DIRECTLINK JOINT VENTURE

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3 November 2004

Mr Sebastian Roberts
General Manager, Regulatory Affairs – Electricity
Australian Competition and Consumer Commission
470 Northbourne Avenue
CANBERRA ACT 2600

Attention: Mr Sabesh Shivasabesan, Director - Electricity, Regulatory Affairs Division

Dear Mr Roberts

Re: Application for Conversion to a Prescribed Service and a Maximum Allowable Revenue to June 2015

On 22 September the Directlink Joint Venturers lodged their revised Application for Conversion to a Prescribed Service and a Maximum Allowable Revenue to June 2015. The application indicated that the Directlink Joint Venturers have concerns about the Commission's asset valuation approach in the Murraylink decision because this approach could produce anomalous and arbitrary results for Directlink that would be inconsistent with Chapter 6 of the Code.

In this separate submission, the Directlink Joint Venturers put forward an alternative asset valuation methodology. This alternative methodology applies the Regulatory Test in a manner that does not produce anomalous and arbitrary results should the Commission draw different conclusions in relation to the scope, costs and benefits of Directlink's alternatives projects than those presented in our application. If the Commission draws the same conclusions, the Commission's Murraylink approach and the alternative approach put forward in this submission yield the same answer.

We engaged The Allen Consulting Group ('**ACG**') to provide expert advice on this matter and this advice is contained in **Attachment 1**. The key points raised in the advice are:

- **Appropriateness of Murraylink methodology**—ACG analyses the methodology that the Commission applied in the Murraylink decision and how—in circumstances in which there is a material difference between the gross market benefits of the asset that is deemed optimal and that of the converting asset—that methodology can result in windfall gains and losses for the owner of a converting asset.

- **Alternative robust methodology**—ACG develops a more robust methodology that uses the Regulatory Test to determine an asset valuation for a converting asset. This

methodology is based on ensuring that the converting asset provides the same net market benefits as the optimal asset.

- **Outcomes for participants consistent with Regulatory Test**—Setting the regulatory asset value of the converting asset to generate the same net benefits as the optimal asset would be consistent with the following outcomes:
  - the converting asset would have passed the Regulatory Test;
  - market participants be in the same position as if the optimal asset had been built rather than the converting asset; and
  - the owners of the converting asset absorb any inefficiency in the converting asset that is in place.
- **No incentive to bypass chapter 5**—ACG's formula for setting the regulatory value for a converting asset will ensure that providers will not have an incentive to use the 'MNSP-immediate conversion' option to bypass chapter 5.
- **Less variability than the Murraylink approach**—While variation in the determination of market benefits will remain, the variation in the regulatory value for a converting asset using the approach proposed by ACG is likely to be far lower than in the estimates of each project's market benefits. Indeed, the Commission's apparently preferred approach of adopting the cost of the optimal project, with no adjustment for the differences in benefits across the projects, may lead to a greater variation in the regulatory value across the plausible range of the input forecasts.

The Directlink Joint Venturers asked National Economic Research Associates ('**NERA**') to provide its opinion on the extent to which the views expressed by ACG are consistent with the views expressed by NERA on previous occasions including in its submissions to the Commission on the Murraylink matter. NERA indicated the following in its letter of 29 October 2004 (**Attachment 2**).

- **Incentive to bypass the Regulatory Test**—The methodology that the Commission applied previously could provide TNSPs with an incentive to bypass the Regulatory Test.
- **Market participants no worse off**—In circumstances where the gross benefits of the converting asset are significantly higher that those of the optimal asset, market participants would be no worse off relative to the situation where the optimal asset were chosen if the owner of the converted asset was compensated for the net difference in market benefits.
- **Formulae are consistent**—The formulae ACG has proposed for estimating the asset value for the converting asset are equivalent representations of the methodology NERA proposed in its previous paper and in its letter.

The Directlink Joint Venturers fully endorse the views put forward by ACG and NERA and request that the Commission take full consideration of the alternative methodology during its deliberations on the Directlink conversion application. The methodology put forward by ACG provides an economically robust method for determining Directlink's asset value in a manner that fairly reflects the value it will provide to the National Electricity Market and that

appropriately recognises the net benefits that other projects could also provide. The methodology's avoidance of windfall gains and losses is highly consistent with the Commission's obligation to determine a sustainable revenue for efficient investment while ensuring a balance of interests of network users and network owners.

Please feel free to contact Ms Sandra Gamble of The Allen Consulting Group if you need her assistance on any matter pertaining to this submission.

Yours sincerely

Dennis Stanley
Directlink Joint Venture Manager

Encl.

ATTACHMENT 1

The Allen Consulting Group, *Conversion of a Market Network Service to a Prescribed Service: Setting the Regulatory Asset Value*, October 2004

The Allen Consulting Group

Conversion of a Market Network Service to a Prescribed Service

Setting the Regulatory Asset Value

October 2004

Report to the Directlink Joint Venture

The Allen Consulting Group

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Contents

Chapter 1

Introduction and Overview

The Allen Consulting Group has been engaged by the Directlink Joint Venturers (DJV) to comment on whether the methodology the Australian Competition and Consumer Commission applied to determine the opening regulatory asset value for the Murraylink asset would be appropriate to determine the opening regulatory asset value for the Directlink asset. This report was prepared by Jeff Balchin, Director, of the Group's infrastructure regulation practice.

A key element of the Commission's valuation methodology in the Murraylink matter was to set the value with reference to the outcome of a hypothetical application of the 'regulatory test'. Under the hypothetical application, the asset in question (Murraylink) was assumed not to exist, and the test was applied to determine which asset, if any, that would have been optimal to build in that circumstance (the optimal project). The opening regulatory asset value for Murraylink was then set at the Commission's estimate of the cost of the optimal project.[1]

An important question when the regulatory test is used to set the opening regulatory asset value for a converting asset is how the asset value is derived where there is a material difference between the gross market benefits of the asset that was deemed optimal under the hypothetical application of the regulatory test and that of the converting asset.

The Commission did not need to consider this issue in the Murraylink matter as the set of alternative projects to Murraylink that the Commission accepted for the hypothetical application of the regulatory test were found generate gross market benefits that were materially the same as Murraylink. However, for the case of Directlink, the estimated gross market benefits for the alternative projects for use in the hypothetical application of the regulatory test vary substantially between the projects. While the project the Directlink Joint Venture has identified as passing the regulatory test has gross market benefits that are materially the same as the actual Directlink asset, the Commission may form a different view.

The ultimate objective behind applying the regulatory test to set the regulatory value for a converting asset needs to be clearly defined in order to understand why differences in the gross market benefits of the optimal and converting assets are relevant to the regulatory value of the converting asset.

The Commission's methodology for setting the regulatory value for a converting asset in the Murraylink matter can be more accurately characterised as follows:

[1] Australian Competition and Consumer Commission, 2003, Murraylink Transmission Company Application for Conversion and Maximum Allowed Revenue: Decision, October, pp.47, 164 (MTC Decision). More precisely, the opening regulatory asset value for Murraylink was set at the estimate of the whole-of-life cost of the optimal project (capital and operating costs, in discounted terms), less the estimate of the whole-of-life operating costs (in discounted terms). In the discussion below, reference is made to the regulatory asset value being set at the estimated cost of the optimal alternatives for brevity, although operating costs must also be included in the analysis.

- First, the Commission decided that the regulatory value for the converting asset should be set to generate a *selected outcome* that would have observed if the converting asset did not exist and if the optimal project had been built.
- Secondly, the regulatory test was conducted on the assumption that the converting asset did not exist in order to identify the project that would have been the optimal project. The test also provides an estimate of the outcomes that market participants would have received if the optimal project (rather than the converting asset) had been built, that is, the gross market benefits generated, cost borne by market participants, and hence, the net market benefits generated.
- Thirdly, the regulatory value for the converting asset was set to deliver the *selected* outcome for market participants that would have been observed if the optimal asset (rather than the converting asset) was in place.

