SEM Committee Paper

Trading and Settlement Code

Policy Parameters 2016

Consultation Paper

SEM-15-042

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Contents

'The SEM Committee is established in Ireland and Northern Ireland by virtue of section 8A of the Electricity Regulation Act 1999 and Article 6 (1) of the Electricity (Single Wholesale Market) (Northern Ireland) Order 2007 respectively. The SEM Committee is a Committee of both CER and NIAUR (together the Regulatory Authorities) that, on behalf of the Regulatory Authorities, takes any decision as to the exercise of a relevant function of CER or NIAUR in relation to an SEM matter.'

1 INTRODUCTION

1.1.1 The SEM Trading and Settlement Code (the Code) sets out a number of policy parameters which are determined by the Regulatory Authorities (RAs) on an annual basis.

1.2 VOLL / PCAP / PFLOOR

1.2.1 In accordance with paragraph 4.12 and 4.95 of the Code, the RAs are required to determine the following three administered prices:

- the Value of Lost Load (VOLL);
- the Market Price Cap (PCAP); and,
- the Market Price Floor (PFLOOR).

1.2.2 Following consultation last year, the RAs decided (SEM-14-067) for the period from 1st January 2015 to 31st December 2015 that:

- PCAP will remain unchanged at €1,000/MWh;
- PFLOOR will remain unchanged at minus €100/MWh.

1.2.3 This Consultation Paper undertakes a review of the effectiveness of PCAP and PFLOOR with a view to setting the values for 2016.

1.2.4 The calculation of VOLL for 2016, using the methodology decided upon in 2007, will be published later in the year, to meet the requirement in paragraph 4.95 of the Code.

1.3 UPLIFT PARAMETERS

1.3.1 Under paragraphs 4.70 and 4.71 of the Code, the RAs are also required to determine three parameters used in the calculation of Uplift[1]. These are:

- The Uplift Alpha value α, which governs the importance of the Uplift Cost Objective, such that $0 \leq \alpha \leq 1$;
- The Uplift Beta value β, which governs the importance of the Uplift Profile Objective, such that $0 \leq \beta \leq 1$ and such that $\alpha + \beta = 1$; and
- The Uplift Delta value δ, to constrain the overall impact on revenue in each Trading Day t arising from the Uplift calculation, such that $\delta \geq 0$.

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[1] For more on the background to the methodology and objectives of Uplift in the SEM see the following: Objectives of the Function to Include Start-Up and No-load Costs in SMP(AIP/SEM/92/06), SMP Uplift Objectives – Decision Paper (AIP/SEM/142/06), SMP Uplift Parameters Consultation (AIP/SEM/230/06), and SMP Uplift Methodology and Parameters – Decision Paper (AIP/SEM/51/07)

1.3.2   Following consultation, the RAs last year decided (SEM-14-056) for the period from 1st January 2015 to 31st December 2015 that:

- α should be set to a value of 0.1;
- β should be set to a value of 0.9; and,
- δ should be set to a value of 5.

1.3.3   As stated in previous consultations, the RAs intend to monitor the effectiveness of the proposed Uplift Methodology. This paper presents some analysis of the behaviour of Uplift for the period May 2014 to April 2015 and proposes values for the three Uplift values (α, β and δ) for the year 2016.

2   PCAP

2.1.1   In each of the previous decision papers on PCAP, it was noted that the RAs were satisfied that:

- the various measures put in place to mitigate market power in the SEM (directed contracts and the requirement to bid at short run marginal cost) would limit the need for a cap on wholesale prices as a defence against the abuse of market power;
- the requirement on generators to bid at Short-run Marginal Cost (SRMC) should avoid prices in the SEM from spiking for reasons other than a spike in short run marginal costs (e.g. reflecting a spike in fuel prices) or from a spike in uplift;

2.1.2   There was nonetheless a case for setting PCAP at a conservative level, at least until:

- there was adequate liquidity in the contract market to enable participants to manage risk effectively;
- there was sufficient certainty that the MSP software does not frequently drive prices to PCAP at times when all load is actually being served.

