Performance Audit of Energy Direct
Final Report

Prepared by: Tom Tetenburg

Date of Audit: 28-29 April 2011

Date Audit Report Complete: 12 July 2011

Executive Summary

This performance audit was conducted at the request of the Gas Industry Company (GIC) in accordance with Rule 65 of the Gas (Downstream Reconciliation) Rules 2008.

The purpose of this audit is to assess the systems, processes and performance of Energy Direct in terms of compliance with these rules.

The audit was conducted in accordance with the terms of reference prepared by the GIC, and in accordance with the "Guideline note for rules 65 to 75 and 80: the commissioning and carrying out of performance audits and event audits,v1.0", which was published by the GIC in March 2009.

The summary of report findings in the table below shows that Energy Direct's control environment is "effective" for nine of the areas evaluated and "adequate" for the other eight. There were no areas that were considered "not adequate".

Energy Direct were found to be compliant in eleven of the seventeen areas evaluated. Six breach allegations are made in relation to the remaining areas. They are summarised as follows:

- Gas gate altitude is used in place of ICP altitude, which is incorrect. This is applied at gas gates with altitude recorded as being over 100 metres above sea level.
- Energy Direct have only applied temperature correction at TOU sites. All other sites have a fixed temperature of 15 deg C applied, ie. temperature factor equal to 1.0000.
- Estimated TOU consumption information has been submitted to the allocation agent on a number of occasions. However, more accurate estimates could have been provided if uncorrected reads had been used, rather than estimating based on prior similar periods.
- Energy Direct's initial submission accuracy did not meet the +/- 15% requirement for all gas gates for the period October 2008 to September 2009, or the +/- 12.5% requirement for all gas gates for the period October 200 to September 2010, when compared to final submissions.
- The calculation of historic estimates does not strictly follow the method prescribed in the rules, whereby the GJs between readings are apportioned. Energy Direct have been apportioning standard cubic metres, and then converting to GJs.
- AsBilled data has been supplied to the allocation agent which contains a UFG component. This means that the data is not suitable for the annual reconciliation purpose, where it is compared to the latest submission data.

Table 1. Summary of Report Findings

Issue	Section	Control Rating (Refer to Appendix 1 for definitions)	Compliance Rating (Compliant or not compliant)	Comments
ICP set up information	2.1	Adequate	Not compliant	The use of gas gate altitude in place of ICP altitude is incorrect. This method is only used where gas gate altitude is recorded as > 100 m.
Metering set up information	2.2	Adequate	Compliant	Some pressure factor and meter dial discrepancies exist between Energy Direct's and meter owners' records. It is recommended that monthly validation occurs to address this matter.
Billing factors	2.3	Adequate	Not compliant	The use of a fixed temperature of 15 deg C does not meet the required accuracy standards. Compressibility is being calculated using an out-dated method. Energy Direct should change to one of the three methods recommended in NZS 5259:2004.
Archiving of reading data	3.1	Effective	Compliant	Robust controls are in place for the security of meter reading data.
Meter interrogation requirements	3.2	Effective	Compliant	Although meter reading occurs monthly regardless, monitoring of consumption also occurs on a monthly basis to ensure ICPs are assigned to the correct allocation group.

Meter reading targets	3.3	Effective	Compliant	Compliance is achieved and targets are met.
Non TOU validation	3.4	Effective	Compliant	Effective validation processes are in place
Non TOU error correction	3.5	Adequate	Compliant	Corrections to allocation group 4 are handled by a specialised team, and signed off by a senior staff member.
TOU validation	3.6	Effective	Compliant	Robust checks are in place for TOU data.
Energy consumption calculation	4	Effective	Compliant	This process is fully automatic within the Orion system. The only opportunity for error is if incorrect factors are present.
TOU estimation and correction	5.1	Effective	Not compliant	Energy Direct could provide more accurate estimates, by using uncorrected reads wherever possible. The existence of any estimated TOU data is considered a matter of non-compliance, as the rules require actual usage to be provided. This issue is addressed on a monthly basis and breach allegations are made in all cases.
Provision of retailer consumption information	5.2	Effective	Compliant	Data is provided in a timely manner each month.
Initial submission accuracy	5.3	Adequate	Not compliant	Some improvement has been made, by identifying and monitoring ICPs which do not follow the historical gate trends.
Forward estimates	5.4	Adequate	Compliant	Retailers may use their own discretion in determining a method for calculating forward estimates.

Historic estimates	5.5	Adequate	Not compliant	Energy Direct should use SADSVs to apportion GJs, rather than to apportion standard cubic metres.
Proportion of HE	5.6	Effective	Compliant	Reported as required, and meets targets.
Billed vs consumption comparison	5.7	Adequate	Not compliant	Analysis indicated that this comparison contained flaws. The billing data contained a UFG component. The billing data was also being offset by one month when it did not need to be. Resolving these issues resulted in a very close comparison.

Persons Involved in This Audit

Auditor: Tom Tetenburg
Tetenburg & Associates Ltd

Table 2. Retailer personnel assisting in this audit

Name	Title
Tara Gannon	Energy Trading Manager
Lisa Rodgers	Energy Trading Analyst
Keith Ramage	Information Systems Manager
Deborah Anderson	Project Manager
Leanne Ellis	Switching Clerk
Vera Mulligan	Billing Clerk

Table 3. Service providers assisting with processes within the audit scope

Company	Processes
Vircom	Meter rreading & TOU downloads
MRSL	Meter reading

Contents

1. Pre-Audit and Operational Infrastructure Information

1.1 Scope of Audit

This performance audit was conducted at the request of the GIC in accordance with Rule 65 of the Gas (Downstream Reconciliation) Rules 2008. Rule 65 states:

"65 Industry body to commission performance audits

65.1 The industry body must arrange at regular intervals performance audits of the allocation agent and allocation participants.

65.2 The purpose of a performance audit under this rule is to assess in relation to the allocation agent or an allocation participant, as the case may be, -

65.2.1 The performance of the allocation participant or that allocation participant in terms of compliance with these rules, and

65.2.2 The systems and processes of the allocation agent or that allocation participant that have been put in place to enable compliance with these rules."

