NDM Algorithm Performance – Strand 1

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

Supporting Document: DESC_0809 WCF SF Assessment_101109.pdf

DESC 10th November 2009

NDM Algorithm 2008/09 Performance Evaluation

Assess 2008/09 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'10

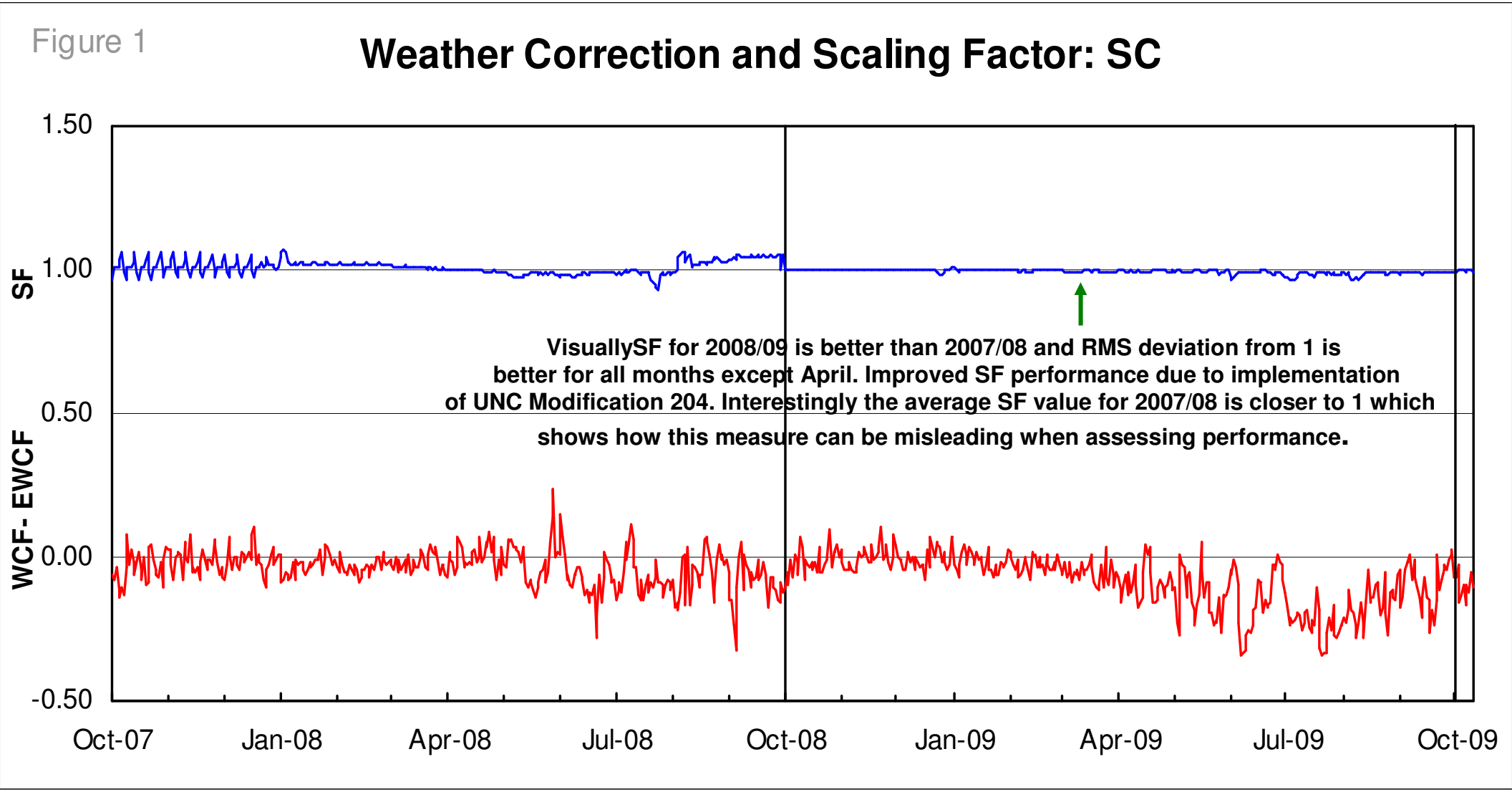
Analysis of Scaling Factor (SF) & Weather Correction Factor (WCF) – Estimated Weather Correction Factor (EWCF)

