Transmission Pipeline Balancing: Supplement to the October 2009 Statement of Proposal

MDL Submission to the Gas Industry Company

27 April 2010

A.   Background

1.   Form of this submission

This submission is in response to the "Transmission Pipeline Balancing: Supplement to the October 2009 Statement of Proposal" issued by the Gas Industry Company in April 2010, which updated and amended the earlier Statement of Proposal issued by the GIC in October 2009.

The following sections deal with four issues:

1. A re-examination of issues raised earlier by MDL, most notably in its letter to the GIC dated 12 February 2010 and its submissions on the earlier version of the Statement of Proposal. This part concentrates on the degree to which MDL's concerns have been answered or mitigated by the changes in the Supplementary Statement of Proposal.

2. Comments on the Rules, as currently drafted.

3. An examination of the effects of the proposed (amended) Rules on the structure of the MPOC and MDL's obligations under it.

4. An evaluation of the NZIER Cost Benefit study attached to the Supplementary Statement of Proposal.

The GIC has asked for specific responses in two areas:

1. Any comments on the Draft Rules.

2. Any comments on the NZIER cost-benefit analysis.

Section A.3, Section E and Annex 1 comment on the cost benefit analysis, while the remainder of this submission deals with the Draft Rules and their consequences. Particular attention also needs to be paid to Section B where the efficiency gains that underpin the NZIER analysis are discussed in more detail.

2.   MDL's overall view of the need for regulation

MDL remains firmly of the view that the proposed regulation of residual balancing is neither necessary nor appropriate. The system for purchasing balancing gas introduced by MDL continues in operation and evolution and the Balancing Gas Exchange (BGX) has been further upgraded to increase the level of transparency about balancing operations as well as providing better pipeline information.

The terms of MDL's operating procedures, have in the past, attracted little if any comment and in MDL's view are working in a satisfactory manner. MDL believes the proposed Rules attempt to impose operating procedures by way of the Draft Rules that are less flexible than those in place and which will add to balancing costs. The reasons why the flexibility currently allowed to the Balancing Operator is being removed arise from the "unlawful sub-delegation" problems inherent in any Regulation. To MDL this merely emphasises that Regulations are being proposed in an area where they are not appropriate.

The alleged advantages of the "unified" balancing system proposed by the Rules are illusory. There is a unified balancing system in place now in that only one party (MDL) carries out balancing actions. The problems, such as they are, relate to the recovery of balancing charges assessed against users of the Vector system. While the Draft Rules provide for increased line pack information across

the entire transmission system, it will be the line pack information in the direct balancing zone which will dictate whether balancing gas will be used or not The advantage of having additional information is largely negated by the imposition of balancing requirements based on whether a particular linepack threshold in a directly balanced zone has been crossed. In other words information about what is happening elsewhere will be of little use in determining whether a balancing action will occur or not. In any case provision of operational information should not require regulation – it is freely available for the Maui Pipeline and could be made available elsewhere too.

The allocation of balancing costs will be improved by the introduction of a back to back balancing system in place of the current provisions of the MPOC. Here again no regulation is needed because MDL has promoted a Change Request to the MPOC which will introduce a back to back system for balancing carried out on the Maui Pipeline (which in practice will cover all pipeline balancing).

The limited support for regulation is attributed principally to Vector and contractual arrangements between Vector and its customers, including both the VTC and non-code shipper contracts.Vector:

- now would prefer to remove itself from its role as a TP Welded Party and a Balancing and Peaking Pool, (BPP), trustee under the terms of the VTC. MDL understands that it prefers to do this rather than renegotiate its code and non-code access arrangements. While MDL agrees that the negotiations required may be difficult, Vector's current intention of removing itself from the contractual relationships it has accepted under the MPOC is not a reason for regulating MDL's pipeline activities.

- is unwilling to accept that it has a contractual responsibility to pay MDL for balancing charges incurred by its customers downstream of the points of connection with the Maui Pipeline unless these charges have first been paid to Vector. This has the effect of transferring the financial consequences of disputes between Vector and its customers onto MDL's balance sheet even though it is not a party to either side of the dispute. Legal means are available to resolve disputes of this type and for that reason there is no basis for using the existence of disputes as an excuse for regulating the activities of an innocent party.

- has threatened to terminate its ICA with MDL if it does not get its way with the issues mentioned above. Given the existing contractual obligations, this action could have the effect, from a contractual perspective, of placing MDL in a position where it could not transmit gas to or from Vector's customers, and in turn, potentially expose MDL to substantial liabilities if it did so. MDL is astonished that the GIC, rather than dealing with this threat at its source, is citing it as one of the reasons for regulating MDL's activities.

