

## Evaluation of Algorithm Performance, 2005/06 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) (this was presented separately at the DESC meeting of 6<sup>th</sup> November 2006)
- 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 discussed at the meeting of DESC on 6<sup>th</sup> November 2006.

It incorporated SF and WCF-EWCF graphs and tables, for the two previous gas years, 2004/05 and 2005/06. 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.

Therefore, 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 also 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 2005/06, this screening process reduced the available data set by an extent ranging from around 19% in December 2005 to 49% 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).

The remaining validated RV data is then used to establish, for each EUC, an average profile of actual and allocated demand. 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 with this approach 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 that is thus derived 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 2005/06 ended only 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 SE, SC, SW, WM, WN and NW 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. Note again that the

uniform apportionment of each reconciliation variance quantity across all applicable days together with fluctuations in the numbers of contributing meters during the period mean that these RV profiles are not comparable to ALP profiles and therefore the apparent “spike” (for example) in the profiles for consumption band 04B in SC LDZ (Figures 2.3 and 2.4) must be seen in this context.

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.

Where the average number of contributing meters across the full year was 2 or less no attempt has been made to derive a classification. Thus, no assessment has been possible for LDZs SC, WN and WS in consumption band 08B and for LDZs NW, NE, EM, WM, WN, WS, NT, SE and SW in consumption band 09B.

It should be noted that not all reconciliation variance data applicable to the period under review (gas year 2005/06) has yet been processed (particularly in those consumption bands with non-monthly read meters). Subject to this caveat, Table 2.1 suggests that during 2005/06 for consumption bands 02B and 03B the profiles have either been good or 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 05B appears to be mostly good (in each of these two bands there is just one exception that is a little too peaky at the 5% level, that of WN LDZ).

The profiles for consumption bands 06B are also mostly good but there are also profiles that are both too peaky and too flat.

The profiles for consumption bands 07B and 08B are also split between those that are good, too flat and too peaky. An assessment of the profile could not be made for 3 LDZs in consumption band 08B. Similarly, for consumption band 09B, assessment was only possible in 4 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, only in WN LDZ is the picture one of profiles that are mostly too peaky. LDZs SO and SW have the greatest number (3 or 4 out of 8) of profiles that are too flat. LDZs NO, NE, WN and WS have the greatest number (3, 4 or 5 out of 8) of profiles that are too peaky. Overall there are no occurrences of profiles that are too flat in consumption bands 02B to 05B. Instances of profiles that are too flat are mainly found in consumption bands 06B, 07B and 08B.

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. Most of the scaling applied is seen to be an uplift (>1). Interpreted simplistically, this might indicate a deficit in the level of AQ in these EUCs. In direct contrast, the WCF and SF strand of performance evaluation assessment which was presented to DESC in November 2006 suggested that aggregate NDM AQs overall were probably too high in gas year 2005/06.

However, this RV analysis does not actually reflect the overall population for a number of reasons. Most significantly, there is no reconciliation of consumption band 01B (which makes up around 72% of overall NDM load in AQ terms). Moreover, RV data validation results in a significant proportion of the raw data having to be discarded (thus the ensuing results for annual scaling do not necessarily represent the overall population). In addition, the results cover the recently concluded gas year (2005/06) pertaining to which all RV data in all consumption bands has not yet become available.

If the assumption is made that the RV results indicate correctly that “non-domestic NDM EUC AQs were too low in 2005/06, since it also appears clear from the WCF and SF analysis that overall aggregate NDM AQs in gas year 2005/06 were too high, that would suggest that “domestic” (consumption band 01B) AQs are notably too high. The more plausible viewpoint is to discount the annual scaling from the RV analysis as being unrepresentative for the reasons stated.

The performance of consumption bands 03B and 04B are of particular interest since these consumption bands have been separately modelled only since gas year 2002/03. Figure 2.13 and Figure 2.15 show the profiles established from the RV data, in consumption bands 03B and 04B 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 03B and 04B appear overall to be acceptable (i.e. within the winter/summer 5% error difference level: < 2.8% for 03B and < 1.2% for 04B). The corresponding error difference levels from this analysis undertaken a year ago were: < 3.5% for 03B and < 2% for 04B.

### 3. Analysis of NDM Sample Daily Consumption Data

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

- i) As used - 2005/06 ALPs and DAFs, real system WCF and SF
- ii) Best estimate 05 - 2005/06 ALPs and DAFs, EWCF, SF = 1
- iii) Best estimate 06 - as (ii) above but with 2006/07 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 2006 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 for the "as used" analysis the percentage errors for most consumption bands over the 12 month period as a whole, are in the range 1 to 4% in most cases (the exception is band 09B). Full year, winter and summer errors are positive for all consumption bands except band 09B over the winter period and band 07B over the summer period. Band 09B should be discounted since it is based on just 4 supply points located in just 3 of 13 LDZs. Band 08B is also based on relatively small data sets made up of 23 or fewer supply points in 10 of the 13 LDZs. The consistently positive errors across most consumption bands indicate under allocation by the models.

This under allocation in most consumption bands in the "as used" analysis, is consistent with population AQs being too high. The "as used" analysis uses real SFs that have taken population AQs into account (i.e. if population AQ was too high then this would have led to a decrease of the relevant SFs from the values that would have otherwise applied). However, the sample AQs used in the analysis are computed from sample data itself. Thus, the resultant "as used" allocations using these real SFs, would be lower than they should be, leading to the consistently positive errors shown in Figure 3.1. The analysis of WCF and SF patterns over gas year 2005/06, presented at the DESC meeting on 6<sup>th</sup> November 2006, also indicated that population NDM AQs appeared to have been too high during this period. The revised NDM supply point AQs instituted at the start of gas year 2006/07, also showed a reduction from those applicable in the previous gas year.

The analysis of WCF and SF patterns over gas year 2005/06, presented at the DESC meeting on 6<sup>th</sup> November 2006, also provided evidence of WCF bias (lower WCF) due to overstated aggregate NDM SNDs during gas year 2005/06. Particularly, in respect of the more weather sensitive consumption bands, for which the DAF\*WCF term would have been more strongly depressed, the observed errors (i.e. under allocation) shown here may be thought to be also due to WCF bias. However, system SF values (used here) have taken in to account the effect of WCF bias, resulting in SF values greater than they would otherwise have been and acting counter to the depressive effect on system SFs of NDM AQs having been too high. Thus, these observed consistent under allocations are probably only due to the AQ effect (system NDM AQs too high).

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. For each "best estimate" analysis, a scaling factor of one is used and EWCF is applied instead of WCF. The EWCF is calculated directly from the models of aggregate NDM demand in the LDZ for the period in question, using the relevant aggregate NDM seasonal normal demands and weather sensitivities along with the actual CWV. Use of the EWCF avoids bias which might be introduced in the WCF by aggregate NDM SND error. Aggregate NDM SND was indeed too high during gas year 2005/06 and did cause WCF bias (lower WCF). Thus, use of EWCF in the "best estimate" analysis circumvents this source of error and allows the performance of the algorithms themselves to be assessed.

The "best estimate 05" analysis is based on the algorithms for 2005/06, while the "best estimate 06" analysis is based on the algorithms derived for 2006/07 and applied with appropriate adjustment to 2005/06.

On the evidence of the bar chart in Figure 3.2 ("best estimate 05"), there was little overall error in the algorithms for any of the consumption bands (band 09B excepted) over gas year 2005/06 as a whole. Overall consumption band winter period errors are of the order of +2% or less and overall consumption band summer period errors are of the order of -5% or less. Actual summer demands are lower and hence percentage errors tend to be greater in the summer.

The bar chart in Figure 3.3 ("best estimate 06") shows that the algorithms derived for 2006/07 would (if applied to gas year 2005/06) have resulted in very similar outcome for each overall consumption band

considered. Whole year errors are very small overall for the consumption bands (except band 09B). Winter and summer period errors would however have been a little worse with the 2006/07 profiles applied to gas year 2005/06 for all consumption bands other than for band 01B and band 08B.

