Review of Reconciliation by Difference (RbD)

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Overview:

Reconciliation by Difference (RbD) is the method of reconciling the difference between actual and deemed measurements of gas allocated to Small Supply Points (SSPs). Since its introduction in 1998, around £270 million in charges to gas shippers has been reconciled through this mechanism. Ofgem has been made aware of the concerns of some shippers and consumers in relation to certain aspects of the RbD process, within which any inaccuracies will predominately affect domestic shippers and ultimately be reflected in domestic consumers' bills.

Whilst many incremental improvements have been made to the RbD process, for instance through the UNC modification process and appropriate industry fora, Ofgem is conscious that since its implementation no holistic review of RBD has been undertaken. This document therefore seeks views on the current operation of RbD, where further improvements can be made, whether RbD remains fit for purpose in the light of longer term industry developments and what role, if any, Ofgem has in this process.

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Target Audience: This document may be of interest to transporters, domestic shippers and suppliers, consumer groups and any other interested parties.

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Context

Ofgem's Corporate Strategy and Plan 2005-2010 set out our intention to review RbD.

Ofgem's principle objective is to protect the interests of consumers present and future, wherever appropriate by promoting effective competition. RbD was introduced in 1998 as a means of facilitating domestic competition whilst recognising the constraints of contemporary systems and procedures. Ofgem therefore considers it is timely to gain a snapshot of the current workings of RbD. This will facilitate the resolution of any issues identified and potentially inform any future assessment of the long term desirability of RbD, particularly in light of developments which may fundamentally change the conditions under which it was introduced.

However, this is not intended to be a fundamental review of RbD. In carrying out our general functions we must have regard to the principles of best regulatory practice i.e. regulatory activities should be transparent, accountable, proportionate, consistent, and targeted only at cases in which action is needed. This document will therefore help establish whether a wider review is warranted and what, if any, role Ofgem has in addressing any of the identified issues with RbD and its long term sustainability.

Associated Documents

Ofgem Corporate Strategy and Plan 2005-2010 - March 2005

www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/10999_10605.pdf?wtfrom=/ofgem/work/index.jsp&section=/areasofwork/corporateplanning

Domestic Metering Innovation; Ofgem consultation document - January 2006

www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/13745_2006.pdf?wtfrom=/ofgem/whats-new/archive.jsp

Theft of electricity and gas - Next steps; Ofgem consultation document - January 2005

www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/9970_next_steps.pdf

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Summary

Background

Reconciliation by Difference (RbD) is the method of reconciling the difference between actual (metered) and deemed (estimated) measurements of gas allocated to Small Supply Points (SSPs), typically to domestic premises. These reconciliations are used in the calculation of energy and transportation charges to shippers.

Under RbD, it is not necessary to reconcile the deemed gas consumption with an actual meter reading for every supply point. In simple terms, the rationale for RbD is that gas consumed on each Local Distribution Zone (LDZ) is calculated daily by metering the gas flowing into each LDZ, adjusting for any stock change and shrinkage[1], then removing that consumed at Daily Metered (DM) Supply Points. The residual amount of gas is then allocated between small and large Non-Daily Metered (NDM) supply points on the basis of their Annual Quantity (AQ) and End User Categories (EUC). Together, the AQ and EUC (essentially a consumer usage profile) provide a reasonable estimate of the gas consumed.

Since its implementation the RbD process has reconciled around **£270m** of gas charges[2]. It was originally anticipated that the amounts reconciled through RbD would diminish year on year, in line with improvements in data quality. Whilst this was true for the years 1999-2004, the reconciliation figure increased in 2004-2005. In each year this reconciliation has resulted in a net allocation of charges to the SSP sector. As the vast majority of gas consumed at SSPs is for domestic purposes, any inaccuracies within the RbD process will predominately affect domestic shippers, and ultimately be reflected in domestic consumers' bills.

Issue

This document highlights several industry concerns of which Ofgem has become aware, either through correspondence or discussion in industry workgroups, which are considered to create undue risk to the accuracy of RbD. If substantial, these issues could potentially lead to a disproportionate allocation of costs to domestic shippers, which is ultimately passed through to domestic consumers. Ofgem is therefore keen to understand the materiality of these issues, and the extent to which they are capable of being addressed by existing industry processes. This exercise may also determine what, if any, role Ofgem should have in the resolution of these issues.

Ofgem is also keen to assess whether the rationale for the introduction of RbD remains valid and the process itself fit for purpose in the longer term, particularly in light of industry developments which may have a bearing upon, or be impacted by, RbD.

[1] Stock change is the allocation to or from regional gas storage. The main components of shrinkage are outlined in Chapter 2.
[2] Figures provided by xoserve. See Appendix 4 for annual breakdown.

Structure of the document

This document, which is intended to gather facts and seek views on RbD issues, is structured as follows:

- Chapter 1 provides an historical background into the reconciliation process prior to the introduction of Domestic Competition, examining the rationale for RbD and explains the current RbD process;
- Chapter 2 highlights the issues that have been raised, such as whether the AQ and shrinkage data feeding into RbD calculations is sufficiently accurate. The chapter also seeks views on the means for addressing any issues raised and what role, if any, Ofgem should have in this;
- Chapter 3 highlights wider considerations such as energy efficiency and advanced metering and seeks views on how RbD may relate to such developments and its long term sustainability.

1. Introduction

Chapter Summary

This chapter provides a brief background to and overview of the gas reconciliation process and the challenges presented by the introduction of domestic competition. It describes the Reconciliation by Difference process, including the role now fulfilled by xoserve and the various RbD related industry groups.

Question box

1. Given the original rationale and benefits of RbD, do you consider it remains valid under the current GB Gas arrangements?
2. Are the costs and benefits of the RbD process transparent to the industry, and if not what how can transparency be improved?
3. Do the various RbD related industry work groups provide sufficient governance and transparency of the RbD arrangements?
4. Is there sufficient transparency of the data or the information xoserve provides to the Industry?
5. Is the scope of the current RbD Audit appropriate?
6. Are there sufficient incentives on all parties to limit the size of RbD?

Background

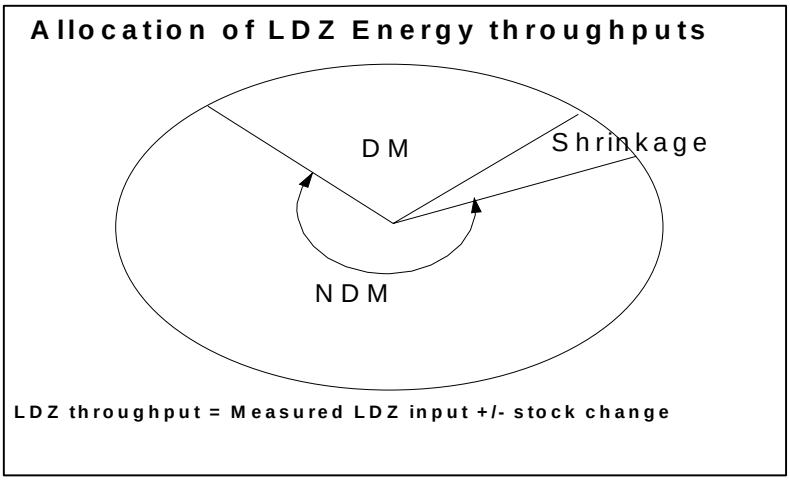
1.1. Following the privatisation of Britain Gas in 1986, competition was initially opened to very large gas consumers, those using over 25,000 therms per annum (732,000 kWh pa) in 1988. This threshold was lowered to 2,500 therms p.a. (73,200 kWh) in 1992. From 1996, competition was introduced in phases, based on geographical region, for all gas consumers, allowing approximately 19 million domestic households to choose between competing gas suppliers.

1.2. Whilst it has always been important to measure and balance the amounts of gas being brought onto and taken from the national pipeline system, the introduction of competition brought with it the need for these amounts to be allocated to the various gas shippers that could now undertake this activity. These allocations are necessary not only to ensure that the pipeline system remains balanced, but so that the various gas shippers are invoiced appropriately for the use of the system, i.e. through the settlement process.

The gas allocation and reconciliation process

1.3. The settlement process for the gas transported for individual shippers at the Local Distribution Zone (LDZ) is calculated daily. The total quantity of gas flowing into the LDZ from the National Transmission System (NTS) is metered, as is any stock change (an import to, or export from, regional storage). An allowance is also made for LDZ shrinkage. The rest of the gas is allocated to shippers customers at the supply point.

