

# **Decision**

## **Review of the Regulatory Test for Network Augmentations**

**11 August 2004**

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## Glossary

ACCC	Australian Competition and Consumer Commission
AGO	Australian Greenhouse Office
ANTS	Annual National Transmission Statement
APR	Annual Planning Report
CAISO	Californian Independent System Operator
COAG	Council of Australian Governments
Code	National Electricity Code
CPUC	Californian Public Utilities Commission
Discussion Paper	Discussion Paper - Review of the <i>regulatory test</i>
DNSP	Distribution Network Service Provider
DRP	Dispute Resolution Panel
ERAA	Energy Retail Association of Australia
ESA	Energy Solutions Australia Pty Ltd
Farrier Swier	Farrier-Swier Consulting Ltd.
Frontier Economics	Frontier Economics Ltd.
HHI	Hirschmann-Herfindahl Index
IPA	Institute of Public Affairs
IRPC	Inter Regional Planning Committee
Issues Paper	Issues Paper - Review of the <i>regulatory test</i>
LRMC	Long Run Marginal Cost
MC	Marginal Cost
MCE	Ministerial Council on Energy
MNSP	Market Network Service Provider
NDR	Network and Distributed Resources
NECA	National Electricity Code Administrator

NEDF	National Electricity Distributors Forum
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NET	National Electricity Tribunal
NPV	Net Present Value
NSP	Network Service Provider
Opex	Operating Expenditure
PV	Present Value
RNPP	Reliability and Network Planning Panel
RSI	Residual Supply Index
SANI/SNI	South Australia – New South Wales Interconnector
SCL	Stanwell Corporation Ltd
SOO	Statement of Opportunities
SPI	SPI PowerNet Pty Ltd
SRMC	Short Run Marginal Cost
TNSP	Transmission Network Service Provider
VENCorp	Victorian Energy Networks Corporation
VCR	Value of Customer Reliability
VoLL	Value of Lost Load
USE	Un-served Energy
WACC	Weighted Average Cost of Capital
WPV	Wambo Power Venture Pty Ltd



# Executive Summary

## 1. Introduction

Under clause 5.6.5A of the National Electricity Code (Code), the Australian Competition and Consumer Commission (ACCC) is responsible for the promulgation of the *regulatory test*<sup>1</sup>.

The *regulatory test* is an economic cost-benefit test used by transmission and distribution businesses in the National Electricity Market (NEM) to assess the efficiency of network investment. It presently consists of three limbs:

- an ‘interconnector limb’ - used when assessing interconnectors and involves the application of a Net Present Value (NPV) analysis which is concerned with assessing the present value of a project’s benefits against the present value of its costs;
- the ‘reliability limb’ - used for considering reliability driven augmentations, which are based on the service obligations imposed on Network Service Providers (NSPs), involves the application of a ‘minimising-cost’ test; and
- the ‘market benefits limb’ - used for all other projects and, like the interconnector limb, involves the application of a NPV analysis.

Since the promulgation of the *regulatory test* in December 1999, a number of concerns were raised by interested parties about its operation. As a result, the ACCC committed to review the *regulatory test* in conjunction with the National Electricity Code Administrator’s (NECA) commitment to review the framework for essential new investment.

On 10 May 2002, the ACCC released an Issues Paper which highlighted specific concerns raised by interested parties with the operation of the *regulatory test*.

From submissions received, the ACCC released a Discussion Paper on 5 February 2003 which outlined three options for the refinement of the *regulatory test*:

- Option 1 - making minor modifications to the *regulatory test* to ensure consistency between it and the Code;
- Option 2 - introducing a number of definitions to be used when applying the test to ensure its consistent application across the NEM; and
- Options 3 - ensuring the *regulatory test* recognises the benefits of increased competition between generators (*competition benefits*).

The ACCC released its Draft Decision on the review of the *regulatory test* on 10 March 2004 proposing changes in line with those contained in its February 2003 Discussion Paper.

During the review process, the ACCC engaged consultants to assist it in considering the complex issue of *competition benefits*. The ACCC held a forum to provide interested parties

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<sup>1</sup> The original regulatory test was promulgated under clause 5.6.5(q) of the code which was superseded by clause 5.6.5A following the Network and Distributed Resources Code amendments.

the opportunity to discuss issues surrounding the definition and measurement of *competition benefits*.

After considering the submissions received from interested parties in response to its Draft Decision, and the advice of its consultants, the ACCC has made a number of amendments to the *regulatory test* which are discussed in this Decision.

This Decision only deals with the mechanics of the *regulatory test*. The framework in which the test operates, and its use by the ACCC in setting a Transmission Network Service Provider's (TNSP) capital expenditure allowance, is addressed in the Statement of Regulatory Principles and is not addressed in this Decision<sup>2</sup>.

The remainder of this section outlines the amendments to the *regulatory test*.

## 2. Amendments to the Regulatory Test

Since the *regulatory test*'s promulgation, there have been a number of developments which have affected the framework governing its operation. These developments include the:

- Network and Distributed Resources (NDR) Code changes authorised by the ACCC in February 2002;
- National Electricity Tribunal's (NET) decision on the South Australia – New South Wales Interconnector (SNI) for which a *regulatory test* was applied by the National Electricity Market Management Company (NEMMCO)<sup>3</sup>;
- Victorian Supreme Court's decision on aspects of the NET's decision<sup>4</sup>;
- ACCC's work on the Murraylink Transmission Company Conversion application; and
- Ministerial Council on Energy's (MCE) communiqué on reforms to the energy market.

In amending the *regulatory test*, the ACCC has considered these developments and comments from interested parties in response to its Issues Paper, Discussion Paper and Draft Decision. The comments from interested parties throughout the review predominantly relate to the 'market benefits limb' of the *regulatory test* in particular the issue of *competition benefits*. As a result this Decision focuses on those amendments necessary to address these concerns. The ACCC notes, however, that the majority of network augmentations undertaken by NSPs are conducted using the 'reliability limb' of the test.

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<sup>2</sup> The ACCC is currently reviewing its Draft Statement of Regulatory Principles which was released by the ACCC in May 1999. It released its discussion paper on the review of the draft regulatory principles in August 2003 and supplementary discussion paper on the capital expenditure framework in March 2004.

<sup>3</sup> The NET's determinations and reports on this matter can be found at [www.netribunal.net.au/determinations.htm](http://www.netribunal.net.au/determinations.htm)

<sup>4</sup> The Victorian Supreme Court's findings on this matter can be found at [www.austlii.edu.au/au/cases/vic/VSC/2003/265.html](http://www.austlii.edu.au/au/cases/vic/VSC/2003/265.html)

## 2.1 Minor amendments

The NDR amendments introduced a number of changes to Chapter 5 of the Code, which have resulted in inconsistencies between it and the *regulatory test*. The four main areas where the test and the Code are inconsistent are in relation to:

- the role and responsibilities of NEMMCO, TNSPs, the Inter-regional Planning Committee (IRPC) and the ACCC for the planning and approval of new transmission network investments;
- references to *inter-regional* and *intra-regional augmentations* in the *regulatory test* compared to references to *new small network assets* and *new large network assets* in the Code;
- the requirement that the ACCC consider the technical requirements of schedule 5.1 of the Code as well as jurisdictional obligations when promulgating the *regulatory test*; and
- other cross-referencing between the *regulatory test* and the Code.

In its Draft Decision the ACCC proposed amending the *regulatory test* to ensure consistency between it and the Code. Most interested parties who commented on this section support the ACCC's proposed amendments. Therefore, the ACCC considers it appropriate to amend the test in line with the changes outlined in its Draft Decision with some minor modifications. These modifications reflect comments made regarding the applicability of the Code's definitions of *new small network asset*, *new large network asset* and *reliability augmentation* to Distribution Network Service Providers (DNSPs).

To ensure that the 'reliability limb' can be applied by DNSPs the ACCC has amended the *regulatory test* to include the definition of a *reliability augmentation*, rather than referring to the definition of a *reliability augmentation* as proposed in its Draft Decision. Regarding whether DNSPs are exempt from applying the *regulatory test* to those augmentations which are either *new small network assets* or *new large network assets* the ACCC believes that Code changes may be required. While the Code allows the ACCC to amend the thresholds for *new small network asset* and *new large network assets* it does not allow the ACCC to amend the definitions to cover DNSPs.

Other amendments made to the *regulatory test* to ensure consistency with the Code include:

- replacing the reference to 'clause 5.6.5(q)(1)' in the preamble with 'clause 5.6.5A';
- replacing references to *intra-regional augmentations* and *new interconnectors* with *new small network assets* and *new large network assets*;
- replacing references to 'proposed augmentation' with 'options';
- deleting the preamble section which outlines the roles and responsibilities of various parties in relation to the planning and approval of new network investments; and
- inserting transitional provisions.

On the issue of the thresholds for *new small network asset* and *new large network assets*, the ACCC considers that this is best addressed as part of the review of the Statement of Regulatory Principles.

## 2.2 Definitional amendments

In its Draft Decision, the ACCC proposed a number of definitional amendments to the *regulatory test* in an attempt to clarify those elements that may be considered ambiguous. There was wide spread support for the definitional amendments proposed by the ACCC in its Draft Decision, subject to specific comments, which are discussed below.

In line with the views expressed by interested parties, the ACCC considers that it is appropriate to amend and define specific terms used in the *regulatory test* to provide greater guidance and certainty to NSPs. These definitions and terms have been developed following the ACCC's consideration of the views expressed by interested parties, the decisions on SNI, as well as the ACCC's review of previous *regulatory test* applications. The main amendments to the test include:

- *Alternative options* – the Code requires that all feasible network and non-network options be considered in a *regulatory test* assessment. However, neither the code nor the test defines what constitutes an *alternative option*. In line with its Draft Decision, the ACCC considers that the definition of *alternative options* should be separated into two limbs to address the different requirements of reliability driven augmentations and market driven augmentations.

When considering options under the 'reliability limb', the ACCC considers that a proponent is required for an alternative to be considered a genuine alternative. This will ensure that a NSP is able to meet its reliability requirements within an appropriate timeframe. However, consistent with the NET and Supreme Court's decisions on SNI, the ACCC considers that it is not necessary for options considered under the 'market benefits limb' of the *regulatory test* to have an identifiable proponent;

- *Market benefits and costs* – the ACCC is including a non-exhaustive list of *market benefits* and *costs* that should be referred to by NSPs when applying the *regulatory test*. The ACCC has ensured that the list does not provide scope for double-counting of *market benefits* or *costs* or include wealth transfers;
- *Committed projects and anticipated projects* – the ACCC is replacing the current definitions of *committed project* and *anticipated project* with definitions which are consistent with those used in NEMMCO's Statement of Opportunities (SOO);
- *Value of Lost Load (VoLL)* – the reference to VoLL is being replaced with a reference to the value of electricity to consumers;
- *Discount rate* – costs and benefits will still be discounted using a commercial discount rate, however, a formula for calculating that rate will not be included;
- *Market failure provision* – the information disclosure provisions introduced in the NDR amendments and outlined in the Annual National Transmission Statement (ANTS) has addressed the issues which were targeted in the market failure provision. The ACCC, therefore, considers it appropriate to remove the market failure test (note 7);

- *Sensitivity Analysis* – a list of parameters that should be considered by NSPs when testing the robustness of the analysis is being introduced. The list is not intended to be an exhaustive list and scope of sensitivity analysis will depend on the size and type of project being considered;
- *Reliability limb* – to best address its obligations under clause 5.6.5A the ACCC will replace the ‘minimising-cost’ approach with a ‘least cost’ approach for the reliability driven augmentations; and
- *Expected value* – the ACCC will revise the ‘market benefits limb’ of the test to include the term ‘expected’ ensuring that the test is consistent with the generally accepted principles of cost-benefit analysis upon which it is based.

While the ACCC believes that these amendments will improve NSPs and interested parties’ understanding of the *regulatory test* there is still sufficient flexibility for the test to evolve over time.

### 2.3 Competition benefits

*Competition benefits* are generally taken to be those benefits arising from an increase in competition between generators across the NEM resulting from freer flowing transmission lines. In its Draft Decision, the ACCC proposed amending the *regulatory test* to clarify that *competition benefits* be taken into account.

When considering the issue of *competition benefits* two questions need to be addressed: how should *competition benefits* be defined and what is the most appropriate methodology to calculate them. Farrier-Swier Consulting (Farrier Swier) and Frontier Economics were engaged to assist the ACCC address these questions. Farrier Swier considered the practical implementation issues of the options canvassed in the ACCC’s Discussion Paper while Frontier Economics’ work details a methodology for the calculation of *competition benefits*.

#### *Defining competition benefits*

There are two definitions of *competition benefits*. The economic definition specifies *competition benefits* as those benefits of increases in the market efficiency arising from greater generator competition. The social definition defines it as the benefits to consumers from enhanced generator competition.

When promulgating the *regulatory test*, the ACCC must have regard to the need to ensure that the test is consistent with the principles set out in Chapter 6 of the Code. Chapter 6 of the Code emphasises that the regime that the ACCC administers must provide for the efficient operation, provision and expansion of transmission facilities. Therefore, in keeping with the Code’s objectives, the ACCC considers that the calculation of *competition benefits* must be limited to benefits of enhanced economic efficiency.

Given this view, the ACCC will define *competition benefits* as the change in benefit between the scenario where, after implementation of the option:

- (a) generator bidding is assumed to be the same as it was before the option was implemented; and

- (b) generator bidding reflects any market power after the implementation of the option

or another reasonable measure that can be demonstrated to produce an equivalent change in benefit.

Due to the complexity of modelling *competition benefits*, the ACCC also believes that it is important to provide NSPs with the discretion to choose when to calculate them.

#### ***A methodology for calculating competition benefits***

The ACCC stated in its Draft Decision that using market simulation techniques is the appropriate method to adopt when calculating *competition benefits*. However, it acknowledged that it was not in a position to advocate a specific model and that further work was required.

Following the release of its Draft Decision, the ACCC engaged Frontier Economics to advise it on a methodology for calculating *competition benefits* using the existing SNOVIC 400 upgrade for illustrative purposes. A copy of the Frontier Economics report is attached to this Decision.

While Frontier Economics' work is a first step in developing a workable methodology for calculating *competition benefits*, the ACCC is encouraged by the results of the analysis. Further work is still required, such as undertaking sensitivity testing of key input variables and assumptions, and modelling the longer term effects on generator entry decisions. The ACCC proposes to continue working on this issue following the release of this Decision however it does not see its continued work affecting the definition of *competition benefits*.

### **3. Conclusion**

Taking into account submissions received from interested parties in response to its Draft Decision the ACCC promulgates this *regulatory test (v.2)* in accordance with clause 5.6.5A of the Code.

For comparative purposes, a copy of the *regulatory test (v.1)* is provided in Appendix B, along with a table comparing versions 1 and 2 of the *regulatory test*.

## ***Regulatory test - version 2***

### **Preamble**

The Australian Competition and Consumer Commission (ACCC) promulgates this *regulatory test* in accordance with clause 5.6.5A of the National Electricity Code (Code).

In this test “option” includes, but is not limited to, an *augmentation*, a *new large network asset* and a *new small network asset*.

### **The regulatory test**

- (1) An option satisfies the *regulatory test* if:
  - (a) in the event the option is necessitated solely by the inability to meet the minimum network performance requirements set out in schedule 5.1 of the Code or in relevant legislation, regulations or any statutory instrument of a participating jurisdiction - the option minimises the present value of *costs*, compared with a number of *alternative options* in a majority of *reasonable scenarios*;
  - (b) in all other cases - the option 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*.

### **For the purposes of this test:**

- (2) *Costs* means the total cost of an option (or an *alternative option*) to all those who produce, distribute or consume electricity in the National Electricity Market.

