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

July 2010

GAS INDUSTRY COMPANY LIMITED

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About Gas Industry Co.

Gas Industry Co was formed to be the co-regulator under the Gas Act.

Its role is to:

- recommend arrangements, including rules and regulations where appropriate, which improve:
  - the operation of gas markets;
  - access to infrastructure; and
  - consumer outcomes;
- administer, oversee compliance with, and review such arrangements; and
- report regularly to the Minister of Energy and Resources on the performance and present state of the New Zealand gas industry, and the achievement of Government's policy objectives for the gas sector.

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1 Introduction

1.1 Background

On 1 April 2010, Gas Industry Co issued the *Transmission Pipeline Balancing Supplement to the October 2009 Statement of Proposal* (Supplement to the SOP). The Supplement to the SOP contained:

- an update on developments since the Statement of Proposal;
- a description of key changes made to the Draft Gas Governance (Balancing) Rules (Draft Rules) following further industry discussions (including a copy of the Draft Rules);
- implementation plans for the Draft Rules determined with industry input; and
- a quantitative cost-benefit analysis of the Draft Rules.

The paper stated that the next step, after considering submissions on the paper, is to make a formal recommendation to the Associate Minister of Energy and Resources (Associate Minister).

Eight submissions on the Supplement to the SOP were received on 27 April 2010. On 30 April 2010, the Independent Director's Subcommittee (IDS) of Gas Industry Co's Board convened. The purpose of the meeting was to consider the submissions and determine whether to recommend that the Associate Minister makes rules for transmission pipeline balancing. The IDS determined that, before making a recommendation, the Company should complete an analysis of the submissions.

Shortly after the IDS meeting, Gas Industry Co received a cross-submission from one party and invited others to make cross-submissions. Three cross-submissions were received, and are included in this analysis.

1.2 Submissions received

Submissions on the Supplement to the SOP were received from:

- Contact Energy Limited (Contact);
- Genesis Energy Limited (Genesis);
- Greymouth Gas Limited (Greymouth);

- Maui Development Limited (MDL);
- Methanex New Zealand Limited (Methanex);
- Mighty River Power Limited (MRP);
- Nova Gas Limited (Nova);
- On Gas Limited, Vector Gas Contracts Limited, and Vector Gas Limited (Vector).

Cross-submissions were received from:

- MDL;
- Nova; and
- Vector.

All submissions and cross-submissions are available on Gas Industry Co's website www.gasindustry.co.nz.

Gas Industry Co thanks those involved in preparing these submissions.

1.3 Structure of this paper

The Supplement to the SOP presented two specific questions, one on the balancing rules, and the other on the cost-benefit analysis. Submitters' responses to these two questions and Gas Industry Co's analysis are in sections 2 and 3.

Gas Industry Co received several comments indirectly related to the two questions in the paper, including comments on policy and process. These comments are discussed and analysed in section 4.

2 The Draft Gas Governance (Balancing) Rules

2.1 The Supplement to the SOP

In the Supplement to the SOP, Gas Industry Co provided an updated version of the Draft Rules. The Draft Rules had been refined as a result of:

- submissions received in the formal consultation on the SOP;
- additional feedback from:
  - the industry workshops,
  - written comments received after the workshops; and
- our own work to identify improvements.

The paper outlined the key issues raised by industry participants on the Draft Rules and Gas Industry Co's response. We that noted none of the key issues or consequent changes to the Draft Rules affected the overall proposal to a degree requiring Gas Industry Co to reissue the SOP. The changes clarified policy already described within the SOP, or clarified intent.

Appendix D of the paper provided a summary of the amendments made to the Draft Rules.

The Supplement to the SOP asked for comments on the Draft Rules. Most submissions discuss specific aspects of the Rules and suggest improvements to wording. These comments and Gas Industry Co's response are discussed in this section.

MDL's submission makes extensive comment on the broader implications of the Rules for the operation of the gas market. In its submission, MDL notes the revisions to the Draft Rules help clarify their intent and make them easier to follow. However, MDL believes many of the issues it has raised in past submissions and at workshops have not been resolved.

Vector included in its submission a copy of the Draft Rules marked up with suggested changes and comments.

2.2 Purpose statement

Submissions

Table 1 Submissions on the purpose statement

	Submission
Greymouth	The change to the purpose statement has made it more complex. The change implies the arrangement now needs to be *actively* managed and that the *aggregate* imbalance, rather than imbalance will be managed. This shift means the arrangement is no longer a 'back-stop' and TSOs may have to outsource more functions to manage imbalance.
MDL	It is difficult to see what advantages 'unification' will have over the current system.

Gas Industry Co response

Several industry participants expressed concerned that the purpose statement was too high-level to be useful and as a result we simplified it by removing the word 'arrangement'. Therefore we do not agree that the change has made the statement more complex. We believe the current drafting of the purpose statement accurately reflects the regulatory purpose of the rules—that is, to manage aggregate pipeline imbalance. In the Supplement to the SOP, we noted that:

> the purpose statement is important because it is a useful aid for resolving different interpretations of the rules. It is not intended to be detailed or prescriptive.

We do not consider the concerns Greymouth has can arise from the purpose statement alone.

In response to MDL, Gas Industry Co considers it has sufficiently argued the need for, and the advantages of, a unified system in earlier consultation papers. The current system is unified in the sense that all balancing actions are taken by one party, but the contractual alignment is not in place.

2.3 Approval process for the balancing plan

Submissions

Table 2 Submissions on the approval process for the balancing plan

	Submission
Greymouth	Rule 32 appears to contain a drafting error, because it is the 'draft' balancing plan that is considered for approval. The amendment to rule 32.1.2(a), requiring the balancing plan to assist in meeting the purpose of the rules changes the emphasis. What is the reference point for assessing the draft balancing plan—the status quo, or the most recent draft balancing plan? (Gas Industry Co confirmed to Greymouth the reference is the status quo.) The move to aggregate imbalance in the purpose statement implies the balancing plan must have regard only to the overall picture and not individual users. (Gas Industry Co

	Submission
	confirmed to Greymouth the industry body would continue to have regard for the right mix of tools and penalties when approving the balancing plan and not just whether it was better for the industry as a whole or not.) The important consideration is section 43ZN(b)(v) of the Gas Act, '*delivered gas costs and prices are subject to sustained downward pressure*'.
MRP	Under the industry body appointment model, the requirement should be to consult with 'transmission system owners, users, and other persons' (rule 45.1.2).
Vector	The industry body should be required to approve a balancing plan if it assists in meeting the purpose of the rules (rather than the industry body having discretion). If the industry body writes the balancing plan it should be required to do so in conjunction with the TSOs. The balancing plan should not be allowed to go-live until transmission system arrangements, IT systems, and business processes are consistent with it. The obligation on TSOs to appoint a Balancing Operator and agree a balancing plan should be spilt so one is not conditional on the other.

Gas Industry Co response

We have amended the drafting error notified by Greymouth. In response to Greymouth's concerns regarding the balancing plan approval, we note that when the industry body considers a balancing plan for approval, it must take into account the overall efficiency of the plan. This includes having regard to the incentives on individual users, physical constraints of the pipeline, and the information available for allocation. The overall costs and benefits of the plan will also be considered. We believe this requirement is consistent with section 43ZN(b)(v) of the Gas Act.

MRP suggests a revision to draft rule 45.1.2 to specify that the industry body should be required to consult with TSOs, users, and other persons. Gas Industry Co considers users are covered in the rule, as it states: '…**any other persons** that the industry body considers are representative of the interests of persons likely to be substantially affected…'. Therefore we do not believe a change is necessary.

We acknowledge Vector's concerns that if the industry body writes the balancing plan it should do so in conjunction with the TSOs. We have added a new rule (45.1.1) requiring the industry body to consult with the TSOs on its draft balancing plan before consulting the industry.

We do not believe it is good policy that disagreements over transmission system arrangements can delay the balancing plan. Provision of a dead-lock breaking mechanism is a core outcome for the proposed rules. However, we acknowledge the potential need for more time to adapt IT systems and business processes. The Draft Rules now allow more time to go live if needed.

If implementing the first balancing plan requires an extended time, we believe the Draft Rules are sufficiently flexible to allow this. The balancing plan itself can include a transitional plan or provide for the plan be implemented in stages (see rule 32.3); or the industry can implement change, as it becomes ready, by proposing amendments to the balancing plan.

2.4 Approval process for amendments

Submissions

Table 3 Submissions on the approval process for balancing plan amendments

	Submission
Genesis	Several issues with the Draft Rules need to be resolved to ensure governance is robust. • The industry body should be required to document its reasons for declining to propose balancing plan amendments to the approved balancing plan. This requirement would improve Gas Industry Co's role as gatekeeper for changes to the balancing plan. • As a significant stakeholder, the Balancing Operator should be able to propose balancing plan amendments. • To prevent stalling under the TSO model, the rules should include a dead-lock breaking mechanism to ensure amendments beneficial to the industry are implemented.
MRP	TSOs should be required to make any changes proposed by the industry body (rule 39.2.3); that is, they should not have discretion. Rather than requiring TSOs to submit amendments to the industry body's balancing plan together, TSOs should be able to submit them individually (after consulting with the other). A TSO should be able to veto the other's amendment (rule 46.2.1).

Gas Industry Co response

Gas Industry Co agrees with Genesis that our role as 'gatekeeper' is important and reasons for declining proposed balancing plan amendments should be transparent. We have amended the rules to reflect this (new rule 40.3.2).

We understand Genesis' view that the Balancing Operator should be able to submit balancing plan amendments. But we think it is unnecessary because the Balancing Operator will be a service provider or agent for either the TSOs or the industry body. Therefore the Balancing Operator would first discuss changes with its contract counter-party.

We agree with Genesis that a dead-lock breaking mechanism is needed to ensure beneficial amendments are made. We have amended the rules accordingly (new rules 42.4 and 43.1.2(b)).

We note MRP's view that TSOs should be required to make any change proposed by the industry body. However, we consider that consultation should be required regardless of who is proposing the change. Consultation will bring out any unforeseen issues that may result from the proposed change.

MRP suggests an individual TSO should be able to submit amendments to the industry body's balancing plan (after consulting with the other TSO). In their view, a TSO should also be able to veto the other's amendments. We believe it would be inefficient to allow this, given the purpose is to achieve 'unification'.

2.5 Industry body role

Submissions

Table 4 Submissions on the role of the industry body

	Submission
Vector	While Vector supports the Draft Rules, it still has several concerns about the detail. It continues to believe it is more appropriate for the industry body than the TSOs, under both subparts, to: • appoint the Balancing Operator; and • levy users directly for the costs and liabilities associated with the Balancing Operator (irrespective of the appointer).

Gas Industry Co response

Gas Industry Co has considered Vector's view that the industry body should appoint the Balancing Operator and levy costs directly on users, under both models. Gas Industry Co notes we identified the participative regulation model as the best option after consultation and careful consideration. Under this option the TSOs agree the balancing plan and appoint the Balancing Operator; and the industry body approves the plan after assessing it against the purpose of the rules. This process involves minimum intervention and maximum flexibility. However, the provision allowing the industry body to determine the balancing plan and appoint the Balancing Operator is an alternative if the TSOs are unable to agree these matters.

2.6 Marginal pricing

Submissions

Table 5 Submissions on marginal pricing

	Submission
MDL	Gas Industry Co insists on using marginal pricing despite the industry's view it should not be used. Marginal pricing will 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.
MRP	Requests clarification of Gas Industry Co's decision to apply weighted average prices for the clearing price definition because it appears to contradict rules 16.4.3 and 16.5.3 (which relate to the marginal clearing price of balancing gas bought/sold though the balancing market).

Gas Industry Co response

Throughout this review, Gas Industry Co has carefully considered marginal pricing versus weighted average pricing. We remain of the view that marginal pricing is likely to be the most efficient outcome consistent with the Gas Act objectives. However, it is important to note the Draft Rules provide for weighted average pricing under rule 17 if transactions on the balancing market under normal terms and conditions are not meeting the purpose of the Draft Rules.

2.7 'Pay when paid' provisions

Submissions

Table 6 Submissions on 'pay when paid' provisions

	Submission
MDL	The 'pay when paid' provisions are likely to cause substantial damage to the operation of the balancing market.
MRP	The provision restricting the payment for gas purchased to the monies the Balancing Operator has received in the preceding month deters potential sellers from participating in the balancing market (rule 22.4.2).

Gas Industry Co response

In response to concerns about risk raised in previous submissions, Gas Industry Co initially proposed an amendment to the Draft Rules so the Balancing Operator:

- may use a 'pay when paid' provision in the terms for provision of call balancing gas; and
- must 'pay when paid' the relevant cash-out user for put balancing gas.

However, after consultation with the industry, the latest draft is silent on 'pay when paid' terms for purchase of call balancing gas, but retains the provision for put gas. As a result only a cash-out user is potentially liable for part payment. This has no affect on the terms and conditions of the balancing market or balancing gas providers. Rule 18.1.2, which requires terms to reflect reasonable commercial practice, restricts the terms for the balancing market. Therefore, we disagree with participants' views that the 'pay when paid' provisions affect participation in the balancing market, or require part payment to 'call gas' providers.

2.8 TSOs' obligation to facilitate balancing

Submissions

Table 7 Submissions on TSOs' obligation to facilitate balancing

	Submission
Greymouth	The TSOs' obligation to facilitate balancing means TSOs should: • invest in additional tools allowing users to balance, to enhance efficiency; and • incur expense to improve arrangements for enabling users to meet their balancing obligations.

Gas Industry Co response

Gas Industry Co believes the Draft Rules provide the correct financial incentives by ensuring costs go to causers. Parties can agree between themselves to invest in additional tools, depending on the costs and benefits of the specific investment.

2.9 TSOs' obligation to balance operational gas

Submissions

Table 8 Submissions on TSOs' obligation to balance operational gas

	Submission
MDL	The obligation on pipeline owners to balance operational gas has the following implications. • TSOs would need to assess their imbalance at the same time as the user imbalance (eg daily). • The calculation of operational gas imbalance has random errors in the order of 5 TJ, which is substantial relative to the size of balancing actions. • A requirement to balance precisely each day would result in excessive TSO balancing. • The requirement for the target to be midway between thresholds is inconsistent with operation of the Maui pipeline and inflexible. • Three parties will be balancing, the two TSOs for operational gas and the Balancing Operator, which may conflict.

Gas Industry Co response

Gas Industry Co considers it efficient and fair that TSOs are obliged to balance operational gas and resulting balancing costs are borne by them. We think it would be inefficient and unfair if costs were allocated to other users who happen to have imbalance on the day. The 'cost to causers' principle is a core tenet of the proposed rules.

Gas Industry Co accepts the Draft Rules require a TSO to calculate the pipeline's operational contribution to imbalance at the same time as determining other users' imbalances. We also understand this process has a significant degree of random error. However Gas Industry Co considers this an inherent problem. Some party must be responsible for operational imbalance, whatever allocation method is used.

We consider TSOs are in the best position to manage operational imbalance, because they manage metering and line pack measurement and can spread the costs over all users. If the TSO had operational tolerance on the day, operational balancing gas would be allocated *ad hoc* to users who happen to be in imbalance on the day. These users have even less control than the TSO.

Gas Industry Co considers TSOs' obligation to manage operational gas and line pack as no more stringent than the obligation on users to manage their individual positions. Each TSO can decide whether it is reasonable to manage their balance daily or at some other frequency; or to invest in improving systems to reduce the uncertainty. The TSO would consider the costs and benefit at the time.

Currently multiple users are balancing, which may at any time result in conflicting behaviours and residual balancing actions. However, we believe the principle of allocating costs to causers will ultimately result in the most efficient outcome. We do not believe TSOs should be different from other users. We would expect them to already be balancing operational gas and, if needed, co-ordinating this with the Balancing Operator.

The Draft Rules allows for variable target line pack. Target line pack is defined by reference to the thresholds. We accept that when the requirement was for the target to be midway between the upper and lower thresholds, this did not allow for asymmetric tolerances. Therefore, we have amended the Draft Rules to allow for target line pack to be determined for different times and different operating conditions (Schedule B(b)).

