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DESC: NDM Algorithm Performance

Strand 1: Weather Correction Factor (WCF) and Scaling Factor (SF)

17th November 2014

NDM Algorithm 2013/14 Performance Evaluation

- Each autumn / winter an assessment of the algorithm performance for the recently completed gas year is carried out, in this case 2013/14.
- Analysis performed by considering three sources of information:
 - [Daily values of Scaling Factor \(SF\) & Weather Correction Factor \(WCF\)](#)
 - Reconciliation Variance data for each EUC
 - Daily consumption data collected from the NDM sample
- This presentation covers the 1st of these strands - Strands 2 & 3 will be covered in February 2015.
- Accompanying document published on Joint Office website sets out full commentary.

Analysis of Scaling Factor (SF) and Weather Correction Factor (WCF)

- Analysis: Data graphs represent daily trends for SF and WCF
 - SF is a multiplier used to ensure total aggregate NDM demand = Allocated demand. Ideal value is one, however variations may occur for a number of reasons:
 - Errors in aggregate AQs, LDZ & DM measurements, imperfections in algorithms such as modelling parameters (ALPs, DAFs, holiday factors)
 - WCF is a value which represents the extent to which actual aggregate NDM demand in the LDZ differs from the sum of the ALP weighted daily average consumption for all EUCs in the LDZ (based on snapshot taken for 1st October and potentially subject to revision within the gas year).
- 3 LDZ specific examples highlighted for period 2012/13 and 2013/14 and first 10 days of 2014/15
 - All LDZs and full explanatory detail contained in supporting document

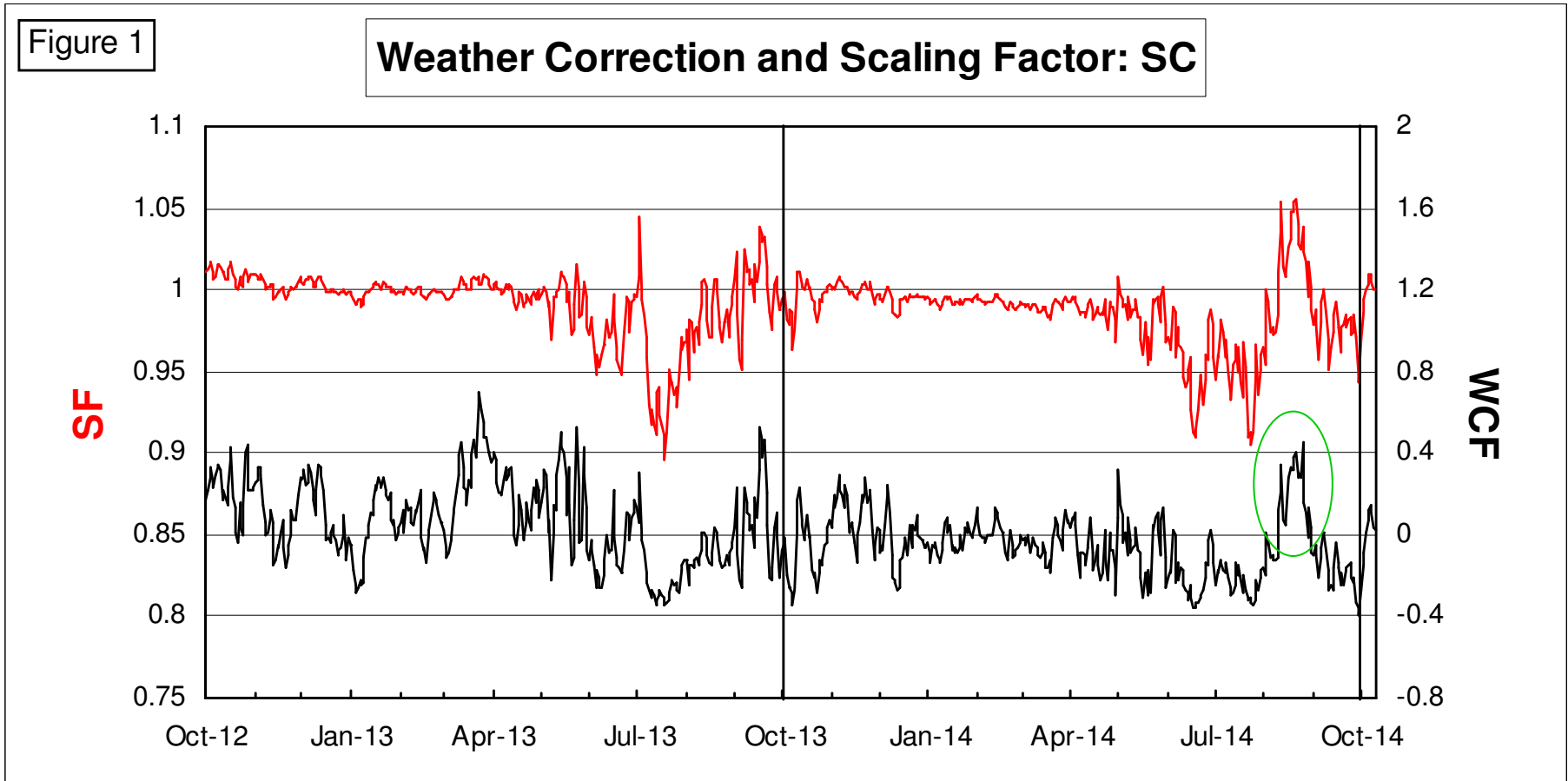
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Weather Correction & Scaling Factor: SC