The central question in this asset valuation is, when setting the regulatory value for the converting asset to replicate a *selected outcome* that would have been observed if the optimal asset (rather than converting asset) was in place, which of the outcomes should be replicated?

The obvious outcome that the regulatory valuation of the converting asset should replicate is the net market benefit that would have been generated for market participants if the optimal asset was in place. Amongst other things, setting the regulatory value to generate the same net market benefits as the optimal asset would be consistent with the following desirable outcomes:

- the regulatory value is set such that if the converting asset could have been constructed for that cost, it would have passed the regulatory test (that is, the cost of the converting asset is established such that it would maximise the *net market benefit*, given the alternative projects available);
- market participants be in the same position as if the optimal asset had been built rather than the converting asset (where the *same position* means that the cost of the converting asset is established such that market participants receive the same *net market benefit* from the converting asset as they would if the optimal asset was constructed); and/or
- the owners of the converting asset absorb any inefficiency in the converting asset that is in place (where the *inefficiency* associated with the converting asset is the difference between the *net market benefit* calculated using the actual cost of the converting asset and the net market benefit from the optimal asset).

The focus on delivering a net market benefit for the converting asset implies that the cost of the optimal asset is a key input for setting the regulatory value of the converting asset. However, it also implies that the gross market benefit of the converting asset relative to the optimal asset is also an integral input. The derivation of the regulatory value for a converting asset is straightforward to calculate from the estimates required to apply the regulatory test, and can be expressed as the following four equivalent formulae:

(1) $$NMB_{RAV} = NMB_{Optimal}$$

(2) $$Cost_{RAV} = Cost_{Optimal} - (GMB_{Optimal} - GMB_{Actual})$$

(3) $Cost_{RAV} = GMB_{Actual} - NMB_{Optimal}$

(4) $Cost_{RAV} = Cost_{Actual} - (NMB_{Optimal} - NMB_{Actual})$

where:

- *Cost* refers to the life-cycle cost of a project (the initial capital cost plus the present value of expected future operating costs), with the subscript *Optimal* referring to the life-cycle cost of project that passes the regulatory test, the subscript *Actual* the actual cost of the converting asset, and the subscript *RAV* referring to the deemed-cost for the converting asset (ie the cost to be reflected in regulated charges), which is the sum of the opening regulatory asset value and the present value of future operating costs;[2]
- *GMB* refers to gross market benefits expected to be delivered by an asset, and the subscripts *Optimal* and *Actual* refer to the gross market benefits expected from the asset that passes the regulatory test and the converting asset, respectively; and
- *NMB* refers to the net market benefits expected to be delivered by an asset, and the subscripts *Optimal* and *Actual* refer to the net market benefits calculated for the optimal asset and the converting asset (ie using actual cost), respectively.

In the Murraylink matter, the Commission set the regulatory value to generate the same cost to market participants as they would have borne if the optimal project (instead of the converting asset) was in place (although as noted above, the gross market benefits for the converting asset and the optimal asset were found not to be materially different in that matter).[3] If the Commission adopted the same approach where the gross market benefits of the converting and optimal assets were materially different, then one of two possible outcomes would occur:

- *The converting asset has lower gross market benefits than the optimal asset* – which would imply that the converting asset would not have passed the regulatory test (that is, calculating net market benefits using the deemed-cost for the asset), market participants would receive a net market benefit that is lower than they would if the optimal asset had been built, and the owners of the asset would not bear any inefficiency associated with the asset – indeed, they could earn a substantial windfall gain; or
- *The converting asset has greater gross market benefits than the optimal asset* – which would imply that market participants would receive a net market benefit that is greater than they would if the asset that passed the regulatory test had been built.

Clearly, neither of these outcomes is desirable. These outcomes are avoided by adopting an asset valuation methodology that seeks to replicate the net market benefits that market participants would have received if the optimal project was constructed, as advocated above.

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2 The regulatory asset value is then simply calculated as $Cost_{Actual}$ less the present value of expected future operating expenses.

3 The Commission described its valuation approach in the Murraylink matter as either applying or using the regulatory test (see, for example, MTC Decision, p.47). It follows from the discussion above that this is an incomplete description of the methodology adopted. The role of the regulatory test is only to identify the outcomes that would have flowed to market participants if the optimal (rather than converting) asset was in place. How the estimates of those outcomes are then used to set the regulatory value for a converting asset requires a further decision.

A key concern the Commission expressed in the Murraylink matter was to ensure that a transmission network provider did not have an incentive to use the option of building an asset as a market network service and then immediately converting to regulated status in order to evade the requirements of chapter 5 of the National Electricity Code (including the requirement to apply the regulatory test).

The formula set out above for setting the regulatory value for a converting asset will ensure that providers will not have an incentive to use the 'MNSP-immediate conversion' option to bypass chapter 5. In particular, equation 4 shows that the best that a provider could expect under the 'MNSP-immediate conversion' option is that it would receive a return on the investment it actually made (ie if the project constructed was the optimal project). In all other cases, the provider would fail to make a commercial return on its full investment – and hence suffer a financial loss. In contrast, if the Commission set the regulatory value for a converting asset that reflected the cost of optimal project with no adjustment for differences in the level of benefits provided, the Commission may well create an incentive for parties to adopt the 'MNSP-immediate conversion' option (attracted by the prospect of a windfall gain).

The Commission has also accepted that the outcome of applying the regulatory test to set the regulatory value of a converting asset should be consistent (even if not identical) with the outcome of an optimised depreciated replacement cost (ODRC) methodology.[4] The key difference the Commission identified was that the regulatory test would require an examination of a wider range of projects than an ODRC valuation.

The Commission has previously accepted that the objective of an ODRC method is to estimate the second-hand value for infrastructure assets, on the assumption that a hypothetical second-hand market for these assets actually existed.[5] A rational purchaser would base its second-hand valuation of sunk assets on the cost of the new optimal project, but would adjust for differences between the forward-looking costs and benefits associated with the optimal and converting assets. It is demonstrated in this report that the value that is obtained from the adjustment for the difference in the forward-looking benefits is the same as that provided by the formulae set out above.

Lastly, the Commission previously expressed concerns about the level of variability in estimates of gross market benefits, and the consequent undesirability of having an asset valuation methodology that is reliant on such estimates. However, the potential variability in the estimates of the gross market benefits for a particular project is not a valid reason to ignore the difference in gross market benefits across projects when setting the initial regulatory value for a converting asset. The adverse consequences of not taking into account the benefits of the various alternative projects may be substantial as discussed above, and the variability in gross market benefits can be reduced through a greater focus on the appropriateness of the required inputs.

[4] MTC Decision, p.47.

[5] DSORP, p.39.

In addition, while variation in the gross market benefits will remain, the variation in the regulatory value for the converting asset – using the approach proposed in this report – is likely to be far lower than in the estimates of each project's market benefits. Indeed, the Commission's apparently preferred approach of merely adopting the cost of the optimal project with no adjustment for the differences in benefits across the projects may lead to a greater variation in the regulatory value across the plausible range of the input forecasts – as is the case on the figures presented for Directlink.

Chapter 2

Objective for the use of the Regulatory Test

The Commission stated in its decision on the Murraylink matter that it considered it appropriate to use the regulatory test to establish the opening regulatory value of an asset that converts from providing market network services to one that provides prescribed services.[6] This chapter discusses the ultimate objective that appeared to sit behind the Commission's use of the regulatory test in this manner, and whether the approach taken in the Murraylink matter is appropriate for other applications.

The chapter discusses first how the regulatory test operates in its normal use – that is, assessing which of a set of alternative projects should proceed – and then how the information from a hypothetical application of the regulatory test may assist in setting the regulatory value for a converting asset. The chapter then contrasts the use of the regulatory test that is considered appropriate with the Commission's apparent intent in the Murraylink matter, and finishes with a comparison of the outcome of the regulatory valuation method described in this report with the outcome of the optimised depreciated replacement cost (ODRC) method.