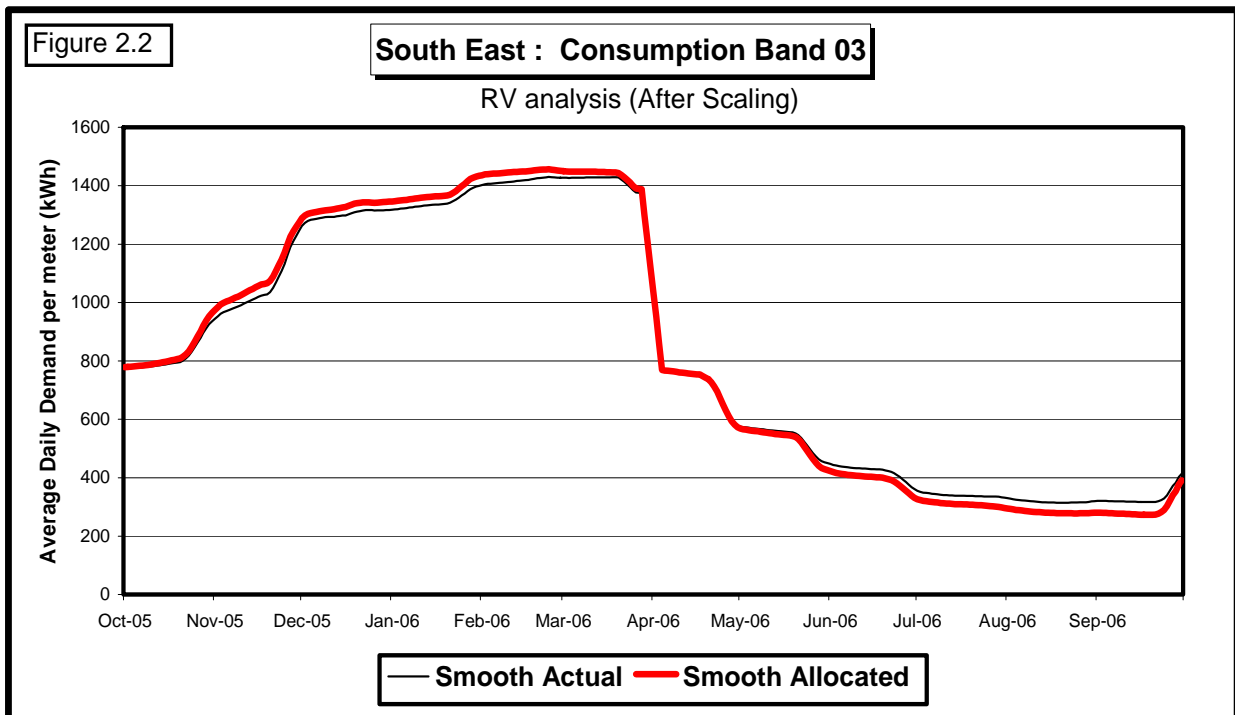
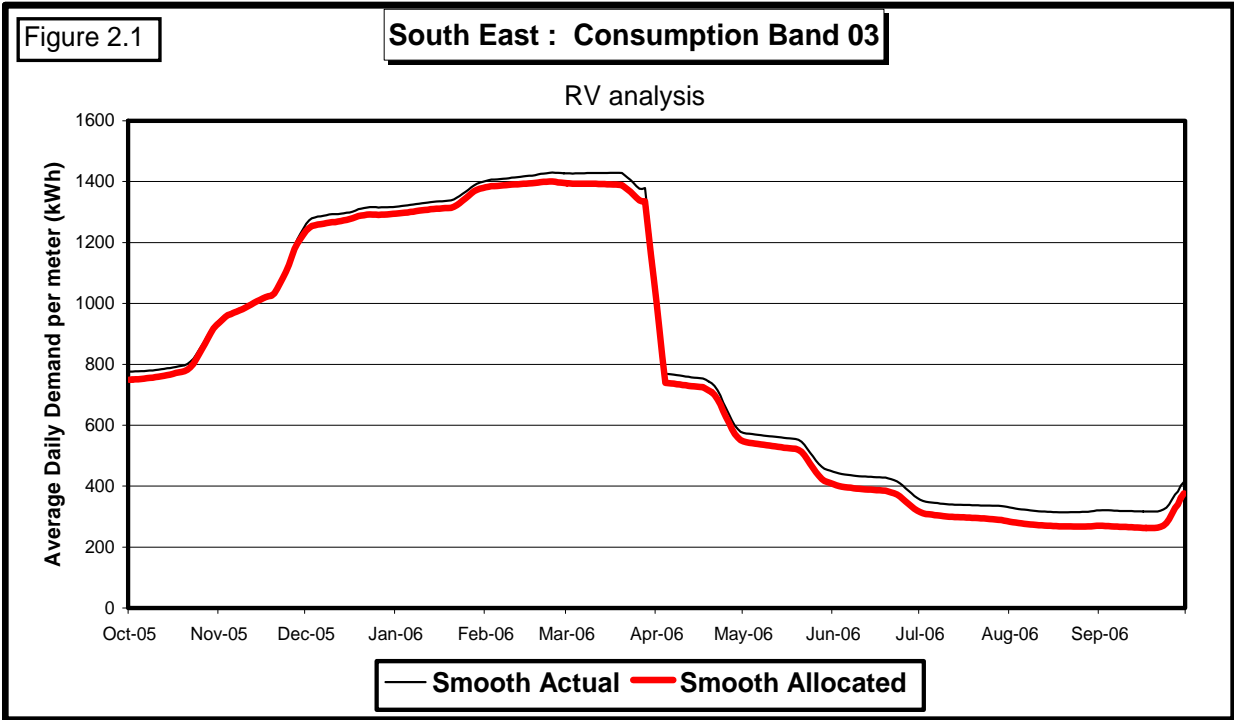
When gas year 2004/05 was similarly assessed and the results presented to the DESC meeting on 12<sup>th</sup> December 2005, it was observed that the 2005/06 profiles performed noticeably better over gas year 2004/05 than the profiles originally applied to 2004/05. The principal reason for this was the improved formulation of the underlying models arising from the revised definitions of all CWVs, which came in to effect from the start of gas year 2005/06. The profiles for both 2005/06 and 2006/07, now examined in the “best estimate” analyses are based on underlying models that all use revised basis CWV definitions. Thus, on this occasion there is little difference in performance between the profiles for 2005/06 and those for 2006/07 when applied to gas year 2005/06.

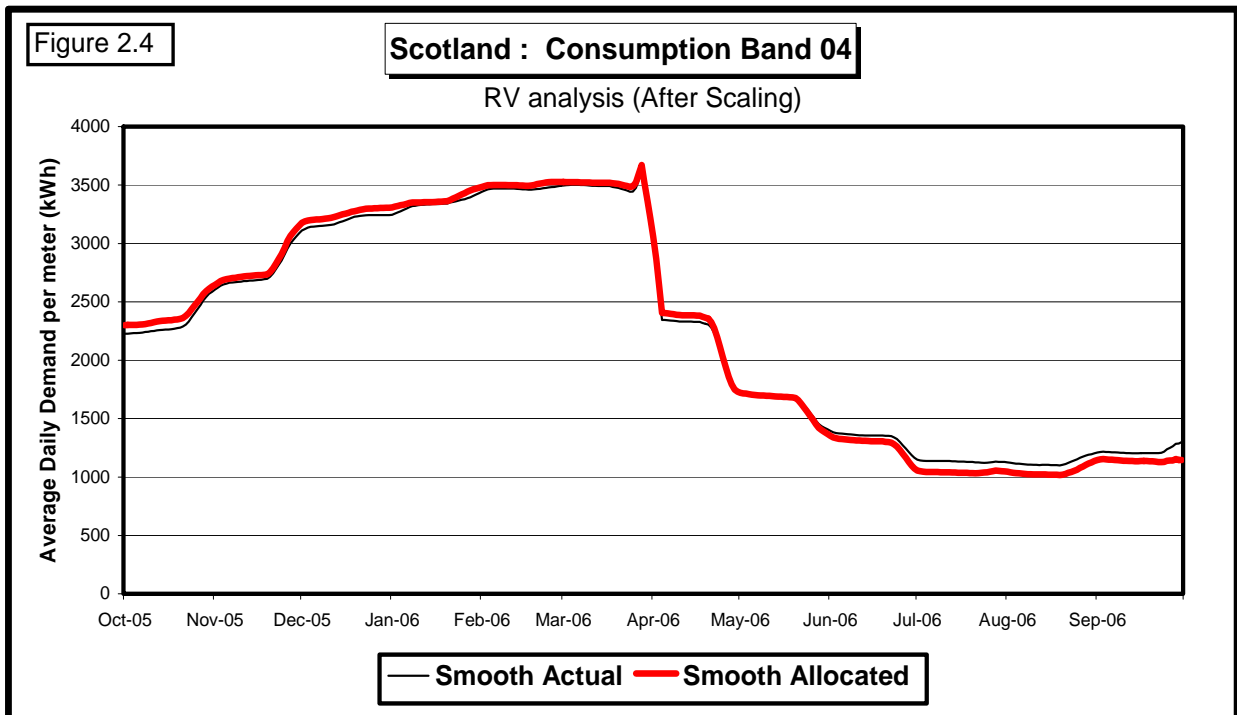
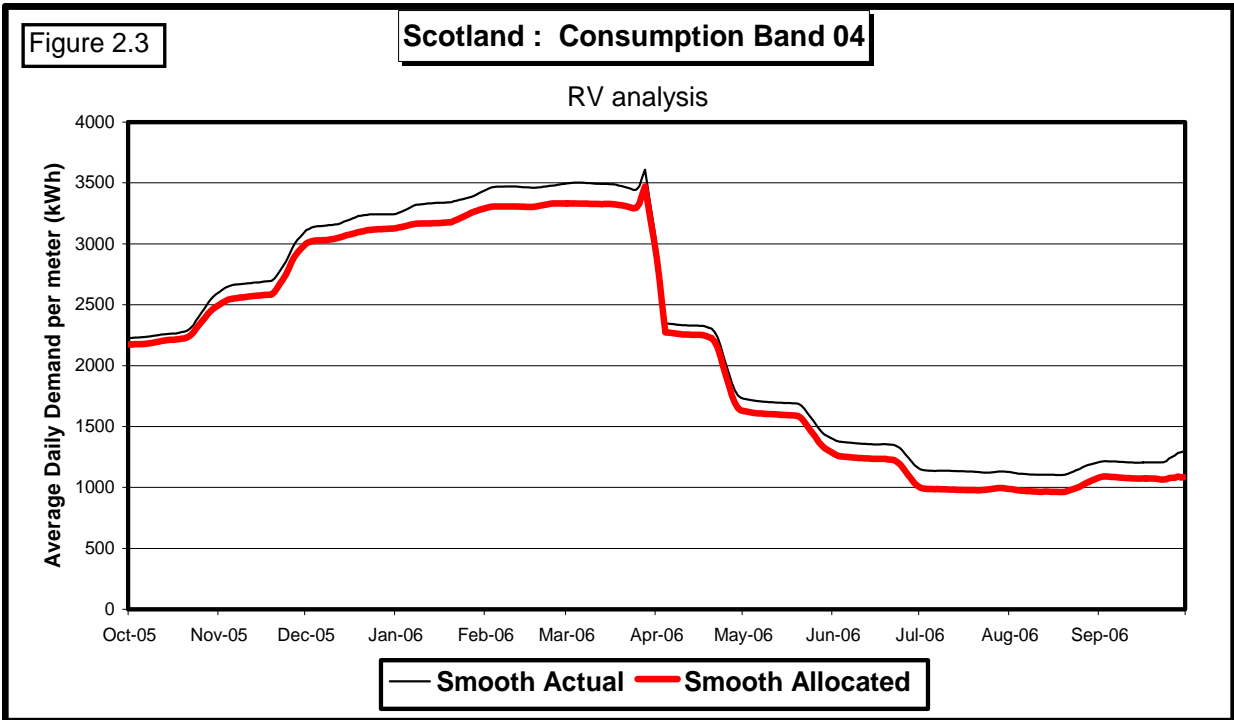
Overall across each consumption band, the “best estimate” analyses suggest under allocation (positive errors) in the winter and corresponding over allocation (negative errors) in the summer. The reconciliation variance analysis in broad terms indicate small over allocation in the winter and corresponding small under allocation in the summer. The two analyses are, however, based on different data sets, neither of which are necessarily representative of the population as a whole. The RV analysis cannot assess consumption band 01B and is based on a validated sub-set of available reconciliation data relating to gas year 2005/06. Moreover, not all RV data pertaining to the period has been received at the time of this analysis (i.e. RVs resulting from non-monthly meter reads). The “best estimate” analyses are based on validated NDM sample data. Both analyses suffer from small numbers of contributing meter/supply points at the higher consumption bands.

