NDM Algorithm Performance – Strand 1

Weather Correction Factor (WCF) & Scaling Factor (SF)

Supporting Document: DESC_0910 WCF SF Assessment_101110.pdf

DESC 10th November 2010

NDM Algorithm 2009/10 Performance Evaluation

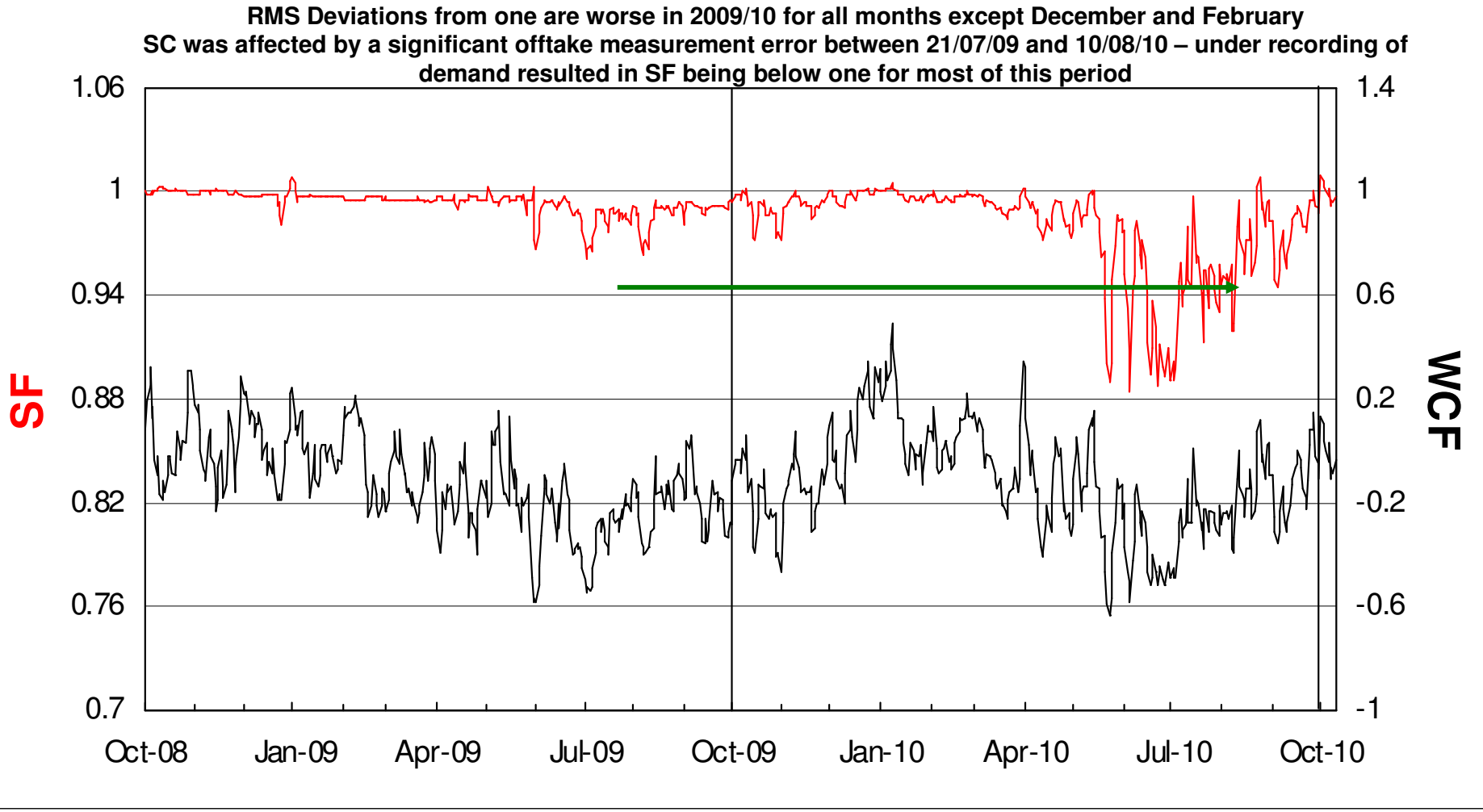
- Assess 2009/10 Gas Year NDM algorithm performance
- By considering three sources of information:
  - Daily values of Scaling Factor (SF) & Weather Correction Factor (WCF)
  - Reconciliation Variance data for each EUC
  - Daily consumption data collected from the NDM sample
- This presentation covers the first of these strands: Strands 2&3 – Feb'11