In determining the *costs*, the analysis may include, but need not be limited to, the following:

- (a) costs incurred in constructing or providing the option;
  - (b) operating and maintenance costs over the operating life of the option;
  - (c) the cost of complying with existing and anticipated laws, regulations and administrative determinations such as those dealing with health and safety, land management and environment pollution and the abatement of pollution (including greenhouse gas abatement). An environmental tax should be treated as part of a project’s cost. An environmental subsidy should be treated as part of a project’s benefits or as a negative cost.
  - (d) other costs that are determined to be relevant to the case concerned.
- (3) *Alternative options* means:
    - (a) For an option proposed in accordance with paragraph 1(a) of this test:

- (i) a genuine alternative to the option being assessed, in that it:
    - (A) has a clearly identifiable proponent; and
    - (B) meets the requirements referred to in paragraph 1(a);
  - (ii) a practicable alternative to the option being assessed in that it is technically feasible.
- (b) For an option proposed in accordance with paragraph 1(b) of this test:
- (i) a genuine alternative to the option being assessed, in that it:
    - (A) delivers similar outcomes to those delivered by the option being assessed; and
    - (B) becomes operational in a similar timeframe to the option being assessed;
  - (ii) a practicable alternative to the option being assessed in that it is:
    - (A) technically feasible; and
    - (B) commercially feasible, which is to be demonstrated by determining whether an objective operator, acting rationally according to the economic criteria prescribed by this test, would be prepared to construct or provide the *alternative option*.

The existence of a genuine proponent for the *alternative option* should be taken into account when determining practicability, however, absence of such a proponent will not exclude a project from being an *alternative option* for the purposes of the regulatory test.

- (4) *Reasonable scenarios* means scenarios incorporating:
- (a) reasonable forecasts of:
    - (i) electricity demand (modified where appropriate to take into account demand-side options, variations in economic growth, variations in weather patterns and reasonable assumptions regarding price elasticity);
    - (ii) the efficient operating costs of competitively supplying energy to meet forecast demand from existing, *committed*, *anticipated* and *modelled* projects including demand side and generation projects;
    - (iii) the avoidable costs of *committed*, *anticipated* and *modelled* projects including demand side and generation projects and whether all avoidable costs are completely or partially avoided or deferred;

- (iv) the cost of providing sufficient ancillary services to meet the forecast demand; and
  - (v) the capital and operating costs of other regulated network and *market network service* projects that are augmentations consistent with the forecast demand and generation scenarios;
- (b) scenarios defined as market development scenarios; and
- (c) sensitivity testing.
- (5) *Market benefit* means the total benefits of an option (or an *alternative option*) to all those who produce, distribute and consume electricity in the National Electricity Market. That is, the change in consumers' plus producers' surplus or another measure that can be demonstrated to produce an equivalent ranking of options in a majority of *reasonable scenarios*. For clarity, *market benefit* does not include the transfer of surplus between consumers and producers.

In determining the *market benefit*, the analysis may include, but need not be limited to the following benefits:

- (a) changes in fuel consumption arising through different generation dispatch;
  - (b) changes in voluntary load curtailment caused through reduction in demand-side curtailment;
  - (c) changes in involuntary load shedding caused through savings in reduction in lost load, using a reasonable forecast of the value of electricity to consumers, or deferral of reliability entry plant;
  - (d) changes in costs caused through:
    - (i) deferral of market entry plant. This must be excluded if reliability benefits are determined using deferral of reliability entry plant;
    - (ii) differences in capital costs;
    - (iii) differences in the operational and maintenance costs; and
    - (iv) deferral of transmission investments;
  - (e) changes in transmission losses;
  - (f) changes in ancillary services;
  - (g) *competition benefits*; and
  - (h) other benefits that are determined to be relevant to the case concerned.
- (6) *Competition benefits* means the change in benefit between the scenario where, after implementation of the option:

- (a) generator bidding is assumed to be the same as it was before the option was implemented; and
- (b) generator bidding reflects any market power after the implementation of the option

or another reasonable measure that can be demonstrated to produce an equivalent change in benefit.

- (7) The *market benefit* of an option will only include *competition benefits* where:
  - (a) the option is a *new large network asset* or a *new large distribution network asset*; and
  - (b) the *Network Service Provider* responsible for undertaking the analysis of the option determines that it is appropriate, in all the circumstances, to take *competition benefits* into account in assessing the *market benefit* of the option.
- (8) In determining *costs* or *market benefits*, any cost or benefit which cannot be measured as a cost or benefit to producers, distributors and consumers of electricity in terms of financial transactions in the market should be disregarded. The allocation of costs and benefits between the electricity and other markets must be based on principles consistent with the Transmission Ring-Fencing Guidelines and/or Distribution Ring-Fencing Guidelines (as appropriate). Only direct costs and benefits (associated with a partial equilibrium analysis) should be included and any additional indirect costs or benefits (associated with a general equilibrium analysis) should be excluded from the assessment.
- (9) In determining the *costs* or *market benefits*, it should be considered whether the *proposed option* will enable:
  - (a) a *Transmission Network Service Provider* to provide both prescribed and other services; or
  - (b) a *Distribution Network Service Provider* to provide both prescribed distribution services and other services.

If it does, the *costs* and *market benefits* associated with the other services should be disregarded. The allocation of costs between prescribed and other services must be consistent with the Transmission Ring-Fencing Guidelines. The allocation of costs between prescribed distribution services and other services must be consistent with the relevant Distribution Ring-Fencing Guidelines.
- (10) The present value calculations must use a commercial discount rate appropriate for the analysis of a private enterprise investment in the electricity sector. The discount rate used should be consistent with the cash flows being discounted.
- (11) The analysis must include modelling a range of reasonable *market development scenarios*, incorporating varying levels of demand growth at relevant load centres (reflecting demand side options), alternative project commissioning dates and various potential generator investments and realistic operating regimes. These scenarios may

include alternative construction timetables as nominated by the proponent providing that relevant reliability standards would be met.

*Market development scenarios* must include:

- (a) *Committed projects*;
- (b) *Anticipated projects*;
- (c) *Modelled projects*; and
- (d) any other technically feasible projects identified during the consultation process.

(12) *Committed project* means a project which satisfies all the following criteria:

- (a) the proponent has obtained all required planning consents, construction approvals and licenses, including completion and acceptance of any necessary environmental impact statement;
- (b) construction of the proposal must either have commenced or a firm commencement date must be set;
- (c) the proponent has purchased/settled/acquired land (or commenced legal proceedings to acquire land) for construction of the proposed development;
- (d) contracts for supply and construction of the major components of the plant and equipment (such as generators, turbines, boilers, transmission towers, conductors, terminal station equipment) should be finalised and executed, including any provisions for cancellation payments; and
- (e) the financing arrangements for the proposal, including any debt plans, must have been finalised and contracts executed.

(13) *Anticipated project* means a project which:

- (a) does not meet each of the criteria in note 12; and
- (b) is in the process of meeting one or more of the criterion in note 12.

(14) *Modelled project* means a project (other than a committed project or anticipated project) modelled using either ‘least-cost market development’ modelling or ‘market-driven market development’ modelling:

- (a) Least-cost market development modelling means modelling projects based on a least-cost planning approach akin to conventional central planning. The proposals to be included would be those where the net present value of benefits, such as fuel substitution and reliability increases, exceeds the costs.
- (b) Market-driven market development modelling means modelling spot price trends based on existing generation and demand and includes new generation developed on the same basis as would a private developer (where the net present value of the spot price revenue exceeds the net present value of

generation costs). The forecasts of spot price trends should reflect a range of market outcomes, ranging from short run marginal cost bidding behaviour to simulations that approximate non-competitive bidding or imperfect competition, with power flows to be those most likely to occur under actual systems and market outcomes.

- (15) The calculation of the *costs* or *market benefits* must encompass sensitivity testing on key input variables. Sensitivity testing may be carried out on, but not limited to, the following, and should be appropriate to the size and type of project:
- (a) *Market benefits*:
    - (i) Using all reasonable methodologies; and
    - (ii) Testing reasonable forecasts of the value of electricity to consumers.
  - (b) Capital and operating costs of *alternative options*.
  - (c) Discount rate (the lower boundary should be the regulated cost of capital).
  - (d) Market demand.
  - (e) Generation bidding behaviour using:
    - (i) SRMC; and
    - (ii) Approximates of realistic bidding if measuring *competition benefits*.
  - (f) Commissioning dates of:
    - (i) Alternative projects;
    - (ii) Committed projects;
    - (iii) Anticipated projects; and
    - (iv) Modelled projects.
  - (g) Market based regulatory instruments that may be used to address greenhouse and environmental issues.
  - (h) Other sensitivity testing determined to be relevant and material to the case concerned.
- (16) Any relevant information which may have a material impact on the determination of *costs* or *market benefits* which comes to light at any time before an assessment is finalised must be considered and made available to interested parties.
- (17) This version of the *regulatory test* (version 2) comes into operation from the date of its promulgation, subject to the following transitional provisions.

The version of the *regulatory test* in operation immediately prior to the promulgation of version 2 of the *regulatory test* continues to apply in relation to:

- (a) possible options for which a *Distribution Network Service Provider* has commenced consultation under clause 5.6.2(f) or an economic cost effectiveness analysis under clause 5.6.2(g) prior to the promulgation of version 2 of the *regulatory test*;
- (b) a *new small network asset* for which a *Transmission Network Service Provider* has set out the matters required under clause 5.6.2A(b)(4) and (5) in an Annual Planning Report published before 30 June 2004. The ACCC can substitute a later date if a *Transmission Network Service Provider* does not publish its Annual Planning Report by 30 June 2004 (as required by clause 5.6.2A(a) of the Code);
- (c) a *new small network asset* not identified in an Annual Planning Report for which a *Transmission Network Service Provider* has published a report required under clause 5.6.6A(c) prior to the promulgation of version 2 of the *regulatory test*; and
- (d) a *new large network asset* for which a *Transmission Network Service Provider* has published an application notice under clause 5.6.6(b) prior to the promulgation of version 2 of the *regulatory test*.

# 1. Introduction

Under clause 5.6.5A of the National Electricity Code (Code), the Australian Competition and Consumer Commission (ACCC) is responsible for the promulgation of the *regulatory test*. Clause 5.6.5A of the Code states:

The ACCC must:

- (a) promulgate the *regulatory test* (and may vary the *regulatory test* from time to time);
- (b) have regard to the need to ensure that the *regulatory test* is consistent with the basis of asset valuation determined by the ACCC for the purposes of clause 6.2.3; and
- (c) have regard to the obligations imposed on *Network Service Providers* to meet the *network performance requirements* set out in schedule 5.1 and relevant legislation and regulations of a *participating jurisdiction*, in developing and maintaining the *regulatory test*.

On the 15 December 1999, the ACCC promulgated the *regulatory test* in accordance with the then clause 5.6.5(q) of the Code<sup>5</sup>.

Since its promulgation, a number of concerns were raised by interested parties about the *regulatory test's* operation. As a result, the ACCC committed to review the *regulatory test* in conjunction with the National Electricity Code Administrator's (NECA) commitment to review the framework for essential new investment.

On 10 May 2002, the ACCC released an Issues Paper which highlighted specific concerns raised by interested parties with the operation of the *regulatory test*. From submissions received, the ACCC released a Discussion Paper on 5 February 2003 which outlined three options for the refinement of the *regulatory test*:

- Option 1 - making minor modifications to the *regulatory test* to ensure consistency between it and the Code;
- Option 2 - introducing a number of definitions to be used when applying the test to ensure its consistent application across the NEM; and
- Options 3 - ensuring the *regulatory test* recognises the benefits of increased competition between generators (*competition benefits*).

A Competition Benefits and Market Review Forum was held on 28 July 2003, which facilitated discussion on the issue of *competition benefits*.

In response to the Discussion Paper and issues discussed at the forum, the ACCC received 52 submissions. The ACCC released its Draft Decision on 10 March 2004 proposing changes largely in line with those identified in its Discussion Paper<sup>6</sup>.

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<sup>5</sup> Prior to the Network and Distributed Resources Code changes authorised by the ACCC on 13 February 2002, the ACCC's responsibility for the promulgation of the *regulatory test* came from the then clause 5.6.5(q) which only included (a) and (b) of clause 5.6.5A.

In response to its Draft Decision, the ACCC received 25 submissions. A list of the parties who provided submissions is outlined in Appendix A. Submissions to the Draft Decision are available on the ACCC's website ([www.accc.gov.au](http://www.accc.gov.au)).

Taking into account submissions received from interested parties in response to its Draft Decision, the ACCC has made a number of amendments to the *regulatory test*, which are outlined in this Decision. For comparative purposes, a copy of the *regulatory test* (v.1) is provided in Appendix B along with a table comparing versions 1 and 2 of the *regulatory test*.

This Decision only deals with the mechanics of the *regulatory test*. The framework in which the test operates, and its use by the ACCC in setting a Transmission Network Service Provider's (TNSP) capital expenditure allowance, is addressed in the Statement of Regulatory Principles and is not addressed in this Decision<sup>7</sup>.

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<sup>6</sup> ACCC, *Draft Decision: Review of the regulatory test*, 10 March 2004.

<sup>7</sup> The ACCC is currently reviewing its Draft Statement of Regulatory Principles which was released by the ACCC in May 1999. It released its discussion paper on the review of the draft regulatory principles in August 2003 and supplementary discussion paper on the capital expenditure framework in March 2004.

## 2. Background

This chapter provides background on the development of the *regulatory test*, and the processes for the development of new network investment in the National Electricity Market (NEM).

### 2.1 Pre - NEM Process

Prior to the commencement of the reforms to the electricity sector, state owned and run enterprises were charged with responsibility for planning and constructing all elements of the electricity supply chain. Transmission networks were built to meet the specific needs of the states. Consequently, planning and investment decisions were not designed around the operation of a competitive national market in electricity.

With the creation of the NEM, network investment decisions needed a framework which ensured economic efficiency, prudence and competitive neutrality. An approach was required which suited the overall regulation of networks to ensure that the open access regime of the NEM promoted competition and access for upstream and downstream users while providing asset owners and operators with a reasonable risk adjusted revenue stream to fund their investment.

The NEM incorporates some market related aspects that are designed to encourage network investment where such investment produces lower losses and minimises energy price variability between regions. Ideally, network pricing arrangements would provide price signals for efficient network investment which reflects the extent of congestion or spare capacity in the network. Without these price signals the market will continue to require regulatory approval for new investment.

In the NEM regulatory approval is largely provided through the application of the *regulatory test*. The test was developed in response to concerns raised by the National Electricity Market Management Company (NEMMCO) following its application of the 'Customer Benefits' test.

### 2.2 The Customer Benefits test

The Customer Benefits test, was part of the original Code authorised by the ACCC and was designed to ensure that network investment would only be undertaken if customers benefited from a particular investment.

In 1998, NEMMCO was asked to perform an assessment of the proposed interconnector between South Australia and New South Wales (SANI) using the 'Customer Benefits' test. The objective was to ensure that the project which satisfied the criteria would enter the relevant regulated asset bases.

In its review of SANI, published in June 1998, NEMMCO noted that the Code contained some ambiguities. In particular, it noted that some clauses referred to public benefit and others to 'Customer Benefits', with 'Customers' being defined in the Code as wholesale market customers, rather than customers at large. NEMMCO found that SANI satisfied a broader public benefits test which considered the benefits to both producers and consumers, but failed the 'Customer Benefits' test. NEMMCO also raised concerns about the process of

identifying and measuring certain costs and benefits. As a result, NEMMCO concluded that the Code, as it stood, might make it difficult for any inter-regional augmentation to gain regulatory approval.

