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DESC: NDM Algorithm Performance Strand 1: Weather Correction Factor (WCF) and Scaling Factor (SF)

7th November 2012

NDM Algorithm 2011/12 Performance Evaluation

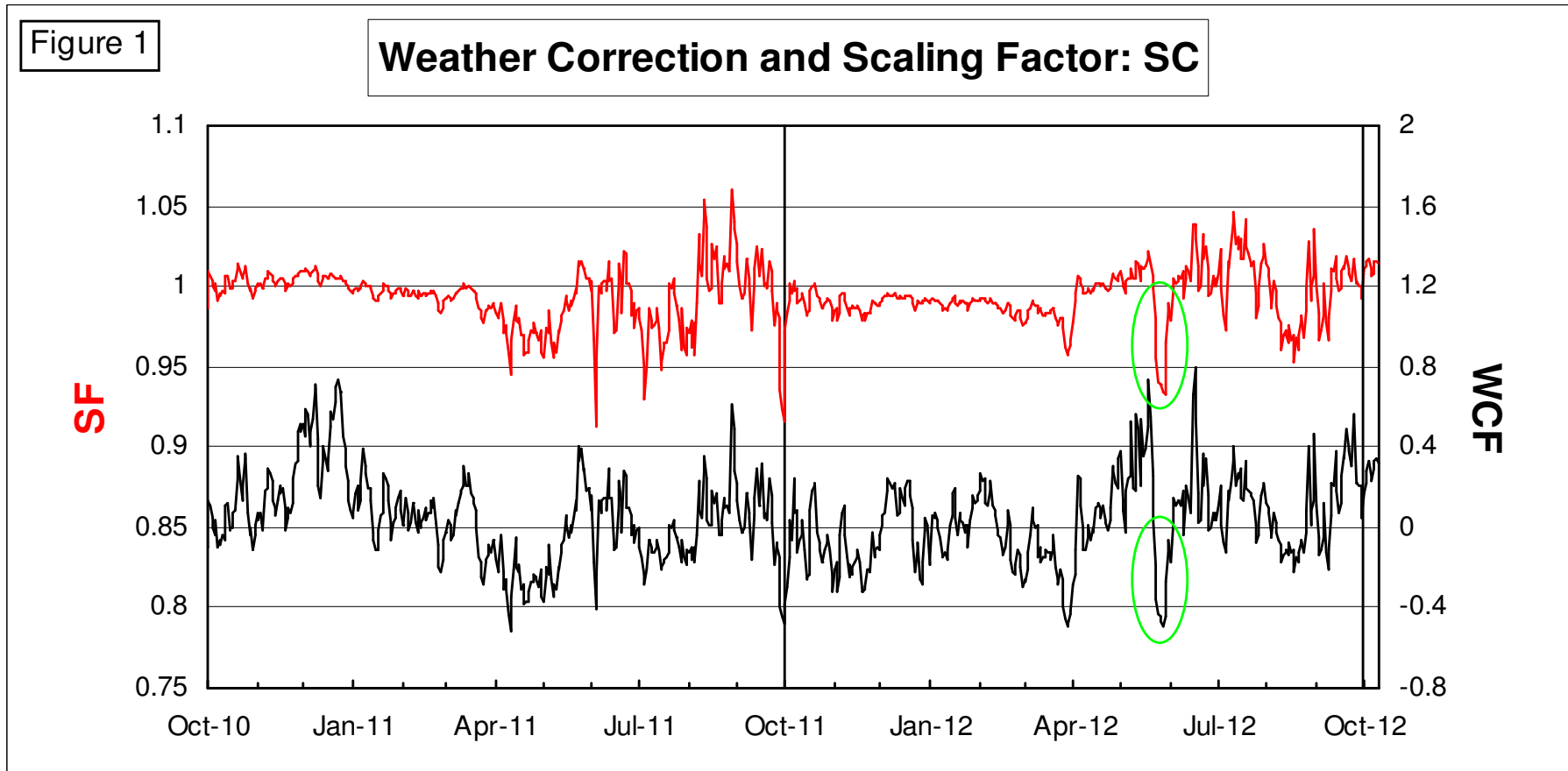
- Each autumn / winter an assessment of the algorithm performance for the recently completed gas year is carried out, in this case 2011/12.
- Analysis performed by considering three sources of information:
 - [Daily values of Scaling Factor \(SF\) & Weather Correction Factor \(WCF\)](#)
 - Reconciliation Variance data for each EUC
 - Daily consumption data collected from the NDM sample
- This presentation covers the first of these strands - Strands 2&3 will be covered during February 2013.
- Accompanying document published on JO 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, 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 2010/11 and 2011/12 and first 10 days of 2012/13
 - All LDZs and full explanatory detail contained in supporting document