Analysis of Scaling Factor (SF) & 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)
    - Scale on graphs amended as per feedback from last year
  - 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 2008/09 and 2009/10 and first 10 days of 2010/11
  - All LDZs and full explanatory detail contained in supporting document

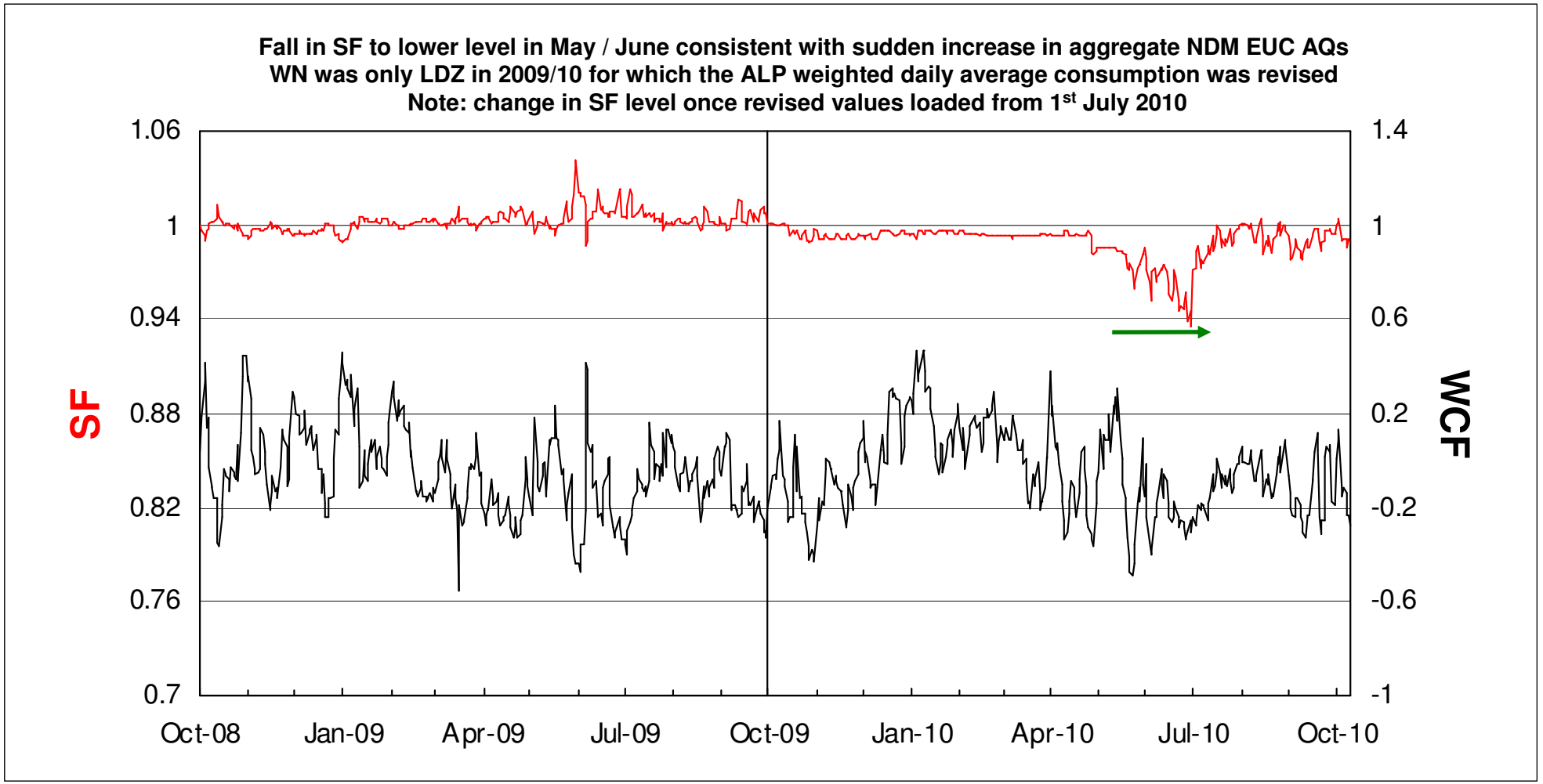
Weather Correction & Scaling Factor: SC

Example 1



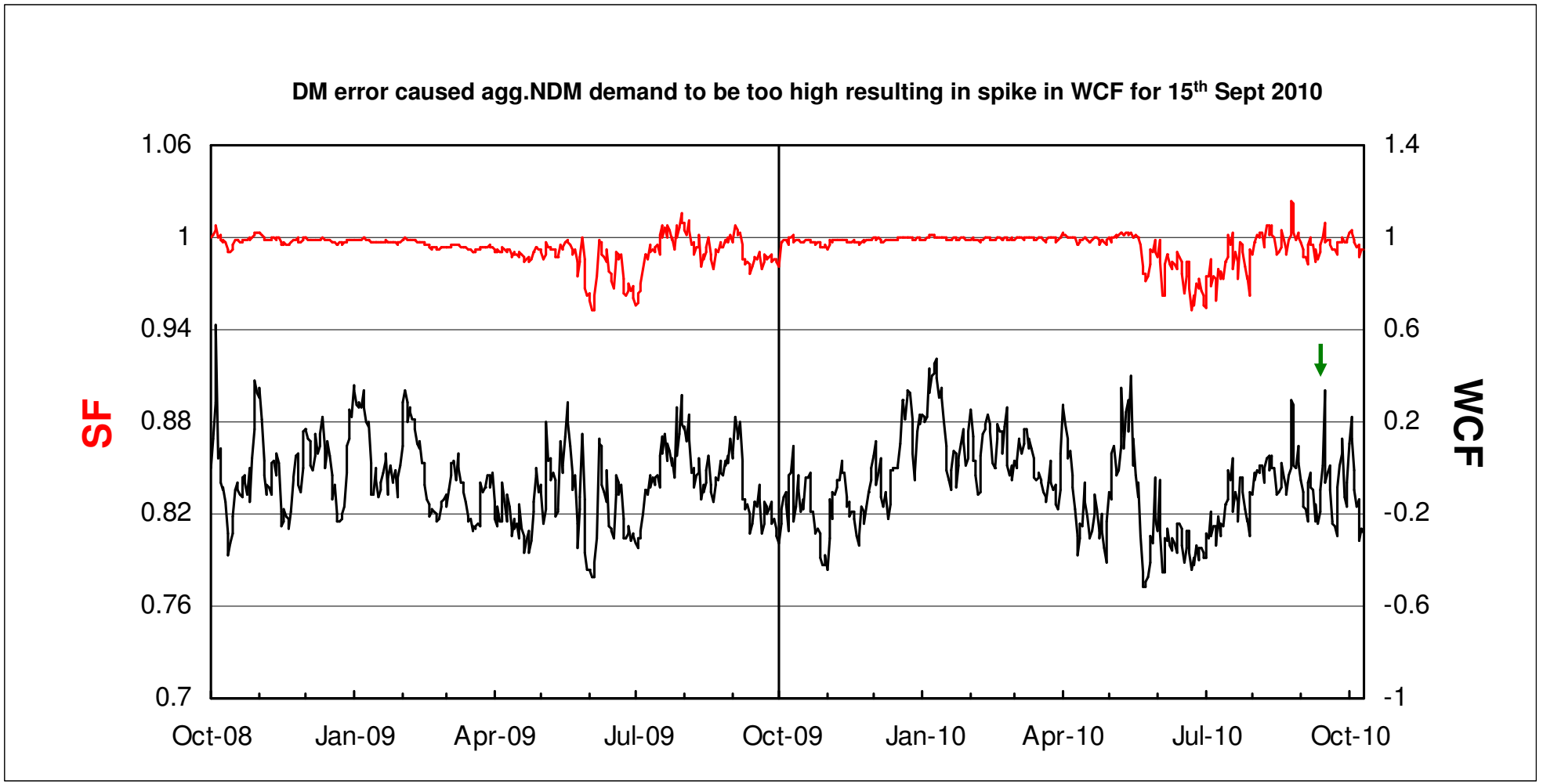
Weather Correction & Scaling Factor: WN

Example 2



Weather Correction & Scaling Factor: WS

Example 3



Analysis: Comparison Values 2008/09 to 2009/10

- Further analysis of algorithm performance considers:

- Change in average values of SF (08/09 to 09/10)
  - RMS deviation of SF from 1 – measures variability of SF

- Change in average values of WCF (08/09 to 09/10)
  - 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 2009/10 to 2010/11

Average Values of SF
Difference between Gas Year 08/09 & Gas Year 09/10

Red: Greater SF deviation from 1 in 2009/10 – Green: Lower SF deviation from 1 in 2009/10

LDZ	Mon-Thur	Friday	Saturday	Sunday	Winter	Summer
SC	-0.013	-0.018	-0.018	-0.015	-0.002	-0.028
NO	-0.006	-0.004	-0.005	-0.005	-0.001	-0.007
NW	-0.009	-0.013	-0.015	-0.010	-0.002	-0.021
NE	-0.002	-0.007	-0.003	-0.001	0.001	-0.006
EM	0.004	0.002	0.003	0.004	-0.001	0.008
WM	0.015	0.013	0.011	0.012	0.001	0.027
WN	-0.010	-0.009	-0.004	-0.005	-0.004	-0.010
WS	0.002	0.002	0.001	0.002	0.002	0.003
EA	0.018	0.016	0.014	0.015	0.003	0.031
NT	0.009	0.007	0.006	0.007	0.001	0.014
SE	0.003	0.001	0.001	0.003	-0.001	0.005
SO	-0.004	-0.004	-0.004	-0.004	-0.002	-0.006
SW	0.006	0.005	0.005	0.006	0.002	0.009

- Average SF behaviour for all of Winter 2009/10 was mixed – improvement for 6 LDZs
- Summer period 7 of 13 LDZs showed improvement compared with 08/09
- For Friday, Saturdays and Sundays 7 of 13 LDZs showed improvement

Average Values of Root Mean Square Deviation of SF from 1 Difference between Gas Year 08/09 and Gas Year 09/10

Red: Greater SF deviation from 1 in 2009/10 – Green: Lower SF deviation from 1 in 2009/10

LDZ	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
SC	-0.0127	-0.0067	0.0017	-0.0002	0.0002	-0.0041	-0.0116	-0.0360	-0.0659	-0.0404	-0.0222	-0.0178
NO	0.0000	-0.0006	0.0104	-0.0015	-0.0008	-0.0001	0.0011	-0.0013	-0.0084	-0.0066	-0.0033	-0.0120
NW	-0.0112	-0.0058	-0.0027	-0.0031	-0.0001	-0.0036	-0.0095	-0.0362	-0.0434	-0.0230	-0.0012	-0.0417
NE	0.0047	0.0003	0.0014	0.0013	0.0050	0.0033	-0.0009	-0.0093	-0.0090	0.0029	0.0101	-0.0059
EM	0.0053	-0.0008	0.0023	0.0013	0.0069	0.0025	0.0092	0.0039	-0.0054	0.0007	0.0274	0.0072
WM	0.0030	0.0019	0.0039	0.0007	0.0034	0.0051	0.0139	0.0095	0.0271	0.0315	0.0333	0.0256
WN	-0.0006	-0.0036	-0.0008	-0.0003	-0.0036	-0.0032	-0.0021	-0.0091	-0.0283	-0.0067	-0.0038	-0.0054
WS	0.0005	0.0001	0.0011	0.0017	0.0035	0.0056	0.0082	0.0040	0.0006	-0.0070	0.0012	0.0061
EA	0.0084	0.0041	0.0044	0.0010	0.0058	0.0083	0.0242	0.0268	0.0275	0.0226	0.0342	0.0368
NT	0.0067	0.0035	0.0022	0.0012	0.0032	0.0059	0.0164	0.0196	0.0202	0.0115	0.0098	0.0247
SE	-0.0080	-0.0039	0.0024	0.0018	0.0030	0.0000	-0.0011	-0.0020	-0.0020	-0.0084	0.0174	0.0113
SO	-0.0067	-0.0032	0.0019	0.0008	-0.0009	-0.0057	-0.0113	-0.0111	-0.0075	-0.0093	0.0000	0.0001
SW	0.0059	0.0031	0.0019	0.0030	0.0043	0.0072	0.0124	0.0114	0.0254	0.0111	0.0077	0.0121
AVG	-0.0004	-0.0009	0.0023	0.0006	0.0023	0.0016	0.0038	-0.0023	-0.0053	-0.0016	0.0085	0.0032

