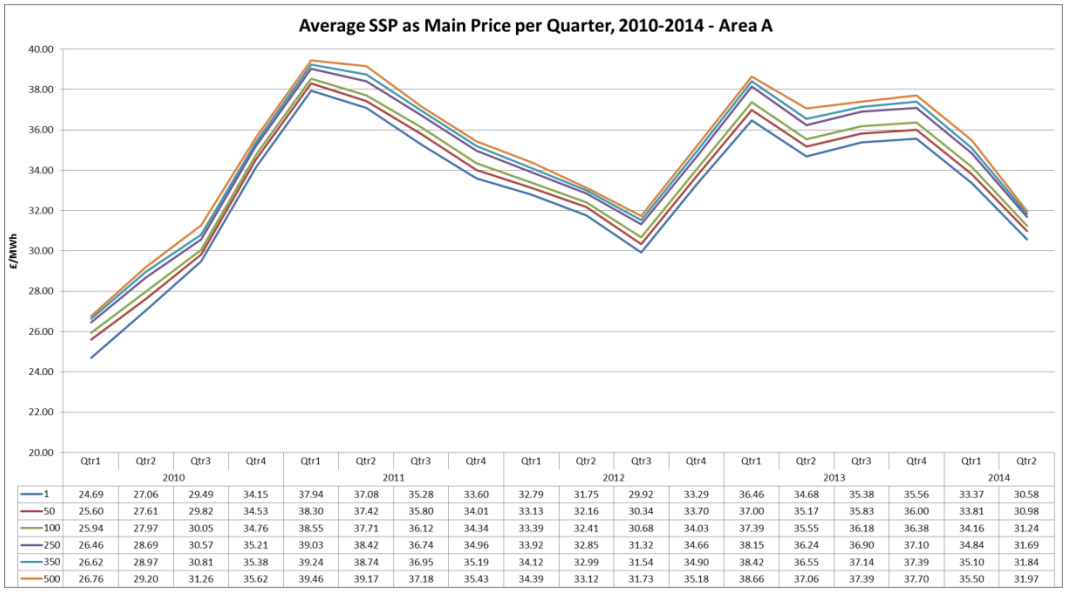
The gap between PAR 250 and PAR 100 prices may be explained by the fact that the average stack size of NIV-tagged BOAs is 296.61MW, with a standard deviation of 233.74MW. Therefore the likelihood of PAR tagging excluding BOAs increases if PAR is set lower than the average stack volume.

Figure 4



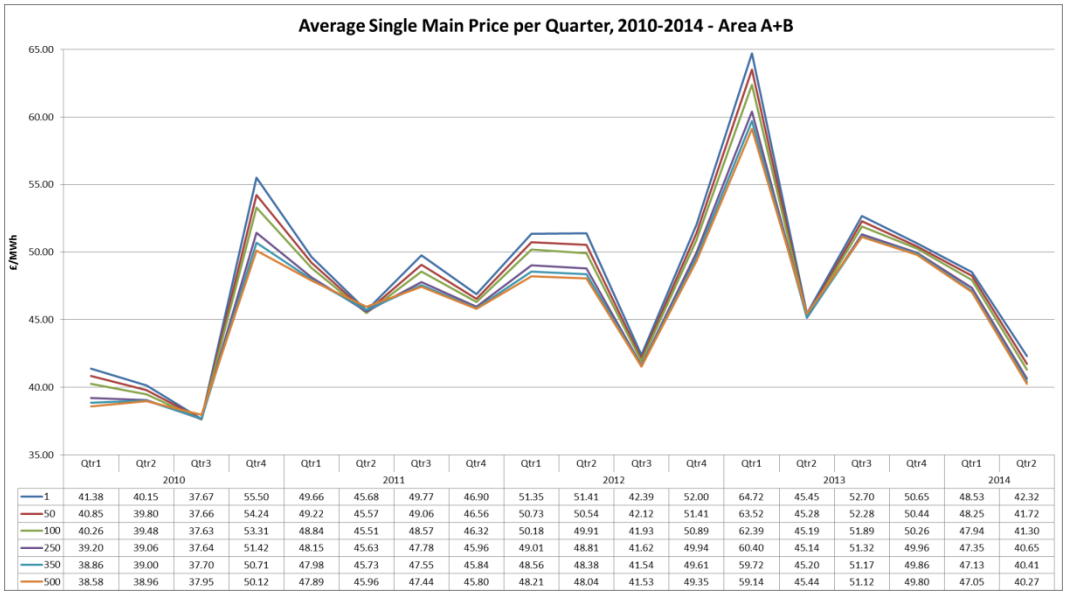
	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2
	2010				2011				2012				2013				2014	
1	69.56	70.03	64.13	86.88	86.65	72.15	78.31	74.96	79.31	78.39	69.42	80.00	94.27	78.51	75.74	75.47	72.66	70.01
50	66.79	67.60	63.01	83.19	83.69	70.67	75.19	73.04	77.24	75.76	67.67	77.89	91.25	76.31	74.16	74.20	71.22	67.03
100	64.62	65.72	62.16	80.57	81.33	69.54	73.09	71.61	75.47	73.93	66.31	76.11	88.54	74.81	72.79	73.12	69.87	65.01
250	60.86	62.73	60.51	75.25	76.92	67.81	69.52	69.17	71.75	70.72	63.94	72.81	83.68	72.46	70.51	71.12	67.28	61.75
350	59.67	61.90	59.98	73.24	75.54	67.27	68.44	68.32	70.32	69.51	63.23	71.61	81.99	71.77	69.83	70.38	66.28	60.62
500	58.67	61.24	59.57	71.42	74.48	66.85	67.64	67.69	69.01	68.52	62.76	70.55	80.54	71.20	69.38	69.71	65.43	59.84

Figure 5



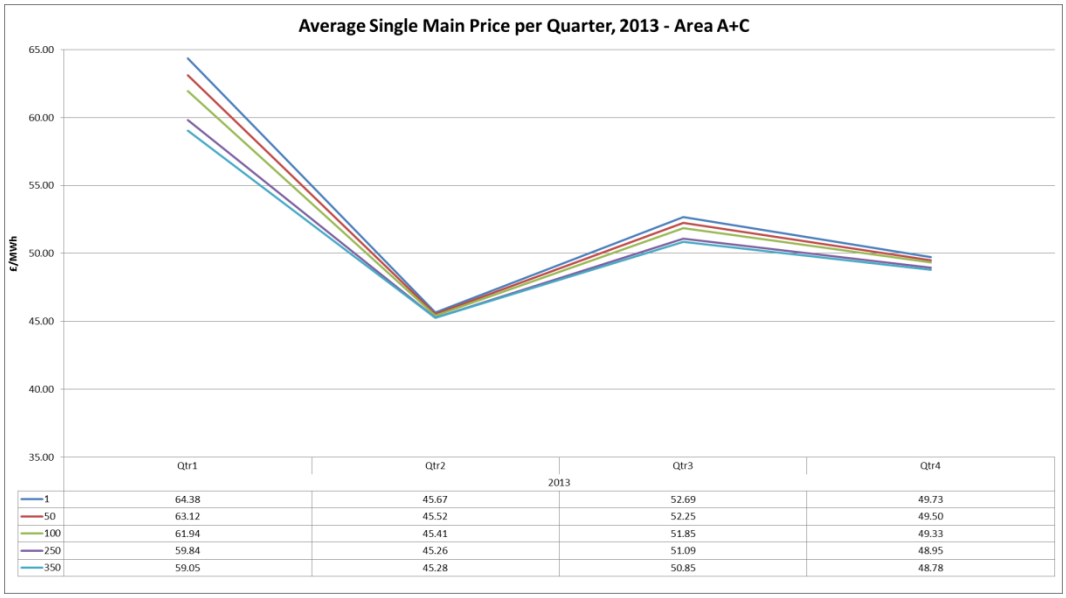
	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2
	2010				2011				2012				2013				2014	
1	24.69	27.06	29.49	34.15	37.94	37.08	35.28	33.60	32.79	31.75	29.92	33.29	36.46	34.68	35.38	35.56	33.37	30.58
50	25.60	27.61	29.82	34.53	38.30	37.42	35.80	34.01	33.13	32.16	30.34	33.70	37.00	35.17	35.83	36.00	33.81	30.98
100	25.94	27.97	30.05	34.76	38.55	37.71	36.12	34.34	33.39	32.41	30.68	34.03	37.39	35.55	36.18	36.38	34.16	31.24
250	26.46	28.69	30.57	35.21	39.03	38.42	36.74	34.96	33.92	32.85	31.32	34.66	38.15	36.24	36.90	37.10	34.84	31.69
350	26.62	28.97	30.81	35.38	39.24	38.74	36.95	35.19	34.12	32.99	31.54	34.90	38.42	36.55	37.14	37.39	35.10	31.84
500	26.76	29.20	31.26	35.62	39.46	39.17	37.18	35.43	34.39	33.12	31.73	35.18	38.66	37.06	37.39	37.70	35.50	31.97

Figure 6



	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2	Qtr3	Qtr4	Qtr1	Qtr2
	2010				2011				2012				2013				2014	
1	41.38	40.15	37.67	55.50	49.66	45.68	49.77	46.90	51.35	51.41	42.39	52.00	64.72	45.45	52.70	50.65	48.53	42.32
50	40.85	39.80	37.66	54.24	49.22	45.57	49.06	46.56	50.73	50.54	42.12	51.41	63.52	45.28	52.28	50.44	48.25	41.72
100	40.26	39.48	37.63	53.31	48.84	45.51	48.57	46.32	50.18	49.91	41.93	50.89	62.39	45.19	51.89	50.26	47.94	41.30
250	39.20	39.06	37.64	51.42	48.15	45.63	47.78	45.96	49.01	48.81	41.62	49.94	60.40	45.14	51.32	49.96	47.35	40.65
350	38.86	39.00	37.70	50.71	47.98	45.73	47.55	45.84	48.56	48.38	41.54	49.61	59.72	45.20	51.17	49.86	47.13	40.41
500	38.58	38.96	37.95	50.12	47.89	45.96	47.44	45.80	48.21	48.04	41.53	49.35	59.14	45.44	51.12	49.80	47.05	40.27

Figure 7



	Qtr1	Qtr2	Qtr3	Qtr4
	2013			
1	64.38	45.67	52.69	49.73
50	63.12	45.52	52.25	49.50
100	61.94	45.41	51.85	49.33
250	59.84	45.26	51.09	48.95
350	59.05	45.28	50.85	48.78

Figure 8

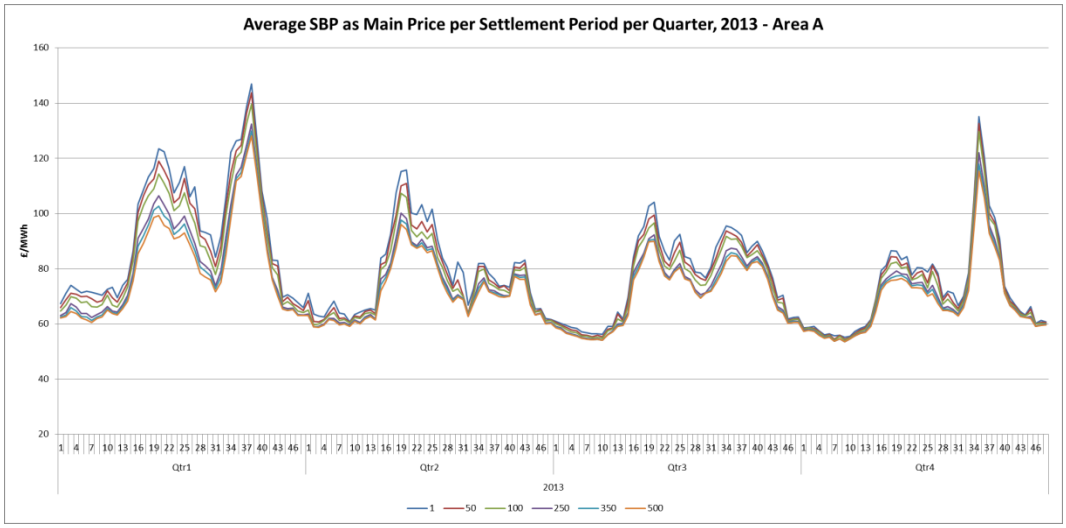


Figure 9

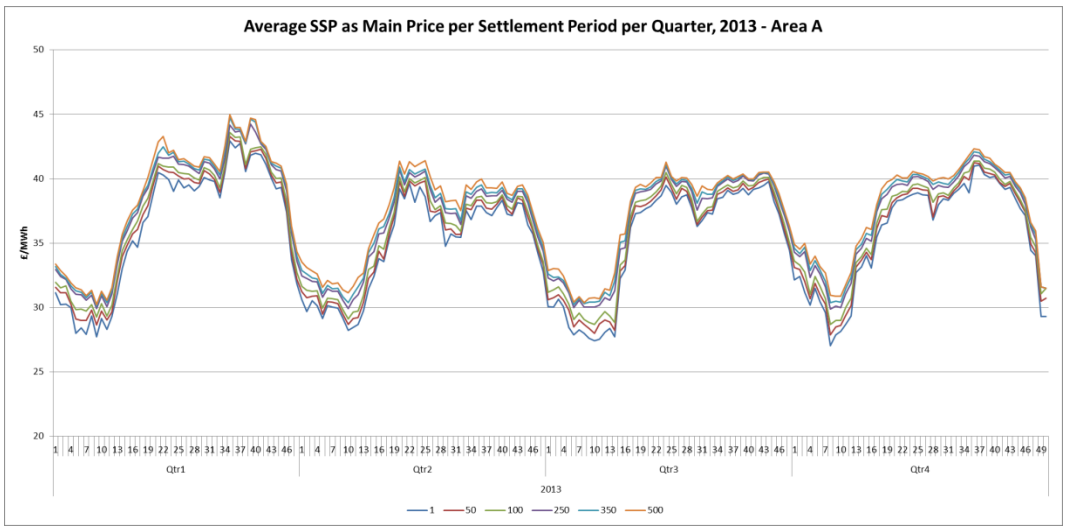


Figure 10

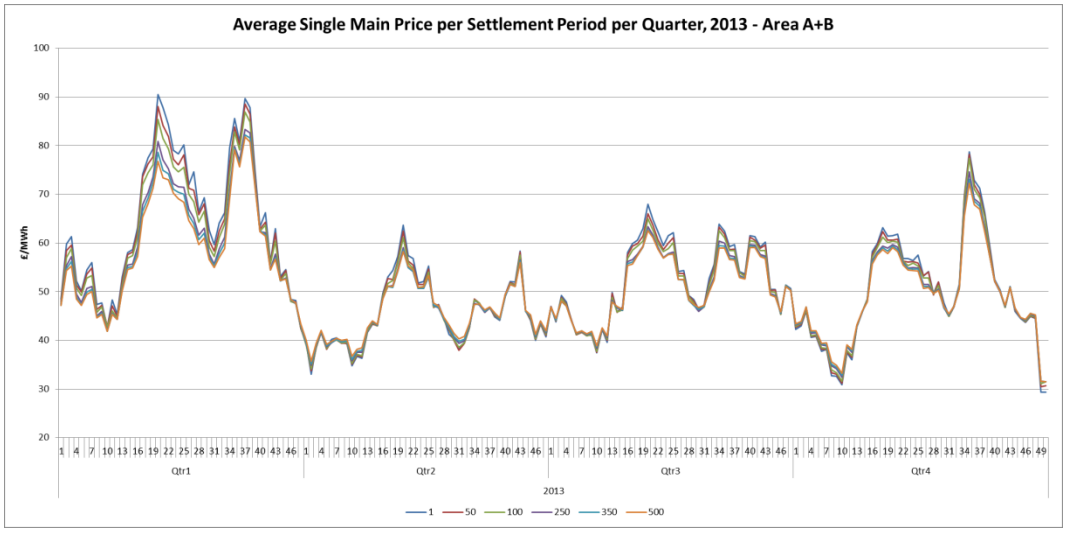
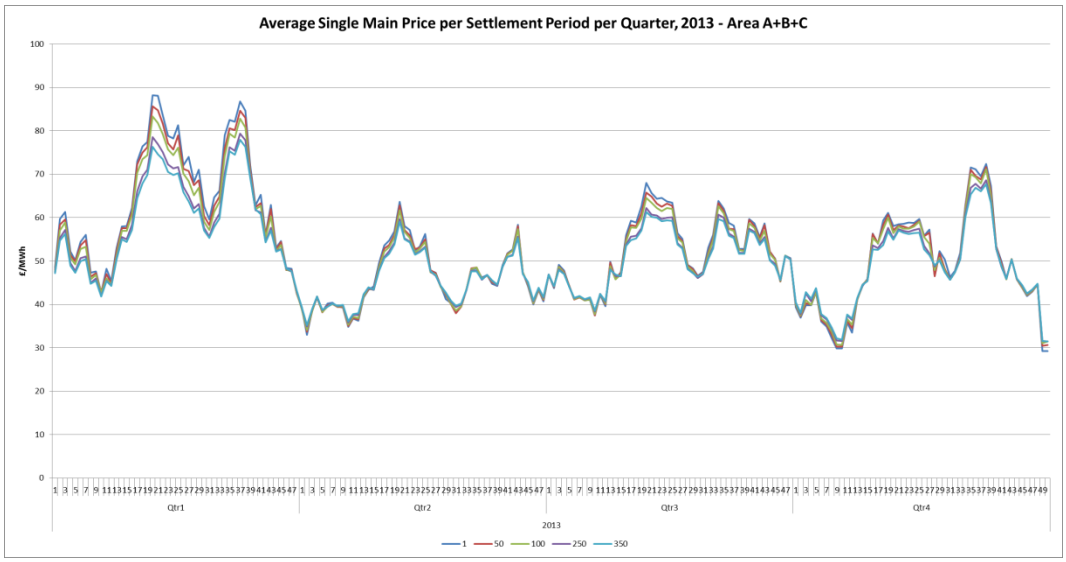


