



# NDM Algorithm Performance – Strand 1

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

Supporting Document: Gas Year 0708 WCF SF Assessment.pdf

DESC 11<sup>th</sup> November 2008

# NDM Algorithm 2008 Performance Evaluation

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- Assess 2007/08 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 – Jan 09

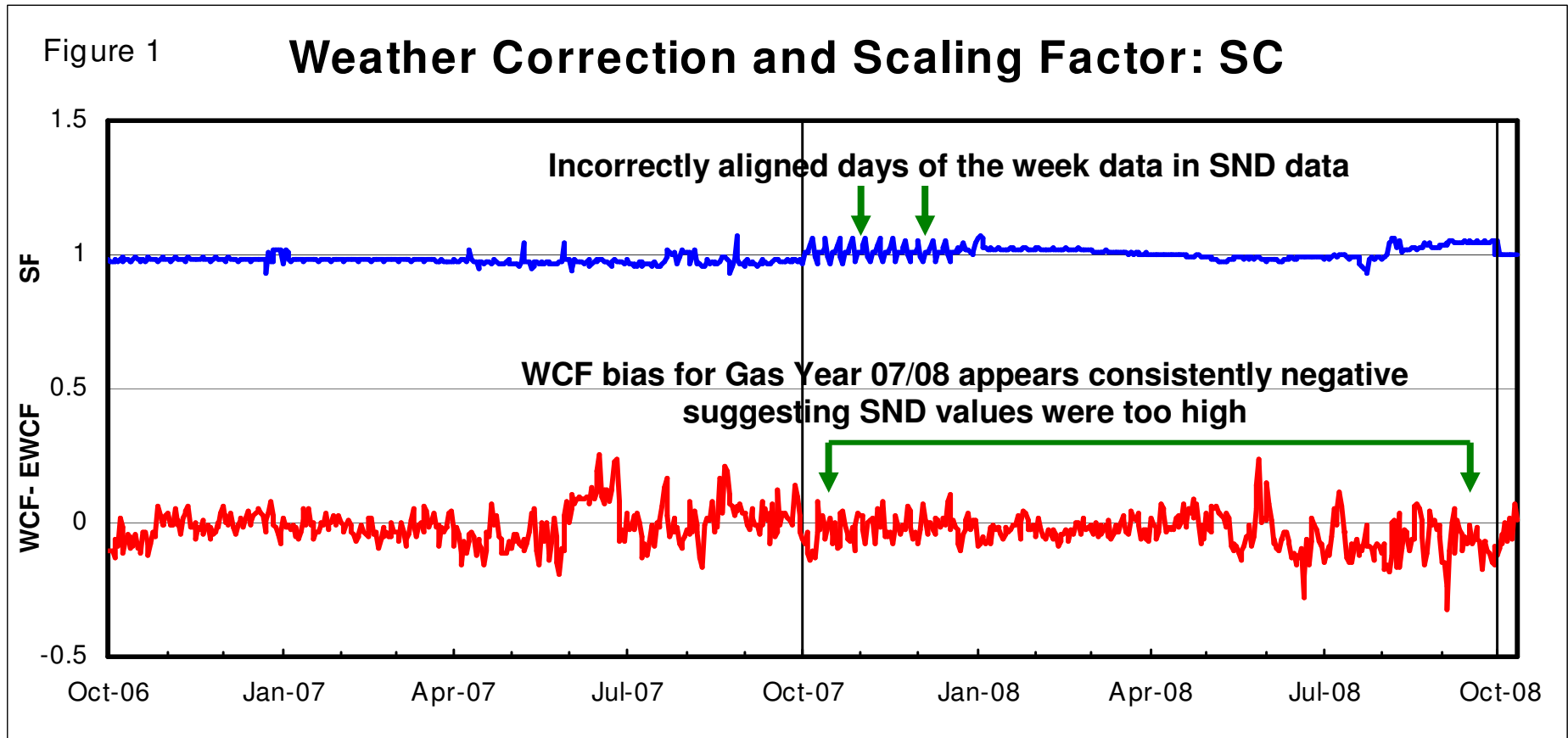
# Analysis of Scaling Factor (SF) & Weather Correction Factor (WCF) – Estimated Weather Correction Factor (EWCF)

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- Analysis: Data graphs represent daily trends for SF and WCF-EWCF
  - WCF - EWCF isolates the non weather component and impacts of demand
  - SF ensures total aggregate NDM Demand = Allocated Demand
    - Dependent on impact of AQ, SND, actual demand and modelling parameters (ALP, DAF, Holiday Factors)
    - Opposing effect of strong WCF bias can result in reduced SF impact
- Two gas years depicted for comparison:
  - 2006/07 and 2007/08 (+ first 10 days of October 2008)
- 3 LDZ specific examples of SF and WCF-EWCF – highlight key points
  - All LDZs and full explanatory detail contained in supporting document