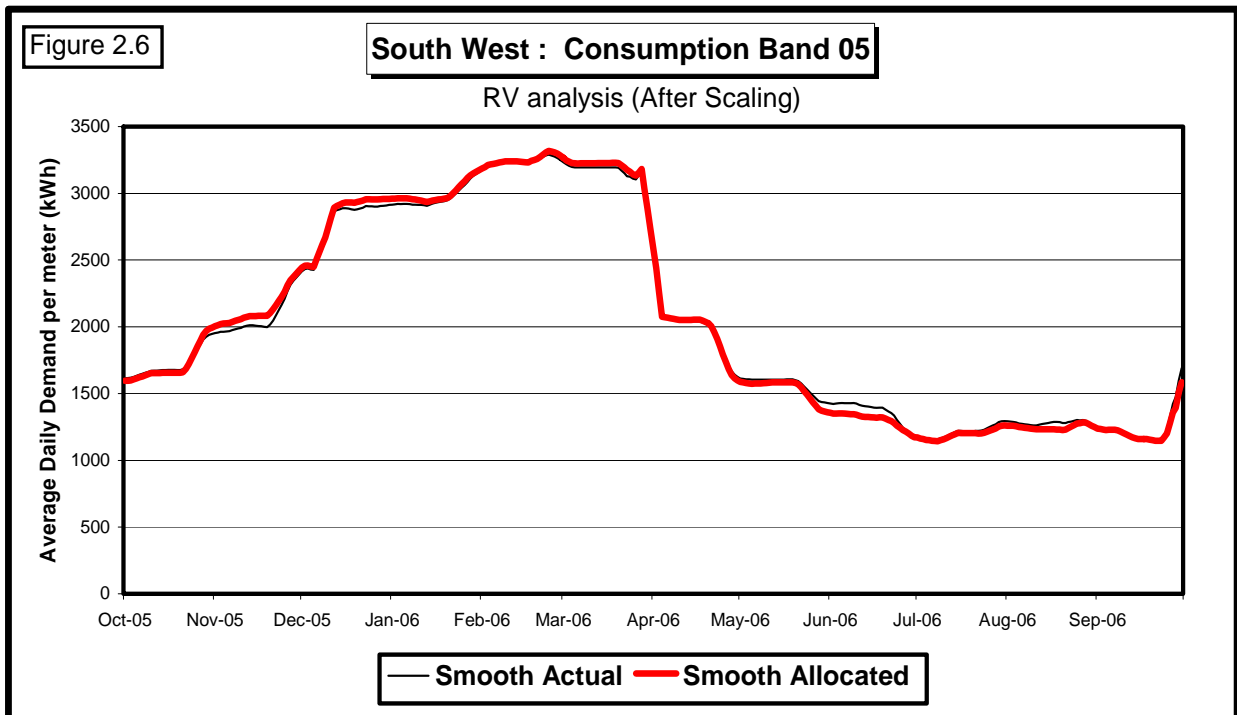
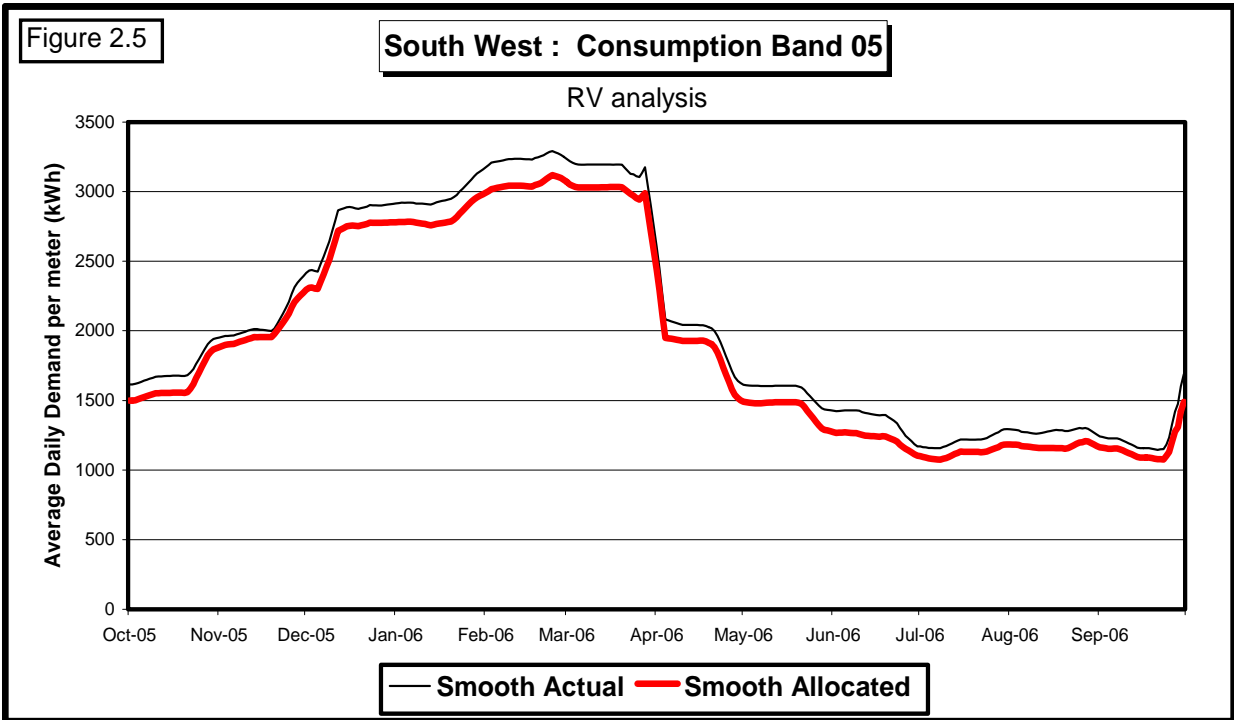
A selection of monthly charts are also presented: Figures 3.4 to 3.11 are monthly bar charts comparing actual and allocated demands, across all LDZs for consumption bands 01B to 08B respectively. These show for each month, actual demand, and allocated demand on the “as used”, “best estimate 05” and “best estimate 06” bases. For all consumption bands a pattern of under allocation in the winter and corresponding over allocation in the summer may be seen in these charts. In addition, the notable under allocation in March 2006 for most consumption bands is noteworthy. Unlike recent past years (for which March has been exceptionally mild) March 2006 was unusually colder than seasonal normal for most days of the month and consequently this increased gas demand. It appears that the profiles (based as they are on historical sample data) did not respond sufficiently.