Figure 11



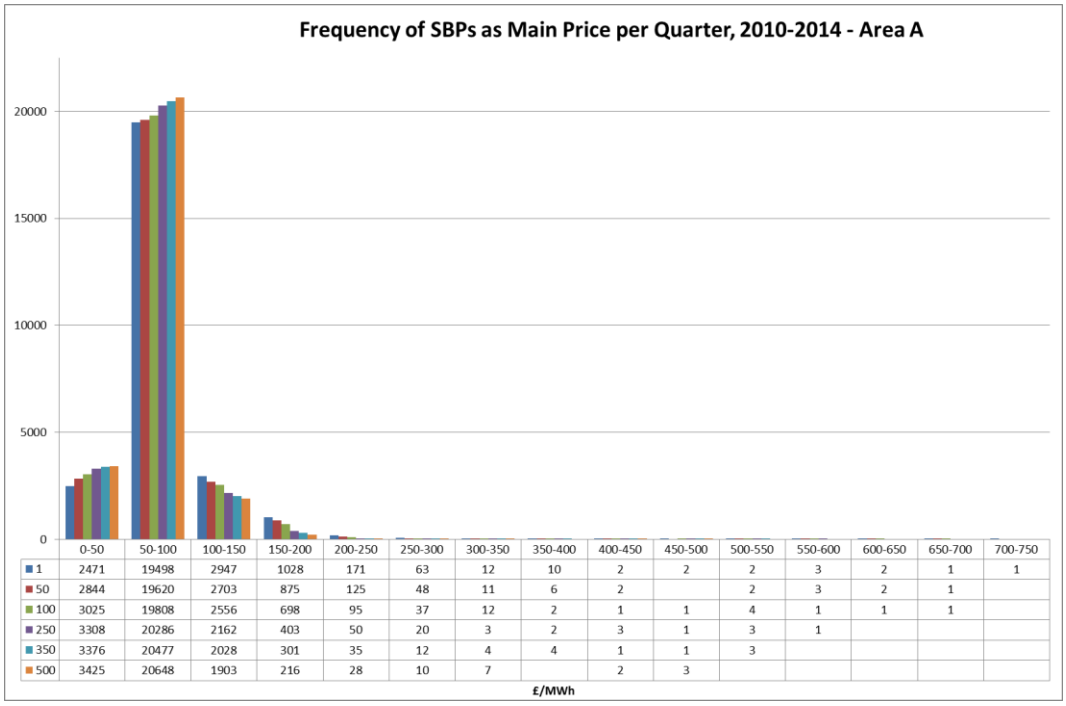
Frequency of prices

Figures 12 to 15 illustrate the frequency of prices calculated under P305 scenarios and further demonstrate the accentuating effect on prices of reducing PAR. Our analysis shows that lower values of PAR produced a wider distribution of prices around the core £0-100/MWh range - which accounts for ~96% of Single Main Prices, ~88% of SSB Main Prices and ~99% of SSP Main Prices.

Assuming PAR 1, there were 4,246 Settlement Periods where the Main Price was between £100/MWh and 750/MWh, almost twice as many than if PAR 500.

Similarly, lower PAR values resulted in an, albeit small number but, greater proportion of larger, negative prices. Between 2010 and 2013, where PAR equalled 500MWh there were 11 instances and where PAR equalled 350MWh there were 17 instances of negative prices, whereas reducing PAR to 1MWh increased the number of instances to 53.

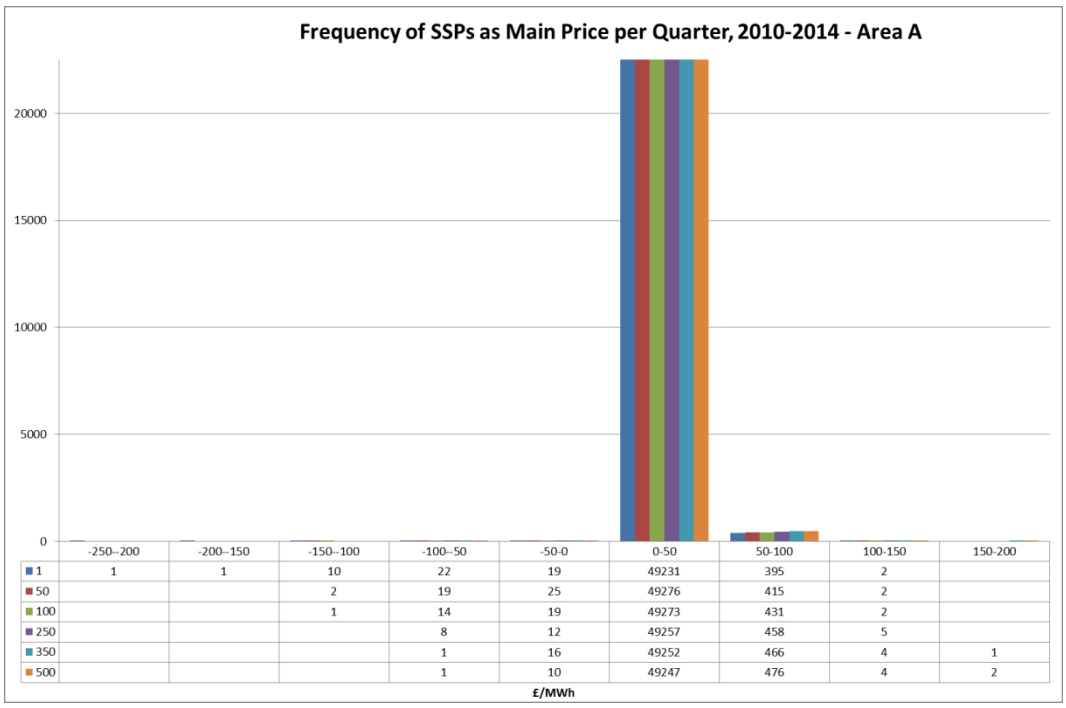
Figure 12



	0-50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	400-450	450-500	500-550	550-600	600-650	650-700	700-750
1	2471	19498	2947	1028	171	63	12	10	2	2	2	3	2	1	1
50	2844	19620	2703	875	125	48	11	6	2		2	3	2	1	
100	3025	19808	2556	698	95	37	12	2	1	1	4	1	1	1	
250	3308	20286	2162	403	50	20	3	2	3	1	3	1			
350	3376	20477	2028	301	35	12	4	4	1	1	3				
500	3425	20648	1903	216	28	10	7		2	3					

£/MWh

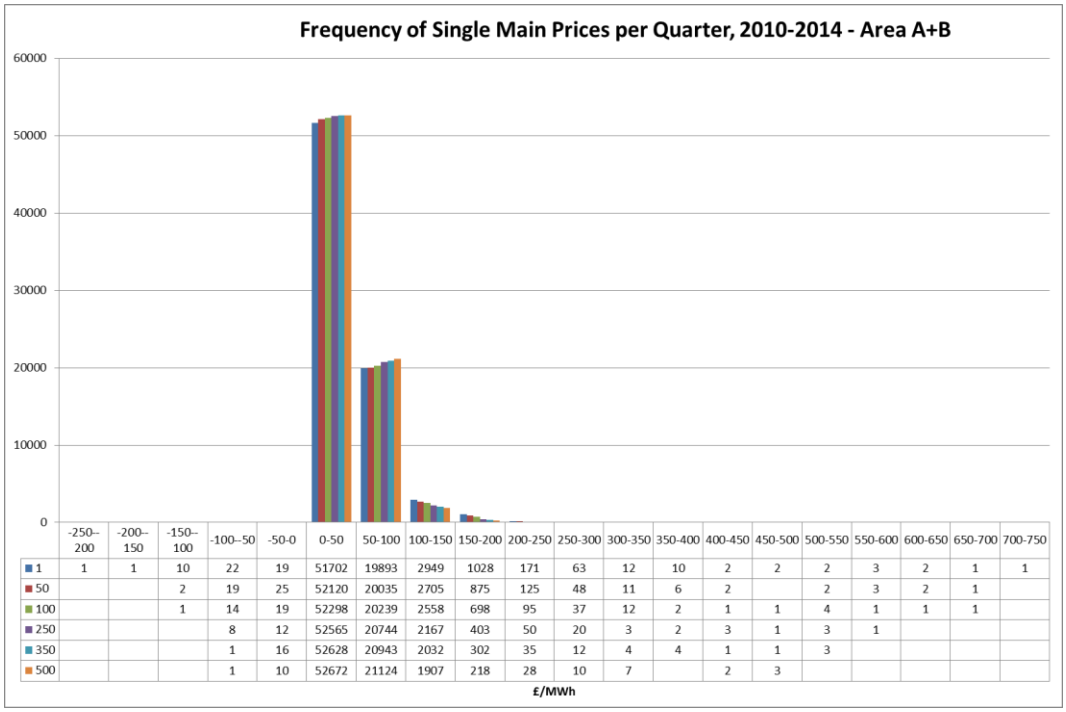
Figure 13



	-250--200	-200--150	-150--100	-100--50	-50-0	0-50	50-100	100-150	150-200
1	1	1	10	22	19	49231	395	2	
50			2	19	25	49276	415	2	
100			1	14	19	49273	431	2	
250				8	12	49257	458	5	
350				1	16	49252	466	4	1
500				1	10	49247	476	4	2

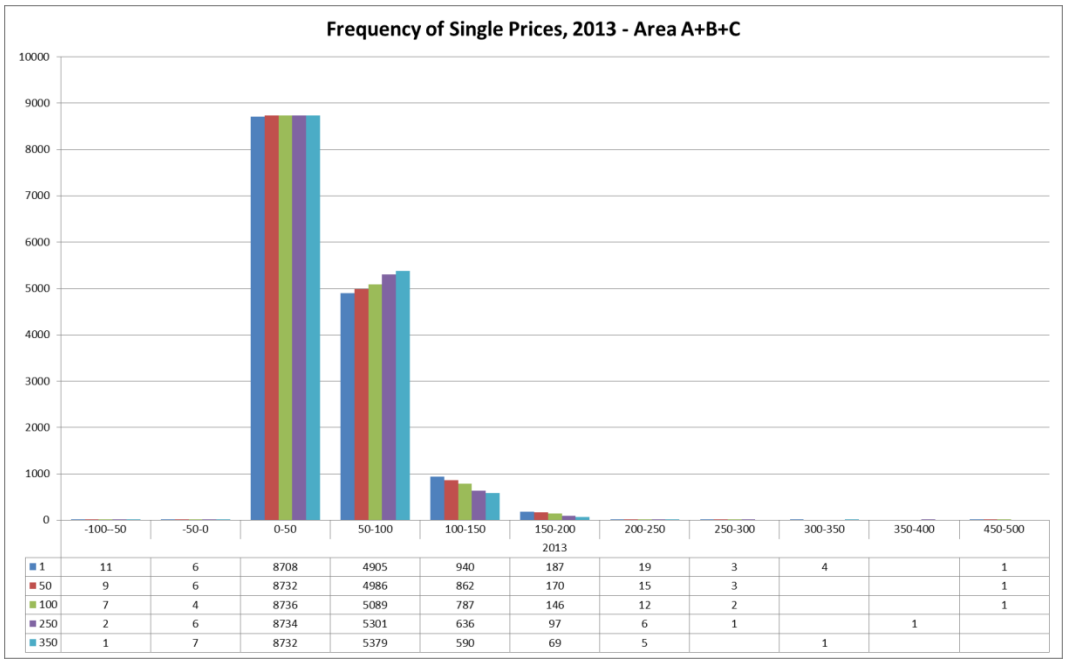
£/MWh

Figure 14



	-250--200	-200--150	-150--100	-100--50	-50-0	0-50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	400-450	450-500	500-550	550-600	600-650	650-700	700-750
1	1	1	10	22	19	51702	19893	2949	1028	171	63	12	10	2	2	2	3	2	1	1
50			2	19	25	52120	20035	2705	875	125	48	11	6	2		2	3	2	1	
100			1	14	19	52298	20239	2558	698	95	37	12	2	1	1	4	1	1	1	
250				8	12	52565	20744	2167	403	50	20	3	2	3	1	3	1			
350				1	16	52628	20943	2032	302	35	12	4	4	1	1	3				
500				1	10	52672	21124	1907	218	28	10	7		2	3					

Figure 15



	-100--50	-50-0	0-50	50-100	100-150	150-200	200-250	250-300	300-350	350-400	450-500
1	11	6	8708	4905	940	187	19	3	4		1
50	9	6	8732	4986	862	170	15	3			1
100	7	4	8736	5089	787	146	12	2			1
250	2	6	8734	5301	636	97	6	1		1	
350	1	7	8732	5379	590	69	5		1		