2.10 Allocations

Submissions

Table 9 Submissions on allocations

	Submission
Greymouth	The key issue with allocating cost based on the best available information is that it may lead to issues with cash flow. This is because some allocations will be made shortly after a balancing action and others at month end when all delivery information is available. Interpretation of this section by the Balancing Operator will determine cash flow effects on each user. The information and allocation timeframes in rule 19 may need to be reworked to reflect a pragmatic solution. The new provisions for amendments to allocations including mop-up allocations and cash-out amounts are positive additions to the Draft Rules.

Gas Industry Co response

We note Greymouth's concern that rule 19.2 appears to require allocation to users only when there is sufficient information to apply the allocation model. The rule does not allow for the Balancing Operator to estimate information, it must receive the actual information in order to make allocations. In addition, we consider this rule improves the cash-flow position of the Balancing Operator because the rule enables the Balancing Operator to invoice the known cash-outs in the same month as paying balancing gas providers.

2.11 Indemnity for the Balancing Operator

Submissions

Table 10 Submissions on indemnity for the Balancing Operator

	Submission
MDL	Rule 29.2.2 is unfair because it requires the appointer of the Balancing Operator to indemnify the Balancing Operator against any costs that cannot be recovered from pipeline owners. However, the appointer has no control over the behaviour of pipeline owners.
MRP	Gas Industry Co should consider applying a penal rate to interest to deal with concerns over users making timely payments (rule 23.1).

Gas Industry Co response

Draft rule 29.2.2 does not require a TSO to indemnify the Balancing Operator. Parties to the Balancing Operator Service Provider Agreement[1] decide this matter. Parties will also agree whether the Balancing Operator acts as a service provider or agent. Gas Industry Co understands that, practically, a Balancing Operator is unlikely to accept credit risk without an indemnity; however, under either subpart of the rules, the Balancing Operator and the appointer decide indemnity arrangements.

MRP suggests a penal rate; however, we consider that a user being liable to pay interest on any late payments is sufficient. A penal rate could quickly become complicated.

2.12 Price thresholds for balancing gas

Submissions

Table 11 Submissions on price thresholds for balancing gas

	Submission
MDL	The provisions for capping the upper and lower thresholds of the price of balancing gas are best described as speculative. Balancing gas prices will be set during a critical contingency event and are likely to vary from event to event. The marginal cost of non-production is not widely known and will vary from field to field.

Gas Industry Co response

Gas Industry Co considers upper and lower price thresholds for buying and selling balancing gas are appropriate and improve transparency over the current arrangements (where the MDL Commercial Operator has discretion to determine what limits are appropriate). The risk of not having thresholds is that, at times, the price for balancing gas the Balancing Operator must accept may be very high. In a thin market a very high balancing gas price could result in windfall profits to a few sellers and crippling costs to a few buyers. Gas Industry Co understands setting these limits is difficult; however, the process of setting the Balancing Plan allows consultation on the prices and for prices to be amended in response to changes in the market.

[1] Gas Industry Co has added this as a definition to the Draft Rules. 'Balancing operator service provider agreement' means an agreement between the transmission system owners or the industry body, as the case may be, and a person in relation to that person's appointment as the balancing operator.

2.13 Operation of the Balancing Operator

Submissions

Table 12 Submissions on the operations of the Balancing Operator

	Submission
MDL	The Draft Rules introduced an element of inflexibility into the operations of the Balancing Operator. The current draft shows an improvement on the previous one. But it still limits human judgement, which could result in increased gas costs and increased risk of curtailment. MDL understands the problems that can result from unlawful sub-delegation where regulations are applied to an area requiring discretion. These difficulties indicate regulation is being inappropriately applied.

Gas Industry Co response

MDL previously expressed the need for the Balancing Operator to have flexibility when buying or selling balancing gas to avoid too much or too little intervention. While MDL acknowledges the new Draft Rules give flexibility it is concerned two situations are not allowed for:

- where line pack will return within thresholds without intervention; and
- where purchasing significant quantities of balancing gas delays the inevitable curtailment by only five to 10 minutes.

Gas Industry Co agrees the decision on timing of taking an action and quantity of balancing gas contains a degree of judgement, and this flexibility is covered in the Draft Rules. We consider these decisions significantly affect users and there will always be differences in opinion and debate on the exact point of intervention. Therefore Gas Industry Co believes the Balancing Operator instructions should be subject to due process, and be clear and transparent to all users. We consider the current Draft Rules are an appropriate balance of transparency while enabling significant flexibility in setting and managing to thresholds.

2.14 Continuation of the current balancing zones and nominations

Submissions

Table 13 Submissions on continuation of the balancing zones

	Submission
MDL	The proposed rules allow the continuation of the current balancing zones and nominations, which may not improve efficiency.

Gas Industry Co response

Gas Industry Co acknowledges the Draft Rules do not impose different balancing zones or new requirements for nominations on the industry. These particular issues have been considered in the analysis of the options and were identified as 'out of scope' to achieve the purpose of new balancing arrangements. However, the balancing zones and nomination requirements may change and the balancing plan has been designed to accommodate such changes.

Curtailment

Submissions

Table 14 Submissions on curtailment

	Submission
MDL	The TSO will be required to curtail users and potentially offer substitute balancing services at short notice. This will add to costs and be difficult to co-ordinate between parties.

Gas Industry Co response

Gas Industry Co notes TSOs must maintain continuous services in several areas including operation of the pipeline (for example, gas control and system operator). TSOs must also be required to manage curtailment during a contingency. These continuous operations are currently co-ordinated between several operators. We do not see how the rules change the need to manage and co-ordinate roles between operators. If this co-ordination were a significant issue for the Balancing Operator role the TSOs would take this into account when deciding whether to contract the role to a new service provider or an existing service provider (for example an existing provider of gas control, critical contingency. or system operator services).

We continue to note with interest MDL's assertion they may set up substitute balancing services as a back stop to the Balancing Operator. We do not see this as an obligation under the proposed rules. No doubt Maui users will consider whether it is necessary, reasonable. or prudent.

2.16 Users' requirements to balance

Submissions

Table 15 Submissions on users' requirements to balance

	Submission
MDL	The only feedback mechanism for matching gas entering the pipeline system to demand is the requirement for end users to match their purchases to demand. Arguments weakening the requirements to balance are illogical or irresponsible.

Gas Industry Co response

Gas Industry Co notes users are required to balance under the Maui and Vector codes. We believe the key issue is the consequence of imbalance and that allocating balancing costs to causers is the most efficient mechanism to provide the incentive on users to balance. The proposed rules improve the allocation of costs to causers by making this principle a requirement of the balancing gas allocation model in the balancing plan.

2.17 Compressor operation policy

Submissions

Table 16 Submissions on compressor operation policy

	Submission
MDL	TSOs will be required to follow their published compressor policies, which will result in further inefficiency.

Gas Industry Co response

Gas Industry Co considers uncoordinated compressor operation may adversely affect balancing. Compressor operational policy should be transparent to all stakeholders, including the Balancing Operator. We consider it usual that control room operators follow written operating instructions/policy. The Draft Rules do not constrain the content of those instructions/policies, but makes the underlying policy transparent.

2.18 Limitations on balancing plan

Submissions

Table 17 Submissions on limitations on balancing plan

	Submission
MDL	The balancing plan should not affect metering and measurement, allocation using operational balancing agreement (OBA) principles, gas specification, or behaviour (other than Reasonable and Prudent Operator standards).

Gas Industry Co response

Gas Industry Co considers the rules:

- do not affect metering and measurement other than directing the costs of managing UFG to the relevant TSO to provide the correct incentive to manage metering;

- do not limit allocation agreements (which under the Draft Rules could be, for example, OBA, swing, pro-rata); and
- do not cover gas specification in any way.

We disagree behaviour should be controlled solely by Reasonable and Prudent Operator obligations. The Draft Rules are designed to influence behaviour by passing balancing costs to the causers of those costs.

2.19 Other comments on the Draft Rules

Table 18 Other comments on the Draft Rules

Issue	Submissions	Gas Industry Co response
Publication of costs	MRP requests the Draft Rules include a requirement for the industry body to publish on-going operational costs per GJ on a monthly basis (rule 52).	Gas Industry Co considers this addition unnecessary; we voluntarily publish annual cost estimates for all our other governance arrangements and will for the Draft Rules.
'As soon as practicable' timing	MRP would like more definitive timing in the Draft Rules wherever specific actions are required.	More prescriptive timing can be undesirable in circumstances requiring human judgement and flexibility. We consider this is the case for many of the areas of the Draft Rules where this wording appears. Therefore we disagree with the suggested change.
Cost recovery	Greymouth suggests that, to ensure TSOs are billed for transport fuel, the word 'shipper' in rule 55.4 should be 'user'. Greymouth sees the addition of the ability for the TSOs to agree another method of cost recovery with Gas Industry Co as a positive addition to the rules, but reiterates the importance of keeping costs low.	Rule 55.4 relates to fees payable under the rules. Transport fuel is excluded from these fees.
Definition of 'balancing action'	In relation to the amended definition of 'balancing action' Greymouth questions the meaning of the phrase 'committed to at the same time'. This phrase could be interpreted as meaning the commitment is at the same time as the purchase or sale of balancing gas; but what happens if the commitment is made at a time different from the contractual purchase or sale of balancing gas?	We intentionally defined balancing action as being the time balancing transactions are committed to, rather than when gas is delivered or when title to the gas changes hands. Balancing gas may flow over several hours after the gas is committed to.

3 NZIER cost-benefit analysis

3.1 The Supplement to the SOP

Framework for the cost-benefit analysis

The Supplement to the SOP included an analysis by the New Zealand Institute of Economic Research (NZIER) of the costs and benefits of the regulatory proposal. The framework for the analysis was developed with the industry at a workshop. The analysis measured the costs and benefits of the proposal against two baseline scenarios, which were as follows.

- A code change scenario, under which improvements to balancing occur through industry change request processes. These change processes include the current December Change Request and ongoing changes to the VTC and MPOC.
- An 'ICD MOU' scenario, under which improvements to balancing arrangements occur through the successful implementation of the balancing solution identified in the Industry Code Development Memorandum of Understanding.

The possible costs and benefits of the regulatory solution were considered under an optimistic and a pessimistic set of assumptions.

Results

The total present value costs and benefits of the Draft Rules (over the period 2010/11 to 2023/24) are presented in Table 19.

Table 19 Present value of total costs and benefits of the proposed balancing rules

	Costs	Benefits	Net Benefits
$ million, 2010/11 to 2023/24			
Baseline scenario of code changes			
Proposed balancing rules - optimistic scenario	2.178	19.191	17.013
Proposed balancing rules - pessimistic scenario	3.949	0.363	-3.586
Baseline scenario of ICD MOU			
Proposed balancing rules - optimistic scenario	1.323	22.404	21.081
Proposed balancing rules - pessimistic scenario	3.094	3.576	0.481

Source: NZIER, Proposed balancing rules cost-benefit analysis, p, 11.

Analysis of results

Extracts from NZIER's analysis of the results are presented below.

> Not surprisingly, the results of the CBA indicate that whether the proposed balancing rules are of net benefit depends on the baseline scenario – specifically, whether the code change process is successful – and whether the costs and benefits of the proposed balancing rules are closer to the optimistic or pessimistic views expressed by the gas industry.
>
> We do not know which of the four possible combinations of scenarios is the most likely, but the results of the CBA indicate that the proposed balancing rules are the superior approach in all but one of these four possible eventualities, as shown below.

		Costs and benefits of Proposed balancing rules	
		Optimistic scenario	Pessimistic scenario
Baseline scenario	Code changes	Proposed balancing rules	Code changes
	ICD MOU	Proposed balancing rules	Proposed balancing rules (marginally)

The results of the CBA indicate that only if the code change process is considered likely to succeed *and* the costs and benefits of the proposed balancing rules are considered likely to be closer to the pessimistic scenario is adopting code changes likely to be somewhat better (by around $3.5 million in present value net benefits over the next 14 years) than implementing the proposed balancing rules.

If the costs and benefits of the proposed balancing rules are considered likely to be closer to the optimistic scenario, it is likely to be substantially better (by $17 million to $21 million) to implement the proposed balancing rules. If the code change process is considered unlikely to succeed, it is likely to be either substantially better or marginally better (by $21 million or $0.5 million) to implement the proposed balancing rules than an ICD MOU.

Source: NZIER, Proposed balancing rules cost-benefit analysis, p, 13-14.

3.2 Submissions

Contact

Contact considers the analysis was flawed and based on speculation that an unregulated approach might fail. It notes the analysis fails to mention:

- actual levels of balancing activity;
- the cost of balancing services under the arrangements; and

- the current value of disputes.

Contact observes the main benefits of the balancing rules are attributed to efficiency gains, but queries how these gains arise. It does not see why regulation would lead to greater efficiency than the baseline scenarios because both involve an open market for balancing services. Nor does Contact see how balancing services will influence the price of gas sold under other short- and long-term sales agreements. It considers the assumed difference between the two baselines —that the ICD MOU would take longer to implement than the code change process—is misconstrued. The two baseline scenarios are, in effect, the same process.

Genesis

Genesis considers it is reasonable to expect a net benefit from implementing the proposed rules based on the analysis presented.

Greymouth

Greymouth commends the NZIER cost-benefit analysis for more accurately capturing industry concerns, but the analysis now paints a picture of uncertainty in Greymouth's view. It cites the unit costs and benefits, and the magnitude of efficiency benefits as being uncertain. Greymouth is concerned the cost-benefit analysis does not conclude the efficiency benefits will be 0.5% and 0.25%; rather it assumes these figures. The uncertainty, in Greymouth's view, appears to outweigh the reward; and the numbers quantifying the benefits lack robustness. It suggests a more operational perspective.

MDL

MDL engaged Infometrics to review the NZIER cost-benefit analysis. Based on the Infometrics review, MDL considers the benefits stated in the NZIER analysis result from assumptions about decreases in gas costs that are unsupported by evidence. MDL doubts the level of efficiency gains attributed to reduced balancing costs resulting from the rules. It draws this conclusion for the following reasons.

- The details of the balancing plan are unknown.
- The 'pay when paid' and marginal pricing provisions are likely to increase balancing gas prices.
- The Balancing Operator has limited flexibility to act.
- The introduction of a 'unified' system provides little real advantage.

Further, MDL states the claimed savings are more than the total amount currently spent on balancing.

MDL also summarises the conclusions reached by Infometrics.

- 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 on the arbitrary assumption it will deliver greater efficiency gains than the code change scenario. This benefit is assumed, but unproven. MDL's own analysis suggests the reverse.
- 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.
- Infometrics' conclusion is that the case for the Balancing Rules requires more evidence before a departure from the code change process can be considered.

Methanex

Methanex considers the NZIER's analysis did not add any particular insight and its conclusions appear biased towards a regulatory solution. It considers an analysis specifically comparing a single unified balancing regime with the counterfactual would have provided a more valuable analysis.

MRP

MRP considers that given the nature of the market, the outcome of possible savings between $3 million and $6 million is extremely unlikely and should be eliminated from the cost-benefit analysis. MRP also suggests the ongoing costs of the Balancing Operator appear low and a more appropriate estimate would be $750,000 or more.

Nova

Nova believes the scope of the proposal is too limited to achieve the benefits provided for in NZIER's cost-benefit analysis. It considers the analysis rests on an arbitrary assumption of productive efficiency gains of 0.5% or 4c/GJ on 150GJ per annum—$6m per annum. It observes that since the removal of the Maui legacy gas contract, the requirements for balancing gas have reduced significantly.

Vector

Vector considers the analysis confirms that under most scenarios, regulation provides a better result. It believes the analysis is conservative and materially underestimates the net benefits that would be delivered by regulation compared with a contractual solution. Vector notes that dynamic efficiency benefits, which would have made up the greatest proportion of the benefits, were not included. Further, NZIER adopted a cautious approach by lowering the efficiency improvements from 1% to 0.5% between its draft and final reports. It notes also the baseline scenarios are unrealistic given a contractual solution is unlikely to eventuate. Vector also considers the reduced costs of balancing

disputes if regulation were put in place have been underestimated. It believes a more likely reduction is $100,000 per annum.

3.3 Gas Industry Co response

Gas Industry Co asked NZIER to respond to submitters' comments on the cost-benefit analysis. NZIER's response is in Appendix A. After considering submissions, NZIER made several additions to the cost-benefit analysis. Notably, additions to table 6 show the efficiency benefits would need to be as low as $300,000 before the Draft Rules would be inferior to either of the baselines under the optimistic scenario. This is well below Infometrics' suggestion of $1 million. Even with these additions the conclusions of the analysis remain the same. The revised report is attached in Appendix C.