MDL notes that the GIC cites the differences between MDL and Vector as a reason for pushing ahead with regulation. In MDL's view this amounts to rewarding intransigent and threatening behaviour with regulations that seek to overturn existing commercial and contractual rights and obligations between MDL and Vector and Vector and its Shippers that have been freely entered into. It is an unacceptable situation.

3.   The financial benefits of regulation

A detailed examination of the NZIER cost benefit analysis relating to the introduction of the Draft Rules is contained in Section E and Annex 1 of this submission. The analysis by Infometrics shows that there are good reasons for believing that the net benefit resulting from the Draft Rules will be

zero or even negative. The positive benefits in the NZIER report result from assumptions about decreases in gas costs that do not seem to be justified by any evidence whatsoever.

4.   The consequences of regulation

The Draft Rules envisage the removal of control over residual balancing activities from the pipeline owners to an independent balancing operator. Since this now places the operation of an important aspect of the Maui Pipeline outside MDL's control, there will then need to be substantial consequential amendments of the MPOC to make those arrangements consistent with the Rules. The consequential amendments to MPOC will need to take into account the changes in the services MDL will be able to provide if the Draft Rules come into force, and to alter the obligations and liabilities that MDL will be prepared to accept given the removal of its control over pipeline balancing. See also Section D.

B.   Issues previously raised by MDL

1.   Damage to the Balancing Market

In earlier letters and submissions MDL has drawn attention to:

- The "pay when paid" provisions for purchases of balancing gas from balancing gas suppliers which are still present in the Rules: MDL has previously pointed out that this provision is likely to cause substantial damage to the operation of the market. Furthermore Rule 29.2.2 requires the "appointer" of the balancing operator, which may be the pipeline owners acting jointly or the GIC, to indemnify the balancing operator against any unrecoverable costs that cannot be recovered from pipeline users. Since these costs will be incurred by an operator acting outside its control, and possibly in relation to events that have not occurred on its pipeline, or following actions by a user with which it has no contractual relationship, MDL will have to give serious consideration as to whether it is prepared to act in the role of "appointer" of the balancing operator. In essence the Rules are requiring MDL, if an appointer, to indemnify behaviour over which it has no direct control. In addition if the GIC is the appointer of the Balancing Operator, MDL and its shippers may well be assessed charges related to the GIC's recovery of the costs of its indemnity to the Balancing Operator even though they may not be associated in any way with the events that led to the costs being incurred.

- The provisions for capping the upper and lower thresholds of the price of balancing gas: The criteria for setting these price thresholds in the Schedule to the Rules can be described as speculative at best as no-one knows the balancing gas prices that will be set during a Critical Contingency event, although it is certain that they may vary from event to event, while the marginal cost of non-production of gas is not widely known and will vary from field to field.

- The insistence on using marginal pricing for balancing gas purchases and sales by the balancing operator in circumstances where the balancing market is likely to remain illiquid with a limited number of suppliers. The argument that this provision allows hedging seems overstated as the balancing gas market will continue to be a physical market, - that is one which requires actual physical delivery of gas rather than financial settlement. As such, only the limited number of users who are able to meet the terms for physically delivering balancing gas will be able to hedge. Marginal pricing will however increase the total price the Balancing Operator pays for Call balancing gas and decrease the total revenue received for Put balancing gas, thus increasing charges for imbalance overall. MDL notes that at past

industry workshops there has been no support for marginal pricing. This view has been ignored by the GIC.

2.   The concept of TSO imbalance

Pipeline owners are still required to use reasonable endeavours to balance to the target linepack within each balancing zone after allowance has been made for all other users' imbalances in that part of the transmission system. If TSO imbalance is recorded, it must be returned to zero. As MDL has pointed out before, the implications of this requirement are far-reaching:

- An assessment of the degree of TSO imbalance is required, presumably at least daily although it will vary during the day.

- In turn, this assessment requires the TSO to know or estimate the total user imbalance for each pipeline zone at the time at which the TSO imbalance is assessed. In the case of the Maui Pipeline this information is available as the sum of Operational Imbalances for the Welded Points, plus Shipper Mismatch, if any. If a midnight measurement point is used, it is not available until early the following day. The TSO is then required to buy or sell gas from the pipeline to return the TSO imbalance to zero.

- There are substantial random errors that occur when this calculation is made for the Maui Pipeline. Because this calculation is subject to all the errors in all Welded Point meters plus the error inherent in linepack measurements, experience shows that the TSO imbalance cannot be calculated consistently within a range of plus or minus 5TJ. A requirement to keep the TSO imbalance to the precise level calculated each day will result in excessive sale and purchase of gas by the TSO, essentially to match the random error in the measurement. If a balancing action occurs on the day the TSO might also be allocated some balancing charges, even though its perceived imbalance resulted from random measurement error which might be reversed the following day. The 5TJ error is substantial in size compared with the size of balancing actions that are normally taken and can be expected to have a significant effect on balancing gas cost allocations.