- Analysis: Data graphs represent daily trends for SF and WCF-EWCF
  - 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).
  - Upto the end of gas year 2007/08 WCF-EWCF used to isolated the 'non weather' component of the WCF
  - WCF – EWCF now measures the difference between aggregate NDM SND used to compute EWCF and the sum of ALP weighted daily average consumption in each LDZ (based on EUC AQs) used to compute the WCF
- 3 LDZ specific examples highlighted for period 2007/08 and 2008/09
  - All LDZs and full explanatory detail contained in supporting document

Weather Correction & Scaling Factor: SC

Example 1

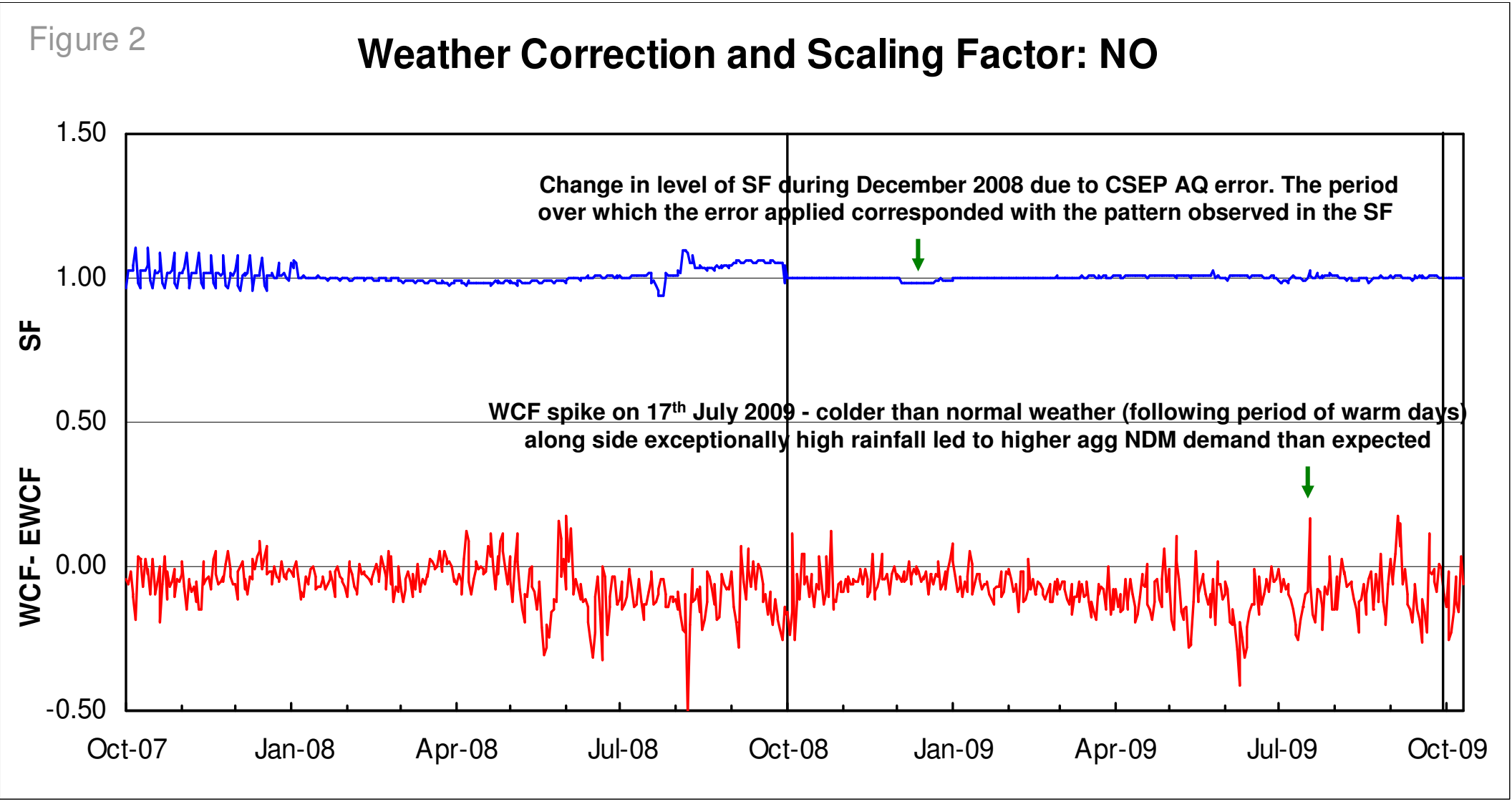
Figure 1



Weather Correction & Scaling Factor: NO

Example 2

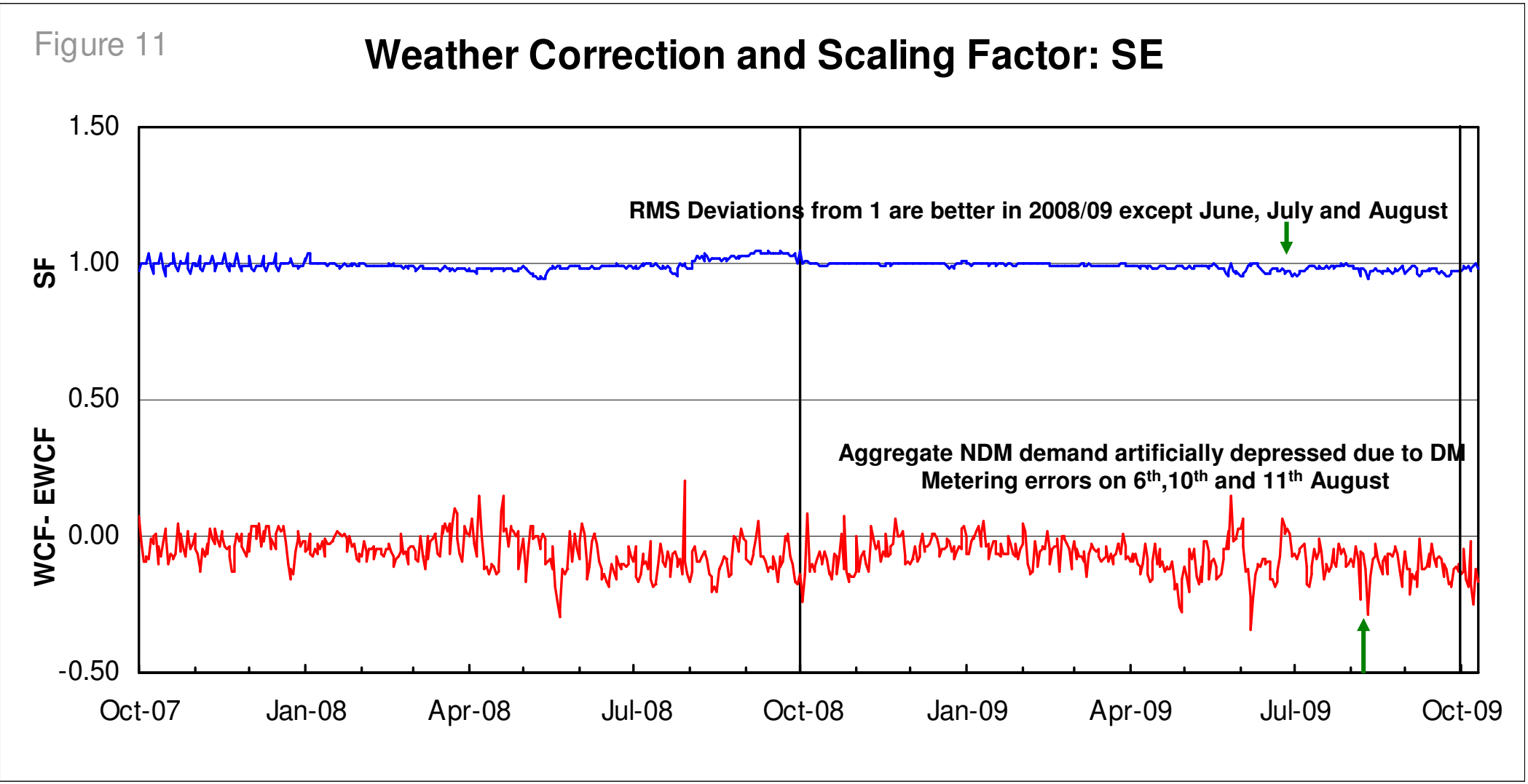
Figure 2



Weather Correction & Scaling Factor: SE