4 Additional comments

4.1 Overview

The Supplement to the SOP presented two questions, one on the balancing rules, and the other on the cost-benefit analysis. As well as responding to the two questions, many submitters made additional comments. We have categorised these other comments by topic and consider them below.

4.2 General comments on process

Submissions

Table 20 Submissions on general comments on process

	Submission
Contact	The extensive changes to the Draft Rules raises doubt about Gas Industry Co's working knowledge of the transmission codes and the proposed rules. Contact provided a detailed analysis of the Draft Rules and sought to work through its analysis with Gas Industry Co. Gas Industry Co did not accept this offer and therefore Contact has not provided analysis of the re-draft of the rules. Gas Industry Co has failed to meet two requirements of the Gas Act: Section 43N(1)(c): 'to ensure that the objective of the regulation is unlikely to be satisfactorily achieved by any practicable means other than the making of the regulation'. And section 43N(1)(b)(i): 'to assess those options by considering…(i) the benefits and costs of each options'. Gas Industry Co has not identified what aspects of the current arrangements justify regulation.
Genesis	Genesis appreciates Gas Industry Co's effort to facilitate improved balancing arrangements through the ICD process, refine the Draft Rules through ongoing engagement with shippers and TSOs, and develop a quantitative analysis looking at the costs and benefits of the options for improving balancing arrangements.

	Submission
Greymouth	Greymouth would be much more comfortable if decisions on the rules were made, or at least supported by, parties with a financial exposure to the rules. At the moment most of the savings appear to go to the parties who are outsourcing their risk for free—Maui and Vector. All risk ultimately sits with consumers.

Gas Industry Co response

We disagree that we have not complied with our obligations under the Gas Act. Below we set out the process required under the Gas Act and our compliance with those requirements.

Part 4 of the Gas Act requires the industry body, before recommending any regulations under that Part (or in this case rules) to –

- undertake an assessment under section 43N that seeks to identify all reasonably practicable options for achieving the objective of the regulation (section 43N(1)(a));
- assesses those options by considering their benefits and costs, the extent to which the objective would be promoted or achieved by each option, and any other matters the industry body considers relevant (section 43N(1)(b)); and
- ensure the objective of the regulation is unlikely to be satisfactorily achieved by any reasonably practicable means other than the regulation (section 43N(1)(c)).

As well, we must prepare a detailed statement of proposal that:

- contains a statement of the reasons for the proposal;
- includes an assessment of the reasonably practicable options, including the proposal identified (s43N(1)(d) and (2));is consulted upon with persons representative of the interests of persons likely to be substantially affected by the proposed regulations (s43L(1)(b)).

The consultation must give those interested persons an opportunity to make submissions (s43L(1)(c)) and the industry body must consider those submissions (s43L(1)(d)).

Gas Industry Co has complied with all these obligations. We published two options papers, and a statement of proposal (SOP), in which we assessed four options (one contracts-based, two relying on prescriptive regulation, and one using a participative regulatory process).

We identified participative regulation as the preferred option and prepared a draft of the proposed rules, which was included in the SOP. The SOP also outlined how Gas Industry Co would run the ICD process in parallel to our own consultation process. We noted the outcome of the ICD process could affect our recommendation to the Associate Minister; if it substantially changed the scope or content of the proposed rules, we would issue a revised SOP.

Gas Industry Co received and considered submissions on the SOP. In December 2009, we published an analysis of those submissions and our decision to recommend participative balancing rules to the Associate Minister. The paper recorded that the ICD process and a qualitative and quantitative analysis of contracts-based alternatives had not caused us to alter our decision to pursue the participative regulatory option.

Following publication of the SOP, Gas Industry Co hosted a series of meetings with the industry and received and considered further submissions on the detail of the rules. As a result, we refined the rules, although their scope remained the same. In addition Gas Industry Co considered an MPOC change request relating to balancing. We also commissioned from NZIER a quantitative cost-benefit analysis of the proposed regulatory option.

Gas Industry Co then released a supplement to the SOP that contained this additional work. The supplement explained why none of the matters arising since the publication of the SOP had caused us to alter our view that we should recommend the making of balancing rules. The supplement included an updated version of the Draft Rules and sought submissions on them and the cost-benefit analysis. Submissions on the supplement were received and analysed.

Gas Industry Co has met all the consultation requirements of the Gas Act. We have also facilitated an industry-led parallel process and commissioned a cost-benefit analysis of our proposal. Gas Industry Co carefully analysed and considered the outcomes of these extensive consultation processes. We concluded the objective of the regulation is unlikely to be satisfactorily achieved by any reasonably practicable means other than the participative regulatory option.

4.3 Rules versus industry-led solutions

Submissions

Table 21 Submissions on rule versus industry-led solutions

	Submission
Contact	It is unnecessary and too soon to propose regulation to resolve balancing concerns. Instead, Gas Industry Co should develop a goal for open access arrangements similar to that developed by the European Regulators Group for Electricity and Gas (EGREG). A recommendation should be made only when issues arise and regulation proves necessary. It would be disappointing and wasteful if Gas Industry Co abandoned the progress made through the ICD process. There is unexplored and unexploited scope to develop code changes to improve balancing arrangements. Gas Industry Co has overlooked the simple change of the MPOC adopting the Rulings Panel. MDL is currently working on a solution based on remote welded points.

	Submission
Genesis	Genesis supports the rules but will continue to work on improvements through code changes. If a code change solution were to prove successful in a short timeframe it would remove the need for rules-based governance; however, the rules are likely to provide a better outcome than the status quo. Therefore, Gas Industry Co should proceed with making its recommendation.
MDL	MDL remains firmly of the view that the proposed regulation of residual balancing is neither necessary nor appropriate. Further upgrades to the BGX have resulted in increased transparency of balancing operations and more information about pipeline operation. Amendments to the Maui Pipeline Standard Operating Procedures (SOPs) attracted little attention and are working well.
Methanex	Methanex strongly favours industry-led solutions to issues affecting the industry including pipeline balancing. The ICD process was not given a fair opportunity because Gas Industry Co had already recommended regulation. A unified balancing regime is unnecessary and undesirable and some aspects of Gas Industry Co's proposal are counter to the broad consensus of some industry participants.
MRP	MRP would prefer to see a contractual solution but accepts that Gas Industry Co intends to adopt a regulatory approach for attempting to resolve balancing issues.
Vector	Vector supports the rules as a means to govern gas transmission system operation as a unified whole. In general, contractual solutions are preferable, but experience of transmission system operation and governance over the last three years and the industry's inability to make progress on the issues, has led Vector to conclude regulation is the only workable option for governance of system operation and security in gas transmission.

Gas Industry Co response

Gas Industry Co considers the industry has had substantial time to agree a contractual solution. In 2008, when we were consulting the industry on balancing issues, participants largely agreed change was needed. We note the participative regulation option was first proposed in the first half of 2009. Our role is to recommend whether regulated solutions are required, which requires us to consider all reasonably practicable options. The ICD process tested whether the industry was ready and able to conclude a contractual option before we recommended the participative option. We were open to the outcome of the ICD process, but could not defer developing alternative solutions should a contractual solution fail to emerge. Gas Industry Co's involvement in the process came to an end after we assessed the ICD MOU. However, at that time, we clearly stated the industry is free to continue the ICD process. To our knowledge, discussions did not advance further.

We note Contact's comment regarding the adoption of the Rulings Panel and disagree that it would be a 'simple change'. Gas Industry Co has discussed the possible change with its lawyers. They have indicated that the change is likely to involve complex amendments to the Gas Act and compliance regulations. A great deal of detail would need to be determined, such as the scope (for example, will all disputes under the MPOC go through Gas Industry Co's compliance regime?), procedures, and funding for the arrangement.

We acknowledge the MDL code change gives some improvement to the status quo, and we have already taken that into account in our recommendation.

4.4 Governance and security of supply

Submissions

Table 22 Submissions on governance and security of supply

	Submission
Genesis	Existing governance arrangements are unsuited to resolving cross-pipeline issues such as balancing. The different interests held by the monopoly TSOs means it is unlikely resolution will be satisfactorily reached via existing arrangements. This is detrimental to the interests of gas shippers, producers, and consumers. The proposed rules would improve existing arrangements by: • requiring development of a balancing plan that cuts across the codes and Vector's ICA with MDL; • creates incentives for more constructive and effective negotiation between the TSOs; and • provides regulatory oversight of, and a regulatory backstop for, balancing arrangements. On the basis of the analysis presented and experience to date, Genesis believes rules are likely to lead to more efficient pipeline balancing than can be expected under existing governance arrangements. It is also reasonable to expect there would be a net benefit from implementing the rules as proposed.
Vector	MDL's SOPs for balancing gas began in December 2008; MDL has since entered into fewer balancing gas transactions. However, for Vector and the users of its system, the reduction in transactions has been accompanied by a significant decline in security of supply, for example, a trebling of contingency events and Operational Flow Orders (OFOs) not initiated by a Welded Party but affecting Vector's Welded Points. Without unified governance and co-ordination of system operation the SOP can be modified at any time. To comply with the GPS, a security of supply standard needs to be agreed and governed in a robust manner to ensure electricity and gas supply to consumers is not jeopardised. The MPOC and VTC do not (nor would any contractual arrangement) provide an adequate framework for robust governance of security standards in gas transmission. In its cross-submission, Vector notes the interdependence between security in gas and electricity supply, and considers that gas governance is 'embryonic' compared with electricity governance. Unified governance and co-ordination through a more structured change process is needed. Contractual arrangements are inadequate and may stymie necessary solutions. The ICD and MDL December Change Request are examples. The ICD MOU was high-level, non-binding, contained many exceptions, and left entrenched commercial positions unchanged. The MDL change request does not reflect industry views and has triggered inefficient work on counter change requests.

Cross-submissions on governance and security of supply

Vector observes that changes in MDL balancing procedures coincided with a significant decline in system security, citing increased curtailment notices. It links the reduction in security with reduced MDL balancing intervention, and notes MDL has considerable unilateral freedom in setting balancing practices. Vector notes MDL's incentives may change if MDL is guaranteed payment of costs, and MDL could then move to too much intervention at high cost. Vector claims the current MDL change request would require Vector to curtail flow almost every hour and is fundamentally incompatible with Vector's regime. It uses an example to illustrate its view.

MDL counters that its reduced balancing intervention is in the context of Gas Industry Co requesting a review because of concerns at tight balancing thresholds and in response to the critical contingency regulations. MDL is concerned at the implication they reduced balancing to reduce exposure to non-payment of costs, noting MDL has no long-term exposure to non-payment under the MPOC. They claim they have no intention to excessively increase security of supply.

MDL considers it must be free to alter its operating procedures at short notice without a drawn- out approval procedure (although it undertakes to consult on changes). MDL considers that sometimes curtailments are appropriate; and increasing diversity in supply is likely to increase the frequency of curtailment. It considers that all but one curtailment from the Vector examples resulted from producer outages. MDL states it fails to understand Vector's claim that its proposed MPOC change request would result in hourly curtailments of power stations. MDL argues a requirement to meet any level of demand where gas has not been ordered makes no sense.

Vector counters the MDL response, standing by its view that the decline in security is because of unilateral changes in balancing by MDL. It considers there is no evidence shippers have improved accuracy of nominations. MDL also notes it excluded producer-initiated events from its analysis and the timing of increased curtailment notices does not correspond to the new gas fields. Vector considers the increased number of producers should, by diversifying supply, decrease supply risk. It reiterates the Maui pipeline should operate as part of an integrated whole, not in isolation.

MDL considers each TSO should retain a residual role to balance their systems and Vector's reluctance to do this and to reimburse MDL for its elevated balancing costs has been the source of balancing being perceived as an issue.

In its cross submission, Nova argues the significant differences between MDL and Vector are likely to result in Gas Industry Co imposing a regulatory solution. A regulatory solution could conflict with the preferences of either MDL or Vector, or both, and would be difficult and risky. Nova also notes Gas Industry Co retains the ability to impose a regulatory solution when benefits exceed costs; however, Nova considers the asserted benefits of the regulatory solution lack evidence. It considers self interest will characterise both regulatory and contractual options and current disputes will simply transfer to the regulatory forum.

Nova also considers the Vector submission advances tenuous and flawed arguments to support a preferred outcome. Nova makes various counter claims. For example, it states security of supply has improved and is assured by the Critical Contingency Regulations. It considers Vector's concerns about operations are unfounded given MDL's practice and intentions, noting MDL's proposals for consultation on operating procedure changes. Nova believes the codes will evolve to provide more certainty. Nova discusses the scenario Vector uses in its submission, noting it is unlikely, but if it did occur users would modify their behaviour. Nova notes the proposed regulation excludes co-ordination of system operation, which can be changed by TSOs. Yet Vector does not propose wider regulation; instead it claims its objectives require an Independent System Operator model.

Gas Industry Co response

Gas Industry Co notes with concern the TSOs' disagreement over security of supply and their differing views of physical events on the pipeline. We believe this illustrates some of the significant difficulties in relying on multilateral agreement in a technically demanding area, where there are complex and multiple interlinked causes and effects, and conflicting interests. We note also that over the period of the Vector example there remained a weak link between costs of balancing and causers, because of the Imbalance Limit Overrun Notice structure in the MPOC. Also, the industry was undergoing significant market transition.

Gas Industry Co considers that under the current regime or under the proposed MDL December Change Request, MDL retains significant unilateral control of security of supply and therefore of balancing costs. While this is an important cost and risk issue, we are unclear why this would lead, as Vector suggests, to hourly curtailment of power stations or to the MDL need for unilateral short-notice changes in practices without process. In its analysis Gas Industry Co considered the options to have a similar risk of curtailment. However, we think good governance is an important factor when determining balancing processes and standards. The governance aspect was extensively covered in our analysis of the options. We also note that with an increased number of less flexible gas producers, the frequency of demand for curtailments should increase. In turn, this increases the importance of good governance on the standards of balancing.

Gas Industry Co considers it more efficient to operate the transmission system as a unified whole. We do not support the proposition that each TSO should physically balance its own system. We consider it would be inefficient, unnecessary, and impractical given New Zealand's small physical system to operate multiple balancing markets with multiple Balancing Operators based on pipeline ownership.

4.5 Vector/MDL dispute

Submissions

Table 23 Submissions on Vector/MDL dispute

	Submission
Contact	Gas Industry Co has pointed to lack of agreement between Vector and MDL as a reason to regulate. However, such a concern would arise only if Vector withdrew its interconnection arrangement. In that case, Gas Industry Co could utilise its emergency regulation process.
MDL	Vector's current intention of removing itself from the contractual relationships it has accepted under the MPOC is not reason for regulating MDL's pipeline activities. Legal means are available to resolve disputes of this type. Therefore, the existence of disputes is no reason for regulating. MDL is astonished Gas Industry Co, rather than dealing with Vector's threat to terminate its Interconnection Agreement with MDL, is citing it as a reason for regulating MDL's activities.

Gas Industry Co response

Gas Industry Co considers it reasonable to consider the TSOs' dispute as a concern in our analysis and we note this is only one of many issues canvassed and considered. The various considerations taken into account in recommending the option can be seen in the analysis of the options at various times.

4.6 Scope of the rules

Submissions

Table 24 Submissions on the scope of the rules

	Submission
Methanex	'All-encompassing' regulation is neither warranted nor desirable. It may add significant costs and complexity for little or no benefit. Rules might be necessary for particular areas that are deadlocked but this does not require 'all-encompassing' regulation at the outset. If a regulated model is inevitable, the balancing plan should be developed before comprehensive rules.
MRP	The proposal deals with only upstream issues, which will increase risk to shippers without giving them tools to manage these risks. Instead, a regulatory approach should be holistic and incorporate both upstream and downstream markets, in particular a daily allocation process and virtual welded points. If downstream issues are resolved allowing shippers to better manage their risks, the volume of balancing gas required would significantly reduce.

	Submission
Nova	Since the removal of Maui Legacy Gas contract provisions, balancing gas requirements have reduced significantly and continue to reduce. This reduction can be attributed to a reduction in UFG on distribution networks, improved aggregate retailer demand forecasting, and increased use of pipeline line pack flexibility by the System Operator. Efficiency gains are likely to exist in areas not covered by the proposed rules such as: • improved compression equipment; • transmission pipeline investment decision making; and • provisions governing interconnection to open access transmission pipelines. Gas Industry Co should defer its recommendation to the Minister, or put balancing work on hold, and refocus on these high priority areas.

