

## Evaluation of algorithm performance, 2004/05 gas year

### Introduction

In accordance with customary practice, three sources of information have been examined in this review:

- i) daily values of scaling factor (SF) and weather correction factor (WCF) (see separate document circulated prior to the DESC meeting of 14<sup>th</sup> November 2005 and discussed at that meeting)
- ii) reconciliation variance (RV) data for each EUC
- iii) daily consumption data collected from the NDM sample

This note presents the results of the review in respect of RV data and NDM sample derived daily consumption data, with brief explanatory notes.

### 1. Scaling Factor (SF) and Weather Correction Factor (WCF)

This material was distributed prior to the meeting of DESC on 14 November 2005 and discussed at that meeting.

It incorporated SF and WCF-EWCF graphs and tables, for the two previous gas years, 2003/04 and 2004/05. In addition figures for the mean square deviation of SF from 1 were provided.

### 2. Reconciliation Variance (RV) analysis

The reconciliation variance (RV) data presented is based on the complete set of reconciliation variances that have been calculated for meter points in "B" EUCs. RVs for WAR band EUCs have not been included in the analysis. The object of this analysis is to try to assess the EUC profiles applied over the gas year from available RV data.

Consequently, prior to analysis the data has been screened to eliminate RVs which are greater than 50% of either the actual or allocated consumption (i.e. both: allocated > 2 x actual and allocated < 0.5 x actual). Additional checks have been made to ensure removal of inappropriate or erroneous data (e.g. actual consumptions should be positive, very low AQs are filtered out). Over gas year 2004/05, this screening process reduced the available data set by an extent ranging from around 19% in March to about 43% at the end of the gas year in September. The "raw" input data to this analysis is all RV data relating to the period in question (i.e. both standard and suppressed reconciliation).

An average profile of actual and allocated demand has been established from the remaining, validated RV data, for each EUC, and on this basis the profiles have been categorised as "peaky", "flat" or "ok". The generation of this average profile for an EUC involves taking each meter in turn and apportioning the total actual and allocated energy values evenly to all dates in the meter's reconciliation period. The ensuing aggregate values for each date are then divided by the number of contributing meters, and subsequently graphed against time. The objective is not to establish a realistic profile resembling an ALP (annual load profile), but rather to highlight any seasonal patterns in the average reconciliation variance.

The RV profile for an EUC can be categorised according to two dimensions, its annual level and its peakiness. The categorisation procedure is undertaken through the calculation of full year, winter and summer average errors expressed as a percentage of the full year average actual figure. The difference between the winter and summer errors is taken to reflect the peakiness of the profile, whereas the size of the full year error indicates whether the average AQ for the meters contributing to each EUC sample is too high or too low. The winter/summer error differences have been classified as acceptable if the absolute value is less than 5% (which is approximately equivalent to a one percentage point change in load factor).

It must be noted that, since gas year 2004/05 ended just a few months previously, RV data relating to meter points that are not monthly read has not fully flowed through to the analysis. Therefore, when this study is revised in spring 2006, the information relating to the lower consumption bands in the analysis will be further refined.

Graphs illustrating the profiles established from the RV data, for SC, WM, EM, SE, SW and EA LDZs in consumption bands 03, 04, 05, 06, 07 and 08 respectively, are attached as Figures 2.1, 2.3, 2.5, 2.7, 2.9 and 2.11. Prior to its being classified as too "peaky" etc., the deemed profile is scaled so that over the year as a whole the level of demand matches the actual level. Figures 2.2, 2.4, 2.6, 2.8, 2.10 and 2.12 show each of the revised profiles for the EUC and consumption band combinations stated above.

Table 2.1 shows the classification of the EUC profiles as regards their peakiness. Tables 2.2 and 2.3 show the percentage errors [(actual-allocated)/actual as a %] over the winter and summer periods respectively, on which the classification is based.

Bearing in mind that not all reconciliation variance data applicable to the period has yet been processed (particularly in those consumption bands with non-monthly read meters), Table 2.1 suggests that during 2004/05 for consumption bands 02B and 03B the profiles have mostly been too-peaky at the 5% level. These bands are the two most likely to contain non-monthly read meter points. Therefore, when this analysis is revised in spring 2006, the information relating to these lower consumption bands will be further refined. The profiles for consumption bands 04B and 06B appears to be mostly good. However, the profiles for consumption bands 05B and 07B are mostly split between those that are too peaky and those that are good. Consumption band 08B shows profiles that are too peaky and too flat as well as some that are acceptable. Data for consumption band 09B is not present for all LDZs. Where data exists, this band features cases that are too flat, too peaky and acceptable. For the higher consumption bands the numbers of individual meters providing data to this analysis are quite small.

Considering individual LDZs, the picture is one of profiles that are mostly too peaky in NE, EM and WN. In the LDZs: SC, NW, NT and SE the profiles are mostly good. The picture is a mixed one in the other LDZs: NO, WM, WS, EA, SO and SW. Overall there are few occurrences of profiles that are too flat. In general the profiles are good or a little too peaky.

It should be noted that, the NDM sample based analysis on the "best estimate 04" basis (see next section) suggests that in all consumption bands the profiles tend to under estimate slightly in the winter and over estimate in the summer, which is indicative of profiles that are a little too flat.

Table 2.4 shows the extent of the scaling that was applied in this RV analysis to the deemed demands in each EUC in order to match the annual demands.

Figure 2.13 and Figure 2.15 show the profiles established from the RV data, in consumption bands 03 and 04 respectively for all LDZs in aggregate. Figures 2.14 and 2.16 show the revised profiles after the application of scaling. On this basis, the scaled profiles for both consumption bands 03 and 04 appear overall to be acceptable (i.e. within the winter/summer 5% error difference level: <3.5% for 03B and <2% for 04B). The decision taken from the spring 2002 NDM analysis onwards to model these consumption bands separately has led to improved representation of these consumption bands. The smoothed models for gas year 2004/05 were the first for these consumption bands where the three constituent single year models were all based on separate analyses of each band (i.e. 03B and 04B). The NDM sample based analysis (see next section) on the "best estimate 04" and "best estimate 05" bases, also indicate progressive improvement in the representation of these two consumption bands from 2004/05 to 2005/06.

### 3. Analysis of NDM sample daily consumption data

The performance of the algorithms has been evaluated on three bases:

- i) As used - 2004/05 ALPs and DAFs, actual WCF and SF
- ii) Best estimate 04 - 2004/05 ALPs and DAFs, EWCF, SF = 1
- iii) Best estimate 05 - as (ii) above but with 2005/06 ALPs and DAFs (equivalent)

Tables showing the error ("actual-allocated") expressed as a percentage of full year demand, for the whole year and for winter and summer separately, for each of the three bases, are attached as Tables 3.1 to 3.9. The layout of these tables and the basis of the calculations are similar to that published on previous occasions (e.g. the June 2005 NDM report).

Figures 3.1, 3.2 and 3.3 are bar charts showing a simple summary of the overall picture given by these three sets of tables. The overall error and apparent winter/summer bias for EUCs in each consumption band is shown averaged across all LDZs.

The bar chart in Figure 3.1 shows that the percentage errors for all EUC bands over the gas year as a whole were slightly positive (0.6% or less) for EUC bands 01B to 05B and slightly negative for EUC bands 06B and above (less than -1% for all except the highest band).

The percentage errors of 0.6% or less over the whole year for EUC bands 01B to 05B overall are indeed very small. Percentage errors were also low over the winter and greater over the summer when demand overall is much lower. For these EUC bands overall there appears to have been a tendency to under allocate over the whole year as well as over the winter and summer periods (except for EUC band 05B where there was a summer over allocation, albeit with still a small whole year under allocation).

EUC bands 06B to 09B, on the other hand, indicate small whole year over allocations with winter under allocation and summer over allocation the usual pattern (except with EUC band 09B).

In general, the observed patterns are consistent with WCF bias due to overstated aggregate NDM SNDs. In the generally more weather sensitive lower consumption band EUCs, where the DAF weather sensitivity

parameter is high, the opposing effects of a WCF bias (lower) and high SFs lead to under allocation since the  $DAF \cdot WCF$  term is dominant. In the higher consumption band EUCs with generally lower weather sensitivity, the high SF is dominant, leading to over allocation. It is also worth noting that the WCF/SF strand of performance evaluation reported to DESC on 14<sup>th</sup> November 2005 reached the same inference with respect to aggregate NDM SND on the basis of the observed WCF bias figures across gas year 2004/05.

However, another factor to be noted here is that the AQs in this "as used" analysis are calculated from the sample data itself and may be considered to be accurate. The "as used" analysis uses real SFs that have taken population AQs into account (i.e. if population AQ was too low then this could have led to an increase of the relevant SFs from the values that would have otherwise applied). Thus, the resultant "as used" allocations using the real SFs may give high estimates of allocated consumptions.

The "best estimate" analysis is potentially more helpful in assessing the performance of the algorithms themselves, as opposed to the performance of the demand attribution process. The "best estimate 04" analysis is based on the algorithms for 2004/05, while the "best estimate 05" analysis is based on the algorithms derived for 2005/06 and applied with appropriate adjustment to 2004/05.

On the evidence of the bar chart in Figure 3.2, there was little overall error in the algorithms for any of the consumption bands over gas year 2004/05. The noteworthy aspect of the winter/summer errors on the bar chart in Figure 3.2 is the over estimation shown in all EUC bands during summer 2005 (April to September). A similar effect was in evidence during the period April to September 2004 (in the previous gas year) and was reported in Appendix 13 of the NDM report dated 29<sup>th</sup> June 2005.

Table 3.10 shows the percentage errors for EUC band 01B for the two months April and May and for the rest of the summer (June to September). In all LDZs the predominant effect is that of large negative error in the two months April and May 2005. During the previous gas year, for EUC band 01B overall across all LDZs, most of the April to September 2004 period error occurred during the first half of that period: in the months of April, May and June 2004.