The audit was conducted in accordance with the terms of reference prepared by the GIC.

The audit was carried out on April 28 & 29 at Energy Direct's offices in Wanganui.

The scope of the audit includes downstream reconciliation only. Switching, meter ownership and data collection functions are not within the audit scope.

1.2 Audit Approach

The purpose of this audit is to assess the performance of Energy Direct in terms of compliance with the rules, and the systems and processes that have been put in place to enable compliance with the rules.

This audit has examined the effectiveness of the controls that Energy Direct has in place to achieve compliance, and where it has been considered appropriate, sampling has been undertaken to determine compliance.

Where sampling has occurred, this has been conducted using the Auditing Standard 506 (AS-506), which was published by the Institute of Charted Accountants of New Zealand.

Where errors have been found or processes found not to be compliant, the materiality of the error or non-compliance has been evaluated.

1.3 General Compliance

This is Energy Direct's first performance audit under Rule 65; therefore there is no previous performance audit report to review.

Event audits have been conducted at TawaA, Greater Auckland, Greater Hamilton and Palmerston North. The relevant findings of these audits, which have been examined further during this performance audit are:

- Flat temperature profile of 15 degrees C applied to all non-TOU ICPs.
- No application of Joule Thomson effect
- Incorrect altitude methodology
- Instances of incorrect metering pressure when compared to meter owner records

Energy Direct have been working towards a billing system upgrade, to resolve these issues. It was anticipated that the new billing system would have been operating in time for this performance audit, however there have been delays for a number of reasons. The changeover is expected to be completed in the coming months. This audit includes examination of the existing billing system, and therefore many of the issues identified by the event audits are still applicable.

Energy Direct have 71 alleged breaches recorded by the Market Administrator since October 2008.

Table 4. Alleged Breaches Recorded

Nature of Breach	Rule	Quantity	Section in this Report
Trading on a new gate	39.2.3	2	
Submission of estimated TOU data	30.3	26	5.1
Initial vs final allocation variances exceeded	37.2	17	5.3
Incorrect submission information	26.2.1	1	
Incorrect pressure	28.2	1	
Ceased trading on a gate	39.2.3	1	
Switching breaches		23	Not within audit scope

As noted in the Summary of Report Findings, this audit has found six areas of non-compliance. The following breach allegations are made in relation to these matters.

Table 5. Breach Allegations made

Breach Allegation	Rule	Section in this report
Estimated TOU consumption information has been provided. Energy Direct could provide a more accurate estimate by using the mechanical uncorrected readings. The existence of estimated information is considered a matter of non-compliance, as actual daily energy quantities are required. This issue is addressed on a monthly basis, and historic breach allegations are listed in Section 5.1	30.3	5.1
Altitude is fixed by gas gate, rather than individual ICP, and applied only at gas gates > 100 metres asl.	28.2	2.1.2
Temperature fixed at 15 degrees C for non-TOU ICPs.	28.2	2.3.1
Historic estimate calculations apportion standard cubic metres rather than GJs.	35	5.5
Energy Direct's initial submission accuracy did not meet the +/-15% requirement for all gas gates for the period October 2008 to Sep 2009, or the +/-12.5% requirement for the period October 2009 to March 2010.	37.2	5.3
Energy Direct's As Billed data provided to the allocation agent contains a UFG component, which defeats the purpose of the annual reconciliation.	52	5.7

1.4 Provision of Information to the Auditor (Rule 69)

In conducting this audit, the auditor may request any information from Energy Direct, the allocation agent and any allocation participant.

As Energy Direct had begun their own reconciliation of information with meter owners in March 2011, I utilised the information attached to forwarded copies of the meter owner's email responses to conduct my own cross-check of metering pressures and meter dials for a sample of ICPs.

Information was provided by all parties in a timely manner. I consider that all parties have complied with the requirements of this rule.

1.5 Draft Audit Report Comments

A draft audit report was provided to the GIC, the allocation agent, and allocation participants that I considered had an interest in the report. In accordance with rule 70.3 of the Gas (Downstream Reconciliation) Rules 2008, those parties were given an opportunity to comment on the draft audit report and indicate whether they would like their comments attached as an appendix to the final audit report.

Comments were received from Energy Direct, and are included in Appendix 3.

The comments received were considered in accordance with rule 71.1, prior to preparing the final audit report. No changes have been made to the final report as a result of the comments received.

1.6 Transmission Methodology and Audit Trails (Rule 28.4.1)

A complete audit trail was viewed for all data gathering, validation and processing functions. Compliance with this rule is confirmed.

2. Set-up and Maintenance of Information in Systems (Rule 28.2)

"28.2 Every retailer must ensure the conversion of measured volume to volume at standard conditions and the conversion of volume at standard conditions to energy complies with NZS 5259:2004 for metering equipment installed at each consumer installation for which the retailer is the responsible retailer."

2.1 ICP Set Up Information

2.1.1 New Connections Process

The process for new connections was examined. Energy Direct has a robust set of validation processes and reports to identify and resolve discrepancies. The validation compares Orion data to registry data, and is performed at least five times per month. Validation includes:

- ICP number
- Connection status
- Gas gate
- Allocation Group
- Network capacity group
- Load shedding category
- Meter charge codes

There are usually very few differences identified, and most are due to timing issues. For instance, a meter owner may have loaded a meter in the registry before the paperwork is received by the retailer for them to load in Orion.

2.1.2 Altitude Information

Energy Direct only calculate an altitude factor for gas gates with altitudes recorded as above 100 metres above sea level. They apply the altitude of the gas gate to all the ICPs connected to that gate.

Energy Direct are applying a correction for altitude at 9 gates on which they trade, or have traded on in the past (see Table 6 below). Note that 4 gates are shown on which Energy Direct have yet to trade.

This method is incorrect. The height above sea level to be used in the altitude factor calculation is that of each individual ICP.

Although it is the network operator's responsibility to populate the registry with altitude information for each ICP, it is still the retailer's responsibility to do their energy conversion accurately, whether or not registry data has been populated.