Figure 16

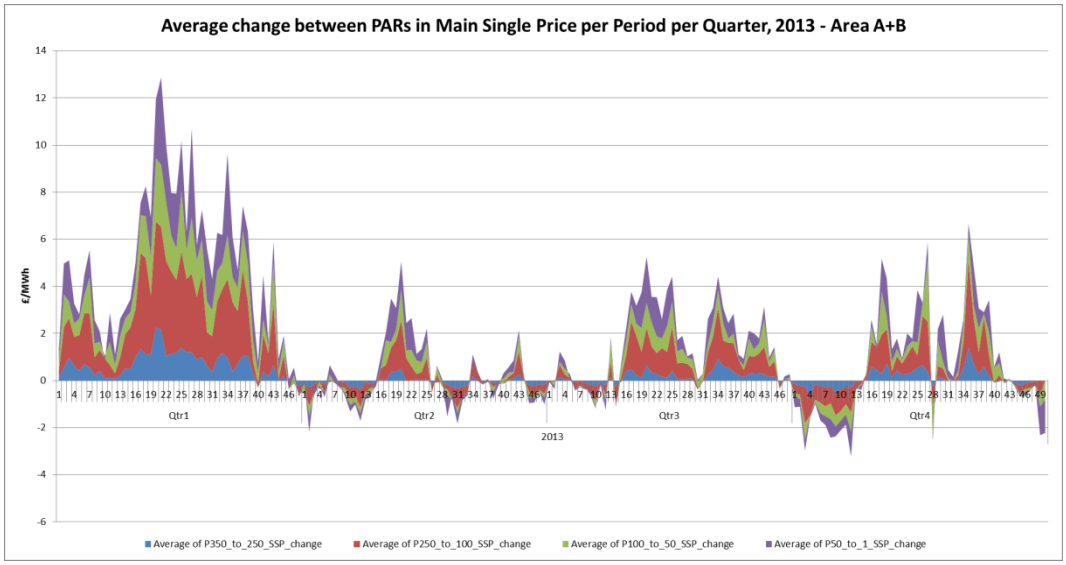


Figure 17

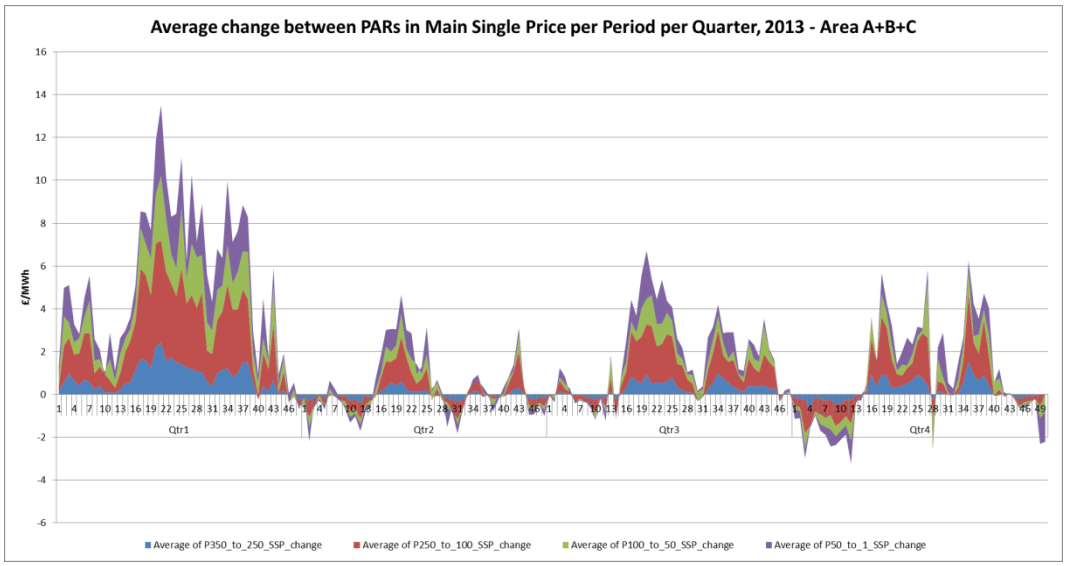


Figure 18

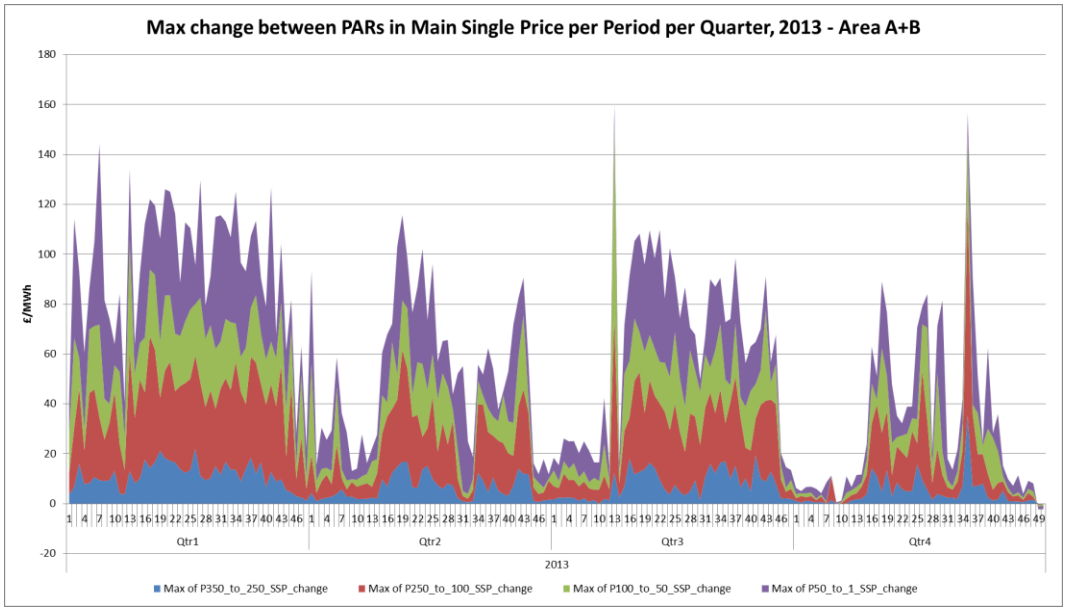
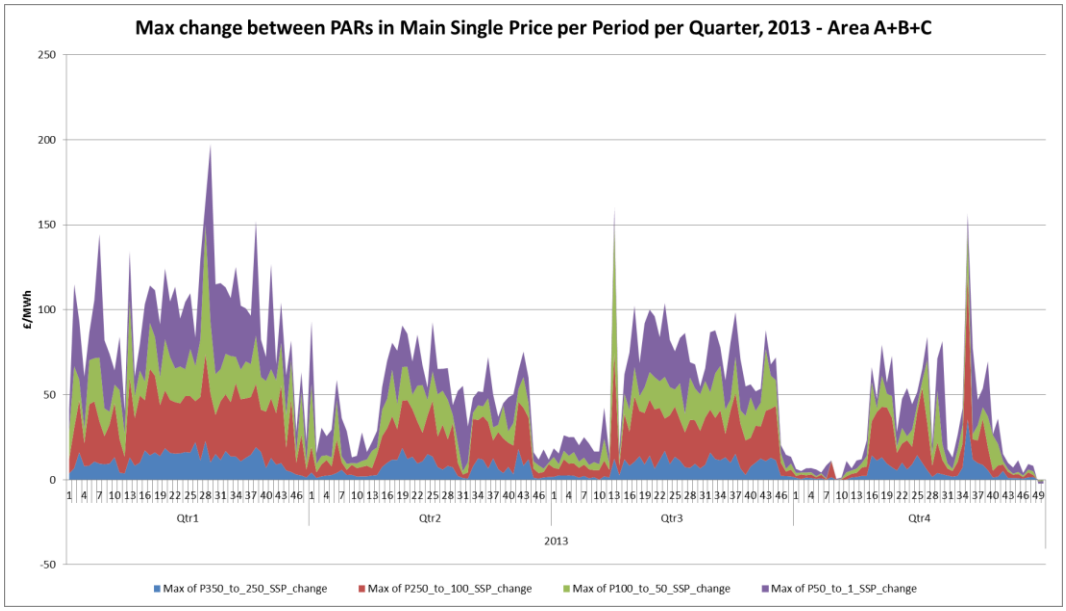


Figure 19



Replacing Dual Prices with a Single Price

Should P305 be implemented, it would have the effect of setting all Reverse Prices equal to the Main Price. In general this increases SSPs to equal SBP when the system is short and decreases SBPs to equal SSPs when the system is long.

Of 14,784 Settlement Periods analysed in 2013, an average of 38% had the SSP increased to equal SBP and an average of 62% had the SBP reduced to equal SSP.

Between 35.11% (assuming PAR 1) and 39.06% (PAR 350) of affected SSPs increased between £11/MWh and £21/MWh. Whereas 19.41% (PAR 1) and 17.37% (PAR 350) of affected SSPs increased between £21 and £31/MWh. A further 24.36% (PAR 1) and 13.93% (PAR 350) of affected SSPs increased by between £31 and £371/MWh.

Between 78.98% (PAR 1) and 79.85% (PAR 350) of affected SBPs reduced between £0/MWh and £21/MWh. Whereas 11.03% (PAR 1) and 8.10% (PAR 350) of affected SBPs decreased between £20 and £30/MWh. A further 4.80% (PAR 1) and 3.43% (PAR 350) of affected SBPs decreased by between £30 and £130/MWh.

Figure 20

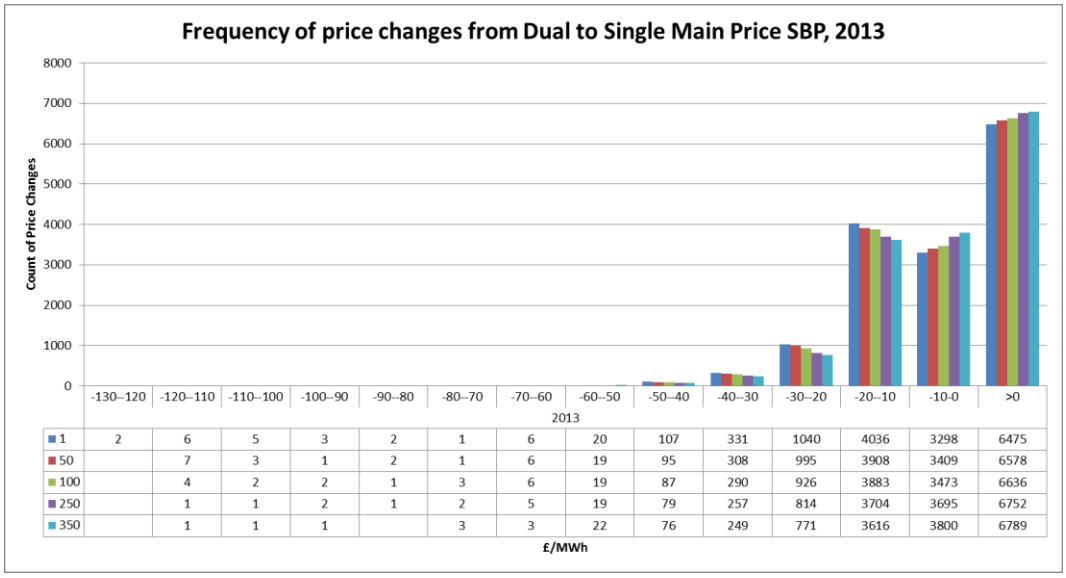
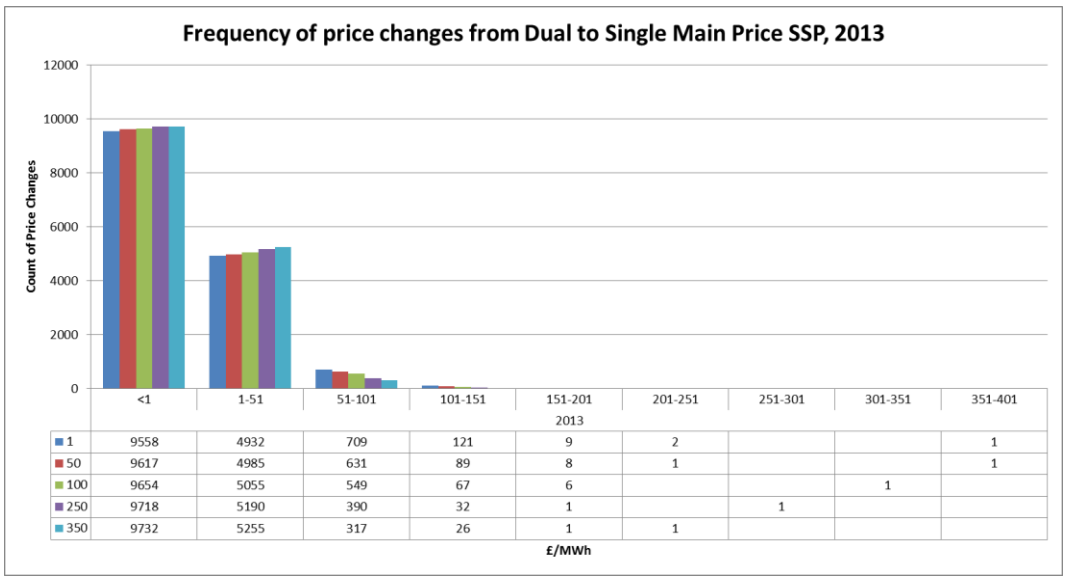


Figure 21



Introducing RSP

P305 proposes to initially set the VoLL at £3,000/MWh from November 2015, rising to £6,000/MWh from November 2018. Including the value of Reserve Scarcity to the calculation of imbalance prices in extreme events has the potential to significantly increase imbalance prices. However, whilst our analysis shows that a significant number of Settlement Periods are affected by the inclusion of RS requirements, the typical effect is comparatively limited and in the majority of cases may be contrary to expectation.

As summarised below, the frequency of STOR actions re-priced to RSP in 2013 was very low and the number of instances where a re-priced STOR action did or could have affected the Main Price even lower. Therefore, the impacts of RSP observed in our analysis are likely to be a consequence of additional non-BM STOR actions and revised Buy Price Adjusters in the Main Price calculation, rather than high values of Loss of Load Probability (LoLP) and RSP influencing the price calculation.

We also observed that in 146 of 14,784 Settlement Periods in 2013, the addition of non-BM STOR actions contributed enough to the volume to switch the system length from long to short.

Frequency of changes

Depending on the value of PAR, of the 14,784 Settlement Periods analysed in 2013, on average 70.93% of Settlement Periods were unaffected by the RSP requirements, 10.10% experienced increased prices and 15.40% experienced reduced prices. Table 2 below shows in more detail the effects of introducing the RSP requirements.

That we observed more decreasing prices than increasing prices may appear contrary to the intent of including RSP in the calculation of imbalance prices. Closer inspection helps to explain the price changes.

In order to assess the exact reason for price changes, the individual Settlement Period calculations would need to be analysed in detail. Due to the short timescales available this deep analysis into many Settlement Periods has not been possible. It is reasonable to predict that on the one hand the RSP requirements have the potential to re-price STOR actions and introduce additional non-BM STOR actions into the price calculation that may increase the average value of all BOAs in the stack, producing higher Main Prices.

However, reducing the PAR value may result in more BOAs, including re-priced or additional STOR actions, being PAR tagged out of the final price calculation.

The larger number of price decreases caused by the inclusion of RSP requirements is likely to be driven by the use of revised BPAs in the Main Price calculation. Revised BPAs are used so the costs of STOR availability charges are removed from the Main Price calculation. The consequence of this is to reduce Main Prices based on SBPs in Settlement Periods where STOR was used. The most notable instance of this caused the highest Main Price calculated in 2013, £520.56/MWh[8], to be reduced by £24.28/MWh.

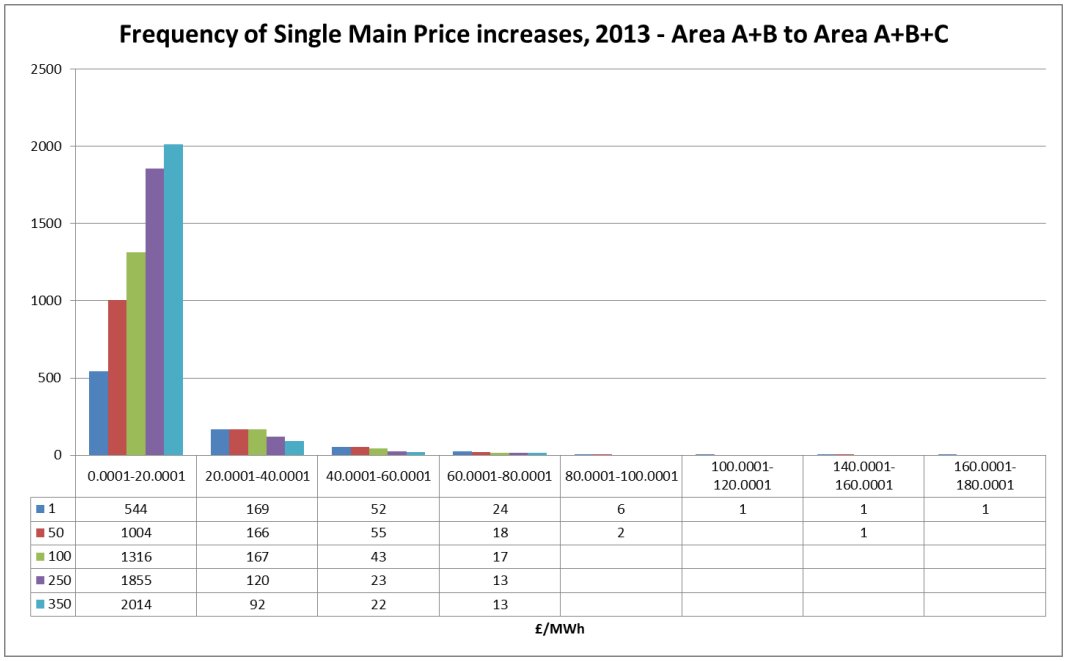
Table 2

Frequency of price changes driven by introducing RSP requirements

PAR	Prices increased	% increased	Prices unchanged	% unchanged	Prices decreased	% decreased
1	798	5.40%	11,815	79.92%	2,171	14.68%
50	1,246	8.43%	11,245	76.06%	2,293	15.51%
100	1,543	10.44%	10,899	73.72%	2,342	15.84%
250	2,011	13.60%	10,298	69.66%	2,475	16.74%
350	2,141	14.48%	10,121	68.46%	2,522	17.06%

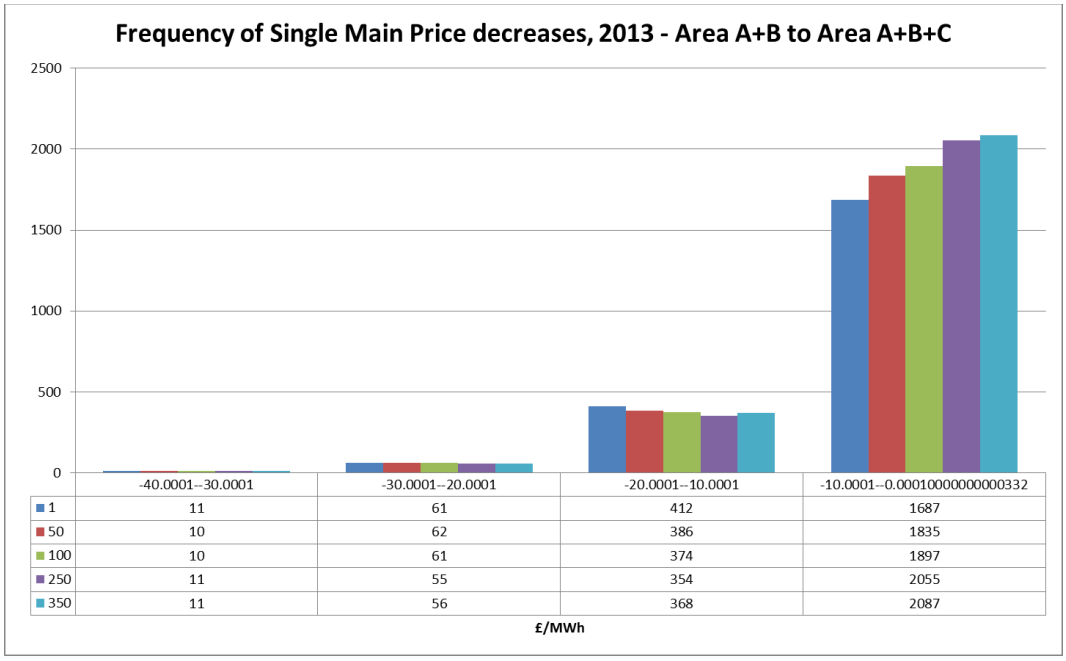
[8] Achieved on 4 November 2013, Settlement Period 35

Figure 22



	0.0001-20.0001	20.0001-40.0001	40.0001-60.0001	60.0001-80.0001	80.0001-100.0001	100.0001-120.0001	140.0001-160.0001	160.0001-180.0001
1	544	169	52	24	6	1	1	1
50	1004	166	55	18	2		1	
100	1316	167	43	17				
250	1855	120	23	13				
350	2014	92	22	13				

Figure 23



	-40.0001--30.0001	-30.0001--20.0001	-20.0001--10.0001	-10.0001--0.00010000000000332
1	11	61	412	1687
50	10	62	386	1835
100	10	61	374	1897
250	11	55	354	2055
350	11	56	368	2087

Range of prices driven by RSP

For the 2013 period, the highest and lowest prices calculated under the RSP requirements are summarised in Table 3 below.

