

P310 'REVISED CREDIT COVER FOR EXPORTING SUPPLIER BM UNITS' – DETAILED ANALYSIS

This is Attachment B to the P310 Assessment Consultation/Report. It provides additional detail of the Workgroup's analysis.

1. Initial views

Modification P310 will impact the data used in the first five working days of the credit calculation. This is the Settlement Dates prior to the II Settlement Run. It will apply a Balancing Mechanism Credit Assessment Export Capacity (BMCAEC) in place of a Balancing Mechanism Credit Assessment Import Capacity (BMCAIC). Simply put, it will estimate an export instead of an import. The calculations will apply for Supplier Base and Additional BM Units, with a zero Demand Capacity (DC) and a non-zero Generation Capacity (GC).

Note that the BMCAEC value is calculated from GC, which is the expected maximum generation during the season, and the "Credit Assessment Load Factor" (CALF), which is the average loading on the BM Unit calculated from the same season of the previous year (i.e. CALF calculated from Summer 2013 metered volumes are used in Summer 2014).

The alternate modification will use the BMCAEC rather than BMCAIC value for all Supplier Base and Additional BM Units where the Relevant Capacity (which is the sum of GC and DC) is greater than zero.

In either case, the modification will apply an export rather than import estimation. Thus in most cases, this will reduce Credit Assessment Energy Indebtedness (CEI) by increasing accuracy in the calculation and hence the credit cover required.

Some exceptions will apply where an accurate export Credit Assessment Load Factor (CALF) cannot be calculated:

- The CALF value uses the previous year's metered data and in some cases the portfolio may have been a net import.
- The BM Units may not have been registered a year ago.
- The BM Units to which sites are assigned can change following contract rounds. Portfolios may change very regularly.
- Embedded generation is growing steadily.

Where a CALF value can't be calculated (the first two points above), a default value could be defined in the Credit Assessment Load Factor Guidance, for example an initial load factor of 0.2000. The latter two points would create a CALF value that wasn't reflective of the current portfolio. This can also be the case with demand CALF values.

2. Analysis of Credit Assessment Credited Energy Indebtedness

As the Credit assessment Price can vary over time we have provided the analysis in MWh rather than £ to avoid step changes in the data. We have examined the impact upon the Credit Assessment Credited Energy Indebtedness (CAQCE) value for several historic seasons. We have determined a "Generation CALF" value for each BM Unit and modelled the impact using the current calculation rules, i.e. the current GC value and the CALF from the same season of the previous year. As we envisage that the generation profile of the impacted BM Units can change significantly over a year, we have also calculated a Generation CALF using the outturn BM Unit Metered Volume for the season to judge the level of error introduces by using year-old values. The graph below (figure 1) shows the CAQCE impact for an 8 day period, which is the average number of calendar days before II data feeds into the calculation.

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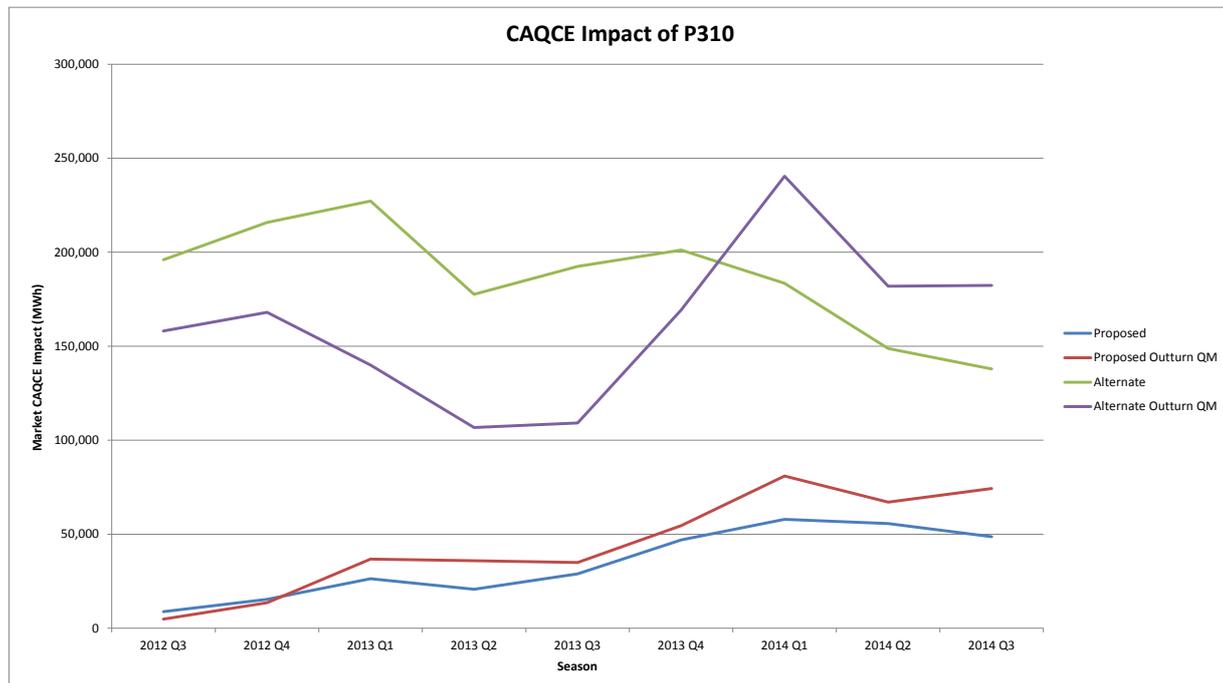


Figure 1 - Market CAQCE Impact

It can be seen that the alternate modification has a much larger impact on Parties owing to there being more BM Units that would qualify.

However, the proposed Modification could be utilised by all BSC Parties with Supplier registered embedded generation. They have the option of registering an additional BM Unit to contain all of their export sites. This would incur an additional £100 per month per Additional BMU administration cost under the BSC.

3. GC, Generation CALF vs QM

P310 will act to reduce the required level of Credit Cover for impacted Parties. It highlights the importance of accurate GC values, as an overstated GC will act similarly to an understated DC in that it will reduce the required level of Credit Cover. To judge the accuracy of the current GC values, the following graphs compare GC with the maximum BM Unit Metered Volume in the season, noting that as GC and DC are (MW) power values, so they have to be multiplied by the Settlement Period Duration (SPD, which is 0.5 hours) before they can be compared to the energy values. The GC represents the maximum generation that the registrant expects will occur on the BM Unit during the season.