Weather Correction & Scaling Factor: SC

Example 1



- May began with an extended (3 week) period of consistently colder than normal temperatures. In contrast, the final week of the month saw temperatures creep high above seasonal normal resulting in low NDM demand with corresponding extreme negative spikes in WCF and a reduced SF value.

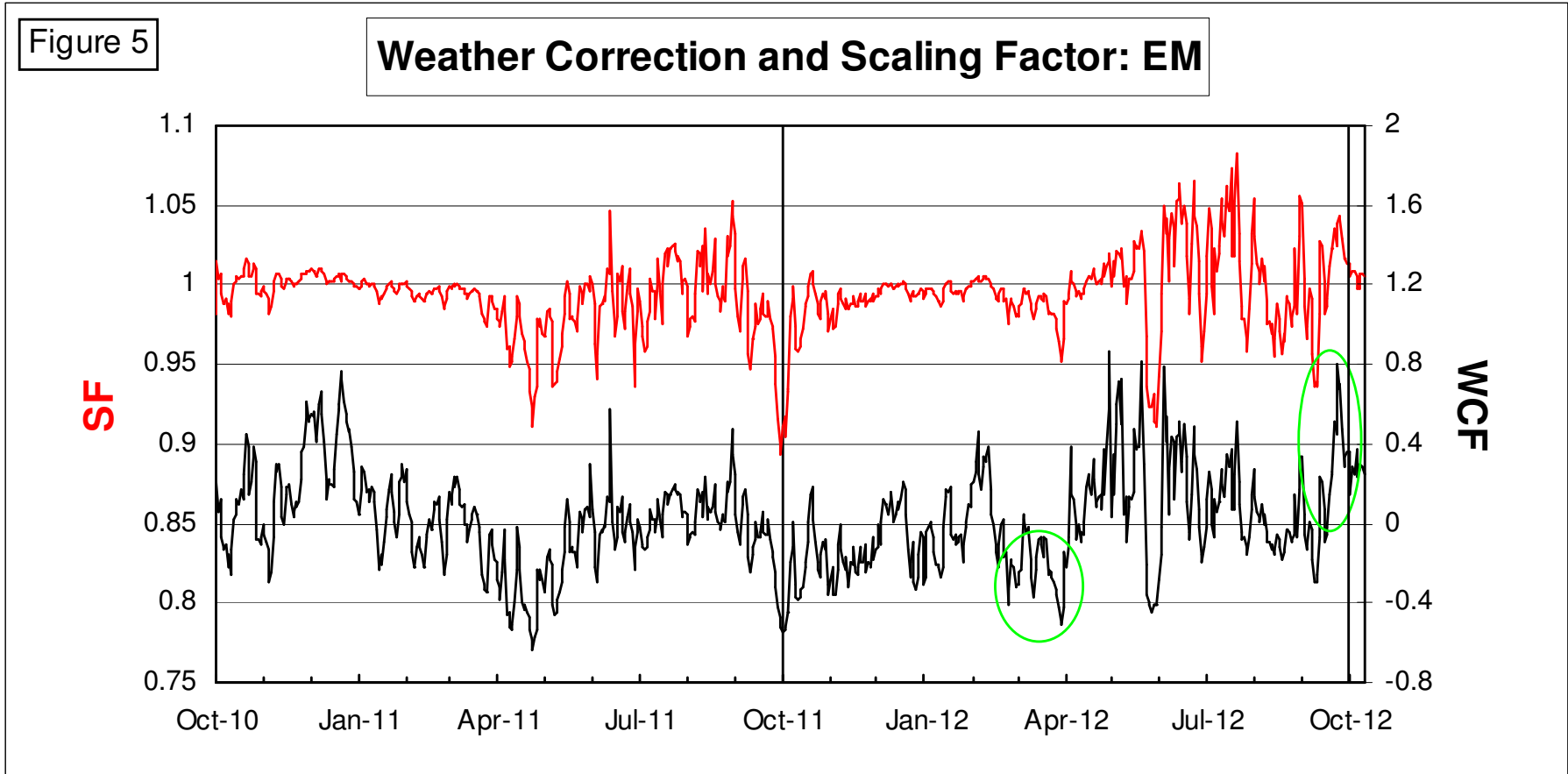
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Weather Correction & Scaling Factor: EM

Example 2



- Warmest March in last 50 years – aggregate NDM demand consistently depressed resulting in negative WCF values.
- 9th coldest September in last 50 years (particularly cold during later half of the month) – inflated NDM demand resulted in sharply positive WCF values.