Reflecting this concern, the NSW Government lodged this issue on NEMMCO's Issues Register requiring it to be resolved prior to the commencement of the NEM. Consequently, the ACCC was asked, as an independent party, to review the test and recommend changes to it to overcome these perceived inadequacies.

## 2.3 Development of the Regulatory Test

The ACCC engaged Ernst & Young to assist it in conducting its review. The ACCC published the Ernst & Young report in March 1999. On the basis of that report, the ACCC published its preliminary view of the *regulatory test* in April 1999. That paper acknowledged the merits in changing the test from a 'Customer Benefits' test to a test based on maximising the Net Present Value (NPV) of the market benefits.

On 23 July 1999, the National Electricity Code Administrator (NECA) sought authorisation of amendments to the Code, which included changes to replace the existing 'Customer Benefits' test with a *regulatory test* to be determined by the ACCC. The amendments required all Network Service Providers (NSPs), including Transmission Network Service Providers (TNSPs) and Distribution Network Service Providers (DNSPs) to consult with interested parties when applying the test. The consultation included examining, amongst other things, alternative generation and demand side options to determine those options that satisfied the test, while meeting the reliability requirements of schedule 5.1 of the Code. The amendments also required the Inter-Regional Planning Committee (IRPC) and NEMMCO to apply the test when considering possible system augmentations. The ACCC authorised the Code changes on 20 October 1999<sup>8</sup>.

The ACCC adopted a parallel process to the Code change process for developing the *regulatory test*, and sought additional submissions in response to its preliminary view. It released a draft test on 22 September 1999. Following further consultation, the ACCC promulgated the *regulatory test* in December 1999 which introduced a 'minimising-cost' test for reliability driven investments

In developing the *regulatory test*, the ACCC relied on the Code's key principles of economic efficiency and competitive neutrality. Consequently, the ACCC based the test on the traditional cost-benefit analysis framework but with a number of qualifications to limit any adverse impacts that regulated network investments might have on the contestable parts of the industry. The test removed the volatility inherent in the 'Customer Benefits' test and ensured even-handed treatment between network and non-network investment by extending the neutrality of the Code such that generation, demand side and unregulated network investment could be considered equally under the test.

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<sup>8</sup> ACCC, *Applications for authorisation: Market Operations for Y2K, Regulated Interconnectors and Augmentations and System Security Compensation*; 20 October 1999.

In summary, the *regulatory test* (v1):

- includes reference to net public benefits rather than net customer benefits;
- calculates the net benefits of various options with reference to the underlying economic cost savings and not with reference to pool price outcomes;
- excludes costs and benefits associated with competitive, non-electricity, market activities (that is a partial equilibrium analysis);
- includes only those environmental impacts that governments or their environment agencies have sought to address;
- uses a discount rate that would be used by participants in the contestable markets; and
- relies on forecasts of future market behaviour based on both assumptions of a competitive market as well as actual market behaviour.

Throughout this review of the *regulatory test* the ACCC has endeavoured to ensure that the Code's principles of economic efficiency and competitive neutrality and the general principles underlying cost-benefit analysis continue to apply.

## 2.4 Cost-Benefit Analysis Framework

Cost-benefit analysis is a widely applied technique to assess and rank the economic viability of investment decisions. It is used predominantly in public sector decision making processes in circumstances of market failure where, if markets were left to their own devices, society as a whole would be left worse off. Typically, cost-benefit analyses seek to maximise the sum of producers' and consumers' surplus based on estimates of efficient economic costs and benefits.

The seminal text in the field of cost-benefit analysis is Mishan's 'Cost-Benefit Analysis – An Informal Introduction',<sup>9</sup> which describes the standard approach to undertaking cost-benefit assessments. Most of Mishan's discussion focuses on the measurement of costs and benefits in a general equilibrium setting.<sup>10</sup> However, the principles are equally applicable to the consideration of partial equilibrium analyses which is relevant for the *regulatory test* framework<sup>11</sup>.

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<sup>9</sup> E. J. Mishan, *Cost-Benefit Analysis – An Informal Introduction*, George Allen & Unwin, Third Edition, 1982.

<sup>10</sup> The Collins Dictionary of Economics defines general equilibrium as 'the analysis of the interrelationships that exists between sub-sectors of an economy. General equilibrium analysis proceeds on the basis that event in one sector can have a significant impact on other sectors that feedback effects, in turn, are likely to affect the functioning of the first...'

<sup>11</sup> The Collins Dictionary of Economics defines partial equilibrium as 'the analysis of relationships within a particular sub-sector of an economy (for example, an individual market) that proceeds on the basis that events in this sector have such an insignificant impact on other sectors that feedback effects will be negligible or non-existent'.

The general principles of cost-benefit analysis outlined by Mishan are summarised below:

- The measurement of economic value of benefits and cost is based on either the value of a consumers' 'willingness to pay', 'opportunity cost', or 'economic cost'. This provides the basis for determining the return available from the most attractive alternative use of the resources for a given project;
- The benefits and costs of a project occur over time and for comparative purposes should be considered at a common date. This is achieved by using a suitable discount rate and discounting future cash flows back to the present. The NPV of the project is the present value (PV) of its benefits minus the PV of its costs, and for socially desirable projects should be greater than zero;
- Three conditions are required to ensure a comparative assessment of the costs and benefits of alternatives:
  - investment outlays must be the same;
  - investment periods must be the same; and
  - reinvestment opportunities open to the benefits of each must be made explicit and fully utilised.
- In selecting alternative investments, the following should be considered:
  - the same type of service required in a different locality, or region, is conceived as a different service;
  - if within a single locality, two or more services can be produced in combination by a single investment project, each different combination of services so producible qualifies as a distinct service;
  - if two or more investment projects need to be combined in order to provide a single service, or a complex of services, each of such combination of investment projects is to be treated as a single investment option;
  - if there are scale effects in any investment, each scale of the project is to be distinguished (in light of the expected demand for the service or services in question) and be treated as a separate investment option; and
  - an analysis of the productivities of yields of the capital components of each alternative should be made to ensure that the most efficient project is arrived at.
- Risk and uncertainty need to be accounted for. Various techniques to account for risk and uncertainty include the use of expected values, assigning probabilities to the likelihood of an event occurring, sensitivity analysis, setting a cut-off period in which the cost and benefits are assessed, and using a higher discount rate for benefits after a stipulated period.

## **2.5 Economic efficiency and wealth transfers**

Consistent with the generally accepted principles of cost-benefit analysis, the focus of the *regulatory test* is on the increases in economic efficiency, or total welfare. Economic efficiency comprises three elements - allocative efficiency, productive efficiency, and dynamic efficiency.

Allocative efficiency occurs when firms employ resources to produce goods and services that provide the maximum benefit to society. From the perspective of the *regulatory test* it would be the *market benefits* arising from higher consumption and production when prices decrease and moves closer to marginal cost following an investment. In the long run, an additional allocative efficiency arises if inefficient generation and transmission investment is avoided.

Productive efficiency occurs when firms have the appropriate incentives to produce services at least cost. It can be described as the *market benefits* that arise when increased interconnection causes lower priced generation to displace higher priced generation.

Dynamic efficiency considers the longer term impact on the market and is achieved in the long term when firms have appropriate incentives to invest and innovate over time.

From a cost-benefit perspective increases in economic efficiency are represented by increases in total welfare. To understand the differences between increases in efficiency and transfers of wealth a simple model is presented in Figures 2.1, 2.2 and 2.3 which assumes a basic level of understanding of economic concepts.

### ***A model of economic efficiency***

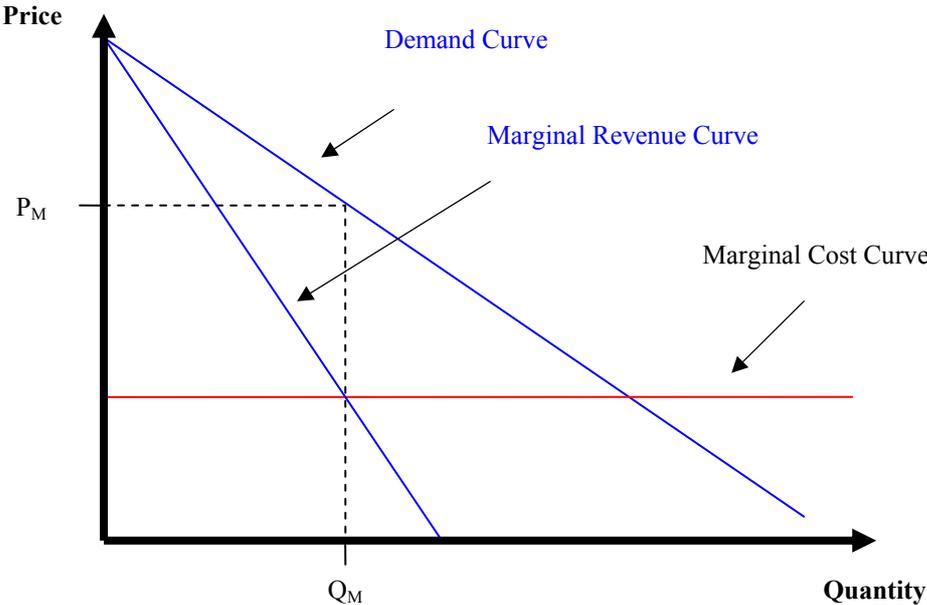
Assume initially that the supply of electricity in a market is provided by a single generator. Suppose for simplicity that the monopolist faces a horizontal Marginal Cost (MC) curve<sup>12</sup>. Assume also that there are no constraints on the generator's ability to exercise its market power. It will set a price which maximises its profits by reference to the intersection of the Marginal Revenue and MC curves<sup>13</sup>. The market clearing price and quantity for electricity will be given by  $P_M$  and  $Q_M$  respectively as illustrated in Figure 2.1.

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<sup>12</sup> Marginal cost is defined as the change in total costs resulting from a one unit change in quantity produced. A horizontal marginal cost curve indicates that the cost of producing one extra unit of good will be constant at all levels of output.

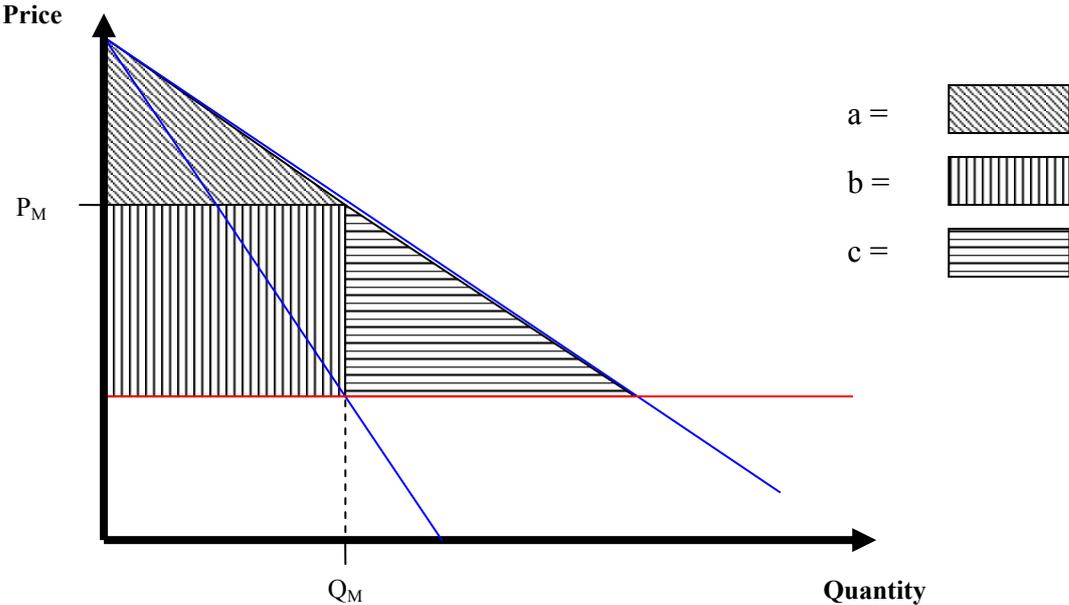
<sup>13</sup> Marginal revenue is defined as the change in total revenue resulting from a one unit change in the quantity sold. If a generator moves away from the intersection of marginal revenue and marginal cost it will be decreasing its total revenue. If the price charged by the monopolist is above  $P_M$  it will be able to increase its profit by decreasing price and increasing the quantity sold. Conversely, if the price charged by the monopolist is below  $P_M$  it will be able to increase its profit by increasing price and decreasing the quantity sold.

**Figure 2.1 Economic Efficiency and Wealth Transfers (part 1)**



Consumer surplus is defined as the difference between a consumer’s maximum willingness to pay for a unit of good and the price that he or she actually pays. In this case, the consumer surplus is given by the shaded triangle **a** in Figure 2.2. Producer surplus is defined as the difference between the generator’s total revenue and opportunity cost of production. This is represented by the shaded square **b**, which sits above the marginal cost curve but below price. The triangle represented by the shaded area **c** is known as the dead weight loss. In this region, there are consumers willing to purchase electricity at a marginal value above the MC curve, however, they are unable to do so at the price set by the generator.

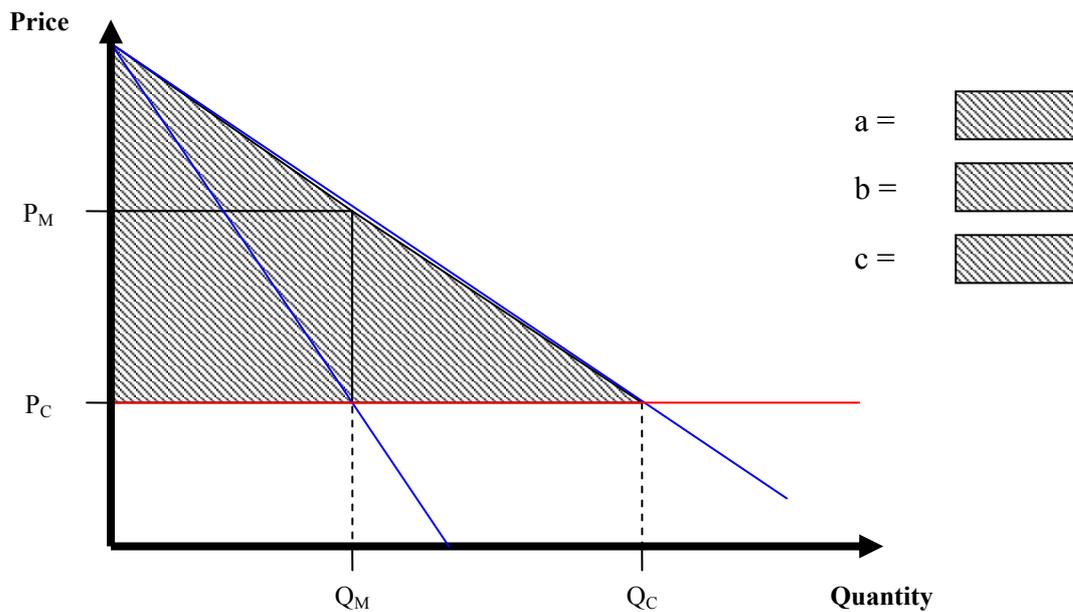
**Figure 2.2 Economic Efficiency and Wealth Transfers (part 2)**



Assume now that the generator is forced to set its price equal to MC, which could result from the entry of a new generator or regulatory intervention. The result is a fall in the price of electricity from  $P_M$  to  $P_C$  and an increase in quantity supplied from  $Q_M$  to  $Q_C$ .

The consumer surplus is now given by the shaded areas **a** + **b** + **c** because there are more consumers who are purchasing electricity at the price charged by the generator. The producer surplus has decreased by the shaded area **b**. The generator is still making a profit, but it is not making any monopoly profits. This is illustrated in Figure 2.3.