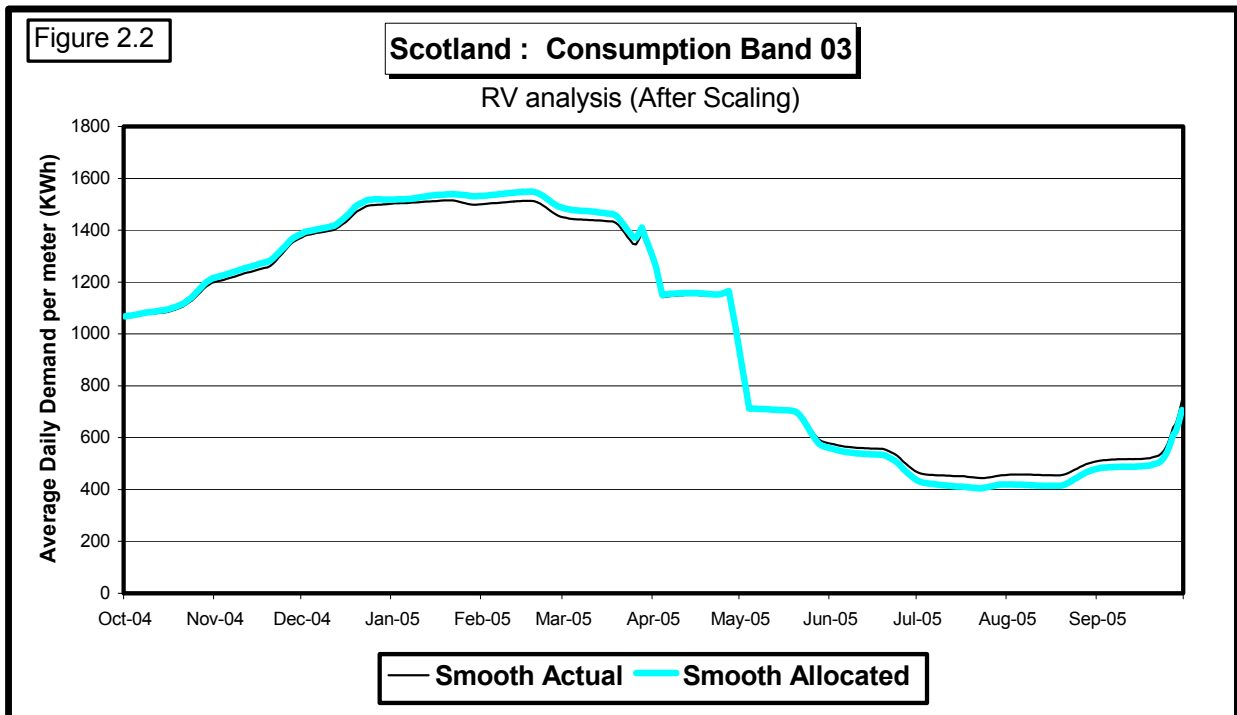
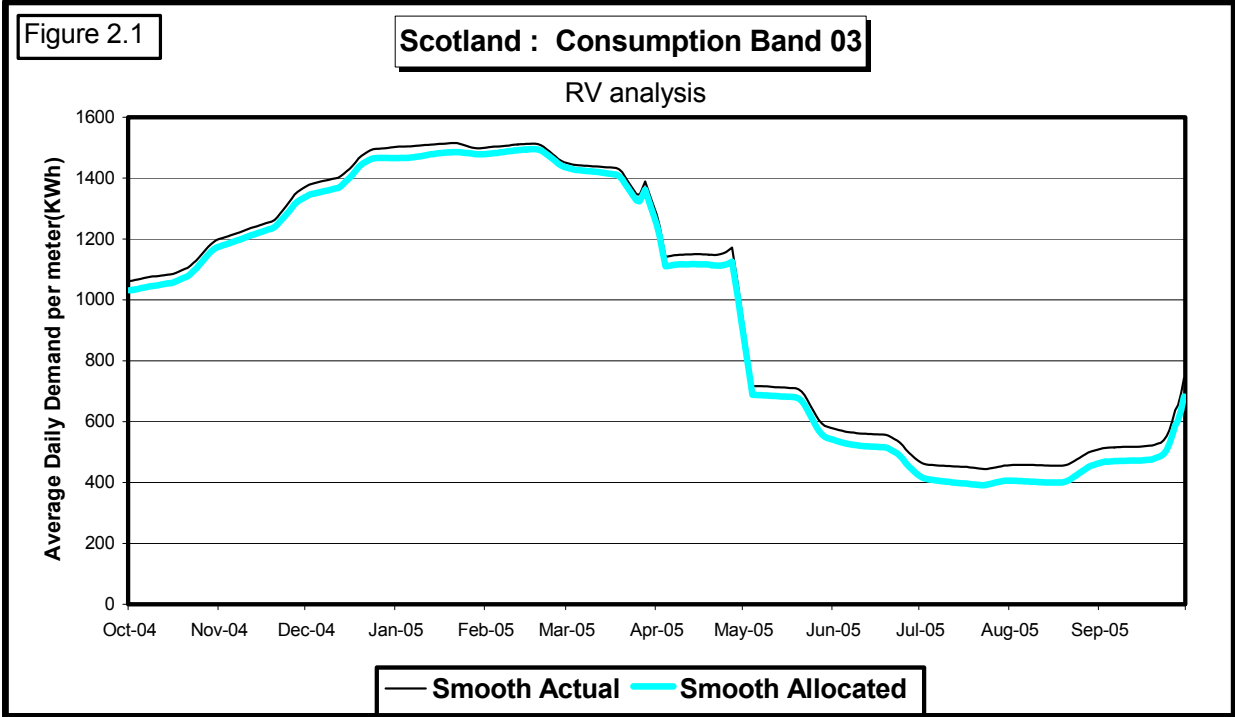
Table 3.11 provides the percentage errors overall in each EUC band for the two months April and May and the rest of the summer (June to September). This shows that in EUC bands 01B, 02B and 03B in particular, there was significant negative error during the April to May period. For these EUC bands, which together constitute just over 83% of total NDM load, the summer period over estimation was mainly during the months of April and May. Thus, the over estimation in summer 2005 may be ascribed for the most part to the impact of April and May 2005.

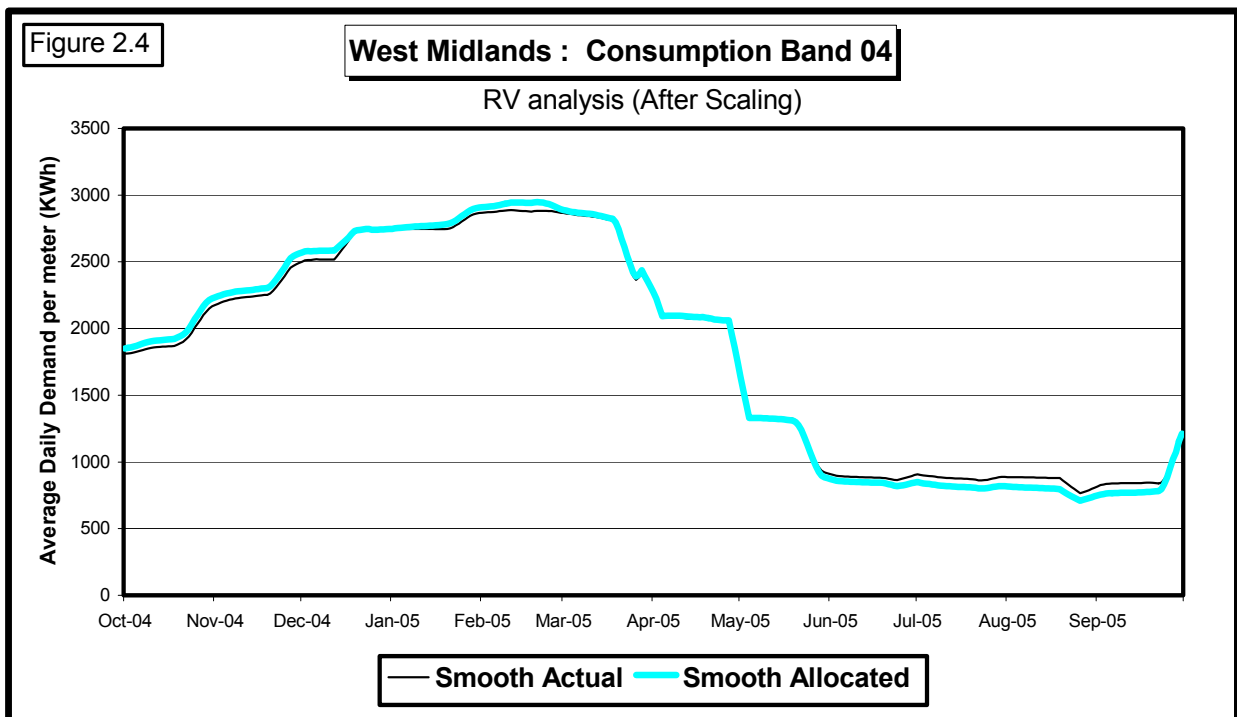
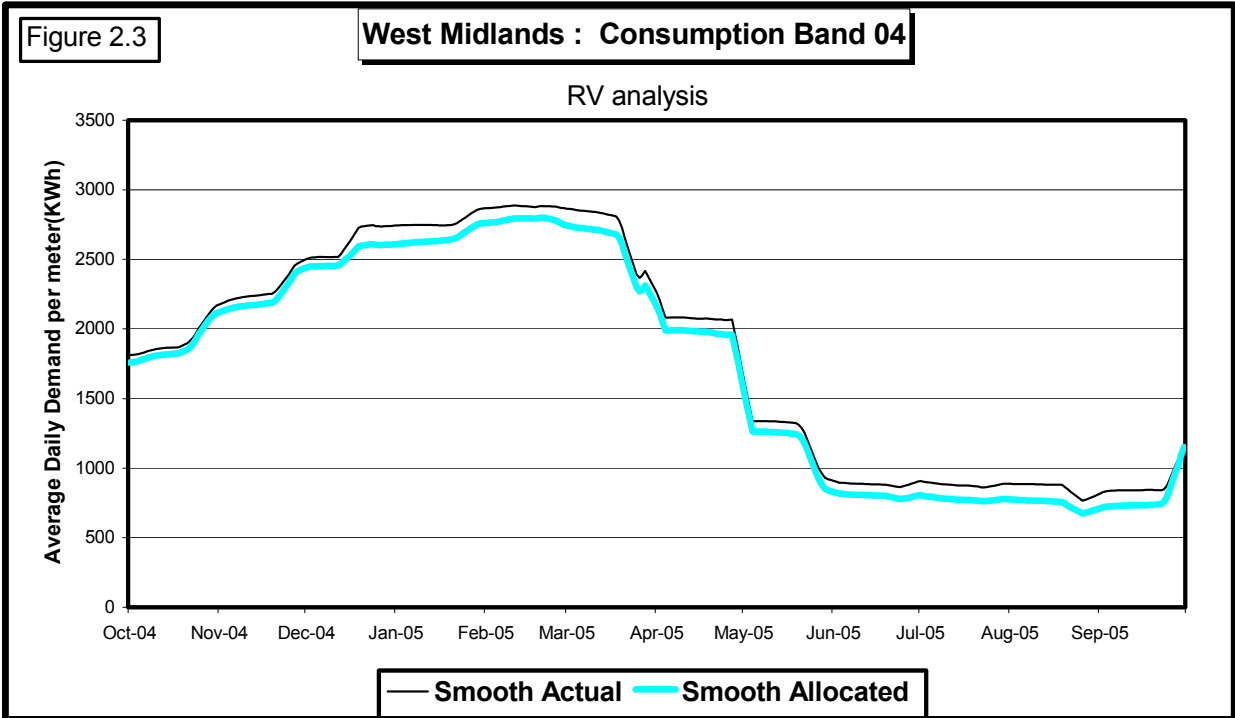
In 2005, the second half of March was much warmer than seasonal normal (new basis) while April and May were each near seasonal normal overall. However, very warm weather from mid-March to the start of April appears to have triggered markedly reduced aggregate NDM demand. Overall weather corrected aggregate NDM demand as a percentage of seasonal normal NDM demand, was around 98-100% in the mid winter months December to February and this remained reasonably steady in March as a whole at above 97%. However, in response to the early warm spell, this figure fell sharply to around 92% in April and dropped to 91% in May. In individual LDZs, the decrease in this statistic from typical mid-winter levels to the levels observed in April and May ranged from 5 to 13 percentage points, with 10 out of 13 LDZs dropping by 7 or more percentage points by May.