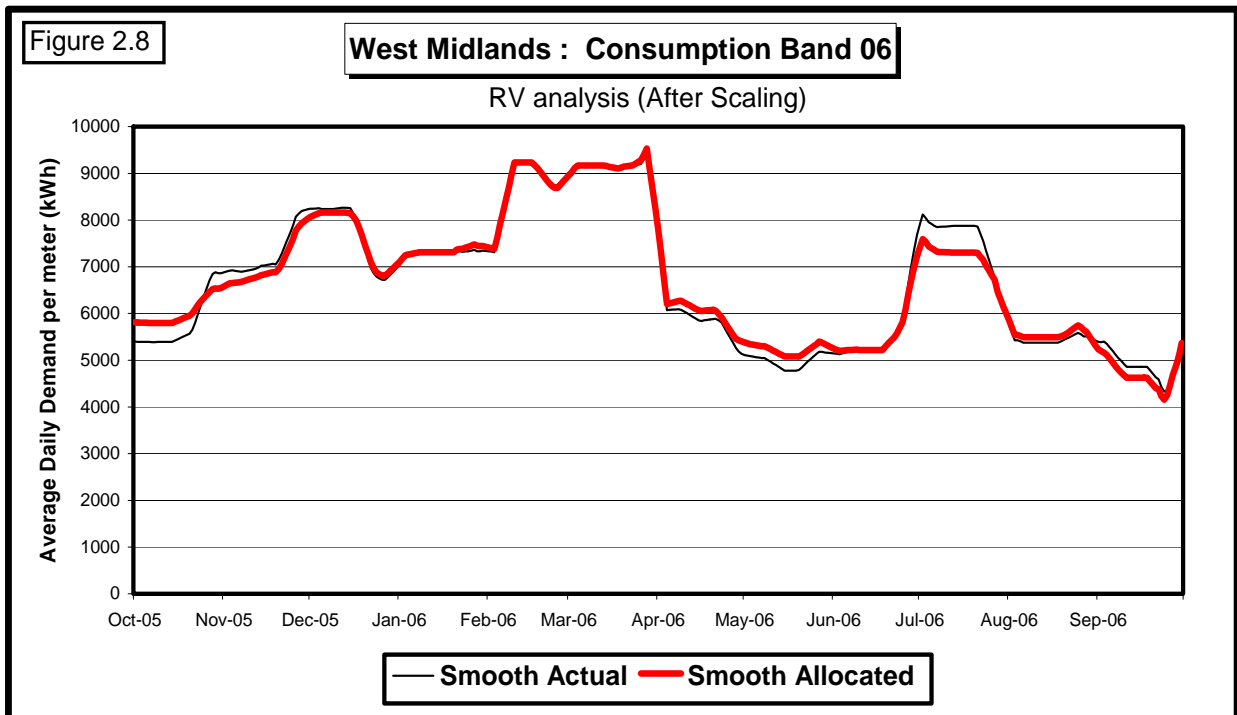
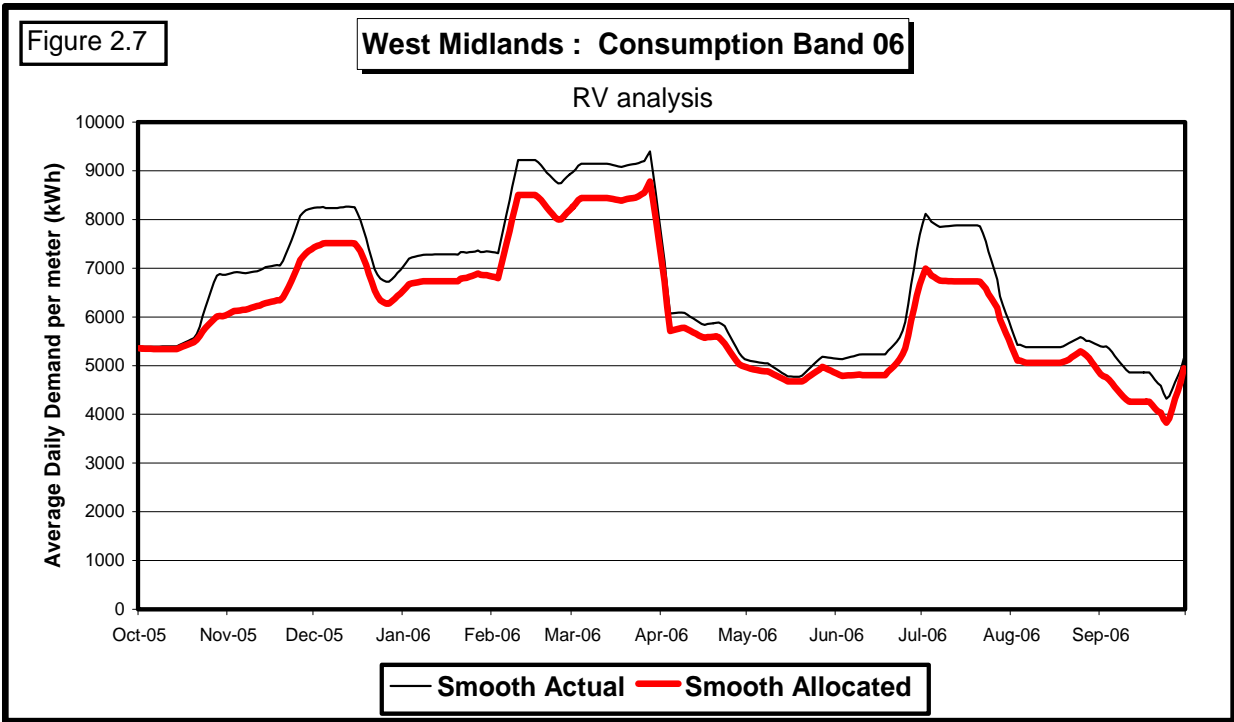
Additionally examples of monthly bar charts for individual EUCs, for each of the first four EUC bands (namely EM:E0401B, NO:E0402B, SC:E0403B and SW:E0404B) are shown in Figures 3.12 to 3.15 respectively. Some of these examples also show notable under allocation in the unusually colder than normal month of March 2006.

In weather terms another exceptional month in the gas year under review was July 2006 (the warmest July on record). Nevertheless, for the “best estimate” analyses, Figures 3.4 to 3.11 do not show strong evidence of consequential over allocation consistently across the consumption bands, in July 2006 over and above other summer months. However, notable over allocation in July 2006 was evident for individual LDZs in some consumption bands (Figure 3.12 is a case in point).

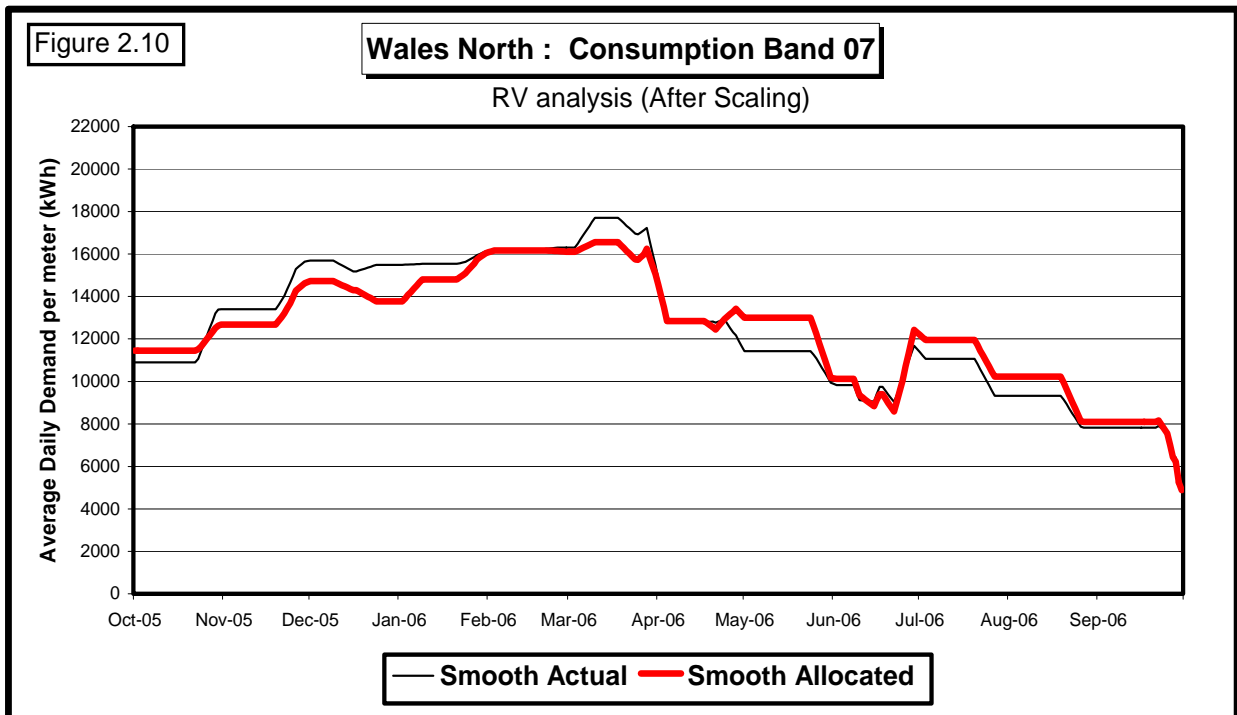
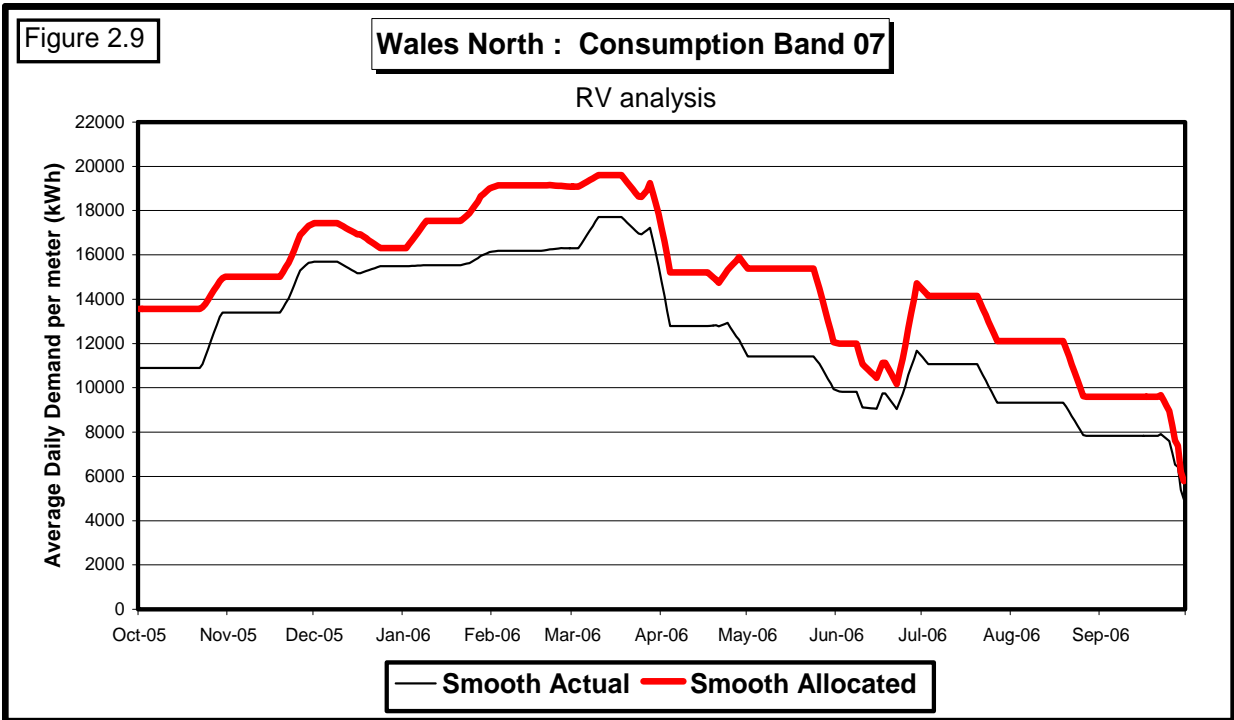