# Weather Correction & Scaling Factor: SC

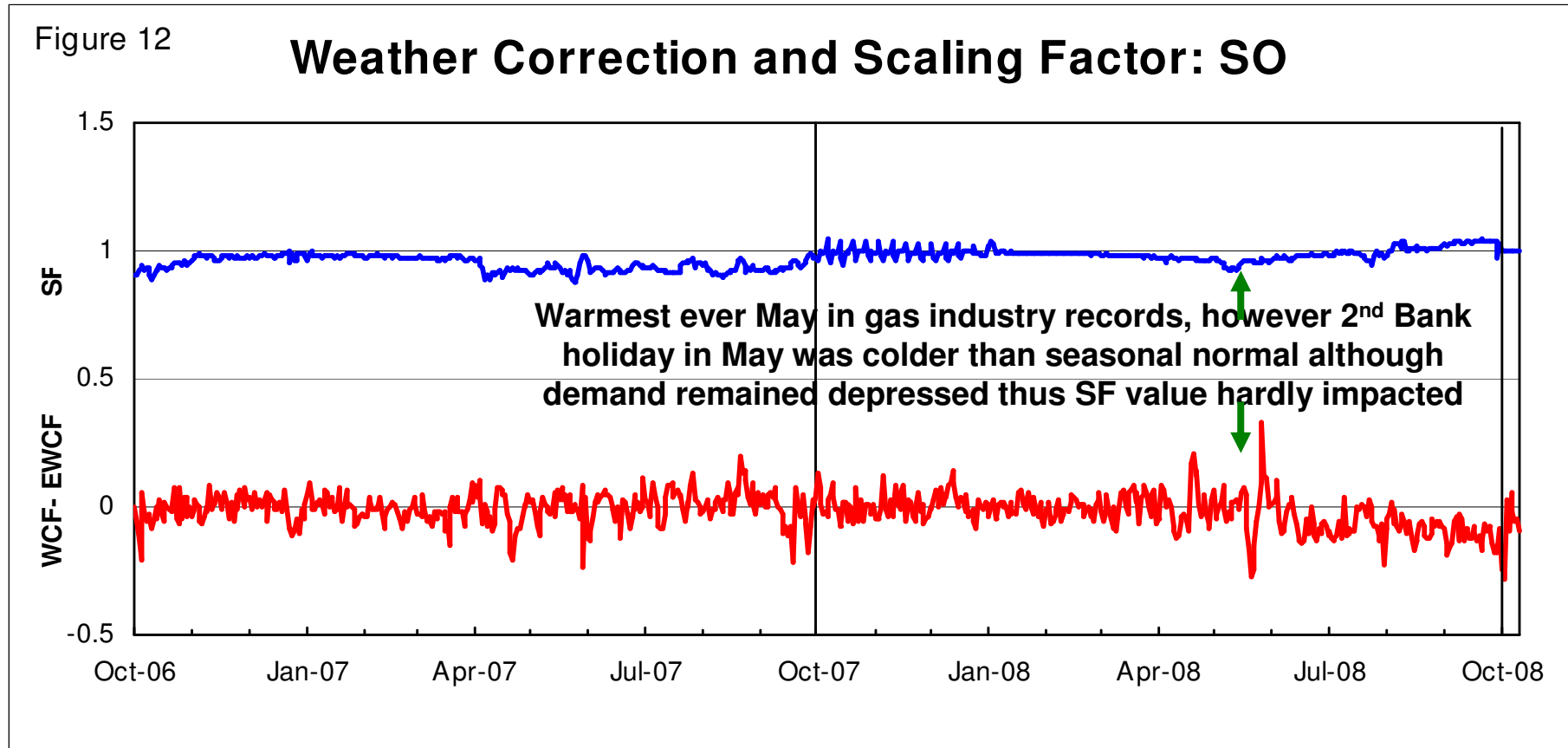
## Example 1



- Example of influences of SND data to algorithm performance – MOD204 reduces this