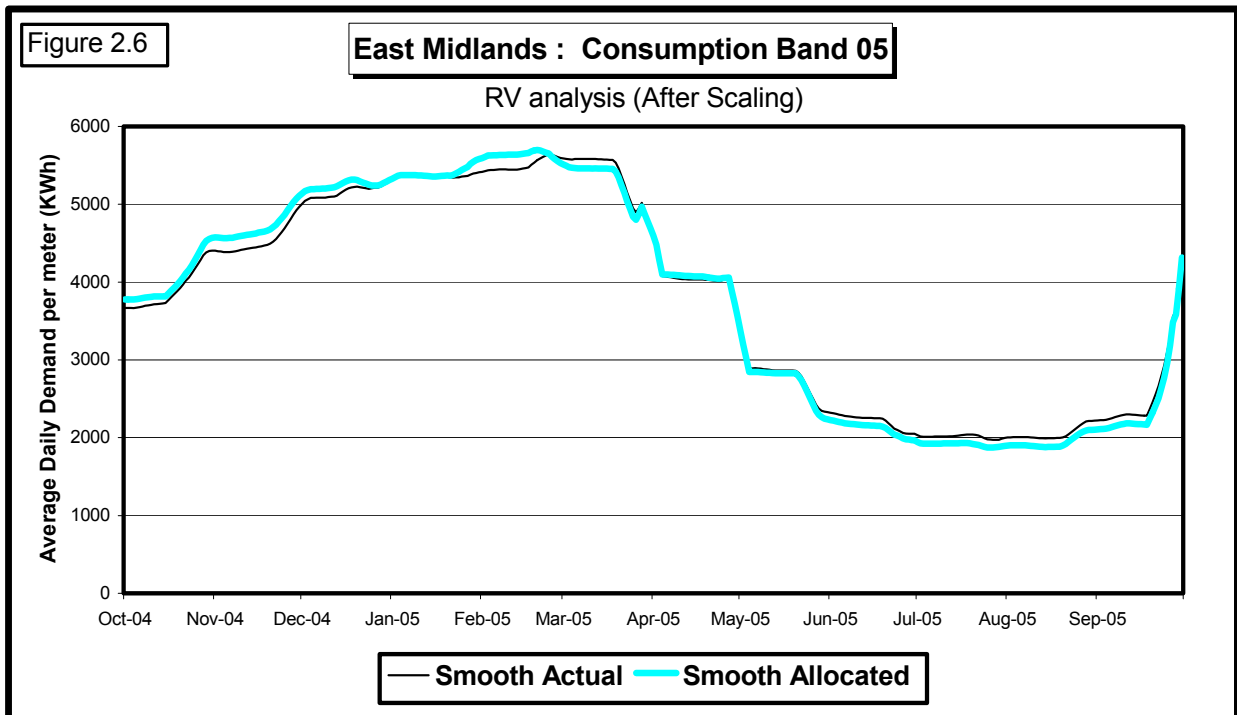
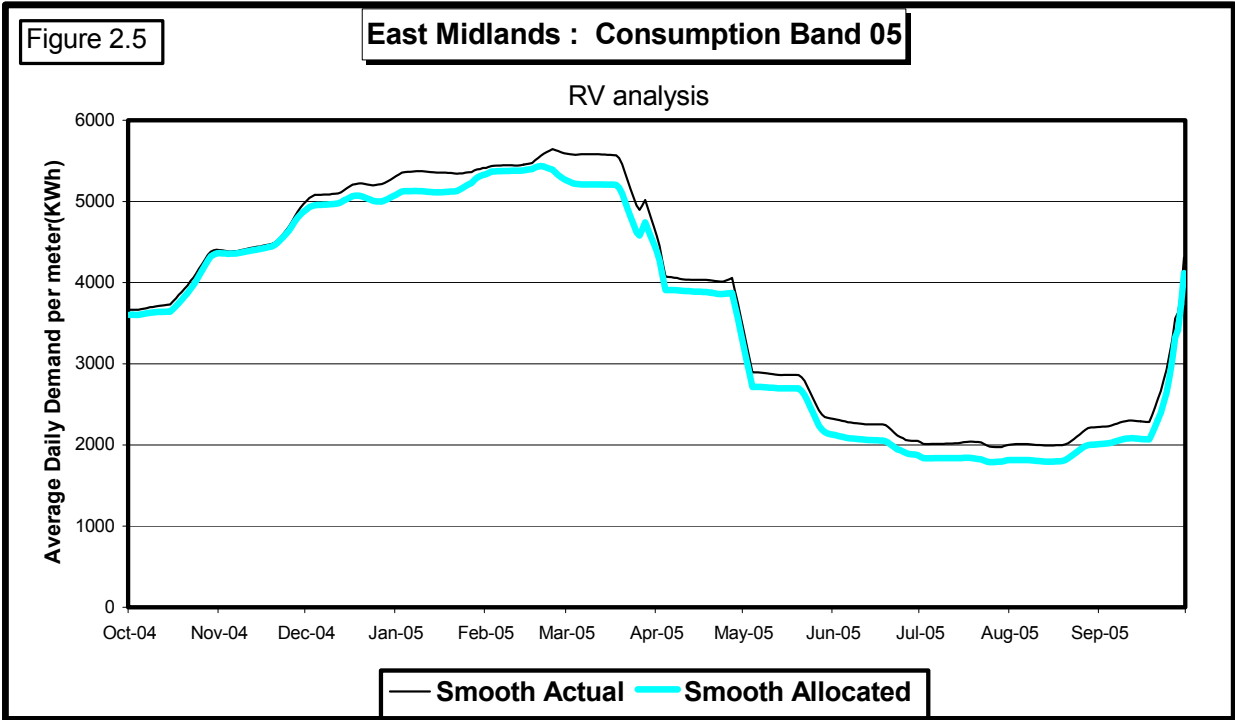
The bar chart in Figure 3.3 shows that the algorithms derived for 2005/06 would (if applied to the previous gas year) have resulted in an improvement overall for each EUC band considered. For this case, overall errors over the gas year as a whole are slightly smaller for all EUCs. Moreover, for all EUC bands, there appear to be clear improvements in the winter and summer period errors in comparison with those resulting with the 2004/05 models [see Figures 3.2 & 3.3 and the relevant error Tables (3.5, 3.6, 3.8 & 3.9)]. EUC bands 01B, 02B, 03B and 04B in particular, show notable winter/summer bias improvement.