2.1 The Regulatory Test

The regulatory test is part of a process that a transmission network service provider (TNSP) must follow prior to constructing a new, large network asset.[7] The regulatory test itself is a formal cost-benefit analysis of the TNSP's proposed project, which requires (in broad terms) that the proposed project be the optimal project, after having considered the possible alternative projects for meeting the perceived market need.

A central identity in the regulatory test is the net market benefit of a project, which is defined as the difference between the estimated gross market benefit from the project, and its estimated capital and operating costs (all expressed in present value terms). The *optimal* project is defined as the project that has the highest *net market benefit* amongst the set of possible alternative projects (including the alternative of doing nothing, which would have a zero net market benefit). The Commission has issued guidance as to what types of benefits should be included in the analysis, as well as on certain methodological matters (such as the appropriate discount rate and on dealing with uncertainty in the relevant parameters). The requirement to select the project that maximises the net market benefit amongst the range of possible alternatives (including the alternative of doing nothing) is broadly equivalent to a requirement to select the most *efficient* transmission projects.[8]

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6 MTC Decision, p.47.

7 The process is set out in Chapter 5 of the National Electricity Code, and the current regulatory test is set out in: Australian Competition and Consumer Commission, 1999, Regulatory Test for New Interconnectors and Network Augmentations, December. The discussion in this section relates to non-reliability augmentations. Projects for reliability purposes are deemed to be required, with the requirement being to find the project that minimises the cost of meeting the relevant standard. That said, non-reliability augmentations may permit the deferral or avoidance of a planned reliability augmentation, and the cost thus avoided is appropriately counted as a benefit of the non-reliability augmentation.

8 The Commission has recently consulted on various aspects of the current Regulatory Test and proposed a number of modifications (Australian Competition and Consumer Commission, 2004, Review of the Regulatory Test for Network Augmentations, August). However, the Commission has also notified the DJV that it will apply the existing version of the Regulatory Test to the application for Directlink to

A benefit of the focus on net market benefits is that the relative merits of alternative projects that are of materially different size (or scale) can be considered, and the most efficient project selected. Thus, a large project that is expected to generate large benefits need not be preferred merely because it generates large benefits as it may also be a high cost alternative. Likewise, a low cost alternative need not necessarily be preferred because it may also deliver commensurately lower benefits. Rather, the test ensures that the project that maximises the gap between benefits and costs is identified.

Under the 'normal' application of the regulatory test, all of the alternatives being evaluated are 'open', and it would be expected that the project that is found to be optimal would be constructed. Accordingly, the expected operation of the test and the subsequent network investment (abstracting from a number of administrative challenges) is as follows:

- The relevant TNSP would undertake an assessment of the alternative projects (ie the Regulatory Test), and subject its analysis to the required transparency.
- The TNSP would construct the project that passes the Regulatory Test, and its regulatory asset value would be expected to be increased by the initial construction cost of the project (ongoing capital and operating expenses would be included in its revenue cap when they were forecast to occur).[9]
- Market participants will receive the gross market benefit generated by the project that is constructed (the optimal asset), and pay transmission charges that reflect the cost of the asset that is installed (which is also the optimal asset).

2.2 Using the regulatory test to set the regulatory value for a converting asset

In the Murraylink matter, the Commission accepted the proposal from the applicant to apply the regulatory test for a hypothetical case, that is, to apply the regulatory test on the assumption that the Murraylink asset was not in existence. The application of the regulatory test in this manner produced an estimate of the project that would have been optimal if Murraylink did not exist, and the outcomes that would have flowed to market participants under this assumption (that is, the additional costs that would have been incurred and the gross market benefits that participants would have received in return). The Commission then set the regulatory value for Murraylink with reference to the cost of the asset that would have been optimal if Murraylink did not exist.

The Commission's approach in the Murraylink matter for setting the regulatory value for a converting asset can be described more fully as follows as the following propositions:

convert to regulated status, and so this report will focus on the existing test only. That said, none of the modifications the Commission has proposed to the Regulatory Test would change any of the matters dealt with in this report.

[9] While there is nothing in the NEC that requires the actual cost of the asset that passes the Regulatory Test to be included in the TNSP's regulatory asset value (and revenue cap), the Commission commented in the MTC decision that '[t]his is a matter that the Commission must determine under [the relevant principles]. However, at the very least, the Commission would be expected to give significant weight to the fact that the asset had passed the regulatory test.' (MTC Decision, p.40). Nevertheless, a number of difficult administrative issues remain. One such issue is how to deal with a case where the cost of the optimal asset is materially higher than forecast for the regulatory test, and in particular, where the project that is constructed (on the revised costs) may no longer have satisfied the regulatory test.

- First, the Commission decided that the regulatory value for the converting asset should be set to generate a *selected outcome* that would have observed if the converting asset did not exist and if the optimal project had been built.
- Secondly, the regulatory test was conducted on the assumption that the converting asset did not exist in order to identify the project that would have been the optimal project. The test also provides an estimate of the outcomes that market participants would have received if the optimal project (rather than the converting asset) had been built, that is, the gross market benefits generated, cost borne by market participants, and hence, the net market benefits generated.
- Thirdly, the regulatory value for the converting asset was set to deliver the *selected* outcome for market participants that would have been observed if the optimal asset (rather than the converting asset) was in place.

The central question with the methodology described above for setting the regulatory value for a converting asset then becomes:

- If the regulatory value for the converting asset will be set to replicate a *selected outcome* for market participants that would have been observed if the converting asset did not exist, which particular outcome should be replicated?

Importantly, unless the gross market benefits of the converting asset are the same as the gross market benefits of the optimal asset, it will be impossible to set the regulatory value for the converting asset to generate *all* of the outcomes that would have been observed if the optimal asset (rather than the converting asset) was in place. This is because the converting asset's gross market benefits will reflect the physical characteristics of that asset – and may differ substantially to the benefits generated by the optimal asset.

- If the gross market benefits of the converting asset *exceed* those of the optimal asset, then the regulatory value can be set so that market participants face the same cost as they would have if the optimal asset was in place. However, participants would receive a greater net market benefit (as the gap between the benefit generated by the converting asset and its 'deemed' cost would exceed the net market benefits generated by the optimal asset).
- Equally, the regulatory value for the converting asset could be set so that market participants receive the same net market benefit as they would if the optimal asset was in place. However, where the gross market benefits generated by the converting asset *exceed* those of the optimal asset, then a higher cost would need to be deemed for the converting asset to result in the same net market benefits to market participants as that of the optimal asset.

As discussed above, the central identity in the regulatory test is the net market benefit that is generated by the alternative projects, and the requirement of the normal application of the regulatory test is to select the project that is expected to deliver the greatest net market benefits. The central importance of net market benefit for the normal application of the regulatory test suggests the outcome of the hypothetical application of the regulatory test to be replicated is the *net market benefit* associated with the optimal project. That is, the regulatory value for the converting asset should be set to provide the same net market benefit as that estimated for the optimal project, as derived by the hypothetical application of the regulatory test.

Setting the regulatory value for the converting asset to replicate the net market benefit associated with the optimal project (according to the hypothetical application of the regulatory test) would be consistent with a number of outcomes that should be considered desirable, which include the following.