Figure 1: Demand attribution process[3]



1.4. The gas deemed to be consumed by the customers of each shipper is then estimated. Very large gas customers will have meter equipment that provide a read on a daily basis, and are therefore referred to as being Daily Metered (DM) supply points.

1.5. For the remaining large Industrial and Commercial (I&C) consumers, whilst they may be on Non-Daily Metered (NDM) supply points, they will nonetheless have their meters read relatively frequently, either monthly or six monthly depending on volumes of gas consumed. When the meter readings for these large consumers are submitted, showing the actual consumption, this is compared with the earlier estimated or 'deemed' consumption. The difference between the two figures is known as a reconciliation, and will lead to either a charge or refund to the invoice of the shipper supplying that consumer. This process is known as Meter Point Reconciliation.

1.6. The process described above worked well for the initial stages of competition. However, even with relatively few meters to be reconciled, this is an intensive process and the introduction of competition into the domestic market raised the possibility of having to individually reconcile the meter readings of 19 million domestic consumers, with far less frequent readings. Apart from the practical considerations of an exponential increase in work load for all parties, there were concerns about the impact of such volumes of data on contemporary systems and more pertinently, whether the costs of doing so would deliver commensurate benefits. Therefore the prevailing Meter Point Reconciliation process was considered to present a risk to the successful roll out of competition to the domestic market.

1.7. Transco[4] highlighted the potential implications of domestic competition to the GB gas settlement arrangements in the summer of 1997 and presented three initial proposals to rationalise the prevailing Network Code requirements. Of these options, RbD for SSPs below 2,500 therms pa (73,200 kWh) was considered to provide the

[3] Source: xoserve
[4] Now National Grid Gas PLC

most viable solution. This proposal was further scoped through Network Code review group 174: 'Review of NDM Reconciliation Process'.

Modification proposal 194: 'Reconciliation by Difference'.

1.8. The culmination of the development work undertaken by Review Group 174, resulted in Transco proposing Modification Proposal 194 “Reconciliation by Difference (RbD). The Reconciliation by Difference (RbD) proposal was considered to better facilitate the reconciliation process, by reducing the potential reconciliation costs and workload required to facilitate Domestic Competition.

1.9. RbD works on the basis that as daily total gas flows are known, when a Meter Point Reconciliation takes place for DM or I&C supply points, then an equal and opposite amount should be allocated to SSP consumers to maintain the balance in gas. This amount is apportioned to SSP shippers based on their market share, which is itself derived on the basis of the individual SSPs Annual Quantity (AQ) and End User Category (EUC). The allocation is then used to derive shipper's transportation commodity charges and the daily energy balance, which is reflected in imbalance charges on the Energy Balancing Invoice.

Current RbD arrangements

1.10. xoserve[5] was launched on 1st May 2005, as part of the restructured gas distribution market in Britain. xoserve is jointly owned by five Gas Distribution Network companies and NG NTS and delivers centralised transportation transactional services on behalf of each of the Networks to the gas shippers.

1.11. xoserve provides a number of core services that support the contractual and licence obligations of the major gas transporters. As part of its operations, xoserve calculates the amount of gas that flows through the gas networks of the large gas transporters and produces gas transportation, energy balancing invoices and adjustments on behalf of the Network companies.

1.12. xoserve also undertakes statistical analysis on various aspects of the RbD process to provide a quality assurance mechanism for RbD. For instance, the size of the RbD invoice is monitored on a monthly basis to assess whether the energy allocations flowing through RbD match expected annual levels based on historical analysis.

1.13. xoserve is involved in a number of industry groups which aim to inform industry parties and facilitate discussion on matters relating to the RbD process.

RbD Audit Subcommittee (RbDASC)

1.14. The RbD Audit Subcommittee (RbDASC) is a subcommittee of the Uniform Network Code committee, and is chaired by the Joint Office. One of the duties of the RbDASC is to select independent auditors[6] to undertake annual RbD audits, in line with the requirements of the UNC.

[5] xoserve was established by Transco through the separation of shipper services.
[6] Currently Ernest and Young

1.15. The RbDASC[7] agrees the approach to the RbD audit, which is sets out in the audit tender document. The principal objective of the audit is to establish whether in determining the charges, gas transporters have for the year in question, adhered to the UNC, taking into account any revisions or amendments to that Code.

1.16. Under the current audit arrangements[8], the risk of a material breach of the UNC is assessed and a determination made of the adequacy of the procedures and controls in place to eliminate or reduce such risk. The current audit is therefore an assessment of the concept of reasonable assurance and is not a guarantee that the calculations and allocations are free from mis-statement.

Billing Operations Forum

1.17. The Billing Operations Forum (BOF) is an open forum, which operates outside of UNC and meets six times a year. The BOF is chaired by xoserve and attended by shippers and relevant transporters. It purpose is:

- to share operational plans and performance of xoserve's shipper invoicing, adjustment or energy balancing cash collection processes;
- to discuss (and where possible resolve) operational issues arising from those processes; and
- to raise awareness of future changes which could impact on the above processes (but not the contractual development of those changes).

1.18. Operational matters related to RbD are discussed in the BOF. Operational RbD updates are brought to the BOF which are likely to affect all RbD Shippers, e.g. forthcoming changes or large transactions.

RbD Sub-group

1.19. The RbD Sub-Group operates under the BOF, and is again chaired by xoserve and attended by shippers and relevant transporters. In the RbD Sub-Group, xoserve provides industry parties with information on its verification and RbD risk modelling[9] analysis. It aims to provide a quality assurance mechanism for RbD.

The materiality of the RBD process

1.20. xoserve data[10] on the volume of reconciliations to the SSP market indicate that from the implementation of RbD until January 2005, a net total allocation of 86,583.60GWh (£269m) has been reconciled to SSPs through the RbD process. This is approximately 3% of total commodity invoicing over the same period.

1.21. The underlying principle of RbD is that there is an equal and opposite energy impact for larger and smaller supply points, such that an over allocation to DM and large NDM supply points represents an under allocation to SSPs. The xoserve data

[7] Additional audit review areas may be determined by the RbDASC
[8] This relates to the approach as determined by the current auditor Ernst & Young; future audits may be approached differently
[9] See Appendix 4
[10] See Appendix 4

therefore suggests that on aggregate, SSPs have been allocated less energy through the demand attribution process than they actually consumed, given that shippers on aggregate have paid out a total of £269.34m of reconciliation. However, within this total there may also be an amount of gas not consumed by SSP consumers but otherwise unaccounted for, as explained in Chapter 2.

1.22. The size of the reconciliations[11] to SSPs year on year may provide an indication of changes in data quality. Given this, we may expect to see improvements in data associated with consistent downward trends in the size of reconciliation. However, the table instead indicates that the net allocation to SSPs from both online reconciliation and offline adjustments inconsistently fluctuates year on year. This may imply that inconsistencies still exist with the quality of data feeding into to the initial deeming process.

1.23. There are several variables, such as the Annual Quantity (AQ) and shrinkage factors, which affect the initial deeming process and therefore affect size of reconciliations to SSPs. Such variables are therefore critical to the success of RbD; the more accurate the initial deeming process, the smaller the volumes being reconciled and apportioned to SSP via RbD. In the following chapters we highlight the issues that have been raised with such variables that affect RbD.

[11] This is the Net Allocation to SSPs section of the table in Appendix 4

2. RbD Issues

Summary

This chapter discusses the issues that have been raised with regards to the AQ process, a key component of the RbD process, both with respect to the arrangements under the UNC and with the independent Gas Transporters (IGT's). This section also examines the impact shrinkage calculations have on the RbD process.

Question box

7. Do you consider there is sufficient transparency in the operation and accuracy of industry processes such as the AQ review and shrinkage calculations?
8. Do you consider the existing governance arrangements around these processes to be appropriate?
9. Do you consider there are there appropriate incentives in place on relevant parties to ensure the timeliness and accuracy of these processes?
10. Do you consider that the timing and scope of the AQ Review is appropriate?

Annual Quantity (AQs)

2.1. The AQ is the sum of the annual consumption of all meters on a site and is the main determinant in apportioning Shippers market share of the SSP market.

2.2. During the evaluation of Modification Proposal 194, portfolio AQ bias within the SSP market was considered to present the greatest risk to the accuracy of RbD. Therefore it was considered that the AQ updates must not allow any shipper the ability to artificially reduce their aggregate portfolio AQ for the SSP market[12].

2.3. As a result of these early discussions, certain prerequisites were placed on the AQ update process. In particular there was a requirement that a check be undertaken to ensure that the total system throughput is approximately equal to the sum of the AQs. In addition, there was an identified requirement that a workshop consider the process for future AQ updates and for the policing of AQ appeals.