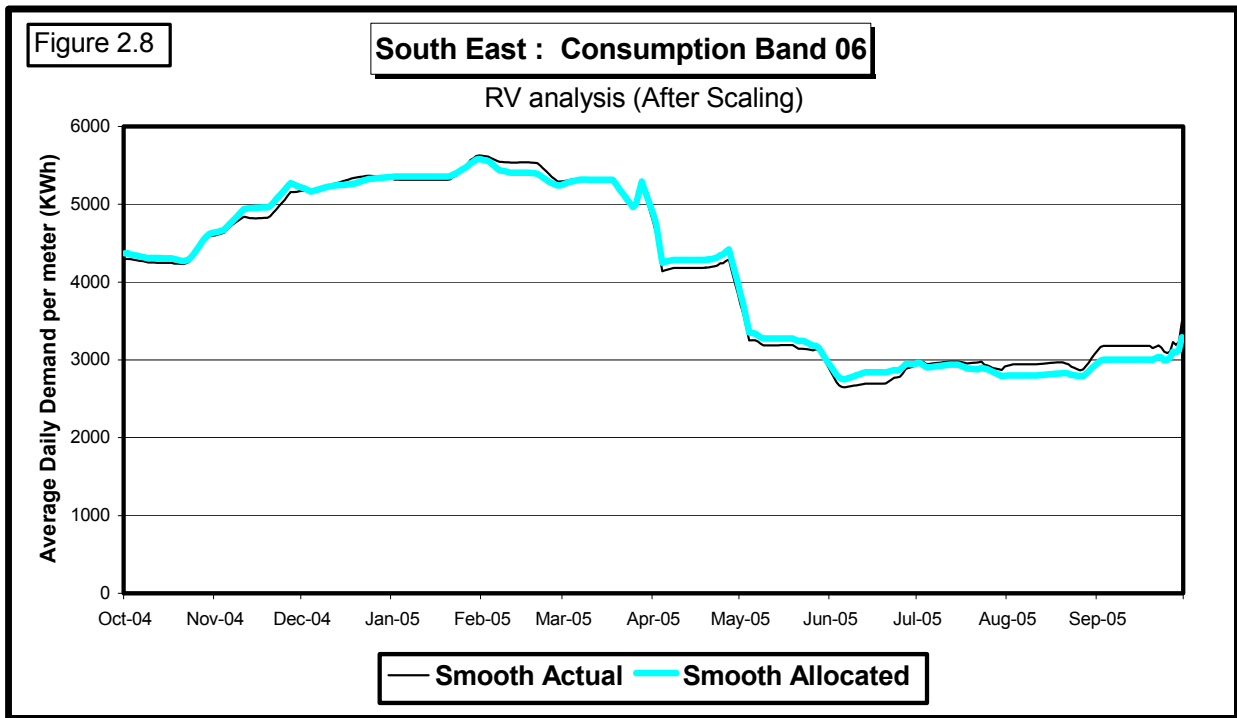
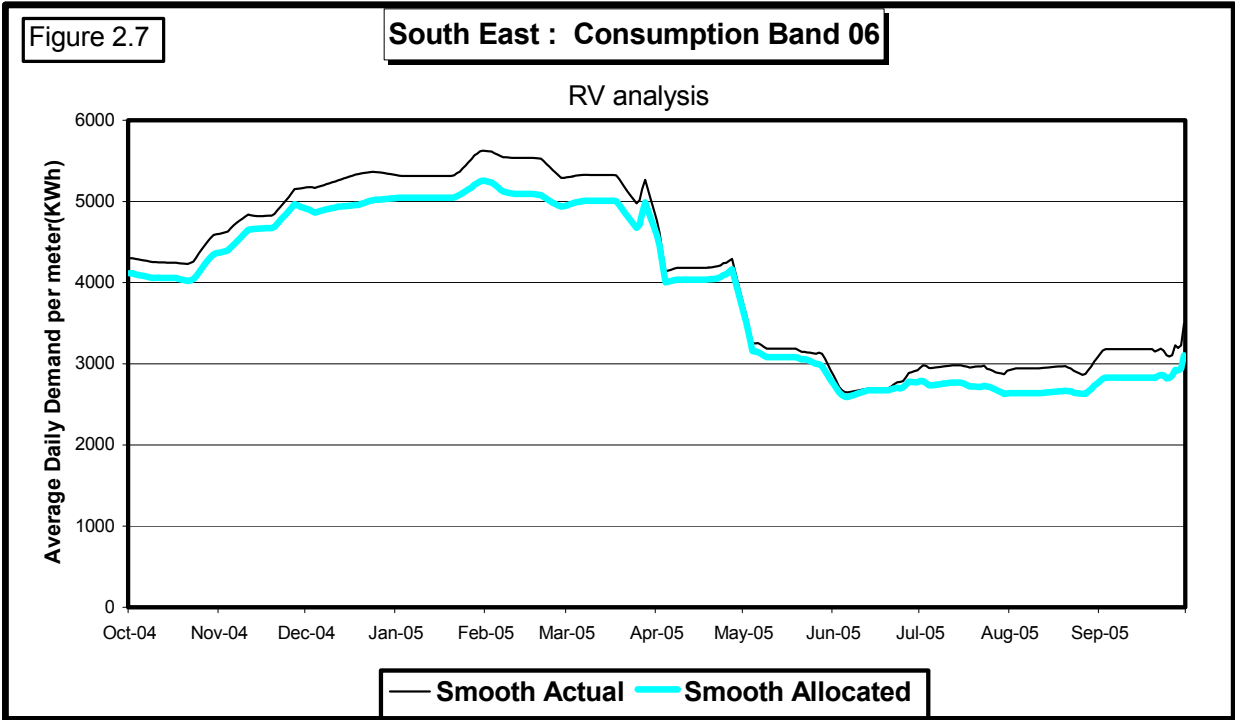
A selection of monthly charts are also presented: Figures 3.4 to 3.11 are monthly bar charts comparing actual and allocated demands, across all LDZs for consumption bands 01B to 08B respectively. Additionally examples of monthly bar charts for individual EUCs, for each of the first four EUC bands (namely EA:E0401B, WS:E0402B, SO:E0403B and NO:E0404B) are shown in Figures 3.12 to 3.15 respectively.

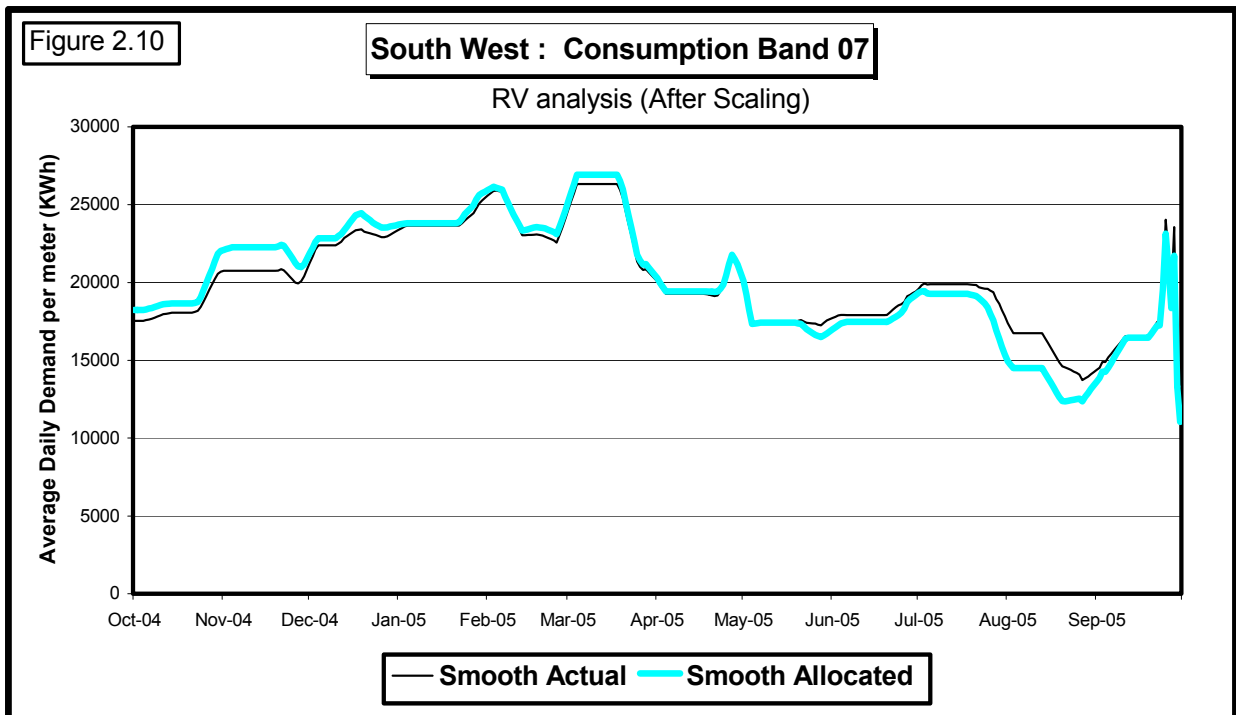
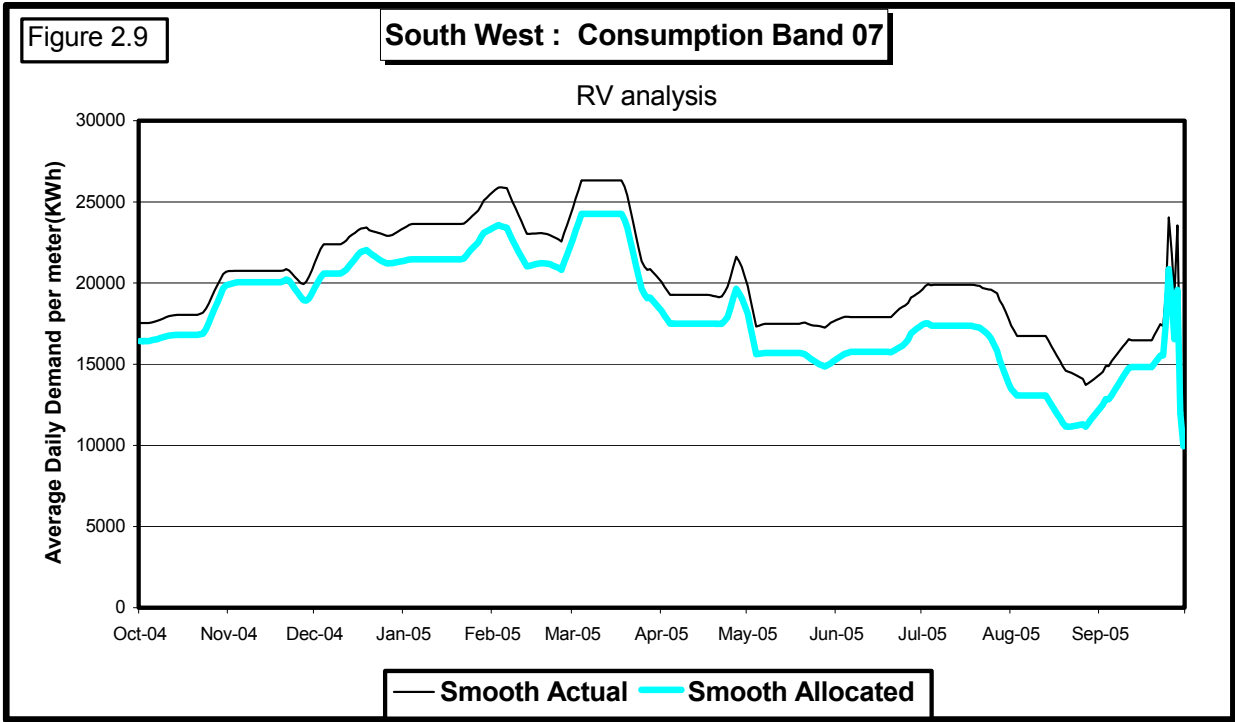
The monthly bar charts for each EUC band across all LDZs, confirm that estimates derived using the 2005/06 algorithms (based on revised weather variables and new basis seasonal normal weather variables) show a closer correspondence with actual consumption than those derived using the 2004/05 algorithms. In particular, the 2005/06 models better represent the transitional months of April/May and October/November. This is most evident with EUC bands 01B to 04B (which make up nearly 90% of total NDM load). The four graphs relating to individual LDZs show one example from each of these EUC bands. These instances also show that the profiles on the whole, and the April/May and October/November characteristics in particular, are better with the 2005/06 models.