Example 1



- August 2014 began with fairly normal temperatures but the arrival of ex-hurricane 'Bertha' passing over the UK on 10th to 11th was the beginning of a colder than normal period (particularly 19th to 27th). During this colder spell, increased aggregate NDM demand resulted in positive WCF values (most noticeable on 25th).

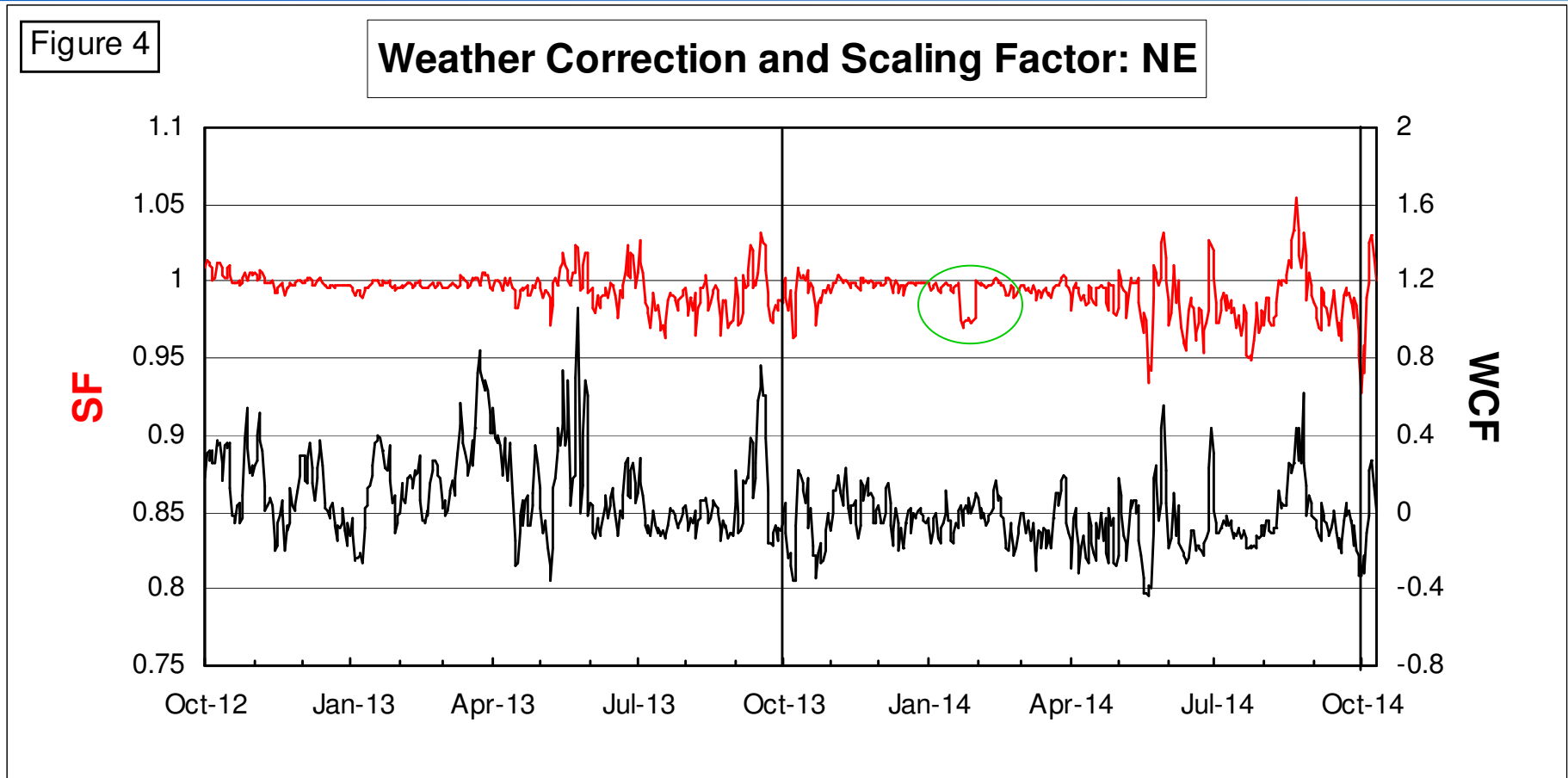
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Weather Correction & Scaling Factor: NE