- Market participants as a whole should be in the *same position* (or indifferent) between the position if the converting asset did not exist (ie the optimal asset would be built and paid for) or using the actual (converting) asset. The net market benefit is a measure of the economic welfare of market participants, and so setting the cost of the converting asset to deliver net market benefits that are the same as the optimal asset would leave participants indifferent between using and paying for the optimal or the converting assets.[10]
- The owners of the converting asset would absorb any inefficiency associated with the in the actual asset that was constructed. As discussed above, the net market benefit of an asset relative to the net market benefit of the optimal asset is a measure of the inefficiency of one asset relative to the other. Setting the regulatory value of the converting asset so that the net market benefit of the converting asset is equal to that of the optimal asset would implies that the regulatory value for the asset would be lowered from its actual cost to the point where its net market benefit is equal to that of the optimal asset. The lowering of the regulatory value of the converting asset implies that the owners of the converting asset would incur a financial loss to the extent of this inefficiency.
- The converting asset would have passed the regulatory test. That is, if an asset could have been constructed for the cost that is deemed for the converting asset and deliver the same benefits as that asset, then that asset would have passed the hypothetical application of the regulatory test.

An implication of setting the regulatory value of the converting asset to generate the same net market benefits as the optimal project implies that the value ascribed to the converting asset needs to reflect both the cost of the optimal asset, as well as the benefits expected from the converting asset relative to the benefits expected from the optimal asset. In particular, intuition would suggest that, for a given target for net market benefits, if the converting asset is expected to deliver lower gross market benefits than the optimal asset, then a regulatory value for the converting asset that is commensurately lower than the cost of the optimal asset should be selected, and vice versa where the benefits expected from the converting asset are greater than those expected from the optimal asset.

This intuition turns out to be correct. The more precise formulations for deriving the regulatory value for the converting asset from the results of the hypothetical test are derived next.

[10] However, market participants would not be expected to agree that they are indifferent between using the optimal and converting asset, and hence support the conversion (and proposed revenue cap). Rather, participants have a incentive to seek to obtain a greater net market benefit from the converting asset than they would have received if the optimal asset had been constructed, and to adopt strategies to pursue this outcome.

2.3 Formulae for Deriving the Regulatory Value for a Converting Asset

The discussion above concluded that the regulatory value for a converting asset should be set to generate the net market benefits that would have been enjoyed by market participants if the optimal project (rather than the converting asset) was in place. Writing this requirement out algebraically implies setting the opening regulatory asset base such that:

$$NMB_{RAV} = NMB_{Optimal} \quad (1)$$

where *NMB* refers to the net market benefits expected to be delivered by an asset, and the subscript *Optimal* refers to the net market benefits that would have been delivered by the optimal asset, and the subscript *RAV* refers to the net market benefits that would be delivered by the converting asset at the regulatory value set by the regulatory.

By writing out each of the net market benefits terms as the difference between the gross market benefits of an asset and its cost, the following expression is derived:

$$(GMB_{Actual} - Cost_{RAV}) = (GMB_{Optimal} - Cost_{Optimal})$$

$$\Rightarrow Cost_{RAV} = Cost_{Optimal} - (GMB_{Optimal} - GMB_{Actual}) \quad (2)$$

where *Cost* refers to the life-cycle cost of a project (the initial capital cost plus the present value of expected future operating costs), with the subscript *Optimal* referring to the life-cycle cost of project that passes the regulatory test, the subscript *RAV* referring to the deemed-cost for the converting asset (ie the regulatory value set by the regulator plus the present value of future operating costs),[11] and *GMB* refers to gross market benefits expected to be delivered by an asset, with the subscripts *Optimal* and *Actual* referring to the gross market benefits expected from the optimal and actual (or converting) assets, respectively.

Equation 2 shows that the regulatory asset value for the converting asset should be set to generate a life-cycle cost to market participants equal to the life-cycle cost of the project that passes the regulatory test (optimal asset), but then adjusted to reflect any difference in the gross market benefits provided by the actual and optimal assets. This equation also demonstrates that it is only when the benefits expected from the optimal and converting assets are materially the same that setting the regulatory value for the converting asset to generate the same cost to participants as the optimal asset also generates the same net market benefits to participants. Where the benefits from the gross market benefits of the optimal and converting assets are materially different, then the regulatory value for the converting asset must take account of both the cost of the optimal asset and the relative benefits of the optimal and converting assets.

[11] The regulatory asset value is then simply calculated as $Cost_{RAV}$ less the present value of expected future operating expenses. One issue of substance is whether the regulatory value for the converting asset should be calculated by deducting the forecast operating expenses of the converting asset from the whole-of-life cost of the optimal asset (and include a forecast of the entity's actual operating expenses in its revenue cap) or to deduct the forecast operating expenses for the optimal project from the whole-of-life cost (and include the operating expenses for the optimal project in the revenue cap). These approaches should deliver equivalent outcomes in present value terms. The Commission adopted the latter approach in the Murraylink matter, whereas we remain of the view expressed in the Murraylink matter that the former approach – using the actual operating expenses – is more appropriate (The Allen Consulting Group, 2003, Application for Conversion of Murraylink to a Prescribed Service, Report to MTC, July, p.31) and agree with the comments made by NERA that the former approach has substantial practicable advantages over the longer term (NERA, 2003, Comments on the ACCC's Preliminary View in relation to Murraylink's Application for Regulated Status: A Report for TransGrid, July, pp.8-9).

Equation 1 can also be rearranged to derive the following expression:

$$Cost_{RAV} = GMB_{Actual} - NMB_{Optimal} \quad (3)$$

This equation shows that the cost that should be deemed for the converting asset can also be expressed simply in terms of the expected gross market benefits of the converting asset, and the net market benefits that would have been delivered by the optimal asset.[12]

A further rearrangement of the equation 1 is also possible. Up until now, none of the expressions have referred to the cost actually incurred in constructing the converting asset, as this information is not strictly necessary for applying the valuation methodology set out above. The net market benefit that would have been generated by the actual (converting) asset is given by the following:

$$NMB_{Actual} = GMB_{Actual} - Cost_{Actual}$$

$$\Rightarrow GMB_{Actual} = NMB_{Actual} + Cost_{Actual}$$

where the subscript Actual now refers to the actual cost of the converting asset, rather than the cost that is deemed by the regulator, and the other terms are as defined above.[13]

This expression for the gross market benefits of the converting asset can then be substituted into equation 3 above to yield the following:

$$Cost_{RAV} = (NMB_{Actual} + Cost_{Actual}) - NMB_{Optimal}$$

$$\Rightarrow Cost_{RAV} = Cost_{Actual} - (NMB_{Optimal} - NMB_{Actual}) \quad (4)$$

Equation 4 demonstrates an alternative process for setting the regulatory value for a converting asset. That is, the regulatory valuation process can start with the actual cost of the converting asset, and then adjust from this cost to reflect the differences in net market benefits of the converting asset (calculated using its actual cost), and the net market benefits of the optimal asset.

Equation 4 also demonstrates another important implication of the regulatory valuation methodology set out above, which is that the best the provider can expect is a commercial return on the investment it has made. In particular, the owner of the converting asset will receive a return on the funds that it has invested only if the net market benefits expected from the project it constructed are the same as the net market benefits expected from the optimal project (that is, the actual project is the optimal project). In all other cases, the regulatory value for the converting asset will be set *lower* than the cost actually incurred by the asset owner.

2.4 Comparison with the Commission's Murraylink methodology

This section compares the methodology for setting an opening regulatory asset value for a converting asset with the methodology the Commission appeared to adopt in the Murraylink matter.

[12] NERA's submissions in the Murraylink matter advocated an asset valuation approach consistent with equation 3 above: NERA, 2003, Comments on Murraylink's Application for Regulated Status: A Report for TransGrid, January, pp.3-4; NERA, 2003, Comments on the ACCC's Preliminary View in relation to Murraylink's Application for Regulated Status: A Report for TransGrid, July, p.11.

[13] Note that, unlike the cost of the converting asset, the gross market benefits cannot be deemed, but rather reflect the actual physical characteristics of the converting asset.