Table 6. Altitudes Used

Network Code	Network Description	Altitude Used	Average Registry Altitude for EDNZ ICPs	Range of Registry Altitude for EDNZ ICPs
STR10201	Stratford	411	314	300 – 340
BEL24510	Belmont	340	31	0 – 180
TKR19701	Tokoroa	324.61	Gate not traded	
RPR30801	Reporoa	322	Gate not traded	
ROT08101	Rotorua	320	290	290
WTG06910	Waitangirua	300	41	0 – 100
TWA35610	TawaA	199	84	0 – 300
ASH34301	Ashhurst	180	57	0 – 90
TAU07001	Taupo	167.64	390	390
PTR32601	Putaruru	162	Gate not traded	
MTN23801	Marton	137	141	5 – 169
LAB20201	Lake Alice/Bulls	119	61	1 – 160
PHT04901	Pahiatua	105	Gate not traded	

By using heights that are too high, the billing and submission volumes will be lower than the true figures.

Table 7. Altitude Errors

Network Code	Network Description	Altitude Used	Average Registry Altitude for EDNZ ICPs	Error at low Pressure (2.5 kPa)
STR10201	Stratford	411	314	1.16%
BEL24510	Belmont	340	31	3.56%
ROT08101	Rotorua	320	290	0.36%
WTG06910	Waitangirua	300	41	3.07%
TWA35610	TawaA	199	84	1.39%
ASH34301	Ashhurst	180	57	1.42%
TAU07001	Taupo	167.64	390	- 2.67%
MTN23801	Marton	137	141	0.05%
LAB20201	Lake Alice/Bulls	119	61	0.67%

The maximum permissible errors for altitude conversion are +/-1.0% where metering pressure < 100 kPa, and +/- 0.5% where metering pressure > 100 kPa.

The process being used does not meet the accuracy requirements of NZS 5259:2004 (Amendment No.1 November 2009), and therefore does not comply with Rule 28.2.

It should also be noted that, in NZS5259:2004 Amendment No.1, November 2009, there was the addition of the following note:

“Note – To minimise uncertainty due to altitude factor the aim should be to determine the altitude to within 10 m where practicable.”

2.2 Metering Set-up Information

The data in the “Orion” billing system was compared to that of meter owners for a sample of ICPs, to check the accuracy of metering pressure, meter dials and multipliers.

For 207 ICPs checked, there were 38 pressure discrepancies (18.4%) and 15 meter dial discrepancies (7.2%). It is worth noting that 28 of the 38 pressure discrepancies involve differences less than or equal to +/- 1.0 kPa, and also that the effect of the unders could possibly cancel out the overs.

One instance being investigated was where Energy Direct has a metering pressure of 3.5 kPa recorded and the meter owner has 35 kPa. The correct figure has been confirmed as 35 kPa. The error is – 23.1%, meaning the billing and submission figures were 23.1% too low.

Another instance being investigated was where Energy Direct has a metering pressure of 21 kPa recorded and the meter owner has 2 kPa. The correct figure has been confirmed as 2 kPa. The error is + 18.4%, meaning the billing and submission figures were 18.4% too high.

In both these instances, the quantities involved are well under 200 GJ per month.

The maximum permissible error for pressure conversion (using fixed factor) is +/- 1.1%.

There are instances where the pressure factor being used does not meet the accuracy requirements of NZS 5259:2004 (Amendment No.1 November 2009), and therefore does not comply with Rule 28.2.

In March 2011, Energy Direct completed a reconciliation between their records and the meter owners' records. Since this initial reconciliation, they have investigated and followed up all differences found. In some cases, the meter owners records have proved to be wrong. In other cases, there are still outstanding queries with the meter owners. Energy Direct plan to do another full reconciliation in June/July.

2.3 Billing Factors

2.3.1 Temperature Information

Energy Direct apply 15 degrees C flat across the whole year for all non-TOU ICPs, at all gas gates. Therefore, only TOU sites have temperature correction.

A recent event audit for Palmerston North found that the error between using this flat profile compared to using a ground temperature profile exceeded the maximum permissible error limits specified in NZS 5259:2004, and a breach was alleged. This method is non-compliant.

Energy Direct do not apply the Joule Thomson effect. The pressure drop between inlet pressure and metering pressure produces a temperature drop of approximately 0.5 degrees C for every 100 kPa of pressure drop. The network owners are responsible for populating the registry with inlet pressure data. This can shift the ground temperature profile lower.

Energy Direct have been working towards a billing system upgrade, which is expected to be completed in the coming months. This upgrade will include the use of ground temperatures, by gate, and incorporate the Joule Thomson effect.

2.3.2 Calorific Values

Gas composition data is downloaded from the Open Access Transmission Information System (OATIS) and is loaded into the Orion system.

The accuracy of the Orion information was checked by comparing an OATIS file for March 2011 to the Orion records. In all cases the information in Orion was correct.

2.3.3 Compressibility

Energy Direct have been using an out-dated method for determining the compressibility factor Fz. The formula used was from the old NZS 5259:1991, and with gas variables fixed (for Treated Kapuni gas) and temperature fixed at 15 deg C. This means that the OATIS data for CO2%, N2%, and S.G. is not being used, even though it is being input every day. The compressibility factor is only calculated for metering pressures above 50 kPa.

The results produced by this method were calculated and found to be fairly close to those calculated using the NX-19 method (within the maximum allowable error limits of NZS 5259:2004). However, the method does not accommodate varying gas types, and is not one of the methods recommended in NZS 5259:2004.

It is recommended that Energy Direct change to one of the three methods recommended in NZS 5259:2004.

3. Meter Reading and Validation

3.1 Archiving of Register Reading Data (Rule 28.4.2)

Retailers are required to keep register reading data for a period of 30 months. Data was examined during the audit and it was confirmed that Energy Direct securely archives data for a period in excess of 30 months.

Some data provided by Energy Direct's meter reading contractors was also checked and it was found that the readings matched the data in Orion. This proves the end-to-end process.