- The schedule to the Rules requires the target linepack to be set midway between the upper and lower line pack bounds used for balancing. This requirement does not take into account normal Maui pipeline operating practice, which allows the target linepack to adjust as the flow rate scheduled through the pipeline alters. (Higher linepack levels are generally needed to support higher flow rates). The proposed Rules require the TSO to balance to a fixed target linepack which does not alter with flow rate once allowance has been made for other users' imbalance. Rather than adding certainty, this requirement reduces the ability of pipeline owners to meet changing circumstances and at high flow rates it may affect pipeline capacity. At the very least, it will make the development of a realistic Balancing Plan considerably more difficult.

- Potentially there will be three different parties adding or removing gas from the Transmission System rather than one as at present. Two TSOs may be involved in meeting TSO imbalance requirements and the Balancing Operator will be attempting to balance to particular linepack thresholds. There will be occasions when the actions of these different parties may conflict. This is unlikely to lead to an efficient outcome.

3.   Flexibility allowed to the balancing operator

In previous submissions, MDL has argued that by requiring the Balancing Operator to purchase or sell balancing gas when fixed linepack levels are reached, but not before, the proposed Rules introduced an element on inflexibility into the operations of the Balancing Operator. This could result in balancing gas purchases that are:

- Too late, when the situation on the pipeline had clearly deteriorated but the linepack limits had not been reached; or

- Unnecessary, when the linepack limit had been exceeded but the situation on the pipeline would right itself without intervention by the Balancing Operator.

Removal of any element of human judgement from the balancing decision making process could lead to both increased balancing gas costs and increased risk of curtailment. Furthermore, the requirement to balance back to the threshold seems to determine the amount of balancing gas to be purchased, irrespective of pipeline behaviour and conditions.

The amendments to Rule 15 in the latest set of Rules do allow some extra flexibility. Some exercise of the Balancing Operator's discretion is allowed as the balancing threshold is approached and the amount of gas purchased is now required to be enough to return the linepack to or close to the threshold in the Balancing Operator's opinion. Although this represents an improvement on the previous draft, situations where the linepack will return to a point within the threshold without balancing action being taken are still not allowed for. In fact once linepack goes outside the threshold, the Balancing Operator seems to be required to continue buying or selling balancing gas until conditions can return within the threshold, or until balancing gas supplies run out. MDL has pointed out in the past that there are situations where purchase of significant quantities of balancing gas at high cost will only delay the inevitable curtailment actions by 5 or 10 minutes.

MDL understands the problems that can arise from unlawful sub-delegation where regulations are being applied to an area that normally involves a significant degree of on the spot judgement and discretion. However, these difficulties indicate that regulation is being applied to an area where it is inappropriate.

4.   Advantages of a unified system

The GIC places considerable emphasis on the additional advantages and efficiencies that it considers will arise from the introduction of a unified balancing system. The elements of the system proposed in the Rules are:

- The apparent splitting both the Vector and Maui pipeline systems into separate balancing zones that are either directly or indirectly managed.

- Balancing gas is purchased only for the directly managed zones with the balancing operator taking any actions specified in the balancing plan to manage indirectly balanced zones.

- Directly managed zones are balanced on the basis of their linepack and the linepack thresholds specified for them in the balancing plan.

- The balancing plan is determined either by the TSOs acting jointly, or failing that by the GIC.

It is difficult to see how this system will be more efficient than the system that is in place now. Balancing gas purchase now is carried out by a single operator working under a single set of instructions. The effect of the adoption of balancing zones is difficult to assess because it relies on a balancing plan that is still to be decided. However the zone allocation in itself is unlikely to improve efficiency.

Under the proposed Rules the Balancing Operator may have access to better information on flow rates at points outside the Maui Pipeline. However this will be of limited use for two reasons:

- The additional information will be metered quantity information which is of limited use for balancing purposes, unless it can be matched with scheduled quantities (gas orders) to generate an estimate of operational imbalance which can be taken into account in predicting linepack behaviour.

- The ability to utilise the information depends on the degree of discretion allowed to the Balancing Operator. Specific provisions in the Rules restrict this.

MDL's view is that there are no advantages in terms of either reduced costs and/or increased efficiency resulting from the unified system outlined in the proposed Rules when compared with current processes for buying, selling and using balancing gas. The advantages of extra information are offset by the reduction in flexibility available to the Balancing Operator and therefore the ability to use it, while flow data on its own is of limited use in assessing operational imbalance trends.