- RMS Deviation provides a measure of the variability of SFs and overall they were less variable than over the previous gas year

Scaling Factor Values 2009/10 - Conclusions

- In most LDZs average SFs tended to be a little lower than one.
  - For 7 / 13 LDZs, on weekdays, Fridays, Saturdays and Sundays, average values of SF improved.
  - Average SF behaviour for all of winter 2009/10 was mixed: an improvement over winter 2008/09 in 6 LDZs a very small worsening in 3 LDZs and a somewhat greater worsening in 4 LDZs.
  - For summer 2009/10 average values of SF were better than summer 2008/09 in 7 / 13 LDZs.
- Monthly RMS values of SF (deviation from one) during 2009/10 were in a majority of LDZ / months combinations better than in 2008/09.
- Considered overall SFs during 2009/10 generally were less variable than over the previous gas year.
- Note: 2 of the LDZs (SC and SO) were affected by significant offtake measurement errors.

Average Values of WCF
Difference between Gas Year 2008/09 and Gas Year 2009/10

Red: WCF deviation further from 0 than 08/09 – Green: WCF deviation closer to 0 than 08/09

LDZ	Mon-Thur	Friday	Saturday	Sunday	Winter	Summer
SC	0.018	-0.032	-0.029	-0.010	-0.006	0.006
NO	0.070	0.024	0.023	0.067	0.052	0.060
NW	0.028	0.006	-0.013	0.032	0.006	0.024
NE	0.061	0.030	0.025	0.054	0.040	0.055
EM	0.055	0.035	0.015	0.031	0.026	0.059
WM	0.050	0.044	0.021	0.030	0.020	0.064
WN	0.014	-0.007	-0.026	0.001	-0.001	0.007
WS	-0.009	-0.018	-0.035	-0.010	0.011	-0.039
EA	0.054	0.028	0.017	0.043	-0.005	0.082
NT	0.043	0.021	0.006	0.040	0.007	0.075
SE	0.065	0.040	0.029	0.065	-0.001	0.115
SO	0.034	0.015	0.000	0.035	-0.017	0.070
SW	0.028	0.016	-0.002	0.026	0.023	0.021

- Differences between years are the result of differences in factors such as weather or EUC AQ excess – results could suggest that actual weather was closer to seasonal normal in 2009/10 than in 2008/09

WCF values in 2009/10 - Conclusions

- Average WCF was negative in all LDZs in 2009/10 on all days of the week, in all LDZs during the summer and in 6 LDZs in the winter.
- WCF was closer to zero in 2009/10 than in 2008/09 on weekdays in 12 LDZs, on Fridays in 10 LDZs, on Saturdays in 8 LDZs and on Sundays in 11 LDZs.
- In winter 2009/10 WCF was closer to zero in 8 out of 13 LDZs.
- In summer 2009/10 WCF was closer to zero in 12 out of 13 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 2010/11

LDZ	% NDM AQ Change
SC	-9.2%
NO	-9.2%
NW	-9.7%
NE	-8.8%
EM	-8.7%
WM	-9.4%
WN	-9.0%
WS	-10.1%
EA	-8.1%
NT	-7.7%
SE	-8.5%
SO	-10.0%
SW	-9.6%
Overall	-9.0%