2.1.3   The RAs therefore decided to set PCAP at a number which was a reasonable multiple of the expected SRMC of the most expensive plant on the system. It was argued that this would:

- allow for variations in SRMC during the year to be reflected in SMP without constraint; and,
- ensure that no generator would be expected to generate at a loss if its SRMC was higher than PCAP.

2.1.4   Thus since the beginning of the market, the RAs set PCAP at €1,000/MWh. This level is set to be at a margin above the highest SMP that could be expected in the market in the following year, but not so high as to allow prices to go to excessive levels in the event that the MSP Software fails to determine a price when there is an Insufficient Capacity Event.

2.2   PRICE OUTCOMES FOR THE PREVIOUS YEAR IN THE SEM

2.2.1   In order to propose the value for PCAP for 2016 and to gauge its performance to date, it is instructive to examine prices over the course of the previous year.

2.2.2   Market data for the period from 1 May 2014 to 30 April 2015 shows that SMP has exceeded €500/MWh on four occasions (0.02% of the time).

2.2.3   The table below shows the occurrences of SMP between the explicit price bands:

SMP	OCCURRENCES	PERCENTAGE
PERIOD - MAY '14 TO APRIL '15 ON 20TH APRIL 2015		
500+	4	0.02%
400 - 500	19	0.11%
300 - 400	13	0.07%
200 - 300	73	0.42%
100 - 200	752	4.30%
70 - 100	1,925	11.02%
50 - 70	4,307	24.65%
0 - 50	10,379	59.40%
<0	0	0.00%

2.2.4   The seven highest SMPs were as follows:

HIGHEST SMPS	DATE AND TIME
	MAY '14 TO APRIL '15 ON 20TH APRIL 2015
€955.38/MWh	29 June 2014 12:30
€944.13/MWh	29 June 2014 13:30
€938.50/MWh	29 June 2014 13:00
€740.26/MWh	11 March 2015 20:00
€492.00/MWh	01 September 2014 10:30
€472.93/MWh	07 January 2015 18:30
€466.59/MWh	23 April 2015 08:30

2.2.5   Uplift has been responsible for spikes in SMP on a number of occasions. Notably it was the main cause of the three of the seven highest SMPs over the period examined and was related to the recovery of start up costs for a number of different units during the relevant trading periods. The largest uplift in any one trading period

was €955.38/MWh. This was driven by the AES Ballylumford peaking unit coming on for three periods between 12:30 and 14:00 on 29th June 2014.

2.2.6   In the period being considered, the SMP exceeded €200/MWh in 109 trading periods (0.62% of the time). This compares with 170 trading periods (0.97% of the time) in the previous year (May 2013 to April 2014), and 157 (0.89%) trading periods in the May 2012 to April 2013 period.

2.3   EFFECTIVENESS

2.3.1   If SMP is frequently being set at PCAP - for reasons other than Insufficient Capacity Events in the MSP software or an inability of the software to reach a feasible solution - then it could be argued that PCAP was set at too low a level and that it was preventing the proper functioning of the price-setting algorithms in the market software.

2.3.2   However, the PCAP was set at a level sufficiently in excess of the SRMC of the most expensive unit on the system. This allows prices to be set as intended by the MSP software without constraint suggesting that PCAP was effective in achieving its objectives – i.e. allowing for variations in SRMC during the year to be reflected in SMP without constraint and ensuring that no generator would be expected to generate at a loss if its SRMC was higher than PCAP. The highest generator bid[2] on 29th June 2014 was £460.91 (circa €575/MWh); this bid was for the Kilroot Unit when running on coal. The next highest bid on 29th June 2014 was £347.14 (circa €433/MWh).

2.3.3   The analysis above suggests that a PCAP of €1,000/MWh is effective in achieving the objectives of a price cap in the SEM although SMP in June 2014 did reach a level close to PCAP.

2.3.4   However, for the reasons given previously i.e. the fact that other measures are in place to prevent prices from spiking for reasons other than SRMC bidding and because Insufficient Capacity Events are rarely likely to be declared by the MSP software, the RAs continue to see merit in maintaining the present level for PCAP. Furthermore, in the setting of parameter values in the SEM, the RAs are cognisant of the need for as much certainty as possible for participants operating in the market.