**Figure 2.2 Economic Efficiency and Wealth Transfers (part 3)**



The gains and losses in the market are relatively straight forward. Consumers gain from the decrease in price from  $P_M$  to  $P_C$  and an increase in quantity from  $Q_M$  to  $Q_C$ , (areas **b** and **c**). The generator loses from the decrease in price and from  $P_M$  to  $P_C$  and  $Q_M$  to  $Q_C$  respectively (area **b**). From this it can be seen that area **b** has been transferred from generators to consumers. The economic term for this is a wealth transfer. The net increase in welfare, or increase in market efficiency, is given by the area **c**, the welfare triangle.

Like the *regulatory test*, the net increase in welfare demonstrated above is only considered from a partial equilibrium perspective. It is not concerned with the flow on or second round effects of a change in variables on other areas of the economy (i.e. a general equilibrium analysis). The *regulatory test* does not consider those benefits arising in a general equilibrium setting.

## 2.6 Network and Distributed Resources Code Changes

As part of its commitment to review the framework for essential new investment NECA developed the NDR Code change package. The Code changes amended the roles of the IRPC, NEMMCO and the ACCC in relation to assessing network investments.

The NDR amendments introduced two major changes to the Code. Firstly, the Code amendments shifted responsibility for the application of the *regulatory test* relating to *inter-regional* augmentations from NEMMCO to TNSPs. Secondly, the amendments removed the distinction between *inter-regional* and *intra-regional* augmentations and replaced it with a distinction between *new large network assets* and *new small network assets*. A *new large network asset* is defined as an augmentation that a TNSP estimates will require a total capitalised expenditure in excess of \$10 million. A *new small network asset* is an augmentation that a TNSP estimates will require a total capitalised expenditure in excess of \$1 million but not greater than \$10 million.

While the proposals were developed with transmission network planning in mind, NECA modified the Code to ensure that the existing provisions and obligations on DNSPs were maintained but not extended. That is, a DNSP must continue to carry out economic cost effectiveness (least-cost) analysis of options that satisfy the *regulatory test* where it has identified necessary augmentations in its Annual Planning Review (APR)<sup>14</sup>.

## 2.7 The Regulatory Test and TNSP Revenue

### 2.7.1 Pre NDR Code changes

Prior to the NDR Code changes, NSPs were required under the then clause 5.6.2 to apply the *regulatory test* to intra-regional transmission system or distribution system augmentations. NEMMCO and the IRPC were required to apply the *regulatory test* to augmentation options in accordance with the then clause 5.6.5, and to proposed new interconnectors in accordance with the then clause 5.6.6.

In terms of disputing the outcomes of the *regulatory test*, a Code participant could dispute the recommendations of a NSP's report to the Dispute Resolution Panel (DRP), using the Chapter 8 procedures, for any proposal which was reasonably likely to change the use of system service charges by more than 2 per cent at the subsequent price review.

NEMMCO's determination of whether an interconnector satisfied the *regulatory test* was a reviewable decision<sup>15</sup>.

#### *The regulatory test and regulated revenue*

Where an NSP assessed an augmentation under the *regulatory test*, clause 5.6.2(k) of the Code implied that the cost of the asset which was deemed to pass the test was rolled into the NSP's asset base. The then clause 5.6.2(k) stated:

...the relevant *Network Service Provider* must arrange for the project to be available for service by the agreed time and the *Network Service Provider* must include the cost of the relevant assets in the calculation of *transmission service* and *distribution service* prices determined in accordance with Chapter 6 of the *Code*.

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<sup>14</sup> Clause 5.6.2(g).

<sup>15</sup> A decision of NEMMCO or NECA that is specified as a reviewable decision is one which pursuant to the *National Electricity Law*, can be reviewed by the *National Electricity Tribunal*.

Further, if a NSP found that a generation option satisfied the *regulatory test*, the NSP was required to include the cost of the associated network support service in the calculation of its network prices, determined in accordance with Chapter 6 of the Code.

Where NEMMCO determined that an augmentation was justified, the Code specifically stated that the augmentation was to be included in the determination of the revenue cap. The then clause 5.6.5(m) stated:

If NEMMCO determines that an *augmentation* of a *network* is justified, then the *Network Service Providers* whose *networks* would require *augmentation* may arrange for the augmentation project to be undertaken and the cost of the relevant assets are to be included in the determination of the *revenue cap* in accordance with Part B of Chapter 6.

However, the outstanding issue in both cases was at what value the asset should be rolled into the NSP's regulatory asset base.

### 2.7.2 NDR Code changes

Chapter 5 of the Code now requires TNSPs to apply the *regulatory test* to all network augmentations in accordance with the Code consultation procedures. Before proceeding with its *regulatory test* assessment the TNSP must consider whether the proposed augmentation is required to meet the relevant reliability standard, in which case the 'reliability limb' of the test is applied, or economic reasons, in which case the 'market benefits limb' of the test is applied. The length and rigour of the TNSP's consultation process depends on whether the proposed augmentation is a *new small network asset* or a *new large network asset*.

In the case of augmentations involving *new small network assets* a TNSP must consult on the augmentation in its APR. The APR must contain an analysis of whether the *new small network asset* satisfies the *regulatory test*. Where a specific *new small network asset* augmentation is not identified in its APR, the TNSP must prepare a separate report that is to be published and circulated to all Code participants and interested parties. There is no avenue of appeal against this analysis. The ACCC is required to take into account the relevant report all material submitted during the consultation process in setting the TNSP's revenue cap.

The process for the construction of a *new large network asset* is lengthier and more onerous. The applicant must publish a notice which sets out a detailed description of:

- the proposed *new large network asset*;
- the reason for proposing the *new large network asset*;
- all reasonable network and non-network alternatives;
- all relevant technical details, including the construction date and timetable;
- the ranking of the *new large network asset* against its alternatives;
- a technical report by the IRPC if it is reasonably likely to have a *material inter-network impact*; and
- detailed analysis of why the *new large network asset* satisfies the *regulatory test*, and/or why it is a *reliability augmentation*.

The Code also requires a TNSP to publish a final report setting out its findings on these issues, with a summary of the report to be published on NEMMCO's website. The grounds for appeal to the DRP are:

- possible alternatives considered and their rankings;
- whether the *new large network asset* will have a material inter-regional impact;
- the basis on which the applicant has assessed that the *new large network asset* satisfies the *regulatory test*; and
- whether the *new large network asset* is a *reliability augmentation* and whether it satisfies the IRPC criteria.

If a matter is appealed, the DRP must publish its findings which must then be incorporated into the TNSP's report. This report can be disputed to the ACCC, where it will consider whether the asset satisfies the *regulatory test*, provided that the asset is not a *reliability augmentation*.

### ***The regulatory test and regulated revenue***

The Code no longer specifies that an augmentation that is deemed to satisfy the *regulatory test* must be rolled into a TNSP's regulatory asset base. However, the ACCC will still place significant weight on the fact that the *regulatory test* has been satisfied. Practically, this could mean that where the scoping of the project has changed significantly or in the ACCC's opinion the *regulatory test* was not applied correctly, it could rely on other criteria to determine whether to roll the asset into the regulatory asset base.

## 3. Minor amendments

### 3.1 Introduction

The NDR amendments introduced a number of changes to Chapter 5 of the Code, which have resulted in inconsistencies between it and the *regulatory test*. The four main areas where the test and the Code are inconsistent are in relation to:

- the role and responsibilities of NEMMCO, TNSPs, the IRPC and the ACCC for the planning and approval of new transmission network investments;
- references to *inter-regional* and *intra-regional augmentations* in the *regulatory test* compared to references to *new small network assets* and *new large network assets* in the Code;
- the requirement that the ACCC consider the technical requirements of schedule 5.1 of the Code as well as jurisdictional obligations when promulgating the *regulatory test*; and
- other cross-referencing between the *regulatory test* and the Code.

The inconsistencies in terminology between the *regulatory test* and the Code could create confusion for NSPs when applying the test and open an avenue for dispute.

The remainder of this chapter summarises the ACCC's Draft Decision and submissions from interested parties in response to the Draft Decision and sets out the ACCC's consideration of the issues raised in those submissions.

### 3.2 ACCC's Draft Decision

In its Draft Decision, the ACCC proposed a number of amendments to realign the *regulatory test* with the Code. The amendments proposed included:

- replacing the reference to clause 5.6.5(q)(1) in the preamble with clause 5.6.5A;
- replacing the reference to *inter-regional augmentation* and *intra-regional augmentation* with *new small network assets* and *new large network assets*;
- deleting that part of the preamble which sets out the roles and responsibilities of various parties in relation to the planning and approval of new network investments;
- amending the 'reliability limb' of the *regulatory test* to include the definition *reliability augmentation* as set out in the Code; and
- making minor amendments to the wording of both limbs of the *regulatory test*, and the structure of the test to add clarity without changing the intent.

The ACCC also expressed its view that the *regulatory test* must be applied to all augmentations greater than \$1 million, irrespective of whether such an augmentation is an incidental augmentation and deferred the issue of whether to amend the thresholds for *new*

*small network assets* and *new large network assets* to its review of the Statement of Regulatory Principles.

### **3.3 Submissions from interested parties on Draft Decision**

#### **3.3.1 Aligning the *regulatory test* with the Code**

EnergyAustralia, NRG Flinders, the Energy Retailers Association of Australia (ERAA), Energy Solutions Australia (ESA), Powerlink, InterGen, and Ergon Energy (retail) all support the ACCC's proposed amendments to align the *regulatory test* with the Code.

However, Ergon Energy (DNSP) raises concerns about the applicability of the terms *reliability augmentation*, *new small network asset* and *new large network asset* to DNSPs. It recommends that the ACCC amend the definition of a *reliability augmentation* to incorporate DNSPs so that they are able to apply the 'reliability limb' of the test to reliability driven augmentations.

Regarding the definition of *new small network asset* and *new large network asset* Ergon Energy (DNSP) contends that for DNSPs, there are no threshold exemptions from carrying out consultation on the *regulatory test*, no matter how small the project. It suggests that the test and the Code should be amended to ensure that it can be applied.

#### **3.3.2 Replacement expenditure and augmentations**

While noting the ACCC's view on this issue, Ergon Energy (DNSP), ElectraNet, and Transend submit that in some cases an asset replacement project designed to maintain or restore existing service capacity may result in an incidental increase in service capacity. They contend that in these instances, the *regulatory test* should not be applied to that part of the project which augments the network. Transend adds that TNSPs should be allowed to make assessments as to the materiality of any augmentation, relative to the project as a whole to determine whether the test should be applied.

#### **3.3.3 Threshold for new small network assets and new large network assets**

While noting that the consideration of this issue has been deferred pending the ACCC's review of the Statement of Regulatory Principles, Transend and ElectraNet reiterate that the present thresholds are too low and should be reconsidered. ElectraNet recommends that the existing thresholds be raised to at least \$5 million for *new small network assets* and at least \$20 million for *new large network assets*. Ergon Energy (DNSP) suggests that the thresholds should have an automatic escalation mechanism.

### **3.4 ACCC's considerations**

#### **3.4.1 Aligning the *regulatory test* with the Code**

The ACCC considers that it has become necessary to bring the *regulatory test* into line with the Code following the NDR Code changes. Realignment may continue to be necessary following any changes to the Code which affects the application of the *regulatory test*. The ACCC aims to ensure that realignment of the Code and the test continues in a timely manner.

The ACCC notes that all interested parties who commented on option 1 support the ACCC's proposed amendments to align the *regulatory test* with the Code. Ergon Energy (DNSP) raise

concerns, however, about the manner in which the ACCC has aligned the *regulatory test* and the Code. Therefore, the ACCC considers it appropriate to amend the test in line with the changes proposed in its Draft Decision with some minor amendments which are addressed below.

The ACCC considers it appropriate to amend the references in the *regulatory test* that relate to the ACCC's power to promulgate the *regulatory test*. It will, therefore, replace the reference in the preamble to 'clause 5.6.5(q)(1)' with 'clause 5.6.5A'.

The ACCC will also replace references in the *regulatory test* to 'intra-regional augmentations and new interconnectors' with *new small network asset* and *new large network asset* to ensure consistency with Code terminology.

Furthermore, in considering the issue of ensuring consistent terminology between the *regulatory test* and the Code, the ACCC believes that amendments to references to 'augmentation' and 'proposed augmentation' in the *regulatory test* are required. In several clauses the Code refers to the assessment of 'options' (eg. clause 5.6.2(g)) while in other clauses the Code refers to the assessment of augmentations such as *new large network assets* (eg. clause 5.6.6(b)(5)).

Also, the Code provides that the application of the test should not be limited to network options, but should also include options such as demand-side and generation options. The ACCC considers that the use of the term 'option' is consistent with the Code, in particular clause 5.6.2. The use of this term is also consistent with clause 5.6.6 provided that it is made clear that an 'option' includes, but is not limited to, an augmentation or a *new small network asset* or *new large network asset*. The ACCC has, therefore, replaced references to 'proposed augmentation' with 'option' in the test.

The ACCC is of the view that the *regulatory test* preamble duplicates the Code in setting out the roles and responsibilities of various parties in relation to the planning and approval of new transmission network investments. Therefore, the ACCC will delete this section of the preamble. This will eliminate discrepancies between the test and the Code if the planning and approval roles are amended in the future.

With respect to the 'reliability limb' of the *regulatory test*, the ACCC notes that the current wording of the test is inconsistent with both the ACCC's obligations under clause 5.6.5A of the Code and the Code's definition of a *reliability augmentation*. The 'reliability limb' of the *regulatory test* (v.1) states:

An *augmentation* satisfies this test if –

in the event the *augmentation* is proposed in order to meet an objectively measurable service standard linked to the technical requirements of schedule 5.1 of the Code – the *augmentation* minimises the net present value of the *cost* of meeting those standards;

Following the NDR Code changes, clause 5.6.5A(c) of the Code specifies that in promulgating the *regulatory test*, the ACCC must:

- (c) have regard to the obligations imposed on *Network Service Providers* to meet the *network* performance requirements set out in Schedule 5.1 and relevant legislation and regulations of a *participating jurisdiction*, in developing and maintaining the *regulatory test*.

This is closely aligned with the Code’s definition of a *reliability augmentation*, which is defined as:

*A transmission network augmentation that is necessitated solely by [the] inability to meet the minimum network performance requirements set out in schedule 5.1 or in relevant legislation, regulations or any statutory instrument of a participating jurisdiction.*<sup>16</sup>

The Code’s definition of a *reliability augmentation* and the obligations outlined in clause 5.6.5A(c) are broader than the existing requirements under the reliability limb of the *regulatory test*. The ACCC notes that the conflicting requirements of the test and the Code may cause confusion and, unless addressed, open an avenue for dispute.

In its Draft Decision the ACCC proposed amending the ‘reliability limb’ of the *regulatory test* to:

- (a) in the event the *proposed augmentation* is a *reliability augmentation*, it minimises the present value of the *costs*, compared with a number of *alternative projects*, in a majority of *reasonable scenarios*; or

As highlighted by Ergon Energy (DNSP), the term *reliability augmentation* only applies to TNSPs. Amending the ‘reliability limb’ of the *regulatory test* along the lines proposed in the Draft Decision would mean that DNSPs would have to assess all augmentations under the ‘market benefits limb’ of the *regulatory test*, even where they are required to meet the technical requirements of schedule 5.1 and/or jurisdictional legislation or regulations. This is not the ACCC’s intention. While the ACCC cannot amend the definition of a *reliability augmentation*, as recommended by Ergon Energy (DNSP), it can change the ‘reliability limb’ of the test to ensure that it applies to all NSPs.