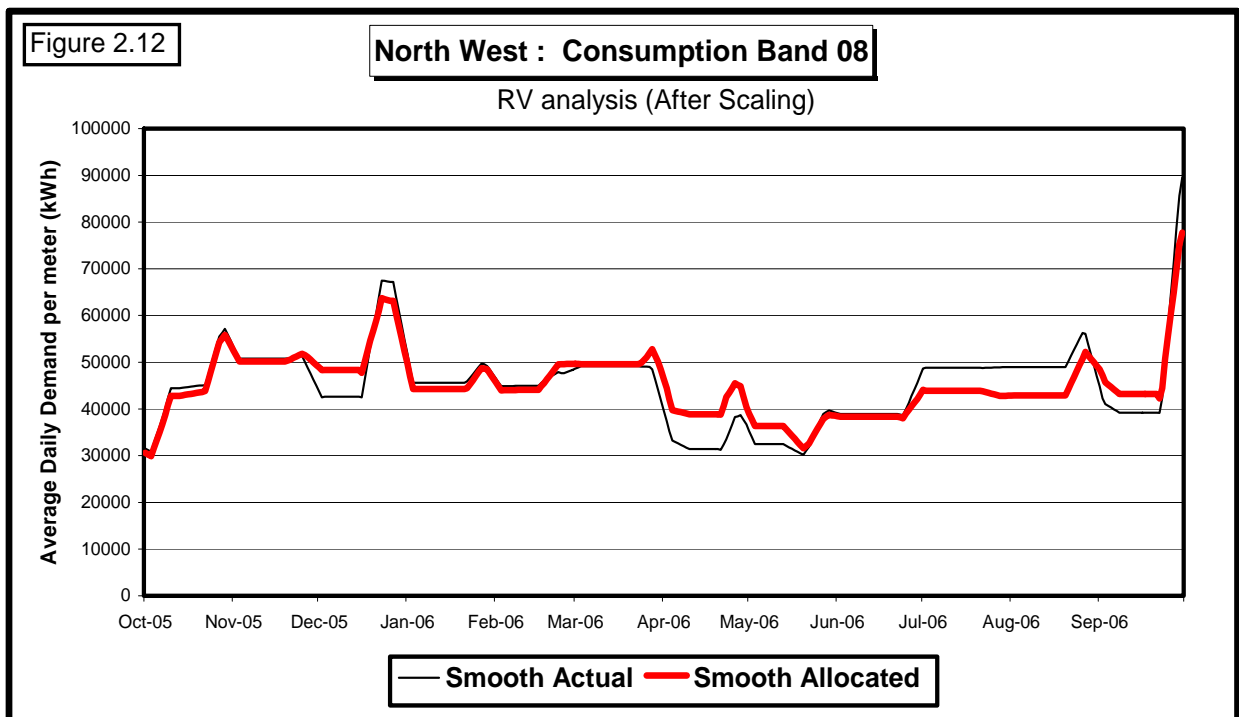
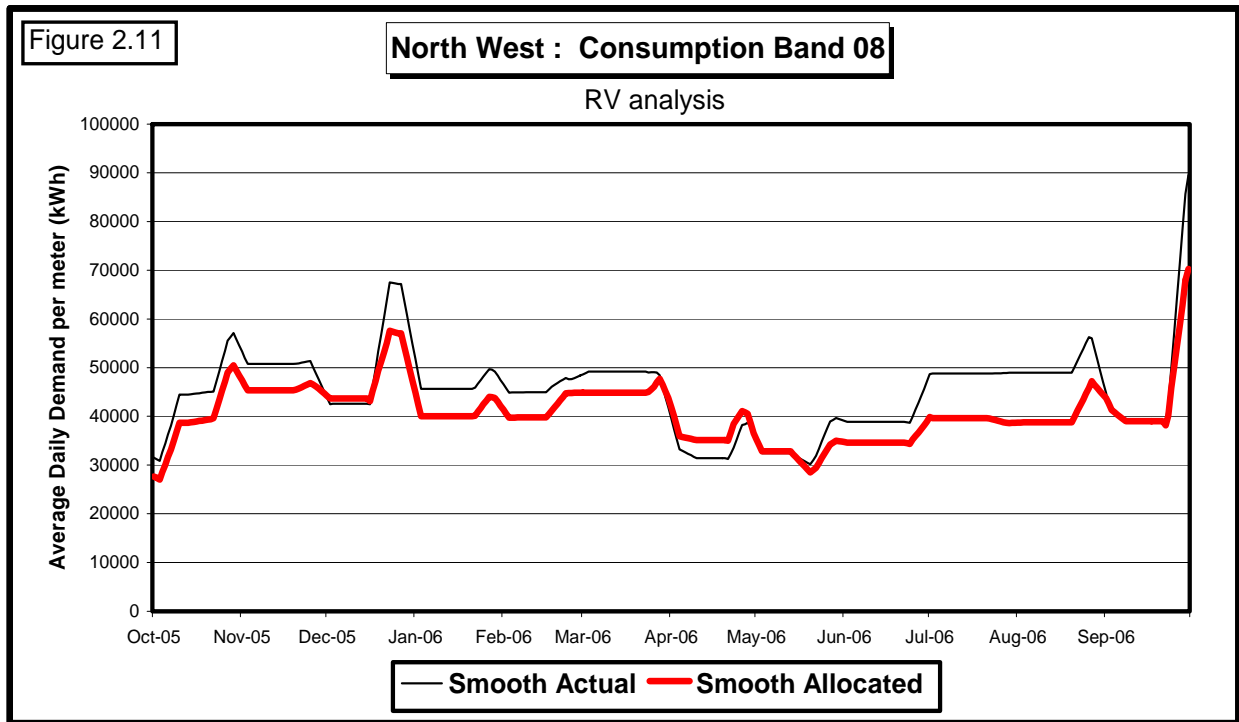


Table 2.1

**RV Categorisations: Profile**

Gas Year: 2005/06

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: 2005/06

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

	<b>EUC</b>	<b>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>B</b>		-0.02	-0.03	-0.02	-0.03	-0.02	-0.02	-0.03	-0.03	-0.02	-0.01	-0.02	-0.02	-0.03
<b>03</b>	<b>B</b>		-0.02	-0.03	-0.02	-0.03	-0.03	-0.02	-0.03	-0.03	-0.03	-0.02	-0.03	-0.04	-0.03
<b>04</b>	<b>B</b>		-0.02	-0.01	0.01	0.00	-0.01	0.00	-0.03	-0.02	-0.01	-0.01	-0.01	-0.01	0.00
<b>05</b>	<b>B</b>		-0.01	0.01	-0.01	-0.01	-0.02	-0.02	-0.03	0.01	0.00	-0.01	-0.01	0.00	-0.01
<b>06</b>	<b>B</b>		0.01	-0.01	0.02	0.00	0.03	0.00	-0.07	-0.05	0.03	0.00	-0.01	0.03	0.05
<b>07</b>	<b>B</b>		0.02	0.06	-0.03	-0.04	-0.02	-0.04	0.05	0.00	0.00	0.04	0.00	0.03	0.04
<b>08</b>	<b>B</b>			0.06	0.00	-0.08	-0.06	0.02			0.01	0.06	0.13	0.06	0.09
<b>09</b>	<b>B</b>		0.07	-0.11							-0.02			0.10	

Table 2.3

**RV Categorisations: Summer** **Gas Year: 2005/06**

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	0.03	0.02	0.03	0.02	0.02	0.03	0.03	0.02	0.01	0.02	0.02	0.03
<b>03 B</b>	0.02	0.03	0.02	0.03	0.02	0.02	0.03	0.03	0.03	0.02	0.03	0.04	0.03
<b>04 B</b>	0.02	0.01	-0.01	0.00	0.01	0.00	0.03	0.02	0.01	0.01	0.01	0.01	0.00
<b>05 B</b>	0.01	-0.01	0.01	0.01	0.01	0.02	0.03	-0.01	0.00	0.01	0.01	0.00	0.01
<b>06 B</b>	-0.01	0.01	-0.02	0.00	-0.03	0.00	0.07	0.05	-0.03	0.00	0.01	-0.03	-0.05
<b>07 B</b>	-0.02	-0.06	0.03	0.04	0.02	0.04	-0.05	0.00	0.00	-0.04	0.00	-0.03	-0.04
<b>08 B</b>		-0.06	0.00	0.09	0.06	-0.02			-0.01	-0.06	-0.15	-0.09	-0.09
<b>09 B</b>	-0.07	0.12							0.02				-0.10