Gas Industry Co response

Gas Industry Co agrees all-encompassing regulation is not warranted, other than in areas that are deadlocked. We note we rejected fully regulated approaches. We acknowledge MRP's submission supported a holistic solution; however we have limited the scope of the Draft Rules to residual balancing, that is, the scope is wide enough only to meet the objectives of this work stream. We identified this area as requiring the most urgent attention through consultation. We believe other matters can be resolved under other work streams, incrementally.

We also accept the concern of MRP that downstream issues create risk, but we consider these risks are largely inherent in the status quo. Tackling upstream and downstream issues at the same time would be complex, resulting in slower progress and risks of its own. Therefore we are progressing daily allocation in a work stream separate from residual balancing.

4.7 Nominations

Submissions

Table 25 Submissions on nominations

	Submission
Vector	Supply is not linked to consumer demand (other than Methanex and Huntly power station) and accuracy of nominations will not improve until such a link exists. There is no discernable pattern or improvement to end-of-day operational imbalance.
MDL	An improved link between supply and demand is needed, but there is currently such a link. Real-time metering and nominations to all major interconnection points would improve the situation.

Cross submissions on nominations

In its cross submission, Nova counters Vector, considering a clear link between nominations and demand exists (citing an example). The right incentives and commercial arrangements to manage force majeure risk give further scope for improving the codes. Vector's focus on imbalance in isolation is misleading. Vector ignores the status quo and its proposals are an overreaction.

Gas Industry Co response

Gas Industry Co notes the differing views on links between nominations and demand. We consider supply and demand are currently linked. The link is made at each Vector-Maui interconnection point where the running operational imbalance is allocated to mismatch on the Vector system via gas trading agreements. This means balancing costs incurred on the Maui pipeline are allocated to the relevant shippers on the Vector pipeline. The key issues Gas Industry Co has identified with this linkage are:

- the delay in cash-out on the Maui regime dilutes allocation of cost to causer;
- the delay in downstream mass market information reduces a causer's ability to manage costs; and
- the potentially uneven treatment of TSO operational imbalance.

Gas Industry Co considers the supply and demand link issue is most efficiently resolved if residual balancing costs are incurred only when physically necessary; and these costs are allocated to the causers of imbalance. This cost-to-causer approach provides incentives for users to self balance, while acknowledging this is not always precisely possible. (It is not intended to meet any level of demand whether or not gas has been ordered as MDL claims). This outcome is core to the assessment of options by the Gas Industry Co.

4.8 Other comments from MDL

MDL believes the alleged advantages of the 'unified' balancing system are illusory. It notes such a regime is currently in place and existing problems relate to the recovery of balancing charges assessed against users of the Vector system.

The rules provide for increased information on line pack across the entire system. In MDL's view, the benefit of this additional information is largely negated by the imposition of balancing requirements based on whether a line pack threshold in a directly managed balancing zone has been breached. It considers other information will be superfluous when a balancing decision is being made. Further, it notes operational information for the Maui Pipeline is currently freely available and could be made available elsewhere too without regulation.

The rules contain provisions for back-to-back balancing. MDL considers this is unnecessary because its current MPOC change request will introduce back-to-back balancing.

MDL is concerned the balancing rules place an important aspect of the Maui Pipeline outside MDL's control and substantial changes to the MPOC would be required as a result. MDL states that over the last 30 years it has taken its responsibilities as a pipeline owner seriously. It is unwilling to accept responsibility for operating decisions, costs, and indemnities outside of its control and will seek to have obligations removed if the rules are adopted.

Gas Industry Co response

Gas Industry acknowledges MDL's views but we disagree the proposed 'unified' regime is currently in place as indicated by MDL. Nor do we agree regulation is only to make line pack information transparent. Governance of balancing arrangements is core to the participative regulation proposal. The Draft Rules create a process for the TSOs to work together to agree a balancing plan that works across the entire transmission system. If they fail to agree, the industry body writes the balancing plan. The Draft Rules would be supported by the Gas Governance (Compliance) Regulations 2008. Such a compliance regime is separate from the current arrangements. It is important to also note that the back-to-back mechanism in the current MPOC Change Request is different from the one proposed in the Draft Rules. We outline the reasons why in our *MPOC 17 December 2009 Change Request Draft Recommendation*, available on our website: www.gasindustry.co.nz.

In relation to MDL's concerns that it would be losing control over the Balancing Operator, Gas Industry Co notes the purpose of the participative regulation option is for the TSOs to jointly appoint the Balancing Operator and determine the terms and conditions of that appointment and the details of the Balancing Plan, subject to certain policy requirements. Determining the details of delegated control of operations is required under any balancing arrangement, and will invariably be subject to certain limitations whether from contracts with users or regulation. Rules are fundamentally different from the current situation with respect to indemnities and control.

Appendix A NZIER response to comments on cost-benefit analysis

Table 1 Submission comments on 31 March 2010 cost-benefit analysis and NZIER's responses

Submission	Comment	Response
Contact	Considers the CBA fundamentally flawed; at this stage, no reason to believe that a regulated approach would yield a significantly better outcome than an unregulated approach; it is speculation that an unregulated approach may somehow fail	The CBA aims to reflect the gas industry group's opinion, which ranged widely; at the meeting on the CBA, the gas industry group indicated that, at worst, a regulated approach could be expected to provide greater certainty and achieve improvements more quickly; the CBA includes a pessimistic scenario, which represents the proposed balancing rules achieving the same magnitudes of benefits as the code changes and ICD MOU scenarios; the gas industry group was divided on whether an unregulated approach would fail, so the CBA models two baseline scenarios in turn – one if it does, one if it doesn't – and presents results for each
	There is a risk that a regulated approach may have higher costs due to appointment of independent balancing operator, increased balancing activity, reduced flexibility to amend and improve arrangements, confusion about who is responsible for providing transmission services	The CBA includes the costs of establishing an independent balancing agent under the proposed rules; allocation of balancing costs to causers of imbalances would encourage more primary balancing and therefore necessitate less residual balancing; the CBA includes the costs of periodically reviewing and amending the rules (or code changes or ICD MOU); it is our understanding, from the Gas Industry Co's options papers and statement of proposal and from discussion at the gas industry group meeting on the CBA, that the proposed rules would provide greater clarity and certainty
	In the CBA, the main benefit of the balancing rules is attributed to efficiency gains; the GIC must therefore fully explain how these gains arise	These are explained in Appendix B of the CBA report; have added footnotes to CBA report providing an analogy with road congestion to aid understanding and noting that the same method was also used in previous CBAs for the Gas Industry Co (and was accepted by gas industry representatives at that time) and previous CBAs for the Electricity Commission
	Don't understand why regulation would lead to greater efficiency gains than baseline scenario	At the gas industry group meeting on the CBA, industry representatives said that, at worst, a regulated approach could be expected to provide greater certainty and achieve improvements more quickly; the CBA models optimistic and pessimistic scenarios to reflect the range of opinion; the pessimistic scenario represents the proposed rules achieving the same magnitudes of benefits as the code changes and ICD MOU scenarios
	Don't understand how offers of balancing services will influence price of gas sold under other short and long-term sales agreements	Efficiency benefits apply to the market for gas (consequent benefits from more efficient use of pipelines and greater certainty about gas delivery and costs), not just balancing gas – see explanation in Appendix B of CBA report
	CBA provides for two baseline scenarios; the essential difference between them is that the ICD MOU would take more time to reach a conclusion; this distinction is misconstrued; the ICD MOU could only be implemented through code changes, scope of ICD MOU may be	This is what the gas industry group said at the meeting on the CBA – that reaching agreement on an ICD MOU would take longer and require more meetings and discussion to work through areas of disagreement

	wider, but achieving the same outcome from the ICD MOU process should take no longer than the code change process because essentially they are the same process CBA lacks credibility because there is no reference to any facts; i.e. actual levels of balancing and cost of balancing services, current value of disputes, quotes from potential balancing operators	The intention (and as directed by the Minister) was to use the gas industry group to provide the best informed expert opinion on the inputs into the CBA; unfortunately, the gas industry group could not reach consensus and opinions ranged widely; we therefore modelled multiple scenarios reflecting the range of opinion of this group and undertook sensitivity analysis to show how the results would differ if the costs and benefits were higher or lower
Genesis	Considers that, on the basis of the CBA, it is reasonable to expect there would be a net benefit from implementing the rules as proposed	No response required
Greymouth Gas	CBA paints a picture of uncertainty – unit costs and benefit are uncertain, magnitude of efficiency benefits is particularly uncertain, CBA does not state that efficiency benefits will be 0.5% and 0.25%, but rather that if they are 0.5% and 0.25%...	Agree that the costs and benefits, especially efficiency benefits, are uncertain – that is inevitable in modelling the future; the intention was to use the gas industry group to provide the best informed expert opinion on the inputs into the CBA, but opinions ranged widely, so we have modelled multiple scenarios to reflect this range and undertaken sensitivity analysis to show how the results would differ if costs and benefits were higher or lower; even if we don't know how large the efficiency benefits would be, it is still informative to model what the results would be if the efficiency benefits were x or y etc., provided that we include sensitivity analysis to show how the results would differ if the efficiency benefits were higher or lower; the CBA's sensitivity analysis highlights, in particular, that the efficiency benefits could be much lower than modelled and still be enough for the proposed rules to provide higher net benefits than the code changes or ICD MOU scenarios under the optimistic scenario
	If this workstream was a company's business case, would you invest; uncertainty seems to outweigh reward and benefit numbers lack robustness	Businesses (and government) have to make commercial and investment decisions under uncertainty/imperfect information all the time; what businesses do is obtain the best information they can in the timeframe available, assess what the implications would be based on this information and explore how much the implications would differ if the key variables were to turn out to be higher or lower; furthermore, businesses face uncertain physical and commercial environments even if they don't invest (in fact, on some occasions there is greater uncertainty and risk in not investing or in not making a decision); in the case of the proposed balancing rules, the costs and benefits of the baseline scenarios – what would happen without the proposed rules – are also very uncertain, so you can't escape uncertainty either way, but still have to make a decision
	Disagrees that efficiency benefits would extend to the market for gas, not just balancing gas	Efficiency benefits apply to the market for gas (consequent benefits from more efficient use of pipelines and greater certainty about gas delivery and costs), not just balancing gas – see explanation in Appendix B of CBA report

Maui Development Limited	Analysis by Infometrics shows that there are good reasons for believing that the net benefit of the proposed rules will be zero or even negative	Disagree that Infometrics' mathematical analysis provides "good reasons" – see responses below; but our CBA also already shows that the proposed rules could have negative net benefits relative to the code changes scenario – specifically, under the pessimistic scenario
	Positive benefits in CBA result from assumptions about decrease in gas costs that do not seem justified by any evidence whatsoever	The efficiency benefits apply to the market for gas (consequent benefits from more efficient use of pipelines and greater certainty about gas delivery and costs), not just balancing gas – see explanation in Appendix B of CBA report; we do not know how large the efficiency benefits would be; our intention was to use the gas industry group to provide the best informed expert opinion on the inputs into the CBA, but opinions ranged widely; we therefore modelled multiple scenarios to reflect the range in opinion and undertook sensitivity analysis to show how the results would differ if the costs and benefits were higher or lower; we include a pessimistic scenario that represents the proposed rules achieving the same magnitudes of efficiency benefits as the code changes and ICD MOU scenarios; the sensitivity analysis highlights that the efficiency benefits could be much lower than modelled and still be enough for the proposed rules to provide higher net benefits than the code changes or ICD MOU scenarios under the optimistic scenario; some members of the gas industry group think the CBA underestimates the efficiency benefits
	Summarises Infometrics' conclusions as: • the costs of the various scenarios, while uncertain, are unlikely to have a major effect on the overall conclusion of the CBA	The CBA's sensitivity analysis already showed this and the CBA report already reported this The Monte Carlo analysis provided in Infometrics' report adds little value, as, without probability distributions for the costs and benefits used in the CBA, all it does is use the -/+ 25% from the sensitivity analysis; the -/+25% used in the sensitivity analysis is not an indicator of the degree of uncertainty around each individual cost or benefit (otherwise it would obviously vary – for example, -/+5% for coefficients that are quite certain to -/+50% for coefficients that have a wider range of possible values); its purpose is to examine how much the results would differ if individual costs or benefits were 25% lower or higher and to identify which of the individual costs and benefits have proportionately most effect on the results (i.e. to which the results are most sensitive); furthermore, we could just as usefully have used 20% or 30% for this purpose
	• the case for the proposed rules rests entirely on the arbitrary assumption that they will deliver greater efficiency gains than the code change scenario; this has not been proven	The CBA report already acknowledges that the efficiency benefits are the greatest uncertainty and that the results are most sensitive to these benefits; we do not know how large the efficiency benefits would be; our intention was to use the gas industry group to provide the best informed expert opinion on the inputs into the CBA, but opinions ranged widely, so we modelled multiple scenarios to reflect the range and undertook sensitivity analysis to show how the results would differ if the

		costs and benefits were higher or lower; at the gas industry group meeting on the CBA, industry representatives said that, even at worst, a regulated approach could be expected to provide greater certainty and achieve improvements more quickly; the pessimistic scenario therefore represents the proposed rules achieving the same magnitudes of benefits as the code changes and ICD MOU scenarios, just ramping up more slowly; some members of the group think the CBA underestimates the efficiency benefits; the sensitivity analysis highlights that the efficiency benefits could be much lower and still be enough for the proposed rules to provide higher net benefits than the code changes or ICD MOU scenarios under the optimistic scenario The net benefits are therefore far from "finely balanced" as Infometrics concludes; the modelling Infometrics uses to reach this conclusion (table 1 of Infometrics' report) is distorted and misleading; first and foremost, it includes pessimistic outcomes in its modelling of variations of the optimistic scenario; these pessimistic outcomes will, of course, drag down the average net benefit (NPV) across all variations, whereas the CBA is more explicit and transparent in modelling optimistic outcomes in the optimistic scenario and pessimistic outcomes in a separate pessimistic scenario; these two scenarios in the CBA are also each internally consistent, whereas the variations modelled by Infometrics are not in that they combine pessimistic outcomes with regard to efficiency benefits with still optimistic assumptions about the ease and effectiveness of the proposed rules with regard to other benefits and costs; Infometrics' modelling includes variations where the efficiency benefits of the proposed rules, code changes or ICD MOU are set equal to zero, which make the net benefits of these variations driven overwhelmingly by the costs (with only a slight difference in dispute reduction benefits), so again, of course, drag down the average net benefit across all variations; the modelling of zero efficiency benefits seems unrealistic and inapplicable – the purpose of the proposed rules, code changes or ICD MOU would be specifically to improve balancing arrangements, so why would you design them to achieve no improvement?; and if they do achieve improvement in balancing arrangements, how could this not result in greater efficiency?; would more accurate allocation of balancing costs to causers of imbalances really have no effect on their decisions/behaviour and the decisions/behaviour of market participants who are currently being overcharged?; if not, why is the industry even contemplating any of the options (proposed rules, code changes or ICD MOU), if they would have no real effect beyond simply moving costs around between participants?; this also ignores the range in opinion of the rest of the gas industry group that fed into the CBA; perhaps the criticism Infometrics meant by this, but didn't state, was of the relationship assumed between the efficiency benefits of the proposed balancing rules and the efficiency benefits of the baseline scenarios; even in this respect, however, we have modelled a range to reflect the range in the opinion; and we do so explicitly through the two separate optimistic and pessimistic scenarios, unlike Infometrics' inclusion of pessimistic outcomes in its variations of