Table 3a

Highest Single Main Prices including RSP, 2013 – Area A+B+C

Settlement Date	Settlement Period	PAR	Single Price exc RSP	Single Price inc RSP	Change in Main Price
04/11/2013	35	50	520.56	496.28	-24.28
04/11/2013	35	1	520.56	496.28	-24.28

Highest Single Main Prices including RSP, 2013 – Area A+B+C					
Settlement Date	Settlement Period	PAR	Single Price exc RSP	Single Price inc RSP	Change in Main Price
04/11/2013	35	100	493.63	469.35	-24.28
04/11/2013	35	250	407.56	383.28	-24.28
04/11/2013	35	350	372.06	347.78	-24.28
04/11/2013	36	1	329.49	311.14	-18.35
24/02/2013	28	1	139.75	300.00	160.25
24/02/2013	29	1	140.00	300.00	160.00
20/03/2013	38	1	192.62	300.00	107.38
24/02/2013	28	50	139.53	293.53	154.00

Table 3b

Lowest Single Main Prices including RSP, 2013 – Area A+B+C					
Settlement Date	Settlement Period	PAR	Single Price exc RSP	Single Price inc RSP	Change in Main Price
31/08/2013	30	50	-78.00	-78.00	0.00
31/08/2013	30	100	-78.00	-78.00	0.00
31/08/2013	31	50	-78.00	-78.00	0.00
31/08/2013	31	100	-78.00	-78.00	0.00
31/08/2013	30	1	-78.00	-78.00	0.00
31/08/2013	31	1	-78.00	-78.00	0.00
06/10/2013	28	1	-78.00	-78.00	0.00
24/10/2013	3	50	-78.00	-78.00	0.00
24/10/2013	4	50	-78.00	-78.00	0.00
24/10/2013	4	100	-78.00	-78.00	0.00

Table 3c

Largest increase in Single Main Prices including RSP, 2013 – Area A+B+C					
Settlement Date	Settlement Period	PAR	Single Price exc RSP	Single Price inc RSP	Change in Main Price
24/02/2013	28	1	139.75	300.00	160.25
24/02/2013	29	1	140.00	300.00	160.00
24/02/2013	28	50	139.53	293.53	154.00
20/03/2013	38	1	192.62	300.00	107.38
26/02/2013	*36*	*1*	*46.05*	*140.00*	*93.95*
11/01/2013	*18*	*1*	*40.90*	*125.00*	*84.10*
29/06/2013	*18*	*1*	*36.70*	*120.00*	*83.30*

Largest increase in Single Main Prices including RSP, 2013 – Area A+B+C					
Settlement Date	Settlement Period	PAR	Single Price exc RSP	Single Price inc RSP	Change in Main Price
28/07/2013	*44*	*1*	*38.29*	*120.00*	*81.71*
28/07/2013	*43*	*1*	*38.30*	*120.00*	*81.70*
28/07/2013	*44*	*50*	*38.29*	*119.87*	*81.57*
24/02/2013	*28*	*1*	*139.75*	*300.00*	*160.25*
24/02/2013	*29*	*1*	*140.00*	*300.00*	*160.00*

Italicised text identifies Settlement Periods where the NIV switched as a consequence of including RSP requirements in Main Price calculation. Consequently the System Length changed from Long to Short.

Figure 24

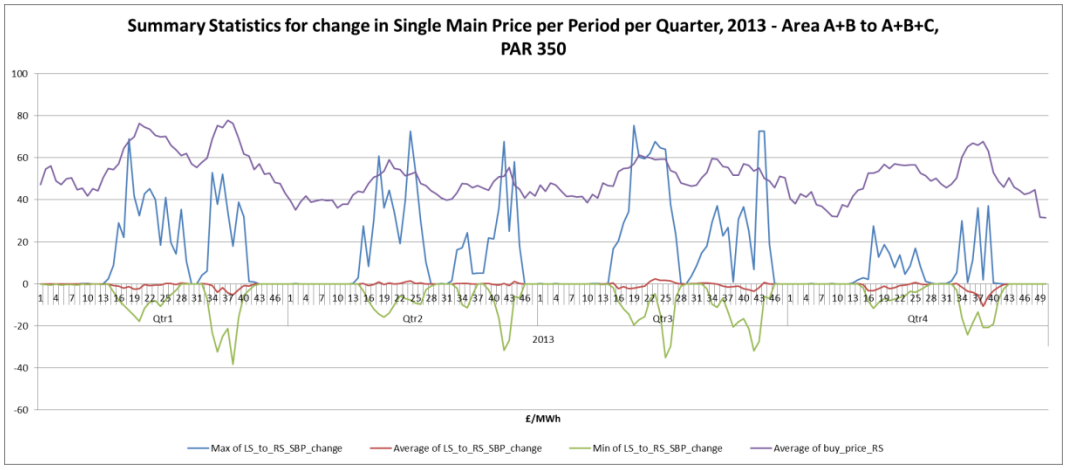
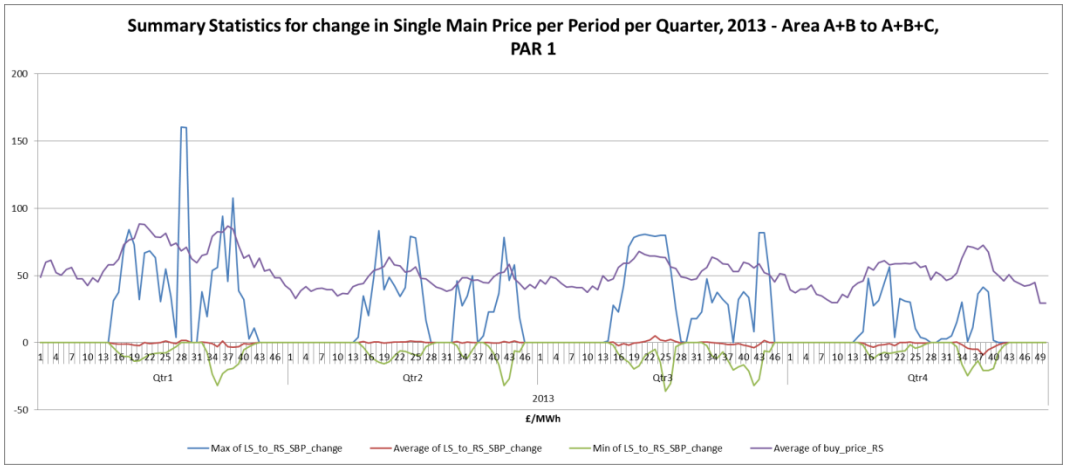


Figure 25



Frequency of re-pricing STOR actions

Figures 22 and 23 illustrate the number and frequency of STOR actions taken during 2013 and the number of those actions that had their utilisation prices re-priced to equal RSP.

Of 38,225 STOR actions in 2013, 36 actions would have been re-priced at RSP where VoLL was equal to £3,000/MWh and 46 actions would have been re-priced at RSP where VoLL was equal to £6,000/MWh.

Figure 26

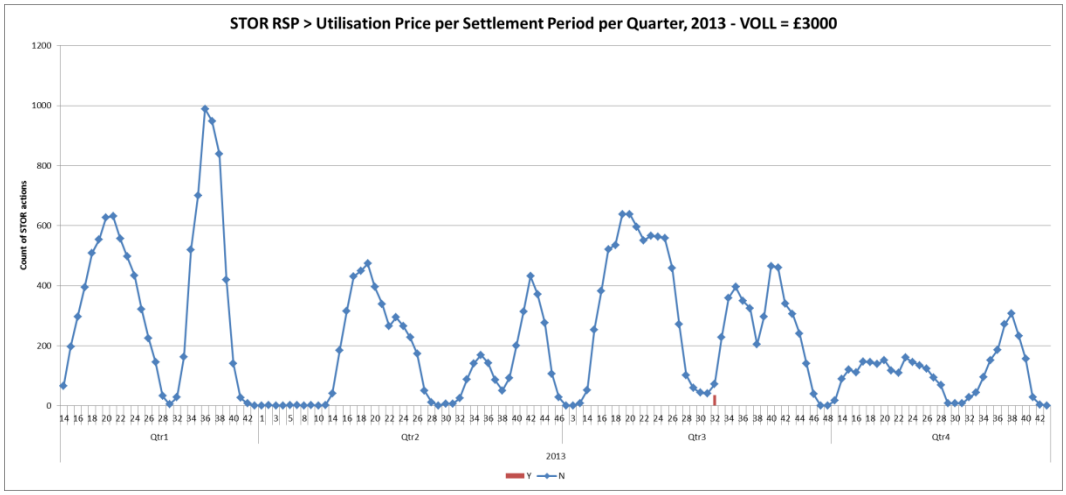
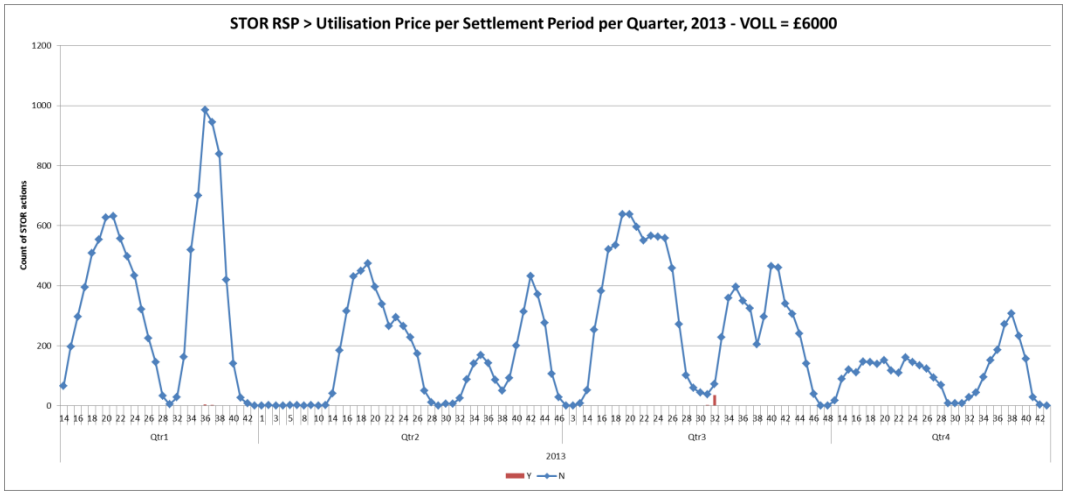


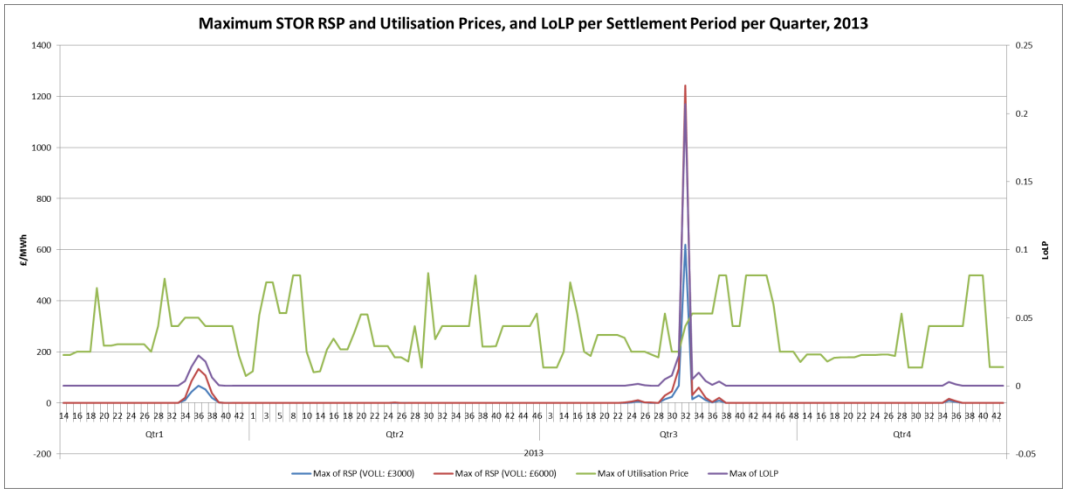
Figure 27



In those instances where STOR actions are priced at RSP and VoLL equalled £3,000/MWh, all 36 actions would have either been tagged out of the calculation by the DMAT or by NIV tagging.

Whilst our analysis did not calculate prices where VoLL equalled £6,000/MWh, a simple review of the Bids and Offers during periods where STOR actions were re-priced to RSP suggests that at most 10 of the 46 re-priced actions may have contributed to the final Main Price.

Figure 28



Impacts on Parties

This subsection focuses on providing a summary of how the P305 requirements could have impacted BSC Parties' historical trading charges. In particular, using the imbalance prices calculated using the P305 scenarios described above, our model has recalculated the absolute differences in BSC Parties' imbalance charges, RCRC charges and overall net positions, and calculated each Parties' change in net position divided by its credited energy volume to produce a comparable £/MWh. In this sense our analysis simply recalculates the impacts of prices on existing, historical imbalance positions. It does not take account of any change in Parties' behaviours in terms of managing their imbalance positions as a consequence of changes to incentives intended by P305.

In general, reducing PAR and the introduction of a single price approach appear to be the most influential elements of P305 on Parties' imbalance charges and overall net positions. As demonstrated above, reducing PAR typically has the effect of increasing SBPs and reducing SSPs, which could have a more detrimental effect on parties who fail to manage their imbalance positions adequately. The introduction of a Single Price approach that tends not to use a Market Price has the effect of increasing the spread between SBPs and SSPs that a Party may be charged at from one Settlement Period to the next. This spread is accentuated by higher SBPs and lower SSPs driven by lower PAR values.

The effects of P305 scenarios are summarised in Tables 4 to 12 further below. Each table provides an aggregated Quarterly view of changes to charges for different BSC Party types – independent suppliers, independent thermal generators, independent wind generators, vertically integrated parties, interconnectors and a 'null' category that reflects all other uncategorised Parties.[9]

Impacts on Parties' imbalance cash flows

Tables 4, 5 and 6 summarise the total change on Parties' imbalance cash flows caused by P305 scenarios. A positive value of 'imbalance_cash_flow_delta' represents an increase in the imbalance charges paid by a Party. A negative value represents a reduction in charges paid.

[9] The Party Types reflect the same types used for our P304 analysis, which were originally compiled to support analysis for Ofgem's EBSCR analysis. The categorisation of parties was based on those Parties' consent. Consequently not all Parties' were categorised and are therefore captured by our 'null' category.

Under dual price arrangements all party types' imbalance cash flows are typically worse on average in all quarters. Parties' imbalance cash flow worsens in all quarters progressively and consistently as PAR is reduced. As described in our analysis of reducing PAR on prices above, deteriorating imbalance cash flows are likely to be driven by an increasing spread between SBPs and SSPs with Market Prices caused by reducing PAR values.