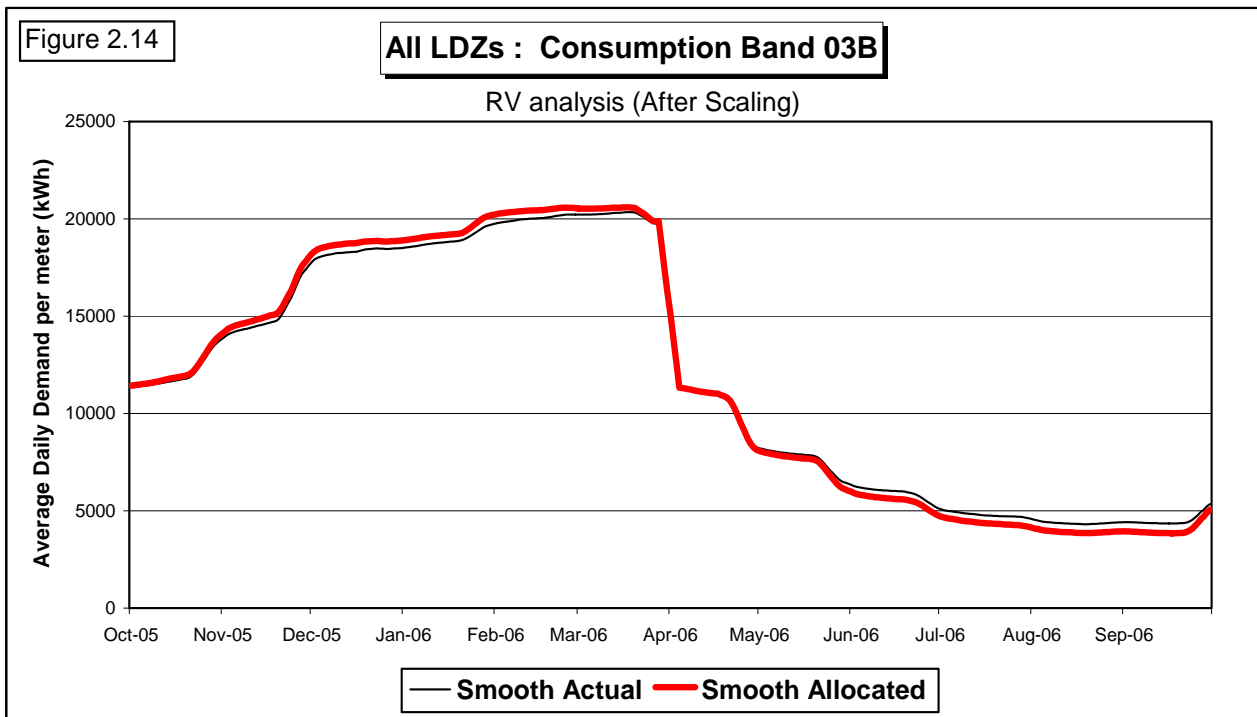
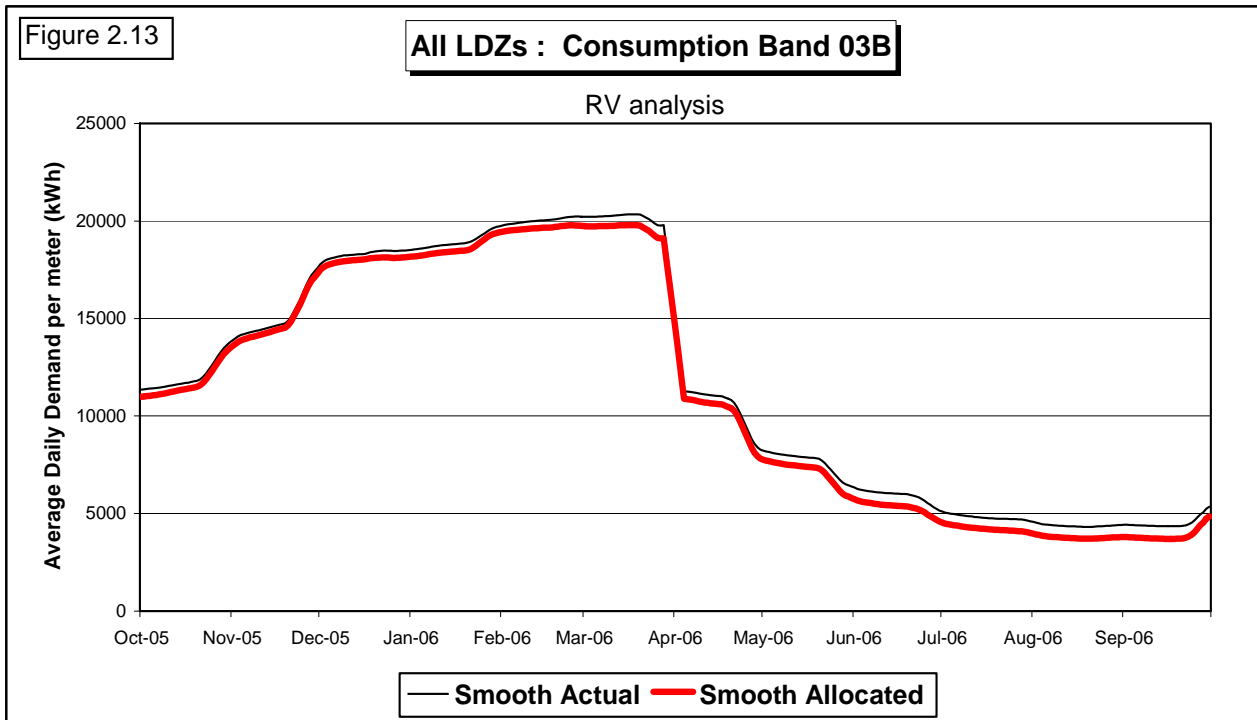
Table 2.4

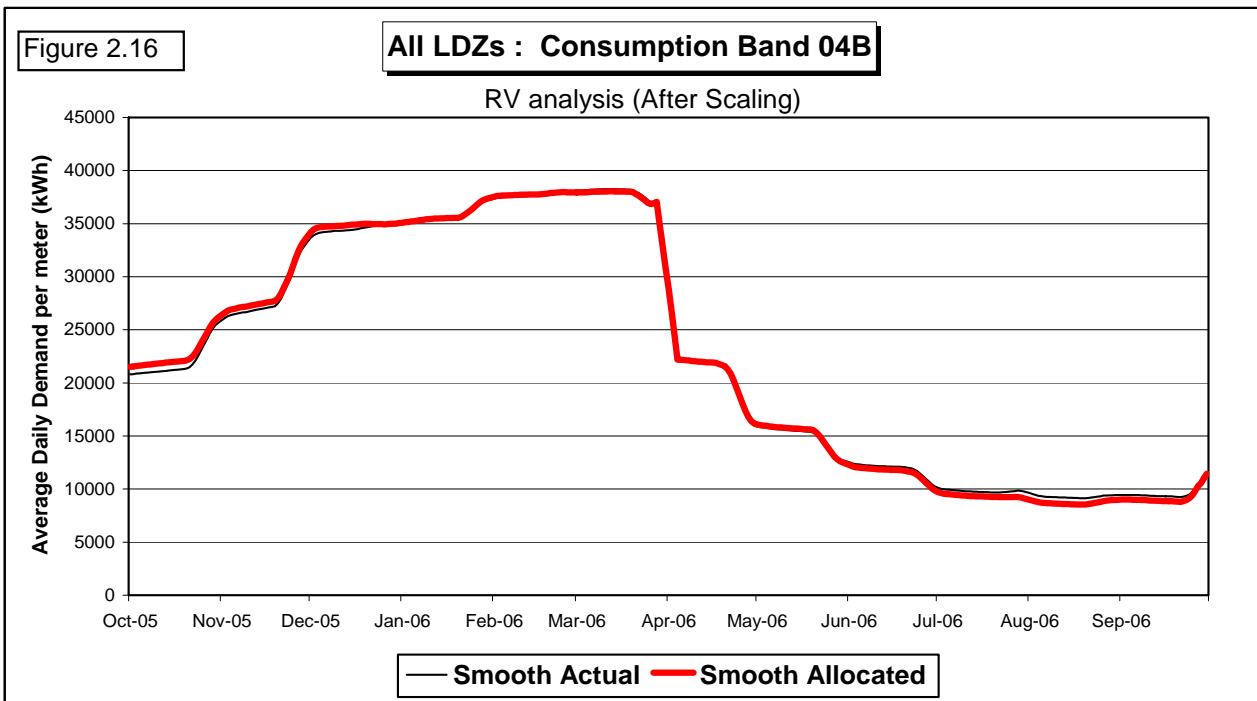
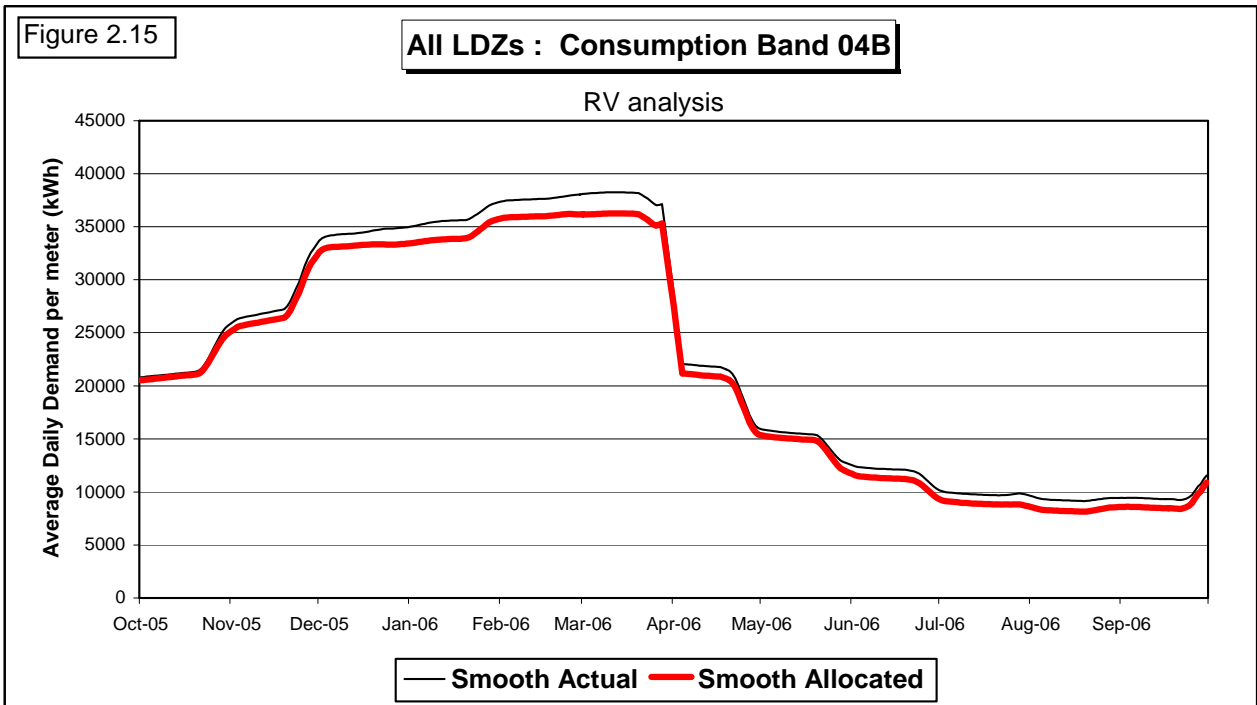
**RV Categorisations: Annual Scaling**