At least initially, the only real-time information about operational imbalance will come from the points where it always has – from the scheduled and metered quantities of Maui Pipeline Welded Points. If all major interconnection points on both pipelines had real-time metering and were required to nominate gas flows, a better comparison between scheduled and metered quantities would be possible. However this is not proposed in the Rules.

5. Duplication of costs

Aside from their obligations regarding TSO imbalance, TSOs may still be required to curtail, or even offer substitute balancing services, in circumstances where the Balancing Operator is unable to supply balancing gas. This is likely to require each TSO to remain in a position to provide these services continuously and at short notice. In some circumstances action supplementary to the Balancing Operator's efforts, such as curtailment, may be required with little warning. The extra interface imposed by having a Balancing Operator solely responsible for residual balancing is likely to make coordination more difficult. The requirement to maintain the capacity to react in two places, instead of one, will add to overall costs.

6. A demand driven system?

It is often argued that gas flows on the Vector transmission system are driven by demand and that operational imbalances are somehow an artifact of the OBA allocation system used by the Maui Pipeline. It seems to MDL that this argument is a legacy from the days when gas from the Maui Pipeline was supplied under the Maui Gas Contract, which has now expired. Since Open Access began on the Maui Pipeline, gas entering the Maui Pipeline at its receipt points is only supplied where it has been nominated by a Shipper. End users may request Shippers to supply too much or too little gas for their demand on the day and some may seek to avoid paying any extra charges for doing so. Recent audits of some downstream allocations provide illuminating examples of this behaviour. Nevertheless, the only feedback mechanism for matching the gas entering the pipeline

system to the demand for gas on the day is the requirement for end users to match their purchases to their demand.

Arguments in favour of weakening the requirement to match gas purchases into the pipeline system with end user demand on the grounds that the system should be "demand driven" are both illogical and irresponsible.

7.   Efficiency Gains

The cost benefit analysis in the GIC Statement of Proposal assumes that there are substantial efficiency gains arising from a reduced cost of balancing that will occur if the Rules are introduced. MDLdoubts this assumption can be grounded in fact, given that:

- The details of the Balancing Plan to be prepared under the Rules are not known.

- The 'pay when paid' provisions for buying balancing gas are likely to increase balancing gas prices.

- Similarly, the introduction of marginal pricing will increase overall balancing gas costs.

- The flexibility allowed to the Balancing Operator to take actions that might reduce costs has been reduced.

- The introduction of a "unified" system provides little real advantage over that is operating and evolving at present.

As noted previously, MDL considers that the changes proposed in the Draft Rules are likely to increase, rather than decrease, balancing gas costs. MDL also notes that claims of savings or efficiencies resulting from the Rules that total more than $6 million lack any credibility as the savings claimed are more than the total amount currently being spent on balancing.

8.   Effect on User Behaviour

We note that under the Rules the obligation of a pipeline user to balance is only a "reasonable endeavours" obligation to balance or return to a balanced position. A user may be allocated balancing gas if a balancing action occurs, but if there is no balancing action because balancing gas is not available, or is not available within the price cap, then there is no charge or penalty associated with imbalance.

C.   The Proposed Rules

A key point about the proposed Rules is that they remove the Balancing Agent function currently administered by MDL and give it to an independent Balancing Operator. This clearly reduces MDL's obligations as a TSO, as it will no longer have control over the residual balancing function.

The revisions to the Rules help clarify their intent and certainly make them easier to follow. On the other hand, many of the issues raised by MDL in earlier submissions, at workshops and in subsequent correspondence have not been addressed in the revised Rules. The items set out below principally cover matters that have changed with the revision of the draft Rules. We have not repeated every point MDL has made in the past even though many of the concerns expressed earlier remain.

Purpose Statement

We note that the purpose is now the efficient, unified management of imbalance in the transmission system. However, the draft Rules also make it clear that the transmission system will be split into zones each of which will be balanced either directly or indirectly. In this regard there will be at least one directly managed zone which will be managed by the buying and selling of balancing gas. The other indirectly managed zones will have to be balanced by transferring gas into or out of the directly managed zone. The concept of balance in an indirectly managed zone will be difficult to administer as only "flow" rather than "imbalance information" will be immediately available for interconnected points[1]. As a result it is difficult to see what advantages the proposed "unification" has over the current system.

Obligation to Balance

This applies to TSOs in respect of each zone on their pipeline. It has significant adverse operational implications[2]. The provision for setting the target linepack in the Schedule to the Rules adds a further unnecessary degree of inflexibility to the process.