The Commission described its asset valuation method in the Murraylink matter as 'the use of the regulatory test'.[14] However, it follows from the discussion above, that the Commission's description of the asset valuation method it adopted is an incomplete description of its method. In particular, the role of the regulatory test is only to provide an estimate of the outcomes that market participants would have received if the optimal asset (rather than the converting asset) was in place. A second decision is required, namely on *which of the outcomes* that market participants would have received if the optimal asset (rather than converting asset) was in place should the regulatory valuation for the converting asset seek to replicate.

A number of the Commission's statements in the Murraylink matter suggested it considered that the converting asset's regulatory value should be set to generate the same *cost* to market participants that would have resulted if the optimal project was in place. One such statement was as follows:[15]

> [the Commission] seeks to determine for Murraylink an asset base that reflects the alternative that maximises the net market benefit. This reflects the value that would have been ascribed to Murraylink had it been proposed as a new large network investment under chapter 5 of the code

Consistent with this, the Commission set the opening regulatory asset value for Murraylink at the cost of the optimal project. However, as commented already above, the gross market benefits of the converting asset and optimal project in the Murraylink matter were not materially different, and so setting the regulatory value to generate the cost that would have been borne if the optimal asset was in place would have given the same result as targeting the net market benefits.

Clearly, the discussion above suggests that if there is a material difference between the gross market benefits of the converting and optimal assets, then setting the regulatory value for the converting asset to replicate the cost of the optimal project rather than the net market benefits would lead to one of two possible outcomes:

- *The converting asset has lower gross market benefits than the optimal asset* – which would imply that the converting asset would not have passed the regulatory test (that is, calculating net market benefits using the deemed-cost for the asset), market participants would receive a net market benefit that is lower than they would if the optimal asset had been built, and the owners of the asset would not bear any inefficiency associated with the asset – indeed, they could earn a substantial windfall gain; or
- *The converting asset has greater gross market benefits than the optimal asset* – which would imply that market participants would receive a net market benefit that is greater than they would if the asset that passed the regulatory test had been built.

[14] MTC Decision, 47.

[15] MTC Decision, p.44. It is noted, however, that the Commission's statement that Murraylink received a regulatory value that reflected the value that would have been ascribed to Murraylink if proposed under chapter 5 of National Electricity Code is not necessary correct. If a TNSP had proposed a project similar to Murraylink under chapter 5 of the Code, but an alternative project was found to deliver higher net market benefits, then it would have been expected that the optimal project would have been built, rather than Murraylink. If the TNSP had built the project resembling Murraylink notwithstanding that it did not pass the regulatory test, then the value that would be ascribed to the sub-optimal project would depend upon how the Commission chose to value such sub-optimal projects. It is shown in 2.5 that, if the Commission applied the ODRC methodology to value the sub-optimal asset, then it would set a value for the sub-optimal project that reflects the cost of the alternative project, but adjusted for any differences in the benefits generated by the sub-optimal and optimal projects – that is, a value consistent with the use of the regulatory test as described in section 2.2.

A concern of the Commission's was to ensure that TNSP's could not use the ability to convert from a market network service to a prescribed service to evade the processes required to establish a new large network asset (which includes applying the regulatory test).[16] The Commission's particular concern appeared to be that a TNSP would build an asset as a market network service, and then immediately seek conversion, thus bypassing the normal process. The Commission emphasised the need for a person seeking conversion to be treated in the same manner as a person seeking approval under chapter 5 of the Code.[17]

Clearly, it is essential that providers not be able to use the conversion provisions to bypass the requirements of chapter 5 of the Code, including the requirement to conduct the regulatory test. Under the method for using the outcomes of the hypothetical application of the regulatory test to set the regulatory value for a converting asset, it is unlikely that a proponent of a project would have an incentive to use conversion to bypass the outcomes of the regulatory test, as discussed above. The two options open to the project proponent are as follows:

- *Follow the process set out in chapter 5* – which would involve the provider constructing the optimal asset, and having a regulatory asset value for the project that reflects its actual expenditure (and hence, receiving a return on and return of its actual investment over time).
- *Construct a project as an MNSP and then convert to a regulated asset* – in which case, at best the regulatory value would reflect its actual expenditure (ie where the project constructed delivered the greatest net market benefits), but with a risk that its regulatory asset value would be set below its actual expenditure (ie where the optimal project delivered greater net market benefits – see equation 3 above). In this case, the provider would not receive a full return on and return of its investment, and hence suffer a financial loss.

It follows that constructing a project first as a MNSP and then seeking conversion to a regulated asset does not offer any prospect of a windfall gain. Rather, the best outcome the proponent could expect is to earn a return on the funds it has invested, but there is also a risk that it would suffer a financial loss. In contrast, a proponent who follows the normal process in chapter 5 of the Code and constructs the optimal asset should expect to earn a return on and return of the funds it has invested.

Indeed, if the Commission set the regulatory value for a converting asset to reflect the cost of the optimal project – with no account of the benefits provided by the converting asset compared to the optimal asset – then the MNSP-conversion option may deliver a windfall gain and hence lead to the regulatory test being bypassed. In particular, the obvious strategy for a provider would be to construct a project as a MNSP that is sub-optimally small, but which is also a commensurately low cost option. On conversion, the provider would demonstrate that the optimal project would be a much larger asset. If the regulatory value for the converting asset is set at the cost of the optimal (but much larger and higher cost) project, the provider would then earn a return on an amount that was much larger than its actual financial investment – and hence, make a windfall gain.

[16] MTC Decision, p.39.
[17] MTC Decision, p.47.

2.5 Equivalence with the Optimised Depreciated Replacement Cost Methodology

The Commission concluded in the Murraylink matter that its valuation methodology that made use of the regulatory test will produce an outcome that is consistent (even if not identical) with the outcome that would have been consistent with an optimised depreciated replacement cost (ODRC) valuation.[18] The Commission considered that a difference between the regulatory test and the ODRC methodology may arise because the regulatory test arguably requires a larger set of options to be considered when assessing how the asset in place compares to the optimal project, which is not material for the discussion below.[19]

The methodology for setting the regulatory value for a converting asset described above will generate outcomes consistent with an ODRC valuation methodology as sought by the Commission.

The objective of an ODRC valuation is to estimate the maximum price that a person would be willing to pay for an existing asset, given the *hypothetical* alternative of constructing a new asset.[20] In effect, it is an estimate of the price that an asset would sell for if that asset was traded in a liquid second-hand market (like used cars). In such a market, the value for the existing asset would reflect the cost of a new – and optimum – asset, but would also reflect all of the differences in the forward-looking benefits and costs of associated with the existing asset, compared to the new asset (all discounted to a present value or cost).[21]

In this hypothetical situation, the steps that the person would go through when deciding what to pay for an existing asset are as follows.

- First, the person would work out which new asset it would actually purchase. This would imply working out the different options, working out the cost of the different options, and the benefits of each of those alternatives, and select the asset that provides the greatest net benefit.
- Secondly, he or she would then compute the difference in the value to it of the old asset compared to the new asset. This would require the person to work out the ongoing costs of the old (second hand) asset and the value of the services provided by the old asset, and compare these ongoing costs and benefits to those associated with the optimal asset.
- Thirdly, the person would then compute the maximum price that he or she was prepared to pay for the old (second hand) asset as the cost of the new (optimal) asset, with two adjustments, namely:

[18] MTC Decision, p.47.

[19] It need not be the case that an ODRC valuation should consider a smaller set of options of alternative projects than when applying the regulatory test. We argued in the Murraylink matter that, in the ODRC valuations that had been performed in Australia to date, the optimisation step had not typically involved consideration of substantially different technologies, line routes or like options and, as a consequence, the Murraylink asset was being subject to a greater degree of optimisation than had been applied to other existing transmission assets (The Allen Consulting Group, 2003, Application for Conversion of Murraylink to a Prescribed Service, Commentary on the Economic Issues, Report to MTC, July, pp.14-16). However, there is no reason *in principle* for the ODRC valuation and regulatory test to deliver different outcomes.