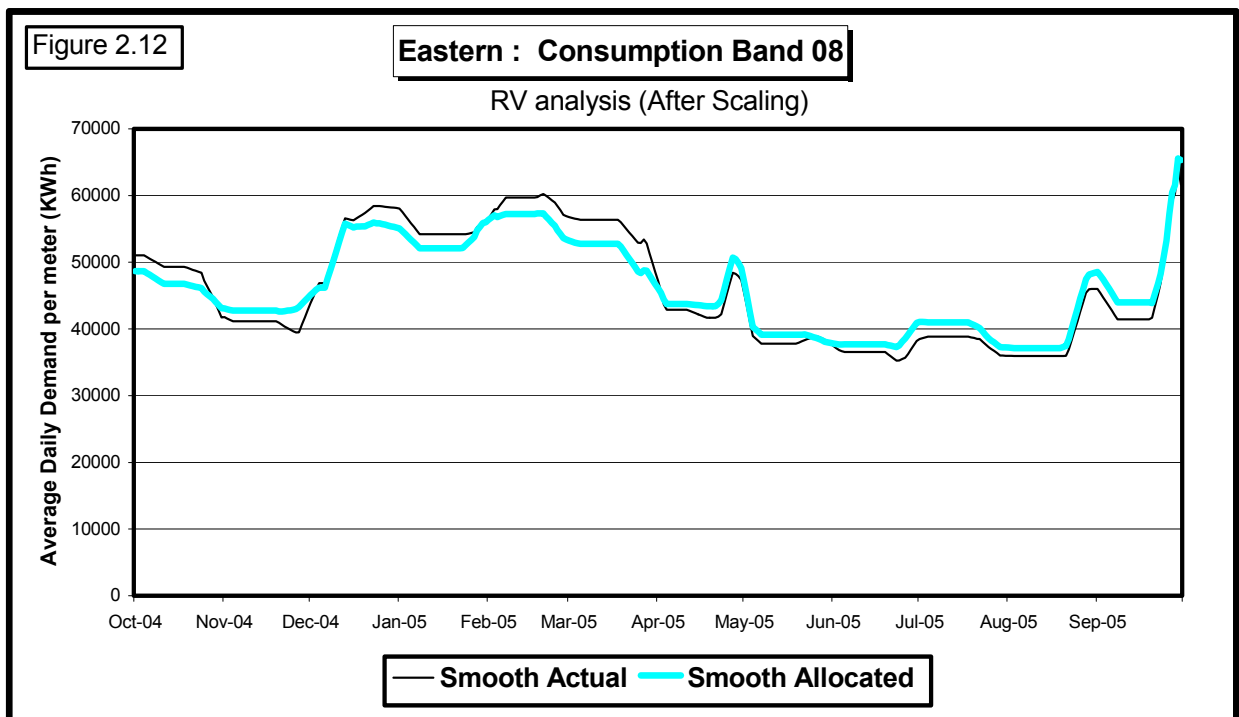
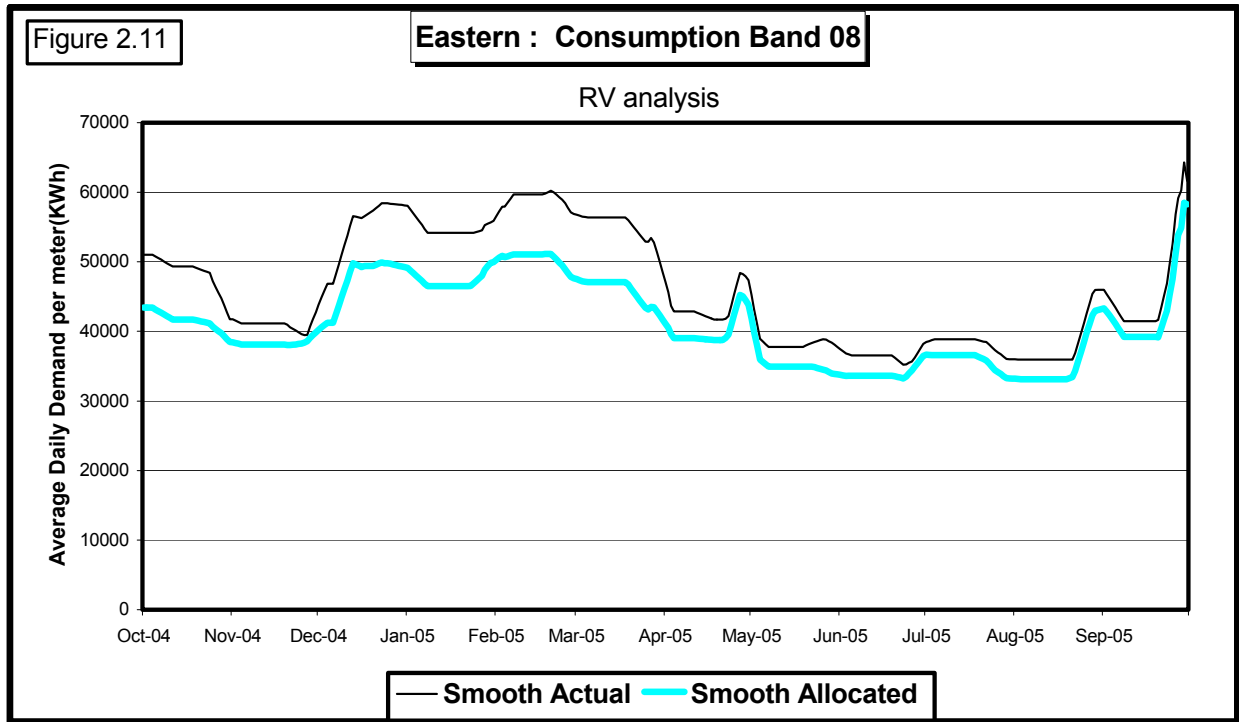


Table 2.1

**RV Categoricals: Profile**

Gas Year: 2004/05

Based on average errors (after scaling) over the period as a percentage of average actual over the full year

EUC BAND	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW
02	B	~	~	↑	↑	↑	↑	↑	~	~	~	↑	↑
03	B	↑	~	↑	↑	↑	↑	↑	↑	↑	↑	↑	↑
04	B	~	~	~	~	~	↑	~	↑	~	~	~	~
05	B	~	↑	↑	~	↑	↑	~	↑	~	~	↑	~
06	B	~	~	↑	~	~	↑	~	~	~	~	~	~
07	B	~	↑	↑	↑	↓	~	↑	~	~	~	~	↑
08	B	~	↓	~	↑	↑	↑	↑	↓	↓	↑	↓	↓
09	B	↓	↓		↑	~			↑	↓		↓	↓
5% level	↑	too peaky		10% level	↑	too peaky							
	↓	too flat			↓	too flat							

Table 2.2

**RV Categorisations: Winter**

Gas Year: 2004/05

Statistics are average errors (after scaling) over the period as a fraction of average actual over the full year

<b>EUC BAND</b>	<b>SC</b>	<b>NO</b>	<b>NW</b>	<b>NE</b>	<b>EM</b>	<b>WM</b>	<b>WN</b>	<b>WS</b>	<b>EA</b>	<b>NT</b>	<b>SE</b>	<b>SO</b>	<b>SW</b>
<b>02 B</b>	-0.02	-0.02	-0.02	-0.03	-0.03	-0.03	-0.03	-0.03	-0.02	-0.02	-0.02	-0.03	-0.04
<b>03 B</b>	-0.02	-0.04	-0.02	-0.04	-0.03	-0.03	-0.04	-0.04	-0.04	-0.03	-0.04	-0.04	-0.05
<b>04 B</b>	-0.02	-0.02	0.00	-0.02	-0.02	-0.02	-0.03	-0.01	-0.03	-0.02	-0.02	-0.02	-0.02
<b>05 B</b>	0.00	-0.03	-0.03	-0.03	-0.02	-0.04	-0.05	0.01	-0.03	-0.02	-0.01	-0.03	-0.02
<b>06 B</b>	-0.01	-0.02	-0.02	-0.04	-0.01	-0.01	-0.10	-0.02	-0.02	-0.01	0.00	0.01	-0.02
<b>07 B</b>	0.02	-0.07	-0.03	-0.06	-0.07	0.03	-0.02	-0.03	-0.02	-0.02	0.01	0.01	-0.03
<b>08 B</b>	0.01	0.04	0.02	0.00	-0.05	-0.04	-0.07	-0.10	0.03	0.04	-0.05	0.03	0.08
<b>09 B</b>	0.23	0.06			-0.15	0.02			-0.09	0.04		0.14	

Table 2.3

**RV Categorisations: Summer**

Gas Year: 2004/05

Statistics are average errors (after scaling) over the period as a fraction of average actual over the full year

<b>EUC BAND</b>	<b>SC</b>	<b>NO</b>	<b>NW</b>	<b>NE</b>	<b>EM</b>	<b>WM</b>	<b>WN</b>	<b>WS</b>	<b>EA</b>	<b>NT</b>	<b>SE</b>	<b>SO</b>	<b>SW</b>
<b>02 B</b>	0.02	0.02	0.02	0.03	0.03	0.02	0.03	0.03	0.02	0.02	0.02	0.03	0.04
<b>03 B</b>	0.02	0.04	0.02	0.04	0.03	0.03	0.04	0.04	0.04	0.03	0.04	0.04	0.05
<b>04 B</b>	0.02	0.02	0.00	0.02	0.02	0.02	0.03	0.01	0.03	0.02	0.02	0.02	0.02
<b>05 B</b>	0.00	0.03	0.03	0.03	0.02	0.04	0.05	-0.01	0.03	0.02	0.01	0.03	0.02
<b>06 B</b>	0.01	0.02	0.02	0.04	0.01	0.01	0.10	0.02	0.02	0.01	0.00	-0.01	0.02
<b>07 B</b>	-0.02	0.07	0.03	0.05	0.07	-0.03	0.02	0.03	0.02	0.02	0.00	-0.01	0.03
<b>08 B</b>	-0.01	-0.04	-0.02	0.00	0.05	0.04	0.07	0.10	-0.03	-0.04	0.05	-0.03	-0.08
<b>09 B</b>	-0.23	-0.08			0.15	-0.02			0.09	-0.12			-0.15

Table 2.4

**RV Categorisations: Annual Scaling**

Gas Year: 2004/05

Statistics are total actual over the full year divided by the total allocated over the full year

<b>EUC BAND</b>	<b>SC</b>	<b>NO</b>	<b>NW</b>	<b>NE</b>	<b>EM</b>	<b>WM</b>	<b>WN</b>	<b>WS</b>	<b>EA</b>	<b>NT</b>	<b>SE</b>	<b>SO</b>	<b>SW</b>
<b>02 B</b>	1.01	1.02	1.01	1.01	1.01	1.01	0.94	1.01	1.00	1.02	1.01	0.99	1.01
<b>03 B</b>	1.04	1.02	1.02	1.02	1.03	1.05	0.97	1.01	1.03	1.04	1.04	1.01	1.03
<b>04 B</b>	1.03	1.04	1.03	1.04	1.02	1.05	0.92	1.02	1.02	1.04	1.04	1.01	1.05
<b>05 B</b>	1.00	1.01	1.03	1.04	1.05	1.04	1.01	1.04	1.04	1.04	1.03	0.99	1.02
<b>06 B</b>	1.00	1.02	1.00	1.10	1.02	1.08	1.05	0.98	1.05	1.03	1.06	0.98	1.05
<b>07 B</b>	1.00	1.10	1.04	0.96	1.07	0.98	0.90	1.02	1.02	1.05	1.01	1.04	1.11
<b>08 B</b>	1.00	1.00	1.04	0.98	0.97	1.02	0.94	0.94	1.12	1.09	1.05	1.01	1.02
<b>09 B</b>	0.93	0.94			0.97	0.96			0.99	0.94		0.98	