In MDL's view, the obligation of a TSO should only be to balance within a specified band of linepack values either side of the target linepack and only then over a specified period[3].

Compressor Operation Policy

TSOs are required to publish their compressor operation policy and presumably follow it once it is published. Pressure to conform to a fixed policy will make it difficult to combine compressor operation with balancing activities as is the case at present thus adding further inefficiency.

Definition of Target Linepack

The requirement that target linepack should be midway between the upper and lower balancing thresholds should be removed from the Schedule to the Draft Rules[4]. The method for setting Target Linepack should be a part of the requirements for the Balancing Plan.

Limitations on Balancing Plan

MDL is concerned that provisions of the Balancing Plan should not be able to affect:
- Metering or measurement.
- Allocation using OBA principles.
- Gas specification.
- Behaviour, other than as a Reasonable and Prudent Operator.

D. Consequential Adjustments to the MPOC

The introduction of the proposed Rules will affect the obligations MDL can assume under the MPOC. The Balancing Operator may be appointed by the TSOs acting jointly[5] or it may be appointed by the GIC[6]. The Balancing Plan may be developed by the TSOs acting jointly, or it may

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[1] See Section B.4
[2] See Sections B.2 and B.3
[3] See Section B.2
[4] See Section B.2
[5] Draft Gas Governance (Balancing) Rules Part 3, Subpart 2
[6] Draft Gas Governance (Balancing) Rules Part 3, Subpart 3

be put in place by the GIC. In either case it may be subject to a lengthy process of consultation and approval by the GIC before it can be implemented and the final Balancing Plan may contain provisions that have not been agreed by either or both of the TSOs. Once appointed, the Balancing Operator is required to carry out its functions at arm's length from either of the TSOs[7].

As noted in MDL's earlier submissions, it is clear that MDL's ability to control the operation of its own pipeline will be severely compromised as a consequence. Substantial changes to the MPOC will therefore be necessary to make clear the obligations that MDL will continue to perform in respect of pipeline users and those it will no longer be able to perform.

E.   Cost Benefit Analysis

MDL has commissioned Infometrics to provide some further analysis of the NZIER cost benefit scenarios included in the GIC's revised Statement of Proposal. A report from Infometrics is attached at Annex 1. Briefly stated, the conclusions are:

- The costs of the various scenarios, while uncertain, are unlikely to have a major effect on the overall conclusions of the cost benefit analysis.

- The case for the proposed Balancing Rules rests entirely on the arbitrary assumption that it will deliver greater efficiency gains than the Code Change scenario. This is assumed, but has not been proven. MDL's own analysis suggests the reverse[8].

- If we assume a $1 million balancing gas cost saving, which MDL regards as an ambitious target given that expenditure is around $4.5 million, and no difference in efficiency gains, the Optimistic case shows less net benefit than the Code Change case.

- After taking an overall view of all scenarios considered, the case for the Balancing Rules requires much more evidence before a departure from the Code Change process can be considered.

MDL's view is that the GIC's cost benefit case for the proposed Rules is deeply flawed in that it relies on an assumption of efficiency gains resulting from the Rules that exceed current balancing costs. If this assumption is removed there is no apparent benefit in proceeding with the Rules.

F.   Summary

MDL has previously pointed out that the implementation of the Rules in their current form will cause unnecessary operational problems. No attention has been paid to this advice. The advantages cited for the Rules are at best illusory and the cost benefit case does not support their implementation once the unsupportable assumptions about the benefits they will bring are stripped out. There seems to be a reckless determination to press ahead with the Rules even though better courses of action that target real problems are available.

Over the last 30 years MDL has taken its responsibilities as a pipeline owner seriously but it is unwilling to accept responsibility for operating decisions, costs and indemnities caused by entities that it cannot control. It will be seeking to have any such obligations removed if the Rules are adopted.

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[7] Draft Gas Governance (Balancing) Rules Rule 14.
[8] See Section B.7 above.

Review of
Proposed Balancing Rules Cost-Benefit Analysis (by NZIER)

for
Maui Development Ltd.

Prepared by Infometrics

22 April 2010

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1.   SUMMARY

This paper looks at the robustness of the conclusions drawn by NZIER in its cost-benefit report of 31 March 2010 on proposed rules for gas transmission pipeline balancing.[1]

The first part of the paper is purely mathematical in the sense that Infometrics is not in a position to supply expert opinion on the possible cost and benefits of one balancing scheme over another. We examine the robustness of the results in relation to changes in assumptions about increases in economic efficiency under the various scenarios. We then use Monte Carlo analysis to investigate the sensitivity of results to changes in relative costs.

The results show that costs of the various scenarios, while uncertain, are unlikely to have a major effect on the overall outcomes. The case for the Proposed Balancing Rules rests entirely on it delivering greater efficiency gains than the Code Change scenario, which has not been established.