Example 2



- A notable step change reduction in SF value is present from 21st to 30th January 2014, caused by a very large erroneous AQ value for a single NDM site, which was successfully revised on 31st.



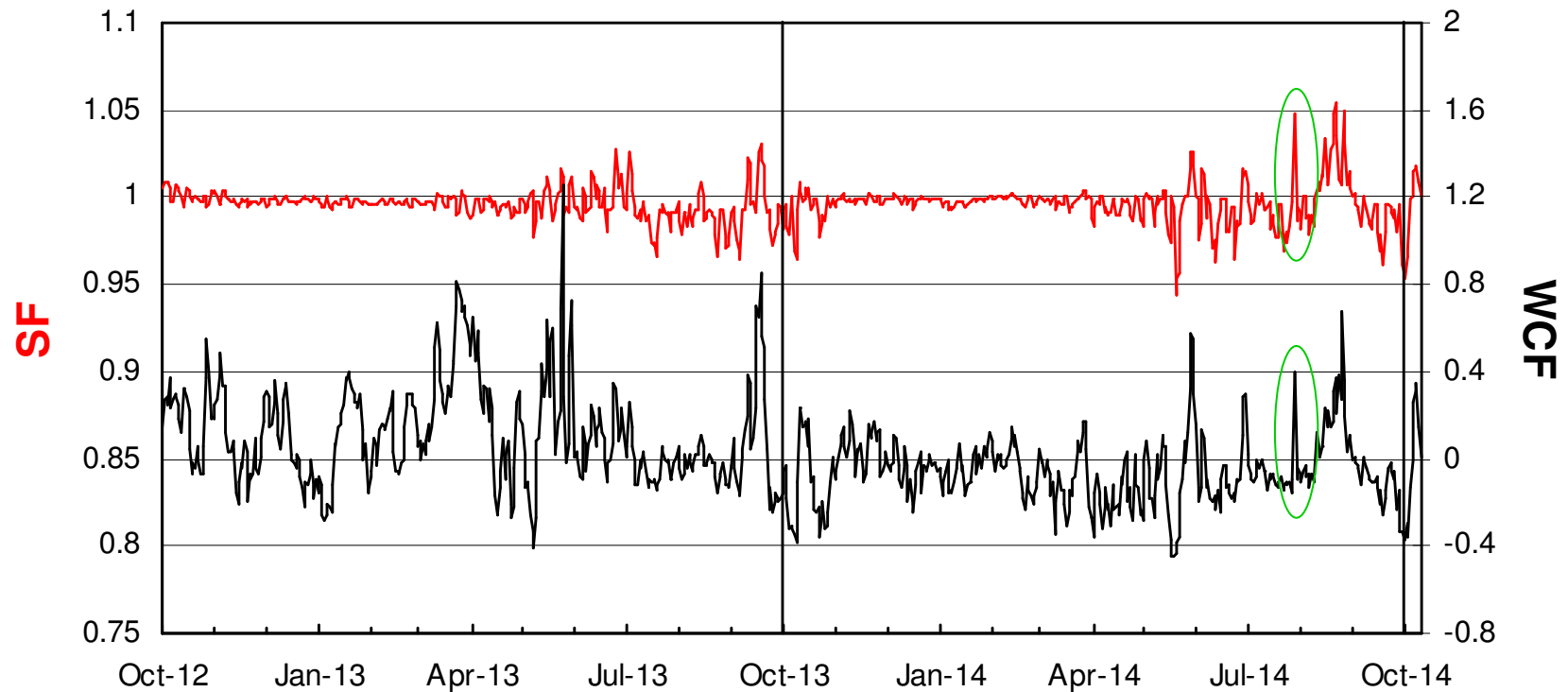
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Weather Correction & Scaling Factor: EM

Example 3

Figure 5

Weather Correction and Scaling Factor: EM



- 28th July 2014 – sharp positive spike in WCF and much increased SF value
- Probably caused by an erroneous input measurement in the LDZ resulting in a corresponding error in the aggregate NDM consumption which was incorrectly too high