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[2] Interconnector offers were not analysed given that they are not subject to SRMC licence conditions.

2.3.5   The data presented for the year May 2014 to April 2015 above indicates that in general SMP has been on average lower than the period reviewed for the setting of the 2015 PCAP. The instance of price spikes and very high SMP is relatively unchanged (36 instances where SMP was more than €300/MWh in the May 2014 to April 2015 period compared to 39 instances in the May 2013 to April 2014 period). As mentioned above however, there were three periods where SMP was close to PCAP.

2.3.6   Coal prices have fallen significantly over the past twelve months with a 21% reduction in prices from this time last year. At the same time the day-ahead gas price has decreased by 7%. Carbon prices have seen a significant reduction also with prices for April 2015 now 37% lower than twelve months ago. In addition to movements in fuel prices, the Euro has fallen in value relative to the Dollar and Sterling since May 2014. As a result, in Euro terms coal prices are now the same as this time last year and gas prices have increased by 7%.

2.3.7   Forward fuel prices for the 2015/16 tariff period suggest a decrease of 6% in gas prices when compared to the average gas price over the last twelve months in Euro terms. Coal prices are forecast to be 7% higher during the 2015/16 period in Euro terms.

2.4   PROPOSAL

2.4.1   The SEM Committee therefore proposes to leave PCAP unchanged at €1,000/MWh for 2016.

3 PFLOOR

3.1.1 At the conclusion of last year's consultation, the RAs set PFLOOR in the SEM at minus €100/MWh, a level sufficiently below zero to allow for any generators whose short run marginal costs are a negative figure.

3.2 PRICE OUTCOMES SO FAR IN THE SEM

3.2.1 Market data for the period from May 2014 to April 2015 shows that:
- SMP was never below €0/MWh.
- SMP was €0/MWh on 4 occasions in reporting period. This is up from zero occasions over the previous 12 months.
- There has been an increase (from 40.22% to 59.40%) in the number of trading periods where the SMP was below €50/MWh when compared to the previous period;
- Negative bids were submitted by price making units in the period in question and,
- No Excessive Generation Events have been called.

3.3 EFFECTIVENESS

3.3.1 If SMP had frequently been set at PFLOOR - for reasons other than Excessive Generation Events in the MSP software – then it might be argued that PFLOOR was set at too high a level and that it was preventing the proper functioning of the price-setting algorithms in the market software.

3.3.2 PFLOOR has therefore been effective in achieving its objectives of minimising exposure of participants to negative prices whilst allowing for an efficient market price signal.

3.3.3 The period examined (May 2014 - April 2015) shows a higher occurrence of prices below €50/MWh relative to the period reviewed for the setting of the 2015 PFLOOR.

3.3.4 Furthermore, an Excessive Generation Event has yet to be declared by the MSP software and prices remain unlikely to go negative, at least in the short term, for reasons other than generator bidding behaviour.

3.4   PROPOSAL

3.4.1   The SEM Committee therefore proposes to leave PFLOOR unchanged at minus €100/MWh for 2016.

4   UPLIFT PARAMETERS

4.1.1   As with consultations on Uplift Parameter values, the RAs are approaching this consideration of the Uplift Parameters from the perspective of seeking to determine whether there is evidence that change is required, rather than from the perspective of a repeat of the full review process that concluded with the Decision Paper of 15th March 2007[3].

4.2   ANALYSIS

4.2.1   The Uplift values[4] calculated over the optimisation time horizon are optimised to meet two objective functions:

1.   Minimising Uplift revenues (the cost objective); and,
2.   Minimising Shadow Price distortion (the profile objective).

4.2.2   These functions are weighted within the optimisation by two Uplift parameters, α and β. In addition, a third Uplift parameter, δ, constrains the overall impact on revenue of the Uplift calculations.

4.2.3   The Code defines that α and β are complementary, such that $0 \leq \alpha \leq 1$, $0 \leq \beta \leq 1$ and $\alpha + \beta = 1$. The RAs concluded in the decision paper on the determination of the 2015 Uplift Parameters (SEM-14-056) that $\alpha = 0.1$, $\beta = 0.9$, $\delta = 5$ were the most appropriate Uplift parameters. This was a change from previous periods where α was set at 0, β set to 1 and δ set to 5. The SEM Committee proceeded with this change on the basis that making the change was not a disproportionate response given the potential gains for consumers and the expected minimal change to the market outcomes.