However, if the Code Change scenario proves unsuccessful and degenerates into the ICD-MOU scenario, the pressure on the Proposed Balancing Rules option to deliver relatively greater efficiency gains is substantially alleviated. The options are then finely balanced.

The second part of the paper applies the NZIER model to MDL's assessment of how much productive efficiency might actually improve, whatever balancing scenario applies.

This analysis further undermines the case for the Proposed Balancing Rules, even if the Code Change scenario has no chance of occurring. The case for the Proposed Balancing Rules scenario is so critically dependent on it delivering efficiency gains that exceed those which could occur under the baseline scenarios, that more evidence is required from the advocates of the Proposed Balancing Rules before departure from the current Code Change path is merited, even if the Code Change path collapses and the ICD-MOU scenario eventuates.

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[1] NZIER (200): *Proposed balancing rules cost-benefit analysis*. Report to Gas Industry Co., 31 March.

2. ROBUSTNESS OF GIC PROPOSAL

Optimistic Scenario

Efficiency Analysis

It is clear that the results of the optimistic scenarios are driven by the benefits, and that these in turn are driven largely by the productive efficiency gains. Productive efficiency gains in the optimistic scenario are assumed to be twice as high as in the two baseline scenarios (price reductions of 0.5% v 0.25%) as well as materialising more quickly. This timing difference disadvantages the baseline options by a further 20-40% in terms of the measured benefit.

While the sensitivity analysis of larger and smaller increases in productive efficiency is commendable, the results are still undermined by two key assumptions:

1. The relativity between scenarios is held constant, so the optimistic scenario always has greater efficiency gains.

2. The central values of 0.5% and 0.25% are arbitrary.

While better balancing arrangements would produce efficiency gains – indeed it is almost a tautology; as discussed in the submission by MDL, it is by no means clear that the Proposed Balancing Rules under the Optimistic scenario would deliver an improvement over the Code Change (CC) baseline.

In the analysis below we adopt no absolute change in efficiency and no relative change in efficiency as the default option. We then look at six combinations of improvements in efficiency that lead to price changes of 0.25% and 0.5%. In all scenarios we assume the same rate of change over time, except that the implementation of ICD-MOU baseline is delayed (as in the NZIER analysis). The assumed price changes also apply to allocative efficiency. The results are shown in Table 1 and Figure 1.
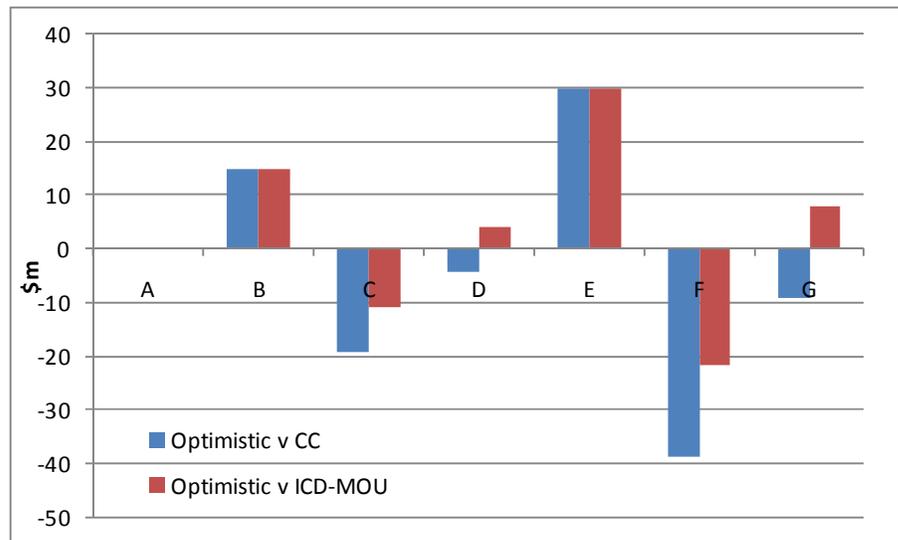
Table 1: Sensitivity Tests with Regard to Efficiency

	Optimistic	CC & ICD-MOU	Optimistic v CC	Optimistic v ICD-MOU	Optimistic v CC	Optimistic v ICD-MOU
	Price Reduction %		PV Benefits		NPV	
A	0	0	0.112	0.125	-1.877	-1.009
B	0.25	0	14.918	14.931	12.929	13.797
C	0	0.25	-19.263	-10.774	-21.252	-11.908
D	0.25	0.25	-4.457	4.032	-6.446	2.898
E	0.50	0	29.728	29.741	27.740	28.608
F	0	0.50	-38.643	-21.675	-40.632	-22.809
G	0.50	0.50	-9.027	7.941	-11.016	6.807
	Means		-4.439	4.054	-6.759	2.731
	NZIER 'replication'		19.191	22.404	17.204	21.272

Note that due to our inability to exactly replicate the Cost values in Table 3 of the NZIER report all NPVs below are understated by about $0.189m. This is not material to the analysis.