As before, the graphs show the Metered volume from the same season and for the same season for the previous year. figure 2 shows the volume comparison, and figure 3 shows the number of Parties and BMUs that would be impacted for each Season. Figure 4 and figure 5 show the same information for the alternate.

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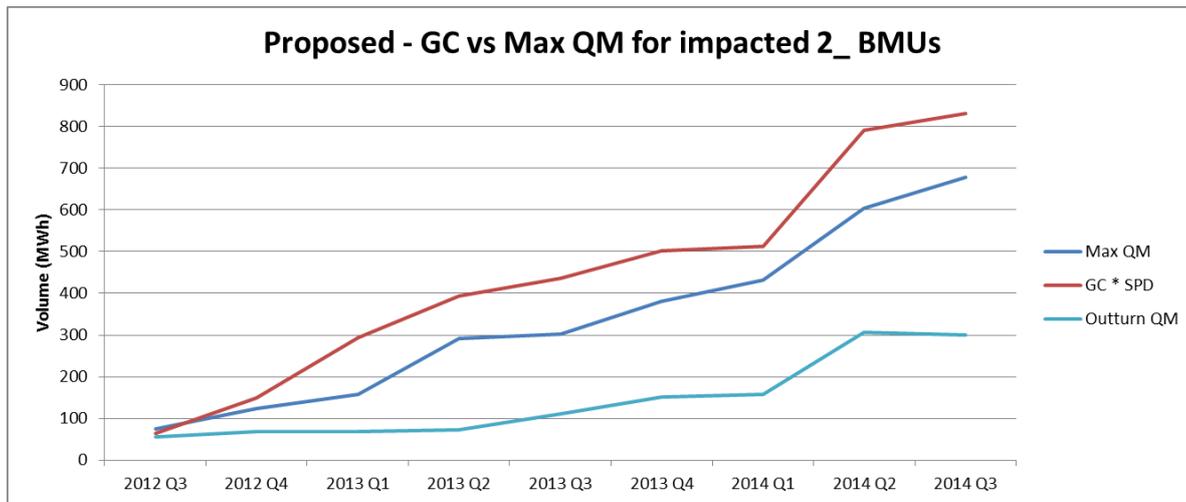


Figure 2 - GC vs QM for the proposed modification

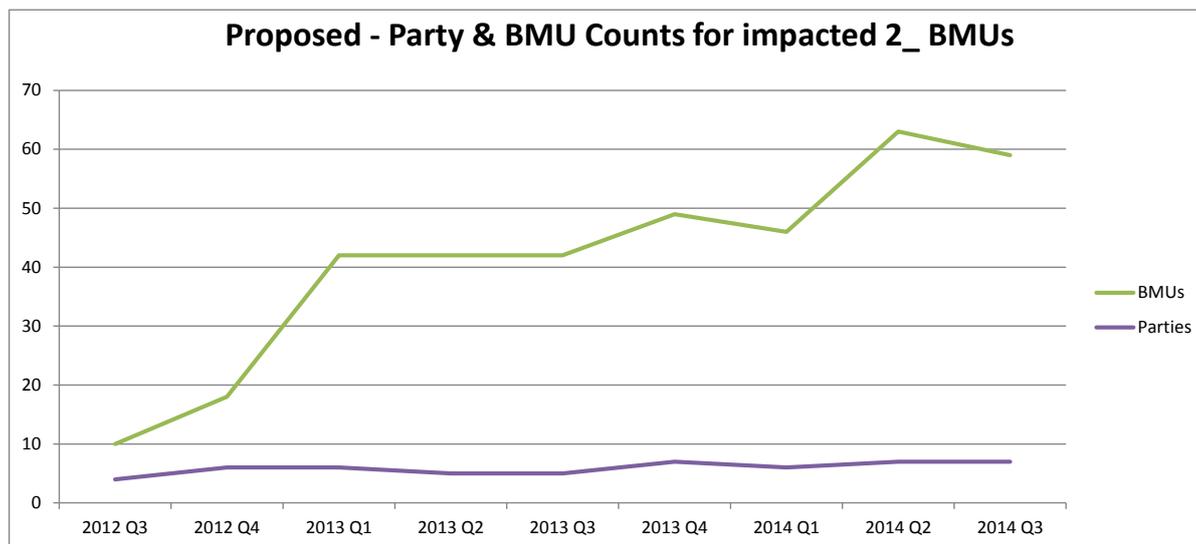


Figure 3 - Impacted BMUs and Party Counts for the proposed modification

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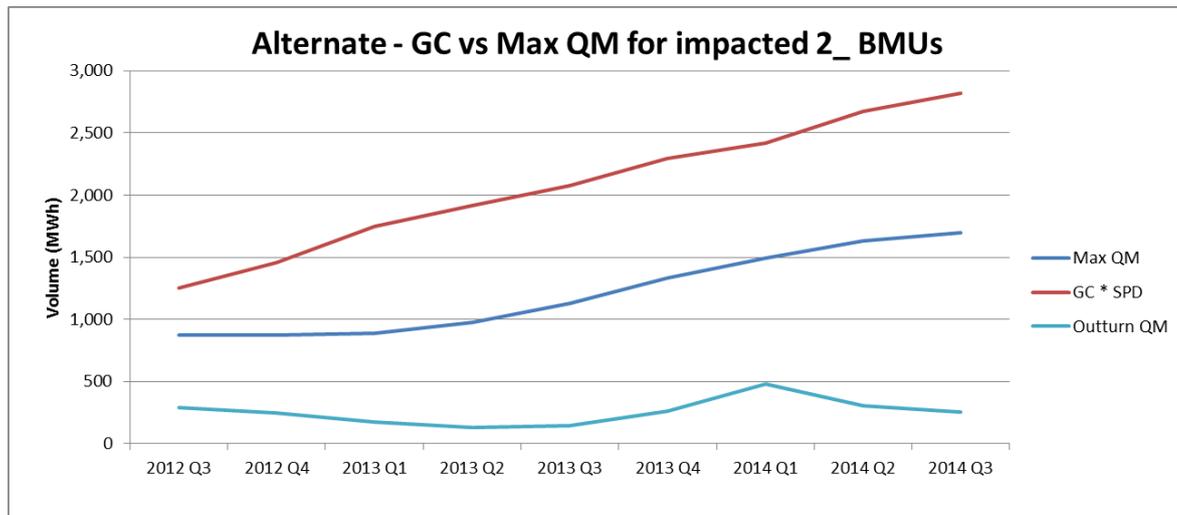