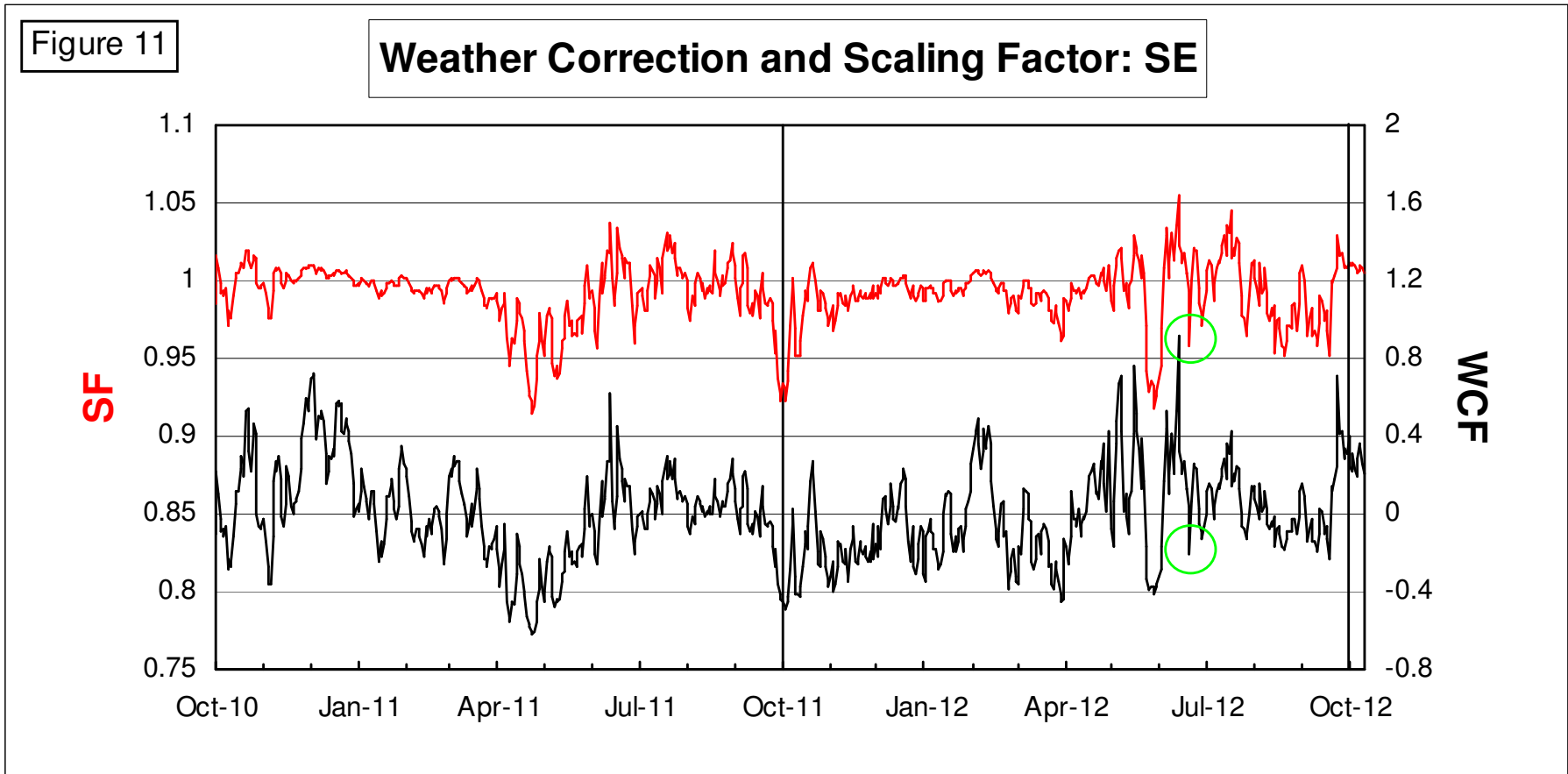
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Weather Correction & Scaling Factor: SE