Figure 1: Sensitivity Tests with Regard to Efficiency (PV of Benefits)

The mean values in Table 1 are unweighted, giving each scenario equal probability which, without more information, appears to be the only sensible option. The results are interesting:

1. They are extremely sensitive to the efficiency parameters.

2. The greater the efficiency improvement, the smaller the advantage of the Optimistic scenario over the CC scenario, but the larger its advantage over the ICD-MOU scenario.

3. The results are not symmetric in the sense that a given increment in efficiency assists the CC scenario more than it assists the Optimistic scenario. However, it assists the Optimistic scenario more than it assists the ICD-MOU scenario.

4. The mean NPV across all tests is negative when comparing Optimistic against CC, and slightly positive when comparing Optimistic against ICD-MOU.

One is forced to infer that the case for the Proposed Balancing Rules scenario (Optimistic scenario) is too dependent on it generating uncertain efficiency improvements over the CC baseline for it to be recommended as the way forward. When assessed against the ICD-MOU scenario the case for the Proposed Balancing Rules is stronger, although hardly convincing.

Combining these inferences would suggest that the industry's effort should be directed into making the CC scenario work, rather than be faced with the prospect of the ICD-MOU scenario. Only if the latter is unavoidable is there a case for the Proposed Balancing Rules and even then the expected gain is very marginal.

Because of the closeness of the results it is possible that the cost side of the equation has more weight than when comparing the Optimistic and CC scenarios. Hence we examine the influence of costs on the relative attractiveness of the Optimistic proposed balancing rules scenario versus ICD-MOU scenario. For this purpose we use Monte Carlo sensitivity analysis.

Monte Carlo Analysis of Costs

In the ICD-MOU scenario there are two types of costs while in the Optimistic scenario there are five, as shown below.

Table 2: Scenario Costs

ICD-MOU Scenario	Optimistic Scenario
<u>Capital</u> Prepare, agree, and establish initial balancing plan and required changes to codes, IT systems, business processes and contracts	<u>Capital</u> Prepare, agree, and establish initial balancing plan and required changes to codes, IT systems, business processes and contracts
	<u>Capital</u> Establish single balancing operator <u>Opex</u> Support balancing operators functions <u>Opex</u> Oversee and monitor balancing operator and balancing market
<u>Opex</u> Prepare agree and establish future amendments to balancing plan and any associated changes to codes, IT systems, business processes and contacts	<u>Opex</u> Prepare agree and establish future amendments to balancing plan and any associated changes to codes, IT systems, business processes and contacts

For each parameter we assume a triangular distribution and, based on the sensitivity analysis in the NZIER report, assume a minimum to maximum range of ±25%. Each parameter value is independent of any other. So for example, operational costs are not a set proportion of capital costs as in the original calculations. This could be altered.

Figure 2 shows the distribution of values for the present value of costs under the Optimistic scenario less those under the ICD-MOU scenario, for 10,000 simulations. The reference value in the NZIER report is $1.323m, but note that our reference value is $1.134m.

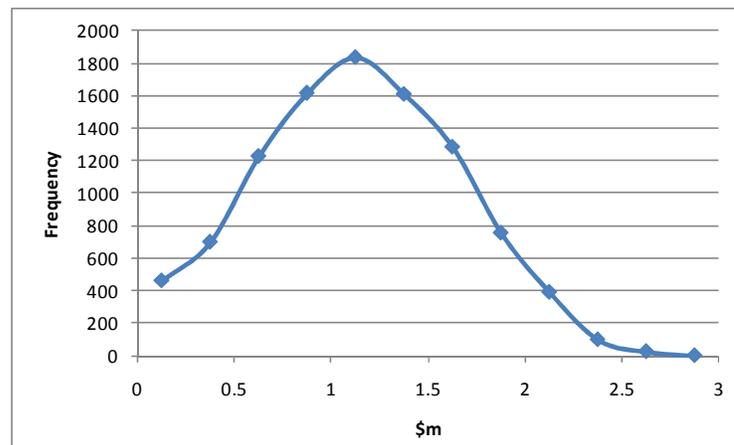Mean: $1.138m

Standard deviation: $0.523m

Figure 2 is graduated in bands of $0.25m, with the x-axis labels at band mid-points. Not surprisingly the modal band is $1.0-1.25m, which encompasses the reference value. Cost differences of over $2.5m are rare.