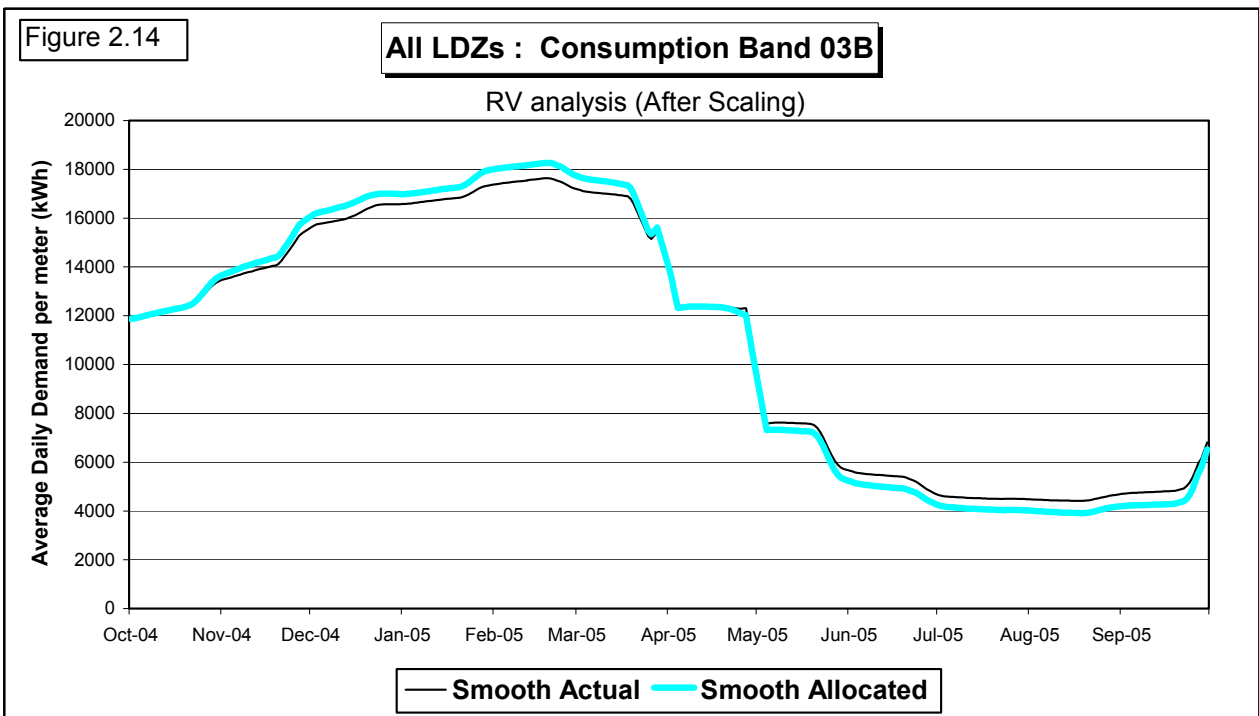
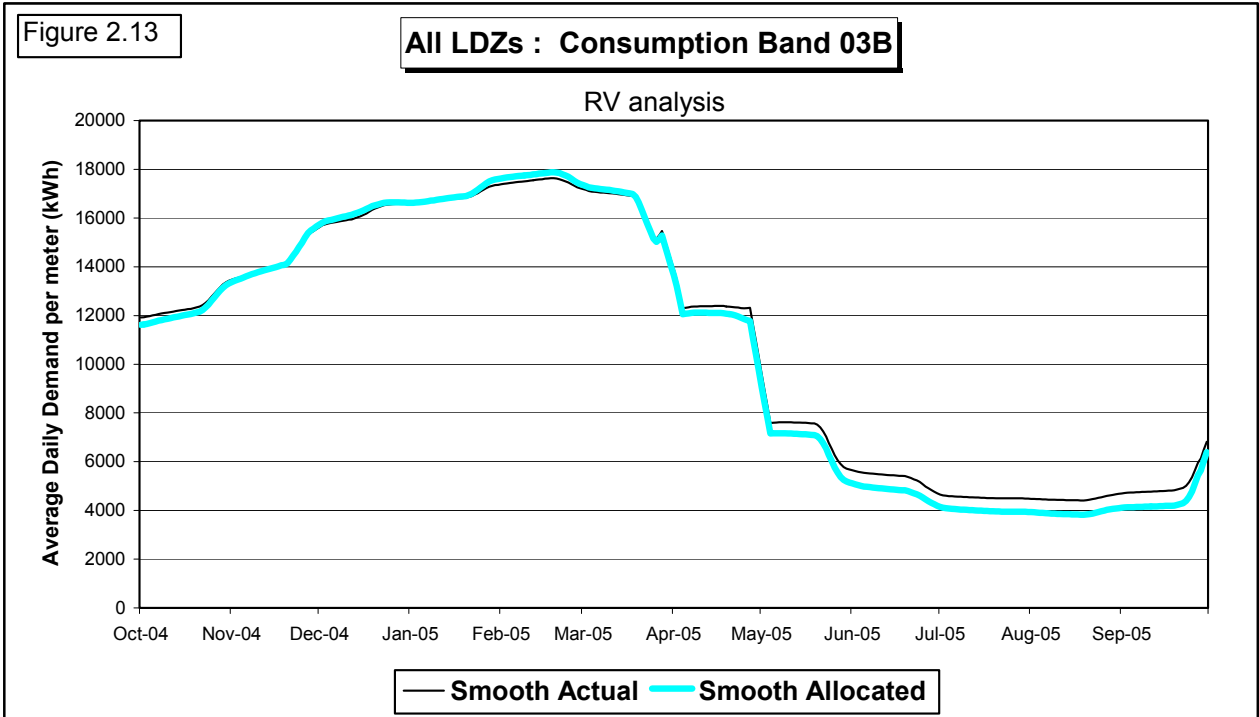


Figure 2.15

All LDZs : Consumption Band 04B

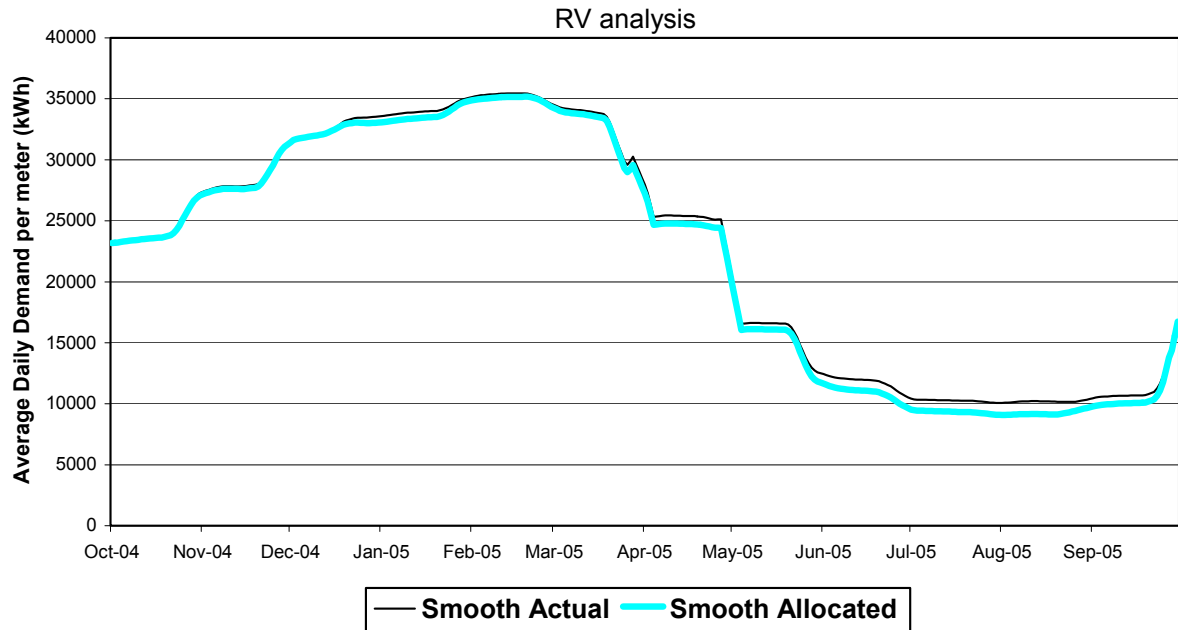
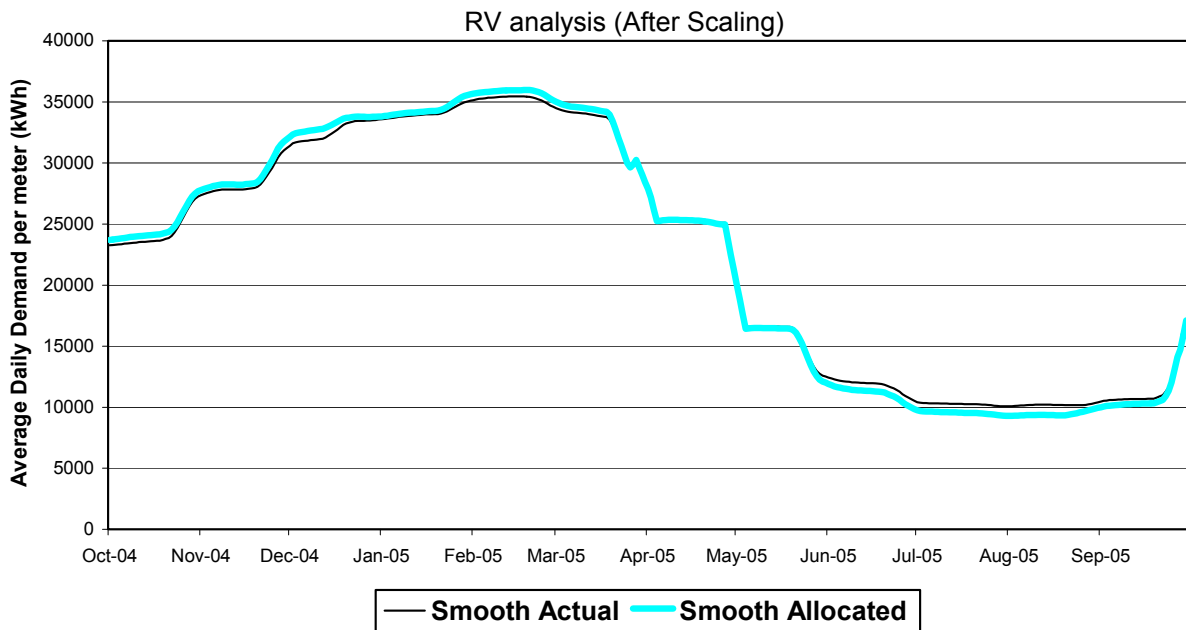