	• if we assume a $1 million balancing gas cost savings and no difference in efficiency gains, the optimistic scenario shows less net benefit than the code change scenario	the optimistic scenario; although the CBA's sensitivity analysis maintains the same relationship between the proposed balancing rules and baseline scenarios with regard to efficiency gains, we already model a wide range explicitly through the optimistic and pessimistic scenarios – that the proposed balancing rules achieve twice the magnitude of efficiency benefits under the optimistic scenario and the same magnitude of efficiency benefits under the pessimistic scenario MDL seems to have misunderstood what Infometrics modelled (table 3 of Infometrics report); Infometrics in fact modelled this $1 million as not just balancing costs savings (which, as simply a transfer between market participants, would show in the CBA as zero net benefit), but, indeed, as resulting efficiency gains Infometrics' modelling is again distorted and misleading; it includes, again, pessimistic outcomes in its variations of the optimistic scenario and in this case also includes optimistic outcomes in its variations of the pessimistic scenario; this not only distorts the average of the net benefits across each set of variations, but is also internally inconsistent in combining pessimistic outcomes with regard to efficiency benefits with optimistic assumptions about the proposed rules' other benefits and costs and combining optimistic outcomes with regard to efficiency benefits with pessimistic assumptions about the proposed rules' other benefits and costs; again, the inclusion of variations that have zero efficiency benefits (which also drag down the average, because the net benefits of these variations are therefore driven overwhelmingly by their costs) seems unrealistic and inapplicable (the purpose of the proposed rules, code changes or ICD MOU would be specifically to improve balancing arrangements, so why would you design them to achieve no improvement; and if they do achieve improvement in balancing arrangements, how could this not result in greater efficiency?) – especially coming from Infometrics who, as economists, should recognise the efficiency benefits to a market of more accurate allocation of charges to users/exacerbators In our CBA model, without Infometrics' distortions, productive efficiency benefits of very close to $1 million ($1,020,000 million, to be precise) would be provided by a 0.085% reduction in price and unit cost of gas; this would result in the proposed balancing rules providing present value net benefits over the first 14 years of $1.175 million and $2.587 million relative to the two baseline scenarios if adopted for the optimistic scenario and -$3.826 million and -$1.871 million if adopted for the pessimistic scenario; thus, even using a figure of just $1 million, the CBA still indicates the proposed balancing rules to provide higher net benefits under the optimistic scenario; this was already within the range covered in the sensitivity analysis of table 6 in the CBA report, so already considered; to facilitate use of this sensitivity analysis, we have added two columns to table 6 in the CBA report to show also the dollar values (rather than just percentage values) of the allocative and productive efficiency benefits modelled in this sensitivity analysis; these show that only if the efficiency benefits were as low as $0.3 million would the proposed

	• the case for the proposed rules requires much more evidence before a departure from the code change process can be considered Considers the cost-benefit case for the proposed rules deeply flawed in that it relies on an assumption of efficiency gains resulting from the rules that exceed current balancing costs; if this is removed there is no apparent case for proceeding with the rules	rules no longer be superior under the optimistic scenario; for balance, we have also added to the discussion the eventuality that the proposed rules, code changes and ICD MOU achieve no improvement in balancing arrangements, although note that this seems remote given that improvement in balancing arrangements is what the proposed rules, code changes and ICD MOU would be designed specifically to achieve Ideally, all CBAs would be entirely evidence based with no uncertainty, but this is rarely feasible in the real world, except perhaps for ex post assessments of past changes/investments (and even for these, there remains uncertainty about what the counterfactual would have been); in the absence of this information, we sought to use the gas industry group to provide the best informed expert opinion on inputs into the CBA; but the gas industry group has a wide range in opinion on the costs and benefits; to reflect the range in opinion, the CBA models multiple scenarios and provides sensitivity analysis to explore how the results would differ if the costs and benefits were higher or lower, including even a pessimistic scenario that represents the proposed rules achieving the same magnitudes of benefits as the code changes and ICD MOU scenarios; the sensitivity analysis highlights that the efficiency benefits could be much lower and still be enough for the proposed rules to provide higher net benefits than the code changes or ICD MOU scenarios under the optimistic scenario; CBA is still useful to model various "what ifs" to help inform decision-making Efficiency benefits apply to the market for gas (consequent benefits from more efficient use of pipelines and greater certainty about gas delivery and costs), not just balancing gas – see explanation in Appendix B of CBA report; if efficiency benefits are removed, there is no case for the code changes and ICD MOU baseline scenarios either; would more accurate allocation of balancing costs to causers of imbalances really have no effect on their decisions/behaviour and the decisions/behaviour of market participants who are currently being overcharged?; if not, why is the industry even contemplating any of the options (proposed rules, code changes, ICD MOU), if they would have no real effect beyond moving costs around between participants?
Methanex	Considers the CBA's conclusions somewhat biased towards supporting a recommendation in favour of regulation Believes that a CBA that was specific to comparing a single unified balancing regime with the counterfactual would have provided a more valuable analysis	The CBA presents results for all four possible combinations of scenarios – optimistic and pessimistic scenarios for the proposed balancing rules and relative to baselines of code changes and an ICD MOU What would be your counterfactual?; the gas industry has already indicated sufficient dissatisfaction with the current arrangements that these would not continue as they are – some improvement would have to occur; the question is whether this improvement is pursued through the proposed rules, proposed code changes or an ICD MOU

	Believes that the proposed rules will require a new balancing market to be established or at the very least a significant design of existing systems; therefore considers the costs in the CBA to be seriously underestimated in this regard	The pessimistic scenario includes the costs of establishing a new balancing market
	Don't think the pessimistic scenario was given enough weight in the commentary	The CBA presents results for all four possible combinations of scenarios; the gas industry group was divided on which scenarios are more likely (optimistic vs. pessimistic, baseline of code changes vs. ICD MOU), so we present results for each and do not make any judgement about which is the more likely
	Insufficient explanation of how derived the significant cost and benefit differences between the code change and ICD MOU scenarios	These are based on the gas industry group's discussion of the CBA and comments on the draft CBA; the group indicated that code changes would take less time and cost less to agree and implement than the optimistic scenario for the proposed balancing rules and an ICD MOU would take longer and cost more to agree and implement than the pessimistic scenario for the proposed balancing rules; opinions ranged widely on how much benefits would differ between the proposed balancing rules and the baseline scenarios, so we modelled optimistic and pessimistic scenarios to reflect this range
Mighty River Power	Believes that the proposed saving of between $3 million and $6 million is overstated and should be eliminated from the cost-benefit calculation, because based on reduction in cost of balancing gas purchased, applied to all gas purchased within the market	Efficiency benefits apply to the market for gas (consequent benefits from more efficient use of pipelines and greater certainty about gas delivery and costs), not just balancing gas – see explanation in Appendix B of CBA report; if eliminated for the proposed balancing rules, would also have to be eliminated for the code changes and ICD MOU scenarios; would more accurate allocation of balancing costs to causers of imbalances really have no effect on their decisions/behaviour and the decisions/behaviour of market participants who are currently being overcharged?; if not, why is the industry even contemplating any of the options (proposed rules, code changes, ICD MOU), if they would have no real effect beyond moving costs around between participants?
	Charts appear to suggest ongoing operating costs of the balancing operator of $250,000 to $300,000 per annum; but costs of critical contingency operator are currently around $387,000 for six months, so it would not be unreasonable to assume annual ongoing costs of the balancing operator of $750,000, probably higher	Actually, these are modelled as zero net cost; see Table 1 in CBA report; the CBA models the <u>additional</u> costs and benefits under the proposed balancing rules relative to costs and benefits under the baseline scenarios, i.e. the differences in costs and benefits; administering balancing and managing funding arrangements occur under both the proposed balancing rules and the baseline scenarios; the difference is the balancing rules would involve transferring these functions and associated costs from the TSOs to the single balancing agent – so incur additional costs to the single balancing agent, but provide equivalent cost savings to the TSOs, so incur no <u>net</u> cost (although the CBA also allows for the TSOs needing to retain some resource to support the balancing operator's functions); furthermore, the critical contingency operator would be required under both the proposed balancing rules and the code changes and ICD MOU baseline scenarios, so involves no <u>additional</u> costs/difference in costs under the proposed balancing rules

Nova Energy	Believes the regulatory proposal is too limited in scope to achieve the benefits provided for in the CBA	The CBA aims to reflect the gas industry group's opinion, which ranged widely; some members think the CBA underestimates the benefits; to reflect the range in opinion, the CBA models multiple scenarios and includes sensitivity analysis to explore how the results would differ if the costs and benefits were higher or lower; we include a pessimistic scenario that represents the proposed rules achieving the same magnitudes of benefits as the code changes and ICD MOU scenarios; the sensitivity analysis highlights that the efficiency benefits could be much lower and still be enough for the proposed rules to provide higher net benefits than the code changes or ICD MOU scenarios under the optimistic scenario
	The assumption of productive efficiency gains of 0.5% is arbitrary and not supported by any empirical evidence	We do not know how large the efficiency benefits would be; our intention was to use the gas industry group to provide the best informed expert opinion on the inputs into the CBA, but opinions ranged widely, so we have modelled multiple scenarios to reflect the range and undertaken sensitivity analysis to show how the results would differ if the costs and benefits were higher or lower; even if we don't know how large the efficiency benefits would be, it is still informative to model what the results would be if the efficiency benefits were x or y etc., provided that we include sensitivity analysis; we include a pessimistic scenario that represents the proposed rules achieving the same magnitudes of efficiency benefits (0.25%) as the code changes and ICD MOU scenarios; the sensitivity analysis highlights that the efficiency benefits could be much lower than modelled and still be enough for the proposed rules to provide higher net benefits than the code changes or ICD MOU scenarios under the optimistic scenario; some members of the gas industry group think the CBA underestimates the benefits
	Further scope for reduction in pipeline balancing is likely to be limited and therefore limited efficiency benefits available; difficult to see how improvements to balancing arrangements through regulation or any other process would result in $6 million per annum (0.5% or 4c/GJ) of benefits	Efficiency benefits apply to the market for gas (consequent benefits from more efficient use of pipelines and greater certainty about gas delivery and costs), not just balancing gas – see explanation in Appendix B of CBA report; the CBA and its multiple scenarios aim to reflect the gas industry group's opinion, which ranged widely; some members think the CBA underestimates the efficiency benefits
Vector	Considers the CBA extremely conservative and materially underestimates the net benefits delivered by regulation relative to a negotiated contractual approach	The CBA aims to reflect the gas industry group's opinion, which ranged widely; some members think the CBA overestimates the benefits; the CBA's sensitivity analysis explores the impact of modelling lower and higher benefits (and costs) and highlights, in particular, that the efficiency benefits could be much lower and still be enough for the proposed rules to provide higher net benefits than the code changes or ICD MOU scenarios under the optimistic scenario; modelling higher benefits wouldn't change this conclusion; being "conservative" can provide for more confidence in findings (e.g. we don't know what the benefits would be, but the CBA shows that even if they were "conservative", they'd outweigh the costs); modelling higher benefits would alter the conclusions under the pessimistic scenario, but this, after all, is intended to reflect pessimistic opinions
	Dynamic efficiency benefits, as recognised in NZIER CBA, would make up the greatest proportion of the benefits, yet are not included	Agree that dynamic efficiency benefits are typically the largest and generally many times as large as productive efficiency benefits, but dynamic efficiency benefits are

	in the quantitative modelling	also longer run and, by their nature, less predictable; have added footnotes to CBA report on economic literature and to note additional dynamic efficiency benefits
	Stability and sustainability of rules based arrangement (due to certainty it provides to market participants) and its enduring benefits to industry and consumers are major benefits and should have been factored into the analysis	All scenarios (proposed rules, code changes and ICD MOU) are modelled as being stable and sustainable once implemented; differences lie in the time and cost involved in achieving agreement on and implementing stable and sustainable rules, code changes or ICD MOU and in the magnitudes of efficiency benefits; all scenarios include "amendment costs" for periodic review and amendment over life of rules, code changes or ICD MOU
	Believes that NZIER adopted an extremely cautious approach in lowering efficiency improvements modelled from 1% or 0.5% between the draft and final report; recognises that there is considerable uncertainty, but believes that 1% is a more realistic assumption when all forms of efficiency are considered	Little is lost in being cautious, given that, whilst we're uncertain how large the benefits would be, even "conservative" assumptions show proposed rules to provide net benefits over alternatives under optimistic scenario; gas industry group opinion ranged widely and some members think the CBA overestimates the benefits; the CBA includes sensitivity analysis to show impact of modelling lower and higher benefits
	Baseline scenario is very unlikely to eventuate; improvements on substantive matters via contract are unlikely in the short or long terms	The CBA includes two baseline scenarios – code changes and, if the code change process is not successful, ICD MOU; the gas industry group was divided on which is more likely, but considered that one or the other would occur (i.e. some improvement will be made – arrangements won't stay as they are currently), so we assess the proposed rules against each in turn
	Reduction in costs of disputes on balancing issues has been underestimated	The CBA aims to reflect the gas industry group's opinion, which ranged widely; some members thought the dispute reduction benefits would be small; the impact of modelling higher or lower dispute reduction benefits is explored in the sensitivity analysis; modelling higher or lower dispute reduction benefits does not change the results very much and does not change the conclusions
	Considers the probability of an effective code change very low, so this scenario should be given very little weighting	The gas industry group was divided on this, so we assess the proposed rules against each of the two baseline scenarios in turn and present the results for each, without making any judgment about which is more likely

Source: NZIER

Appendix B Updated NZIER cost-benefit analysis

nzier
authoritative analysis

Proposed balancing rules

Cost-benefit analysis

Report to Gas Industry Co

7 May 2010

About NZIER

The New Zealand Institute of Economic Research (NZIER) is a specialist consulting firm that uses applied economic research and analysis to provide a wide range of strategic advice to clients in the public and private sectors, throughout New Zealand and Australia, and further afield.

NZIER is also known for its long-established *Quarterly Survey of Business Opinion* and *Quarterly Predictions*.

Our aim is to be the premier centre of applied economic research in New Zealand. We pride ourselves on our reputation for independence and delivering quality analysis in the right form, and at the right time, for our clients. We ensure quality through teamwork on individual projects, critical review at internal seminars, and by peer review at various stages through a project by a senior staff member otherwise not involved in the project.

NZIER was established in 1958.

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Executive summary

Gas Industry Co has reviewed current balancing arrangements on New Zealand's two open access gas transmission pipelines. It has concluded that the best means of achieving the government's objectives for the industry is the introduction of rules to provide for the efficient, unified management of aggregate imbalance in the transmission pipeline system.

The Associate Minister of Energy and Resources has requested that a quantitative cost-benefit analysis (CBA) accompany any regulatory recommendation made by Gas Industry Co. Gas Industry Co has engaged NZIER to assist in preparing this CBA. This report outlines the method and results of this CBA.

To reflect the diversity of views in the gas industry, we model the costs and benefits of the proposed balancing rules under two scenarios – an optimistic scenario and a pessimistic scenario. Under the pessimistic scenario the proposed balancing rules take longer and cost more to implement and also achieve smaller benefits than under the optimistic scenario.

Views differ also on what would occur in the absence of the proposed balancing rules. Further improvement in current balancing arrangements seems likely, given industry dissatisfaction, but it is not yet clear whether this would be achieved through code changes, such as those currently proposed by Maui Development Limited (MDL), or, if the code change process is not successful, through a wider industry initiative, such as the Industry Code Development (ICD) process which produced a Memorandum of Understanding (MOU) in December 2009, setting out the broad parameters of a wide ranging balancing solution. We therefore assess the proposed balancing rules relative to each of these two alternative baseline scenarios, in turn – a code changes scenario and an ICD MOU scenario.

Not surprisingly, the results of the CBA indicate that whether the proposed balancing rules are of net benefit depends on the baseline scenario – specifically, whether the code change process is successful – and whether the costs and benefits of the proposed balancing rules, especially the resulting benefits of more efficient use of transmission pipelines, are closer to the optimistic or pessimistic views expressed by the gas industry.

We do not know which of the four possible combinations of scenarios is the most likely, but the results of the CBA indicate that the proposed balancing rules are the superior approach in all but one of these four possible eventualities, as shown below.

Superior approach by scenario

		Costs and benefits of Proposed balancing rules	
		Optimistic scenario	Pessimistic scenario
Baseline scenario	Code changes	Proposed balancing rules (by $17 million)	Code changes (by $3.5 million)
	ICD MOU	Proposed balancing rules (by $21 million)	Proposed balancing rules (marginally) (by $0.5 million))

Source: NZIER

The results of the CBA indicate that only if the code change process is considered likely to succeed *and* the costs and benefits of the proposed balancing rules are considered likely to be closer to the pessimistic scenario is adopting code changes likely to be somewhat better (by around $3.5 million in present value net benefits over the next 14 years) than implementing the proposed balancing rules.