3.2 Retailer to Ensure Certain Metering Interrogation Requirements are Met (Rule 29)

This rule requires that for consumer installations where the actual or expected consumption is greater than 10 TJs, a TOU meter will be installed and the installation will be assigned to allocation group 1 or 2. For consumer installations where the actual or expected consumption is between 250 GJs and 10 TJs, a non-TOU meter will be installed and the installation will be assigned to allocation group 3 or 4.

Energy Direct conduct regular analysis of ICPs' consumption several times per month, and ensure that ICPs are in the correct allocation groups once a month. The most recent check resulted in one ICP moving from allocation group 4 to 6. Note that nevertheless, all meters are endeavoured to be read monthly.

During the audit I also noted an ICP that had decreased below 10 TJs per annum of consumption, and this site had its TOU equipment removed.

3.3 Meter Reading Targets (Rules 29.4.3, 29.5 & 40.2)

Validated register readings must be obtained at least once every 4 months for 90% of the consumer installations with non-TOU meters continuously supplied for the previous 4 months.

All consumer installations with non-TOU meters must have readings recorded at least once every 12 months unless exception circumstances prevent such an interrogation.

Energy Direct endeavour to read all their customers' meters every month. A copy of the GAS080 report for April 2011 was examined, which covers the 12 months April 2010 to March 2011.

Table 8. GAS080 results for April 2011

Target	Reading Percentage (GAS080)
Rolling 4 Months (target 90%)	99.87%
12 Months (target 100%)	100.00%

Energy Direct achieved compliance with Rule 40.2, which is the requirement to report the number and percentage of validated register readings obtained in accordance with rule 29.4.3 and rule 29.5.

3.4 Non TOU Validation

All reads are validated by the meter readers' hand held devices, and in the meter readers' system. The handheld device checks that the number of meter dials is as expected, and that the consumption is within +/- 50% of the previous month's consumption. Overnight validation in the meter reader's system checks consumption compared to other months/years, and if not satisfied, the system can ask for a re-read.

Energy Direct's Orion billing system also checks the reading and reading dates when they are entered. A meter read import report is generated, which checks for possible errors such as reading date earlier than latest read, usage too low, usage too high, index rollover and negative usage.

After conversion to energy and invoice generation, checks are made to compare dollar amounts to the previous invoice, and invoices are checked where the variance is too low or too high.

Meter readings are not edited during these processes. If a reading fails the validations process and an incorrect reading is suspected, then a check reading is performed.

3.5 Non TOU Error Correction

Any errors to be corrected in Allocation Groups 1 – 4 are handled by a specialised team, and are signed off by a senior staff member.

3.6 TOU Validation

Energy Direct are emailed downloads by the meter reader. They then perform a series of checks to verify the data is complete and looks reasonable. It is uploaded into Orion where further checks are made before it is converted automatically to GJs. The billing data is also checked graphically, before the file for the allocation agent is finally generated.

Uncorrected mechanical index readings are not routinely gathered, and there is no checking against these. These readings should be gathered in case of corrector malfunction or failure.

4. Energy Consumption Calculation (Rule 28.2)

A sample of ICPs were used to check the conversion from volume between meter readings to volume at standard conditions and then to energy consumption. The resulting energy value was compared to that calculated by the Orion system. These comparisons confirmed the accuracy of the Orion calculation, and confirmed compliance with NZS 5259:2004.

The only opportunity for error is if incorrect factors are present within the Orion system.

5. Estimation and Submission Information

5.1 TOU Estimation and Correction (Rule 30.3)

This rule requires that retailers must provide the best estimate of consumption information to the Allocation Agent in situations where actual TOU data is not available.

In these situations, Energy Direct base their estimates on historic consumption patterns for similar time periods. All estimates are performed by a specialised team and signed off by a senior staff member.

I have suggested that more accurate estimates could be produced by using the uncorrected mechanical register readings and applying a correction factor, and then applying a profile from a similar period. In this way, the monthly quantity is more accurately estimated, and it is only the application of a daily profile that is liable to vary.

This is the approach outlined in Schedule 1 of the Gas (Downstream Reconciliation) Rules 2008, concerning meter errors, which states:

"Where a corrector has failed completely, the corrected volume will be calculated from the uncorrected volume measured by the meter, using:

- An appropriate correction factor from a period when the corrector was functioning properly; or
- Independent corrections for pressure and temperature and other factors (as applicable)."

The retailer needs to ensure that they get corrected and uncorrected readings (uncorrected from the mechanical index) each month from their meter readers, so that they have sufficient data to determine previous correction factors.

A TOU problem can span several months before it is resolved, with each month's estimated data constituting a separate breach.

Also, if a problem causes actual TOU data to be unavailable, and therefore estimated at the initial allocation, it is highly likely that the same estimated data will be used for the subsequent interim and final allocations, and in such cases a breach will be registered three times.

A summary of the breach allegations for estimated TOU data is shown in the Appendix 2.

5.2 Provision of Retailer Consumption Information (Rules 30 to 33)

Energy Direct are complying with the requirements to provide consumption information for initial, interim and final allocations. They work closely with the allocation agent to keep them informed of any data problems or delays.

By reading all their ICPs monthly, any effects of a customer moving from, say, allocation group 6 to group 4 are negligible.

Where ICPs are vacant and volume is detected, this consumption is assigned and billed back to the retailer, so that the allocation processes can proceed smoothly. Investigations then follow to try to establish a debtor to pay for the gas usage.

5.3 Initial Submission Accuracy (Rule 37.2)

Final allocations are complete for the months October 2008 to March 2010. Rule 37.2 requires that the accuracy of initial consumption information, for allocation groups 3 to 6, fall within a required percentage error compared to the final consumption information. The percentage for the months October 2008 to September 2009 is +/- 15%, and for October 2009 to September 2010 is +/- 12.5%.

The Market Administrator has also advised, through a guideline note published on 10 November 2010, that breaches where the absolute value of the volume differences are less than 200 GJs should not be determined material or referred to the Investigator.