Therefore, options proposed by a NSP to meet the network performance requirements imposed by the Code or state legislation or regulations should be assessed under the ‘reliability limb’ of the *regulatory test*. In all other cases, the option must be assessed under the ‘market benefits limb’ of the test.

Other amendments to the ‘reliability limb’ of the *regulatory test* as raised by interested parties in response to the ACCC’s Draft Decision are considered in Chapter 4 of this Decision.

Regarding Ergon Energy’s (DNSP) concern that there is no threshold exemption for a DNSP to carry out the *regulatory test*, no matter how small the augmentation, the ACCC has considered the Code’s definitions.

The Code defines a *new small distribution network asset* as:

*A new small network asset which forms, or will form, part of a distribution system.*

and *new large distribution network asset* as:

*A new large network asset which forms, or will form, part of a distribution system.*

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<sup>16</sup> The difference between the *reliability augmentation* definition and the ACCC’s obligations in promulgating the *regulatory test* is that *reliability augmentations* only apply to TNSPs, whereas the ACCC’s obligation extends to ensuring that all NSPs meet their reliability requirements.

As with the *reliability augmentation* definition, the code defines a *new large network asset* and *new small network asset* with reference to augmentations undertaken by TNSPs, not DNSPs.

The Code only allows the ACCC to amend the thresholds for *new small network assets* and *new large network assets*, not *new large distribution assets* and *new small distribution assets*. Therefore, even if the ACCC amended the thresholds for *new small network asset* and *new large network asset* this threshold would still not apply to DNSPs. The statement that these thresholds apply only to TNSPs is consistent with NECA's NDR Code Change Panel Report<sup>17</sup>. Further, while the Code also defines a *new small distribution network asset* and a *new large distribution network asset*, these terms are not used in Chapter 5 of the Code. The ACCC is unable to address Ergon Energy's (DNSP) concerns through this decision and intends to raise this issue with NECA.

Considering the comments provided by interested parties in response to its Draft Decision the ACCC promulgates the following amendments to the *regulatory test*:

#### **Preamble**

The Australian Competition and Consumer Commission (ACCC) promulgates this *regulatory test* in accordance with clause 5.6.5A of the National Electricity Code (the Code).

In this test "option" includes, but is not limited to, an *augmentation*, *new large network asset* and *new small network asset*.

#### **The regulatory test**

- (1) An option satisfies the *regulatory test* if:
  - (a) in the event the option is necessitated solely by the inability to meet the minimum network performance requirements set out in schedule 5.1 of the Code or in relevant legislation, regulations or any statutory instrument of a participating jurisdiction - the option minimises the present value of *costs*, compared with a number of *alternative options* in a majority of *reasonable scenarios*;
  - (b) in all other cases - the option 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*.

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<sup>17</sup> NECA Code Change Panel Report, *A Network and Distributed Resources Package*, December 2000, p 10.

### 3.4.2 Replacement expenditure and augmentations

The ACCC is of the view that clauses 5.6.6 and 5.6.6A require that the *regulatory test* be applied to that part of an investment that augments a network. It is not intended to apply to replacement and refurbishment expenditure. This view has been formed considering the Code's definition of an augmentation and NECA's NDR Code Change Panel Report.

The terms 'augment' and 'augmentation' are defined in the Code as:

Works to enlarge a *network* or to increase the capability of a network to transmit or distribute *active energy*

A *new small network asset* is defined as:

An asset of a *Transmission Network Service Provider* which is an *augmentation*...

A *new large network asset* is defined as:

An asset of a *Transmission Network Service Provider* which is an *augmentation*...

It can be seen that if works undertaken by a TNSP involve the construction of a new asset in order to enlarge its network or increase its capability those works are defined as an augmentation, which must be assessed under the *regulatory test*.

Where capital works do no more than replace an existing asset, without enlarging the network or increasing its capacity, then the works will not be an augmentation, and will not be subjected to a *regulatory test* assessment. This is also confirmed by NECA in its NDR Code Change Panel Report.<sup>18</sup> This report notes that the definitions of a *new small network asset* and *new large network asset* were amended to ensure and clarify that such assets are limited to network augmentation and do not include maintenance works or replacement of existing capital works.

The question raised by NSPs is what happens in those circumstances where asset replacement projects designed to maintain or restore existing service capacity may result in an incidental increase in service capacity. For example, the replacement of ageing equipment with its modern equivalent may also increase the capability of the network due to advances in technology. Alternatively there may be instances where replacement on a like for like basis is not possible given that equipment may no longer be manufactured.

In instances where an asset replacement or refurbishment simultaneously augments the network, the ACCC believes that the Code requires that the *regulatory test* must be applied to that part that augments the network. However, in those instances where the cost of the augmentation is less than \$1 million, the *regulatory test* does not have to be applied by the TNSP. The ACCC sees this as largely a Code issue which it is unable to amend.

### 3.4.3 New small and new large network asset thresholds

There is still support for amending the thresholds for *new small network assets* and *new large network assets*. Given that the ACCC is reviewing its approach to setting and approving

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<sup>18</sup> *ibid.*

capital expenditure, it believes that this issue is best addressed as part of its review of the Statement of Regulatory Principles.

#### **3.4.4 Transitional provision**

The transitional provisions proposed in the Draft Decision have been amended. They now provide that, in certain circumstances, the current version of the test (v.1), rather than the new version (v.2) is the test that should continue to be applied for the consultation and assessment required under Chapter 5 of the Code, including any dispute process or appeal.

Where a DNSP has commenced the consultation or cost effectiveness analysis of options under clause 5.6.2, the *regulatory test* (v.1) should continue to be used for the consultation and assessment of those options under Chapter 5 of the Code.

In relation to *new small network assets* identified in a TNSP's APR, version 1 of the test should continue to be used for the consultation and assessment for those projects. This means that version 1 of the test will also be applicable to any further assessment of such assets required under clause 5.6.6A. Version 1 of the test will apply with respect to *new small network assets* identified in an APR published before 30 June 2004. Since clause 5.6.2A(a) requires a TNSP to publish an APR by 30 June in each year, it is appropriate to use the existing test for all APRs published before 30 June 2004, and to use the new test (v.2) in the development of APRs which are due to be published by 30 June 2005. However, the ACCC can extend this date if a TNSP will not be able to publish its 2004 Report by the 30 June deadline.

In relation to a *new small network asset* not identified in an APR, clause 5.6.6A(c) requires a separate report to be published. If such a report has been published with respect to *new small network asset*, (v.1) of the test should continue to apply to all further consultation and assessment for that *new small network asset*. However, if such a report has not yet been published, the new test should be used. While this may require some further work to be done on reports being prepared, this option is considered preferable as it is difficult to identify the point at which preparation of such a report can be said to have commenced.

Version 1 of the test should continue to be used for consultation and assessment of a *new large network asset* where an application notice has been published under clause 5.6.6(b) prior to the promulgation of this test. Again, while this may require some further work to be done on reports being prepared, this option is considered preferable as it is difficult to identify the point at which preparation of an application notice can be said to have commenced.

Considering the comments provided by interested parties in response to its Draft Decision the ACCC promulgates the following amendments to the *regulatory test*:

(17) This version of the *regulatory test* (version 2) comes into operation from the date of its promulgation, subject to the following transitional provisions.

The version of the *regulatory test* in operation immediately prior to the promulgation of version 2 of the *regulatory test* continues to apply in relation to:

- (a) possible options for which a *Distribution Network Service Provider* has commenced consultation under clause 5.6.2(f) or an economic cost effectiveness analysis under clause 5.6.2(g) prior to the promulgation of version 2 of the *regulatory test*;
- (b) a *new small network asset* for which a *Transmission Network Service Provider* has set out the matters required under clause 5.6.2A(b)(4) and (5) in an Annual Planning Report published before 30 June 2004. The ACCC can substitute a later date if a *Transmission Network Service Provider* does not publish its Annual Planning Report by 30 June 2004 (as required by clause 5.6.2A(a) of the Code);
- (c) a *new small network asset* not identified in an Annual Planning Report for which a *Transmission Network Service Provider* has published a report required under clause 5.6.6A(c) prior to the promulgation of version 2 of the *regulatory test*;
- (d) a *new large network asset* for which a *Transmission Network Service Provider* has published an application notice under clause 5.6.6(b) prior to the promulgation of version 2 of the *regulatory test*.

## 4. Definitional amendments

### 4.1 Introduction

The ACCC is of the view that to ensure the consistent application of the *regulatory test* definitions should be as clear as possible. In defining terms used in the *regulatory test*, the ACCC must strike a balance between providing guidance and ensuring that the test is not too narrow and prescriptive. If the test is defined too narrowly, real benefits or costs could be unintentionally excluded. This could have a material and detrimental impact on the outcome of an assessment. Therefore, in addition to the proposed amendments outlined in Chapter 3, the ACCC amends and defines certain terms in the test which it considers will provide greater guidance in its application whilst still providing sufficient flexibility for the test to evolve over time.

The remainder of this chapter summarises the ACCC's Draft Decision and submissions from interested parties and presents the ACCC's definitional amendments to the *regulatory test*.

### 4.2 ACCC's Draft Decision

In its Draft Decision, the ACCC proposed the following amendments to the test:

- Defining the term *alternative projects* to reflect the different requirements under the 'reliability limb' and 'market benefits limb' of the *regulatory test*. The ACCC proposed that *alternative projects* under the 'reliability limb' should have a clearly identifiable proponent and meet all necessary reliability obligations. The definition of *alternative projects* proposed using the 'market benefits limb' is based on the findings of the National Electricity Tribunal (NET) and Supreme Court's Decision on SNI where the alternative project considered must be similar to the proposal under consideration and must be both technically and commercially feasible, but need not have a clearly identifiable proponent;
- Introducing a non-exhaustive list of *market benefits* and *costs*;
- Re-defining the terms *committed project* and *anticipated project* so that they are consistent with NEMMCO's *committed project* definition used in the Statement of Opportunities (SOO);
- Replacing the term Value of Lost Load (VoLL) with the Value of Customer Reliability (VCR) whilst ensuring that sensitivity testing was conducted using both values;
- Including a formula for the calculation of the discount rate, but still maintaining the principle that a commercial discount rate be used;
- Deleting the market failure test given other amendments in the Code;
- Setting out the parameters to be considered in the sensitivity testing;

- Replacing the words ‘in most (although not all) credible scenarios’ with ‘in a majority of *reasonable scenarios*’ for both limbs and replacing ‘net present value’ with ‘present value’ in the ‘reliability limb’; and
- Making other clarifying amendments, such as re-ordering the test.

### 4.3 Submissions from interested parties on the Draft Decision

The ERAA, Ergon Energy (Retail) and InterGen support the definitional amendments proposed in the ACCC’s Draft Decision.

Professor McDonnell notes that the proposed clarifications outlined by the ACCC had previously been set out in the NET minority decision on SNI. However, he adds that not all of the necessary clarifications had been included in the Draft Decision. Professor McDonnell states that as the NET minority decision drew on defined meanings well understood in the discipline of cost-benefit analysis they should be incorporated into the *regulatory test*.

Transend, ElectraNet, ESA, TXU, TransGrid, SPI, VENCORP and Powerlink generally support the ACCC’s proposed amendments subject to specific comments which are summarised below.

#### 4.3.1 Alternative projects

##### *Proponents*

ElectraNet, TXU, NRG Flinders and Transend support the proposed definition of alternative projects. Wambo Power Venture Pty Ltd (WPV), EnergyAustralia, ElectraNet, Powerlink and TransGrid support the proposed requirement for a reliability driven augmentation to have a proponent. Powerlink also supports the proposed requirement that alternative projects under the ‘reliability limb’ must meet all necessary reliability obligations and be technically feasible.

In contrast, ESA disagrees with the requirement for reliability driven alternative projects to have a clearly identifiable proponent arguing that this provides a mechanism for TNSPs to limit the range of alternative options considered.

For the market driven alternative projects Powerlink, Transend, ElectraNet and TransGrid raise concerns with them not needing a proponent. TransGrid proposes that, like reliability driven augmentations, they should also have a proponent, while the others suggest that the ACCC should establish a process for projects which satisfy the *regulatory test* but do not have a proponent.

VENCORP considers that the approach to identifying and defining alternative projects should be consistent irrespective of the type of augmentation proposed. VENCORP suggests that the criteria to be applied should minimise the risk that practicable alternatives may not be given reasonable consideration under either limb of the *regulatory test*. VENCORP adds that it is important to ensure that any processes set down in or implied in the *regulatory test* are workable in practice and will deliver least-cost (value maximising) outcomes.

### *Commercial feasibility*

ESA submits that the proposed term commercial feasibility, while closely reflecting the definition used by the Supreme Court of Victoria in its SNI Decision, should reflect the actual wording used in that decision. In contrast, TransGrid recommends that the term economic incentive should be replaced with commercial incentive because it would require an applicant to form a judgment on the commercial position of different participants, which is difficult and could be controversial.

#### **4.3.2 Market benefits and costs**

WPV, TXU, ElectraNet, Powerlink and NRG Flinders support the proposed non-exhaustive list of *market benefits* and *costs* in the *regulatory test*.

EnergyAustralia raises concerns that the non-exhaustive list of *market benefits* and *costs* proposed may be interpreted as an exhaustive list and may make it difficult for consideration of other *market benefits* and *costs* in any analysis.

Powerlink argues that clarification is required regarding the treatment of losses due to power flows, as they appear in both the list of *market benefits* and *costs*.

NRG Flinders and TXU contend that there is potential to double count certain *market benefits*. TXU argues that the inclusion of both ‘savings in reduction in lost load’ and ‘deferral of reliability entry plant’ potentially count the same benefit. It suggests that the phrase should be amended to: ‘reduction in lost load or deferral of reliability entry plant’. TXU also submits that the assessment of reliability benefits should only be permitted through ‘savings in reduction in lost load’, as this multiplied by VoLL is equivalent to the value that could be captured by a market based investment. It adds that market options can not capture the value of deferral of reliability plant.

VENCorp seeks clarification of the proposal relating to the benefits of savings in fuel consumption. It contends that the ACCC must ensure that the approach taken by all users for the evaluation of fuel costs and total resource costs associated with dispatch is consistent with the definition of *market benefits* as set out in the *regulatory test*. VENCorp also recommends that the words ‘capital deferral’ dealing with the definition of market benefits, be amended to ‘in terms of reduced or avoided costs’.

The Australian Greenhouse Office (AGO) argues that the *regulatory test* requires further clarification of the treatment of mandated greenhouse emission abatement schemes. The AGO notes that recent applications of the *regulatory test* do not appear to have considered the costs and benefits of existing legislated greenhouse schemes, such as the NSW Greenhouse Gas Abatement Scheme, Mandatory Renewable Energy Targets, and the new Queensland 13 per cent Gas scheme. The AGO proposes a number of revisions to the *regulatory test* to ensure that the appropriate costs and benefits are captured.

TransGrid proposes a number of amendments to the definition of *market benefits* and *costs*. It suggests that the ACCC ensure that other *market benefits* and *costs* that are determined to be relevant and material to the case concerned should be added to the respective definitions. It also proposes that the ACCC clarify that the *market benefits* do not include wealth transfers and adds that the note on government taxes or subsidies should be moved into the definition of *market benefits*.

### 4.3.3 Committed and anticipated projects

EnergyAustralia, TXU and Origin Energy support the ACCC's proposed definitions of *committed projects* and *anticipated projects*. ESA notes that a letter of commitment from the governing body could be sufficient evidence of commitment and suggests that this be incorporated into the definition of a *committed project*. In contrast, Powerlink submits that a project which has satisfies the *regulatory test* should be considered a *committed project* as funding approval is not likely to be given by a TNSP's board until the necessary regulatory requirements are met. However, Powerlink accepts the ACCC's view that passing the test may not always mean that a network augmentation will be constructed.