2.4. Since RbD has been implemented, there have been regular industry presentations, through the Demand Estimation Sub Committee, on the scaling factor[13]. In addition, the relevant values are reported through the NDM Profiling and Capacity Estimation Parameters report. The RbD sub-group committee also discusses various aspects of the AQ mechanism. Over the years the sub-group has facilitated a number of Network Code modifications aimed at improving the robustness of the AQ process.

[12] Individual meter point AQ accuracy in the SSP market was considered to be less an issue as it was assumed that all AQ errors will be randomly distributed.
[13] The scaling factor picks up significant variations between total AQ and the throughput on any day

2.5. In addition, during the AQ review process, xoserve submits annual reports on the outcome of annual appeal activity to enable Ofgem to discuss any AQ anomalies with shippers. Nevertheless, there has been continued concerns raised in regards to AQs which can be split into three categories: data quality, governance and the AQ review process.

Data quality

2.6. Accurate AQs are critical to the success of RbD. The better the initial deeming process of Shipper demand, the smaller the reconciliation quantity to be apportioned by RbD and the more accurate the Shipper energy allocation. Although Shippers ultimately drive AQ accuracy through their meter submissions, there have been continued concerns raised that despite the processes that xoserve have put in place to identify and resolve any erroneous AQs, inaccurate metering submissions by Shippers are feeding into the Shipper AQ values and leading to inappropriate Shipper RbD energy allocations.

2.7. Improvements have been made to the AQ data feeding into RbD, for instance, in June 2004 Ofgem approved Network Code modification 0640[14]. This was considered to allow NGG to undertake an end of year reconciliation on certain categories of SSP threshold crossers.

2.8. In its decision letter Ofgem considered that in the absence of fundamental changes to SSP settlement, the modification was an improvement on the current baseline such that it:

- identifies a category of SSPs that cross the threshold;
- puts in place a mechanism to rectify potentially adverse effects associated with the AQ review which impact RbD shippers;
- enables NGT to bill aggregate transportation and energy correctly to shippers and then apply RbD to adjust each shippers annual AQs, thereby reducing the misallocation of charges through RbD; and
- introduce incentives on shippers to monitor and pursue threshold crosser appeals.

AQ Governance

2.9. Concerns have also been raised with respect to the potential for gaming. Some industry participants consider that the current AQ review process may allow domestic shippers the ability to influence other industry players RbD charges. This was highlighted during Transco's 2002 SSP AQ review process, where a Shipper was considered to have submitted a large number of SSP amendments that universally reduced AQs. A number of shippers also submitted amendments using read periods that did not comply with Transco's Network Code. Transco rejected the amendments that utilised inappropriate read periods, however, Transco did not reject amendments that only reduced AQs because the network code did not contain any rules to prevent such activity.

[14] Modification 0640 'End of Year Reconciliation of Specific Categories of Smaller Supply Points'

2.10. In addition, concerns were raised with regard to the lack of transparency in the data associated with the AQ review process. It was considered that the lack of transparency is inhibiting the industry in securing an understanding any mismatch between estimated energy throughput and actual consumption data.

2.11. During discussions at Transco's AQ sub-group meeting, measures were discussed to reduce risks arising from Shipper amendment activity. In particular, the sub-group recommended the development of network code changes to prevent shippers from selectively submitting SSP AQ amendments.

2.12. In April 2003, Ofgem approved Network Code Modification 624[15], which proposed changes to the 2003 AQ Amendment process. The Modification was supported by the majority of respondents who welcomed measures to prevent shippers from submitting AQ amendments that only reduced their AQ. However, in its response Ofgem noted that the modification proposal sought short term changes to the AQ review process that obliged shippers to take a balanced approach to amendment submission, and urged the industry to further consider AQ review requirements and associated impacts, such as the impacts of process changes on RbD and rules to prevent the selective submission of meter reads.

2.13. In addition, improvements have been made to the AQ review process, for instance since the first AQ review, the data reviewed was extended to include domestic threshold crossers, default values and Connected System Exit Point (CSEP) AQs of large SSPs.

The AQ review process

2.14. Ofgem is aware that some concerns have been expressed that as the current AQ process is an annual exercise, it does not provide for changes in consumption patterns to be appropriately reflected in shipper charges in a timely manner. In addition, industrial and commercial consumers have also expressed concerns of being 'locked into' an AQ for a period which may not represent their true consumption and which affects the transportation charges that are passed through to them under their contracts with suppliers. It has been suggested that as an alternative, the AQ review process should either; allow mid-year shipper nominated amendments, or more radically; be conducted on a rolling basis.

2.15. It has also been suggested that shippers would be in a better position to provide accurate amendments to the AQs if they had access to their customer's historic data, from before they transferred to them.

Independent Gas Transporters (IGT's)

2.16. Independent Gas Transporters (IGT's)[16] own and operate small local gas networks and levy distribution charges on Shippers. IGT's networks are either connected directly to Gas Distribution Networks (GDNs) via a CSEP or indirectly via

[15] http://www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/3230_614&624.pdf
[16] In 2001, Ofgem estimated that around 240,000 consumers were connected to IGT networks. In 2005, this figure was around 600,000 customers.

another IGT (a Nested CSEP). Both industrial and commercial and domestic consumers are connected to IGT networks.

2.17. The quantity of gas that is deemed to have been offtaken by CSEP Supply Points is established by the IGT and communicated to GDNs in the form of standard Annual Quantity (AQ) values[17], in aggregate[18]. The standard AQ values are set out in the CSEP Network Exit Agreement (NExA).

2.18. IGTs are required under the terms of the NExA Agreement to submit timely updates to GDNs to allow them to facilitate the reconciliation of larger Supply Points. GDNs then compare the corrected metric volume to the deemed volumes and calculate a RQ and RCV to the appropriate User.

2.19. SSPs within CSEPs are reconciled via RbD. Directly connected and CSEP AQs are considered together in deriving the total market share. Thus CSEP AQ attracts reconciliation charges in the same ratio as those that are directly connected.

IGT Charges

2.20. New charging arrangements for the IGTs were implemented on 1 January 2004[19]. One of the main outcomes of the review was the introduction of a Relative Price Control (RPC) for new properties connecting to IGT networks. RPC has the effect of capping IGT charges at levels that are broadly consistent with NG's charges

NExA Obligations concerns (CSEP Updates and Reconciliation values)

2.21. The CSEP NExA Agreement governs the relationship between the CSEP User (the relevant IGT) and the appropriate GDN. Although the NExA obligations set out the timing and method for provision of data and the responsibilities of each party involved, concerns have been raised that parties are not adhering the NExA obligations. There is little incentive either financial or commercial for parties to comply with the terms of the CSEP NExA to trigger the reconciliation. The lack of timely AQ Updates and reconciliation volumes by IGTs is considered to create undue risk to RbD, in terms of creating a potential misallocation of energy volumes through the RbD smearing mechanism, and thereby impacting on costs.

2.22. AQ updates and CSEP reconciliation activity relating to individual IGTs are reported by xoserve to the IGT Workgroup. However there is a concern that there is no verification undertaken to ensure that IGTs are submitting all Supply Point activity over their Networks. The problem is considered to be compounded where Nested CSEPS exist with the lead IGT regularly reporting that they receive no AQ Updates from IGTs downstream of their Networks.

2.23. Furthermore, individual NExA Agreements are negotiated between IGTs where Nested Networks exist. There are concerns that there is a lack of transparency on

[17] AQ values for properties on IGT networks are selected from standard AQ values which vary depending on the size of and location of properties. The AQ value is therefore the average AQ for all properties reviewed in that year in each Band and Area (i.e. all the AQs are added up and then divided by the number of houses).
[18] per CSEP User, per development
[19] The Regulation of Independent Gas Transporter Charging - Final Proposals, Ofgem, July 2003.

what obligations are placed on the each of the Parties to provide AQ Updates and reconciliation volumes. In addition, there are concerns that there may be a lack of appropriate incentives for Transporters and IGTs to re-negotiate the terms of the NExA and introduce charges for failure to adhere to the obligations.

IGT AQ Review concerns

2.24. IGTs undertake an Annual Review of AQ values in accordance with their NExA obligations. Shippers have raised several concerns with the operation of this IGT AQ review process, particular as it does not follow that undertaken by xoserve on behalf of GDNs. Some of these issues, such as the level of administrative burden, are better addressed elsewhere. However, the inconsistent approach has raised legitimate concerns pertinent to this document. For instance, given the inconsistent approach to the AQ review, shippers have expressed concern that the revised Weather Adjusted Annual Load Project (WAALP) data[20] may be inconsistently and inaccurately applied by IGTs. However, Ofgem notes that modification proposals have recently been raised which seek to obligate IGTs to adhere to a common AQ review process.