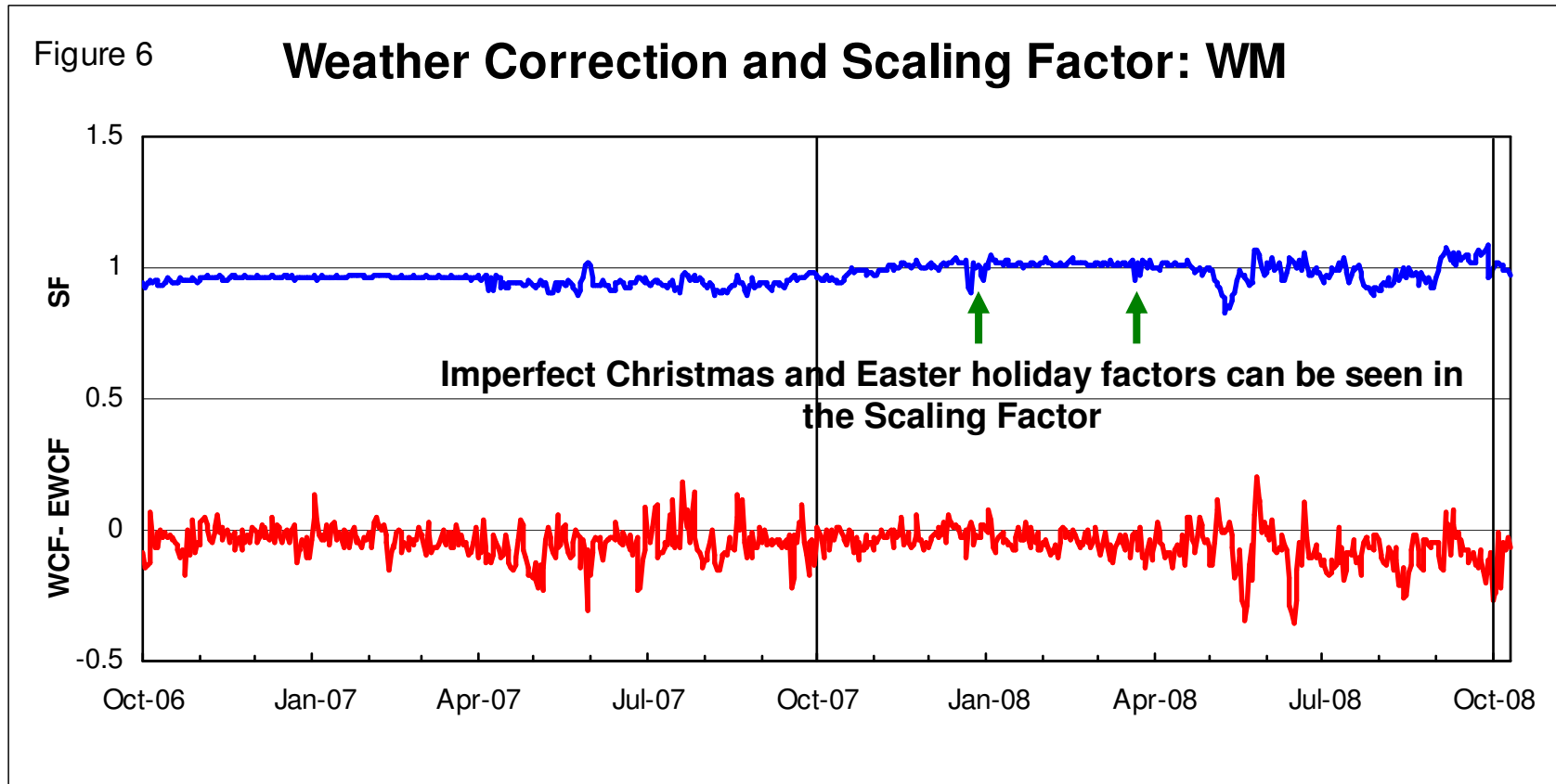
# Weather Correction & Scaling Factor: SO

## Example 2



# Weather Correction & Scaling Factor: WM

## *Example 3*



## Analysis: Comparison Values 2006/07 to 2007/08

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- Further analysis of algorithm performance considers:
  - Change in average values of SF (06/07 to 07/08)
    - RMS deviation of SF from 1 – measures variability of SF
  - Change in average values of WCF – EWCF
  - Compare actual Weather Corrected Demand to SND
    - Impact of SND forecasts
  - Impact of AQ
    - Over or under statement impacts and recent changes reflecting this

## Average Values of SF Difference between Gas Year 2006/07 & Gas Year 2007/08

*Red: Greater SF deviation from 1 in 2007/08 – Green: Lower SF deviation from 1 in 2007/08*