Figure 4 - GC vs QM for the alternate modification

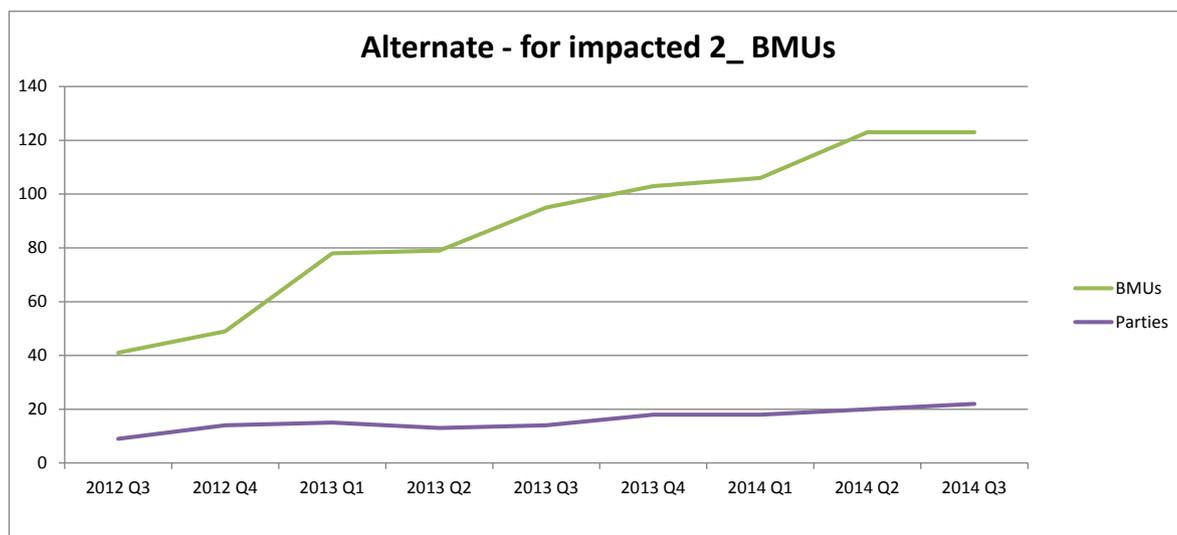


Figure 5 - Impacted BMUs and Party Counts for the alternate modification

With the current BM Unit configurations, the alternate modification would impact twice as many BM Units, and more than twice as many Parties. Looking at the number of BMUs in each season (in the table below), it is clear that the number generation BM Units and BM Units with some generation are increasing significantly.

| Season | BM Units with just a DC | BM Units with just a GC | BM Units with both GC & DC |
|---------|-------------------------|-------------------------|----------------------------|
| 2012 Q3 | 462 | 10 | 60 |
| 2012 Q4 | 473 | 18 | 62 |
| 2013 Q1 | 495 | 42 | 68 |
| 2013 Q2 | 501 | 42 | 70 |

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| Season | BM Units with just a DC | BM Units with just a GC | BM Units with both GC & DC |
|---------|-------------------------|-------------------------|----------------------------|
| 2013 Q3 | 517 | 42 | 82 |
| 2013 Q4 | 513 | 49 | 101 |
| 2014 Q1 | 513 | 46 | 98 |
| 2014 Q2 | 549 | 63 | 104 |
| 2014 Q3 | 553 | 59 | 118 |

In energy terms, (i.e. GC * SPD or DC * SPD), the figures are:

| Season | Σ DC*SPD for BM Units with just a DC | Σ GC*SPD for BM Units with just a GC | Σ DC*SPD for BM Units with both GC & DC | Σ GC*SPD for BM Units with both GC & DC | Σ DC*SPD for BM Units with GC + DC > 0 | Σ GC*SPD for BM Units with GC + DC > 0 |
|---------|---|---|--|--|---|---|
| 2012 Q3 | -23055 | 64 | -2285 | 1739 | -326 | 1253 |
| 2012 Q4 | -27294 | 150 | -2210 | 1772 | -349 | 1456 |
| 2013 Q1 | -30566 | 295 | -2347 | 1874 | -449 | 1745 |
| 2013 Q2 | -27343 | 393 | -2156 | 1957 | -430 | 1918 |
| 2013 Q3 | -23568 | 435 | -1968 | 2072 | -491 | 2076 |
| 2013 Q4 | -27826 | 502 | -3343 | 2283 | -617 | 2296 |
| 2014 Q1 | -29426 | 513 | -3111 | 2347 | -625 | 2415 |
| 2014 Q2 | -26718 | 791 | -4141 | 2420 | -722 | 2673 |
| 2014 Q3 | -22150 | 830 | -3837 | 2580 | -726 | 2820 |