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Analysis: Comparison Values 2012/13 to 2013/14

- Further analysis of algorithm performance considers:
 - Change in average values of SF (12/13 to 13/14)
 - RMS deviation of SF from 1 (12/13 to 13/14): measures variability of SF
 - Change in average values of WCF (12/13 to 13/14)
 - Difference of WCF-EWCF no longer a measure of bias in the WCF due to SND for agg.NDM being under or over stated.
 - However for completeness WCF-EWCF analysis has been carried out - results can be seen in supporting document.
- Change in aggregate NDM AQ from gas year 2013/14 to 2014/15

Average Values of SF

Difference between Gas Year 12/13 & Gas Year 13/14

Red: Greater SF deviation from 1 in 2013/14 – **Green:** Lower SF deviation from 1 in 2013/14

LDZ	Mon-Thur	Friday	Saturday	Sunday	Winter	Summer
SC	-0.009	-0.006	-0.004	-0.005	-0.004	-0.005
NO	-0.008	-0.004	-0.001	-0.001	-0.001	-0.006
NW	-0.009	-0.006	-0.001	-0.003	-0.005	-0.009
NE	-0.008	-0.004	0.001	-0.001	-0.004	-0.007
EM	-0.003	0.001	0.006	0.004	0.000	0.001
WM	-0.007	-0.004	0.000	0.000	-0.003	-0.005
WN	-0.023	-0.017	-0.007	-0.006	-0.004	-0.024
WS	-0.001	-0.005	0.002	0.002	0.001	-0.003
EA	-0.009	-0.009	-0.005	-0.005	-0.004	-0.011
NT	-0.003	-0.003	-0.002	-0.001	0.000	-0.004
SE	-0.003	-0.005	-0.004	-0.004	-0.004	-0.005
SO	-0.016	-0.016	-0.013	-0.014	-0.006	-0.022
SW	-0.013	-0.012	-0.009	-0.008	-0.006	-0.017

- The difference between absolute average value of SFs from 1 has been calculated for gas years 2012/13 and 2013/14
- Table compares the differences in results between gas year 2012/13 and 2013/14
- Red indicates on average the SF was further from the ideal value of one
- Despite this slight worsening when compared to gas year 2012/13, SFs remain very close to the ideal value of one

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Average Values of Root Mean Square Deviation of SF from 1 Difference between Gas Year 12/13 and Gas Year 13/14

Red: Greater SF deviation from 1 in 2013/14 – **Green:** Lower SF deviation from 1 in 2013/14

LDZ	October	November	December	January	February	March	April	May	June	July	August	September
SC	-0.0011	0.0006	-0.0035	-0.0029	-0.0058	-0.0056	-0.0086	-0.0069	-0.0195	0.0059	-0.0079	-0.0055
NO	0.0007	0.0009	-0.0009	-0.0003	-0.0018	-0.0008	-0.0031	-0.0022	-0.0081	-0.0084	0.0011	-0.0033
NW	-0.0113	0.0008	-0.0020	0.0008	-0.0006	-0.0042	-0.0143	-0.0152	-0.0181	0.0044	-0.0117	-0.0129
NE	-0.0064	0.0014	-0.0005	-0.0104	-0.0017	-0.0027	-0.0048	-0.0114	-0.0142	-0.0096	-0.0040	-0.0046
EM	-0.0076	0.0009	0.0003	0.0003	0.0008	0.0014	-0.0018	-0.0098	-0.0074	-0.0012	-0.0070	0.0000
WM	-0.0048	-0.0001	-0.0007	-0.0018	-0.0019	-0.0013	-0.0034	-0.0064	-0.0106	0.0000	-0.0053	-0.0024
WN	-0.0141	0.0020	0.0001	0.0008	-0.0033	-0.0027	-0.0190	-0.0006	-0.0242	-0.0193	-0.0200	-0.0147
WS	-0.0084	0.0011	-0.0013	0.0014	0.0011	-0.0003	-0.0058	-0.0011	-0.0290	-0.0325	-0.0233	0.0040
EA	-0.0056	0.0010	0.0009	-0.0001	-0.0023	-0.0060	-0.0072	-0.0076	-0.0112	-0.0099	-0.0060	-0.0057
NT	-0.0040	-0.0013	-0.0006	0.0002	-0.0004	0.0003	0.0002	-0.0024	-0.0059	-0.0037	-0.0109	0.0038
SE	-0.0018	0.0017	-0.0004	-0.0008	-0.0035	-0.0048	-0.0066	-0.0023	-0.0003	-0.0032	-0.0058	-0.0014
SO	-0.0102	0.0019	0.0000	-0.0009	-0.0049	-0.0054	-0.0092	-0.0027	-0.0193	-0.0131	-0.0056	-0.0123
SW	-0.0126	0.0000	-0.0020	-0.0007	-0.0044	-0.0062	-0.0107	-0.0063	-0.0264	-0.0156	-0.0111	-0.0159
AVG	-0.0067	0.0008	-0.0008	-0.0011	-0.0022	-0.0029	-0.0073	-0.0058	-0.0149	-0.0082	-0.0090	-0.0055