[20] When applied to infrastructure assets that have economies of scale and scope and a high proportion of sunk costs, the choice to instantly construct new assets (and hence duplicate the whole network) does not actually exist.

[21] The Commission has discussed the theoretical foundations of the ODRC valuation in similar terms: Australian Competition and Consumer Commission, Draft Statement of Principles for the Regulation of Transmission Revenues, May 1999, pp.39-40.

- he or she would deduct an amount equal to the increase in the ongoing cost of operating the old asset compared to the new asset; and
- he or she would deduct an amount equal to the decrease in the value of services provided by the old asset compared to the new asset.

These last two adjustments have been expressed in the way that the adjustments typically would be required – that is, old assets generally have higher maintenance costs than new assets, implying a reduction in the price of the second-hand asset, and old assets typically also provide a lower level of service, and so a further reduction in the price for the second hand asset would be required. However, if the old asset had an element of gold-plating, the optimal asset may deliver a lower level of service than the actual asset. In this case, all else constant, the person would be prepared to pay more for the old asset – by an amount up to the increase in the value of the services it provides.

Stated algebraically, setting the calculation of the regulatory value for an asset using the ODRC method can be expressed as:

$$RAV = Cap\ Cost_{Optimal} - (Opex_{Actual} - Opex_{Optimal}) - (Ben_{Optimal} - Ben_{Actual})$$

$$\Rightarrow (RAV + Opex_{Actual}) = (Cap\ Cost_{Optimal} + Opex_{Optimal}) - (Ben_{Optimal} - Ben_{Actual})$$

where RAV refers to the regulatory asset value, $Cap\ Cost_{Optimal}$ refers to the initial capital cost of the optimal asset, *Opex* refers to forward-looking costs of operating each asset, and *Ben* refers to the value of the services (benefits) provided by each of the assets, the *Optimal* and *Actual* subscripts refer to the optimal and actual assets respectively, and all costs and benefits are calculated as present values.

The benefits delivered by the optimal and actual assets are equivalent to the gross market benefits for these assets (that is, if the same approach to quantifying the benefits is adopted), and the sums of the initial capital costs and forward-looking costs is equivalent to the lifecycle costs referred to in section 2.3. Accordingly, using the same notation as section 2.3, the equation above can be expressed as:

$$Cost_{RAV} = Cost_{Optimal} - (GMB_{Optimal} - GMB_{Actual})$$

This equation is identical to equation 2 in section 2.3. Accordingly, it can be concluded that the formulae derived in section 2.3 for setting the regulatory value for a converting asset will deliver a valuation that is consistent with an ODRC valuation.

Chapter 3

Application of the 'Regulatory Test' Valuation Methodology

The purpose of this section is to provide some illustrative calculations of the regulatory value of as converting asset according to the approach that is set out in section 2.3, using the estimates of the relevant parameters for Directlink as an example. The section then addresses one of the potential concerns with the use of an asset valuation methodology that is dependent on an estimate of the gross market benefits of a converting asset, which is how to address potential imprecision in the estimates of those benefits.

3.1 Application of the Regulatory Test Valuation Methodology for Directlink

The estimation of the gross market benefit for a project requires a number of input assumptions, the more important of which are the commercial discount rate, form of bidding behaviour expected from generators (two choices of which include a proxy for long run marginal cost [LRMC proxy] and short run marginal cost [SRMC] bidding) and the value of unserved energy. In addition, benefit estimates are also contingent forecasts of future outcomes – namely, future demand, and the calculation of net market benefits requires a forecast or estimate of the cost of the feasible set of alternative projects, both of which are estimated with a degree of uncertainty.

Table 3.1 sets out the estimates of the gross market benefits and costs of the set of feasible alternatives to Directlink for the central case that was adopted. Under the central case, the input assumptions for the commercial discount rate, bidding behaviour and value of unserved energy are 9 per cent, LRMC proxy and $29,600 per MWh, respectively, together with the medium growth forecast and best estimates of the costs of the alternative projects.

Table 3.1

GROSS MARKET BENEFITS AND COSTS - CENTRAL CASE (DJV SCENARIO 5)[22]

	Alt 0	Alt 1	Alt 2	Alt 3	Alt 5
GMB	240.1	240.1	240.1	128.3	231.4
Cost	196.3	284.9	184.6	103.8	231.4
NMB	43.8	-44.8	55.5	24.5	0.0

Source: ACG analysis.

[22] The scenario reference numbers in the following tables are taken from: Directlink Joint Venture, 2004, Application for Conversion to a Prescribed Service and a Maximum Allowable Revenue to 30 June 2015, September, p.49.

Alternative 0 reflects the benefits and costs of the actual Directlink asset. Alternatives 1, 2 and 3 each include an interconnector element. Alternative 5 comprises the projects that would required solely for reliability purposes if Directlink or Alternatives 1, 2 or 3 were not in existence. In the regulatory test analysis, if Alternative 5 was constructed instead of Directlink, then Alternative 5 effectively would be avoiding itself – and hence, its gross market benefits and costs coincide. Indeed, the fact that reliability augmentations would be required if Directlink were not present means that one of the alternative projects to Directlink necessarily will pass the regulatory test.

The project that maximises the net market benefits for the base case set of assumptions is Alternative 2, with a projected $55.5 million in net market benefits to customers. The calculation of the life-cycle cost for the converting asset (i.e. opening regulatory value plus the present value of operating costs) using the different formulae provided in section 2.3 is as follows:

- $Cost_{RAV} = Cost_{Optimal} - (GMB_{Optimal} - GMB_{Actual})$ = 184.6 – (240.1 – 240.1) = 184.6
- $Cost_{RAV} = GMB_{Actual} - NMB_{Optimal}$ = 240.1 – 55.5 = 184.6
- $Cost_{RAV} = Cost_{Actual} - (NMB_{Optimal} - NMB_{Actual})$ = 196.3 – (55.5 – 43.8) = 184.6

In addition, as the estimated gross market benefits of the converting asset are the same as the optimal asset, the Commission's apparent Murraylink methodology (ie just setting the life-cycle cost of the converting asset at the cost of the optimal asset) will deliver the same result, i.e. it would be $184.6 million.

However, if different assumptions were made in the estimation of the benefits of costs of the alternative projects, then the importance of taking account of the difference in the benefits expected from the alternative projects becomes apparent. By way of example, if the same input assumptions as discussed above are adopted, the estimated net market benefits of the projects under the low load growth forecast are set out in Table 3.2.

Table 3.2

GROSS MARKET BENEFITS AND COSTS - LOW LOAD GROWTH (DJV SCENARIO 6)

	Alt 0	Alt 1	Alt 2	Alt 3	Alt 5
GMB	160.3	160.3	160.3	100.4	231.4
Cost	196.3	284.9	184.6	103.8	231.4
NMB	-36.0	-124.6	-24.3	-3.4	0.0

Source: ACG Analysis.

In this case, Alternative 5 generates the greatest net market benefits and hence passes the regulatory test. The calculation of the life-cycle cost for the converting asset using the different formulae provided in section 2.3, and the result obtained using the Commission's apparent Murraylink formula, are as follows:

- $Cost_{RAV} = Cost_{Optimal} - (GMB_{Optimal} - GMB_{Actual})$ = 231.4 – (231.4 – 160.3) = 160.3
- $Cost_{RAV} = GMB_{Actual} - NMB_{Optimal}$ = 160.3 – 0.0 = 160.3
- $Cost_{RAV} = Cost_{Actual} - (NMB_{Optimal} - NMB_{Actual})$ = 196.3 – (0 – (-36.0)) = 160.3

- *Commission approach:* $Cost_{RAV} = Cost_{Optimal} = \underline{231.4}$

A number of perverse outcomes would flow from the application of the Commission's approach in this case.