Many of the breaches were for gas gates where Energy Direct retail very small quantities of gas each month, and so are well under the 200 GJ materiality limit.

The results are summarised below, with the last two columns showing the changes when the 200 GJs materiality is also taken into consideration.

Table 9. Initial Submission Accuracy - % Compliant

Month	Total Gas Gates	Number within +/-15%	% Compliant	Within +/-15% or < 200 GJ	% Compliant or immaterial
Oct2008	36	24	67%	34	94%
Nov2008	37	19	52%	36	97%
Dec2008	37	17	46%	34	92%
Jan2009	39	14	36%	35	90%
Feb2009	39	21	54%	37	95%
Mar2009	39	22	56%	36	92%
Apr2009	39	24	62%	37	95%
May2009	39	19	49%	33	85%
Jun2009	39	30	77%	36	92%
Jul2009	39	35	90%	38	97%
Aug2009	39	23	59%	37	95%
Sep2009	39	30	77%	38	97%
		Number within +/- 12.5%		Withn+/-12.5% or < 200 GJ	
Oct2009	39	25	64%	37	95%
Nov2009	38	30	79%	38	100%
Dec2009	38	25	66%	38	100%
Jan2010	40	30	75%	40	100%
Feb2010	39	26	67%	38	97%
Mar2010					

The largest number of significant changes (non-compliant and material) from initial to final allocations came in May 2009, which is unsurprising as this was when the winter chill came earlier in the year than expected.

Table 10. Initial Submission Accuracy - Variation

Month	Initial Subs All Gates	Final Subs All Gates	Variation GJs	% Variation	
Oct2008	48,286	46,154	- 2,132	- 4.6%	
Nov2008	35,719	34,274	- 1,445	- 4.2%	
Dec2008	25,908	27,326	1,418	5.2%	
Jan2009	26,605	25,411	- 1,194	- 4.7%	
Feb2009	23,490	24,669	- 1,179	- 4.8%	
Mar2009	31,433	33,444	2,011	6.0%	
Apr2009	38,200	42,079	3,879	9.2%	
May2009	68,194	77,475	9,281	12.0%	
Jun2009	91,682	93,380	1,698	1.8%	
Jul2009	96,708	94,225	- 2,483	- 2.6%	
Aug2009	82,112	72,697	- 9,415	- 13.0%	
Sep2009	61,699	63,108	1,409	2.2%	
Oct2009	55,601	61,918	6,317	10.2%	
Nov2009	43,170	42,269	- 901	- 2.1%	
Dec2009	33,001	32,015	- 986	- 3.1%	
Jan2010	28,472	27,169	- 1,303	- 4.8%	
Feb2010	25,338	23,812	- 1,526	- 6.4%	
Mar2010					

Again it can be seen that May 2009 was unseasonably cold, and this caused many retailers to under-estimate their initial consumption information coming into winter. There was also a corresponding over-estimation later on in August 2009.

5.4 Forward Estimates (Rules 34 & 36)

Rule36.2 states “A retailer may determine the method used for calculating a forward estimate at its discretion”.

Energy Direct use their own SADSVs for forward estimation for initial allocations. The SADSVs applied are based on historic information published by the Allocation Agent for 2009-2009 and 2009-2010. Where these profiles were different from year to year, an average of the two years was applied. They also look at the historic consumption patterns of their customers on each gas gate.

Forward estimates are derived by:

- Calculating the annual consumption for the previous year for the ICP. If a full year of consumption is not available, the annual consumption is calculated by applying a profile for the type of customer; then
- Applying SADSVs to apportion the consumption to the days to be forward estimated.

Energy Direct are also refining the use of SADSVs for some individual customers, by identifying those whose usage patterns do not follow the generic trend, eg swimming pools. For ICPs where the gate SADSV profile is not applicable, then either TOU should be installed or it may be more appropriate to treat these ICPs as Allocation Group 3 ICPs, with static deemed profiles.

5.5 Historic Estimates (Rules 34 & 35)

Historic estimates for initial allocation submissions are derived by:

- Calculating the difference between validated readings where part or all of the reading period falls within the allocation month; then
- Applying SADSVs to apportion the consumption between the months covered by the validated readings.

Manual calculations were performed using the relevant SADSV files, and compared to the values calculated by the Orion system. The correct SADSVs were being used in all cases.

However, Energy Direct are not following rule 35 strictly, which outlines methodologies which must be used to calculate historic estimates.

Rule 35 provides that the billing GJs are apportioned using the SADSVs. Energy Direct are calculating back to standard cubic metres for the billing period, which are then pro-rata’d using the SADSVs, and then average CVs are applied for each period to convert back to two separate GJ values. By using this methodology, the summation of the two GJ values does not exactly match the billing GJs, although it is very close.

5.6 Proportion of Historic Estimates (Rule 40.1)

This rule requires retailers to report to the Allocation Agent the proportion of historic estimates contained within the consumption information for the previous initial, interim and final allocations in

allocation groups 3 to 6. This is being achieved as a component of the three individual GAS040 files, provided each month.

A GAS040 file was examined and compared to the data in Energy Direct's system at ICP level. It was found that the totals matched which confirms compliance. This also proves that Energy Direct's consumption information is calculated at an ICP level and then aggregated.

5.7 Billed vs Consumption Comparison (Rule 52)

Rule 52.1 states: "The purpose of an annual reconciliation is to verify, on a monthly basis, the accuracy and completeness of quantities billed to consumers when compared with consumption information provided to the allocation agent for the previous 12 billing months."

The GAR080 files were checked for the months September 2009 to March 2011. These files compare the total quantities billed by retailer for each gas gate for the previous 12 billing months against the sum of the best available consumption information. Note that at the time the GAR080 files are compiled, the best available consumption information means either 10 interim and 2 initial allocation datasets, or 1 final, 9 interim and 2 initial allocation datasets.