LDZ	MON-THUR	FRIDAY	SATURDAY	SUNDAY	WINTER	SUMMER
SC	0.014	0.017	0.002	0.010	0.003	0.021
NO	0.032	0.026	0.005	0.035	0.029	0.029
NW	0.041	0.032	0.023	0.025	0.011	0.051
NE	-0.009	-0.024	-0.054	-0.028	-0.020	-0.021
EM	0.046	0.042	0.037	0.042	0.018	0.044
WM	0.043	0.046	0.041	0.038	0.036	0.044
WN	-0.047	-0.045	-0.058	-0.058	-0.036	-0.063
WS	0.026	0.025	0.023	0.026	0.025	0.021
EA	0.047	0.045	0.024	0.032	0.037	0.046
NT	0.032	0.025	-0.003	-0.003	0.045	-0.002
SE	0.050	0.050	0.038	0.041	0.044	0.054
SO	0.037	0.041	0.049	0.037	0.021	0.057
SW	0.038	0.037	0.007	0.001	0.038	-0.002

- Average values of SF are generally closer to the ideal value of 1 compared to 2006/07
- Exceptions exist: NE and WN



# Average Values of Root Mean Square Deviation of SF from 1 DIFFERENCE between Gas Year 06/07 & 07/08

*Red: Greater SF deviation from 1 in 2007/08 – Green: Lower SF deviation from 1 in 2007/08*

LDZ	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
SC	-0.0092	-0.0107	-0.0038	-0.0098	0.0015	0.0136	0.0235	0.0160	0.0155	0.0059	0.0000	-0.0173
NO	0.0029	-0.0028	-0.0003	0.0153	0.0270	0.0181	0.0217	0.0393	0.0337	0.0210	-0.0008	-0.0188
NW	0.0116	0.0076	-0.0136	-0.0067	-0.0031	0.0028	0.0276	-0.0051	0.0380	0.0188	0.0464	0.0085
NE	-0.0010	-0.0279	-0.0279	-0.0448	-0.0335	-0.0174	0.0067	0.0152	-0.0147	-0.0220	-0.0293	-0.0521
EM	0.0401	0.0139	-0.0059	-0.0100	-0.0086	0.0009	0.0515	0.0071	0.0189	0.0141	0.0318	0.0145
WM	0.0177	0.0261	0.0078	0.0170	0.0161	0.0195	0.0431	-0.0105	0.0374	0.0080	0.0268	0.0056
WN	-0.0194	-0.0273	-0.0397	-0.0371	-0.0438	-0.0483	-0.0505	-0.0179	-0.0846	-0.0459	-0.0653	-0.0877
WS	0.0173	0.0216	0.0175	0.0425	0.0268	0.0068	0.0328	-0.0090	0.0094	0.0045	0.0026	0.0016
EA	0.0817	0.0245	0.0028	0.0072	0.0120	0.0282	0.0927	0.0525	-0.0031	0.0463	0.0578	-0.0214
NT	0.0742	0.0360	0.0254	0.0230	0.0255	0.0321	0.0783	0.0801	-0.0282	-0.0091	0.0020	-0.0196
SE	0.0430	0.0300	0.0302	0.0348	0.0383	0.0325	0.0497	0.0470	0.0282	0.0521	0.0567	-0.0085
SO	0.0432	0.0038	0.0029	0.0087	0.0128	0.0088	0.0488	0.0267	0.0503	0.0460	0.0574	0.0266
SW	0.0198	0.0285	0.0364	0.0350	0.0410	0.0392	0.0583	0.0160	-0.0372	-0.0189	-0.0078	-0.0488
AVG	0.0248	0.0095	0.0024	0.0058	0.0086	0.0105	0.0372	0.0198	0.0049	0.0093	0.0137	-0.0167

- RMS value shows SF variability in 07/08 was overall better than in 06/07 (11 out of 12 months)
- SC, NE and NO variability in Oct to Dec can be linked to incorrect SND profiles

## Scaling Factor Values 2007/08 - Conclusions

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- In 2007/08, SF values generally closer to one in majority of LDZs (compared to 06/07)
- In most LDZs average SF above 1
- Accounted for by two compensating effects:
  - AQs still being too high driving SF further from 1
    - Supported by AQ values pre and post October 08 show overall reduction in AQ of 3.4%
  - Negative WCF bias is present tending to inflate SFs closer to 1
    - Caused by aggregate NDM SND being too high
- Result: SF above 1, but closer to 1
- Compare WCF...