2.25. Shippers have also expressed concern that due to the charging arrangements in place for IGTs, particular the RPC, the outputs of the IGT AQ Review have no material impact on the level of charges applied by them and only affect the CSEP element of the charge. Whilst Ofgem notes that any reconciliation arrangements should operate within the restrictions of the RPC, in particular the upper level of the charging cap, this should not in itself preclude shippers and IGTs from seeking to improve the AQ review process and in particular making AQ values more reflective of true consumption. Ofgem would therefore welcome views and suggestions.

Shrinkage

2.26. Shrinkage gas is gas lost through the transportation system at both the NTS and LDZ level. Under Section N of the UNC, the relevant transporter has an obligation to set LDZ Shrinkage factors to provide for the gas that is used by each of its LDZs or lost from its system.

2.27. Transporters forecast LDZ Shrinkage requirements for a gas year through publication of a LDZ shrinkage Factor Proposal. The forecasts and assessments of the shrinkage components, the methodology and processes that are applied are subject to discussion with shippers at the LDZ Shrinkage Forum. Representatives at these meetings include RbD shippers and Ofgem. The purpose of the forum is to provide information on the LDZ Shrinkage process, assess validity of methodologies and data used and propose enhancements where appropriate to do so.

2.28. After consultation, the transporter's final LDZ Shrinkage factor proposals are published[21]. Ofgem can issue a disapproval notice of the DNO's proposals. In such circumstances, the LDZ Shrinkage Factors applicable to the preceding year continue

[20] The WAALP has been revised to take account of climate change. This will have the overall affect of reducing AQ values and requires IGTs to perform an additional step within the AQ Review Process.
[21] Available of the Joint Office website at: www.gasgovernance.com/publications.asp

to be applied. Components of LDZ gas shrinkage includes gas lost through leakage, gas used for operational purposes and theft of gas.

Leakage

2.29. Leakage represents the biggest component of the LDZ shrinkage factor, and unlike theft of gas and operational use of gas, is based upon LDZ specific data rather than a national formula. The allocations therefore vary, but are generally between 0.5%-0.7% of LDZ consumption.

Theft of Gas

2.30. The scale of theft of gas is, by its nature, difficult to assess. Measuring the extent of theft is problematic due to the millions of premises that take gas and associated meters that could potentially be tampered with. Given the lack of certainty over losses through transportation, understanding the extent of theft is not simply a matter of identifying the difference between the inputs to and offtake from the pipeline system. Some estimates provided to Ofgem suggest that the value of gas and electricity stolen each year may be as much as £100m, though the majority of this is accounted for in electricity. In gas, the figure traditionally attributed to unidentified theft of gas has been 0.3% of total LDZ consumption.

2.31. Whilst the responsibility for theft of gas is split between shippers and transporters, only a small proportion falls upon the latter. This is based on the evidence of identified cases, where only a small percentage resulted from gas being taken illegally from upstream of the emergency control valve (i.e. directly from the network) or where there was no shipper in place for a premise which was taking gas.

2.32. Although there is also a likelihood of theft of gas by industrial and commercial users, the current reconciliation process does not apportion any costs for theft of gas to the DM or large NDM sectors.

Gas used for operational purposes

2.33. Transporters use an amount of gas in the operation of the pipeline system, for instance in pre-heating gas. As the pressure of natural gas is reduced (i.e. when offtaken from the NTS or passing through a local transmission system pressure regulator) it experiences a drop in temperature. Pre-heating is used, where necessary to maintain a temperature above 0 ºC. The level of shrinkage factor which is attributed to the transporters estimated own use of gas, derived in part from temperature and (heating) plant efficiency data.

Issues

2.34. Shippers have previously raised concerns about determining shrinkage factors using I&C temperature data to accommodate variations in pressure and temperature between the LDZs. On the 19 January 2001, Ofgem accepted Network Code

modification proposal 396[22], which permitted a retrospective reconciliation for SSPs in order to take into account the results of the 1999/2000 Domestic Temperature Survey and to allow for any prospective adjustments that may be required following the results of the 2000/2001 domestic survey. Ofgem considered the modification would limit any cross subsidy between LDZ's and provide for more accurate shrinkage data.

2.35. More recently, the shrinkage attributed to transporters own use of gas has been reduced from 0.06% of LDZ throughput in 2004/05 to 0.35% in 2005/06. This was itself a compromise position, with transporters originally proposing a lower figure of around 0.02%. Ofgem notes that each of the shippers who responded to the LDZ shrinkage factor proposals expressed a desire to move towards metering the gas consumed in the transporters own use. It is open to shippers to raise UNC modifications to incentivise the transporter to meter their own use of gas.

2.36. The cost of identified LDZ shrinkage gas is recovered as part of general transportation revenue[23]. Whilst prior to the implementation of RbD, any error in shrinkage was spread across all NDM shippers (excluding Daily Metered sites), under RbD any error is borne by small NDM (generally domestic) shippers.

2.37. Despite the fact that the bulk of the shrinkage figures are derived from the National Leakage survey, which had full Shipper involvement in the determination of the methodology and assessment of the results compiled by an independent third party, Ofgem understand that some shippers remain concerned that shrinkage factors may still be inaccurate. In particular some consider that upstream leakage may be underestimated by transporters, and that I&C theft has not been acknowledged. Therefore some industry participants consider that SSP shippers are being disadvantaged by facing a disproportionate apportionment of shrinkage, and as a consequence higher energy bills.

Conclusion

2.38. Ofgem's current view is that the issues arising from this chapter can most appropriately be addressed through existing industry mechanisms such as the UNC modifications process. Ofgem notes that several modification proposals have been raised recently, both on the UNC and on the Network Codes of the IGTs, aimed at improving the general governance around the AQ review process. If UNC or Network Code parties consider there is any further defect with the current arrangement, they are at liberty to raise modifications proposals as appropriate.

2.39. Ofgem cannot itself raise modification proposals and nothing in this document or elsewhere can fetter the discretion of the Authority over the eventual decision on whether to accept or reject any of the current or potential proposals. However, Ofgem considers that it is appropriate to draw attention to, and facilitate discussion of, the issues raised in this chapter and in particular invite comment from those

[22] Modification Proposal 396: "Proposal to allow for RBD Adjustment to be processed consequent to the recalculation of LDZ Specific Shrinkage Factors for revised temperature data for the period from the implementation of RBD to the start of current Supply year 1999/2000"
[23] to the extent that shrinkage costs are allowed for in the DNOs' price control.

parties who may otherwise be unaware of the current modification proposals or discussion at existing industry meetings.

2.40. Ofgem would therefore encourage all parties with an interest in the RbD process to respond to the current modification proposals, through the appropriate channels. For instance, those who wish to respond to UNC Modification Proposals should contact the Joint Office of Gas Transporters[24].

[24] Email: Enquiries@gasgovernance.com

3. Wider Considerations

Chapter Summary

The Chapter considers whether the RbD process remains fit for purpose in the context of improvements in technology and wider, longer term developments in the gas industry. For instance, improvements in metering technology, particularly a roll out of smart metering, could facilitate improvements to the existing reconciliation process, and potentially allow for individual meter reconciliation in the SSP sector.

Ofgem would also welcome views on the wider benefits that could be realised from the introduction of individual Meter Point Reconciliation. Ofgem has suggested energy efficiency as one example of an area which is affected, albeit indirectly, by the current reconciliation arrangements. Ofgem would welcome views on what other areas may be impacted by RbD, whether directly or indirectly, and how.

Question box

11. What would the likely costs and benefits be of introducing Meter Point Reconciliation to all supply points?
12. What conditions would need to be satisfied in order for individual Meter Point reconciliation to be practicable, and to what timescale?
13. Would it be feasible for shippers to choose whether their supply point should be individually reconciled or processed through RbD?

Advanced Metering technology

3.1. Advanced or 'smart' metering refers to technology that goes above the basic requirements[25] of a gas or electricity meter within the UK domestic market.

3.2. In February 2006, Ofgem published a consultation on 'Domestic metering innovation'[26] which addresses how concerns such as tackling fuel poverty and reducing greenhouse gas emissions could be facilitated through smarter, more innovative domestic energy meters. For instance, smarter meters provide customers with more information about how much energy they consume and when, which may encourage customers to look at ways of being more energy efficient. More generally, smart meters are likely to facilitate remote reading, greatly increasing the frequency and accuracy of meter read data.