Powerlink adds that applying NEMMCO's *committed project* definition to regulated network investments will mean that future network augmentations that have not yet satisfied the *regulatory test* will always fall into the category of either an *anticipated project* or a *modelled project*. However, it notes that it cannot foresee any major practical difficulties associated with this outcome.

### 4.3.4 Discount rate

TXU supports the ACCC's reiteration that the discount rate must be a commercial discount rate. ElectraNet, Transend, VENCorp, and Powerlink recommend that the ACCC not include a formula for the discount rate into the *regulatory test*. Powerlink adds that should a formula be incorporated, a pre-tax WACC formulation be adopted given the difficulty in determining the tax position of each project in advance.

VENCorp considers that the *regulatory test's* use of either a real, nominal, pre-tax or post-tax discount rate should be consistent with the opportunity cost of capital of an investment and the cash flow being discounted. Transend suggests that the discount rate should be the regulatory WACC, with sensitivity testing around that rate.

### 4.3.5 Value of Lost Load

AGL, TXU, NRG Flinders, and ESA submit that using VCR introduces a bias towards regulated projects and violates the principle of competitive neutrality. NRG Flinders and TXU contend that the proposed wording gives the proponent discretion to use either VoLL or VCR, and may encourage gaming of the test. TXU adds that if the ACCC is of the view that VCR is appropriate then this must be applied to all projects in a consistent manner. This view is shared by SPI PowerNet. In contrast Powerlink and ElectraNet are of the view that the reference to VoLL should be removed from the *regulatory test* given that it is not a measure of the value of energy to customers.

TransGrid, ElectraNet, VENCorp, Powerlink, and Transend note that VCR is undefined. VENCorp supports defining this term in one of the notes to the test. Transend is of the view that VCR should be replaced with the 'cost of supply reliability' while Powerlink suggests it should be 'reasonable forecasts of the value of electricity to consumers'. TransGrid submits that the definition could either be decoupled from definitions that may be used within jurisdictions or explicitly linked to the definition used within the relevant jurisdiction.

#### 4.3.6 Market failure provision

Origin, Powerlink, and CS Energy support the removal of the market failure provision from the *regulatory test* and considers that this is consistent with the Ministerial Council on Energy's (MCE) decision to remove biases in favour of unregulated transmission investment.

In contrast WPV, ESA, Loy Yang, NRG Flinders, and TXU disagree with the proposal. ESA adds that regulated network services should only be permitted to proceed where market failure has been demonstrated.

Loy Yang submits that reliance on NEMMCO's SOO and Annual National Transmission Statement (ANTS) and TNSPs' APRs and *regulatory test* assessments will not provide market participants with the detailed information required to make an assessment on a specific investment. Similarly, TXU argues that relying upon a TNSP's consultation processes do not provide interested parties with sufficient time to comment on a *regulatory test* assessment, and that regulated solutions should consider future market needs only after the market has had time to invest. Loy Yang recommends that the ACCC retain the market failure provision and modify it if necessary to overcome any misinterpretation because it meets the competitive neutrality provisions.

NRG Flinders notes that the removal of the market failure provision requires the insertion of a replacement clause to ensure that the original intent of the provision is met, and to ensure that regulated options do not pre-empt market solutions.

EnergyAustralia believes that further clarification of timeframes that may or may not apply under a *regulatory test* framework would be beneficial.

#### 4.3.7 Sensitivity analysis

TXU supports the sensitivity analysis provisions proposed in the *regulatory test*. Powerlink notes that some of the factors in the sensitivity testing are not relevant to reliability augmentations. It adds that for *new small network assets* the analysis of some of the sensitivity factors may not be material and not justify the level of analysis being proposed. It suggests that the ACCC recognises that only sensitivity analysis appropriate to the size and type of project should be carried out.

Transend states that given that there may be a number of reasonable methodologies for calculating market benefits, the requirement for sensitivity analysis to be undertaken for all projects may prove cumbersome. Transend suggests that the ACCC remove the requirement for all projects to be subjected to sensitivity analysis.

Transend seeks clarity on the phrase '*the sensitivity testing should always ensure that the relevant reliability standards are met*'. It suggests that the ACCC should make it clear that where sensitivity testing for a particular alternative project indicates that reliability standards will not be met then that project should no longer be considered an alternative project.

#### 4.3.8 Reliability limb

SPI PowerNet, CS Energy, ElectraNet and Powerlink support the retention of the 'reliability limb' of the *regulatory test*. Powerlink and ElectraNet note that the retention of the 'reliability limb' of the test is essential to enable TNSPs to meet mandated reliability standards.

ESA argues that the jurisdictional requirements referred to in clause 5.6.5A(c) are not clear and, given that the IRPC's work on developing an objective criteria has not progressed, the ACCC should remove the 'reliability limb' of the test.

TransGrid submits that the ACCC should retain the term 'net' in the 'reliability limb' so that the test continues to be a 'minimising-cost test' rather than a 'least-cost' test. It argues that the 'least-cost' test biases investments in favour of regulated solutions. It adds that this will enable the ACCC to retain the provision that all notes accompanying the *regulatory test* are equally applicable to both reliability driven and market driven augmentations.

#### 4.3.9 Other amendments

VENCorp proposes the following amendments to the *regulatory test*:

- Revising proposed note 1(b), the market benefits limb of the *regulatory test* to read: '*in all other cases, it is the alternative that maximises the expected present value of the market benefit using a number of reasonable scenarios*' to ensure no misinterpretation;
- Rewording proposed note 3(xii) to clarify that the definition of costs within any reasonable scenario should include all avoidable costs associated with alternative projects, regardless of the status of those alternatives. VENCorp also suggests that proposed note 3(viii), referencing VCR should be included in the non-exhaustive list of *market benefits*;
- Combining proposed notes 3 and 11, relating to the definition of reasonable scenarios and market development scenarios, into one clause that sets out all of the requirements for defining reasonable scenarios to ensure that there is no overlap;
- Amending potential inconsistencies between proposed notes 15(i) and 15(ii). VENCorp suggests that the definitions set out in these clauses be aligned, and that the definitions should take into account the timing of commencement of the design and equipment procurement processes. Therefore, it notes that it is more appropriate for paragraph (i) to define the commencement of the project, rather than commencement of construction; and
- Renumbering and some minor wording amendments to proposed notes 12, 13, and 14 of the test.

Powerlink suggests that the market development scenario requirement should be changed to ensure technically infeasible projects put forward should not be considered in a *regulatory test* assessment and proposes the following wording amendments: '*market development scenarios should include ...any other technically feasible project identified during the consultation process*'.

TransGrid suggests that the ACCC should review the wording of the *regulatory test* with a view to ensuring that the mandatory requirements of the test are clearly identified.

EnergyAustralia notes that it is unclear why note 8 of the proposed *regulatory test* references to replacement works and recommends either clarification or removal of this reference.

## 4.4 ACCC's considerations

### 4.4.1 Alternative projects

#### *Alternative options*

As noted in section 3.4.1 of this Decision, the ACCC has replaced reference to '*proposed augmentations*' and '*projects*' in the test with '*options*' to ensure consistency with the code terminology. All references herein are to *alternative options*.

#### *Proponents*

In defining the term *alternative options* for the purposes of the test, the ACCC has considered the submissions made in response to its Draft Decision, the decisions of the National Electricity Tribunal (NET) and the Supreme Court of Victoria in relation to SNI, and the service requirements imposed on NSPs by the Code and jurisdictional legislation. The ACCC has also referred to the economic principles underlying cost-benefit analyses. On the matter of selecting *alternative options* Mishan states:

...in general, the technically feasible investment projects, from which the selection will be made, will not have the same (equivalent) initial outlay.

As for the question of how the purpose, or required services, and the alternative investment options that can be used to provide them, are to be counted, occasions may well arise when the treatment has to be arbitrary. The following rules, however, provide some guidance.

- (a) The same type of service required in a different locality, or region, is conceived as a different service.
- (b) If, within a single locality, two or more services can be produced in combination by a single investment project, each different combination of services so producible qualifies as a distinct service. Thus if it is possible to provide flood control alone, possible also to provide electricity alone, and possible also to provide both, though in three different proportions, there will be five different services in that locality.
- (c) *Per contra*, if two or more investment projects need to combine in order to provide a single service, or a complex of services, each of such combination of investment project is to be treated as a single investment option.
- (d) If there are scale effects in any investment, each scale of the project is to be distinguished (in light of the expected demand for the services in question) and is to be treated as a separate investment option.<sup>19</sup>

The ACCC notes that these principles have largely been adopted by NSPs in their application of the *regulatory test* and considered in the NET majority and minority decisions. However, the ACCC considers that due to some of the unique arrangements in the NEM, NSPs and interested parties would benefit from a clearly defined set of principles which must be used when considering *alternative options*. In particular, the ACCC is keen to ensure that the framework for the selection of an *alternative option* explicitly considers the reliability obligations imposed on NSPs.

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<sup>19</sup> Mishan, op cit, p 274

On the criteria outlined in the Draft Decision, the main issue raised by interested parties relates to whether reliability driven *alternative options* should have a proponent. Most parties supported this proposal, however, a number of others argued that it could lead to more efficient options being excluded by NSPs. The ACCC still considers that requiring a reliability driven *alternative option* to have a proponent is appropriate for a number of reasons.

In promulgating the *regulatory test* the Code requires the ACCC to ensure that NSPs adequately meet mandated reliability standards. The ‘reliability limb’ of the *regulatory test* has been included to explicitly recognise these obligations. Where a NSP is required to meet these obligations it will consider all available alternatives. The ACCC is concerned that, from a public interest view point, should an *alternative option* satisfy the *regulatory test* and not proceed there will be a significant risk of system wide blackouts. Further, NSPs will also be in breach of their Code or license obligation. Therefore, the ACCC considers that to ensure NSPs meet their statutory obligations a proponent should always be identified when it considers the various options.

In relation to market driven augmentations, which are more closely aligned with the cost-benefit framework set out in the economics literature, the ACCC believes that *alternative options* need not have a proponent. This is consistent with the decisions of the NET and Victorian Supreme Court on SNI. Further, consistent with the views of the NET, the ACCC believes that while the existence of a proponent is a good indicator of a project’s commercial and technical feasibility it does not believe that the existence or otherwise of a proponent should be the sole determinant of a project’s practicability.

Interested parties, while agreeing in principle, suggest that the ACCC should clarify the process that NSPs must follow when an *alternative option* which satisfies the test does not have a proponent. While the ACCC does not intend to set out a specific process that NSPs must consider where this does occur, it believes that in those cases the NSPs *regulatory test* assessment will signal investment opportunities for the market.

#### *Commercial feasibility*

The ACCC concurs with ESA that its proposed definition of commercial feasibility in the Draft Decision, while closely aligned to the definition adopted by the Victoria Supreme Court, does not reflect the actual wording. The ACCC will amend the definition to align it with the Supreme Court’s findings.

#### *Number of alternative options*

The ACCC does not consider it necessary to strictly define the number of *alternative options* which should be considered in a *regulatory test* assessment. The number of alternatives considered should be proportional to the size and/or importance of the investment being assessed.

Considering the views submitted by interested parties in response to the ACCC’s Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

(3) *Alternative options* means:

- (a) For an option proposed in accordance with paragraph 1(a) of this test:
  - (i) a genuine alternative to the option being assessed, in that it:
    - (A) has a clearly identifiable proponent; and
    - (B) meets the requirements referred to in paragraph 1(a);
  - (ii) a practicable alternative to the option being assessed in that it is technically feasible.
- (b) For an option proposed in accordance with paragraph 1(b) of this test:
  - (i) a genuine alternative to the option being assessed, in that it:
    - (A) delivers similar outcomes to those delivered by the option being assessed; and
    - (B) becomes operational in a similar timeframe to the option being assessed;
  - (ii) a practicable alternative to the option being assessed in that it is:
    - (A) technically feasible; and
    - (B) commercially feasible, which is to be demonstrated by determining whether an objective operator, acting rationally according to the economic criteria prescribed by this test, would be prepared to construct or provide the *alternative option*.

The existence of a genuine proponent for the *alternative option* should be taken into account when determining practicability, however, absence of such a proponent will not exclude a project from being an *alternative option* for the purposes of the regulatory test.

#### 4.4.2 Market benefits

Before considering the comments raised by interested parties in response to the amendments proposed in the Draft Decision, the ACCC has considered the *regulatory test's* definition of *market benefits*. The 'market benefits limb' of the test states that 'the augmentation maximises the **net** present value of the *market benefits*' [emphasis added] where *market*

*benefits* are defined with reference to the ‘total **net benefits** [emphasis added]. A strict interpretation of these provisions would suggest that the *costs* be deducted twice.

This is not the ACCC’s intention. *Market benefits* should be defined with reference to the change in consumers’ and producers’ surplus only. The change in total surplus is discussed in the welfare economic literature without reference to *costs*. The ACCC notes that NSPs have applied these provisions within the context of their generally understood meanings. Nevertheless, the ACCC believes that it is worthwhile clarifying the text to reflect this principle.

On the issues raised by interested parties in response to the Draft Decision, the ACCC notes that there was general support for its proposed non-exhaustive list of benefits. The advantage of not including an exhaustive list of benefits ensures that other relevant benefits not specified can still be included in an assessment. To ensure that the list is not misinterpreted as being an exhaustive one, the ACCC considers that it is appropriate to specify, in line with TransGrid’s suggestion, that other relevant and material benefits can be included in an assessment.

More generally the ACCC continues to believe that the decision on how *market benefits* should be calculated is best left to the market. The ACCC considers that the Code consultation process provides sufficient opportunity for NSPs and interested parties to point out any *market benefits* that have not been appropriately evaluated.

In its Draft Decision, the ACCC proposed including both ‘savings in reduction in lost load’ and ‘deferral of reliability entry plant’. Both methods have been employed to calculate the reliability benefits of a proposed augmentation. The ACCC concurs with TXU and NRG Flinders that the recognition of both options may result in the double counting of reliability benefits and has, therefore, amended the *regulatory test* to allow recognition of either method, but not both.

The ACCC also sees merit in TXU’s suggestion that reliability benefits should only be permitted through ‘savings in reduction in lost of load’, as this multiplied by the value of energy to consumers is equivalent to the value that could be captured by a market based investment. Market options cannot capture the value of deferral of reliability benefits. While the ACCC’s preference is for reliability benefits to be determined through ‘savings in reduction in lost load’ it considers that NSPs should test the sensitivity of its reliability benefits using various methodologies. The determination of reliability benefits using the ‘deferral of reliability plant’ methodology, discussed above, and accounting for benefits relating to deferral of merchant entry would result in a double counting of *market benefits*. The *regulatory test* has been amended to ensure that this does not occur.

The ACCC notes VENCORP’s concern with respect to proposed note referring to the ‘benefits of savings in fuel consumption’. The ACCC considers that the approach adopted by VENCORP for the calculation of fuel costs and total resource cost associated with dispatch is consistent with the definition of *market benefits*. To ensure that there is no further confusion, the ACCC has included in the definition of *market benefits* ‘benefits of savings in fuel consumption arising through different generation dispatch’.

The ACCC notes Powerlink’s issue that the treatment of losses due to power flows appears in both the list of *costs* and *market benefits*. Given that the ACCC believes that losses due to

power flows is more appropriately considered as a *market benefit* it has removed the reference from the definition of *costs*.

The ACCC concurs with VENCORP's recommendation that the words 'capital deferral' in the proposed note be amended to read 'in terms of reduced or avoided costs'. The ACCC has amended the *regulatory test* accordingly.