By introducing Single Price arrangements, P305 could have the effect of reducing all party types' imbalance cash flows. This may be a consequence of generally reducing ~60% of Settlement Periods SBPs to the SSP, which would have the effect of reducing the amount paid to parties that are long or payments by parties that are short in these periods. However, reducing PAR has the effect of generally widening the gap between average SBPs and SSPs. This may explain why any beneficial reduction in imbalance cash flows due to a single price is consistently eroded as PAR reduces.

Impacts on Parties' RCRC receipts

Tables 7, 8 and 9 summarise the absolute impacts of P305 scenarios on Parties' RCRC receipts. A positive value of 'RCRC_delta' represents an increase in RCRC charges or a decrease in RCRC payments to Parties. Whereas a negative value of 'RCRC_delta' represents a decrease in RCRC charges or an increase in RCRC payments.

All monies recovered or paid through imbalance charges are returned back to or paid by Parties through RCRC in proportion to a parties credited energy volume(s). Consequently any increase or decrease in imbalance charge cash flow will have a direct impact on the size of RCRC payments made by or paid back to BSC Parties.

As described above, because imbalance cash flows increased under dual price arrangements, the volumes of RCRC received by all Parties increased too.

Conversely, under single price arrangements, imbalance cash flows reduced and so the size of RCRC charges and receipts to all parties reduced too.

Impacts on Parties' net positions

Each Parties' net position is the sum of imbalance cashflows and RCRC. A positive net position represents an increase in charges paid by a Party, whereas a negative value represents a decrease in the charges paid by a Party.

Under dual price arrangements, Independent Suppliers and Interconnectors consistently pay more under P305 scenarios. This is because they pay more imbalance charges than they receive in terms of RCRC receipts. This position is made worse by reducing PAR.

On the other hand Vertically Integrated parties and Independent Thermal generators typically benefit under dual price arrangements as they receive a greater proportion of RCRC payments which counteract increases in imbalance cashflows.

By moving to single price arrangements all parties except Vertically Integrated parties benefit. This is primarily because as net beneficiaries or contributors of RCRC, Vertically Integrated parties are affected most by receiving a decreasing amount through RCRC as the level of imbalance cashflow decreases.

Table 4 – Total impacts of P305 scenarios on Imbalance Cashflows (£s) – Area A

Sum of imbalance_cashflow_delta	Column Labels																	
	Live																	
	Twin																	
	2010				2011				2012				2013				2014	
Row Labels	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
1																		
Independent Supplier	437,707	669,287	471,979	1,767,501	927,459	843,562	1,043,425	1,003,779	1,189,823	1,314,978	956,401	1,512,957	2,446,168	1,262,276	1,161,163	1,390,132	1,416,799	1,081,257
Independent Thermal	596,138	1,527,641	936,537	3,290,828	1,244,818	924,459	2,454,257	1,245,244	1,810,082	1,544,797	1,165,637	1,617,662	2,317,584	1,000,314	1,164,821	1,166,824	1,134,874	696,866
Independent Wind	0	2	0	12	3	3	13	9	10	8	13	31	4,281	52	42,199	43	45	19
Interconnector	24,065	25,350	9,647	46,129	70,832	35,204	150,666	83,486	94,208	99,826	78,405	102,951	104,008	73,555	76,051	50,885	68,074	17,656
NULL	0	0	0	0	0	0	0	0	0	0	0	0	2,551	34	2,061	61,682	115,624	44,282
Vertically Integrated	6,145,224	7,780,649	5,025,985	20,716,772	9,552,137	6,378,323	9,039,185	7,997,442	12,977,932	11,142,300	6,447,031	12,224,792	20,163,389	8,635,890	7,540,131	8,797,106	9,528,350	6,016,036
50																		
Independent Supplier	318,184	487,029	390,987	1,365,686	698,696	681,791	778,965	748,039	968,447	968,639	739,697	1,201,963	1,943,223	981,000	910,989	1,132,155	1,155,165	794,148
Independent Thermal	417,073	1,168,933	743,968	2,641,123	936,770	744,064	1,818,640	972,222	1,500,877	1,141,851	902,100	1,291,994	1,831,747	775,178	911,624	918,496	949,023	534,358
Independent Wind	0	2	0	9	2	3	9	7	8	5	10	24	3,525	41	32,855	34	35	14
Interconnector	18,195	16,608	7,698	33,167	58,275	27,572	84,665	69,377	75,757	73,586	61,318	78,731	79,911	53,700	54,790	40,596	56,180	14,096
NULL	0	0	0	0	0	0	0	0	0	0	0	0	2,543	88	1,203	46,553	88,813	34,168
Vertically Integrated	4,516,482	5,954,159	4,063,977	16,368,075	7,491,564	5,307,227	6,647,531	6,165,910	10,664,978	8,470,244	5,067,616	9,832,396	16,143,143	6,739,688	6,008,769	7,187,010	7,808,297	4,273,040
100																		
Independent Supplier	236,952	353,868	321,329	1,079,755	524,168	544,911	595,086	556,892	774,505	743,058	557,716	933,440	1,495,974	771,193	690,277	886,930	913,340	590,090
Independent Thermal	310,044	870,211	604,296	2,099,494	709,207	582,537	1,360,976	741,412	1,226,735	874,342	685,026	1,007,137	1,409,973	596,453	691,215	715,093	754,510	403,896
Independent Wind	0	1	0	7	2	2	7	5	6	4	7	19	2,648	33	26,256	27	28	11
Interconnector	14,431	10,994	5,953	25,356	43,416	21,693	55,247	53,021	56,940	54,663	41,940	62,543	57,804	39,428	35,376	30,641	45,509	11,171
NULL	0	0	0	0	0	0	0	0	0	0	0	0	1,374	69	914	35,158	71,559	26,238
Vertically Integrated	3,383,335	4,502,025	3,343,448	13,198,113	5,778,885	4,302,986	5,099,256	4,753,658	8,601,089	6,535,750	3,919,712	7,666,741	12,476,048	5,253,563	4,567,995	5,697,181	6,238,757	3,164,513
250																		
Independent Supplier	89,460	120,688	168,642	489,029	209,621	255,862	235,285	223,748	350,038	326,498	216,760	412,810	637,555	380,574	261,747	392,513	430,372	254,613
Independent Thermal	125,875	321,586	304,531	983,677	275,394	262,152	531,895	297,890	582,386	375,562	282,524	468,885	601,406	285,229	266,214	328,368	348,712	174,567
Independent Wind	0	0	0	3	1	1	2	2	3	1	3	8	945	18	10,640	12	14	5
Interconnector	6,705	3,724	2,326	10,918	14,672	9,838	21,180	22,154	19,904	22,138	12,043	29,683	22,537	17,665	10,719	11,803	18,120	5,372
NULL	0	0	0	0	0	0	0	0	0	0	0	0	459	25	256	15,787	37,017	10,011
Vertically Integrated	1,352,878	1,822,691	1,767,140	6,120,283	2,443,780	2,113,480	2,087,501	2,071,565	4,031,250	2,950,613	1,591,959	3,391,868	5,311,649	2,572,474	1,815,577	2,616,773	3,013,618	1,358,769
350																		
Independent Supplier	40,514	53,627	99,384	246,368	98,144	137,203	108,686	103,710	178,365	156,051	96,794	205,471	312,218	220,891	119,839	197,065	231,514	121,545
Independent Thermal	63,791	140,067	176,401	504,613	123,997	140,564	250,386	129,782	291,978	171,417	129,824	240,633	296,243	159,874	116,183	170,098	178,339	83,092
Independent Wind	0	0	0	2	0	1	1	1	1	1	1	4	442	11	4,810	7	9	2
Interconnector	3,152	1,708	1,126	5,273	8,035	5,186	9,920	9,880	9,585	10,084	4,757	15,602	10,507	9,594	4,203	5,432	8,387	2,459
NULL	0	0	0	0	0	0	0	0	0	0	0	0	197	15	68	8,136	21,788	4,670
Vertically Integrated	632,727	866,130	1,054,257	3,113,008	1,182,309	1,163,425	978,787	1,014,649	2,070,724	1,438,844	734,894	1,678,860	2,584,815	1,485,173	834,023	1,313,792	1,571,407	630,583

Table 5 - Total impacts of P305 scenarios on Imbalance Cashflows (£s) – Area A+B

Sum of imbalance_cashflow_delta	Column Labels																	
	Live																	
	Single																	
	2010				2011				2012				2013				2014	
Row Labels	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
1																		
Independent Supplier	-489,403	-1,032,978	-917,333	-3,904,578	-2,166,133	-1,702,310	-2,127,278	-1,570,115	-1,485,631	-1,826,926	-1,586,601	-2,459,853	-4,044,880	-1,558,386	-2,804,219	-3,467,597	-2,229,666	-1,095,598
Independent Thermal	-1,161,500	-1,880,589	-1,777,630	-3,220,566	-2,149,681	-1,615,700	-1,416,373	-2,215,773	-2,718,884	-3,618,344	-2,139,369	-2,727,538	-3,821,234	-1,737,890	-2,316,425	-2,340,485	-1,614,078	-1,054,829
Independent Wind	0	-60	0	5	-15	-9	-25	-41	-74	-80	-62	-129	-1,327	-109	-168,292	-214	-228	-102
Interconnector	-89,170	-69,301	-70,214	-187,293	-121,537	-160,840	-124,598	-251,045	-270,458	-112,862	-221,271	-208,603	-167,643	-166,301	-164,587	-158,800	-108,905	-45,107
NULL	0	0	0	0	0	0	0	0	0	0	0	0	91	-2,477	-6,438	-332,430	-313,305	-112,739
Vertically Integrated	-375,328	-2,807,389	-3,977,622	2,715,733	-1,660,395	-3,397,038	-1,685,250	-4,474,713	-1,362,648	-3,079,317	-4,150,349	-5,900,207	-3,453,680	-5,476,318	-4,936,845	-6,380,026	-2,809,873	-2,329,008
50																		
Independent Supplier	-539,393	-1,094,730	-938,779	-3,799,737	-2,194,356	-1,727,403	-2,097,255	-1,674,823	-1,573,105	-1,973,374	-1,674,151	-2,550,602	-4,083,548	-1,651,681	-2,821,498	-3,496,559	-2,288,707	-1,199,854
Independent Thermal	-1,193,625	-1,990,040	-1,855,661	-3,322,307	-2,226,689	-1,668,991	-1,761,533	-2,291,879	-2,756,197	-3,652,450	-2,211,823	-2,807,313	-3,856,944	-1,787,257	-2,393,140	-2,418,523	-1,641,028	-1,060,230
Independent Wind	0	-57	0	2	-14	-9	-26	-41	-71	-76	-60	-125	-1,597	-108	-169,569	-209	-221	-97
Interconnector	-87,978	-71,698	-68,247	-178,200	-124,592	-161,557	-166,958	-246,643	-272,417	-128,164	-221,742	-219,810	-177,045	-175,090	-177,639	-161,817	-112,895	-44,526
NULL	0	0	0	0	0	0	0	0	0	0	0	0	83	-2,179	-7,076	-325,984	-317,160	-107,627
Vertically Integrated	-1,468,843	-3,891,564	-4,587,919	-314,651	-2,984,951	-4,009,175	-3,194,339	-5,549,879	-2,963,211	-4,779,066	-4,958,407	-7,307,775	-5,847,602	-6,520,815	-5,791,071	-7,315,624	-3,868,779	-3,082,588
100																		
Independent Supplier	-574,450	-1,139,903	-966,374	-3,720,722	-2,197,590	-1,757,969	-2,097,047	-1,753,787	-1,652,246	-2,056,481	-1,754,586	-2,637,495	-4,122,961	-1,733,327	-2,857,464	-3,560,758	-2,346,121	-1,267,391
Independent Thermal	-1,193,059	-2,091,171	-1,900,970	-3,466,603	-2,277,972	-1,724,170	-2,015,175	-2,373,698	-2,797,786	-3,656,843	-2,284,992	-2,876,619	-3,877,816	-1,845,705	-2,454,032	-2,479,667	-1,692,347	-1,079,980
Independent Wind	0	-51	0	0	-14	-9	-26	-40	-68	-73	-59	-123	-2,218	-108	-166,290	-205	-214	-92
Interconnector	-85,211	-72,467	-67,078	-172,677	-130,934	-160,476	-178,536	-249,742	-275,559	-141,622	-229,316	-225,119	-186,517	-180,666	-189,819	-165,185	-117,373	-43,877
NULL	0	0	0	0	0	0	0	0	0	0	0	0	-1,073	-2,093	-7,147	-317,059	-312,282	-106,076
Vertically Integrated	-2,266,560	-4,815,804	-5,039,866	-2,537,066	-4,164,461	-4,655,808	-4,146,388	-6,432,111	-4,448,382	-6,052,992	-5,681,860	-8,656,884	-8,153,748	-7,411,177	-6,704,998	-8,251,386	-4,885,272	-3,704,076
250																		
Independent Supplier	-634,639	-1,227,759	-1,029,387	-3,565,418	-2,194,248	-1,871,522	-2,152,656	-1,891,655	-1,823,457	-2,238,871	-1,914,724	-2,832,610	-4,229,667	-1,917,997	-2,982,315	-3,709,274	-2,488,462	-1,379,074
Independent Thermal	-1,185,252	-2,318,828	-2,032,311	-3,767,039	-2,375,844	-1,862,901	-2,494,945	-2,537,588	-2,970,855	-3,708,000	-2,452,764	-2,994,942	-3,969,014	-1,954,333	-2,617,842	-2,589,337	-1,828,782	-1,123,124
Independent Wind	0	-45	-1	-4	-13	-9	-27	-39	-62	-67	-57	-118	-3,277	-109	-160,935	-198	-200	-83
Interconnector	-80,632	-69,571	-65,693	-164,216	-145,032	-159,542	-185,928	-253,383	-278,532	-160,753	-240,706	-233,433	-196,130	-185,659	-200,941	-171,278	-131,885	-43,970
NULL	0	0	0	0	0	0	0	0	0	0	0	0	-1,971	-2,096	-7,412	-301,199	-304,307	-106,818
Vertically Integrated	-3,738,189	-6,665,453	-6,114,242	-7,826,577	-6,591,643	-6,240,459	-6,203,598	-8,252,445	-7,907,346	-8,622,251	-7,295,492	-11,555,222	-12,979,093	-9,181,752	-8,592,627	-10,319,573	-7,135,423	-4,922,654
350																		
Independent Supplier	-654,199	-1,251,331	-1,066,617	-3,516,981	-2,197,510	-1,924,210	-2,193,017	-1,941,730	-1,898,933	-2,328,372	-1,979,891	-2,929,282	-4,298,712	-2,010,415	-3,030,328	-3,770,949	-2,559,512	-1,428,117
Independent Thermal	-1,191,656	-2,411,613	-2,101,863	-3,938,941	-2,419,489	-1,920,889	-2,667,926	-2,605,606	-3,088,501	-3,747,228	-2,536,254	-3,066,682	-4,030,269	-2,010,874	-2,693,454	-2,645,337	-1,894,733	-1,139,937
Independent Wind	0	-41	-1	-5	-13	-9	-27	-38	-60	-65	-56	-116	-3,429	-111	-159,660	-196	-195	-81
Interconnector	-80,352	-68,654	-64,796	-162,539	-146,011	-159,128	-188,109	-252,778	-274,857	-168,523	-241,845	-236,041	-199,655	-187,134	-203,211	-172,880	-136,583	-44,781
NULL	0	0	0	0	0	0	0	0	0	0	0	0	-2,218	-2,099	-7,489	-296,896	-304,549	-107,253
Vertically Integrated	-4,300,158	-7,411,384	-6,660,304	-10,219,393	-7,592,715	-6,991,132	-7,035,214	-9,044,299	-9,480,298	-9,791,731	-7,952,007	-12,820,304	-14,973,449	-9,966,965	-9,351,038	-11,249,031	-8,233,481	-5,482,448

Table 6 - Total impacts of P305 scenarios on Imbalance Cashflows (£s) – Area A+B+C