## Average Values of WCF-EWCF Difference between Gas Year 2006/07 & Gas Year 2007/08

*Red: Greater WCF Bias in 2007/08 – Green: Lower WCF Bias in 2007/08*

LDZ	MON-THUR	FRIDAY	SATURDAY	SUNDAY	WINTER	SUMMER
SC	-0.016	-0.045	-0.047	-0.034	-0.006	-0.049
NO	-0.013	-0.014	-0.010	-0.019	-0.006	-0.022
NW	-0.012	-0.009	-0.010	-0.044	-0.007	-0.024
NE	-0.014	-0.035	-0.019	-0.024	-0.020	-0.018
EM	-0.006	-0.022	-0.014	-0.029	-0.006	-0.019
WM	-0.010	-0.027	0.002	-0.028	-0.003	-0.023
WN	-0.087	-0.064	-0.057	-0.064	0.001	-0.107
WS	-0.005	-0.030	0.005	-0.053	-0.048	0.019
EA	-0.059	-0.073	-0.046	-0.061	-0.014	-0.105
NT	-0.039	-0.039	-0.025	-0.049	-0.023	-0.035
SE	-0.039	-0.049	-0.022	-0.031	-0.012	-0.062
SO	-0.018	-0.029	-0.019	-0.025	0.006	-0.052
SW	-0.015	-0.021	0.000	-0.043	-0.011	-0.024

- WCF bias in 07/08 is generally negative and by a greater extent than 06/07
- SND levels in 07/08 were higher than 06/07 creating worse WCF bias

# NDM Weather Corrected Demand as % of NDM Seasonal Normal Demand: Gas Year 2007/08

*Red: SND > WCD – Green: SND < WCD*

LDZ	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
SC	96.37%	98.52%	99.19%	97.17%	96.65%	97.94%	100.49%	98.96%	92.83%	93.07%	95.02%	90.76%
NO	95.13%	95.26%	98.44%	94.93%	96.77%	97.05%	100.14%	91.23%	90.07%	90.21%	87.95%	88.96%
NW	96.26%	96.81%	100.46%	97.04%	97.49%	95.24%	96.23%	93.20%	88.67%	88.23%	88.03%	90.24%
NE	91.82%	92.60%	96.70%	94.83%	93.73%	96.74%	96.96%	89.71%	95.89%	91.12%	89.04%	83.43%
EM	94.45%	96.49%	98.13%	96.34%	95.42%	96.23%	95.93%	90.64%	90.16%	89.94%	90.89%	84.80%
WM	95.99%	97.19%	99.13%	96.68%	96.07%	93.48%	95.17%	93.73%	89.93%	90.37%	89.29%	91.44%
WN	98.50%	98.13%	102.01%	97.95%	97.23%	92.55%	94.25%	91.06%	80.08%	77.02%	80.45%	84.17%
WS	90.67%	93.68%	96.75%	96.97%	92.91%	95.41%	91.17%	95.10%	95.81%	96.63%	106.25%	94.42%
EA	93.52%	98.08%	98.40%	96.95%	96.00%	97.87%	94.67%	93.92%	92.12%	85.45%	82.04%	81.82%
NT	94.87%	96.09%	97.46%	96.79%	94.07%	96.48%	95.60%	98.24%	94.47%	94.31%	97.69%	91.44%
SE	96.65%	96.01%	98.22%	96.84%	94.35%	98.17%	96.86%	92.25%	91.25%	90.09%	91.44%	91.00%
SO	99.64%	99.65%	102.22%	99.98%	99.41%	100.71%	99.79%	99.22%	94.23%	93.16%	92.38%	88.91%
SW	95.21%	97.35%	98.03%	96.97%	92.45%	95.94%	92.41%	93.03%	88.42%	91.99%	93.26%	87.63%

- 2007/08: 149 of 156 cases aggregate SND considered too high (% WCD of SND <100%)
- 2006/07: 127 Cases

## WCF-EWCF Values in 2007/08 - Conclusions

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- Majority LDZs: WCF bias in 2007/08 is more negative than in 2006/07
- A negative WCF bias may lead to SFs tending to be higher than the ideal value
  - However compensating AQ values will have reduced SFs below 1
- Over gas year 2007/08 monthly average values of weather corrected demand as % of aggregate NDM SND are below 100%
  - Indicates aggregate NDM SNDs for gas year 2007/08 too high
- Overall: Some improved performance but impacts of AQ and SND impacting WCF and SF values

## Impact of UNC Modification 204 Scaling Factor Values 2008/09

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- WCF not based on SND but on ALP weighted daily average demand (  $\sum ALP * (AQ/365)$  )
- Improvement in SF values expected
- Summer SF volatility should also be improved
- First 10 days in October showed notably improved SF values in majority of LDZs
- SFs not as well behaved in NE, EM, WM and EA
- WCF bias no longer indicates SND error and not directly linked to SF discrepancies