3.3. In the short term, the impact of innovative gas metering on RbD is expected to be limited, given the relatively low volumes of such meters in the UK. However, it is Ofgem's intention to unlock the potential of smarter metering for domestic customers in the long term through working alongside stakeholders such as suppliers and network operators within the energy industry. We therefore consider that it is

[25] Basic meter requirements - accurately measuring the quantity of energy supplied to a consumer and ensuring that a meter is safe and that a secure display is available.
[26] Domestic metering innovation consultation:
www.ofgem.gov.uk/temp/ofgem/cache/cmsattach/13745_2006.pdf

appropriate for industry parties to consider the impact of advanced metering innovation on RbD.

3.4. For instance, the ability to read the meter remotely opens up, in the short term, potential improvements in data quality, which in turn may improve accuracy throughout the reconciliation process. Further, given that a smart meter could essentially offer the same communications functionality as Daily Read Equipment, it may be possible to offer shippers the option of opting out of RbD and having the relevant supply point individually reconciled.

Energy Efficiency

3.5. The Electricity and Gas (Energy Efficiency Obligations) Order 2004 ('the Order') came into force on 22 December 2004 and established energy efficiency obligations for certain domestic gas suppliers and electricity suppliers for the period 1 April 2005 to 31 March 2008. The Order provides for the Authority to establish energy efficiency targets, to be achieved by suppliers through the establishment of schemes offered to domestic consumers. Suppliers are incentivised to achieve part of their targets by offering innovative energy efficiency measures to consumers.

3.6. Failure by a supplier to comply with a requirement imposed under the Order may lead to the imposition of financial penalties under section 30A of the Gas Act 1986 or section 27A of the Electricity Act 1989.

3.7. As AQs are at best adjusted yearly, such that transportation charges are not directly proportional to current usage, the incentives for shippers to provide customers with energy saving devices and associated innovative tariffs may not be immediately realisable. Some industry participants have suggested that shippers should have the option of adjusting the AQ at the time when customers are provided with energy saving devices

Conclusion

3.8. The intent of this chapter is to seek views on the wider implications of RbD, prompt discussion and for Ofgem to gain a better understanding of the sustainability and desirability of RbD in the longer term. In particular, it is hoped that responses will help identify all the various strands that are impacted by current reconciliation arrangements and assist Ofgem in coming to a holistic and strategic view on RbD. Following consideration of responses to this document, we intend to publish a summary of responses, together with further thoughts and how, if appropriate, Ofgem intends to take forward these wider, longer term considerations.

Appendices

Index

Appendix 1 - Consultation Response and Questions

1.1. Ofgem would like to hear the views of interested parties in relation to any of the issues set out in this document.

1.2. We would especially welcome responses to the specific questions which we have set out at the beginning of each chapter heading and which are replicated below.

1.3. Responses should be received by 12 May 2006 and should be sent to:

Ms Ndidi Njoku
Industry Codes
9 Millbank
London
SW1P 3GE
020 7901 7157
ndidi.njoku@ofgem.gov.uk

1.4. Unless marked confidential, all responses will be published by placing them in Ofgem's library and on its website www.ofgem.gov.uk. Respondents may request that their response is kept confidential. Ofgem shall respect this request, subject to any obligations to disclose information, for example, under the Freedom of Information Act 2000 or the Environmental Information Regulations 2004.

1.5. Respondents who wish to have their responses remain confidential should clearly mark the document/s to that effect and include the reasons for confidentiality. It would be helpful if responses could be submitted both electronically and in writing. Respondents are asked to put any confidential material in the appendices to their responses.

1.6. Next steps: Having considered the responses to this consultation, Ofgem intends to publish a document which summaries respondents' views and may provide conclusions or options on a way forward, as appropriate.

1.7. Any questions on this document should, in the first instance, be directed to Ndidi Njoku, details provide above.

CHAPTER One: Introduction

Questions:
1. Given the original rationale and benefits of RbD, do you consider it remains valid under the current GB Gas arrangements?
2. Are the costs and benefits of the RbD process transparent to the industry, and if not what how can transparency be improved?
3. Do the various RbD related industry work groups provide sufficient governance and transparency of the RbD arrangements?
4. Is there sufficient transparency of the data or the information xoserve provides to the Industry?
5. Is the scope of the current RbD Audit appropriate?
6. Are there sufficient incentives on all parties to limit the size of RbD?

CHAPTER Two: RbD Issues

Questions:
7. Do you consider there is sufficient transparency in the operation and accuracy of industry processes such as the AQ review and shrinkage calculations?
8. Do you consider the existing governance arrangements around these processes to be appropriate?
9. Do you consider there are there appropriate incentives in place on relevant parties to ensure the timeliness and accuracy of these processes?
10. Do you consider that the timing and scope of the AQ Review is appropriate?

CHAPTER Three: Wider Considerations

Questions:
11. What would the likely costs and benefits be of introducing Meter Point reconciliation to all supply points?
12. What conditions would need to be satisfied in order for individual Meter Point reconciliation to be practicable?
13. Would it be feasible for shippers to choose whether their supply point should be individually reconciled or processed through RbD?

Appendix 2 - Feedback Questionnaire

Ofgem considers that consultation is at the heart of good policy development. We are keen to consider any comments or complaints about the manner in which this consultation has been conducted. In any case we would be keen to get your answers to the following questions:

1. Do you have any comments about the overall process, which was adopted for this consultation?
2. Do you have any comments about the overall tone and content of the report?
3. Was the report easy to read and understand, could it have been better written?
4. To what extent did the report's conclusions provide a balanced view?
5. To what extent did the report make reasoned recommendations for improvement?
6. Please add any further comments?

Please send your comments to:

Selvi Jegatheswara
Consultation Co-ordinator
Ofgem
9 Millbank
London
SW1P 3GE
selvi.jegatheswara@ofgem.gov.uk

Appendix 3 - The Authority's Powers and Duties

Ofgem is the Office of Gas and Electricity Markets which supports the Gas and Electricity Markets Authority ("the Authority"), the regulator of the gas and electricity industries in Great Britain. This Appendix summarises the primary powers and duties of the Authority. It is not comprehensive and is not a substitute to reference to the relevant legal instruments (including, but not limited to, those referred to below).

The Authority's powers and duties are largely provided for in statute, principally the Gas Act 1986, the Electricity Act 1989, the Utilities Act 2000, the Competition Act 1998, the Enterprise Act 2002 and the Energy Act 2004, as well as arising from directly effective European Community legislation. References to the Gas Act and the Electricity Act in this Appendix are to Part 1 of each of those Acts.[27]

Duties and functions relating to gas are set out in the Gas Act and those relating to electricity are set out in the Electricity Act. This Appendix must be read accordingly[28].

The Authority's principal objective when carrying out certain of its functions under each of the Gas Act and the Electricity Act is to protect the interests of consumers, present and future, wherever appropriate by promoting effective competition between persons engaged in, or in commercial activities connected with, the shipping, transportation or supply of gas conveyed through pipes, and the generation, transmission, distribution or supply of electricity or the provision or use of electricity interconnectors.

The Authority must when carrying out those functions have regard to:

- The need to secure that, so far as it is economical to meet them, all reasonable demands in Great Britain for gas conveyed through pipes are met;
- The need to secure that all reasonable demands for electricity are met;
- The need to secure that licence holders are able to finance the activities which are the subject of obligations on them[29]; and
- The interests of individuals who are disabled or chronically sick, of pensionable age, with low incomes, or residing in rural areas.[30]

Subject to the above, the Authority is required to carry out the functions referred to in the manner which it considers is best calculated to:

- Promote efficiency and economy on the part of those licensed[31] under the relevant Act and the efficient use of gas conveyed through pipes and electricity conveyed by distribution systems or transmission systems;

[27] Entitled "Gas Supply" and "Electricity Supply" respectively.
[28] However, in exercising a function under the Electricity Act the Authority may have regard to the interests of consumers in relation to gas conveyed through pipes and vice versa in the case of it exercising a function under the Gas Act.
[29] Under the Gas Act and the Utilities Act, in the case of Gas Act functions, or the Electricity Act, the Utilities Act and certain parts of the Energy Act in the case of Electricity Act functions.
[30] The Authority may have regard to other descriptions of consumers.

- Protect the public from dangers arising from the conveyance of gas through pipes or the use of gas conveyed through pipes and from the generation, transmission, distribution or supply of electricity;
- Contribute to the achievement of sustainable development; and
- Secure a diverse and viable long-term energy supply.