- RMS Deviation provides a measure of the variability of SF. The deviation from 1 has been analysed for gas years 2012/13 and 2013/14
- Table compares the differences in results between gas year 2012/13 and 2013/14
- Overall SFs were slightly more variable than the previous gas year
- SFs are still very close to the ideal value of one, with the biggest individual LDZ & Month difference being 5.9% (WN LDZ in July '14)

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Scaling Factor Values 2013/14 : Conclusions

- In general, the average SFs tended to be lower than one.
- In 12 / 13 LDZs on weekdays (and 9 / 13 on weekend days), average values of SF were slightly worse compared to 2012/13.
- For winter 2013/14 average values of SF showed marginal deterioration when compared to winter 2012/13 in 10 / 13 LDZs.
- Average SF values for all of summer 2013/14 worsened slightly when compared to winter 2013/14 in 12 / 13 LDZs.
- Monthly RMS values of SF (deviation from one) during 2013/14 were in a majority of LDZ / months combinations marginally worse than in 2012/13.
- Considered overall SFs during 2013/14 generally were more variable than over the previous gas year.
- Due to the large number of factors that affect SF, it is difficult to draw conclusions from the analysis.

Average Values of WCF

Difference between Gas Year 2012/13 and Gas Year 2013/14

Red: WCF deviation further from 0 than 12/13 – **Green:** WCF deviation closer to 0 than 12/13

LDZ	Mon-Thur	Friday	Saturday	Sunday	Winter	Summer
SC	0.012	0.018	0.012	0.006	0.122	-0.098
NO	0.055	0.063	0.039	0.016	0.127	-0.031
NW	0.060	0.108	0.124	0.125	0.143	0.028
NE	0.056	0.097	0.120	0.072	0.125	0.022
EM	0.057	0.076	0.060	0.048	0.102	0.016
WM	0.085	0.098	0.116	0.106	0.122	0.066
WN	0.069	0.131	0.181	0.176	0.184	0.034
WS	0.025	-0.016	-0.011	0.063	0.100	-0.061
EA	0.108	0.121	0.132	0.115	0.144	0.085
NT	0.126	0.144	0.173	0.147	0.119	0.157
SE	0.113	0.121	0.129	0.119	0.119	0.115
SO	0.072	0.079	0.092	0.089	0.144	0.012
SW	0.088	0.080	0.123	0.153	0.130	0.072

- The difference between absolute average value of WCFs from zero has been calculated for gas years 2012/13 and 2013/14
- Table compares the differences in results between gas year 2012/13 and 2013/14
- Green indicates on average the WCF was slightly closer to zero than in 2012/13

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Weather Correction Factor Values 2013/14 :

Conclusions

- The differences between the years are the result of differences in factors such as weather or EUC AQ excess.
- Average WCF was negative in all LDZs on Mondays to Thursdays, Fridays and weekend days.
- WCF was closer to the ideal value of zero in 2013/14 than in 2012/13 on Mondays to Thursdays, Fridays and weekend days in 12 out of 13 LDZs.
- In winter 2013/14 WCF was closer to zero in all LDZs.
- In summer 2013/14 WCF was closer to zero in 10 out of 13 LDZs.

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Aggregate NDM AQ Changes start of gas year 2014/15

LDZ	% NDM AQ Change
SC	-3.2%
NO	-1.8%
NW	-3.0%
NE	-3.3%
EM	-2.4%
WM	-3.0%
WN	-3.3%
WS	-2.9%
EA	-2.1%
NT	-1.5%
SE	-2.0%
SO	-3.0%
SW	-1.3%
Overall	-2.5%

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NDM Algorithm 2013/14 Performance Evaluation

- Next Steps – Strands 2 and 3 to be presented at February 2015 DESC.
 - 1. Daily values of Scaling Factor (SF) & Weather Correction Factor (WCF)
 - 2. Reconciliation Variance data for each EUC
 - 3. Daily consumption data collected from the NDM sample

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