Example 3



- 20th June 2012 – sharp negative spike in WCF and much reduced SF value
- Probably caused by an erroneous high consumption reading for a single DM supply point in the LDZ which resulted in corresponding error in actual aggregate NDM consumption

Analysis: Comparison Values 2010/11 to 2011/12

- Further analysis of algorithm performance considers:
- Change in average values of SF (10/11 to 11/12)
 - RMS deviation of SF from 1 (10/11 to 11/12): measures variability of SF
- Change in average values of WCF (10/11 to 11/12)
 - 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 2011/12 to 2012/13

Average Values of SF

Difference between Gas Year 10/11 & Gas Year 11/12

Red: Greater SF deviation from 1 in 2011/12 – **Green:** Lower SF deviation from 1 in 2011/12

LDZ	Mon-Thur	Friday	Saturday	Sunday	Winter	Summer
SC	-0.001	0.002	0.002	0.000	-0.011	0.011
NO	0.002	0.006	0.000	0.000	-0.009	0.012
NW	0.000	0.011	0.003	0.001	-0.009	0.008
NE	0.005	0.010	0.006	0.004	-0.007	0.018
EM	0.004	0.010	0.006	0.004	-0.009	0.012
WM	0.005	0.008	0.006	0.004	-0.004	0.009
WN	-0.001	0.009	0.005	0.002	-0.017	0.009
WS	-0.005	-0.002	-0.003	-0.002	-0.007	-0.001
EA	0.002	0.005	0.004	0.003	-0.009	0.014
NT	0.001	0.004	0.003	0.002	-0.009	0.012
SE	-0.001	0.002	0.000	0.000	-0.010	0.008
SO	-0.004	0.000	-0.001	-0.002	-0.013	0.008
SW	0.000	0.001	0.002	0.001	-0.008	0.004

- The difference between absolute average value of SFs from 1 has been calculated for gas years 2010/11 and 2011/12.
- Table compares the differences in results between gas year 2010/11 and 2011/12
- Green indicates on average the SF was closer to ideal value of one.

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Average Values of Root Mean Square Deviation of SF from 1 Difference between Gas Year 10/11 and Gas Year 11/12

Red: Greater SF deviation from 1 in 2011/12 – **Green:** Lower SF deviation from 1 in 2011/12

LDZ	October	November	December	January	February	March	April	May	June	July	August	September
SC	-0.0048	-0.0088	-0.0014	-0.0065	-0.0073	-0.0124	0.0259	-0.0074	0.0077	0.0087	0.0021	0.0121
NO	-0.0237	-0.0114	-0.0039	-0.0027	-0.0049	-0.0191	0.0185	-0.0181	0.0063	-0.0089	-0.0117	-0.0093
NW	-0.0257	-0.0065	0.0020	-0.0015	-0.0027	-0.0152	0.0359	-0.0218	-0.0109	-0.0060	0.0037	0.0066
NE	-0.0223	-0.0066	-0.0017	-0.0008	-0.0021	-0.0108	0.0225	-0.0209	-0.0018	0.0021	-0.0053	0.0052
EM	-0.0279	-0.0064	0.0012	-0.0014	-0.0024	-0.0085	0.0348	-0.0156	-0.0115	-0.0187	-0.0047	0.0098
WM	-0.0162	-0.0031	-0.0007	-0.0004	0.0001	-0.0024	0.0278	-0.0081	-0.0090	-0.0114	-0.0002	0.0095
WN	-0.0429	-0.0164	-0.0034	-0.0092	-0.0099	-0.0233	0.0174	-0.0355	-0.0137	-0.0273	-0.0256	-0.0062
WS	-0.0076	-0.0032	-0.0025	-0.0062	-0.0054	-0.0116	0.0152	-0.0336	-0.0066	-0.0202	-0.0103	0.0059
EA	-0.0276	-0.0055	-0.0012	-0.0023	-0.0036	-0.0072	0.0318	-0.0020	-0.0102	-0.0088	-0.0117	0.0078
NT	-0.0200	-0.0069	-0.0005	-0.0025	-0.0016	-0.0072	0.0319	0.0018	-0.0073	-0.0110	-0.0129	0.0001
SE	-0.0220	-0.0051	-0.0005	-0.0027	-0.0023	-0.0094	0.0375	-0.0058	-0.0035	-0.0066	-0.0134	0.0045
SO	-0.0301	-0.0133	-0.0049	-0.0059	-0.0047	-0.0148	0.0303	-0.0209	-0.0147	-0.0181	-0.0055	-0.0014
SW	-0.0165	-0.0070	-0.0043	-0.0045	-0.0029	-0.0100	0.0162	-0.0092	-0.0114	-0.0112	-0.0048	0.0010
AVG	-0.0221	-0.0077	-0.0017	-0.0036	-0.0038	-0.0117	0.0266	-0.0152	-0.0067	-0.0106	-0.0077	0.0035