If the costs and benefits of the proposed balancing rules are considered likely to be closer to the optimistic scenario, it is likely to be substantially better (by $17 million to $21 million) to implement the proposed balancing rules. If the code change process is considered unlikely to succeed, it is likely to be either substantially better or marginally better (by $21 million or $0.5 million) to implement the proposed balancing rules than an ICD MOU.

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1. Purpose

Gas Industry Co has reviewed current balancing arrangements on New Zealand's two open access gas transmission pipelines[1]. It has concluded that the best means of achieving the government's objectives for the industry is the introduction of rules to provide for the efficient, unified management of aggregate imbalance in the transmission pipeline system. The rationale for this conclusion was set out in the transmission pipeline balancing statement of proposal[2]. This conclusion was supported by a qualitative cost-benefit analysis (CBA).

Subsequently, the Associate Minister of Energy and Resources (Associate Minister) has requested that a quantitative CBA accompany any regulatory recommendation made by Gas Industry Co. Gas Industry Co has engaged NZIER to assist in preparing this CBA. This report outlines the method and results of this CBA.

2. Proposed balancing rules

Balancing refers to maintaining the gas inventory in a pipeline ("linepack") within limits to ensure the reliable delivery and receipt of gas. Balancing is necessary to keep the gas pressure in the pipeline above the minimum required to maintain supply of gas to customers, but below the safe physical operating limit for the pipeline.

Users of the pipeline have an obligation to balance their inputs and outputs so as not to consume linepack or park gas in the transmission system beyond allowed tolerances. This is known as primary balancing.

There remains a need for residual balancing, given common use of the pipeline by multiple users. Currently, this is the responsibility of the two transmission system owners (TSOs) Maui Development Limited (MDL) and Vector Gas Limited (Vector).

The purpose of the proposed balancing rules is[3]:

> *…to achieve an efficient, unified management of aggregate imbalance in the transmission system.*

In summary, the rules provide for:

> *the appointment of –*
>
> - *a single balancing operator and development of a unified balancing plan (to be approved by the industry body) by transmission system owners; or*

[1] Gas Industry Company (2008) *Transmission Balancing Options Paper*, December 2008; Gas Industry Company (2009) *Transmission Balancing Second Options Paper*, July 2009.

[2] Gas Industry Company (2009) *Statement of Proposal Transmission Pipeline Balancing,* October 2009.

[3] *Draft Gas Governance (Balancing) Rules*, updated following February 2010 consultation , p.1.

- *in certain circumstances, a single balancing operator and development of a unified balancing plan by the industry body; and*

the powers and functions of the balancing operator to –

- *purchase and sell gas when thresholds in the balancing plan are or may be breached; and*
- *allocate gas and costs associated with the purchase and sale of gas under the rules; and*

the rights and obligations of users and transmission service owners in relation to the balancing operator's functions.

3. Method

3.1 Cost-benefit analysis

CBA provides a formal, structured method for systematically assessing proposals in terms of their outcomes relative to their use of resources.

The CBA process comprises 10 steps:

1. define the problem
2. select the options for assessment (proposal and alternatives)
3. specify the baseline scenario
4. identify the impacts of the options – positive (benefits) and negative (costs)
5. where possible, quantify the impacts
6. where possible, value the impacts
7. adjust for differences in the timing of the impacts
8. calculate decision criteria
9. analyse the sensitivity of the results and
10. document the CBA

In the analysis of government policy, CBA is normally undertaken from a national economy perspective, weighing up the relative costs and benefits to New Zealand as a whole. Wealth transfers between parties, although affecting the distribution of costs and benefits, cancel each other out in the aggregation of total costs and benefits to New Zealand (i.e. where a cost to one party is an equivalent benefit to another party).

3.2 Baseline scenarios

A critical step in any CBA is specifying the baseline scenario – the default or prevailing situation or conditions that would occur in the absence of the proposal and

any alternatives under consideration. It is relative to this counterfactual that the costs and benefits of the proposal and any alternatives are measured.

For the purpose of assessing the costs and benefits of the proposed balancing rules, we define the baseline scenario as the "status quo" – continuation of the current balancing arrangements, but subject to gradual improvement over time. Some improvement seems likely, given industry dissatisfaction, such that it would be unrealistic to adopt a status quo of no further improvement in current balancing arrangements in the absence of the proposed balancing rules.

A difficulty in specifying this baseline scenario is that it is uncertain whether this improvement in current balancing arrangements would be achieved through code changes, such as those currently proposed by MDL, or, if the code change process is not successful, through a wider industry initiative, such as the Industry Code Development (ICD) process which produced a Memorandum of Understanding (MOU) in December 2009, setting out the broad parameters of a wide ranging balancing solution. We therefore assess the proposed balancing rules relative to each of these two alternative baseline scenarios, in turn:

- a code changes scenario and
- an ICD MOU scenario.

The CBA assesses the extent to which the proposed balancing rules would incur additional costs and deliver additional benefits beyond those that would otherwise occur under each of these two baseline scenarios.

3.3 Scenarios for proposed balancing rules

Discussions with representatives of the gas industry have highlighted the diversity of views on the current balancing arrangements and the proposed balancing rules. To reflect the range of these views, we model the costs and benefits of the proposed balancing rules under two scenarios:

- an optimistic scenario and
- a pessimistic scenario.

These two scenarios differ in terms of the timing and magnitude of the costs and benefits of the proposed balancing rules relative to those that would otherwise occur under the baseline scenarios of gradual improvement over time in current balancing arrangements through either code changes or an ICD MOU. The proposed balancing rules take longer and cost more to implement under the pessimistic scenario and also achieve smaller benefits than under the optimistic scenario.

Note that these scenarios seek to reflect the range of views on what is considered realistic and likely, rather than more extreme low probability "best" or "worst" possible outcomes.

3.4 Time horizon

If the proposed balancing rules are recommended to the Associate Minister in the second quarter of 2010, approved by the Associate Minister and gazetted by early July 2010, they would come into effect from the beginning of August 2010.

Representatives of the gas industry have assisted in outlining a timeline for implementing the proposed balancing rules, if approved. Implementation would involve preparing, agreeing and establishing the balancing plan and required changes to pipeline codes, information technology (IT) systems, business processes and contracts. Under the optimistic scenario, this implementation could be achieved within a total of 12 months. We therefore model the new balancing arrangements as operational from the beginning of August 2011. Under the pessimistic scenario, significant areas of disagreement would take longer to resolve and implementation could take a total of 34.5 months to achieve. In this case, we model the new balancing arrangements as operational from the beginning of July 2013.

In comparing the proposed balancing rules with the baseline scenarios, we assume that code changes could be completed within a year and be operational from the beginning of July 2011. If the code change process is not successful, we assume that an ICD MOU would take three years to agree and implement and be operational from the beginning of July 2013.

We do not include in the CBA any development costs already incurred to date, given that these are "sunk" costs regardless of whether or not the proposed balancing rules are implemented. We model the costs and benefits from the decision point of whether or not the Associate Minister approves the proposed balancing rules.

To capture sufficient ongoing costs and benefits after initial implementation for a robust assessment of the proposed balancing rules, we model the costs and benefits over a period of 14 years, from mid 2010 to mid 2024. Thus, we model at least 10 years of operating under the new balancing arrangements, even if implementation takes the longer estimate of three years.

So that we can compare directly costs and benefits occurring at different points in time, we adopt a discount rate of 10% to convert future costs and benefits to their present values in 2009/10. In the sensitivity analysis, we also model discount rates of 6%, to reflect a public policy perspective, and 12%, to reflect a commercial perspective[4].

3.5 Costs and benefits

The types of costs likely to be incurred by the proposed balancing rules are shown in Table 1. Table 1 also indicates the magnitudes of these costs modelled in the CBA, over and above the costs incurred under the baseline scenarios of code changes or an ICD MOU. The types of benefits likely to result from the proposed balancing rules

[4] Treasury now recommends an 8% real discount rate for energy and water infrastructure projects. This is spanned by the range we model in the sensitivity analysis.

are shown in Table 2, together with the magnitudes modelled in the CBA, again additional to the benefits achieved under the baseline scenarios.

Table 1 Costs of proposed balancing rules

Additional to baseline scenario

Cost	Frequency	Optimistic scenario	Pessimistic scenario
Prepare, agree and establish initial balancing plan and required changes to codes, IT systems, business processes and contracts	Initial	As outlined in implementation timeline[1], $2.233 million over 12 months Net of implementation costs under baseline scenarios, $1.8 million over one year for code changes, $2.8 million over three years for an ICD MOU	As outlined in implementation timeline[1], $2.560 million over 34.5 months Net of implementation costs under baseline scenarios, $1.8 million over one year for code changes, $2.8 million over three years for an ICD MOU
Establish single balancing operator	Initial	Competitively priced bids from existing TSO service providers, $1 million	$2 million[2]
Establish new balancing market	Initial	Use existing market, no additional cost	Unable to use existing market, establish new market, $0.5 million
Administer balancing operator and manage funding arrangements	Ongoing	Transfer of functions and associated costs from TSOs to single balancing operator, no net cost	Transfer of functions and associated costs from TSOs to single balancing operator, no net cost
Support balancing operator's functions	Ongoing	Resource retained by TSOs, quarter of a FTE, $35,000	Resource retained by TSOs, half a FTE, $70,000
Operate under balancing plan and amended codes, IT systems, business processes and contracts	Ongoing	May also provide some cost savings, net cost no more than currently, under proposed balancing rules and baseline scenarios	Costs average of $10,000 more per year per market participant, across 10 market participants, than operating under the baseline scenarios
Oversee and monitor balancing operator and balancing market	Ongoing	Quarter of a FTE, $35,000	Half a FTE, $70,000
Prepare, agree and establish future amendments to balancing plan and any associated changes to codes, IT systems, business processes and contracts	Ongoing	Quarter of initial cost (see above), every three years, average per year Net of cost of future amendments to codes or contracts under baseline scenarios, quarter of initial cost, every three years, average per year	Quarter of initial cost (see above), every three years, average per year Net of cost of future amendments to codes or contracts under baseline scenarios, quarter of initial cost, every three years, average per year

Notes: [1] See Appendix A for details of implementation costs.

[2] Gas Industry Company (2008) *Transmission Balancing Options Paper*, December 2008, p.22.

Source: Gas industry representatives, Gas Industry Co, NZIER

Table 2 Benefits of proposed balancing rules

Additional to baseline scenario

Benefit	Frequency	Optimistic scenario	Pessimistic scenario
Reduction in cost of residual balancing actions	Ongoing	Transfer of balancing costs between market participants (reduction in balancing costs to users, equivalent reduction in revenues to balancing operator, some reallocation of balancing costs between users), no net benefit	Transfer between market participants, no net benefit
Reduction in cost of disputes over balancing	Ongoing	Averts one major dispute every two years, average benefit $25,000 per year, from first year of operation Net of reduction in dispute costs under baseline scenarios, avert one major dispute every five years, average benefit $10,000 per year, reached gradually over first five years	Averts one major dispute every five years, average benefit $10,000 per year, from first year of operation Net of reduction in dispute costs under baseline scenarios, avert one major dispute every five years, average benefit $10,000 per year, reached gradually over first five years
Cost savings to TSOs of administering balancing and managing funding arrangements	Ongoing	Transfer of functions and associated costs from TSOs to single balancing operator, no net benefit	Transfer of functions and associated costs from TSOs to single balancing operator, no net benefit
Efficiency benefits More efficient levels of balancing and more accurate allocation of balancing costs Results in more efficient use of pipelines, more economically efficient production and consumption decisions and potentially increased market participation and competition (greater certainty about actual costs and benefits of buying and selling gas)	Ongoing	Allocative efficiency improvements[1] resulting in 0.5% reduction in price of gas, from first year of operation, productive efficiency improvements resulting in 0.5% reduction in unit cost of gas, reached gradually over first five years Net of efficiency improvements under baseline scenarios, allocative efficiency improvements[1] resulting in 0.25% reduction in price of gas, reached gradually over first five years, productive efficiency improvements resulting in 0.25% reduction in unit cost of gas, reached gradually over first 10 years	Allocative efficiency improvements[1] resulting in 0.25% reduction in price of gas, from first year of operation, productive efficiency improvements resulting in 0.25% reduction in unit cost of gas, reached gradually over first five years Net of efficiency improvements under baseline scenarios, allocative efficiency improvements[1] resulting in 0.25% reduction in price of gas, reached gradually over first five years, productive efficiency improvements resulting in 0.25% reduction in unit cost of gas, reached gradually over first 10 years

Notes: [1] See Appendix B for details of efficiency benefits.

Source: Gas industry representatives, Gas Industry Co, NZIER

The proposed balancing rules may affect some individual market participants more than others. The costs and benefits modelled reflect averages across the industry. Given that the magnitudes of these costs and benefits are uncertain, we test the sensitivity of the CBA's results across a range of values for each type of cost and benefit (see Section 4.3 below).

4. Results

4.1 Annual costs and benefits

Figure 1 and Figure 2 show our estimates of the total annual costs and benefits of the proposed balancing rules, under the optimistic and pessimistic scenarios, relative to the baseline scenario of code changes.

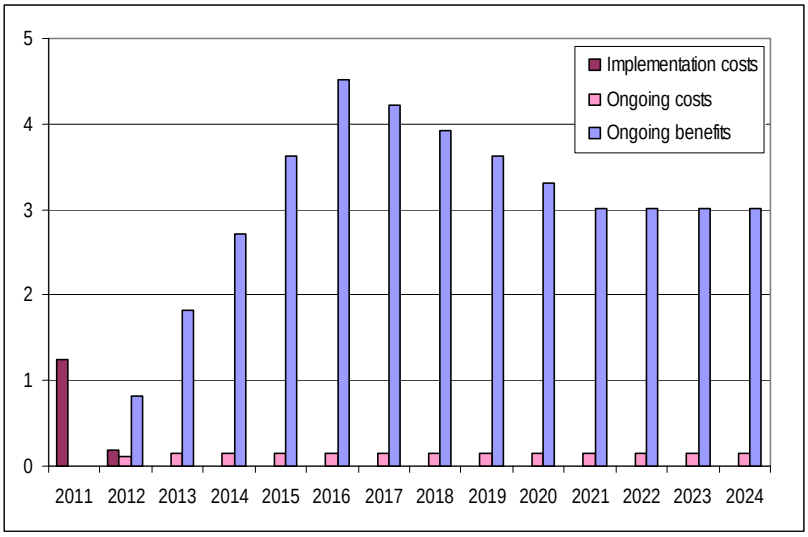
Recall that these are the additional costs and benefits of the proposed balancing rules over those of the baseline scenario. This explains the negative "additional" benefits initially in Figure 2, when improved balancing arrangements under the proposed balancing rules have yet to come into effect due to the longer development and implementation process under the pessimistic scenario, whilst code changes are already achieving some improvement. It also explains why annual benefits decline from 2016/17 in Figure 1 and 2018/19 in Figure 2 as the benefits achieved through code changes increase over time.

Recall also that the costs to the balancing operator of administering balancing and managing funding arrangements, and the equivalent cost savings to TSOs from no longer having to perform these functions, are not modelled explicitly, as they cancel each other out. Nor is the reduction in cost of residual balancing actions modelled explicitly as it represents the transfer of balancing costs between market participants, which again cancel each other out. In the figures below, the effect of including these transfers would be to raise the annual cost and annual benefit by the same amount.

Under the optimistic scenario, the proposed balancing rules cost more to implement initially than code changes and a little more to operate under thereafter, but deliver substantially more benefits, as shown in Figure 1. Under the pessimistic scenario, however, the proposed balancing rules cost more to implement initially than code changes and more to operate under thereafter, for not much more in benefits, as shown in Figure 2. The resulting annual net benefits under the two scenarios are shown in Figure 3.