The results imply that unless the relative costs of the Optimistic scenario are grossly understated, the attractiveness of the Optimistic scenario when compared against the ICD-MOU scenario is most unlikely to be affected by errors on the cost side of the equation. In other words, there is no escaping the critical role of relative efficiency changes.

This places the onus of proof squarely on the proponents of the Proposed Balancing Rules to demonstrate that efficiency gains will be larger than under the two baseline scenarios.

Figure 2: Distribution of Difference in PV of Costs (Optimistic Scenario less ICD-MOU Scenario)

Pessimistic Scenario

So far we have said nothing about the Pessimistic scenario for the Proposed Balancing Rules. In the NZIER analysis the results for the Pessimistic scenario are driven largely by the assumption that efficiency improvements are the same as in the two baseline scenarios (albeit that the latter are still disadvantaged by a slower phase in). Thus we can infer the robustness of the case for the Pessimistic scenario simply by looking at the results of tests A, D and G in Table 1.

It is clear that if the case for the Optimistic scenario over the CC scenario is comprehensively undermined by uncertainty about efficiency gains, the case for the Pessimistic scenario which has much lower efficiency gains and also somewhat higher costs is totally vacuous.

When compared against the ICD-MOU scenario, the Pessimistic scenario looks stronger, but by definition cannot be better than the case for the Optimistic scenario.

Conclusion

Accordingly the three main conclusions one must draw are:

1. The costs of the various scenarios, while uncertain, are unlikely to have a major effect on the overall outcomes.

2. The case for the Proposed Balancing Rules rests entirely on it delivering greater efficiency gains than the Code Change scenario.

3. However, if the Code Change scenario proves unsuccessful and degenerates into the ICD-MOU scenario, the pressure on the Proposed Balancing Rules option to deliver relatively greater efficiency gains is substantially alleviated. The options are then finely balanced.

Hence from this point forward, those in favour of the Proposed Balancing Rules need to clearly demonstrate that it will deliver greater efficiency gains while those in favour of the Code Change scenario need to expedite the process and ensure it does morph onto the ICD-MOU scenario.

In the next section we examine the effects of efficiency gains that MDL consider to be more realistic, though still difficult to achieve.

3. MDL ESTIMATES

MDL in their response to the GIC note that balancing costs are currently running at approximately $4.5m per annum, down from around $20m in 2007 and 2008. MDL estimate that perhaps another $1m could be saved although this would be ambitious.

We examine the effects of $1m of production efficiency benefits (with corresponding allocative efficiency benefits) in all combinations of the two Proposed Balancing Rules scenarios against the two baseline scenarios. The results are shown in Table 3.

Table 3: Sensitivity Tests with $1m Efficiency Gain

	Optimistic	CC & ICD-MOU	Optimistic v CC	Optimistic v ICD-MOU	Optimistic v CC	Optimistic v ICD-MOU
	Efficiency Gain $m		PV Benefits		NPV	
A	0	0	0.112	0.125	-1.877	-1.009
H	$1m	0	5.047	5.060	3.058	3.926
I	0	$1m	-6.346	-3.508	-8.335	-4.642
J	$1m	$1m	-1.411	1.427	-3.400	0.293
	Pessimistic	CC & ICD-MOU	Pessimistic v CC	Pessimistic v ICD-MOU	Pessimistic v CC	Pessimistic v ICD-MOU
K	0	0	-0.001	0.012	-3.996	-3.128
L	$1m	0	3.632	3.645	-0.363	0.505
M	0	$1m	-6.459	-3.620	-10.453	-6.760
N	$1m	$1m	-2.826	0.013	-6.821	-3.128

The following features are notable:

1. Of the eight situations when there is no difference in efficiency gains (two each for A, J, K, N), only one shows a net benefit in favour of the Proposed Balancing Rules. This is in the Optimistic Scenario relative to the ICD-MOU scenario. Even then the NPV is only $0.293m.

2. If the Proposed Balancing Rules lead to efficiency gains, but the baseline options do not (tests H and L), the former lead in three out of four cases, but the case for the Pessimistic scenario is not strong.

3. If the baseline options lead to efficiency gains, but the Proposed Balancing Rules do not (tests I and M), the baseline options lead in all four cases, and by a sizeable margin.

Thus if one was to weight the probability of each scenario equally, the Proposed Balancing Rules look too risky. The mean NPV is $-2.9m.

Even if the Code Change scenario had no chance of eventuating, the mean NPV of the Proposed Balancing Rules scenarios relative to the ICD-MOU scenario is negative at $-1.7m.