- The deviation from 1 has been analysed for gas years 2010/11 and 2011/12.
- Table compares the differences in results between gas year 2010/11 and 2011/12
- Although on average the SF was closer to one for 2011/12 these results show the SF was generally more variable over the year.

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Scaling Factor Values 2011/12 : Conclusions

- In general, the average SFs tended to be a little lower than one.
- In 6 / 13 LDZs, on weekdays (and 8 / 13 on Fridays, Saturdays and Sundays), average values of SF improved compared to 2010/11.
- Average SF values for all of winter 2011/12 worsened when compared to winter 2010/11 in all LDZs.
- For summer 2011/12 average values of SF were better than summer 2010/11 in 12 / 13 LDZs.
- Monthly RMS values of SF (deviation from one) during 2011/12 were in a majority of LDZ / months combinations slightly worse than in 2010/11.
- Considered overall SFs during 2011/12 generally were slightly 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 2010/11 and Gas Year 2011/12

Red: WCF deviation further from 0 than 10/11 – **Green:** WCF deviation closer to 0 than 10/11

LDZ	Mon-Thur	Friday	Saturday	Sunday	Winter	Summer
SC	0.040	-0.001	0.005	0.042	0.081	-0.068
NO	-0.014	-0.026	-0.024	0.009	0.000	-0.045
NW	0.003	-0.013	-0.046	-0.009	0.001	-0.049
NE	0.013	-0.057	-0.045	0.001	0.027	-0.086
EM	0.013	-0.003	-0.006	0.009	-0.008	-0.044
WM	0.004	-0.026	-0.050	-0.020	-0.009	-0.096
WN	-0.009	-0.024	-0.021	0.006	0.012	-0.037
WS	0.032	-0.008	0.015	0.046	0.000	-0.068
EA	0.011	0.004	-0.011	-0.003	0.024	-0.012
NT	0.013	0.000	-0.004	0.010	0.010	-0.041
SE	-0.007	-0.019	0.006	0.019	-0.006	-0.006
SO	0.040	0.019	0.015	0.042	0.027	-0.062
SW	0.037	0.016	0.011	0.046	-0.020	-0.119

- The difference between absolute average value of WCFs from zero has been calculated for gas years 2010/11 and 2011/12.
- Table compares the differences in results between gas year 2010/11 and 2011/12
- Green indicates on average the WCF was closer to zero than in 2010/11.

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Weather Correction Factor Values 2011/12 : Conclusions

- Average WCF was negative in 9 / 13 LDZs on Mondays to Thursdays and was positive for all LDZs on Fridays and weekends (except for 2 LDZs on Fridays and 1 LDZ on Saturdays).
- WCF was closer to zero in 2011/12 than in 2010/11 on Mon-Thur and Sundays in 10 LDZs, on Fridays in 3 LDZs and on Saturdays in 5 LDZs.
- In winter 2011/12 WCF was closer to zero in 7 out of 13 LDZs.
- In summer 2011/12 WCF was further away from zero in all LDZs.
- The differences between the years are the result of differences in factors such as weather or EUC AQ excess.

Aggregate NDM AQ Changes - start of gas year 2012/13

LDZ	% NDM AQ Change
SC	-4.7%
NO	-5.6%
NW	-6.4%
NE	-4.5%
EM	-5.4%
WM	-5.0%
WN	-8.0%
WS	-6.5%
EA	-5.9%
NT	-6.0%
SE	-6.6%
SO	-5.6%
SW	-7.3%
Overall	-5.8%

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NDM Algorithm 2011/12 Performance Evaluation

- Next Steps – Strands 2 and 3 to be presented at February 2013 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