Gas Year: 2005/06

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>	1.02	1.02	1.01	1.01	1.01	1.03	0.97	1.01	1.02	1.03	1.01	1.01	1.02
<b>03 B</b>	1.04	1.05	1.04	1.02	1.05	1.06	1.02	1.05	1.05	1.04	1.04	1.03	1.03
<b>04 B</b>	1.06	1.05	1.05	1.03	1.04	1.08	1.02	1.06	1.06	1.05	1.05	1.02	1.06
<b>05 B</b>	1.01	1.05	1.06	1.03	1.06	1.05	1.03	1.01	1.07	1.03	1.03	1.01	1.06
<b>06 B</b>	1.03	0.98	1.06	1.12	1.03	1.09	1.03	0.97	1.08	1.04	1.04	0.99	1.06
<b>07 B</b>	1.09	1.02	1.12	1.03	1.05	1.04	0.84	1.15	0.99	1.05	0.93	1.04	1.00
<b>08 B</b>		0.99	1.11	0.95	0.89	1.01			0.96	0.79	1.10	1.03	1.00
<b>09 B</b>	1.09	1.20							1.08			1.04	







**Table 3.1** Oct 05 - Sep 06 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	4.04%	2.49%	2.10%	3.05%	3.67%	5.96%	-	3.03%	5.24%	5.62%	4.83%	2.57%	4.02%	3.89%	3.89%
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	2593
02B	4.11%	2.94%	1.85%	4.07%	3.65%	5.27%	-2.42%	3.71%	5.04%	3.93%	3.62%	2.37%	5.29%	3.79%	3.79%
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	1236
03B	3.19%	2.23%	1.90%	2.80%	3.25%	5.76%	-2.49%	2.29%	4.92%	4.17%	3.78%	1.65%	4.01%	3.32%	3.32%
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	1326
04B	3.47%	1.95%	1.90%	3.00%	3.78%	5.71%	-2.65%	2.14%	4.65%	3.73%	3.21%	1.49%	2.93%	3.16%	3.16%
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	3948
05B	3.07%	2.21%	2.01%	2.58%	3.28%	4.64%	-2.87%	1.99%	4.50%	2.95%	2.95%	0.99%	2.36%	2.81%	2.81%
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	3177
06B	2.47%	1.93%	1.84%	1.67%	2.90%	3.24%	-3.61%	1.05%	4.54%	2.44%	2.18%	0.63%	1.37%	2.21%	2.21%
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	1183
07B	1.90%	1.59%	1.73%	1.39%	2.66%	2.34%	-4.01%	1.37%	4.05%	1.89%	2.03%	0.75%	1.48%	1.89%	1.89%
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	402
08B	1.05%	1.10%	1.35%	0.85%	2.34%	1.58%	-5.11%	0.38%	3.51%	0.75%	1.17%	-0.24%	-0.18%	1.10%	1.10%
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	204
09B	0.98%	-	-	-	-	2.93%	-5.20%	-	-	-	-	-	-	-0.08%	-0.08%
Num S. pts	2	-	-	-	-	1	1	-	-	-	-	-	-	4	4

**Table 3.2** Oct 05 - Mar 06 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	2.43%	2.24%	1.79%	2.29%	2.66%	4.89%	-	3.56%	4.86%	4.55%	4.57%	1.68%	4.31%	3.31%	3.31%
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	2593
02B	0.87%	1.48%	0.47%	2.63%	2.60%	3.41%	-15.63%	1.83%	4.82%	6.72%	5.42%	-0.16%	3.09%	2.81%	2.81%
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	1236
03B	2.33%	-0.44%	2.21%	0.36%	4.19%	5.99%	-11.98%	-0.71%	5.33%	5.10%	3.98%	2.01%	4.05%	2.97%	2.97%
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	1326
04B	3.07%	0.98%	2.38%	3.36%	3.15%	5.40%	-5.17%	3.72%	3.92%	5.00%	4.37%	1.14%	4.04%	3.33%	3.33%
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	3948
05B	3.72%	2.60%	1.48%	3.69%	2.78%	6.17%	-4.50%	2.74%	4.61%	4.26%	4.09%	1.94%	4.49%	3.50%	3.50%
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	3177
06B	2.93%	1.25%	1.80%	3.92%	3.23%	6.05%	-4.12%	2.48%	5.46%	4.87%	3.06%	2.70%	1.47%	3.30%	3.30%
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	1183
07B	1.81%	8.73%	0.17%	2.49%	-1.11%	7.57%	-11.19%	3.63%	6.52%	-3.64%	-0.05%	7.41%	-0.30%	2.77%	2.77%
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	402
08B	3.20%	-3.57%	4.89%	1.30%	-4.37%	4.77%	-17.18%	-2.33%	7.31%	4.61%	-1.59%	3.28%	2.69%	0.92%	0.92%
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	204
09B	-7.57%	-	-	-	-	2.60%	-11.65%	-	-	-	-	-	-	-6.05%	-6.05%
Num S. pts	2	-	-	-	-	1	1	-	-	-	-	-	-	4	4

**Table 3.3** Apr 06 - Sep 06 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	8.39%	3.26%	3.07%	5.34%	6.93%	9.52%	-	1.24%	6.54%	9.12%	5.75%	5.60%	2.94%	5.69%	
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	
02B	12.06%	7.61%	5.82%	9.61%	7.57%	11.93%	23.89%	10.70%	5.73%	-4.35%	-2.15%	9.49%	13.53%	6.94%	
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	
03B	5.40%	9.67%	1.02%	10.05%	0.11%	4.93%	17.27%	10.97%	3.61%	1.44%	3.12%	0.47%	3.85%	4.15%	
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	
04B	4.37%	4.63%	0.61%	2.02%	5.68%	6.66%	3.36%	-2.69%	6.78%	0.23%	-0.13%	2.50%	-0.09%	2.67%	
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	
05B	1.66%	1.32%	3.16%	-0.03%	4.40%	0.78%	0.49%	0.27%	4.24%	-0.09%	0.10%	-1.41%	-2.40%	1.14%	
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	
06B	1.64%	3.20%	1.91%	-2.63%	2.31%	-2.24%	-2.74%	-1.53%	2.64%	-2.52%	0.47%	-4.02%	1.19%	0.05%	
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	
07B	2.03%	-12.13%	4.12%	-0.29%	8.08%	-6.73%	5.60%	-3.10%	-0.49%	9.53%	5.21%	-14.42%	4.50%	-0.41%	
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	
08B	-1.73%	6.40%	-3.64%	0.25%	10.34%	-2.96%	7.04%	3.87%	-2.40%	-4.79%	4.61%	-5.60%	-4.27%	0.84%	
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	
09B	9.73%	-	-	-	-	3.33%	1.93%	-	-	-	-	-	-	6.18%	
Num S. pts	2	-	-	-	-	1	1	-	-	-	-	-	-	4	

**Table 3.4** Oct 05 - Sep 06 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%	0.00%	0.00%	0.00%	0.00%	0.00%	-	0.00%	-0.17%	0.00%	0.00%	0.00%	-0.15%	-0.03%	
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	
02B	0.10%	0.13%	-0.18%	0.25%	-0.05%	-0.45%	-0.18%	0.20%	-0.16%	-0.17%	-0.26%	0.04%	0.16%	-0.05%	
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	
03B	-0.20%	-0.16%	-0.11%	-0.16%	-0.03%	-0.05%	-0.11%	-0.32%	-0.21%	-0.24%	-0.29%	-0.28%	-0.14%	-0.19%	
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	
04B	0.06%	-0.24%	-0.06%	0.18%	0.17%	0.19%	-0.06%	-0.21%	-0.23%	-0.24%	-0.30%	-0.25%	-0.03%	-0.08%	
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	
05B	0.06%	0.07%	0.09%	0.17%	0.16%	0.15%	0.09%	0.06%	-0.12%	-0.20%	-0.19%	-0.17%	0.11%	0.01%	
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	
06B	0.07%	0.07%	0.09%	0.06%	0.17%	0.15%	0.09%	0.06%	0.08%	-0.08%	-0.09%	-0.11%	0.09%	0.05%	
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	
07B	0.07%	0.06%	0.08%	0.13%	0.14%	0.11%	0.08%	0.06%	0.05%	0.05%	0.05%	0.06%	0.08%	0.09%	
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	
08B	0.06%	0.03%	0.03%	0.08%	0.08%	0.07%	0.03%	0.02%	0.04%	0.04%	0.04%	0.03%	0.04%	0.05%	
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	
09B	0.06%	-	-	-	-	1.85%	0.03%	-	-	-	-	-	-	0.50%	
Num S. pts	2	-	-	-	-	1	1	-	-	-	-	-	-	4	