4.2.4   The analysis in the 2015 Policy Parameters Consultation Paper (SEM-14-022) focused on the behaviour of SMP when the Uplift parameter values are changed to $\alpha = 0.1$, $\beta = 0.9$ for four months – January, April, July and October 2013.

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[3] See http://www.allislandproject.org/GetAttachment.aspx?id=ed31f7f2-57d3-4a9c-b00d-9150e3fc93c5 for further details

[4] The uplift element of SMP is explicitly designed to cover the costs of start-up and no-load, and is defined such that all price maker generator units should, within each period of continuous operation, recover their scheduled costs of operation from SMP payments (i.e. without resort to make whole payments to individual generators). Uplift is calculated in an optimisation which minimises a weighted sum of total generator revenue and the sum of the square of the uplift price, reflecting the objectives set out in the Code

4.2.5   In considering the Uplift Parameter values for 2016, the RAs have undertaken further statistical analysis to examine the performance of Uplift and to determine whether the relationships between SMP, Shadow Prices and Uplift values have substantially changed from the previous analysis undertaken for the 2015 values.

4.2.6   Specifically, this paper presents analysis from the previous data set May 2013 – April 2014 for comparison to the May 2014 – April 2015 data set but will also analyse the four month period January to April in 2014 and 2015 given that the changes to Uplift only came into effect in January 2015.

PREVIOUS DATA SET – MAY 2013 TO APRIL 2014

€/MWh where appropriate	Shadow	Uplift	SMP
Mean	44.4	18.36	62.76
Median	46.58	10.30	55.05
Maximum	290.36	567.24	682.85
Minimum	0.03	0	0.03
Standard Deviation - All Trading Periods	14.24	28.58	35.87
Coefficient of variation	0.32	1.56	0.57

SMP correlated with…	Shadow	Uplift
Correlation	0.66	0.93

NEW DATA SET — MAY 2014 TO APRIL 2015

4.2.7   The RAs have examined the data for one year from May 2014 to April 2015 and the following are the results:

€/MWh where appropriate	Shadow	Uplift	SMP
Mean	39.41	14.76	54.17
Median	37.95	7.34	46.07
Maximum	330	886.72	955.38
Minimum	0	0	0
Standard Deviation - All Trading Periods	12.27	27.49	32.87
Coefficient of variation	0.31	1.86	0.61

SMP correlated with…	Shadow	Uplift
Correlation	0.59	0.93

4.2.8   From this it can be seen that there are some changes to the observed data. In particular it is noted that:

- the mean of the Shadow Price, the Uplift and the SMP have all decreased by 11.5%, 19.8% and 13.9% respectively in line with fuel price reductions
- the standard deviation of the Shadow Price, Uplift and the SMP has decreased by 14.5%, 3.8% and 8.3% respectively. The change in the standard deviation of the Shadow price suggests that the profile of the shadow price is less correlated with the demand profile as a result of the changes in the Uplift parameters that came into effect on 1 January 2015.
- the coefficient of variation has decreased slightly for the Shadow Price but has increased for both SMP and Uplift.
- the correlation between SMP and Uplift has increased slightly while the correlation between SMP and Shadow Price has decreased.

4.3   ANALYSIS OF THE EFFECT OF THE CHANGE IN UPLIFT PARAMETERS

4.3.1   In this section, the RAs have examined the data for the January – April period in both 2014 and 2015. The RAs note that this data set is not comprehensive but it should give an indication of ant impacts of the changes to the Uplift Parameters that came into effect in January 2015. Specifically the effects these changes have on the SMP, and Uplift and the correlation between each are outlined for the four month period.