In carrying out the functions referred to, the Authority must also have regard, to:

- The effect on the environment of activities connected with the conveyance of gas through pipes or with the generation, transmission, distribution or supply of electricity;
- The principles under which regulatory activities should be transparent, accountable, proportionate, consistent and targeted only at cases in which action is needed and any other principles that appear to it to represent the best regulatory practice; and
- Certain statutory guidance on social and environmental matters issued by the Secretary of State.

The Authority has powers under the Competition Act to investigate suspected anti-competitive activity and take action for breaches of the prohibitions in the legislation in respect of the gas and electricity sectors in Great Britain and is a designated National Competition Authority under the EC Modernisation Regulation[32] and therefore part of the European Competition Network. The Authority also has concurrent powers with the Office of Fair Trading in respect of market investigation references to the Competition Commission.

[31] Or persons authorised by exemptions to carry on any activity.
[32] Council Regulation (EC) 1/2003

Appendix 4 – Supporting information

Meter Point Reconciliation

3.9. Meter Point Reconciliation assumes that the actual consumption obtained from the meter read, is deemed to have been consumed in the same demand profile as the allocation model (the curve of the line in figure 2 below) and effectively reconciles for each and every day in the reconciliation period, taking into account the daily Calorific Value and the market price of gas on the day (System Average Price (SAP))[33].

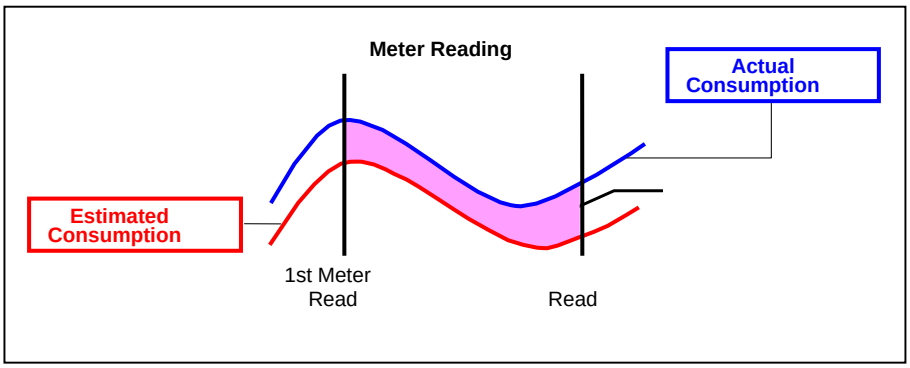


Figure 1: Meter Point Reconciliation based on the demand attribution profiles[34]

3.10. The energy variance that results from differences between the estimated and actual consumption at DM and large NDM supply points is known as the Reconciliation Quantity (RQ). The RQ is then used to calculate Transportation Charge Adjustments[35], which are invoiced to the Shipper to each supply point.

3.11. The cost of the gas variance, known as the Reconciliation Clearing Value (RCV)[36], is then derived by multiplying the daily RQs by the daily SAP. The RCV is then invoiced to shipper for each meter point (explained below).

3.12. The calculation of aggregate reconciliation at SSPs is achieved by apportioning the RQs and RCVs obtained from Meter Point Reconciliation at DM and large supply points at the LDZ. The aggregated SSPs RQ is therefore equal and opposite to the net aggregate quantities obtained from Meter Point Reconciliation.

Calculations of the cost of gas variance

To illustrate how RCVs are calculated, the following numerical example takes a three day period where the demand allocation process has allocated a meter point

[33] An numerical example of the cost of gas variance is shown in Appendix 4
[34] Source: xoserve
[35] Charge type: Transportation Reconciled Energy (TRE)
[36] Charge type Gas Reconciled Energy (GRE)

50+60+40+=150 units of gas. Suppose, when the meter is read it shows that 180 units of gas had actually been consumed during that period.

The reconciliation for that 3 day period will apportion the extra 20% in proportion to the allocation, giving the daily reconciliation quantities.

i.e. Reconciliation Quantity (RQ) = *(Actual –Allocated) Consumption*

In this case RQ = 180- 150 = 30

The RQ is apportioned in proportion to the allocation, therefore RQ = 10 +12+8=30

The System Average Price (SAP) may have been different on each day, so the Reconciliation Clearing Value (RCV) is calculated by multiplying each day's reconciliation quantity by the daily SAP.

i.e. RCV = *RQ*SAP*

In this case the RCV = 10*SAP1+12*SAP2+8*SAP3

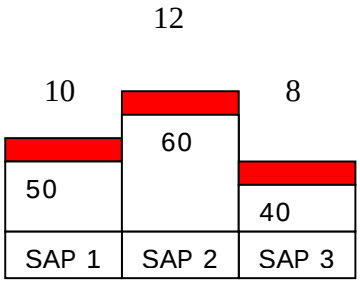


Figure A5.1 shows cost of gas variance

RQs are converted to Reconciliation Transportation Charge Adjustments (charge type Transportation Reconciled Energy (TRE)) is calculated by multiplying RQs by the sum of NTS, LDZ and, if applicable the customer commodity rates. These charges are invoiced to the shipper for that meter point.

The RCVs (charge type Gas Reconciled Energy (GRE)) are also invoiced to the shipper for that meter point. The Transporter remains cash neutral on these charges, as they relate to the cost of gas energy. This is achieved by debiting or crediting reconciliation neutrality the equal and opposite of the GRE charge invoiced to the shipper. Through this mechanism the aggregate reconciliation neutrality values are apportioned amongst all shippers in proportion to their NDM allocations.

Calculations and apportionment of Aggregate Reconciliation Clearing Values and Aggregate Reconciliation Transportation Charge Adjustments[37]

This section outlines the calculations of charges that are apportioned and invoiced to shippers.

Calculation of Reconciliation Clearing Values (RCV) to be apportioned

The calculation of the Reconciliation Clearing Values (RCV) to be apportioned in each LDZ, for each billing period, is derived from aggregating meter point reconciliations and adjustments in that LDZ for that period is into one of 3 sectors: monthly, 6-monthly and 12-monthly depending on the source of the clearing values (see **Table A5.1** below)[38].

Monthly sector	Reconciliations from monthly read meters DM and Unique Sites reconciliations, other than those arising from planned site visits Reconciliations and adjustments from meter point on larger supply points within CSEPs Smaller supply point adjustments with a duration of less than 1 month LDZ reconciliations
6 monthly sector	Reconciliations and adjustments of non-monthly read meters Smaller supply point adjustments with a duration of between 1 and 4 months
12 monthly sector	Reconciliations from re-synchronisations of DM and Unique Sites meters points arising from planned site visits Smaller supply point adjustments with a duration of more than 4 months
Additionally a 4th Sector	
LDZ errors sector	LDZ measurement errors

Apportionment of RCV into Billing Months

The Aggregate Reconciliation Clearing Values (ARCV) and Aggregate Reconciliation Transportation Charge Adjustments (ARTCA) are apportioned across shippers as follows:

[37] Source: Xoserve

[38] Any RCV arising from the correction of an LDZ measurement error is also allocated to an aggregate reconciliation transportation charge adjustment.

The aggregate values in the **monthly sector** are apportioned across shippers based on their share of the smaller supply point market in that LDZ in the last month prior to the issuing of the reconciliation invoice.

The aggregate values in the **6 monthly sector** are divided by 6 and each sixth apportioned across shippers based on their share of the smaller supply point market in that LDZ in each of the last 6 months prior to the issuing of the reconciliation invoice.

The aggregate values in the **12 monthly** sector are divided by 12 and each twelfth apportioned across shippers based on their share of the smaller supply point market in that LDZ in each of the last 12 months prior to the issuing of the reconciliation invoice.

Basis of apportionment

The basis for apportionment is the share of the smaller supply point market, which each shipper held in the relevant month(s). The share of the market is determined by aggregating the smaller supply point AQ for each shipper for each day in each LDZ throughout the month, and then determining the proportion of this total aggregation, which each shipper held.

Isolated meter points (including those on Isolated and Withdrawn supply points) are excluded from shipper market share calculations.

	Day 1	Day 2	Day 3	Total	Shipper Share
Shipper A	500	300	100	900	0.3
Shipper B	400	600	400	1,400	0.47
Shipper C	100	100	500	700	0.23
LDZ total				3,000	

Table A5.2 shows the principle of determining a Shippers market shares of the SSP market based on a 3 day month.