- First, the net market benefits that market participants receive would be substantially lower than the net market benefits expected if the optimal project was constructed. In particular, if the regulatory value of the converting project was set at the cost of the optimal asset, then net market benefits of minus $71.1 million would be generated (160.3 – 231.4), compared to 0.0 for the optimal project
- Secondly, the asset owner would receive an opening regulatory value that generates a life-cycle cost substantially higher than the costs incurred (231.4 compared to 196.3), and hence a windfall gain, even though the converting asset was found not to be optimal.

Adopting other variations to the base case assumptions can generate further changes to the order of the alternative projects. Table 3.3 sets out the estimated benefits and costs for the alternative projects that would be derived for a different set of input assumptions – namely a value of unserved energy of $10,000 per MWh, a high discount rate (11 per cent, pre tax real), as well as the low-case demand forecast.

Table 3.3

GROSS MARKET BENEFITS AND COSTS - ALTERNATIVE INPUTS (DJV SCENARIO 15)

	Alt 0	Alt 1	Alt 2	Alt 3	Alt 5
GMB	189.4	189.4	189.4	118.2	225.6
Cost	191.1	282.6	181.7	100.5	225.6
NMB	-1.7	-93.2	7.7	17.7	0.0

Source: ACG Analysis.

In this case, Alternative 3 generates the greatest net market benefits and hence passes the regulatory test. The calculation of the life-cycle cost for the converting asset using the different formulae provided in section 2.3, and the result obtained using the Commission's apparent Murraylink formula, are as follows:

- $Cost_{RAV} = Cost_{Optimal} - (GMB_{Optimal} - GMB_{Actual}) = 100.5 - (118.2 - 189.4) = \underline{171.7}$
- $Cost_{RAV} = GMB_{Actual} - NMB_{Optimal} = 189.4 - 17.7 = \underline{171.7}$
- $Cost_{RAV} = Cost_{Actual} - (NMB_{Optimal} - NMB_{Actual}) = 191.1 - (17.7 - (-1.7)) = \underline{171.7}$
- *Commission approach:* $Cost_{RAV} = Cost_{Optimal} = \underline{100.5}$

A number of perverse outcomes would flow from the application of the Commission's approach in this case:

- First, the net market benefits that market participants would receive under the Commission's approach would substantially exceed the net market benefits expected if the optimal project was constructed. In particular, if the regulatory value of the converting project was set at the cost of the optimal asset, then net market benefits of $88.9 million would be generated (189.4 – 100.5), compared to $17.7 million for the optimal project.
- Secondly, the asset owners would suffer a reduction in the value of their actual investment of $90.9 million, even though the regulatory test demonstrated that the inefficiency of the actual investment (as reflected in the difference between the net market benefits of the actual and optimal projects) of $19.4 million (17.7 – (-1.7)).

As noted above, one concern the Commission previously has expressed about estimates of gross market benefits being an input into an asset valuation methodology is that estimates of benefits are subject to a degree of variability. This issue is addressed next.

3.2 Setting the Regulatory Asset Value – Addressing Statistical Uncertainty

The Commission previously expressed concerns about the level of variability in estimates of gross market benefits, and the consequent undesirability of having an asset valuation methodology that is reliant on such estimates. By way of example, in its Draft Decision on the Murraylink matter, the Commission commented as follows:[23]

> [t]he sensitivities provided do not confirm that the base case chosen to determine the regulatory asset value is robust but indicate that the single number chosen by MTC is subject to variability. As such, the Commission considers that based on MTC's determination of a regulatory asset base using the gross market benefits derived from the regulatory test, the regulatory asset base would vary according to the input assumption, sensitivities and market development scenario.
>
> Further it must be recognised that there are a number of key assumptions in the regulatory test which has a direct and material impact on the estimation of market benefits. This highlights that the estimation of market benefits is highly sensitive to the assumptions adopted.

A number of comments are relevant for question of the level of variability in the estimates of gross market benefits and the implications for setting a regulatory value for a converting asset.

First, as demonstrated above, ignoring the difference in the market benefits of the actual and optimal projects – and just setting the regulatory value of the asset based on the cost of the optimal project – is likely to lead to outcomes that are far less desirable than the Commission's perceived undesirability of having to make a judgement about the projects' gross market benefits. In particular, it was demonstrated that a failure to take account of the differences in the benefits expected from the alternative projects could lead to windfall gains to either the asset owner or other market participants – and lead to outcomes for participants that are inconsistent with the regulatory test.

[23] MTC Draft Decision, p.42.

Secondly, the range of potential estimates of market benefits can be reduced substantially by focusing more on the validity of the input assumptions to the estimation of market benefits, and separating out the assumptions where true statistical uncertainty remains. In particular, robust assumptions on matters like the commercial discount rate, form of bidding behaviour expected from generators, and the value of unserved energy are possible though analytical means. Once assumptions for these factors are made, the uncertainty in the net market benefit estimates reflects mainly the variation in potential future market growth, and the uncertainty around estimates of the cost of the various alternative projects.

Thirdly, and most importantly, the level of variability in the regulatory value derived according to the use of the valuation formulae derived in section 2.3 is likely to be far lower than the level of variability in the estimates of gross market benefits for each of the projects. Equation 3 expressed the derivation of the regulatory value as follows:

$$Cost_{RAV} = Cost_{Optimal} - (GMB_{Optimal} - GMB_{Actual})$$

This equation shows that, if the cost of the optimal project is held fixed, the variation in the regulatory value for the converting asset will reflect the *difference* between the gross market benefits of the actual and converting asset. Where the different projects have similar categories of benefits, the estimates of the benefits for the alternative projects are likely to be influenced by similar factors, and hence move together to an extent. In this case, the variation in the difference between the benefits would be less than the variation in each of the estimates.

Table 3.4 demonstrates the variability in the estimates of the deemed life-cycle cost of the Directlink asset (ie its regulatory value and forecast operating costs, in present value terms) for the credible scenarios identified by the DJV.[24] These estimates use the central assumptions for the inputs described above (namely, a commercial discount rate of 9 per cent, proxy for LRMC bidding and a value of unserved energy of $29,600 per MWh) and show the effects of variations in the forecast parameters (demand growth and cost of the alternatives). Table 3.4 also shows the effect of alternative bidding behaviour (SRMC bidding), given the central assumptions for all inputs.

Table 3.4

VARIATION IN THE REGULATORY ASSET VALUE (FOR THE DJV'S CREDIBLE SCENARIOS)

	DJV Scenario No.	GMB (Actual Asset)	GMB (Optimal Asset)	Cost (Optimal Asset)	NMB (Optimal Asset)	Deemed Cost (Reg Test)	Deemed Cost (ACCC)
Base Case	5	240.1	240.1	184.6	55.5	184.6	184.6
Low Demand	6	160.3	231.4	231.4	0.0	160.3	231.4
High Demand	4	304.9	304.9	184.6	120.3	184.6	184.6
SRMC Bidding	11	162.3	231.4	231.4	0.0	162.3	231.4
Low Cost	12B	229.6	229.6	166.2	63.5	166.2	166.2
High Cost	12A	250.6	250.6	199.5	51.2	199.5	199.5

Source: ACG Analysis.

[24] Directlink Joint Venture, 2004, Application for Conversion to a Prescribed Service and a Maximum Allowable Revenue to 30 June 2015, September, p.49.

The third column from the left shows that the estimated gross market benefits generated by the Directlink asset vary from between $160.3 million and $304.9 million, a range of almost $150 million. However, the 'deemed cost' for the Directlink (ie the regulatory value and present value of future operating expenses) using the method recommended in this report varies within a comparatively tight band, that is, between $160.3 million and $199.5 million, or a range of under $40 million (second column from the right).

In contrast, the results presented above suggest that the Commission's preferred approach has the potential to create more uncertainty in the setting of the initial regulatory value for a converting asset than the approach advocated in this report. In particular, using the Commission's approach (rightmost column), the deemed cost for the converting asset would vary between $166.2 million and $231.4 million, a range of over $65 million.