Figure 1 Annual costs and benefits of proposed balancing rules under optimistic scenario relative to baseline scenario of code changes

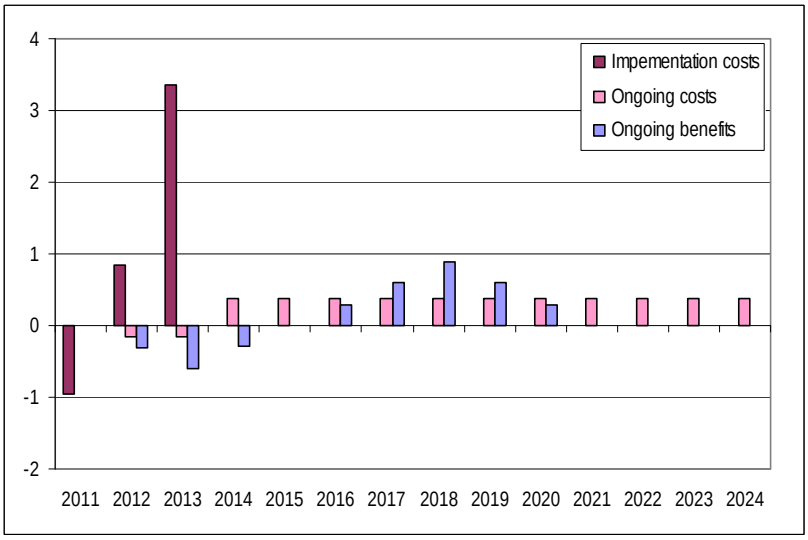
$ million, year ending June



Source: NZIER

Figure 2 Annual costs and benefits of proposed balancing rules under pessimistic scenario relative to baseline scenario of code changes

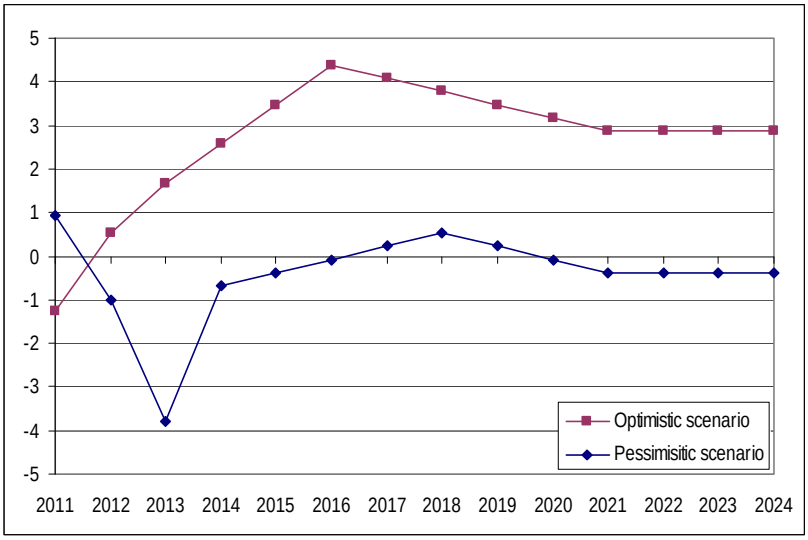
$ million, year ending June



Source: NZIER

Figure 3 Annual net benefits of proposed balancing rules relative to baseline scenario of code changes

$ million, year ending June



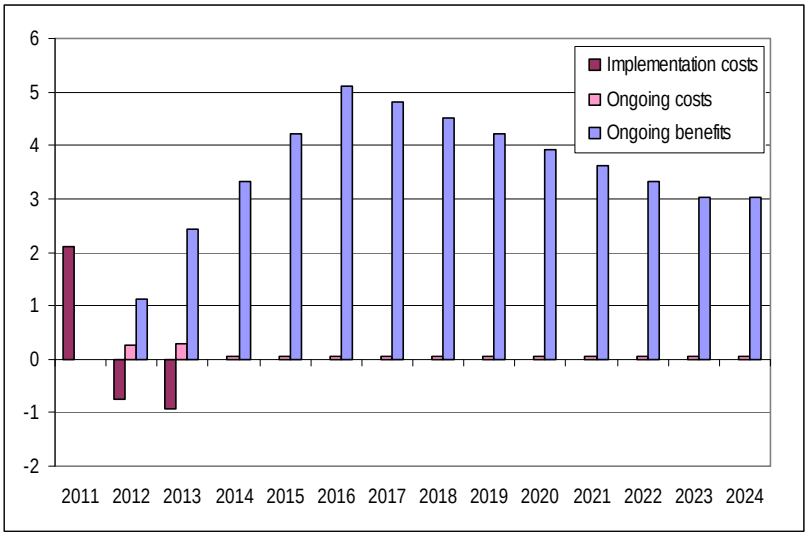
Source: NZIER

Figure 4 and Figure 5 show our estimates of the total annual costs and benefits of the proposed balancing rules, under the optimistic and pessimistic scenarios, relative to the baseline scenario of an ICD MOU, if the code change process is not successful.

Under the optimistic scenario, the proposed balancing rules cost not much more to implement initially than an ICD MOU and a little more to operate under thereafter, but deliver substantially more benefits, as shown in Figure 4. Under the pessimistic scenario, the proposed balancing rules cost more to implement initially than an ICD MOU and more to operate under thereafter, but also deliver more in benefits for several years, as shown in Figure 5. The resulting annual net benefits under the two scenarios are shown in Figure 6.

Figure 4 Annual costs and benefits of proposed balancing rules under optimistic scenario relative to baseline scenario of ICD MOU

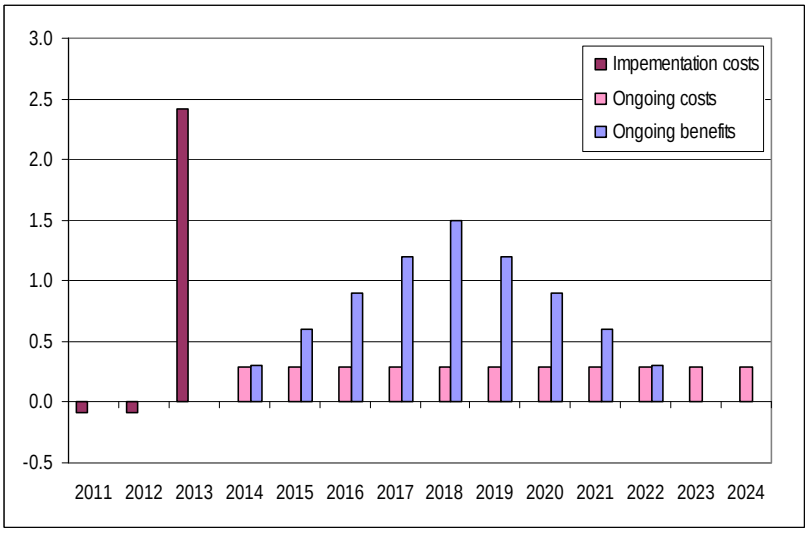
$ million, year ending June



Source: NZIER

Figure 5 Annual costs and benefits of proposed balancing rules under pessimistic scenario relative to baseline scenario of ICD MOU

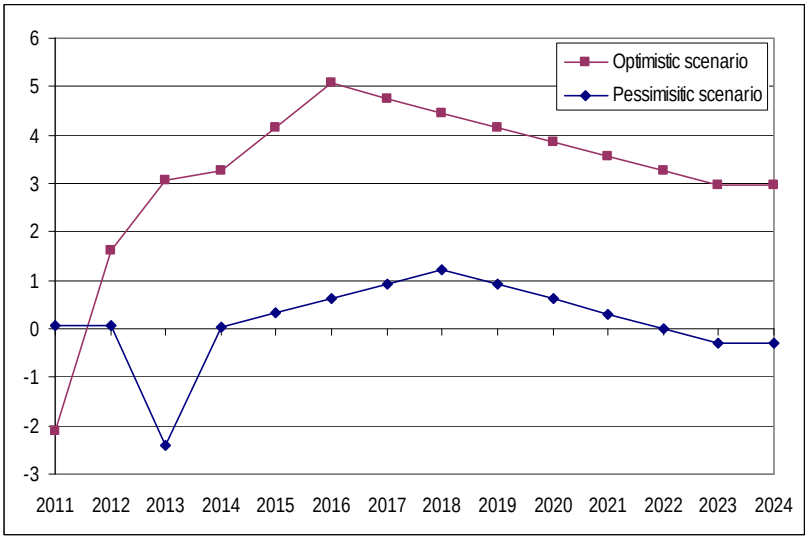
$ million, year ending June



Source: NZIER

Figure 6 Annual net benefits of proposed balancing rules relative to baseline scenario of ICD MOU

$ million, year ending June



Source: NZIER

4.2 Total costs and benefits

With discounting to reflect their relative timing, the above annual costs and benefits imply present value total costs and benefits over 2010/11 to 2023/24 as shown in Table 3.

Table 3 Present value total costs and benefits of proposed balancing rules

$ million, 2010/11 to 2023/24

	Costs	Benefits	Net Benefits
Baseline scenario of code changes			
Proposed balancing rules - optimistic scenario	2.178	19.191	17.013
Proposed balancing rules - pessimistic scenario	3.949	0.363	-3.586
Baseline scenario of ICD MOU			
Proposed balancing rules - optimistic scenario	1.323	22.404	21.081
Proposed balancing rules - pessimistic scenario	3.094	3.576	0.481

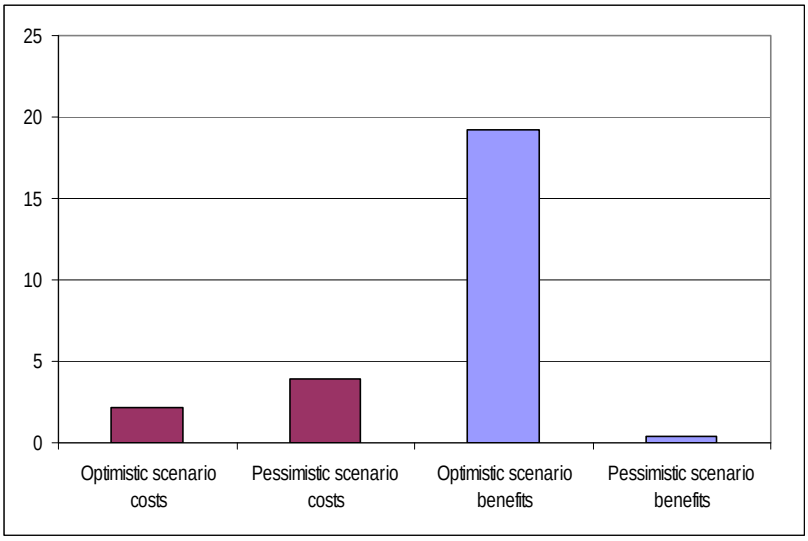
Source: NZIER

Relative to the baseline scenario of code changes, the proposed balancing rules are estimated to deliver around $17 million more in net benefits over the next 14 years under the optimistic scenario. For each dollar of cost, they return $8.81 in benefits. They break even in three years.

Under the pessimistic scenario, however, the proposed balancing rules are estimated to deliver around $3.5 million less in net benefits than the baseline scenario of code changes.

Figure 7 Present value total costs and benefits of proposed balancing rules relative to baseline scenario of code changes

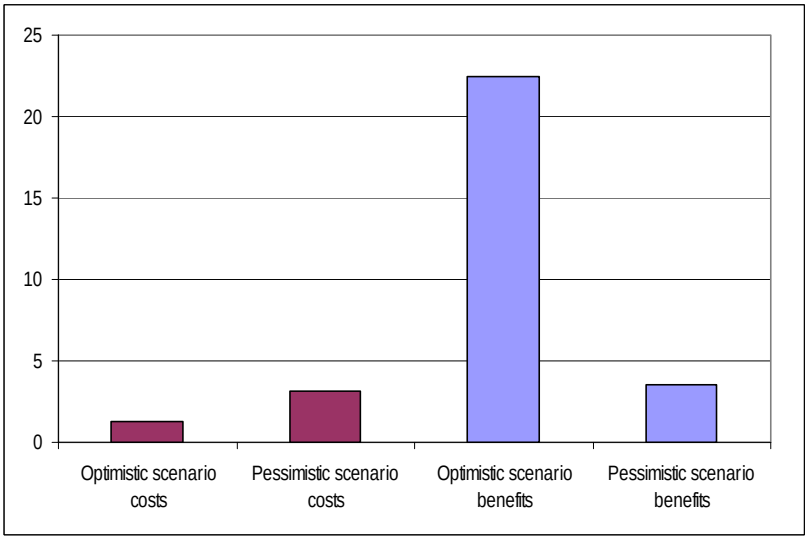
$ million , 2010/11 to 2023/24



Source: NZIER

Figure 8 Present value total costs and benefits of proposed balancing rules relative to baseline scenario of ICD MOU

$ million , 2010/11 to 2023/24



Source: NZIER

Relative to the baseline scenario of an ICD MOU, the proposed balancing rules are estimated to deliver around $21 million more in net benefits under the optimistic

scenario. For each dollar of cost, they return $16.93 in benefits. They break even in three years.

Even under the pessimistic scenario, the proposed balancing rules still deliver around $0.5 million more in net benefits over the next 14 years than the baseline scenario of an ICD MOU. For each dollar of cost, they return $1.16 in benefits. They break even in nine years. The net benefits of the proposed balancing rules are, however, marginal and, over the long term, would eventually be eroded by the small negative ongoing annual net benefits from 2022/23 onwards shown in Figure 6 above.

Not surprisingly, these results indicate that whether the proposed balancing rules are of greater net benefit depends on the baseline scenario – specifically, whether the code change process is successful – and whether the costs and benefits of the proposed balancing rules, especially the resulting benefits of more efficient use of transmission pipelines, are closer to the optimistic or pessimistic views expressed by representatives of the gas industry.

If the code change process is successful and the costs and benefits of the proposed balancing rules are closer to the optimistic scenario, the proposed balancing rules provide greater net benefits. If, however, the costs and benefits of the proposed balancing rules are closer to the pessimistic scenario, code changes provide greater net benefits, provided that they succeed.

If the code change process is not successful, the proposed balancing rules provide greater net benefits than an ICD MOU, regardless of whether their costs and benefits are closer to the optimistic or pessimistic scenarios, although the difference is marginal under the pessimistic scenario.

In other words, the proposed balancing rules are the superior approach in all but one of these four possible eventualities, as summarised in Table 4.

Table 4 Superior approach by scenario

		Costs and benefits of proposed balancing rules	
		Optimistic scenario	Pessimistic scenario
Baseline scenario	Code changes	Proposed balancing rules (by $17 million)	Code changes (by $3.5 million)
	ICD MOU	Proposed balancing rules (by $21 million)	Proposed balancing rules (marginally) (by $0.5 million)

Source: NZIER

We do not know which of these four possible eventualities is the most likely. From Table 4, we can say, however, that only if the code change process is considered likely to succeed *and* the costs and benefits of the proposed balancing rules are considered likely to be closer to the pessimistic scenario is adopting code changes likely to be somewhat better (by around $3.5 million over the next 14 years) than implementing the proposed balancing rules. If the costs and benefits of the proposed balancing rules are considered likely to be closer to the optimistic scenario, it is likely to be substantially better (by $17 million to $21 million) to implement the proposed balancing rules. If the code change process is considered unlikely to succeed, it is likely to be either substantially better or marginally better (by $21 million or $0.5 million) to implement the proposed balancing rules than an ICD MOU.[5]

We do not know the relative probabilities of these different eventualities, but if, by way of illustration, we assume that the two baseline scenarios are equally likely, the expected net benefits of the proposed balancing rules are around $19 million under the optimistic scenario and -$1.5 million under the pessimistic scenario. Alternatively, if we assume that the optimistic and pessimistic scenarios are equally likely, the expected net benefits of the proposed balancing rules are around $7 million relative to the baseline scenario of code changes and $11 million relative to the baseline scenario of an ICD MOU. If the two baseline scenarios are equally likely *and* the optimistic and pessimistic scenarios are also equally likely, the expected net benefits of the proposed balancing rules are around $9 million.

4.3 Sensitivity analysis

As noted above, the unit costs and benefits modelled in the CBA are uncertain. We therefore test the sensitivity of the main results presented above across a range of values for each type of cost and benefit. The results of this sensitivity analysis are shown in Table 5. This table shows how adopting 10% or 25% lower or higher unit costs or benefits would alter the estimated present value total net benefits of the proposed balancing rules, relative to the baseline scenarios, over the next 14 years. It is normal practice to hold the baseline scenario constant in sensitivity analysis of a proposal or options, but this is not possible in this case because a number of the uncertainties apply to the baseline scenarios also. In this sensitivity analysis, we allow values to vary in the baseline scenarios also, but hold constant the relationships between the optimistic and pessimistic scenarios and the baseline~~s~~ scenarios.