RbD Adjustments

In addition to reconciliation of small supply points from meter point reconciliation at larger supply points, an under or over allocation meters may also be identified through various categories of adjustments, including the following; Reconciliation consumption adjustments (DM or NDM meter points); Smaller supply point portfolio adjustments; and LDZ reconciliations.

Reconciliation consumption adjustments (DM or NDM meter points)

Reconciliation adjustments to meters at larger supply points are required from time to time. They may be required due to incorrect measurements or standing data at the meter point, or as part of a larger adjustment arising from an error of

completeness or existence (e.g. Missing meter point or Duplicate meter point). These adjustments may be debits or credits to the Shipper(s) responsible for the meter point.

Smaller supply point portfolio adjustments

Smaller supply point portfolio adjustments are required from time to time. They may be required due to an error of completeness or existence within a Shipper's portfolio (e.g. Missing meter point or Duplicate meter point). These adjustments may be debits or credits to the Shipper(s) responsible for the meter points. The adjustment will be the equivalent to the cost of allocated energy and associated transportation for a meter point with that AQ in the relevant LDZ for the affected period, at the appropriate SAP rates and smaller supply point commodity rates. These adjustments are billed as GRE, NRE, ZRE and CRE (Customer Commodity Reconciliation) to the Shipper(s) responsible for the meter points, and may be debits or credits.

LDZ reconciliations

LDZ Reconciliations are required from time to time, when a measurement error is discovered at an LDZ off-take. These adjustments represent a change (increase or decrease) to the energy consumed in the LDZ on one or more affected days. The adjustment values will be calculated at SAP rates on a daily basis.

Risk Modelling[39]

RbD risk modelling is provided by xoserve as a complementary exercise to support the RbD Audit and provide additional confidence in the RbD process. The purpose of the work is to review all of the processes and factors that support RbD and to quantify the extent to which probable variations in these will affect the risk to Shippers. Risk is categorised as the measure of variation in an RbD invoice from the gas flow within the month. The risk modelling analysis is reported from time to time to the RbD community through the RbD Sub-Group.

Methodology

The risk model calculates the maximum variation or risk that can be expected between the consumption invoiced and actual consumption for a typical month. It does this by simulating the deeming process and calculating the expected consumption, by adding corrections and random fluctuations around declared AQ and monthly profile data. From these two streams the reconciliation variances and hence RbD can be calculated. RbD risk is determined by a comparison of the expected domestic consumption, domestic allocations and RbD.

Each of the contributing variables that are considered to have variation has a risk distribution added. The distributions provide an indication of how likely the variable

[39] Source: xoserve

is to achieve a range of values. The amount of variation in the final results will provide an idea of the risk involved in RbD.

If the spread of monthly RbD values is wide there is potentially a larger and less predictable risk involved than if the values are tightly clustered and do not change greatly month on month.

Over the lifespan of RbD the Empirical Feeder Model has replaced the original risk model. This risk-based model has been developed to provide risk analysis based on each feeder process to RbD. The model was developed in conjunction with the community providing a comprehensive and easy to understand determination of the impacts each feeder process has on the final RbD contribution to the reconciliation invoice.

Risk Model Results Overview

The most recent calculation[40] of the model showed the level of risk was running at 0.35% ± 3.5%. As this interval covers zero the model currently suggests that there is no bias in the risk.

Over half of the variation in the invoices is due to seasonality of the gas market and would be present regardless of the reconciliation mechanism employed within the SSP market.

As designed risk modelling comments on variability of monthly invoice charges and had some use for Shipper management of cash flow before there was enough RbD invoice history for assessment. The verification analysis provides assurance over whether the total volume of energy invoiced through RbD is correct and is arguably a more relevant measure than risk modelling.

Current Position on the Impact on RbD to individual shippers

The risk analysis indicated:

- a slight benefit (in respect to risk) if a shipper is increasing its market share (given the delay in meter reads etc), and hence proportionally more of the risk if a shipper is losing market share.

- with respect to risk to very small portfolios, the model showed that there is not a great deal of difference in risk between a small and large portfolio. If AQs are understated, a shipper with increasing market share will have a smaller percentage of the risk. If AQs are overstated, a shipper losing market share will benefit, as they will have a smaller share of the risk.

Verification

xoserve's verification analysis seeks to compare the trend in billed consumption (i.e. deemed and RbD) to actual consumption (from sample data) over the long term, to

[40] Source: xoserve, February 2006

ensure that SSP Shippers are not materially advantaged or disadvantaged by RbD in the long run.

Methodology

Verification analysis is undertaken by estimating the average consumption of a SSP by using a sample of consumptions obtained from British Gas Trading's (BGT) Domestic Monitor Panel (DMP), which is considered to be indicative of the market as a whole. The panel is a stratified sample designed to provide a robust estimate of domestic consumption at LDZ level. It is considered that the BGT panel should provide an estimate of domestic consumption by an average customer with 95% confidence that the estimate would be accurate to 1% nationally and 3-4% at individual LDZ levels.

To enable a more accurate representative comparison, the sample is weighted to reflect the distribution of AQ and supply points held on Sites & Meters. The DMP panel is then used to provide an estimate of consumption per customer (the 'actual' shown in **Figure A5.2** below). The estimated consumption is compared with the average consumption invoiced through the Commodity and RbD invoices (the 'billed' shown in **Figure A5.3**).

Verification Results Overview

The monthly billed consumption, actual consumption and the difference (see **Figure A5.2** below), and comparable cumulative figures (see **Figure A5.3** below), are analysed monthly to assess any trends that may be evident. As long as any difference between billed and estimated actual are within the tolerance of the model then the model provides no evidence that there is any bias in invoices.

Since the start of RbD, the billed consumption is approximately 1,950 kWh per meter point greater than the estimated actual consumption using this model. On a simple grossed up basis, after allowing for expected theft of gas levels and other adjustments yet to flow, this represents 1% of Domestic throughput for the lifetime of RbD. These results are within the tolerance around the sample 'actual' (expected to be at least equal to the design tolerance of 1%). The findings are reported quarterly at the RbD Sub-Group.

Figure A5.2

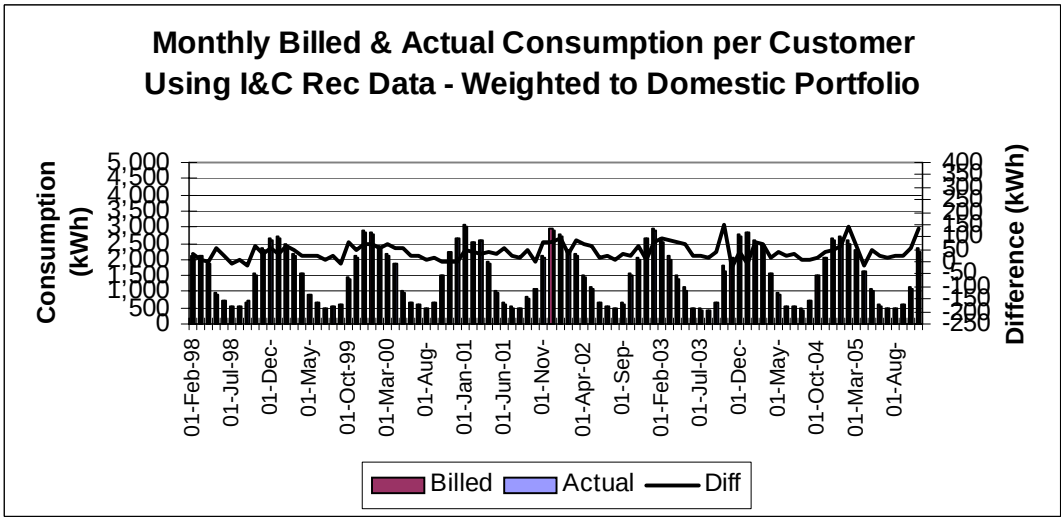
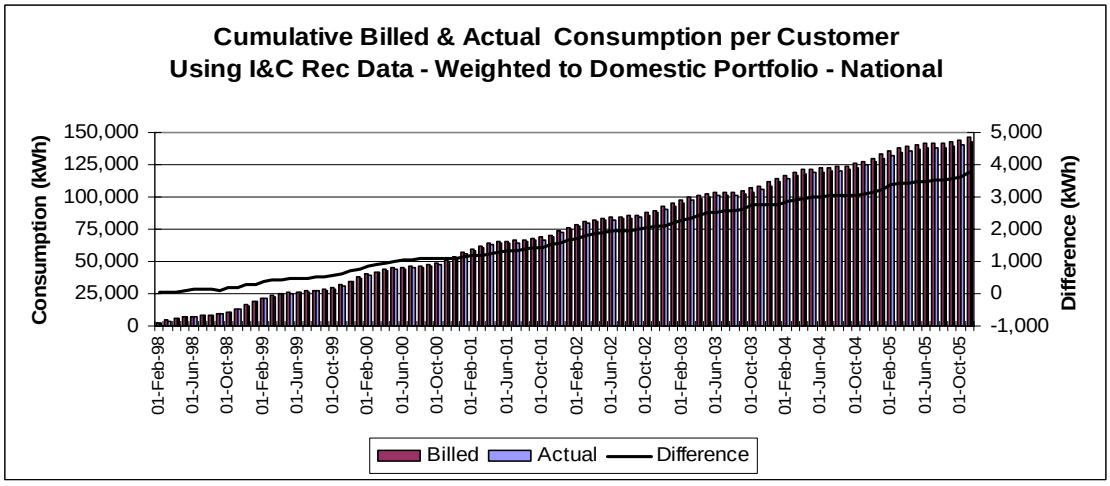