The ACCC has considered amendments proposed by the AGO to clarify the treatment of mandated greenhouse emission abatement schemes in the *regulatory test*. The ACCC is of the view that the wording of the test makes it clear that the *costs* and *market benefits* of complying with all government environmental requirements are to be included in a proposed augmentation assessment.

A review of previous *regulatory test* assessments suggests that this has been the case. For example, as noted by the AGO in its submission, the IRPC in its work on the SNI considered and incorporated sensitivity analysis in relation to carbon taxes. The ACCC also understands that VENCORP tested the sensitivity of the introduction of carbon tax/emission trading in its La Trobe Valley test assessment.

The ACCC is, therefore, of the opinion that the existing requirements are broad enough to capture any means by which governments may set environmental policy objectives including, legislation, licensing requirements, taxes/subsidies and/or environmental agency requirements. It does not propose to amend the test except to ensure that sensitivity testing is carried out on possible future environmental obligations.

In line with TransGrid's suggestion that ACCC has also made it clear that wealth transfers are not to be considered as *market benefits*.

The ACCC's list also incorporates *competition benefits* into the test. *Competition benefits* are discussed in detail in chapter 5 of this Decision.

Considering views submitted by interested parties in response to the ACCC's Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

(5) *Market benefit* means the total benefits of an option (or an *alternative option*) to all those who produce, distribute and consume electricity in the National Electricity Market. That is, the change in consumers' plus producers' surplus or another measure that can be demonstrated to produce an equivalent ranking of options in a majority of *reasonable scenarios*. For clarity, *market benefit* does not include the transfer of surplus between consumers and producers.

In determining the *market benefit*, the analysis may include, but need not be limited to the following benefits:

- (a) changes in fuel consumption arising through different generation dispatch;
- (b) changes in voluntary load curtailment caused through reduction in demand-side curtailment;
- (c) changes in involuntary load shedding caused through savings in reduction in lost load, using a reasonable forecast of the value of electricity to

- consumers, or deferral of reliability entry plant;
- (d) changes in costs caused through:
    - (i) deferral of market entry plant. This must be excluded if reliability benefits are determined using deferral of reliability entry plant;
    - (ii) differences in capital costs;
    - (iii) differences in the operational and maintenance costs; and
    - (iv) deferral of transmission investments;
  - (e) changes in transmission losses;
  - (f) changes in ancillary services;
  - (g) *competition benefits*; and
  - (h) other benefits that are determined to be relevant to the case concerned.

#### 4.4.3 Costs

The ACCC received few comments with respect to its proposed amendments to the definition of *costs* to be included in a *regulatory test* assessment. The ACCC, therefore, considers it appropriate to adopt its definition of *costs* as outlined in its Draft Decision with some amendments reflecting comments made by TransGrid.

The ACCC has considered TransGrid's suggested amendment with respect to the cost of disruption to the NEM. It considers that *costs* to be included in an assessment should be restricted to those *costs* borne by those who produce, distribute and consume electricity in the NEM, excluding *costs* which may be considered to result in wealth transfers. This ensures consistency between the definition of *market benefits* and *costs*, and the assessment of options under both limbs of the *regulatory test*. In line with TransGrid's suggestion, the ACCC considers it appropriate to delete 'the cost of disruption to the NEM' from the definition of *costs*, given that these costs will result in wealth transfers.

After further consideration, the ACCC believes that 'ancillary service costs' may also result in wealth transfers and believes that it should also be removed from the list of *costs*.

EnergyAustralia raises concerns that the list may be interpreted as an exhaustive list. The ACCC believes that it is clear that the purpose of the list is to provide guidance on the range of *costs* that should be considered in the evaluation of an option and its alternatives under the *regulatory test*. However, in line with TransGrid's suggestion the ACCC has allowed other costs that are determined to be relevant to the case concerned to be included.

Taking into account the views submitted by interested parties in response to the ACCC's Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

(2) *Costs* means the total cost of an option (or an *alternative option*) to all those who produce, distribute or consume electricity in the National Electricity Market.

In determining the *costs*, the analysis may include, but need not be limited to, the following:

- (a) costs incurred in constructing or providing the option;
- (b) operating and maintenance costs over the operating life of the option;
- (c) the cost of complying with existing and anticipated laws, regulations and administrative determinations such as those dealing with health and safety, land management and environment pollution and the abatement of pollution (including greenhouse gas abatement). An environmental tax should be treated as part of a project's cost. An environmental subsidy should be treated as part of a project's benefits or as a negative cost.
- (d) other costs that are determined to be relevant to the case concerned.

#### 4.4.4 Committed projects and anticipated projects

The ACCC notes that the rigour of a *regulatory test* assessment depends on how projects are classified. The test requires that NSPs identify *committed projects* and *anticipated projects* to ensure that an option and its alternatives are assessed with reference to current and future project developments within the NEM.

*Committed projects* identified in a *regulatory test* assessment are considered in every market development scenario. In contrast, *anticipated projects* should be considered in some, but not necessarily all, scenarios given that there is less certainty about whether these projects will proceed. Additionally, the NSP should consider weighting the probability of an *anticipated project* proceeding.

The main issue raised in response to the Draft Decision was that the ACCC should allow those projects which have satisfied the *regulatory test* to be considered *committed projects*. The ACCC remains of the view that it is not sufficient to consider a project a *committed project* if it satisfies the *regulatory test* given that issues such as planning consent approval, land acquisition, and dispute resolution processes are unlikely to have been completed. The ACCC notes that there have been some projects which have satisfied the *regulatory test* but have not been constructed due to environmental and other considerations. There have been other instances where projects have been significantly re-scoped and/or redesigned from the project assessed in the *regulatory test*.

The ACCC, therefore, remains of the view that the SOO's criteria for *committed projects* are appropriate for both regulated and non-regulated projects. Adopting NEMMCO's definition will ensure a consistent identification of *committed project* throughout the NEM.

The ACCC agrees with Powerlink that applying NEMMCO's SOO criteria to regulated network investments may mean that future network augmentations that have not yet passed the test will be categorised as either an *anticipated project* or a *modelled project*. The ACCC considers that this is appropriate particularly if an assessment has not been carried out on the proposed augmentation.

No comments were received regarding the definition of an *anticipated project*. The ACCC considers that it is appropriate that the hurdle for an *anticipated project* is lower than for a *committed project*.

Considering the views submitted by interested parties in response to the ACCC's Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

- (12) *Committed project* means a project which satisfies all the following criteria:
- (a) the proponent has obtained all required planning consents, construction approvals and licenses, including completion and acceptance of any necessary environmental impact statement;
  - (b) construction of the proposal must either have commenced or a firm commencement date must be set;
  - (c) the proponent has purchased/settled/acquired land (or commenced legal proceedings to acquire land) for construction of the proposed development;
  - (d) contracts for supply and construction of the major components of the plant and equipment (such as generators, turbines, boilers, transmission towers, conductors, terminal station equipment) should be finalised and executed, including any provisions for cancellation payments; and
  - (e) the financing arrangements for the proposal, including any debt plans, must have been finalised and contracts executed.
- (13) *Anticipated project* means a project which:
- (a) does not meet each of the criteria in note 12; and
  - (b) is in the process of meeting one or more of the criterion in note 12.

#### 4.4.5 Discount rate

The critical aspect of defining the discount rate for the purposes of the *regulatory test* is to ensure that the relevant discount rate recognises regulated and unregulated investments in a competitively neutral manner.

Based on the ACCC's review of previous *regulatory test* assessments the discount rate has been a relatively uncontroversial parameter, given that changes in the commercial discount

rate do not change the ranking of options, and that most augmentations have been assessed under the ‘reliability limb’ of the test.

The ACCC concurs with interested parties that including a formula for the determination of a discount rate may create an unnecessary debate. The ACCC has, therefore, removed the formula for the calculation of the discount rate from the *regulatory test*.

On the use of either a real, nominal, pre-tax or post-tax discount rate, the ACCC believes that, in line with VENCORP’s suggestion, the guiding principle should be that the discount rate must be consistent with the cash flows being discounted. This is consistent with generally accepted finance principles.

The ACCC disagrees with Transend that the discount rate used in the *regulatory test* should reflect the regulatory WACC for the respective TNSPs. The ACCC considers that the discount rate adopted for the purposes of a *regulatory test* evaluation should be a commercial discount rate in order to ensure network and non-network investments are compared on a competitively neutral basis. The discount rate used in an assessment should be consistent with the opportunity cost of capital of an investment in electricity infrastructure. The ACCC believes that the regulatory WACC might reasonably be considered the lower boundary of the discount rate but not the mean value around which sensitivity testing is conducted. The ACCC has amended the *regulatory test* to ensure that the regulatory WACC can only be considered a lower boundary in a *regulatory test* assessment.

Considering the views submitted by interested parties in response to the ACCC’s Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

- |   |
|---|
| <p>(10) The present value calculations must use a commercial discount rate appropriate for the analysis of a private enterprise investment in the electricity sector. The discount rate used should be consistent with the cash flows being discounted.</p> |
|---|

#### 4.4.6 Value of lost load

The ACCC notes the views submitted by interested parties in response to its proposal in the Draft Decision that the *regulatory test* should reference both VoLL and VCR as a measure of the value of electricity to consumers.

The ACCC notes that VoLL is the wholesale price cap. As such it is unlikely to be an appropriate value for making a determination of the true value of lost load to customers. The ACCC considers that recognising the value of energy to electricity consumers as a value other than the wholesale market price cap achieves a balance between the principles of competitive neutrality and economic efficiency.

In its Draft Decision, the ACCC proposed including the term VCR. However, it did not define VCR. As noted by Transend, VCR is a specific measurement technique used by VENCORP for the Victorian region of the NEM, and there may be other means of determining the cost of supply reliability for other regions. The ACCC considers it appropriate to replace VCR with Powerlink’s suggested definition of a ‘*reasonable forecasts of the value of electricity to consumers*’ This expression will now replace the term VoLL which previously appeared in the *regulatory test*.

The ACCC will also make amendments along lines suggested by NRG Flinders and TXU to ensure that the applicant does not inconsistently apply the value of electricity to consumers to the options considered in an assessment. Irrespective of the value selected, the ACCC believes that the assessment should be tempered with sensitivity analysis conducted using different values of electricity to consumers. This is reflected in the sensitivity testing requirements.

Considering the views submitted by interested parties in response to the ACCC's Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

(5) *Market benefit* means the total benefits of an option (or an *alternative option*) to all those who produce, distribute and consume electricity in the National Electricity Market. That is, the change in consumers' plus producers' surplus or another measure that can be demonstrated to produce an equivalent ranking of options in a majority of *reasonable scenarios*. For clarity, *market benefit* does not include the transfer of surplus between consumers and producers.

In determining the *market benefit*, the analysis may include, but need not be limited to the following benefits:

...

- (c) changes in involuntary load shedding caused through savings in reduction in lost load, using a reasonable forecast of the value of electricity to consumers, or deferral of reliability entry plant;

#### 4.4.7 Market failure provision

There were differing views submitted with respect to whether or not the ACCC should remove the market failure provision from the *regulatory test*, either partly or in its entirety. In its Draft Decision, the ACCC proposed removing it in its entirety. The ACCC continues to remain of this view for the following reasons.

The ACCC's reasoning for including the market failure provision was set out in its December 1999 decision, where it stated:

...a market failure criterion should provide the scope for unregulated networks to respond to market signals and opportunities. The purpose of the market failure criterion is not to prevent the construction of projects that would otherwise provide net benefits. In a similar vein, the [ACCC] would not want the market failure criterion to prevent augmentations in response to unforeseen circumstances or emergencies.

As a result it included the following into the *regulatory test* (v.1):

In determining the *market benefits*, the *proposed augmentation* should not pre-empt nor distort potential unregulated developments including network, generation and demand side developments. To this end:

- (a) a *proposed augmentation* must not be determined to satisfy this test more than 12 months before the start of construction date;

- (b) a *proposed augmentation* will cease to satisfy this test if it has not commenced operation by 12 months after the *commissioning* date unless there has been a delay clearly due to unforeseen circumstances;
- (c) unless there are exceptional circumstances, *new interconnectors* must not be determined to satisfy this test if *start of construction* is within 18 months of the project's need being first identified in a network's annual planning review of NEMMCO's statement of opportunities (or in some similar published document in the period prior to 13 December 1998).

Since the time of the promulgation of the *regulatory test* (v.1), there have been amendments to the Code which the ACCC believes largely replicate these provisions. In particular, the NDR Code changes have significantly increased the information disclosure provisions of TNSPs.

The information that is now required to be provided in a TNSP's APR and NEMMCO's SOO informs the market of potential investment opportunities. TNSPs publish information about possible network constraints and developments including information on the month and year in which augmentations are proposed to become operational and the reason for the existing or potential constraint. The ANTS document has further increased information on potential investment opportunities to the market.

The ACCC considers that these documents provide market participants with the ability to consider the viability of market investments to address emerging constraints in the NEM. The Code consultation processes for the development of a network augmentation also provides market participants with the opportunity to put forward alternative options. These documents and processes will ensure that network and non-network options will continue to be treated in a competitively neutral manner and that only the most efficient outcome for the market will proceed. The ACCC will, therefore, remove the market failure provision from the *regulatory test*.

In any event, the ACCC believes that the provisions of note 7 have been misinterpreted by interested parties. Note 7(c) was not intended to imply that interconnector construction can only proceed 18 months after a *regulatory test* application. It was designed to ensure that the market is informed in advance of emerging limitations through either the TNSP's APR or NEMMCO's SOO. Once identified the TNSP could follow the same *regulatory test* procedure for the interconnector as it would for other augmentations.

As in its Draft Decision, the ACCC continues to be of the view that the market failure provisions should be removed from the *regulatory test* and the following amendment is accordingly promulgated.

Taking into account comments from interested parties in response to its Draft Decision, the ACCC proposes to remove note (7) (the market failure provision) from the *regulatory test* (v.1).

#### 4.4.8 Sensitivity analysis

The *market benefits* of options considered in a *regulatory test* assessment depend on the assumed behaviour of market participants and macro-economic factors. Since the behaviour of market participants cannot be predicted with any certainty a range of reasonable scenarios and market development scenarios need to be considered. Similarly, changes in macro-economic variables, such as population growth and the strength of the economy will affect the outcome of an assessment. Modelling these factors necessitates assumptions about their dependence and effect on the NEM. As a result, testing of key input parameters is important to verify the robustness of a *regulatory test* analysis.

Market development scenarios are required to be considered under both the ‘reliability limb’ and ‘market benefits limb’ of test. In addition, the *regulatory test* (v.1) specifies that sensitivity analysis should be undertaken to test key input parameters, ‘including capital and operating costs, the discount rate and commissioning date’. However, the ACCC considers that a more comprehensive list will provide interested parties with assurances about the strength of a NSP’s assessment.

There was general support for the inclusion of the non-exhaustive list of sensitivity analysis parameters to be conducted in such an assessment, however, there were some concerns raised regarding the detail required.

The ACCC concurs with Powerlink and Transend that some of the parameters in the list proposed in the Draft Decision are not relevant to reliability driven augmentations. Furthermore, for smaller network augmentations, the analysis of some parameters may not be material. The ACCC has, therefore, modified the wording of the *regulatory test*.

The ACCC notes comments from Transend, who seeks clarification of the requirement that ‘the sensitivity testing should always ensure that the relevant reliability standards are met’. Upon reflection, the ACCC believes that the intent behind these words have been encompassed in the phrase ‘in a majority of reasonable scenarios’. That is, while a particular option may not meet the reliability standards in one particular scenario, providing that it meets those standards ‘in a majority of reasonable scenarios’ the option should continue to be considered in a *regulatory test* assessment. The ACCC will therefore delete the phrase ‘the sensitivity testing should always ensure that the relevant reliability standards are met’.