**Table 3.5** Oct 05 - Mar 06 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	0.58%	2.33%	1.48%	0.25%	1.93%	1.06%	-	2.45%	1.91%	0.20%	1.40%	1.11%	2.36%	1.40%	1.40%
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	2593
02B	-1.02%	1.46%	0.06%	0.19%	1.68%	-0.63%	-11.37%	0.55%	1.89%	3.01%	2.52%	-0.62%	0.72%	0.84%	0.84%
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	1236
03B	0.57%	-0.47%	1.86%	-1.97%	3.39%	1.90%	-7.72%	-1.74%	2.47%	1.17%	0.95%	1.67%	1.93%	1.04%	1.04%
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	1326
04B	1.36%	0.92%	2.08%	1.32%	2.38%	1.67%	-1.03%	2.86%	1.16%	1.32%	1.65%	0.96%	2.34%	1.60%	1.60%
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	3948
05B	2.13%	2.52%	1.31%	1.81%	2.30%	3.00%	-0.07%	2.09%	2.14%	1.02%	1.56%	2.20%	3.02%	2.00%	2.00%
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	3177
06B	1.51%	1.12%	1.83%	2.33%	3.01%	3.70%	0.84%	2.31%	3.26%	1.98%	0.97%	3.31%	0.34%	2.19%	2.19%
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	1183
07B	0.56%	8.55%	0.34%	1.13%	-1.15%	5.84%	-5.55%	3.28%	4.74%	-6.42%	-2.06%	8.11%	-1.49%	2.00%	2.00%
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	402
08B	2.28%	-3.78%	5.44%	0.23%	-4.15%	3.53%	-10.24%	-2.12%	6.04%	2.78%	-3.08%	4.93%	2.26%	0.67%	0.67%
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	204
09B	-8.56%	-	-	-	-	1.67%	-4.96%	-	-	-	-	-	-	-5.10%	-5.10%
Num S. pts	2	-	-	-	-	1	-	-	-	-	-	-	-	4	4

**Table 3.6** Apr 06 - Sep 06 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	-1.54%	-6.96%	-4.54%	-0.78%	-6.20%	-3.52%	-	-8.15%	-7.20%	-0.63%	-4.81%	-3.77%	-9.37%	-4.73%	
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	
02B	2.87%	-4.13%	-0.87%	0.48%	-6.51%	0.18%	22.11%	-1.10%	-6.65%	-9.60%	-9.20%	1.91%	-1.94%	-3.07%	
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	
03B	-2.18%	0.72%	-5.74%	5.23%	-11.42%	-6.93%	15.74%	3.77%	-8.83%	-4.37%	-4.20%	-6.71%	-7.64%	-4.28%	
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	
04B	-2.92%	-3.47%	-5.80%	-2.89%	-6.51%	-4.20%	2.26%	-9.59%	-4.23%	-4.53%	-5.91%	-3.79%	-6.44%	-4.81%	
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	
05B	-4.34%	-5.59%	-2.54%	-3.71%	-4.61%	-7.07%	0.42%	-4.61%	-5.80%	-3.04%	-4.52%	-6.22%	-6.41%	-4.65%	
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	
06B	-2.52%	-1.91%	-2.99%	-4.27%	-4.96%	-6.74%	-1.21%	-3.97%	-6.52%	-4.31%	-2.16%	-7.82%	-0.36%	-4.10%	
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	
07B	-0.67%	-16.27%	-0.33%	-1.38%	1.99%	-9.83%	7.61%	-6.32%	-8.60%	8.97%	3.26%	-18.30%	2.76%	-3.98%	
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	
08B	-2.81%	4.34%	-7.58%	-0.12%	5.12%	-4.87%	10.37%	2.79%	-9.31%	-3.87%	3.93%	-7.43%	-3.12%	-1.24%	
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	
09B	8.88%	-	-	-	-	2.06%	5.55%	-	-	-	-	-	-	6.34%	
Num S. pts	2	-	-	-	-	1	1	-	-	-	-	-	-	4	

**Table 3.7** Oct 05 - Sep 06 EWCF, with SF=1: 2006/07 ALPs and DAFs 'Best Estimate 06'  
**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%	0.00%	0.00%	-0.18%	-0.20%	0.00%	-	0.00%	-0.19%	-0.18%	0.00%	0.00%	-0.19%	-0.08%	-0.08%
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	2593
02B	0.09%	0.14%	-0.11%	0.26%	-0.10%	-0.42%	-0.11%	0.15%	-0.07%	-0.16%	-0.19%	0.06%	0.15%	-0.02%	-0.02%
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	1236
03B	-0.17%	0.05%	-0.10%	-0.24%	0.00%	-0.01%	-0.10%	-0.26%	-0.16%	-0.19%	-0.25%	-0.23%	-0.38%	-0.16%	-0.16%
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	1326
04B	0.07%	-0.25%	0.11%	0.19%	0.17%	0.20%	0.11%	-0.16%	-0.16%	-0.24%	-0.26%	-0.23%	-0.04%	-0.05%	-0.05%
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	3948
05B	0.06%	0.07%	0.10%	0.17%	0.16%	0.16%	0.10%	0.06%	-0.10%	-0.19%	-0.16%	-0.15%	0.11%	0.02%	0.02%
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	3177
06B	0.07%	0.08%	0.09%	0.06%	0.17%	0.16%	0.09%	0.06%	0.09%	-0.07%	-0.08%	-0.11%	0.08%	0.06%	0.06%
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	1183
07B	0.07%	-0.03%	0.08%	0.14%	0.14%	0.12%	0.08%	0.04%	0.05%	0.05%	0.05%	-0.04%	0.08%	0.07%	0.07%
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	402
08B	0.07%	0.03%	0.03%	0.08%	0.08%	0.07%	0.03%	-0.13%	0.04%	0.04%	0.04%	0.03%	0.04%	0.05%	0.05%
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	204
09B	0.06%	-	-	-	-	1.84%	0.03%	-	-	-	-	-	-	0.50%	0.50%
Num S. pts	2	-	-	-	-	1	1	-	-	-	-	-	-	4	4

**Table 3.8** Oct 05 - Mar 06 EWCF, with SF=1: 2006/07 ALPs and DAFs 'Best Estimate 06'  
**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	0.85%	2.11%	1.69%	0.30%	1.45%	1.34%	-	1.76%	1.93%	0.40%	1.30%	1.12%	2.01%	1.34%	1.34%
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	2593
02B	-1.20%	1.12%	-0.05%	0.42%	2.85%	0.22%	-11.49%	0.87%	1.98%	3.80%	3.01%	0.29%	0.89%	1.22%	1.22%
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	1236
03B	0.78%	0.84%	1.85%	-1.65%	3.02%	2.62%	-7.73%	-1.01%	2.91%	1.32%	0.86%	3.12%	2.45%	1.39%	1.39%
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	1326
04B	1.76%	1.06%	2.35%	1.34%	2.58%	2.66%	-0.76%	2.48%	1.79%	1.49%	1.97%	1.83%	2.12%	1.92%	1.92%
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	3948
05B	2.04%	2.25%	1.61%	1.85%	2.61%	3.10%	0.23%	1.79%	1.85%	1.14%	1.60%	2.15%	3.23%	2.05%	2.05%
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	3177
06B	2.04%	1.20%	2.36%	3.12%	2.48%	4.34%	1.37%	2.27%	3.06%	2.04%	0.91%	2.94%	0.99%	2.41%	2.41%
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	1183
07B	1.41%	8.69%	0.81%	0.91%	-1.37%	5.77%	-5.06%	3.30%	5.33%	-5.74%	-1.42%	8.14%	-1.21%	2.20%	2.20%
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	402
08B	0.96%	-5.03%	4.36%	0.19%	-4.18%	3.60%	-11.50%	-2.67%	6.15%	2.91%	-2.94%	5.08%	2.37%	0.35%	0.35%
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	204
09B	-8.64%	-	-	-	-	1.79%	-4.84%	-	-	-	-	-	-	-5.08%	-5.08%
Num S. pts	2	-	-	-	-	1	1	-	-	-	-	-	-	4	4



**Table 3.9** Apr 06 - Sep 06 EWCF, with SF=1: 2006/07 ALPs and DAFs 'Best Estimate 06'  
**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	-2.27%	-6.32%	-5.16%	-1.65%	-5.49%	-4.44%	-	-5.86%	-7.35%	-2.08%	-4.47%	-3.81%	-8.27%	-4.71%	
Num S. pts	232	201	201	227	228	194	-	218	229	227	209	224	203	2593	
02B	3.27%	-3.00%	-0.28%	-0.37%	-11.10%	-2.71%	22.57%	-2.52%	-6.55%	-11.89%	-10.51%	-0.59%	-2.59%	-4.26%	
Num S. pts	95	93	113	96	104	93	6	74	107	122	120	99	114	1236	
03B	-2.58%	-2.13%	-5.69%	3.95%	-10.05%	-9.30%	15.78%	1.90%	-10.02%	-4.62%	-3.75%	-11.24%	-10.68%	-5.26%	
Num S. pts	118	88	119	83	126	72	15	73	131	141	185	89	86	1326	
04B	-3.85%	-3.91%	-5.88%	-2.89%	-7.11%	-7.12%	2.18%	-8.21%	-5.77%	-4.98%	-6.68%	-6.27%	-5.90%	-5.60%	
Num S. pts	370	243	425	274	352	301	42	159	359	385	463	330	245	3948	
05B	-4.16%	-4.96%	-3.16%	-3.78%	-5.31%	-7.30%	-0.19%	-3.91%	-4.99%	-3.31%	-4.53%	-6.01%	-6.86%	-4.73%	
Num S. pts	363	191	345	221	286	342	45	110	207	375	271	237	184	3177	
06B	-3.47%	-2.03%	-3.91%	-5.77%	-3.99%	-7.98%	-2.11%	-3.91%	-6.09%	-4.40%	-2.00%	-6.97%	-1.49%	-4.46%	
Num S. pts	97	70	156	89	120	138	20	46	89	118	87	75	78	1183	
07B	-1.97%	-16.80%	-1.05%	-1.04%	2.32%	-9.69%	6.94%	-6.38%	-9.68%	8.04%	2.29%	-18.67%	2.27%	-4.34%	
Num S. pts	36	26	41	40	55	54	6	20	29	22	11	35	27	402	
08B	-1.09%	5.77%	-6.05%	-0.07%	5.17%	-4.95%	11.64%	3.14%	-9.49%	-4.06%	3.76%	-7.65%	-3.28%	-0.86%	
Num S. pts	9	13	27	23	29	38	6	12	7	8	14	9	9	204	
09B	8.96%	-	-	-	-	1.89%	5.41%	-	-	-	-	-	-	6.31%	
Num S. pts	2	-	-	-	-	1	1	-	-	-	-	-	-	4	