Example 3

Figure 11



Analysis: Comparison Values 2007/08 to 2008/09

- Further analysis of algorithm performance considers:

- Change in average values of SF (07/08 to 08/09)
  - RMS deviation of SF from 1 – measures variability of SF

- Change in average values of WCF – EWCF (07/08 to 08/09)
  - WCF redefined from 2008/09
  - UNC Modification 204 meant the WCF from gas year 2008/09 was redefined and so comparison between 07/08 & 08/09 could be misleading on this occasion

- Compare actual Weather Corrected Demand to aggregate NDM SND

- Change in aggregate NDM AQ from gas year 2008/09 to 2009/10

Average Values of SF
Difference between Gas Year 07/08 & Gas Year 08/09

Red: Greater SF deviation from 1 in 2008/09 – Green: Lower SF deviation from 1 in 2008/09

LDZ	MON-THUR	FRIDAY	SATURDAY	SUNDAY	WINTER	SUMMER
SC	0.000	0.008	0.015	-0.003	0.012	-0.006
NO	0.007	0.005	0.021	0.001	0.004	0.007
NW	-0.010	-0.003	0.002	0.004	0.011	-0.012
NE	0.022	0.034	0.048	0.031	0.038	0.019
EM	-0.021	-0.020	-0.015	-0.019	0.013	-0.027
WM	-0.014	-0.014	-0.019	-0.012	0.001	-0.025
WN	0.070	0.083	0.111	0.112	0.081	0.084
WS	-0.006	-0.006	-0.003	-0.003	0.001	-0.006
EA	-0.010	-0.005	0.012	0.004	0.000	-0.009
NT	0.003	0.009	0.027	0.028	0.003	0.019
SE	-0.007	-0.005	-0.003	-0.003	0.003	-0.017
SO	0.007	0.007	-0.002	0.011	0.008	0.005
SW	-0.009	-0.008	0.009	0.009	0.004	0.009

- During Winter period average SFs for 2008/09 were closer to ideal value of one than in 2007/08. Summer period more of a mixed picture where 6 of 13 LDZs showed improvement
- Overall SFs during 2008/09 were closer to one and less variable than over the previous gas year – consider RMS deviation…..