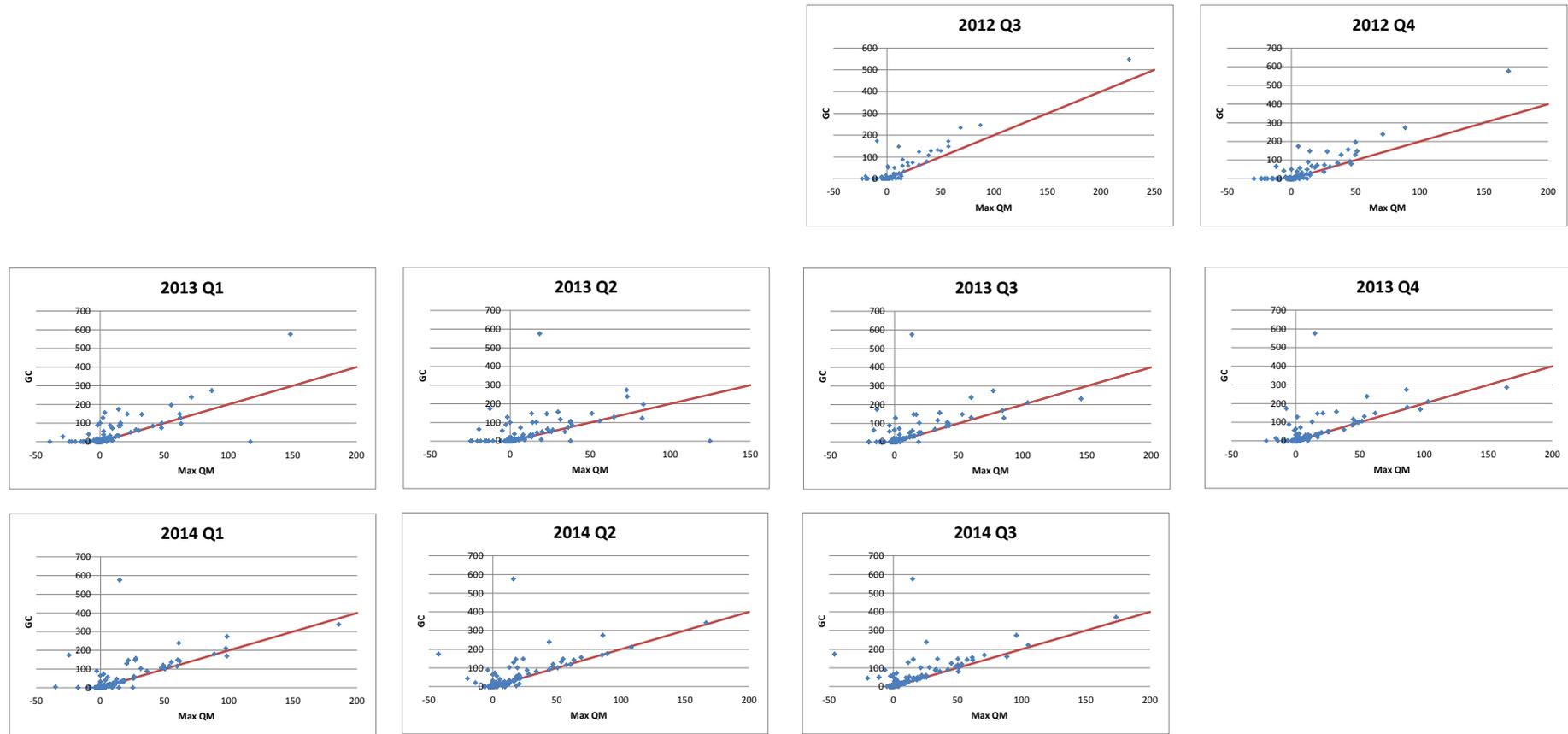
For example, for the last quarter, the proposed modification would include an additional 830 MWh of generation in the CEI calculation that would otherwise have been treated as zero.

For the alternate, 726MWh of demand would be replaced with 2,820MWh of generation. Of the BM Units with GC and DC values that would be classed as generation, it appears from spot checks that many would have always been classed as generation. However, some BM Units would have initially been classified as demand and flipped to generation, which would cause an immediate drop in the BM Unit's CAQCE to zero, as the generation CALF would be zero.

Note, the final solution must work with mid-season GC/DC re-declarations.

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The following set of graphs show the declared GC against the maximum metered volume for the BM Units impacted to the modification, with the red line on each graph being $GC * SPD = Max\ QM$. Declared values of QM should not be below the line (Note that Section K of the BSC specifies tolerances for exceeding GC). Also points significantly above the line indicate over declared values of GC.



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4. Individual Party impacts

The impact of the modification will vary between Parties depending upon the makeup of their portfolio. To enable the group to see the individual Party impacts, this section shows the total CAQCE impact for an eight day period (the average length of CEI), again showing the values created from a "Generation CALF" calculated from the previous and actual season. Party names have been randomly replaced for confidentiality, and Parties with no impact have been removed.

Where there are zero volumes from a method but non-zero where the real outturn QM is used, this is owing to the fact that there was no generation on that BM Unit in the previous year, so the Generation CALF would be zero.

| Party Reference | Proposed | Proposed (Real Outturn) | Alternate | Alternate (Real Outturn) |
|-----------------|----------|-------------------------|-----------|--------------------------|
| Party 01 | | | | |
| Party 02 | | | | |
| Party 03 | | | | |

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| Party Reference | Proposed | Proposed (Real Outturn) | Alternate | Alternate (Real Outturn) |
|-----------------|----------|-------------------------|-----------|--------------------------|
| Party 05 | | | | |
| Party 06 | | | | |
| Party 07 | | | | |
| Party 08 | | | | |

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| Party Reference | Proposed | Proposed (Real Outturn) | Alternate | Alternate (Real Outturn) |
|-----------------|----------|-------------------------|-----------|--------------------------|
| Party 09 | | | | |
| Party 10 | | | | |
| Party 11 | | | | |
| Party 13 | | | | |

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| Party Reference | Proposed | Proposed (Real Outturn) | Alternate | Alternate (Real Outturn) |
|-----------------|----------|-------------------------|-----------|--------------------------|
| Party 15 | | | | |
| Party 16 | | | | |
| Party 17 | | | | |
| Party 18 | | | | |

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| Party Reference | Proposed | Proposed (Real Outturn) | Alternate | Alternate (Real Outturn) |
|-----------------|----------|-------------------------|-----------|--------------------------|
| Party 19 | | | | |
| Party 20 | | | | |
| Party 21 | | | | |
| Party 22 | | | | |

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| Party Reference | Proposed | Proposed (Real Outturn) | Alternate | Alternate (Real Outturn) |
|-----------------|----------|-------------------------|-----------|--------------------------|
| Party 23 | | | | |
| Party 24 | | | | |
| Party 26 | | | | |

5. CAQCE accuracy

To try and measure the accuracy of the proposed changes, the CAQCE values for each impacted BM Unit were calculated for both the proposed methodologies, and the resultant values were compared to the period metered volume. The following table shows the minimum, maximum, average and standard deviation of these values (CAQCE – QM) over the last several seasons for all BM Units impacted by the alternate, with a negative value showing an under estimate of CAQCE.

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For the BM Units that are impacted by the alternate proposal, the results are:

| Season | Live | | | | Proposal | | | | Alternate | | | |
|----------------|-----------|----------|---------|---------|-----------|---------|---------|---------|-----------|----------|---------|---------|
| | Minimum | Maximum | Average | Std Dev | Minimum | Maximum | Average | Std Dev | Minimum | Maximum | Average | Std Dev |
| 2012 Q3 | -218.2265 | 85.7690 | -1.8328 | 13.1344 | -226.4530 | 85.9238 | -2.3858 | 15.9884 | -73.8642 | 175.9126 | 1.9279 | 10.8589 |
| 2012 Q4 | -158.0350 | 61.0550 | -0.4742 | 11.1042 | -169.2070 | 64.3910 | -2.1622 | 13.5677 | -77.0130 | 187.3138 | 2.5737 | 12.0441 |
| 2013 Q1 | -206.2845 | 124.9630 | 0.7063 | 17.3070 | -203.2066 | 73.1047 | -2.3802 | 16.2401 | -203.2066 | 202.6618 | 2.4599 | 23.1786 |
| 2013 Q2 | -148.1560 | 174.3270 | 0.6167 | 17.5388 | -147.2936 | 92.8924 | -1.4519 | 9.8487 | -147.2936 | 197.1876 | 1.9479 | 19.5043 |
| 2013 Q3 | -159.0070 | 159.5520 | 0.6480 | 16.6758 | -158.7417 | 41.8178 | -0.9894 | 10.4928 | -145.5420 | 186.2182 | 2.6250 | 19.4466 |
| 2013 Q4 | -211.0180 | 123.9320 | -1.3771 | 17.1907 | -211.4375 | 41.9579 | -1.8713 | 15.0104 | -164.4770 | 197.3395 | 1.8997 | 20.3004 |
| 2014 Q1 | -207.5120 | 62.1040 | -3.8930 | 15.3642 | -185.6350 | 58.5952 | -3.1239 | 14.5352 | -133.6554 | 100.0315 | -0.2097 | 11.4427 |
| 2014 Q2 | -207.1765 | 42.2380 | -3.7781 | 14.7707 | -166.5180 | 42.6599 | -2.3528 | 12.6433 | -120.4597 | 86.5823 | 0.5444 | 9.6351 |
| 2014 Q3 | -223.6570 | 51.1320 | -2.5749 | 13.7537 | -173.5830 | 77.0160 | -2.2348 | 12.7204 | -85.9086 | 164.9234 | 0.8125 | 8.4035 |

For the BM Units that are just impacted by the original proposal, the results are:

| Season | Live | | | | Proposal | | | | Alternate | | | |
|----------------|----------|---------|---------|---------|----------|---------|---------|---------|-----------|---------|---------|---------|
| | Minimum | Maximum | Average | Std Dev | Minimum | Maximum | Average | Std Dev | Minimum | Maximum | Average | Std Dev |
| 2012 Q3 | -16.1070 | 9.8525 | -0.6513 | 2.2248 | -17.6430 | 6.8599 | -0.2516 | 2.1268 | -17.6430 | 6.8599 | -0.2323 | 2.1222 |
| 2012 Q4 | -16.1070 | 9.8525 | -0.6513 | 2.2248 | -25.3814 | 13.7199 | -0.2598 | 2.3631 | -25.3814 | 13.7199 | -0.1609 | 2.4062 |
| 2013 Q1 | -16.1070 | 9.8525 | -0.6513 | 2.2248 | -23.7692 | 17.7148 | -0.1364 | 3.4384 | -23.7692 | 17.7148 | 0.0601 | 3.4365 |
| 2013 Q2 | -15.7570 | 6.4960 | -0.7480 | 1.9868 | -31.5122 | 15.5740 | -0.7264 | 3.4085 | -31.5122 | 15.5740 | -0.5715 | 3.3573 |

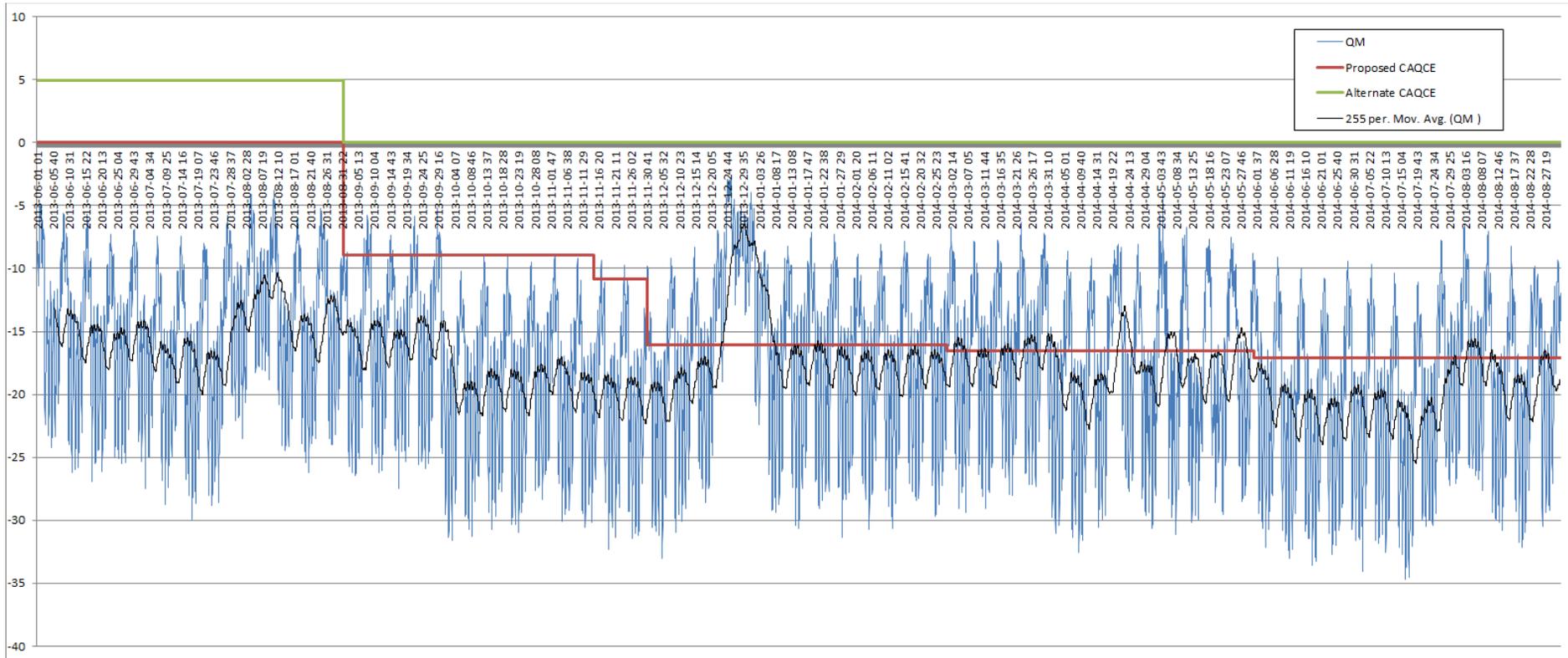
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| Season | Live | | | | Proposal | | | | Alternate | | | |
|----------------|----------|---------|---------|---------|----------|---------|---------|---------|-----------|---------|---------|---------|
| | Minimum | Maximum | Average | Std Dev | Minimum | Maximum | Average | Std Dev | Minimum | Maximum | Average | Std Dev |
| 2013 Q3 | -18.6195 | 3.6125 | -0.6415 | 1.8781 | -31.7083 | 10.6800 | -0.1828 | 3.0574 | -31.7083 | 10.6800 | -0.0516 | 2.9802 |
| 2013 Q4 | -25.4570 | 6.2150 | -0.6889 | 2.0171 | -41.7332 | 17.4644 | 0.0863 | 3.8765 | -41.7332 | 17.4644 | 0.2061 | 3.8562 |
| 2014 Q1 | -23.8730 | 12.8670 | -0.9725 | 2.4927 | -40.7989 | 22.4715 | -0.4965 | 5.2143 | -40.7989 | 22.4715 | -0.4745 | 5.2140 |
| 2014 Q2 | -37.8310 | 15.5740 | -1.4792 | 3.8521 | -43.3918 | 21.1165 | 0.0250 | 4.1546 | -43.3918 | 21.1165 | 0.0345 | 4.1560 |
| 2014 Q3 | -45.7010 | 9.0830 | -1.3115 | 3.8228 | -50.3791 | 14.1851 | -0.2381 | 4.3534 | -50.3791 | 14.1851 | -0.2144 | 4.3493 |