Figure 2.16

All LDZs : Consumption Band 04B



**Table 3.1** Oct 04 - Sep 05 Actual WCF and SF: ALPs and DAFs 'As Used'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	-2.56%	0.15%	0.81%	-0.92%	-0.30%	2.59%	-	1.28%	-0.15%	3.03%	2.56%	-0.70%	1.01%	0.56%	
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	
02B	-2.45%	0.42%	0.76%	-0.70%	-0.36%	2.41%	-7.20%	1.81%	-0.17%	2.46%	2.41%	-0.87%	1.52%	0.60%	
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	
03B	-2.78%	0.16%	0.99%	-0.96%	-0.29%	2.33%	-7.08%	0.54%	-0.08%	2.67%	2.40%	-1.21%	0.57%	0.46%	
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	
04B	-2.73%	-0.13%	0.70%	-0.53%	-0.23%	2.40%	-7.53%	0.67%	-0.27%	2.35%	2.32%	-1.39%	0.10%	0.24%	
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	
05B	-2.96%	-0.50%	0.65%	-0.45%	0.17%	1.76%	-7.95%	0.28%	-0.22%	1.92%	2.23%	-1.81%	-0.57%	0.05%	
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	
06B	-3.39%	-1.00%	0.33%	-0.39%	0.50%	1.00%	-8.74%	-0.56%	-0.12%	1.49%	2.00%	-2.15%	-1.34%	-0.30%	
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	
07B	-3.58%	-1.83%	0.10%	-0.14%	0.62%	0.31%	-9.32%	-0.45%	-0.17%	1.07%	1.82%	-2.30%	-1.26%	-0.55%	
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	
08B	-4.15%	-2.71%	-0.27%	-0.22%	0.67%	-0.11%	-10.35%	-1.31%	-0.21%	0.35%	1.49%	-3.11%	-2.49%	-0.88%	
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	
09B	-4.16%	-	-	-	0.67%	-0.44%	-	-	-	-	-	-	-	-1.31%	
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	



**Table 3.2** Oct 04 - Mar 05 Actual WCF and SF: ALPs and DAFs 'As Used'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	-2.72%	0.42%	-0.38%	-0.86%	-0.64%	1.50%	-	0.60%	-1.47%	2.37%	2.33%	-1.31%	1.30%	0.10%	0.10%
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	2626
02B	-0.63%	1.11%	0.45%	-2.31%	-2.88%	2.00%	-8.54%	-0.55%	2.75%	2.23%	5.27%	-5.03%	-0.62%	0.22%	0.22%
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	1194
03B	-3.26%	-1.60%	0.18%	-1.40%	0.29%	1.41%	-11.19%	-0.47%	-1.35%	2.16%	3.22%	-2.12%	1.38%	0.03%	0.03%
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	1294
04B	-2.15%	0.98%	1.26%	0.32%	-1.25%	2.57%	-11.01%	0.36%	-1.61%	2.96%	2.64%	-2.34%	1.67%	0.36%	0.36%
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	4066
05B	-2.25%	0.59%	-0.10%	1.13%	-0.60%	3.49%	-9.70%	3.98%	0.53%	2.60%	2.71%	-1.57%	1.08%	0.73%	0.73%
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	3361
06B	-2.01%	-1.39%	0.62%	0.20%	0.68%	2.88%	-4.27%	4.37%	0.78%	1.64%	3.52%	-1.04%	0.49%	0.77%	0.77%
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	1272
07B	-1.07%	-0.19%	1.95%	-2.63%	0.31%	8.14%	-15.18%	-4.34%	-0.26%	5.68%	3.92%	5.19%	-2.81%	1.32%	1.32%
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	420
08B	0.86%	4.92%	7.49%	1.47%	-4.23%	3.86%	-23.01%	-2.88%	0.12%	5.81%	5.55%	-2.11%	1.86%	1.39%	1.39%
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	219
09B	4.81%	-	-	-	-3.93%	-5.05%	-	-	-	-	-	-	-	-1.39%	-1.39%
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	6

**Table 3.3** Apr 05 - Sep 05 Actual WCF and SF: ALPs and DAFs 'As Used'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	-2.18%	-0.54%	3.90%	-1.07%	0.65%	5.71%	-	3.11%	3.57%	4.93%	3.23%	1.11%	0.10%	1.84%	
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	
02B	-6.99%	-1.45%	1.55%	4.19%	7.10%	3.79%	-3.92%	9.07%	-8.90%	2.99%	-5.95%	9.28%	8.17%	1.64%	
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	
03B	-1.71%	4.42%	2.98%	0.29%	-1.96%	4.85%	1.58%	3.28%	3.37%	3.98%	0.07%	1.28%	-1.95%	1.46%	
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	
04B	-3.95%	-2.84%	-0.62%	-2.55%	2.36%	1.95%	-0.48%	1.43%	3.14%	0.84%	1.52%	1.00%	-3.59%	0.01%	
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	
05B	-4.30%	-2.70%	2.11%	-3.83%	1.72%	-2.11%	-4.73%	-7.84%	-1.93%	0.46%	1.18%	-2.33%	-3.81%	-1.43%	
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	
06B	-5.72%	-0.33%	-0.14%	-1.38%	0.20%	-2.31%	-16.53%	-9.03%	-1.84%	1.23%	-0.79%	-4.31%	-4.35%	-2.19%	
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	
07B	-7.37%	-4.22%	-2.69%	3.08%	1.07%	-13.04%	-2.06%	5.43%	-0.02%	-6.88%	-1.60%	-17.97%	1.16%	-4.10%	
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	
08B	-10.58%	-13.22%	-11.25%	-2.39%	6.48%	-5.59%	1.35%	0.64%	-0.66%	-7.55%	-4.25%	-4.43%	-8.46%	-4.30%	
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	
09B	-16.89%	-	-	-	5.84%	4.50%	-	-	-	-	-	-	-	-2.18%	
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	

**Table 3.4** Oct 04 - Sep 05 EWCF, with SF=1: 2004/05 ALPs and DAFs 'Best Estimate 04'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	-0.01%	-0.01%	-0.01%	-0.02%	-0.02%	-0.01%	-	-0.01%	-0.01%	-0.07%	-0.09%	-0.01%	0.00%	-0.02%	
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	
02B	0.05%	0.01%	-0.12%	-0.07%	-0.04%	-0.33%	-0.12%	-0.13%	-0.11%	-0.11%	-0.12%	-0.07%	-0.24%	-0.11%	
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	
03B	-0.17%	-0.03%	0.00%	-0.44%	-0.06%	-0.31%	0.00%	-0.70%	-0.07%	-0.16%	-0.19%	-0.10%	-0.62%	-0.21%	
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	
04B	0.04%	0.01%	-0.05%	-0.08%	-0.06%	-0.09%	-0.05%	-0.23%	-0.15%	-0.08%	-0.09%	-0.09%	-0.10%	-0.07%	
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	
05B	0.04%	0.07%	-0.01%	-0.07%	0.02%	-0.05%	-0.01%	-0.05%	-0.07%	-0.02%	-0.03%	-0.03%	-0.08%	-0.02%	
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	
06B	-0.07%	0.08%	-0.01%	-0.10%	0.03%	-0.06%	-0.01%	-0.05%	-0.05%	-0.01%	0.01%	-0.01%	-0.08%	-0.03%	
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	
07B	0.04%	0.03%	-0.02%	0.02%	0.01%	-0.04%	-0.02%	-0.21%	-0.03%	-0.03%	-0.03%	-0.06%	-0.09%	-0.03%	
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	
08B	0.02%	0.01%	-0.01%	0.00%	-0.01%	-0.04%	-0.01%	-0.15%	-0.04%	-0.05%	-0.05%	-0.04%	-0.05%	-0.03%	
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	
09B	0.02%	-	-	-	0.00%	-0.02%	-	-	-	-	-	-	-	0.00%	
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	

**Table 3.5** Oct 04 - Mar 05 EWCF, with SF=1: 2004/05 ALPs and DAFs 'Best Estimate 04'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	0.75%	2.92%	1.75%	0.80%	2.61%	1.34%	-	2.13%	1.41%	1.19%	1.87%	2.06%	2.01%	1.72%	1.72%
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	2626
02B	2.64%	3.44%	2.23%	-0.80%	0.46%	1.57%	0.05%	1.01%	5.24%	0.91%	4.48%	-1.52%	-0.15%	1.66%	1.66%
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	1194
03B	0.15%	0.81%	1.99%	0.09%	3.38%	0.91%	-2.33%	1.03%	1.37%	0.81%	2.48%	1.28%	1.84%	1.43%	1.43%
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	1294
04B	1.22%	3.34%	2.91%	1.44%	1.81%	2.22%	-2.10%	1.79%	0.99%	1.72%	1.77%	1.10%	2.29%	1.80%	1.80%
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	4066
05B	1.15%	3.00%	1.48%	2.06%	2.09%	3.32%	-0.72%	5.29%	3.00%	1.44%	1.69%	1.88%	1.75%	2.09%	2.09%
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	3361
06B	1.44%	1.11%	1.88%	0.81%	2.91%	2.87%	4.49%	5.50%	3.14%	0.53%	2.17%	2.41%	1.26%	2.09%	2.09%
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	1272
07B	2.40%	2.38%	3.06%	-2.47%	2.35%	8.32%	-5.25%	-2.98%	2.06%	4.60%	2.54%	8.43%	-2.00%	2.76%	2.76%
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	420
08B	4.39%	7.54%	8.25%	1.53%	-2.23%	4.22%	-11.87%	-1.69%	2.25%	4.81%	3.85%	1.44%	2.84%	2.71%	2.71%
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	219
09B	8.21%	-	-	-	-2.00%	-4.46%	-	-	-	-	-	-	-	0.58%	0.58%
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	6