Table 11. Billed vs Consumption – version 1

(GJ)	Billed	Consumption	Difference	% Difference
Oct2009	1,372,129	1,320,759	51,370	- 3.74%
Nov2009	1,383,768	1,337,259	46,509	- 3.36%
Dec2009	1,380,852	1,355,144	25,708	- 1.86%
Jan2010	1,373,776	1,359,446	14,329	- 1.04%
Feb2010	1,363,345	1,353,212	10,133	- 0.74%
Mar2010	1,350,013	1,278,414	71,599	- 5.30%
Apr2010	1,312,527	1,245,023	67,505	- 5.14%
May2010	1,276,739	1,199,871	76,867	- 6.02%
Jun2010	1,213,419	1,252,297	- 38,878	3.20%
Jul2010	1,178,218	1,193,013	- 14,795	1.26%
Aug2010	1,138,801	1,161,051	- 22,250	1.95%
Sep2010	1,079,636	1,105,593	- 25,957	2.40%
Oct2010	1,010,998	1,001,012	9,986	- 0.99%
Nov2010	980,805	995,758	- 14,953	1.52%
Dec2010	939,994	961,622	- 21,628	2.30%
Jan2011	914,855	933,409	- 18,554	2.03%
Feb2011	872,195	907,615	- 35,420	4.06%
Mar2011	822,068	867,088	- 45,019	5.48%

The table infers that Energy Direct's consumption information that is submitted to the Allocation Agent is higher than the billed information by 5.48% for the 12 month period ending Mar2011. Based on this table, it appears strange that they have over-submitted to March 2011 by 45 TJs, and under-submitted to May 2010 by 77 TJs.

The content of the files was checked by selecting some gas gates and checking the invoiced quantities for all ICPs at those gates against the totals billed in the GAR080 files. This analysis uncovered two flaws.

Firstly, the GAS070 files (Aggregate Monthly As Billed Data) that Energy Direct send to the Allocation Agent each month includes a UFG factor that is billed to the end consumer. The consumption information submitted for allocation each month does not include this UFG factor.

Secondly, the Allocation Agent compares 12 months of As Billed data one month offset from the 12 months of consumption. For example, for the GAR080 report for the 12 months to the end of Mar2011 (published on 16/05/2011), the As Billed submissions for May2010 – Apr2011 are totalled and compared to the best available consumption information for Apr2010 – Mar2011. This is because it is assumed that the retailer's billing falls one month behind the end consumers' actual usage. This one month offset does not apply to the majority of Energy Direct's consumers.

Energy Direct bill their TOU and large commercial customers with an invoice date of the last day of the month. So even though a TOU device was downloaded early in the next month, the summation of gas invoices with an invoice date during the calendar month means that the billed usage aligns with the actual month consumption. Commercial customers are read close to or at the end of each month. Energy Direct are also reading all their customers monthly and invoicing monthly, so it is only those residential customers read early in the month whose invoiced usage relates predominantly to the previous month.

The following table shows the annual reconciliation information, with billing data adjusted for UFG factors (at a gas gate level), and with the one month offset removed. With these adjusements, there is close alignment between billing data and consumption data, with the exception of the four months highlighted: March, April, May and October 2010.

Table 12. GAR080 data adjusted for UFG factors and one month offset removed – version 2

(GJ)	Billed	Consumption	Difference	% Difference
Oct2009	1,330,105	1,320,759	9,346	- 0.70%
Nov2009	1,349,666	1,337,259	12,407	- 0.92%
Dec2009	1,361,097	1,355,144	5,954	- 0.44%
Jan2010	1,358,233	1,359,446	- 1,213	0.09%
Feb2010	1,351,303	1,353,212	- 1,909	0.14%
Mar2010	1,341,037	1,278,414	62,623	- 4.67%
Apr2010	1,327,959	1,245,023	82,936	- 6.25%
May2010	1,291,068	1,199,871	91,197	- 7.06%
Jun2010	1,255,802	1,252,297	3,505	- 0.28%
Jul2010	1,193,258	1,193,013	245	- 0.02%
Aug2010	1,158,602	1,161,051	- 2,450	0.21%
Sep2010	1,119,969	1,105,593	14,376	- 1.28%
Oct2010	1,061,785	1,001,012	60,773	- 5.72%
Nov2010	994,378	995,758	- 1,380	0.14%
Dec2010	964,731	961,622	3,110	- 0.32%
Jan2011	924,707	933,409	- 8,701	0.94%
Feb2011	900,046	907,615	- 7,569	0.84%
Mar2011	858,110	867,088	- 8,978	1.05%

To check the Allocation Agent's calculation of rolling 12 month consumption volumes, I requested the base monthly consumption data (including final data where available) from the allocation agent. It appears that there were errors in the Allocation Agent's calculations of March, April, May, and October 2010 consumption volumes. The corrected volumes are included in the table below. The issue of incorrect volume calculations has been referred to Gas Industry Co for investigation as part of the performance audit of the Allocation Agent.

Table 13. GAR080 data adjusted for UFG factors and one month offset removed – version 3

(GJ)	Billed	Consumption	Difference	% Difference
Oct2009	1,330,105	1,320,759	9,346	- 0.70%
Nov2009	1,349,666	1,337,259	12,407	- 0.92%
Dec2009	1,361,097	1,355,144	5,954	- 0.44%
Jan2010	1,358,233	1,359,446	- 1,213	0.09%
Feb2010	1,351,303	1,353,212	- 1,909	0.14%
Mar2010	1,341,037	1,342,030	- 993	0.07%
Apr2010	1,327,959	1,328,385	- 426	0.03%
May2010	1,291,068	1,289,418	1,650	- 0.13%
Jun2010	1,255,802	1,252,297	3,505	- 0.28%
Jul2010	1,193,258	1,193,013	245	- 0.02%
Aug2010	1,158,602	1,161,051	- 2,450	0.21%
Sep2010	1,119,969	1,105,593	14,376	- 1.28%
Oct2010	1,061,785	1,042,971	18,814	- 1.77%
Nov2010	994,378	995,758	- 1,380	0.14%
Dec2010	964,731	961,622	3,110	- 0.32%
Jan2011	924,707	933,409	- 8,701	0.94%
Feb2011	900,046	907,615	- 7,569	0.84%
Mar2011	858,110	867,088	- 8,978	1.05%

There is now a very close alignment between billed volumes and consumption volumes for all months. The differences around September 2010 and October 2010 are attributable to one large ICP which was over billed, and for which reversals and rebilling soon resolved this in the following months.