Monthly Billed & Actual Consumption per Customer
Using I&C Rec Data - Weighted to Domestic Portfolio
Consumption (kWh)
Difference (kWh)
Billed
Actual
Diff

Figure A5.3


Cumulative Billed & Actual Consumption per Customer
Using I&C Rec Data - Weighted to Domestic Portfolio - National
Consumption (kWh)
Difference (kWh)
Billed
Actual
Difference

Reconciliations to SSPs

The table[41] below shows the volumes of reconciliations undertaken in the SSP since RbD was implemented in February 1998.

The online reconciliation column refers to the difference between allocated and actual energy consumption for the SSPs.

The offline adjustment column refers to ad hoc financial adjustments which have been primary due to adjustments/ improvements in data quality i.e. adjusting AQs to take into account duplication of sites, isolations, AQ migrations, daily metered consumption adjustments etc.

The table shows that since the implementation of Rbd until January 2005, a net total allocation of 86,583.60 Gwh amounting to £269.34m has been reconciled to SSPs through the RbD process.

Billing Month	Online Reconciliation	Adjustments	Total	Online Reconciliation	Adjustments	Total
	GWh	GWh	Gwh	Million £	Million £	Million £
Feb 98-Jan-99						
Average per Month	579.16	7.30	586.45	£2.18	£0.03	£2.21
Net Allocation into SSP	6,949.90	87.56	7,037.46	£26.15	£0.35	£26.50
Feb 99-Jan-00						
Average per Month	1,711.30	-31.83	1,679.46	£5.81	-£0.06	£5.75
Net Allocation into SSP	20,535.54	-381.96	20,153.58	£69.69	-£0.69	£69.00
Feb 00-Jan-01						
Average per Month	1,002.52	59.47	1,061.99	£3.15	£0.32	£3.47
Net Allocation into SSP	12,030.24	713.68	12,743.92	£37.85	£3.81	£41.67
Feb 01-Jan-02						
Average per Month	813.81	264.09	1,077.90	£2.11	£0.99	£3.10
Net Allocation into SSP	9,765.75	3,169.06	12,934.81	£25.30	£11.90	£37.20
Feb 02-Jan-03						
Average per Month	857.89	151.72	1,009.61	£2.29	£0.40	£2.69
Net Allocation into SSP	10,294.68	1,820.69	12,115.37	£27.44	£4.80	£32.24
Feb 03-Jan-04						
Average per Month	638.84	116.15	754.99	£1.79	£0.41	£2.21
Net Allocation into	7,666.12	1,393.76	9,059.88	£21.54	£4.97	£26.50

[41] Source: xoserve

SSP						
Feb 04-Jan-05						
Average per Month	1,023.20	21.68	1,044.88	£2.95	£0.07	£3.02
Net Allocation into SSP	12,278.37	260.22	12,538.58	£35.41	£0.83	£36.24
Total since implementation						
Average per Month	946.67	546.54	1,030.76	£2.90	£2.01	3.21
Net Allocation into SSP	79,520.61	7,651.58	86,583.60	£243.37	£28.13	269.34

Appendix 5 - Glossary

A

The **Annual Quantity (AQ)** (measured in kWh or therms) is the sum of the annual consumption of all meters on a site. AQs are based on historical usage from previous years and are used by NGG to, amongst other things; forecast the demand for gas across its network.

The **AQ Review** is the review of the registered User's determination of what the Annual Quantity in respect of a Supply Meter Point should be.

C

A **Connected System Exit Point (CSEP**) is a point on the distribution system that comprises one or more individual offtakes that are not metered supply points. These include connections to Independent Gas Transporters (IGTs).

Customers are contractual parties responsible for the offtake of gas at a relevant Supply Point

D

The **Daily Calorific Value is t**he ratio of energy to volume measured in Megajoules per cubic meter (MJ/m3), for gas this is measured and expressed on a daily basis under standard conditions of temperature and pressure.

Daily Metered (DM) Supply Points are supply points that have an annual gas consumption greater than 58,600,000kwh (2,000,000 therms per annum). DM Supply Points have mandatory telemeter equipment, such as a datalogger. Any supply point which is interruptible and/or connected to the NTS will also be daily metered.

A **Datalogger** is a piece of equipment attached to the meter that allow readings of gas consumed at the Supply Meter point to be taken and communicated generally on a daily basis.

E

An **End User Category** is a category of NDM Supply Point Components in an LDZ.

G

Gas Transporter's (GT's) are holders of a licence to operate a system to convey gas granted under section 7 paragraph 4 of the Gas Act 1986 as amended.

I

Independent Gas Transporter (IGTs) own and operate small local gas networks and levy distribution charges on shippers.

L

Large NDM Supply Meter Points - see Non Daily Metered (NDM) Supply Meter Points

Local Distribution Zones (LDZs) are low pressure pipeline systems which deliver gas to final users and IGTs. There are twelve LDZs which take gas from the high pressure transmission system for onward distribution at lower pressures.

N

National Grid Gas plc (NGG) (formerly Transco) is a gas transporter which transports gas through its network on behalf of a Shipper. NGG provides, installs and maintains the vast majority of domestic gas meters in this country.

National Transmission System (NTS) is National Grid's high pressure transmission system which consists of more than 6,400 km of pipe carrying gas at pressures of up to 85 bar (85 times normal atmospheric pressure).

NExA's are the Transporter's Network Exit Arrangements

A **Nested CSEP** is where an IGT adjoins another IGT network.

Non Daily Metered (NDM) Supply Meter Points are exit points that do not have a meter recording daily flows. There are large and small NDM Supply Meter Points which differ by the size of their AQs:

- **Large NDM Supply Meter Points** have an AQ below 58,600,000kwh (2,000,000 therms) but above 73,200kwh (below 2,500 therms) per annum.

- **Small NDM Supply Meter Points** have an AQ less than 73,200 kwh (below 2,500 therms) per annum. Most NDM supply points are located on the LDZ and do not require daily meter readings. The vast majority of Small NDM Supply Points are domestic but there are some Industry and Commercial Supply Points.

R

Reconciliation by Difference (Rbd) operates at the LDZ level and is a method of reconciling the difference between allocated and actual energy for small supply points which have an Annual Quantity (AQ) of up to 73,200 kWh.

Reconciliation Clearing Values (RCVs) are derived from Meter Point Reconciliations in a LDZ within a billing period, and are aggregated into one of 3 sectors (the 6-monthly and 12-monthly and monthly sectors) depending on the source of the clearing value.

The Reconciliation Quantities (RQs) is the difference between allocated and actual consumption which rises during the reconciliation of a large supply point.

S

Shrinkage consists of gas used by the system, for instance in the use of heaters or compressors, leakage and theft of gas. Further details are provided in Chapter 2.

Gas **Shippers** arrange for the conveyance of gas over the distribution network to final consumers. Shippers pay distribution charges to the relevant gas transporter and are holders of a licence given under Section 7A (2) of the Gas Act 1986 as amended.

Small NDM Supply Meter Points- see Non Daily Metered (NDM) Supply Meter Points

Suppliers are holders of a licence to supply gas given under Section 7A (1) of the Gas Act 1986 as amended or a person excepted from the requirement to hold a licence by virtue of paragraph 5 of schedule 2A of the Act.

The **System Average Price (SAP) is** the price set by all NGG (formerly Transco) and shipper trades on the OCM (on-the-day commodity market) on a given day.

U

The **Uniform Network Code (UNC)** replaced NGG's Network Code on 1 May 2005 as the contractual framework for the NTS, GDNs and System Users.