The present value net benefits of the proposed balancing rules are most sensitive to the magnitude of efficiency benefits modelled, the discount rate applied and the cost of establishing the single balancing operator. Only if the efficiency benefits were 25% lower than modelled, however, would an ICD MOU, under the pessimistic scenario, provide greater net benefits than the proposed balancing rules (highlighted in bold in Table 5). With this one exception, the findings of Table 4 above hold throughout Table 5 – the proposed balancing rules remain superior to code changes under the

[5] Note that these results do not include dynamic efficiency benefits, which are longer run but have potential to be many times larger than allocative and productive efficiency benefits.

optimistic scenario and to an ICD MOU under both the optimistic and pessimistic scenarios.

As noted in Appendix B, the magnitude of efficiency benefits is particularly uncertain, not only from the proposed balancing rules but also under the two baseline scenarios. Table 6 shows how modelling different magnitudes of efficiency benefits would alter the estimated present value total net benefits of the proposed balancing rules, relative to the baseline scenarios, over the next 14 years. Only if the efficiency benefits of the proposed balancing rules were as low as a 0.025% reduction in the price and unit cost of gas (equivalent to just 0.2 cents/GJ at an average price of gas of $8/GJ, amounting to just $0.3 million per year) would the proposed balancing rules no longer be superior to either of the two baseline scenarios under the optimistic scenario (highlighted in bold in Table 6).

In the event that neither of the two baseline scenarios deliver any future efficiency benefits, the net benefits of the proposed balancing rules would be positive in all four possible combinations of scenarios and range between around $7 million (pessimistic scenario, relative to both baseline scenarios) and $28 million (optimistic scenario, relative to both baseline scenarios). In the event that neither of the two baseline scenarios nor the proposed balancing rules deliver any future efficiency benefits, the net benefits of the proposed balancing rules relative to the baseline scenarios would range between -$1.2 million and -$4.0 million. These eventualities seems remote, however, given that the proposed balancing rules, code changes or ICD MOU would be designed specifically to achieve further improvement in balancing arrangements.

Table 5 Sensitivity analysis

Present value total net benefits, $ million, 2010/11 to 2023/24

		Relative to baseline scenario of code changes		Relative to baseline scenario of ICD MOU	
		Optimistic scenario	Pessimistic scenario	Optimistic scenario	Pessimistic scenario
Main results		17.013	-3.586	21.081	0.481
Costs					
Prepare and establish balancing plan and changes to codes, IT systems, business processes and contracts (including future amendments)	-25%	17.163	-3.447	21.017	0.407
	-10%	17.073	-3.530	21.055	0.452
	+10%	16.954	-3.642	21.107	0.511
	+25%	16.864	-3.726	21.145	0.555
Establish single balancing operator	-25%	17.241	-3.211	21.308	0.857
	-10%	17.104	-3.436	21.172	0.632
	+10%	16.923	-3.737	20.990	0.331
	+25%	16.786	-3.962	20.854	0.106
Establish new balancing market	-25%	17.013	-3.492	21.081	0.575
	-10%	17.013	-3.549	21.081	0.519
	+10%	17.013	-3.624	21.081	0.444
	+25%	17.013	-3.680	21.081	0.387
Operate under balancing plan and amended codes, IT systems, business processes and contracts	-25%	17.013	-3.464	21.081	0.603
	-10%	17.013	-3.538	21.081	0.530
	+10%	17.013	-3.635	21.081	0.432
	+25%	17.013	-3.708	21.081	0.359
Oversee and monitor balancing operator and balancing market	-25%	17.069	-3.501	21.137	0.567
	-10%	17.036	-3.552	21.103	0.515
	+10%	16.991	-3.620	21.059	0.447
	+25%	16.958	-3.672	21.025	0.396
Support balancing operator's functions	-25%	17.125	-3.416	21.193	0.652
	-10%	17.058	-3.518	21.126	0.550
	+10%	16.969	-3.655	21.036	0.413
	+25%	16.902	-3.757	20.969	0.310

Benefits					
Fewer disputes over balancing	-25%	16.983	-3.589	21.050	0.478
	-10%	17.001	-3.587	21.069	0.480
	+10%	17.026	-3.585	21.093	0.483
	+25%	17.044	-3.584	21.112	0.484
Efficiency benefits	-25%	12.243	-3.677	15.511	-0.410
	-10%	15.105	-3.623	18.853	0.125
	+10%	18.922	-3.550	23.309	0.838
	+25%	21.784	-3.495	26.651	1.372
Discount rate	6%	22.895	-4.206	28.048	0.948
	12%	14.782	-3.331	18.420	0.307

Source: NZIER

Table 6 Sensitivity analysis – efficiency benefits

Present value total net benefits, $ million, 2010/11 to 2023/24

Allocative and productive efficiency improvement (reduction in price and unit cost of gas)		Allocative and productive efficiency improvement ($ million)		Net benefits Rrelative to baseline scenario of code changes ($ million)		Net benefits rRelative to baseline scenario of ICD MOU ($ million)	
Optimistic scenario	Pessimistic scenario and baseline scenarios[1]	Optimistic scenario	Pessimistic scenario and baseline scenarios	Optimistic scenario	Pessimistic scenario	Optimistic scenario	Pessimistic scenario
2.000%	1.000%	24.024	12.006	74.349	-2.496	88.022	11.177
1.000%	0.500%	12.006	6.002	36.110	-3.223	43.378	4.046
0.500%	0.250%	6.002	3.000	17.013	-3.586	21.081	0.481
0.450%	0.225%	5.401	2.700	15.105	-3.623	18.852	0.125
0.400%	0.200%	4.801	2.400	13.196	-3.659	16.624	-0.231
0.350%	0.175%	4.201	2.100	11.288	-3.695	14.395	-0.588
0.300%	0.150%	3.601	1.800	9.379	-3.732	12.167	-0.944
0.250%	0.125%	3.000	1.500	7.471	-3.768	9.939	-1.300
0.200%	0.100%	2.400	1.200	5.563	-3.804	7.711	-1.657
0.150%	0.075%	1.800	0.900	3.655	-3.841	5.483	-2.013
0.100%	0.050%	1.200	0.600	1.748	-3.877	3.255	-2.369
0.050%	0.025%	0.600	0.300	-0.160	-3.914	1.028	-2.726
0.025%	0.013%	0.300	0.150	-1.114	-3.932	-0.086	-2.904

Notes: [1] Maintaining the same relationships between scenarios, i.e. that the pessimistic scenario achieves half as much improvement in efficiency as the optimistic scenario and the baseline scenarios achieve the same improvement in efficiency as the pessimistic scenario but more gradually (see Table 2).

Source: NZIER

Appendix A Implementation costs

Representatives of the gas industry have assisted in outlining a timeline for implementing the proposed balancing rules, if approved. Implementation would involve preparing, agreeing and establishing the balancing plan and required changes to pipeline codes, IT systems, business processes and contracts.

Under the optimistic scenario, this implementation could be completed within a total time period of 12 months. Under the pessimistic scenario, significant areas of disagreement would take longer to resolve and implementation could take a total time period of 34.5 months to complete.

We have used this timeline to estimate the approximate resource requirements of implementation under the two scenarios. Although resource requirements are greater under the pessimistic scenario, some of its longer timeline is attributable to more risk averse sequencing of activities, which are able to be undertaken concurrently under the optimistic scenario.

A.1 Proposed balancing rules – optimistic scenario

Balancing plan:

- TSOs prepare draft balancing plan, three months each, at a standard rate of $140,000/FTE
- eight market participants review and comment on draft balancing plan, one month each, at $140,000/ FTE
- Gas Industry Co reviews and approves draft balancing plan, one month, at $140,000/FTE.

Code changes:

- TSOs prepare code changes, six weeks, at $140,000/FTE
- eight market participants review and make submissions on code changes, two weeks each, at $140,000/ FTE
- Gas Industry Co reviews submissions on code changes and makes determinations, six weeks, at $140,000/FTE.

OATIS changes:

- one TSO designs, codes and tests changes to OATIS, seven months, two FTEs at $200,000/FTE
- $800,000 for linked nominations.

Other IT changes:

- 10 market participants design, code and test changes to other IT systems, 4.5 months each, at $200,000/ FTE.

Business process and contract changes:

- 10 market participants make changes to business processes and contracts, six weeks each, at $140,000/ FTE.

A.2 Proposed balancing rules – pessimistic scenario

Balancing plan:

- TSOs start preparing draft balancing plan, three months each, at $140,000/FTE
- Gas Industry Co completes preparing draft balancing plan, three months, at 140,000/FTE
- 10 market participants review and comment on draft balancing plan, six weeks each, at $140,000/ FTE
- Gas Industry Co reviews submissions and approves draft balancing plan, three months, at $140,000/FTE.

Code changes:

- TSOs prepare code changes, three months, at $140,000/FTE
- eight market participants review and make submissions on code changes, one month each, at $140,000/ FTE
- Gas Industry Co reviews submissions on code changes and makes determinations, two months, at $140,000/FTE.

OATIS changes:

- one TSO designs, codes and tests changes to OATIS, 10 months, two FTEs at $200,000/FTE
- $800,000 for linked nominations.

Other IT changes:

- 10 market participants design, code and test changes to other IT systems, 4.5 months each, at $200,000/ FTE.

Business process and contract changes:

- 10 market participants make changes to business processes and contracts, six weeks each, at $140,000/ FTE.

A.3 Baseline scenarios

Implementing code changes or an ICD MOU under either of the two baseline scenarios would incur many of the same types of costs as listed above. Representatives of the gas industry indicated that code changes could be readily implemented, if successful. If the code change process is not successful, an ICD MOU would be time consuming and costly to agree and establish. In comparing the proposed balancing rules with the baseline scenarios, we model implementation of code changes as taking a year at a cost of $1.800 million. We model an ICD MOU as taking three years to agree and establish at a cost of $2.800 million.

Appendix B Efficiency benefits

Improved balancing arrangements would achieve efficiency benefits through reducing residual balancing to efficient levels, paid for by the causers of imbalances. Pipeline users would seek to manage their inputs and outputs to avoid causing imbalances where it is less costly for them to undertake this primary balancing than to be charged the balancing costs of the balancing operator. In this way, the transmission pipelines would not only be kept in balance at a lower total cost, but, ultimately, used more efficiently, as users adjust the timing or volume of their inputs and outputs according to pipeline capacity and the value of their inputs and outputs.[6]

With more efficient levels of balancing and more accurate allocation of balancing costs, market participants would have greater certainty about the actual costs and benefits to them of buying and selling gas and improved confidence that they would secure the actual net benefits of the gas they supply or demand. This may in turn increase or decrease the amount of gas they are willing to supply or demand and increase competition. Increased competition between participants would exert downward pressure on the sale price and supply cost of gas and enhance the incentive to pursue future cost reductions, with all of which to achieve an advantage over competing participants.[7]

The consequence is therefore better – in terms of more economically efficient – production and consumption decisions, where the three components of economic efficiency are:

- allocative efficiency – the price and quantity of gas supplied
- productive efficiency – the cost of supplying gas and
- dynamic efficiency – investment and innovation to pursue reduction over time in the cost of supplying gas.

The magnitude of efficiency benefits from improving balancing arrangements is unknown. For the purpose of assessing whether the proposed balancing rules are likely to provide net benefits over the baseline scenarios of gradual improvement

[6] This is somewhat analogous to road congestion charges, which promote a more even flow of traffic over peak and off-peak times of day and thereby more efficient use of road capacity, by charging users for the otherwise "external" costs they impose on other drivers through adding to congestion. Congestion charges incentivise drivers who can more easily and cheaply move their time of travel to off-peak times to do so. Drivers for whom there is high value in using the road during peak times or high cost in moving their time of travel to off-peak times can choose to continue to travel at peak times, pay the congestion charge and benefit from the lower congestion and shorter travel times that result from some other drivers moving to off-peak times. Thus, congestion is reduced, travel times are reduced and more efficient use is made of the road's capacity over the course of the day, at the lowest total cost to all drivers.

[7] To continue the road congestion charge analogy, road users, plus businesses and households that do not use the road directly but depend on it for delivery of goods and services, benefit not only from lower congestion and reduced travel times, but also greater certainty about the cost, including travel time, of using this road according to the time of day travelled. This will clearly affect decisions about use of this road, including decisions on costs, prices and volumes of goods and services supplied by this road, as well as decisions on use of alternative roads, alternative forms of transport, alternative goods and services, and, in the longer run, alterative locations for businesses and housing.

over time in current balancing arrangements through code changes or an ICD MOU, we model potential competition benefits as follows.[8]

B.1 Proposed balancing rules – optimistic scenario

Improved balancing arrangements would promote allocative efficiency through providing greater certainty about costs and increased competition between participants. If, under the proposed balancing rules, these effects lowered the price at which gas is supplied by, for example, just 0.5%[9], at an average price of around $8/GJ, this would reduce the average price by $0.04/GJ. For existing demand, this reduction in price is simply a transfer from producers to consumers, resulting in no net benefit. Under a price elasticity of demand of -0.1, a 0.5% reduction in price would increase total demand by 0.05%, which would be around an additional 0.075 PJ per year. For this additional demand, there is a benefit to additional consumers who did not consume gas at the previous higher price, in the form of a "consumer surplus" of half[10] the price reduction, applied across the increase in quantity demanded. We therefore model allocative efficiency benefits to the market of around $1,500 per year from the proposed balancing rules under the optimistic scenario.

Improved balancing arrangements would also promote productive efficiency through increased competition between participants improving the efficiency with which gas is produced and supplied. If, under the proposed balancing rules, this effect lowered the average unit cost of supplying gas by again just 0.5%, at an average price of gas of around $8/GJ, this would reduce the average cost by $0.04/GJ. Across around 150 PJ of gas supplied through the transmission pipelines each year, these benefits would amount to around $6 million per year from the proposed balancing rules under the optimistic scenario. Unlike the immediate allocative efficiency benefits above, however, improvements to production and supply processes take time to develop and implement. We therefore phase in these benefits over the first five years of operating under the proposed balancing rules.

Over time, dynamic efficiency benefits have potential to outweigh by far the above static efficiency improvements.[11] These are much longer term, however, so we assume for simplicity that they are beyond the time horizon of the CBA.

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[8] We have used the same method previously to model efficiency benefits in previous CBAs prepared for Gas Industry Co in consultation with gas industry representatives – NZIER (2007) *Reconciliation of Downstream Gas Quantities Cost-Benefit Analysis* and NZIER (2007) *Transmission Assess Framework Cost-Benefit Analysis.* Most recently, we used the same method in a CBA for the Electricity Commission, NZIER (2010) *Cost-Benefit Analysis of Proposed Rule Changes for Part D.*

[9] This is the greatest uncertainty in the CBA, but does not seem unreasonable. In the sensitivity analysis, we test how small this effect could be for costs and benefits to just break even.

[10] To give the area of the consumer surplus triangle formed by the intersection of the demand and supply curves.

[11] There is a large body of economic literature on the primary importance of dynamic efficiency to a society's long-run economic growth and welfare. Empirical evidence from a variety of innovations in a wide range of sectors has shown dynamic efficiency benefits can be many times greater than productive efficiency benefits (which, in turn, are generally many times greater than allocative efficiency benefits).

B.2 Proposed balancing rules – pessimistic scenario

Under the pessimistic scenario, we model the proposed balancing rules as achieving allocative and productive efficiency improvements half the size of those modelled under the optimistic scenario. Under the pessimistic scenario, the proposed balancing rules therefore result in a 0.25% reduction in the price of gas and 0.25% reduction in the unit cost of supplying gas, providing allocative efficiency benefits of $375 per year and productive efficiency benefits of $3 million per year, the latter phased in over the first five years of operating under the proposed balancing rules.

B.3 Baseline scenarios

Under each of the baseline scenarios, improvement in current balancing arrangements is also likely to achieve some gradual increase in efficiency over time. For the purpose of the CBA, we model the baseline scenarios of code changes or an ICD MOU as achieving the same efficiency benefits as the proposed balancing rules under the pessimistic scenario, but less quickly. Under the baseline scenarios, gradual improvement over time in current balancing arrangements therefore results in a 0.25% reduction in the price of gas and 0.25% reduction in the unit cost of supplying gas, providing allocative efficiency benefits of $375 per year, phased in over the first five years of operation, and productive efficiency benefits of $3 million per year, phased in over the first 10 years of operation.

These efficiency benefits under each of the baseline scenarios are subtracted from the efficiency benefits of the proposed balancing rules under the optimistic and pessimistic scenarios to give the *additional* benefits achieved by the proposed balancing rules.