What happens when all available final data is included in this process is examined in the following table. It compares the base monthly billing data and best available consumption data (including final data where available) for the rolling 12 months. The first seven rows have 12 months of final allocation data, then progressively as one final is not available, an interim is used, and so on down to where initials are used (see letter code in last column):

Table 14. GAR080 data adjusted for UFG and month offset, with best available consumption – version 4

(GJ)	Billed	Consumption	Difference	% Difference
Oct2009	1,330,105	1,336,321	- 6,216	0.47% F
Nov2009	1,349,666	1,351,210	- 1,544	0.11% F
Dec2009	1,361,097	1,361,686	- 589	0.04% F
Jan2010	1,358,233	1,358,560	- 327	0.02% F
Feb2010	1,351,303	1,351,946	- 644	0.05% F
Mar2010	1,341,037	1,340,199	838	- 0.06% F
Apr2010	1,327,959	1,325,524	2,434	- 0.18% F
May2010	1,291,068	1,283,246	7,823	- 0.61% 1M
Jun2010	1,255,802	1,248,809	6,993	- 0.56% 2M
Jul2010	1,193,258	1,187,057	6,201	- 0.52% 3M
Aug2010	1,158,602	1,154,538	4,064	- 0.35% 4M
Sep2010	1,119,969	1,105,382	14,587	- 1.30% 5M
Oct2010	1,061,785	1,042,161	19,624	- 1.85% 6M
Nov2010	994,378	992,734	1,644	- 0.17% 7M
Dec2010	964,731	958,633	6,098	- 0.63% 8M
Jan2011	924,707	931,491	- 6,784	0.73% 9M
Feb2011	900,046	906,082	- 6,036	0.67% 1 I
Mar2011	858,110	866,387	- 8,277	0.96% 2 I

The average of the seven rolling 12 month periods to Oct2009 – Apr2010 (all final allocations) is: Billed 1,345,629; Consumption 1,346,492; Difference - 863; % Difference 0.06%

As the annual reconciliation table does not use as much final data, these improvements can not be seen.

This table now shows that Energy Direct's consumption information that is submitted to the Allocation Agent is higher than the billed information by 0.96% for the 12 month period ending March 2011. However this figure will also change with further final allocations.

In summary, the purpose of the annual reconciliation is not being fulfilled with regard to Energy Direct.

Firstly, Energy Direct need to submit GAS070 AsBilled reports with data that does not include the UFG factor they apply to their customers, as the submitted allocation data to which it is compared does not include this.

Secondly, the rolling 12 month billing data summation does not need to be offset by one month, as the invoice dating method used by Energy Direct, coupled with their approach of meter reading monthly and invoicing monthly, means that the calendar month billing data aligns directly with the calendar month submission data.

6. Recommendations

Many of the changes required to be made as a result of this performance audit are already incorporated into the specifications of Energy Direct's billing system upgrade. Nevertheless, they were present in the system being used at the time of this performance audit and so are included in the following recommendations:

- The altitude factor calculation method should be changed to utilise individual ICP altitude, not gas gate altitude. Altitudes below 100 metres should also be compensated for.
- Monthly validation/reconciliation of retailer metering pressure and meter dials information versus meter owners' records. Investigate and resolve any discrepancies identified promptly.
- Use of ground temperature profiles, coupled with Joule Thomson effect, to more accurately estimate the gas temperature to be compensated for.
- Change the method used to determine compressibility factors to one of the three methods recommended in NZS5259:2004.
- Where TOU actual daily data is not available, estimates should be made using the monthly uncorrected readings and applying an appropriate correction factor.
- The uncorrected mechanical index readings should be gathered each month at TOU sites, for use in case of corrector malfunction or failure.
- Further work to improve the accuracy of initial allocation submissions, which may involve using deemed profiles for some customers.
- Calculations for historic estimates should apportion GJs directly.
- The AsBilled data provided to the allocation agent each month should not contain any UFG component billed to the consumer.

Appendix 1 – Control Rating Definitions

Table 15. Control Rating Definitions

Control Rating	Definition
Control environment is not adequate	Operating controls designed to mitigate key risks are not applied, or are ineffective, or do not exist. Controls designed to ensure compliance are not applied, or are ineffective, or do not exist. Efficiency/effectiveness of many key processes requires improvement.
Control environment is adequate	Operating controls designed to mitigate key risks are not consistently applied, or are not fully effective. Controls designed to ensure compliance are not consistently applied, or are not fully effective. Efficiency/effectiveness of some key processes requires improvement.
Control environment is effective	Isolated exceptions identified when testing the effectiveness of operating controls to mitigate key risks. Isolated exceptions identified when testing the effectiveness of controls to ensure compliance. Isolated exceptions where efficiency/effectiveness of key processes could be enhanced.

Appendix 2 – Breach Allegations Summary

Table 16. Breach Allegations Summary

Breach Identifier	Date Notified	Nature of Alleged Breach
2009-42	20/04/2009	Submission of estimated data for TOU sites at GTA03610 and NPL12101 for Interim December 2008
2009-76	5/06/2009	Submission of estimated data for TOU sites at GTA03610 and NPL12101 for Interim January 2009
2009-81	10/06/2009	Submission of estimated data for TOU site at GTA03610 for Initial May 2009
2009-86	16/06/2009	Submission of estimated data for TOU site at GTA03610 for Interim February 2009
2009-101	9/07/2009	Submission of estimated data for TOU site at PAP06610 for Initial June 2009
2009-124	12/08/2009	Submission of estimated data for TOU site at PAP06610 for Initial July 2009
2009-156	16/09/2009	Submission of estimated data for TOU site at PAP06610 for Interim May 2009
2009-177	9/10/2009	Submission of estimated data for TOU site at LAB20201 for Initial July 2009
2009-181	14/10/2009	Submission of estimated data for TOU site at PAP06610 for Interim June 2009
2009-205	16/11/2009	Submission of estimated data for TOU site at PAP06610 for Interim July 2009
2010-12	13/01/2010	Submission of estimated data for TOU site at LAB20201 for Interim July 2009
2010-22	19/01/2010	Submission of estimated data for TOU site at HST05210 for Initial December 2009
2010-26	26/01/2010	Submission of estimated data for TOU sites at GTA03610 and NPL12101 for Final December 2008
2010-63	24/02/2010	Submission of estimated data for TOU sites at GTA03610 and NPL12101 for Final January 2009