DATA SET – JANUARY 2014 TO APRIL 2014

€/MWh where appropriate	SMP	Shadow	Uplift
Mean	62.41	45	17.40
Median	50.09	43.61	5.34
Maximum	670.25	290.36	509.27
Minimum	6.98	6.98	0.00
Standard Deviation - All Trading Periods	42.87	18.21	32.82
Coefficient of variation	0.69	0.40	1.89

SMP correlated with…	Shadow	Uplift
Correlation	0.70	0.92

DATA SET – JANUARY 2015 TO APRIL 2015

€/MWh where appropriate	SMP	Shadow	Uplift
Mean	54.95	41.22	13.73
Median	44.33	41.24	0.11
Maximum	740.26	320.00	422.41
Minimum	0.00	0.00	0.00
Standard Deviation - All Trading Periods	34.16	12.85	27.91
Coefficient of variation	0.62	0.31	2.03

SMP correlated with…	Shadow	Uplift
Correlation	0.63	0.93

4.3.2   From this it can be seen that there are some changes to the observed data. In particular it is noted that:

- The percentage of uplift in the SMP has reduced from 27.9% to 25%.
- the mean of the Shadow Price, the Uplift and the SMP have all decreased by 8%, 21% and 12% respectively.

- the standard deviation of the Shadow Price, Uplift and the SMP has decreased by 29%, 15% and 20% respectively. There is a significant reduction in the standard deviation which suggests that prices are less correlated with the demand profile as a result of the change in the Uplift beta (profile objective) parameter.
- the coefficient of variation have decreased for Shadow Price and SMP but has increased for Uplift.
- the correlation between SMP and Uplift has increased slightly while the correlation between SMP and Shadow Price has decreased. This result was not unexpected as the analysis carried out for the 2015 uplift parameters suggested that the correlation between SMP and Shadow Price would decrease but that this decrease should not have a material impact.

4.3.3 As stated above, the standard deviation has reduced in each of price component of the SMP. To further investigate, the correlation between the SMP and System Demand has been analysed between January and April for both 2014 and 2015. As can be seen the correlation has reduced by 16%.

	Correlation between SMP and System Demand
Jan – Feb 2014	0.55
Jan – Feb 2015	0.46

4.3.4 This outcome is not unexpected by the RAs. The analysis carried out by the RAs for the 2015 policy parameters consultation indicated there would be impacts on the SMP profile but that these changes did not appear to be excessive.

4.4 PROPOSED UPLIFT PARAMETERS FOR 2016

4.4.1 The RAs are minded to leave the current Uplift Parameters unchanged for 2016 for two reasons. Firstly, the changes to the Uplift Parameters arising from the last consultation only came into effect in January 2015 and therefore the impact of these changes is not fully quantifiable. Secondly, based on the data that is available, the standard deviation is significantly lower than the previous period as a result of the changes. It had been expected in previous consultations that any changes would increase the volatility of the SMP and, as a result, suppliers risk. This appears not to be the case in the three months of data that has been analysed in this paper and hence consumers should benefit from the reduction in Uplift rather than it being negated by any increased SMP volatility.

4.4.2　Based upon the above considerations, the SEM Committee proposes that the values of the Uplift Parameters for the year 2016 should remain unchanged. Therefore:

- α should be set at 0.1;
- β should be set at 0.9; and
- δ should be set at 5.

4.4.3　Lastly, the RAs recognise that a significantly reduced correlation between the SMP and System Demand could lead to negative impacts in the market with regard to having correct price signals for generator and/or interconnector utilisation. However given the limited data available and that the impact does not appear to be excessive at this stage, the RAs will nonetheless continue to closely monitor this correlation along with other related indicators throughout the year as further data becomes available.

5   PROPOSED PARAMETERS FOR 2016

5.1.1   As detailed in this paper, the SEM Committee proposes to leave the value of the policy parameters for 2016 unchanged as follows:

- PCAP at €1,000/MWh;
- PFLOOR at minus €100/MWh;
- Uplift Parameter α to be set at 0.1;
- Uplift Parameter β to be set at 0.9; and,
- Uplift Parameter δ to be set at 5.

5.1.2   The SEM Committee welcomes the views of interested parties on these proposals. It is intended to publish all responses received. If any respondent wishes all or part of their submission to remain confidential, this should be clearly stated in their response. Comments on this paper should be sent to Clive Bowers, preferably electronically, by 5pm on Tuesday 14th July 2015.

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