Average Values of Root Mean Square Deviation of SF from 1 Difference between Gas Year 07/08 and Gas Year 08/09

Red: Greater SF deviation from 1 in 2008/09 – Green: Lower SF deviation from 1 in 2008/09

LDZ	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
SC	0.0281	0.0268	0.0200	0.0257	0.0146	0.0039	-0.0008	0.0099	0.0025	0.0052	0.0161	0.0360
NO	0.0424	0.0363	0.0188	0.0153	0.0016	0.0098	0.0106	0.0067	-0.0021	0.0128	0.0445	0.0488
NW	0.0193	0.0122	0.0341	0.0247	0.0217	0.0183	0.0041	0.0506	-0.0075	0.0048	0.0001	0.0224
NE	0.0290	0.0453	0.0501	0.0612	0.0481	0.0341	0.0205	0.0236	-0.0013	0.0030	0.0384	0.0588
EM	0.0176	0.0117	0.0259	0.0295	0.0249	0.0213	-0.0085	0.0364	-0.0255	-0.0093	-0.0020	-0.0037
WM	0.0193	0.0048	0.0228	0.0135	0.0116	0.0096	-0.0118	0.0350	-0.0465	-0.0133	-0.0099	0.0003
WN	0.0603	0.0761	0.0856	0.0828	0.0908	0.0876	0.0766	0.0524	0.0996	0.0853	0.0995	0.1152
WS	0.0003	0.0024	0.0092	0.0052	-0.0013	0.0185	-0.0070	0.0315	-0.0123	0.0026	0.0112	0.0036
EA	0.0037	0.0000	0.0151	0.0108	0.0052	0.0007	-0.0228	0.0165	0.0101	-0.0059	-0.0057	0.0257
NT	0.0057	0.0057	0.0110	0.0137	0.0107	0.0107	-0.0029	-0.0067	0.0295	0.0377	0.0327	0.0299
SE	0.0157	0.0142	0.0100	0.0072	0.0039	0.0132	0.0077	0.0113	-0.0148	-0.0017	-0.0061	0.0074
SO	0.0233	0.0189	0.0144	0.0092	0.0074	0.0183	0.0284	0.0413	0.0076	0.0113	0.0102	0.0223
SW	0.0287	0.0088	0.0047	0.0031	-0.0019	-0.0002	-0.0056	0.0433	0.0170	0.0278	0.0311	0.0541
AVG	0.0226	0.0202	0.0247	0.0232	0.0183	0.0189	0.0068	0.0271	0.0043	0.0123	0.0200	0.0324

- RMS Deviation shows SF variability in 08/09 was overall better than in 07/08 for all months
- Winter period clearly much better for all LDZs
- Summer period for some LDZs more mixed

Scaling Factor Values 2008/09 - Conclusions

In most LDZs average SFs tended to be a little lower than one

- In 2007/08 prior to Mod. 204, SFs tended to be greater than one

Most LDZs average values of SF for winter 2008/09 appeared to be closer to the ideal value of one than for winter 2007/08.

For summer 2008/09 average values of SF were mixed

- 7 of 13 LDZs being worse than in summer 2007/08.

Monthly RMS values of SF (deviation from one) during 2008/09 were on the whole better than in 2007/08

- Very few exceptions in the winter months and a greater number of exceptions in the summer months (e.g. April and June).

Even when lower than one the average SF values tended to be close to the ideal value.

Average Values of WCF-EWCF
Difference between Gas Year 2007/08 and Gas Year 2008/09

Red: WCF deviation worse than 07/08 – Green: WCF deviation better than 07/08

LDZ	Mon-Thur	Friday	Saturday	Sunday	Winter	Summer
SC	-0.049	-0.026	-0.041	-0.049	0.004	-0.093
NO	-0.016	-0.021	-0.016	-0.033	-0.026	-0.013
NW	-0.024	-0.041	-0.019	-0.012	-0.009	-0.039
NE	-0.015	-0.018	-0.006	-0.013	-0.015	-0.012
EM	-0.014	-0.037	-0.018	-0.014	-0.018	-0.017
WM	-0.050	-0.068	-0.058	-0.052	-0.030	-0.078
WN	0.038	0.026	0.057	0.071	0.017	0.070
WS	-0.013	-0.016	-0.041	-0.013	0.001	-0.035
EA	0.002	0.004	0.012	0.013	-0.018	0.029
NT	-0.010	-0.010	0.011	0.014	0.000	-0.007
SE	-0.023	-0.020	-0.015	-0.029	-0.024	-0.021
SO	-0.072	-0.084	-0.060	-0.068	-0.063	-0.072
SW	-0.010	-0.031	-0.020	0.003	-0.028	0.003