It is difficult to see much of a pattern in these tables. This may be due to the fact that not all BM Units were impacted in all seasons, and also that by nature, the embedded generation is quite, meaning that there are significant variations in QM. This latter point can be shown by looking at individual BM Units – a small sample of such are shown below. Note that the black lines on each graph are a 255 Settlement Period rolling average – Excel can't work with more points than that.

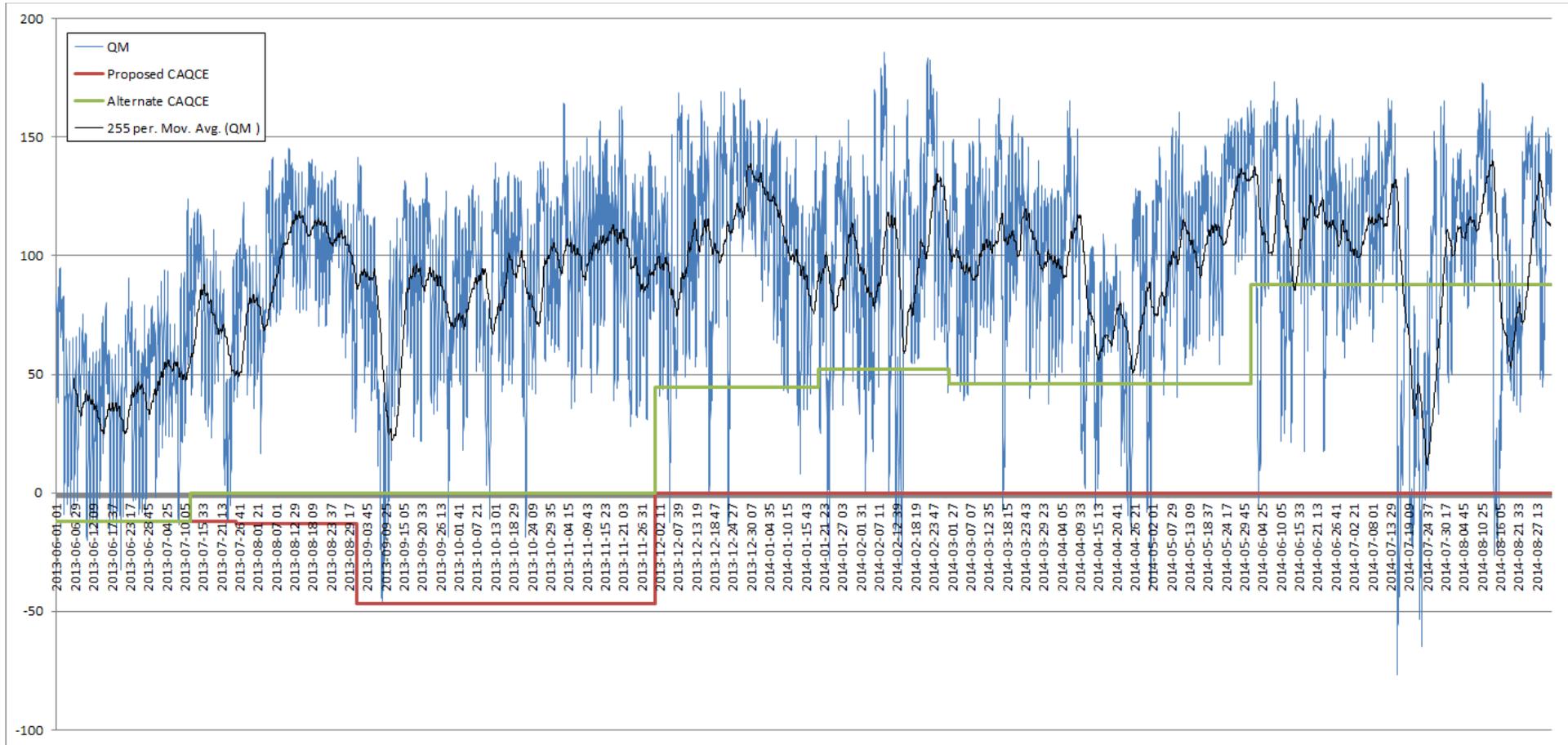
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BM Unit 1:



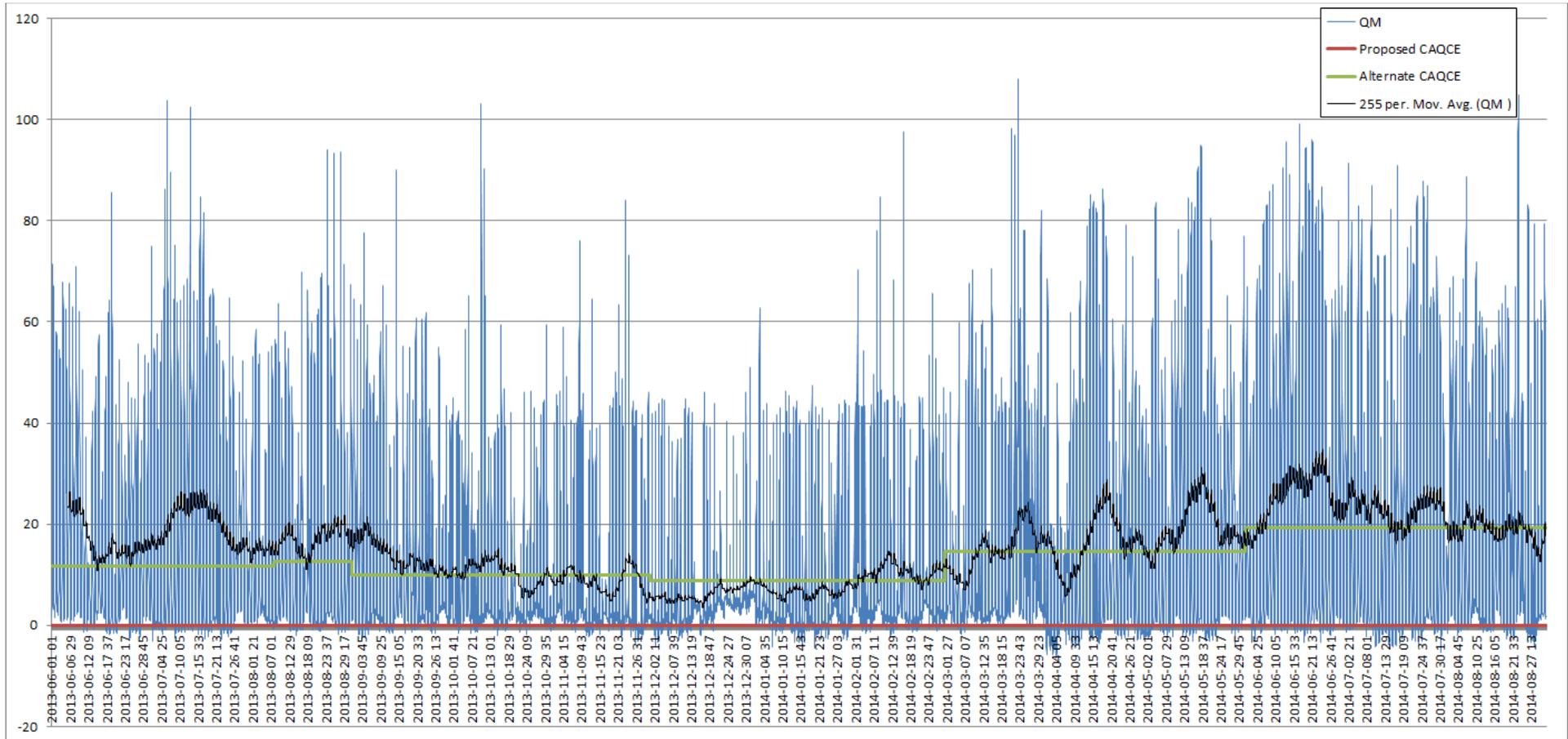
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BM Unit 2:



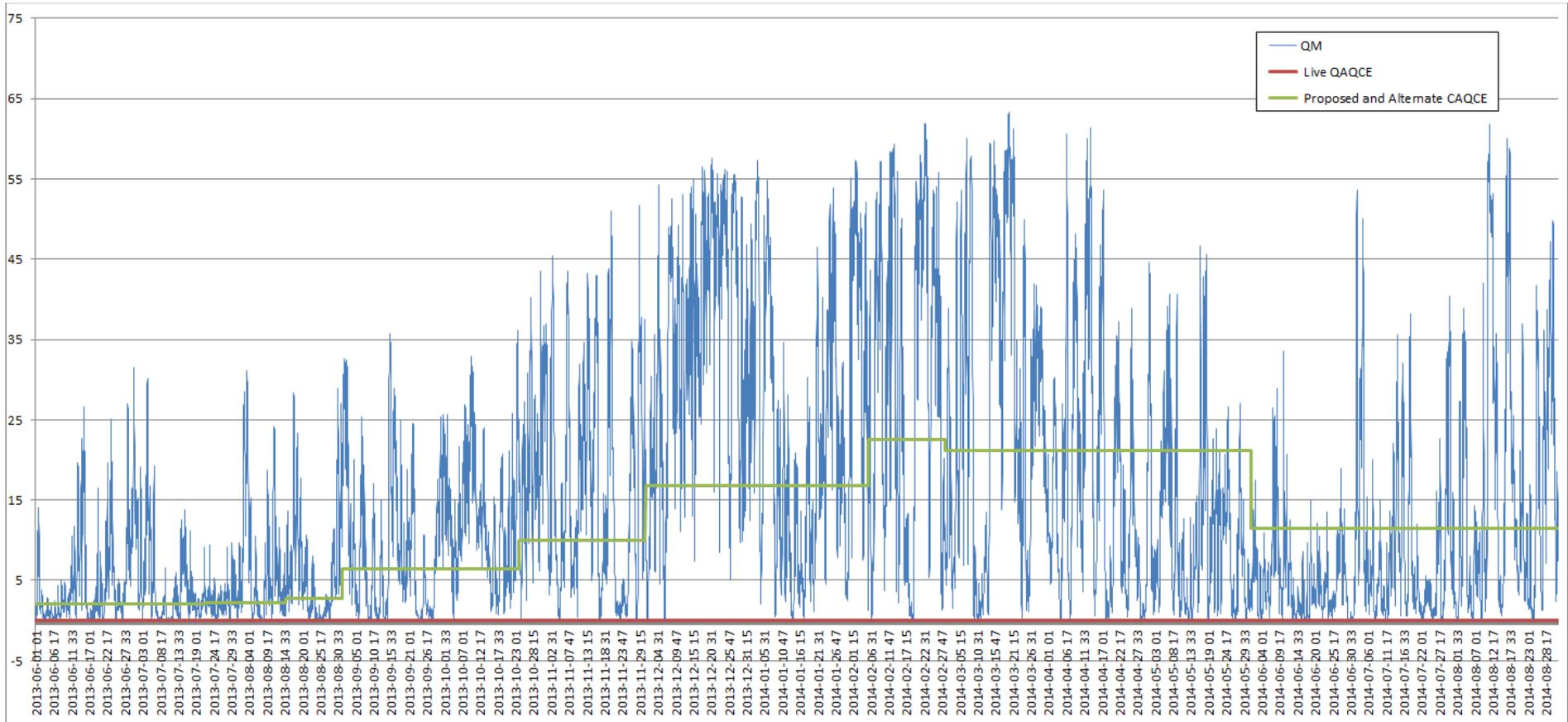
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BM Unit 3:



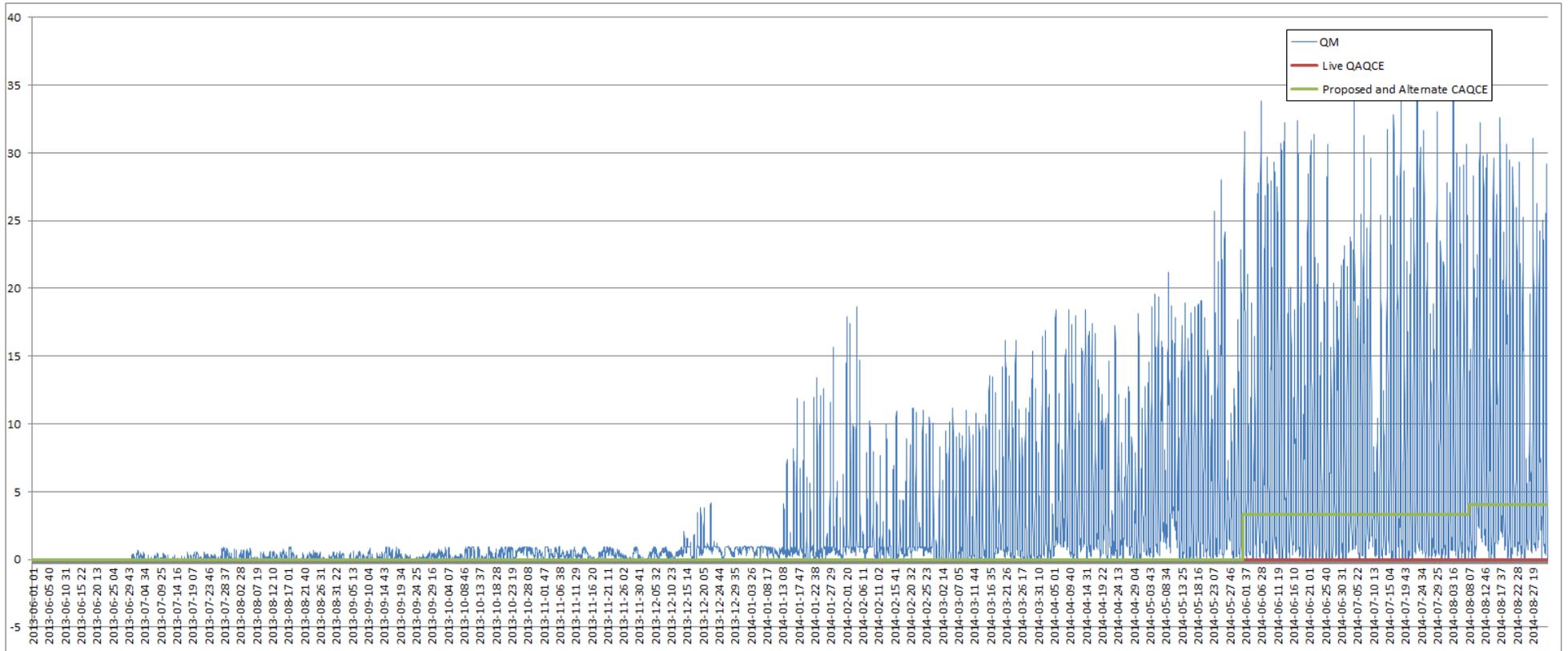
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BM Unit 4:



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BM Unit 5:



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6. Conclusions and observations

Both the proposed and alternate solutions for this modification will act to reduce the amount of Credit Assessment Energy Indebtedness. The alternate has a much broader reach as currently there are many BM Units with both GC and DC values. Additionally, the number of BM Units with generation or generation and demand is increasing.

GC and DC values can be compared to BM Unit Metered Volumes to see if they are within tolerance. As a high GC would reduce a Parties' credit cover requirements, additional monitoring or auditing may need to be put in place to ensure that the submitted values are realistic. Existing BSC Section K requirements would only allow for post BSC Season checks on excessive GC as the value is declared in good faith for the whole BSC Season. It could be assumed that the GC would be met on the final Settlement Period of the BSC Season.

One potential risk with the alternate is that a BM Unit with a large DC and a large GC could be considered "generation" – which would effectively remove the DC from the credit calculation and create the opposite problem than the one that the modification is addressing – i.e. the Party may have too little Credit Cover. Such BM Units could potentially have very small CALF values if the amount of generation and demand on the BM Unit were similar as the average QM over the season would be close to zero, but this would obviously depend upon the operating characteristics of the BM Unit. It should be noted that with the alternate, there is potential for a Party to over-state their GC to remove a BM Unit from the CAQCE calculations (assuming that generation CALF was zero).

It should be noted however that should the original proposal be implemented, Parties could migrate all their generation to additional BM Units to get the full benefit of the proposed Modification.

When a BM Unit does switch from "Demand" to "Generation", it will have a CAQCE of zero until there is enough historic generation data to create a "Generation CALF". A default could be used, but this would potentially under-report the CAQCE, so using zero may be a safer option for generation BM Units to ensure that Credit Cover isn't under estimated.

The CALF Guidelines, owned by the Imbalance Settlement Group, allows for CALF appeals to be raised within two months of the CALF values being published. The CALF values are calculated by ELEXON and published approximately three months ahead of the relevant BSC Season.

The CALF Guidance document also contains a manual workaround for BM Units with a combination of import and export. This is known as an 'Alternative CALF'. Subject to the progression of this Modification the Alternative CALF process should be removed from the CALF Guidance document.

Pros and cons applicable to both options

- + Generation Only BM Units are included in the CEI calculation, so CEI is more representative of a Parties' portfolio;
- GC values may need more rigorous auditing.

Modification pros and cons

- + Mixed Generation and Demand BM Units are included as Demand sites, which reduces risk to other participants;
- + To take full advantage of generation CAQCE, Parties will need to split a mixed Generation and Demand BM Unit into separate demand and generation BM Units. This will mean that the CALF values will be more accurate.

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- This will incur additional charges (e.g. Section D).
- Where EMR CfD sites are not CVA registered they will need to be registered in Additional BMUs. The sites will predominantly be generation and may have a small station load. They would be excluded from the proposed solution. Some existing sites will also fit this criteria.

Alternate pros and cons

- + Generation Only BM Units are included in the CEI calculation, so CEI is more representative of a Parties' portfolio;
- + Mixed Generation and Demand BM Units with more generation than demand are also included in the CEI calculation as generation sites;
- For Mixed Generation and Demand BM Units, the CAQCE value may not be reflective of metered volume, especially if the Relevant Capacity is close to zero; and
- For Mixed Generation and Demand BM Units, the unit is treated as pure generation or pure demand, and the corresponding CALF may not be very representative due to a near zero average QM. Also, as the net average value is used in the CALF calculation, generation and demand volumes are both influencing the resultant CALF value.