Accordingly, the potential variability in the estimates of the gross market benefits for a particular project is not a valid reason to ignore the difference in gross market benefits across projects when setting the initial regulatory value for a converting asset. The adverse consequences of not taking into account the benefits of the various alternative projects may be substantial, and the variability in gross market benefits can be reduced through a greater focus on the appropriateness of the required inputs. In addition, while variation in the gross market benefits will remain, the variation in the regulatory value for the converting asset – using the approach proposed in this report – is likely to be far lower than in the estimates of each project's market benefits. Indeed, the Commission's apparently preferred approach of merely adopting the cost of the optimal project with no adjustment for the differences in benefits across the projects may lead to a greater variation in the regulatory value across the plausible range of the input forecasts – as is the case on the figures presented for Directlink.

ATTACHMENT 2

National Economic Research Associates, Letter to the Dennis Stanley of Directlink Joint Venture, 1 November 2004

n/e/r/a
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1 November 2004

Dennis Stanley
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Dear Mr Stanley

Establishing Regulatory Asset Values for Converted Assets

This letter responds to your request for an opinion on whether or not the methodology used by the Australian Competition and Consumer Commission ('ACCC' or 'the Commission') to determine the opening regulatory asset value for the converting Murraylink transmission asset would be appropriate for determining the opening regulatory asset value for the converting Directlink transmission asset. Specifically, you have asked us to consider the appropriate treatment of the market benefits associated with various alternative investment options.

In forming this opinion, I have reviewed a report from the Allen Consulting Group ('ACG'), ***Conversion of a Market Network Service to a Prescribed Service***, which addresses this same question. This letter provides a second opinion on the following question:

> ***To what extent are the views expressed by ACG consistent with the views expressed by NERA on previous occasions including in its submissions to the Commission on the Murraylink matter?***

Before addressing this question, I first set out the economic principles that underlie our response.

The Regulatory Asset Base, the Regulatory Test and NERA's Previous Advice

A principal concern of the ACCC in establishing the methodology for establishing an appropriate regulatory asset value ('RAV') for the converting Murraylink asset was to ensure consistency with the methodology used to value other regulated assets:[1]

> ***"…the approach adopted by the Commission will help ensure consistency between its consideration of MTC's application for conversion and its approval of other forms of regulated investments. In this case, it has determined a regulatory asset value for Murraylink in the same way that regulated asset values for other new investments by TNSPs are determined. Therefore, by applying the regulatory test to converted network services an MNSP will not be able to bypass the provisions contained in chapter 5 of the code. This will ensure that the regulated revenue entitlement is appropriate, and that transmission customers will not bear the costs of inefficient investment."***

The Commission therefore intended to use the regulatory test as the basis for its methodology. The regulatory test specifies that, in the case of interconnectors, the test will be satisfied by the option that:[2]

> ***"maximises the expected net present value of the market benefit (or in other words, the present value of the market benefit less the present value of costs) compared with a number of alternative options and timings, in a majority of reasonable scenarios".***

The market benefits associated with particular investment options enter the analysis of converting transmission assets at two stages:

1. in assessing which alternative would pass the regulatory test, it is absolutely necessary to estimate the benefits associated with the various options; and
2. in the event that the converted asset would not have passed the regulatory test, a RAV that leaves market participants (as a group) no worse off must account for differences in the costs ***and the benefits*** associated with the alternative that would have passed the test.

Using the regulatory test as the basis for establishing the RAV of a converting asset therefore involves setting the RAV by reference to the cost of the investment alternative that would have passed the regulatory test, has the test had been applied prior to the converted asset being put in place. Ensuring that market participants are no worse off than if the asset that

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[1] Australian Competition and Consumer Commission, ***Murraylink Transmission Company Application for Conversion and Maximum Allowed Revenue, Decision***, 1 October 2003, page ix

[2] This is the test under Version 2 of the Regulatory Test, as released by the Commission in August 2004.

passes the regulatory test had in fact been put in place requires that any differences in the benefits associated with the alternative investment be taken into account.

An alternative way to consider the problem is to ask:

- What would the cost of the converted asset need to have been to ensure that this investment option passed the regulatory test?

Because the regulatory test involves a comparison of costs and benefits, the notional 'cost' that satisfies this question must reflect any differences in the benefits associated with the converted asset and the optimal investment.

NERA's 2003 paper to the ACCC on behalf of TransGrid, ***Comments on Murraylink's Application for Conversion to Regulated Status***, set out the steps for arriving at a RAV that would ensure consistency with other investment appraisals made under the regulatory test. These steps were:[3]

- Define the service that [the asset] provides.
- Calculate the gross market benefit provided by [the asset].
- Identify alternative projects that provide the same service and estimate the cost of these alternatives ***and the gross market benefit of these alternatives***.
- If the net market benefit of [the asset] is greater than the net market benefit of alternative projects, then [the asset] passes the regulatory test and its RAV should be set equal to the capital cost of [the asset].
- If the net market benefit of [the asset] is less than the net market benefit of alternative projects, then set the regulated cost for [the asset] (RAV plus lifecycle opex) as:
  - the gross market benefit of [the asset] ***minus the highest positive net market benefit associated with an alterative project.***

The ACCC's Approach to the Conversion of Murraylink

In my opinion, the ACCC's approach to the conversion of the Murraylink transmission asset did not fully comply with its stated objective of ensuring consistency between situations where an asset converted to regulated status and where a TNSP applied the regulatory test prior to implementing the investment. Although the ACCC indicated that the optimal asset

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[3] NERA, ***Comments on Murraylink's Application for Conversion to Regulated Status,*** A report for TransGrid, January 2003 page 3

would be identified by assessing the net present value of the market benefits associated with alternatives,[4] the Commission then set Murraylink's revenue cap on the basis of the ***cost*** of the alternative option, without reference to any differences in the associated benefits.

In the case of the converting Murraylink asset, such an approach would have been a reasonable approximation to that proposed by NERA since the gross benefits were assumed to be the same for each option.[5] On that basis, there was no need to adjust the RAV to account for differences in the associated benefits.

Consistency with ACG's Expressed Views

I have reviewed ACG's report, ***Conversion of a Market Network Service to a Prescribed Service: Setting the Regulatory Asset Base,*** and considered whether the conclusions it reaches are consistent with the advice NERA has provided in the past, and would continue to provide now.

Overall, the analysis presented in the ACG report is consistent with the views presented in NERA's report in relation to the Murraylink application, as discussed above. Specifically:

1. I agree with ACG's conclusion that in circumstances where the gross market benefits of the asset that is deemed optimal are significantly higher than those of the converting asset, the methodology previously applied by the ACCC to the Murraylink converting asset could result in a windfall gain to the owner of a converting asset. This would provide TNSPs with an incentive to bypass the regulatory test and seek conversion to regulated status once a sub-optimal investment has taken place.
2. I also agree that, in circumstances where the gross benefits of the converting asset are significantly higher than those of the optimal asset, market participants would be no worse off relative to the situation where the optimal asset were chosen if the owner of the converted asset was compensated for the net difference in market benefits.
3. I agree that the four formulae ACG has proposed for estimating the asset value for the converting asset are equivalent representations of the methodology NERA proposed in its previous paper and as set out above.

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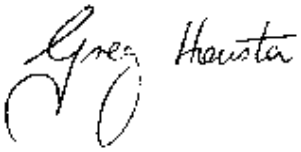
[4] Australian Competition and Consumer Commission, ***Murraylink Transmission Company Application for Conversion and Maximum Allowed Revenue, Decision***, 1 October 2003, page xiii

[5] ***ibid***, page 62

n/e/r/a

Please do not hesitate to contact me if you would like to discuss any aspect of this assessment.

Yours sincerely



Greg Houston
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