- WCF – EWCF deviation is broadly worse in 2008/09 than 2007/08, however…..
- Definitions of WCF in 2008/09 different to that applied in 2007/08

NDM Weather Corrected Demand as % of NDM Seasonal Normal Demand, Gas Year 2008/09

LDZ	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
SC	98.2%	99.0%	98.4%	96.9%	96.1%	93.4%	90.0%	86.7%	86.2%	78.3%	85.6%	91.7%
NO	93.8%	95.8%	97.1%	94.5%	92.6%	89.7%	91.4%	89.7%	84.6%	88.6%	90.8%	93.2%
NW	92.5%	96.5%	97.6%	94.9%	93.7%	90.1%	87.6%	91.6%	84.9%	84.5%	90.0%	91.1%
NE	90.7%	91.7%	95.4%	93.6%	94.7%	90.2%	88.9%	93.3%	85.7%	84.2%	91.2%	90.7%
EM	90.8%	90.2%	94.3%	94.2%	93.8%	89.8%	87.3%	88.2%	89.6%	90.6%	95.2%	89.7%
WM	92.8%	94.0%	95.2%	93.1%	92.7%	89.0%	83.5%	89.2%	84.7%	85.4%	89.3%	90.6%
WN	86.3%	91.2%	91.1%	94.0%	88.8%	83.9%	85.7%	82.1%	77.9%	77.6%	81.5%	80.0%
WS	96.5%	96.8%	95.5%	96.5%	93.9%	89.5%	85.8%	93.5%	91.8%	101.2%	103.7%	93.5%
EA	93.3%	95.6%	94.7%	94.1%	94.7%	94.0%	89.4%	92.2%	97.3%	95.7%	102.0%	93.4%
NT	93.7%	96.9%	96.2%	95.9%	95.2%	93.3%	91.6%	94.1%	97.8%	101.9%	103.0%	96.7%
SE	91.2%	95.6%	96.7%	95.8%	94.0%	93.5%	88.9%	93.8%	93.8%	98.6%	96.9%	91.0%
SO	90.8%	93.4%	93.4%	92.2%	92.8%	87.8%	83.4%	84.8%	90.1%	93.1%	97.2%	91.0%
SW	92.5%	96.4%	95.6%	95.9%	95.1%	89.3%	86.0%	89.2%	91.5%	95.6%	99.2%	92.4%

- More than 70% of month/LDZ combinations the percentages for 2008/09 are lower than 2007/08
- Consistent with greater WCF-EWCF deviation results on previous slide

WCF-EWCF values in 2008/09 - Conclusions

For gas year 2007/08 WCF-EWCF was a measure of WCF bias

WCF bias was negative in most LDZs in 2007/08

For gas year 2008/09 WCF-EWCF no longer indicates WCF bias

- WCF no longer dependent on aggregate NDM SND

WCF deviation has worsened in 2008/09 over 2007/08

However, this cannot be related to aggregate NDM SND being biased (too high or too low)

WCF deviation is now caused by the difference between aggregate NDM SND used to compute EWCF and the sum of ALP weighted daily average consumption in each LDZ (based on EUC AQs) used to compute WCF

Aggregate NDM AQ Changes - start of gas year 2009/10

LDZ	% NDM AQ Change
SC	-3.9%
NO	-5.2%
NW	-3.8%
NE	-4.7%
EM	-5.0%
WM	-5.1%
WN	-4.8%
WS	-4.3%
EA	-4.5%
NT	-3.2%
SE	-4.2%
SO	-5.4%
SW	-4.7%
Overall	-4.4%