**Table 3.6** Apr 05 - Sep 05 EWCF, with SF=1: 2004/05 ALPs and DAFs 'Best Estimate 04'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	-1.89%	-7.53%	-4.59%	-2.19%	-7.35%	-3.85%	-	-5.73%	-3.98%	-3.70%	-5.94%	-6.05%	-6.08%	-4.87%	
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	
02B	-6.46%	-9.21%	-6.29%	2.14%	-1.54%	-6.59%	-0.53%	-3.62%	-16.14%	-2.54%	-13.59%	3.47%	-0.53%	-5.14%	
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	
03B	-0.89%	-2.07%	-4.85%	-1.94%	-9.78%	-3.68%	4.94%	-5.38%	-3.96%	-2.61%	-7.88%	-3.84%	-8.26%	-4.73%	
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	
04B	-2.42%	-8.20%	-7.08%	-3.70%	-4.78%	-6.07%	4.10%	-5.19%	-3.03%	-4.48%	-4.80%	-3.09%	-5.72%	-4.66%	
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	
05B	-2.09%	-5.86%	-2.92%	-4.61%	-4.11%	-7.60%	1.30%	-11.79%	-7.03%	-3.13%	-3.84%	-4.27%	-3.69%	-4.50%	
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	
06B	-2.63%	-1.66%	-3.09%	-1.64%	-4.72%	-5.21%	-7.87%	-9.57%	-6.14%	-0.97%	-3.96%	-4.74%	-2.29%	-3.74%	
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	
07B	-3.52%	-3.41%	-4.66%	3.23%	-3.36%	-14.31%	6.45%	3.98%	-3.39%	-8.02%	-4.21%	-17.83%	2.88%	-5.00%	
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	
08B	-5.58%	-10.37%	-11.69%	-1.98%	2.64%	-5.93%	10.96%	1.75%	-3.16%	-7.06%	-5.54%	-2.01%	-4.02%	-4.01%	
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	
09B	-11.60%	-	-	-	2.24%	4.74%	-	-	-	-	-	-	-	-1.54%	
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	

**Table 3.7** Oct 04 - Sep 05 EWCF, with SF=1: 2005/06 ALPs and DAFs 'Best Estimate 05'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	-0.01%	-0.02%	-0.02%	-0.01%	-0.01%	-0.01%	-	-0.01%	-0.08%	-0.01%	-0.01%	-0.01%	-0.07%	-0.02%	-0.02%
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	2626
02B	0.06%	0.09%	-0.06%	0.11%	-0.03%	-0.23%	-0.06%	-0.07%	-0.10%	-0.09%	-0.12%	0.02%	-0.14%	-0.05%	-0.05%
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	1194
03B	-0.08%	0.00%	-0.01%	0.04%	0.03%	-0.11%	-0.01%	-0.25%	-0.10%	-0.10%	-0.17%	-0.14%	-0.22%	-0.09%	-0.09%
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	1294
04B	0.06%	-0.01%	-0.02%	0.10%	0.06%	-0.01%	-0.02%	-0.17%	-0.13%	-0.08%	-0.12%	-0.13%	-0.10%	-0.04%	-0.04%
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	4066
05B	0.06%	0.11%	0.04%	0.07%	0.05%	-0.01%	0.04%	-0.01%	-0.08%	-0.05%	-0.07%	-0.10%	-0.05%	0.00%	0.00%
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	3361
06B	0.05%	0.11%	0.02%	0.03%	0.04%	-0.03%	0.02%	-0.03%	-0.01%	-0.03%	-0.05%	-0.07%	-0.06%	0.00%	0.00%
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	1272
07B	0.05%	0.06%	0.00%	0.03%	0.02%	-0.03%	0.00%	-0.03%	0.00%	0.00%	0.00%	-0.04%	-0.07%	0.00%	0.00%
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	420
08B	0.03%	0.04%	0.00%	0.01%	0.00%	-0.03%	0.00%	-0.02%	-0.02%	-0.02%	-0.02%	-0.03%	-0.04%	-0.01%	-0.01%
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	219
09B	0.02%	-	-	-	0.00%	-0.01%	-	-	-	-	-	-	-	0.00%	0.00%
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	6

**Table 3.8** Oct 04 - Mar 05 EWCF, with SF=1: 2005/06 ALPs and DAFs 'Best Estimate 05'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	0.19%	0.84%	0.30%	-0.12%	1.57%	0.25%	-	0.70%	0.22%	-0.12%	0.91%	0.57%	0.67%	0.49%	0.49%
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	2626
02B	2.03%	0.59%	1.32%	-1.36%	0.04%	0.66%	-0.88%	0.46%	3.66%	0.04%	3.13%	-1.46%	-0.32%	0.76%	0.76%
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	1194
03B	-0.78%	-0.92%	0.80%	0.16%	2.86%	-0.88%	-3.58%	0.70%	1.05%	0.44%	1.76%	0.00%	1.35%	0.68%	0.68%
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	1294
04B	0.92%	0.99%	2.18%	1.06%	1.25%	1.10%	-2.86%	0.94%	0.61%	0.82%	0.99%	-0.22%	1.11%	0.95%	0.95%
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	4066
05B	0.85%	1.41%	1.37%	1.89%	1.56%	2.28%	-0.83%	4.09%	1.86%	0.86%	0.78%	0.98%	1.40%	1.42%	1.42%
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	3361
06B	1.28%	-0.05%	1.61%	0.74%	2.38%	3.16%	4.23%	3.73%	2.92%	0.22%	1.33%	1.47%	0.68%	1.68%	1.68%
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	1272
07B	2.20%	0.86%	2.00%	-3.32%	1.49%	7.47%	-6.40%	-3.31%	2.01%	4.54%	2.45%	8.03%	-2.46%	2.13%	2.13%
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	420
08B	3.13%	6.10%	7.02%	1.61%	-2.19%	4.25%	-13.38%	-1.76%	2.34%	4.88%	3.90%	1.18%	2.56%	2.36%	2.36%
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	219
09B	7.70%	-	-	-	-2.45%	-4.94%	-	-	-	-	-	-	-	0.10%	0.10%
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	6

**Table 3.9** Apr 05 - Sep 05 EWCF, with SF=1: 2005/06 ALPs and DAFs 'Best Estimate 05'  
**Analysis of Daily Percentage Error: Statistic is Total Errors as percentage of Full Period Demand**

	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW	AI	LDZs
01B	-0.50%	-2.22%	-0.83%	0.27%	-4.42%	-0.78%	-	-1.90%	-0.93%	0.33%	-2.74%	-1.68%	-2.31%	-1.47%	
Num S. pts	221	211	197	243	224	219	-	216	220	223	222	208	222	2626	
02B	-4.86%	-1.27%	-3.68%	4.56%	-0.22%	-3.16%	1.94%	-1.69%	-11.38%	-0.42%	-9.65%	3.65%	0.44%	-2.38%	
Num S. pts	101	93	107	92	94	92	5	75	101	129	108	102	95	1194	
03B	1.48%	2.23%	-1.99%	-0.28%	-7.98%	2.03%	7.53%	-2.84%	-3.21%	-1.49%	-5.74%	-0.51%	-5.11%	-2.35%	
Num S. pts	103	81	117	85	124	62	15	77	127	156	178	83	86	1294	
04B	-1.74%	-2.47%	-5.25%	-2.18%	-2.96%	-2.89%	5.74%	-2.89%	-2.01%	-2.28%	-2.95%	0.10%	-2.94%	-2.47%	
Num S. pts	383	250	413	297	354	308	51	153	376	415	478	324	264	4066	
05B	-1.45%	-2.52%	-2.57%	-3.83%	-2.95%	-5.14%	1.63%	-9.04%	-4.49%	-1.99%	-1.97%	-2.47%	-2.90%	-3.02%	
Num S. pts	373	205	373	232	294	356	45	117	225	411	300	236	194	3361	
06B	-2.01%	0.38%	-2.57%	-1.16%	-3.82%	-5.66%	-7.33%	-6.47%	-5.59%	-0.48%	-2.58%	-3.09%	-1.27%	-2.94%	
Num S. pts	112	78	162	96	117	153	21	53	102	133	80	83	82	1272	
07B	-3.21%	-1.12%	-3.00%	4.35%	-2.11%	-12.81%	7.93%	4.95%	-3.24%	-7.84%	-3.99%	-16.92%	3.66%	-3.96%	
Num S. pts	32	22	43	36	60	58	6	23	30	24	19	36	31	420	
08B	-3.95%	-8.33%	-9.91%	-2.06%	2.60%	-5.92%	12.37%	2.12%	-3.23%	-7.10%	-5.55%	-1.63%	-3.61%	-3.50%	
Num S. pts	13	15	25	22	32	40	5	13	11	10	13	9	11	219	
09B	-10.87%	-	-	-	2.76%	5.27%	-	-	-	-	-	-	-	-0.94%	
Num S. pts	2	-	-	-	2	2	-	-	-	-	-	-	-	6	



**Table 3.10** Apr 05 - Sep 05 EWCF, with SF=1: 2004/05 ALPs and DAFs 'Best Estimate 04'

Analysis of Daily Percentage Error: Statistic is Total Errors as Percentage of Full Period Demand

01B	SC	NO	NW	NE	EM	WM	WN	WS	EA	NT	SE	SO	SW
Apr 05 - May 05	-3.8%	-7.0%	-4.8%	-3.6%	-4.5%	-4.8%	-	-6.6%	-3.7%	-4.4%	-5.0%	-6.7%	-7.0%
Jun 05 - Sep 05	1.9%	-0.6%	0.2%	1.4%	-2.9%	1.0%	-	0.8%	-0.3%	0.7%	-0.9%	0.6%	1.0%

**Table 3.11** Apr 05 - Sep 05 EWCF, with SF=1: 2004/05 ALPs and DAFs 'Best Estimate 04'

Analysis of Daily Percentage Error: Statistic is Total Errors as Percentage of Actual Demand

All LDZs	01B	02B	03B	04B	05B	06B	07B	08B	09B
Apr 05 - May 05	-9.2%	-7.8%	-6.5%	-4.4%	-3.5%	-2.6%	-1.5%	-0.5%	0.3%
Jun 05 - Sep 05	0.6%	-1.4%	-2.5%	-5.0%	-5.5%	-4.7%	-7.9%	-6.5%	-3.2%