2010-93	24/03/2010	Submission of estimated data for TOU site at GTA03610 for Final February 2009
2010-120	15/04/2010	Submission of estimated data for TOU site at HST05210 for Interim December 2009
2010-145	12/05/2010	Submission of estimated data for TOU site at TWA35610 for Initial April 2010
2010-146	12/05/2010	Submission of estimated data for TOU site at PLN24201 for Initial April 2010
2010-194	25/06/2010	Submission of estimated data for TOU site at PAP06610 for Final May 2009
2010-219	26/07/2010	Submission of estimated data for TOU site at PAP06610 for Final June 2009
2010-244	17/08/2010	Submission of estimated data for TOU site at TWA35610 for Interim April 2010
2010-246	17/08/2010	Submission of estimated data for TOU site at PAP06610 for Final July 2009
2010-328	27/10/2010	Submission of estimated data for TOU site at LAB20201 for Final July 2009
2011-014	14/01/2011	Submission of estimated data for TOU sites at WST03610 and PLN24201 for Initial December 2010
2011-020	28/01/2011	Submission of estimated data for TOU site at HST05210 for Final December 2009
2011-097	8/04/2011	Submission of estimated data for TOU site at WAG21501 for Initial March 2011

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20/7

4 July 2011

Mr Tom Tetenburg
Tetenburg & Associates Ltd
7 Karemoana Drive
Te Atatu Peninsula
Auckland 0610

Dear Tom

PERFORMANCE AUDIT OF ENERGY DIRECT NZ LIMITED – DRAFT REPORT

Thank you for the opportunity to comment on the Performance Audit of Energy Direct NZ Limited draft report. I am responding on behalf of Energy Direct NZ (EDNZ).

We are in the final stages of testing an upgrade to our billing system. The upgraded system has gas conversion processes which fully comply with NZS5259:2004, and will allow gas reconciliation consumption to be converted to GJ before SADSVS are applied.

Use of ICP level altitudes
We accept and will implement the recommendation.

Our upgraded billing system will use the conversion process specified in NZS5259:2004. An altitude factor will be calculated based on the site altitude held on the Gas Registry for each ICP. Altitudes will be matched to the registry monthly.

We have relatively small numbers of customers at each of the affected gates. We believe that the errors all fall below the materiality threshold of ±200 GJ per month for each gas gate.

Validation of retailer meter pressure and dials information
We accept and will implement the recommendation.

We have requested monthly supply of meter serial number, make, model, dials, multipliers and pressure from all meter owners to allow us to complete this reconciliation monthly.

Use of ground temperature profiles and the Joule Thomson effect
We accept and will implement the recommendation.

Conversion processes will be fully compliant with NZS5259:2004 once our upgraded billing system is implemented.

Our upgraded billing system will apply the average daily ground temperature for the billing period from the nearest NIWA Climate Station to the gas gate.

The Joule Thomson effect will be applied for all meters where the network pressure shown on the registry is greater than the meter pressure. The temperature drop will be 0.5 degrees Celsius for each 100 kPa pressure drop (or part thereof).

Method to determine compressibility factors
We accept and will implement the recommendation.

Our upgraded billing system will apply the compressibility calculation method set out in AGA NX19, as recommended by NZS5259:2004. Compressibility will be applied for all gas meters.

TOU estimates should be calculated using uncorrected readings where available, and uncorrected meter readings should be gathered
We accept and will implement the recommendation.

We have arranged for mechanical reads to be provided to us each month, in addition to corrector downloads. These reads will be used for estimation should a corrector fail.

Improvements to accuracy of initial allocation submissions
We accept this recommendation, and will continue to work to improve the accuracy of our initial submissions.

We have a very small number of commercial customers without TOU whose usage patterns vary significantly from the consumption pattern at the gas gate. These customers include swimming pools, holiday parks and small seasonal food, beverage and animal feed processors. Almost all of these customers use less than 4,000 GJ pa, and all use less than 8,000 GJ pa.

All of these customers are in reconciliation group 4 and we receive actual reads in the final few days of each month. As they are consistently read very close to month end only a small portion of consumption needs to be apportioned between the months using SADSVS, and almost all the consumption for initial allocations is based on historic estimates.

We do not believe that the expense of installing TOU metering is justified as the consumption for these customers is relatively low, and we are reporting and billing actual consumption for each month.

Static deemed profiles may not be appropriate as these customers' consumption patterns can change from year to year depending on weather patterns, e.g. open dates for outdoor pools and harvest dates for food processors.

Calculation of historic estimates should apportion GJs directly
We accept and will implement the recommendation.

Our upgraded billing system will complete the calculation of normalised consumption in the correct order. Raw CM will be converted to GJ prior to application of the SADSVS.

The As Billed data reported to the Allocation Agent each month should not have a UFG component
We accept and will implement the recommendation to remove billed UFG from our as billed data immediately.

At the time the rules came into effect we were advised by the Gas Industry Company that our as billed submissions needed to include all GJ invoiced, including any UFG. The Gas Industry Company has now confirmed that this advice was incorrect and UFG should be removed.

If you would like to discuss our comments further please contact me by email at tara.gannon@energydirectnz.co.nz or by phone on DDI 06 349 2055. Alternatively you can contact our General Manager, Michael Ram, by email at michael.ram@energydirect.co.nz or by phone on 06 349 0129.

Yours sincerely

Tara Gannon
Energy Trading Manager
Copy to: Pamela Caird, Gas Industry Company
Enc