Sum of imbalance_cashflow_delta	Column Labels			
	RSP			
	Single			
	2013			
Row Labels	1	2	3	4
1				
Independent Supplier	-4,126,508	-1,752,150	-3,089,811	-1,036,818
Independent Thermal	-3,794,652	-1,750,753	-2,206,277	-919,039
Independent Wind	-2,166	-113	-177,266	-73
Interconnector	-171,381	-167,567	-165,691	-52,038
NULL	-807	-2,514	-6,705	-122,811
Vertically Integrated	-4,216,416	-5,547,774	-5,624,471	-2,242,025
50				
Independent Supplier	-4,171,388	-1,840,336	-3,103,053	-1,044,102
Independent Thermal	-3,813,691	-1,804,261	-2,254,496	-935,685
Independent Wind	-2,145	-112	-177,065	-72
Interconnector	-180,840	-171,680	-178,750	-52,613
NULL	-806	-2,216	-7,308	-119,487
Vertically Integrated	-6,687,390	-6,499,303	-6,462,856	-2,637,310
100				
Independent Supplier	-4,199,205	-1,907,510	-3,126,549	-1,068,128
Independent Thermal	-3,815,927	-1,855,364	-2,324,571	-954,160
Independent Wind	-2,596	-110	-171,178	-70
Interconnector	-191,861	-178,596	-187,964	-54,133
NULL	-1,475	-2,130	-7,355	-113,831
Vertically Integrated	-8,981,582	-7,384,936	-7,296,601	-3,035,304
250				
Independent Supplier	-4,294,903	-2,062,591	-3,212,740	-1,106,165
Independent Thermal	-3,878,761	-1,948,108	-2,518,340	-990,992
Independent Wind	-3,483	-110	-161,947	-67
Interconnector	-202,602	-185,216	-208,001	-57,195
NULL	-2,548	-2,133	-7,674	-104,966
Vertically Integrated	-13,854,575	-9,205,305	-9,301,564	-3,978,811
350				
Independent Supplier	-4,335,372	-2,148,211	-3,243,808	-1,120,960
Independent Thermal	-3,928,870	-2,006,948	-2,601,378	-1,006,110
Independent Wind	-3,600	-112	-160,443	-66
Interconnector	-207,555	-186,843	-211,397	-57,939
NULL	-2,741	-2,136	-7,786	-102,664
Vertically Integrated	-15,981,477	-10,033,069	-10,138,829	-4,414,671

Table 7 - Total impacts of P305 scenarios on RCRC (£s) – Area A

Sum of rcrc_delta	Column Labels																	
	Live																	
	Twin																	
	2010				2011				2012				2013				2014	
Row Labels	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
1																		
Independent Supplier	-100,497	-178,994	-141,233	-490,789	-223,930	-169,510	-308,953	-244,912	-413,870	-377,842	-339,484	-572,227	-1,098,379	-619,895	-391,659	-464,916	-489,301	-364,615
Independent Thermal	-1,158,662	-1,784,587	-1,221,462	-3,820,162	-1,831,373	-1,389,561	-2,184,644	-1,663,307	-2,505,669	-2,165,526	-1,301,937	-2,195,578	-3,391,739	-1,581,465	-1,580,662	-1,760,791	-1,749,518	-1,100,788
Independent Wind	0	0	0	0	0	-4	8	-141	-6	-3	61	425	-148	501	-2,596	3,889	3,471	438
Interconnector	-915	-932	-530	-2,165	-6,721	-34,753	-52,317	-35,229	-69,218	-67,862	-44,386	-70,185	-110,845	-59,684	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	-1	-16	-9,699	-10,357	-6,594
Vertically Integrated	-5,943,060	-8,038,415	-5,080,923	-21,508,125	-9,733,224	-6,587,723	-10,141,638	-8,386,370	-13,083,291	-11,490,675	-6,961,739	-12,620,827	-20,436,868	-8,711,578	-8,011,492	-9,235,155	-10,018,059	-6,384,557
50																		
Independent Supplier	-73,055	-137,419	-114,525	-385,010	-173,104	-139,908	-228,535	-188,591	-341,065	-284,583	-265,744	-458,404	-875,030	-484,780	-310,860	-378,181	-399,231	-261,091
Independent Thermal	-844,454	-1,364,154	-986,477	-3,017,720	-1,424,526	-1,151,441	-1,609,878	-1,281,802	-2,057,237	-1,634,662	-1,018,467	-1,762,318	-2,709,571	-1,234,520	-1,251,967	-1,431,768	-1,432,132	-787,946
Independent Wind	0	0	0	0	0	-2	3	-141	-6	-2	54	387	-131	201	-2,271	3,155	3,062	380
Interconnector	-730	-676	-424	-1,583	-5,657	-29,397	-39,574	-27,018	-56,515	-51,291	-34,635	-55,976	-88,081	-46,716	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-13	-7,903	-8,404	-4,196
Vertically Integrated	-4,351,695	-6,124,481	-4,105,205	-17,003,748	-7,582,020	-5,439,909	-7,451,825	-6,458,002	-10,755,243	-8,683,788	-5,451,949	-10,128,796	-16,331,278	-6,783,881	-6,355,119	-7,510,147	-8,220,808	-4,596,972
100																		
Independent Supplier	-53,981	-104,225	-94,686	-307,729	-133,026	-112,901	-174,540	-144,304	-275,688	-218,464	-204,820	-356,810	-675,397	-378,251	-236,053	-298,928	-318,920	-193,316
Independent Thermal	-631,195	-1,029,027	-810,506	-2,423,590	-1,094,309	-931,178	-1,228,738	-983,439	-1,659,995	-1,256,929	-780,539	-1,376,140	-2,092,610	-963,610	-949,326	-1,131,595	-1,143,049	-584,812
Independent Wind	0	0	0	0	0	0	-2	-131	-6	-1	49	355	-108	207	-1,861	2,442	2,695	330
Interconnector	-588	-499	-343	-1,228	-4,539	-24,334	-30,527	-21,032	-45,112	-40,045	-26,640	-44,147	-67,751	-36,502	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-9	-6,205	-6,685	-2,925
Vertically Integrated	-3,259,000	-4,603,346	-3,369,492	-13,670,178	-5,823,804	-4,383,718	-5,676,764	-4,956,081	-8,678,474	-6,692,378	-4,192,451	-7,893,137	-12,607,954	-5,282,584	-4,824,783	-5,930,744	-6,557,745	-3,415,195
250																		
Independent Supplier	-21,089	-41,241	-50,101	-142,576	-55,816	-54,563	-70,497	-61,896	-129,306	-97,078	-83,122	-158,361	-287,710	-186,243	-92,920	-136,259	-153,777	-82,452
Independent Thermal	-251,299	-407,379	-425,733	-1,125,248	-457,661	-453,720	-497,914	-421,650	-776,489	-559,754	-313,348	-613,332	-891,270	-472,657	-370,655	-517,603	-548,023	-252,300
Independent Wind	0	0	0	0	0	-1	-6	-80	-4	0	26	194	-43	281	-923	1,264	1,669	214
Interconnector	-273	-187	-171	-543	-2,027	-12,339	-12,606	-9,342	-20,356	-18,283	-10,752	-19,885	-28,463	-18,102	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-4	-2,892	-3,181	-1,104
Vertically Integrated	-1,302,256	-1,819,882	-1,766,634	-6,335,542	-2,427,964	-2,120,710	-2,294,840	-2,122,391	-4,057,425	-2,999,697	-1,696,093	-3,511,872	-5,367,065	-2,579,263	-1,900,652	-2,709,766	-3,144,542	-1,467,695
350																		
Independent Supplier	-9,903	-19,023	-29,905	-72,137	-26,824	-29,937	-32,963	-30,107	-66,481	-46,523	-37,946	-78,400	-140,385	-108,212	-42,428	-68,482	-80,718	-38,378
Independent Thermal	-117,548	-189,943	-252,884	-574,215	-219,924	-249,384	-233,349	-201,871	-398,067	-270,058	-143,539	-305,065	-434,032	-272,563	-168,748	-261,604	-287,839	-118,314
Independent Wind	0	0	0	0	0	0	-2	-48	-2	1	18	101	-21	324	-563	721	1,128	126
Interconnector	-141	-89	-96	-282	-1,014	-7,097	-5,962	-4,667	-10,342	-8,889	-4,851	-10,045	-13,738	-10,880	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	-2	-1,502	-1,714	-500
Vertically Integrated	-612,592	-852,477	-1,048,284	-3,222,630	-1,164,724	-1,159,962	-1,075,504	-1,021,330	-2,075,762	-1,450,927	-779,952	-1,747,161	-2,616,246	-1,484,228	-867,386	-1,363,663	-1,642,300	-685,285

Table 8 - Total impacts of P305 scenarios on RCRC (£s) – Area A+B

Sum of rcrc_delta	Column Labels																	
	Live																	
	Single																	
	2010				2011				2012				2013				2014	
Row Labels	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
1																		
Independent Supplier	32,800	97,020	138,008	89,283	107,286	141,091	137,807	190,611	147,874	245,147	319,735	418,100	506,938	482,374	405,124	516,414	280,725	220,813
Independent Thermal	319,377	991,803	1,260,334	697,491	902,736	1,108,629	922,957	1,318,901	899,960	1,356,540	1,210,833	1,603,772	1,537,567	1,252,206	1,641,621	1,905,658	1,015,562	656,893
Independent Wind	0	1	0	0	0	13	-14	31	2	28	-80	137	22	-1,413	1,755	801	-667	-144
Interconnector	409	415	470	1,039	5,528	22,624	24,264	33,093	35,939	45,661	43,795	55,538	51,668	40,635	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	19	10,316	7,591	6,036
Vertically Integrated	1,762,816	4,701,077	5,343,988	3,808,886	5,082,211	5,603,538	4,268,509	6,969,052	4,753,921	6,990,152	6,523,368	9,218,783	9,392,478	7,167,679	8,348,286	10,246,362	5,772,845	3,753,783
50																		
Independent Supplier	49,344	119,247	153,748	148,092	135,496	155,471	182,030	220,398	191,773	296,244	357,784	477,613	616,991	549,738	442,916	558,362	328,147	259,395
Independent Thermal	510,566	1,215,192	1,395,440	1,146,458	1,127,347	1,225,051	1,243,252	1,520,663	1,170,445	1,647,176	1,356,852	1,829,162	1,874,587	1,423,486	1,795,248	2,066,531	1,181,724	775,184
Independent Wind	0	1	0	0	0	14	-15	30	2	28	-82	113	44	-1,668	1,909	236	-941	-179
Interconnector	511	553	529	1,332	6,001	25,375	31,135	37,457	43,316	54,855	48,662	62,846	63,199	47,392	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	20	11,201	8,582	6,601
Vertically Integrated	2,729,417	5,713,098	5,900,890	6,319,011	6,261,759	6,161,224	5,763,708	7,984,715	6,159,466	8,534,826	7,302,966	10,515,891	11,411,832	8,118,181	9,119,899	11,082,385	6,711,278	4,453,919
100																		
Independent Supplier	61,234	138,165	165,011	192,035	158,982	170,643	211,578	245,580	233,200	333,218	392,147	533,958	720,912	609,203	483,036	600,990	372,636	291,530
Independent Thermal	644,114	1,405,824	1,494,494	1,486,295	1,320,225	1,348,770	1,453,077	1,689,753	1,421,046	1,858,602	1,491,311	2,041,620	2,197,326	1,572,339	1,957,771	2,229,902	1,341,716	872,914
Independent Wind	0	1	0	0	0	15	-18	37	2	29	-85	92	64	-1,640	2,164	-314	-1,162	-214
Interconnector	591	655	572	1,518	6,609	28,328	36,167	40,777	50,178	61,193	53,064	69,361	74,018	53,228	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	22	12,156	9,530	7,059
Vertically Integrated	3,413,342	6,574,752	6,314,213	8,217,221	7,285,156	6,750,676	6,736,369	8,833,231	7,469,615	9,654,969	8,014,376	11,751,208	13,352,014	8,939,946	9,936,755	11,931,523	7,630,888	5,030,202
250																		
Independent Supplier	82,383	177,809	193,174	293,086	206,803	208,926	275,330	296,015	331,851	408,609	468,616	653,442	940,838	727,281	568,806	694,834	473,044	354,712
Independent Thermal	888,044	1,795,885	1,735,015	2,288,727	1,714,208	1,662,202	1,902,547	2,033,013	2,014,114	2,291,204	1,785,708	2,499,271	2,882,192	1,871,574	2,305,658	2,589,723	1,703,336	1,063,367
Independent Wind	0	1	0	0	0	14	-20	71	3	29	-100	-31	112	-1,567	2,724	-1,216	-1,841	-302
Interconnector	782	851	676	1,908	8,100	36,707	47,415	47,879	66,206	74,867	63,050	83,956	96,393	64,616	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	25	14,195	11,681	7,988
Vertically Integrated	4,667,504	8,307,109	7,312,769	12,739,531	9,377,669	8,226,584	8,811,880	10,558,132	10,568,078	11,955,232	9,586,471	14,379,686	17,459,616	10,580,042	11,684,857	13,793,323	9,702,839	6,149,957
350																		
Independent Supplier	90,359	193,797	207,827	340,186	226,805	226,732	301,050	317,368	377,472	443,326	500,528	706,612	1,033,878	780,684	603,468	737,100	522,493	383,443
Independent Thermal	982,330	1,951,896	1,859,005	2,660,655	1,877,593	1,809,942	2,084,081	2,180,526	2,288,570	2,490,310	1,906,359	2,704,198	3,171,879	2,007,576	2,444,863	2,751,570	1,879,106	1,150,980
Independent Wind	0	1	0	0	0	14	-17	93	4	29	-107	-103	127	-1,524	2,955	-1,644	-2,221	-369
Interconnector	873	921	729	2,076	8,767	40,680	52,057	51,025	73,246	81,393	67,249	90,511	105,684	69,558	0	0	0	0
NULL	0	0	0	0	0	0	0	0	0	0	0	0	0	0	27	15,131	12,686	8,382
Vertically Integrated	5,152,805	8,996,408	7,826,020	14,834,943	10,242,572	8,918,001	9,647,121	11,295,439	12,003,356	13,020,859	10,236,023	15,551,204	19,196,162	11,321,304	12,393,866	14,633,131	10,716,989	6,660,179

Table 9 - Total impacts of P305 scenarios on RCRC (£s) – Area A+B+C

Sum of rcrc_delta	Column Labels			
	RSP			
	Single			
	2013			
Row Labels	1	2	3	4
1				
Independent Supplier	541,818	497,358	438,543	172,546
Independent Thermal	1,646,499	1,292,496	1,773,294	688,373
Independent Wind	44	-1,503	1,793	1,337
Interconnector	54,695	42,279	0	0
NULL	0	0	20	3,807
Vertically Integrated	10,068,873	7,390,241	9,056,570	3,506,741
50				
Independent Supplier	654,066	559,480	474,693	189,414
Independent Thermal	1,992,192	1,450,340	1,919,374	755,588
Independent Wind	57	-1,745	1,935	913
Interconnector	66,485	48,565	0	0
NULL	0	0	22	4,212
Vertically Integrated	12,143,458	8,261,267	9,787,503	3,839,143
100				
Independent Supplier	756,576	617,646	511,479	207,082
Independent Thermal	2,308,929	1,595,625	2,068,607	826,119
Independent Wind	74	-1,715	2,183	515
Interconnector	77,164	54,218	0	0
NULL	0	0	23	4,645
Vertically Integrated	14,049,904	9,062,872	10,531,926	4,187,264
250				
Independent Supplier	977,182	736,040	601,495	248,053
Independent Thermal	2,994,561	1,895,522	2,433,697	989,242
Independent Wind	117	-1,632	2,773	-69
Interconnector	99,434	65,629	0	0
NULL	0	0	27	5,592
Vertically Integrated	18,165,575	10,707,904	12,372,274	4,995,379
350				
Independent Supplier	1,074,353	791,479	638,875	266,682
Independent Thermal	3,296,248	2,036,864	2,583,279	1,063,430
Independent Wind	131	-1,590	3,003	-329
Interconnector	109,117	70,831	0	0
NULL	0	0	28	6,025
Vertically Integrated	19,979,764	11,479,733	13,138,455	5,366,601

Table 10 - Total impacts of P305 scenarios on Net Positions (£s) – Area A

Sum of net_impact	Column Labels																	
	Live																	
	Twin																	
	2010				2011				2012				2013				2014	
Row Labels	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
1																		
Independent Supplier	337,209	490,293	330,745	1,276,712	703,528	674,052	734,471	758,868	775,953	937,136	616,916	940,730	1,347,789	642,381	769,503	925,216	927,497	716,642
Independent Thermal	-562,524	-256,946	-284,925	-529,334	-586,556	-465,102	269,613	-418,063	-695,587	-620,729	-136,300	-577,916	-1,074,155	-581,151	-415,841	-593,967	-614,644	-403,922
Independent Wind	0	2	0	12	3	-1	21	-133	4	5	74	456	4,133	554	39,604	3,932	3,516	457
Interconnector	23,150	24,418	9,117	43,964	64,111	452	98,348	48,257	24,990	31,964	34,018	32,766	-6,836	13,872	76,051	50,885	68,074	17,656
NULL	0	0	0	0	0	0	0	0	0	0	0	0	2,551	34	2,044	51,983	105,267	37,687
Vertically Integrated	202,164	-257,766	-54,938	-791,353	-181,086	-209,400	-1,102,453	-388,928	-105,358	-348,375	-514,709	-396,035	-273,479	-75,688	-471,361	-438,049	-489,709	-368,521
50																		
Independent Supplier	245,129	349,610	276,462	980,676	525,592	541,883	550,430	559,448	627,382	684,056	473,954	743,558	1,068,193	496,221	600,129	753,974	755,935	533,057
Independent Thermal	-427,381	-195,221	-242,508	-376,597	-487,756	-407,376	208,761	-309,580	-556,360	-492,811	-116,368	-470,324	-877,824	-459,342	-340,343	-513,272	-483,109	-253,587
Independent Wind	0	1	0	9	2	1	13	-135	2	3	63	411	3,395	243	30,584	3,189	3,097	394
Interconnector	17,465	15,932	7,275	31,584	52,618	-1,826	45,090	42,359	19,242	22,295	26,683	22,755	-8,170	6,984	54,790	40,596	56,180	14,096
NULL	0	0	0	0	0	0	0	0	0	0	0	0	2,543	88	1,191	38,650	80,410	29,972
Vertically Integrated	164,787	-170,323	-41,228	-635,673	-90,457	-132,682	-804,294	-292,092	-90,265	-213,543	-384,332	-296,400	-188,135	-44,193	-346,350	-323,137	-412,511	-323,932
100																		
Independent Supplier	182,972	249,642	226,643	772,026	391,142	432,010	420,546	412,588	498,817	524,594	352,896	576,630	820,577	392,943	454,224	588,003	594,420	396,774
Independent Thermal	-321,150	-158,815	-206,209	-324,096	-385,102	-348,641	132,238	-242,027	-433,260	-382,587	-95,513	-369,003	-682,637	-367,157	-258,110	-416,502	-388,538	-180,916
Independent Wind	0	1	0	7	2	3	4	-126	0	3	56	373	2,540	240	24,395	2,470	2,724	341
Interconnector	13,843	10,494	5,610	24,128	38,877	-2,640	24,721	31,989	11,829	14,618	15,300	18,396	-9,947	2,926	35,376	30,641	45,509	11,171
NULL	0	0	0	0	0	0	0	0	0	0	0	0	1,374	69	904	28,953	64,875	23,313
Vertically Integrated	124,335	-101,322	-26,044	-472,065	-44,919	-80,731	-577,508	-202,423	-77,385	-156,627	-272,739	-226,396	-131,906	-29,021	-256,788	-233,563	-318,988	-250,682
250																		
Independent Supplier	68,370	79,447	118,541	346,452	153,805	201,299	164,788	161,852	220,732	229,419	133,638	254,450	349,845	194,331	168,827	256,254	276,595	172,162
Independent Thermal	-125,423	-85,793	-121,202	-141,572	-182,267	-191,568	33,981	-123,761	-194,103	-184,191	-30,824	-144,447	-289,864	-187,428	-104,441	-189,236	-199,311	-77,733
Independent Wind	0	0	0	3	1	0	-4	-78	-2	2	29	202	903	299	9,717	1,277	1,684	219
Interconnector	6,431	3,538	2,156	10,375	12,645	-2,501	8,574	12,812	-452	3,855	1,291	9,799	-5,926	-437	10,719	11,803	18,120	5,372
NULL	0	0	0	0	0	0	0	0	0	0	0	0	459	25	253	12,895	33,836	8,907
Vertically Integrated	50,622	2,809	505	-215,259	15,816	-7,230	-207,340	-50,826	-26,176	-49,084	-104,134	-120,003	-55,416	-6,790	-85,075	-92,993	-130,924	-108,926
350																		
Independent Supplier	30,611	34,604	69,480	174,231	71,320	107,267	75,723	73,603	111,884	109,527	58,848	127,071	171,833	112,679	77,411	128,583	150,795	83,167
Independent Thermal	-53,757	-49,876	-76,483	-69,602	-95,927	-108,820	17,037	-72,089	-106,089	-98,641	-13,715	-64,432	-137,789	-112,689	-52,565	-91,506	-109,500	-35,222
Independent Wind	0	0	0	2	0	1	-1	-47	-1	2	20	105	421	336	4,247	728	1,136	128
Interconnector	3,011	1,619	1,030	4,991	7,021	-1,911	3,958	5,214	-756	1,195	-94	5,557	-3,231	-1,286	4,203	5,432	8,387	2,459
NULL	0	0	0	0	0	0	0	0	0	0	0	0	197	15	66	6,634	20,074	4,171
Vertically Integrated	20,135	13,653	5,973	-109,622	17,585	3,464	-96,717	-6,681	-5,038	-12,083	-45,058	-68,301	-31,431	945	-33,362	-49,871	-70,893	-54,703

Table 11 - Total impacts of P305 scenarios on Net Positions (£s) – Area A+B

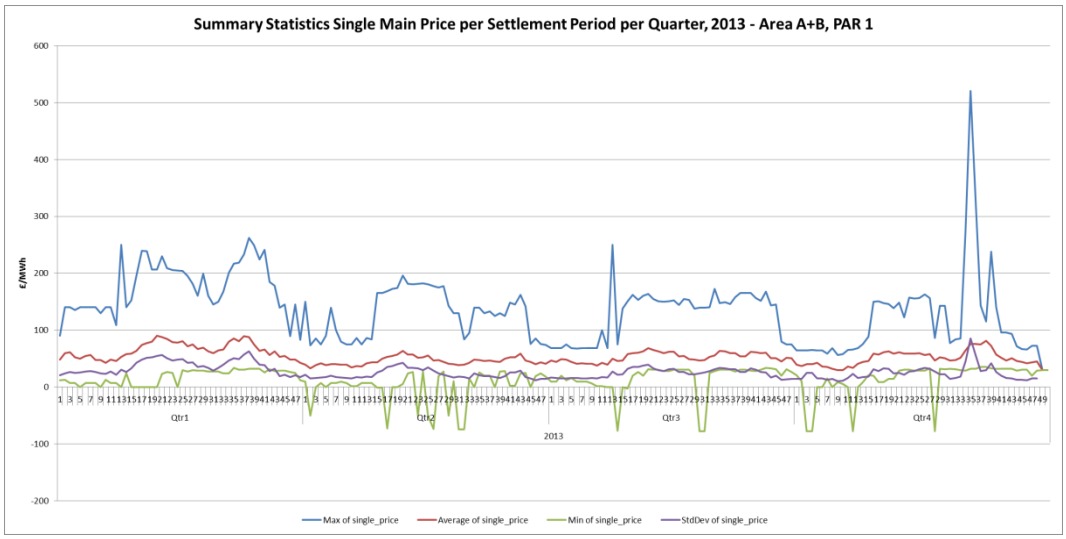
Sum of net_impact	Column Labels																	
	Live																	
	Single																	
	2010				2011				2012				2013				2014	
Row Labels	1	2	3	4	1	2	3	4	1	2	3	4	1	2	3	4	1	2
1																		
Independent Supplier	-456,603	-935,958	-779,325	-3,815,295	-2,058,847	-1,561,219	-1,989,471	-1,379,505	-1,337,757	-1,581,779	-1,266,866	-2,041,753	-3,537,943	-1,076,011	-2,399,095	-2,951,184	-1,948,941	-874,785
Independent Thermal	-842,122	-888,786	-517,296	-2,523,075	-1,246,945	-507,070	-493,416	-896,873	-1,818,925	-2,261,804	-928,537	-1,123,767	-2,283,667	-485,685	-674,803	-434,826	-598,517	-397,936
Independent Wind	0	-59	0	5	-15	4	-38	-10	-73	-52	-142	8	-1,305	-1,522	-166,537	587	-895	-246
Interconnector	-88,762	-68,885	-69,745	-186,253	-116,010	-138,216	-100,334	-217,952	-234,519	-67,201	-177,476	-153,065	-115,975	-125,666	-164,587	-158,800	-108,905	-45,107
NULL	0	0	0	0	0	0	0	0	0	0	0	0	91	-2,477	-6,419	-322,115	-305,715	-106,702
Vertically Integrated	1,387,487	1,893,688	1,366,367	6,524,619	3,421,816	2,206,500	2,583,259	2,494,339	3,391,273	3,910,836	2,373,020	3,318,576	5,938,798	1,691,361	3,411,441	3,866,337	2,962,972	1,424,775
50																		
Independent Supplier	-490,048	-975,483	-785,031	-3,651,645	-2,058,860	-1,571,932	-1,915,225	-1,454,425	-1,381,331	-1,677,129	-1,316,366	-2,072,990	-3,466,557	-1,101,943	-2,378,582	-2,938,197	-1,960,561	-940,459
Independent Thermal	-683,059	-774,848	-460,221	-2,175,850	-1,099,343	-443,941	-518,281	-771,215	-1,585,753	-2,005,274	-854,970	-978,152	-1,982,357	-363,771	-597,891	-351,992	-459,304	-285,046
Independent Wind	0	-57	0	2	-14	5	-40	-10	-70	-47	-142	-12	-1,554	-1,776	-167,660	27	-1,162	-275
Interconnector	-87,466	-71,146	-67,719	-176,867	-118,590	-136,182	-135,823	-209,186	-229,102	-73,309	-173,080	-156,963	-113,845	-127,697	-177,639	-161,817	-112,895	-44,526
NULL	0	0	0	0	0	0	0	0	0	0	0	0	83	-2,179	-7,056	-314,782	-308,578	-101,026
Vertically Integrated	1,260,574	1,821,534	1,312,971	6,004,360	3,276,808	2,152,049	2,569,369	2,434,836	3,196,255	3,755,760	2,344,559	3,208,116	5,564,230	1,597,367	3,328,828	3,766,761	2,842,499	1,371,331
100																		
Independent Supplier	-513,217	-1,001,738	-801,364	-3,528,688	-2,038,607	-1,587,326	-1,885,469	-1,508,208	-1,419,046	-1,723,263	-1,362,440	-2,103,537	-3,402,049	-1,124,123	-2,374,427	-2,959,767	-1,973,485	-975,861
Independent Thermal	-548,945	-685,347	-406,476	-1,980,308	-957,748	-375,400	-562,098	-683,944	-1,376,739	-1,798,241	-793,681	-834,999	-1,680,490	-273,366	-496,261	-249,765	-350,631	-207,066
Independent Wind	0	-51	0	0	-14	6	-44	-4	-67	-44	-143	-30	-2,155	-1,748	-164,125	-518	-1,376	-306
Interconnector	-84,620	-71,812	-66,506	-171,159	-124,326	-132,148	-142,369	-208,965	-225,381	-80,429	-176,252	-155,758	-112,499	-127,438	-189,819	-165,185	-117,373	-43,877
NULL	0	0	0	0	0	0	0	0	0	0	0	0	-1,073	-2,093	-7,125	-304,902	-302,752	-99,017
Vertically Integrated	1,146,782	1,758,948	1,274,346	5,680,154	3,120,695	2,094,868	2,589,980	2,401,120	3,021,233	3,601,977	2,332,516	3,094,323	5,198,266	1,528,769	3,231,757	3,680,137	2,745,616	1,326,126
250																		
Independent Supplier	-552,256	-1,049,949	-836,213	-3,272,331	-1,987,445	-1,662,596	-1,877,325	-1,595,640	-1,491,606	-1,830,262	-1,446,108	-2,179,168	-3,288,829	-1,190,716	-2,413,509	-3,014,441	-2,015,419	-1,024,361
Independent Thermal	-297,208	-522,943	-297,296	-1,478,311	-661,636	-200,699	-592,398	-504,575	-956,741	-1,416,796	-667,056	-495,671	-1,086,822	-82,759	-312,185	386	-125,446	-59,757
Independent Wind	0	-44	-1	-4	-13	5	-47	32	-60	-38	-157	-149	-3,165	-1,676	-158,210	-1,414	-2,041	-385
Interconnector	-79,851	-68,720	-65,018	-162,308	-136,933	-122,836	-138,512	-205,505	-212,326	-85,885	-177,657	-149,477	-99,737	-121,044	-200,941	-171,278	-131,885	-43,970
NULL	0	0	0	0	0	0	0	0	0	0	0	0	-1,971	-2,096	-7,386	-287,004	-292,626	-98,830
Vertically Integrated	929,315	1,641,656	1,198,527	4,912,954	2,786,026	1,986,125	2,608,282	2,305,687	2,660,732	3,332,981	2,290,978	2,824,464	4,480,523	1,398,290	3,092,230	3,473,750	2,567,416	1,227,303
350																		
Independent Supplier	-563,840	-1,057,534	-858,790	-3,176,796	-1,970,706	-1,697,479	-1,891,966	-1,624,363	-1,521,461	-1,885,046	-1,479,363	-2,222,670	-3,264,834	-1,229,730	-2,426,860	-3,033,849	-2,037,020	-1,044,673
Independent Thermal	-209,327	-459,716	-242,858	-1,278,286	-541,895	-110,947	-583,845	-425,081	-799,931	-1,256,918	-629,895	-362,483	-858,390	-3,299	-248,591	106,233	-15,627	11,044
Independent Wind	0	-40	-1	-5	-13	5	-44	55	-56	-36	-163	-219	-3,302	-1,635	-156,705	-1,841	-2,416	-450
Interconnector	-79,480	-67,733	-64,067	-160,463	-137,244	-118,448	-136,052	-201,753	-201,611	-87,129	-174,597	-145,529	-93,971	-117,576	-203,211	-172,880	-136,583	-44,781
NULL	0	0	0	0	0	0	0	0	0	0	0	0	-2,218	-2,099	-7,463	-281,765	-291,863	-98,872
Vertically Integrated	852,647	1,585,024	1,165,716	4,615,550	2,649,858	1,926,869	2,611,907	2,251,140	2,523,058	3,229,128	2,284,016	2,730,900	4,222,714	1,354,339	3,042,829	3,384,099	2,483,508	1,177,731

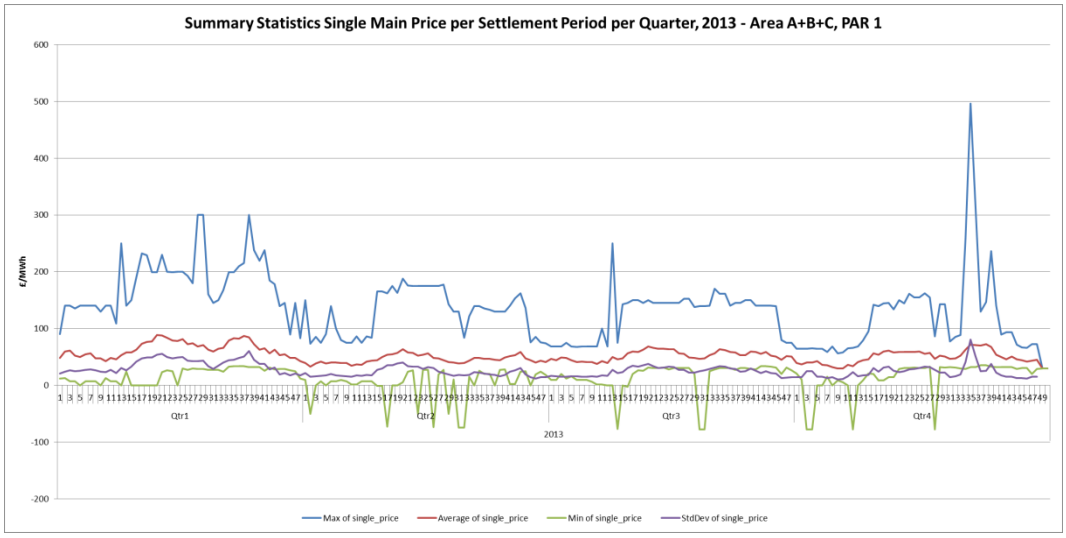
Table 12 - Total impacts of P305 scenarios on Net Positions (£s) – Area A+B+C

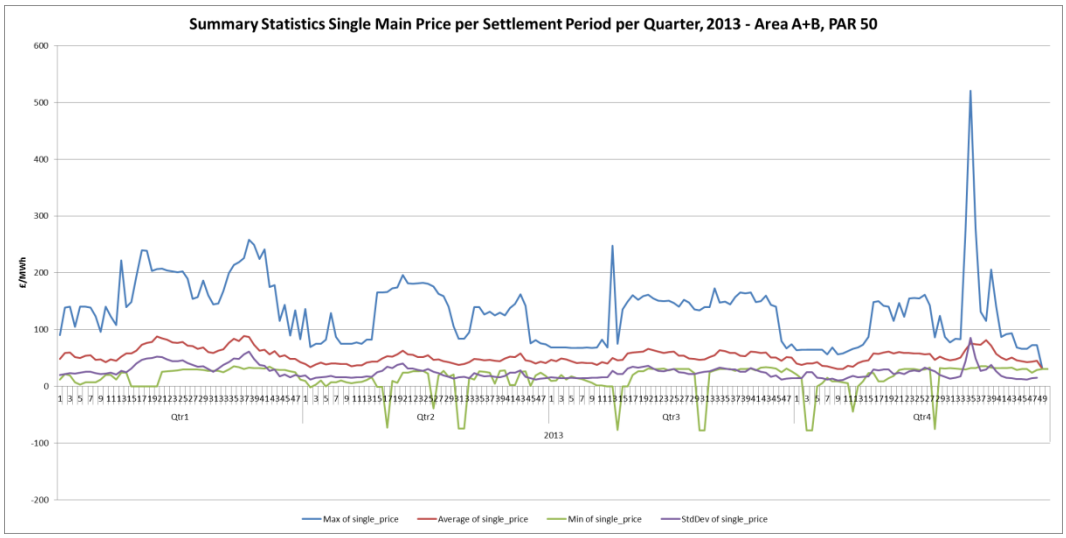
Sum of net_impact	Column Labels			
	RSP			
	Single			
	2013			
Row Labels	1	2	3	4
1				
Independent Supplier	-3,584,690	-1,254,792	-2,651,268	-864,272
Independent Thermal	-2,148,153	-458,257	-432,982	-230,666
Independent Wind	-2,122	-1,616	-175,473	1,263
Interconnector	-116,686	-125,288	-165,691	-52,038
NULL	-807	-2,514	-6,685	-119,004
Vertically Integrated	5,852,457	1,842,466	3,432,098	1,264,716
50				
Independent Supplier	-3,517,322	-1,280,857	-2,628,359	-854,689
Independent Thermal	-1,821,499	-353,921	-335,121	-180,097
Independent Wind	-2,088	-1,857	-175,130	841
Interconnector	-114,355	-123,114	-178,750	-52,613
NULL	-806	-2,216	-7,286	-115,275
Vertically Integrated	5,456,068	1,761,964	3,324,647	1,201,833
100				
Independent Supplier	-3,442,629	-1,289,864	-2,615,071	-861,046
Independent Thermal	-1,506,998	-259,738	-255,964	-128,041
Independent Wind	-2,523	-1,826	-168,995	445
Interconnector	-114,698	-124,378	-187,964	-54,133
NULL	-1,475	-2,130	-7,331	-109,186
Vertically Integrated	5,068,321	1,677,936	3,235,325	1,151,961
250				
Independent Supplier	-3,317,721	-1,326,551	-2,611,245	-858,112
Independent Thermal	-884,200	-52,586	-84,643	-1,750
Independent Wind	-3,366	-1,742	-159,175	-136
Interconnector	-103,168	-119,587	-208,001	-57,195
NULL	-2,548	-2,133	-7,647	-99,374
Vertically Integrated	4,311,000	1,502,598	3,070,710	1,016,568
350				
Independent Supplier	-3,261,019	-1,356,732	-2,604,932	-854,278
Independent Thermal	-632,622	29,916	-18,099	57,320
Independent Wind	-3,469	-1,701	-157,440	-395
Interconnector	-98,439	-116,012	-211,397	-57,939
NULL	-2,741	-2,136	-7,758	-96,639
Vertically Integrated	3,998,287	1,446,665	2,999,626	951,930

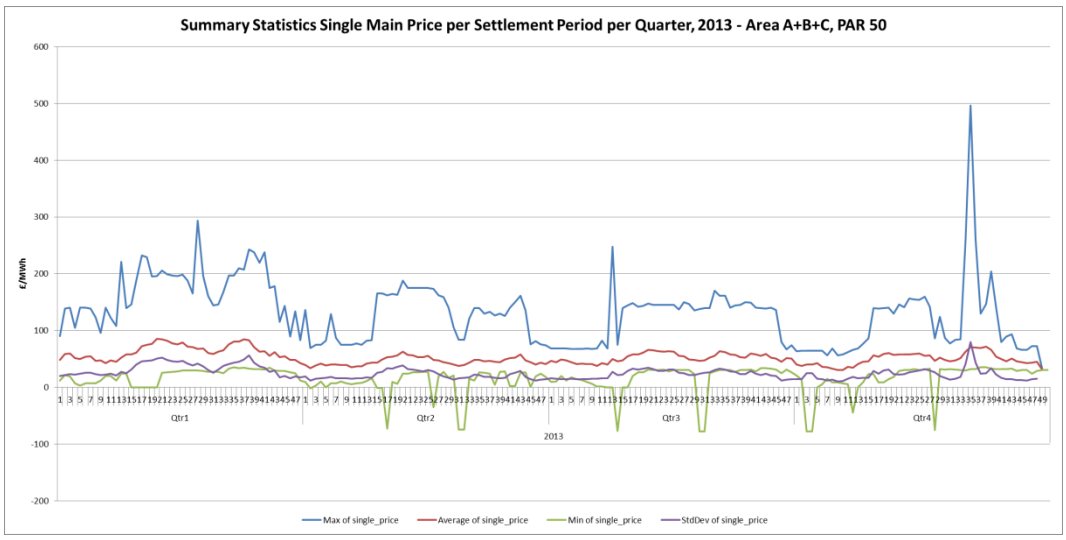
Additional charts

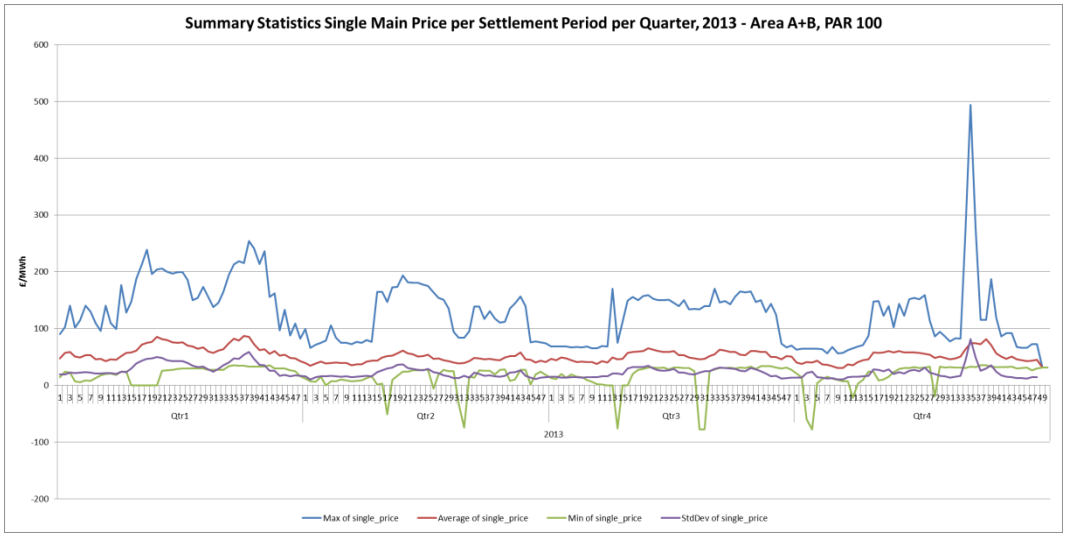
Summary Statistics

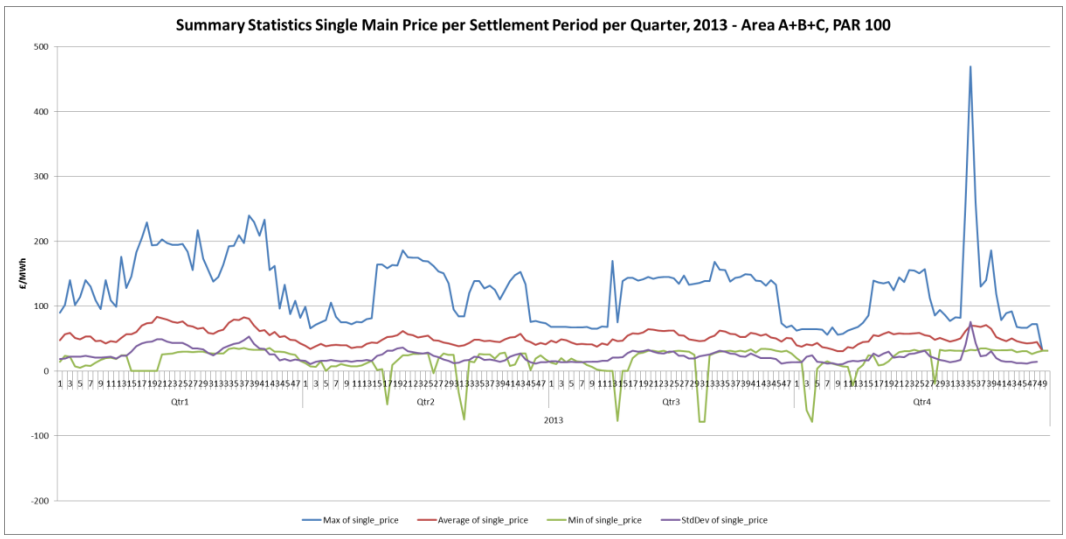


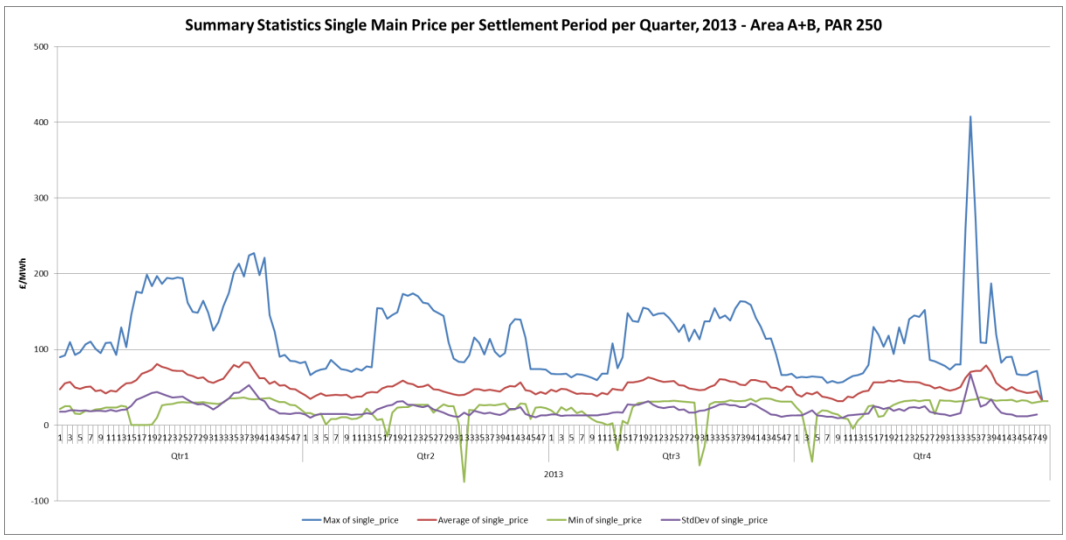


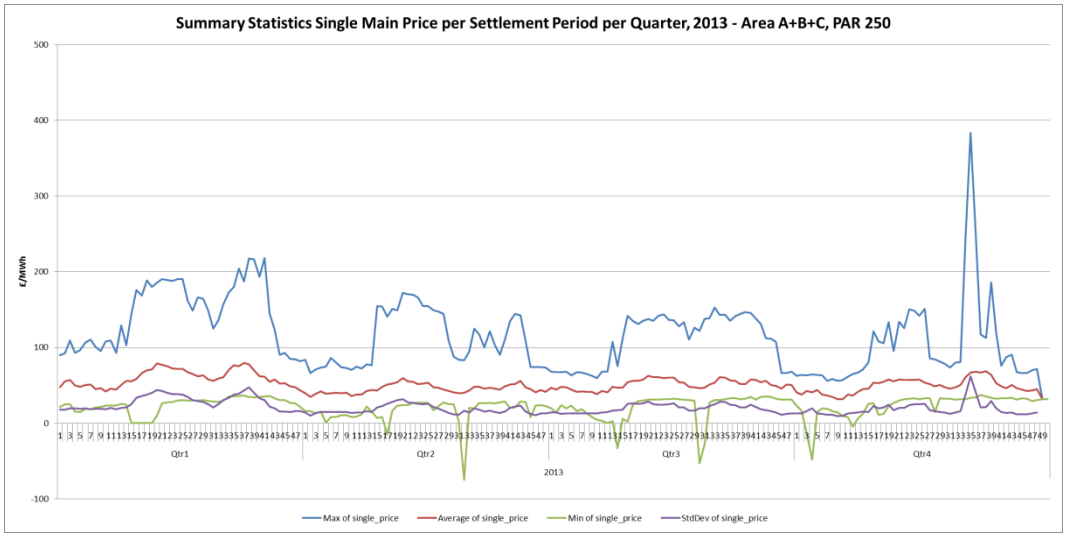


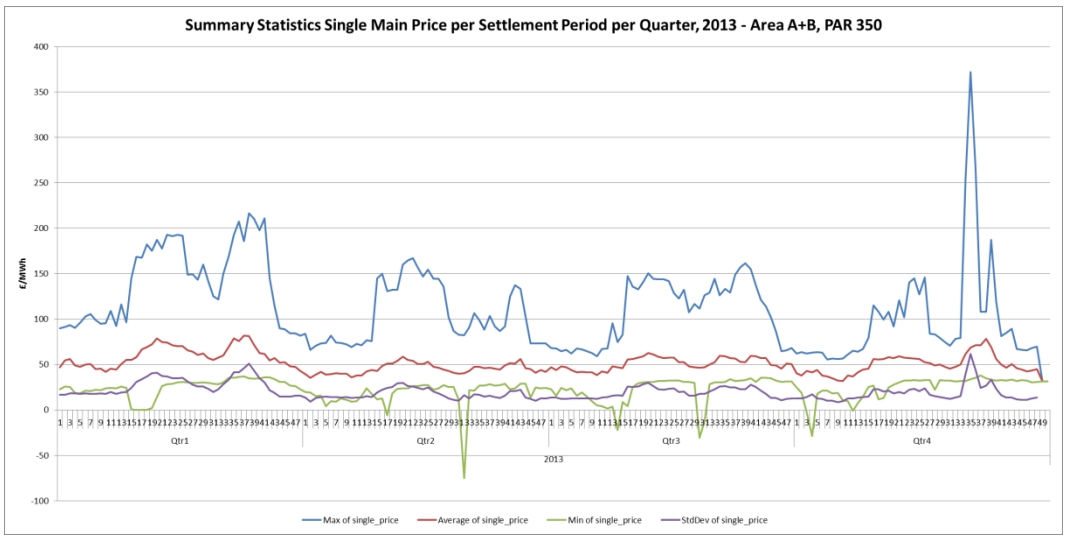


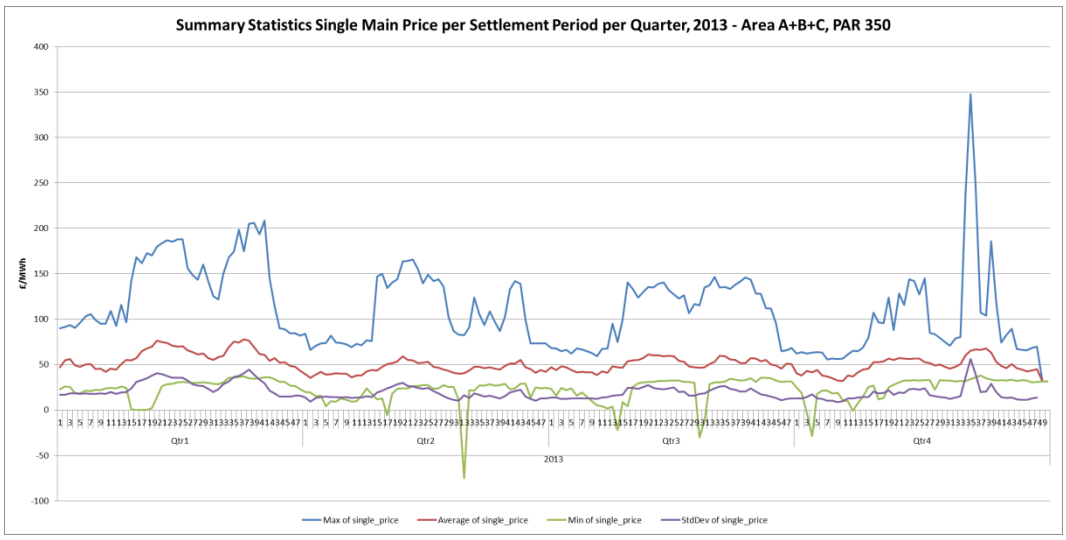












System Prices scatter by margin