Considering the views expressed by interested parties in response to the ACCC’s Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

- (15) The calculation of the *costs* or *market benefits* must encompass sensitivity testing on key input variables. Sensitivity testing may be carried out on, but not limited to, the following, and should be appropriate to the size and type of project:
- (a) *Market benefits*:
    - (i) Using all reasonable methodologies; and
    - (ii) Testing reasonable forecasts of the value of electricity to

consumers.

- (b) Capital and operating costs of *alternative options*.
- (c) Discount rate (the lower boundary should be the regulated cost of capital).
- (d) Market demand.
- (e) Generation bidding behaviour using:
  - (i) SRMC; and
  - (ii) Approximates of realistic bidding if measuring *competition benefits*.
- (f) Commissioning dates of:
  - (i) Alternative projects;
  - (ii) Committed projects;
  - (iii) Anticipated projects; and
  - (iv) Modelled projects.
- (g) Market based regulatory instruments that may be used to address greenhouse and environmental issues.
- (h) Other sensitivity testing determined to be relevant and material to the case concerned.

#### 4.4.9 Reliability limb of the *regulatory test*

Since the NDR Code changes, when promulgating the *regulatory test*, the ACCC must have regard to the service standards imposed on NSPs. As noted earlier in this Decision, the ‘reliability limb’ of the test is designed to allow NSPs to meet their statutory reliability obligations. The *regulatory test* (v.1) requires that NSPs minimise the NPV of costs when considering reliability driven augmentations. That is, the NSP must consider both the *market benefits* and *costs* and choose the option which minimises the net cost to the market.

In its Draft Decision the ACCC proposed replacing the ‘minimising-cost’ test with a ‘least-cost’ test. The ACCC argued that this was in keeping with most NSPs understanding on how the ‘reliability limb’ of the *regulatory test* should be applied.

TransGrid has however, applied the ‘reliability limb’ in accordance with the actual wording of the *regulatory test* and argues that to do otherwise would bias the *regulatory test* in favour of network solutions. The ACCC has considered TransGrid’s suggestions and believes that the ‘least-cost’ best replaces the ‘minimising-cost’ test.

The ‘minimising-cost’ test could potentially result in a NSP constructing something larger than it would necessarily be required to construct if it were solely meeting its reliability requirements. For example, it may choose to install a larger transformer than it is strictly necessary if it believes that the larger transformer delivers additional *market benefits*. The ACCC is concerned that in these instances consumers are required to pay for additional equipment which is not strictly mandated by jurisdictional obligations.

The ACCC also believes that a least-cost test is consistent with the cost-effectiveness statement set out in clause 5.6.2 of the Code as well as the intention behind the definition of a *reliability augmentation* as something being ‘necessitated solely by [the] inability to meet network performance requirements’.

Considering the views expressed by interested parties in response to the ACCC’s Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

Considering comments from interested parties, the ACCC proposes to replace the words ‘net present value’ with ‘present value’ in the ‘market benefits limb’ of the *regulatory test*.

#### 4.4.10 Expected value of market benefits

In its submission, VENCORP notes that the wording used in the ‘market benefits limb’ of the *regulatory test* should be revised from ‘a *proposed augmentation* maximises the present value of the *market benefit*, compared with a number of *alternative projects*, in a majority of *reasonable scenarios*’ to ‘in all other cases, it is the alternative that maximises the **expected** present value of the *market benefit* using a number of *reasonable scenarios*’ [emphasis added].

VENCORP also suggests that the expected present value of the market benefits for a particular alternative project should be calculated using the present value of the market benefit discounted by a probability weighting for each scenario.

The ACCC notes that in the NET minority decision there was a discussion on the appropriate treatment of risks within the cost-benefit analysis framework. It states, with references to Mishan, that estimating the future values of costs and benefits for a specific project within a cost benefit analysis framework is subject to estimation error and requires judgement. It adds that within a cost-benefits framework analysis there are generally two methods for factoring in risk and uncertainty. This includes the use of expected values, and the use of sensitivity analysis.

On this matter Mishan states:

“ ... apart from general uncertainties in the social discount rate at the particular period, i.e., of the value of money, e.g., those arising from inflation or market disturbance, or consideration of public/private financing options, etc., which should be reflected in the choice of the discount rate for a CBA... Risks and uncertainties can be divided into two classes—those in estimating the *levels* of costs and benefits, and those associated with their *timing*. There are two approaches to the first:

- the use of expected values, in which probability functions are allocated to available values of the variables, or
- the use of sensitivity analysis, in which ranges of values are set for the variables, often for simplicity assigned only to those which are expected to have a major influence on the result. Sensitivity analysis

is usually, but not always, the simplest and most searching way of analysing factors producing different levels of the variables.”<sup>20</sup>

The *regulatory test* requires that sensitivity analysis be undertaken to assess the flexibility of key input parameters. In previous applications of the test, market development scenarios have been weighted to ensure that they reflect the likelihood of each outcome.

VENCorp, in its LaTrobe Valley to Melbourne economic evaluation, assessed ‘the expected net market benefits of the alternative transmission projects ...for a number of market development scenarios’<sup>21</sup>. A similar approach was adopted by the IRPC in its assessment of SNI, where it weighted the market development scenarios to reflect the likelihood of each scenario occurring<sup>22</sup>.

The ACCC believes that weighting scenarios in a *regulatory test* assessment is consistent with the economic theory underlying cost-benefit analysis. The ACCC, therefore, considers it appropriate to amend the ‘market benefits limb’ of the *regulatory test*, in line with VENCorp’s suggestion, to make reference to ‘the *proposed augmentation* maximises the **expected** present value of *market benefits*’. In practice this is likely to mean that the net market benefits for a proposed augmentation and its alternatives are calculated by using a probability weighting for each scenario multiplied by the net present value of the *market benefits* for that scenario.

Considering the views expressed by interested parties in response to the ACCC’s Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

#### **The regulatory test**

- (1) An option satisfies the *regulatory test* if:
  - ...
  - (b) in all other cases - the option 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*.

#### **4.4.11 Other amendments**

The ACCC has considered the various drafting amendments proposed by a number of interested parties, including VENCorp, TransGrid, Powerlink, and EnergyAustralia and to aid clarity, has made a number of minor amendments to the *regulatory test*.

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<sup>20</sup> Mishan, *op cit*, p 363

<sup>21</sup> VENCorp, *Economic Evaluation – Optimising the Latrobe Valley to Melbourne Electricity Transmission Capacity*, February 2002, p 5

<sup>22</sup> IRPC, *IRPC Stage 1 Report: Proposed SNI Interconnector*, 26 October 2001, Appendix E

The ACCC has considered the amendments proposed by VENCORP and, to avoid confusion, it has clarified what it considers are ‘reasonable scenarios’ in the context of the application of the test and the information requirements for the purpose of determining market benefits and costs.

The ACCC considers Powerlink’s suggested amendments regarding the market development scenarios are appropriate and has amended the note to include reference to ‘other technically feasible projects’. This ensures consistency with the definition of alternative options which includes references to technically feasible projects.

Noting comments made by TransGrid, the ACCC has reviewed the provisions of the *regulatory test* to ensure that mandatory requirements of the test are clearly identified.

On the issue raised by EnergyAustralia regarding the reference to replacement works the ACCC will delete this reference. This reference was inserted in the Draft Decision to confirm that the *regulatory test* is not to be applied to replacement works, in line with the discussion in section 3.4.2. However, the ACCC believes that the Code deals with this issue.

The ACCC has reordered the *regulatory test* to aid clarity without changing the intent.

## 5. Competition Benefits

### 5.1 Introduction

A major criticism of the *regulatory test* from interested parties is that in its current form it does not explicitly recognise *competition benefits*. When considering the issue of *competition benefits* two questions need to be addressed: how should *competition benefits* be defined and what is the most appropriate methodology to calculate them. Farrier-Swier Consulting (Farrier Swier) and Frontier Economics were engaged to assist the ACCC address these questions<sup>23</sup>.

The remainder of this chapter summarises the ACCC's Draft Decision and submissions from interested parties, outlines the main findings of the consultants' reports and concludes with the ACCC's considerations.

### 5.2 ACCC's Draft Decision

In defining *competition benefits* the ACCC considered that Chapter 6 of the Code requires *competition benefits* must be limited to those benefits arising from increases in efficiency due to greater competition between generators across the NEM. It does not include those benefits which would be considered wealth transfers<sup>24</sup>.

Based on this, in its Draft Decision, the ACCC proposed defining *competition benefits* as the difference arising from the following two network scenarios:

- the augmented network with bidding assumed to be the same as in the status quo network; and
- the augmented network with bidding which accurately and fully reflects any market power in the augmented network.

It discussed the various methods suggested to calculate competition benefits, which included:

- Market simulations – which utilises the modelling required under the *regulatory test*;
- Powerlink's public benefits competition test – which utilises market modelling but is only triggered in public interest situations;
- Hirschmann-Herfindahl Index (HHI) and modified HHI indices – which would aim to apply the tools used by competition authorities worldwide in assessing mergers;
- A residual supply analysis – using the techniques under consideration by the Californian Independent System Operator (CAISO);
- Commercial benefits analysis – utilises the Inter-regional Settlement Residues; and

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<sup>23</sup> Farrier Swier Consulting, *An Analysis of Competition Benefits*, July 2003. This report can be found at: [www.accc.gov.au/content/index.phtml/itemId/344969/fromItemId/54368](http://www.accc.gov.au/content/index.phtml/itemId/344969/fromItemId/54368)

<sup>24</sup> See Chapter 3 for a discussion on wealth transfers.

- Stanwell Competition Index – which uses a qualitative assessment process.

The ACCC’s analysis suggested that the most plausible way to calculate *competition benefits* is to use market simulation techniques. This view was supported by its consultant Farrier Swier. A number of possible market simulation methodologies were outlined including:

- Cournot – Nash;
- Bertrand; and
- Supply Function Equilibrium.

However, the ACCC stated that further work would be required before it could comment on which method was the most appropriate and committed to undertake further work on this issue.

### 5.3 Submissions from interested parties on Draft Decision

Most parties who commented on the Draft Decision focused on the issue of *competition benefits*. In particular they focused on the ACCC’s definition of *competition benefits*; the methodology to be used for the calculation of *competition benefits*; and the materiality of *competition benefits*.

#### 5.3.1 ACCC’s definition of competition benefits

TransGrid, Powerlink, Ergon Energy (Retail), ERAA, ESA, NRG Flinders, TXU, InterGen, SPI Powernet, Origin and VENCORP support the inclusion of *competition benefits* in the *regulatory test*. TransGrid adds that the scope of *competition benefits* should be widened beyond those proposed in the ACCC’s Draft Decision. Powerlink, Transend, ElectraNet, TransGrid and CS Energy consider that the ACCC must ensure that its definition is consistent with the MCE’s proposal that the *regulatory test* include the ‘full economic benefits of increased competition’<sup>25</sup>.

The ERAA, ESA, NRG Flinders, TXU, InterGen, SPI Powernet and VENCORP support the principle that *competition benefits* be limited to those benefits arising from increases in efficiency, excluding wealth transfers. They also agree that this interpretation of *competition benefits* is consistent with the ACCC’s Code objectives outlined in clauses 6.2.2 and 6.2.3. CS Energy considers that the ACCC’s proposed definition of *competition benefits* falls short of the definition proposed by Professor Littlechild<sup>26</sup>.

Ergon Energy (Retail) suggests that the term *market power* used in the definition be replaced with ‘revised bidding strategy’ given that market power may have a specified meaning. Transend similarly notes that the ACCC’s proposed definition requires a TNSP to consider the effect of an augmentation on market power and that TNSPs will only be able to provide a reasonable assessment of the likely market power in the market.

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<sup>25</sup> Ministerial Council on Energy, *Reform of Energy Markets*, 11 December 2003. p11.

<sup>26</sup> Professor Stephen Littlechild, *Competition Benefits: A paper for the ACCC’s Competition Benefits and Market Review Forum*, 28 July 2003.

VENCorp submits that the proposed definition of *competition benefits* is not sufficiently clear. It suggests that the ACCC should consider including additional explanatory notes based on the information contained in Appendix D of its Draft Decision.

### **5.3.2 Methodology for the measurement of competition benefits**

Most parties support the ACCC's proposed way forward, particularly the engagement of a consultant to develop a methodology for the calculating *competition benefits*.

However, Professor McDonnell is of the view that the ACCC's proposal is likely to present unrealistic demands in terms of data and modelling, and contends that there may be some theoretical issues that will need to be considered.

Ergon Energy (Retail) suggests that any method used to measure *competition benefits* must be capable of both identifying those generators whose bidding behaviour is affected by the investment and the benefits to the market. It notes that there are inherent problems associated with modelling electricity markets including the repeated nature of the auction process, inelastic demand and poor access to data.

NRG Flinders does not believe that the refined methodology for the measurement of *competition benefits* would add value to the *regulatory test* and further justification is required before it is added to the test. NRG Flinders recommends that at a minimum any revised approach to the test should ensure that the assessment of *competition benefits* is consistent with the general principles underlying cost-benefit analysis and the *regulatory test*.

CS Energy suggests that if the ACCC considers it inappropriate to include the 'full economic benefits of competition' as defined by the MCE, the ACCC should consider adopting an approach to the definition of *competition benefits* that is simple, such as using 10 per cent of the price differences between regions, or an alternative approach involving the HHI.

Powerlink states that it is unable to ascertain whether the ACCC's preferred methodology is able to capture the relevant benefits of transmission augmentations. However, it welcomes the ACCC's proposal to allow pool price impacts to be included in the *regulatory test* analysis and the recognition of benefits of transmission augmentation in reducing market power.

Drayton Analytics (Drayton) agrees with the ACCC's approach to calculating *competition benefits*. However, it believes that the ACCC needs to revise its comments on the Residual Supply Index (RSI) analysis. It states that the RSI analysis is a technique to produce dynamic bidding inside a market simulation model, based on observed historical bidding patterns. It submits that as a result the RSI analysis is consistent with the ACCC's recommendation that *competition benefits* are measured using market simulations and that it is an emerging technique that can produce useful results.

### **5.3.3 Materiality of competition benefits**

The Institute of Public Affairs (IPA) and TXU argue that *competition benefits* are typically small, and note that even if new investment causes a 20 per cent price reduction, *competition benefits* would be unlikely to exceed 1 per cent of costs. The IPA further notes that uncertainties in demand and price outcomes means that these *competition benefits* are difficult to estimate and can easily be confused with wealth transfers and may create a potential bias against commercial investments.

## 5.4 Consultants' reports

During the course of its review, the ACCC engaged two consultants to assist it in its consideration of issues surrounding the quantification and assessment of *competition benefits*. Farrier Swier was engaged to consider the various options canvassed in the ACCC's Discussion Paper and to report on the issues arising from the practical implementation of the various approaches to the measurement of *competition benefits*.

Following the release of its Draft Decision, the ACCC engaged Frontier Economics to assist it in the consideration of the framework for the calculation of *competition benefits* using market simulation techniques on SNOVIC400<sup>27</sup>.

The main findings of both reports are summarised below.

### 5.4.1 Farrier Swier's report

#### *Defining competition benefits*

Farrier Swier defines *competition benefits* to be the benefits attributable to increased transmission capability of bringing NEM prices closer to Short Run Marginal Costs (SRMC). It states that these benefits can be captured under the market-driven market development approach under the *regulatory test* (v. 1) where non-SRMC bidding is assumed.

Farrier Swier adds that *competition benefits* consists of the following economic efficiency elements:

- *allocative efficiencies* from increased production and sales if a transmission augmentation lowers wholesale electricity prices;
- *allocative efficiencies* from avoiding or deferring the construction of generation and transmission assets (which may otherwise be developed if prices were higher); and
- *productive efficiencies* from lower priced generation plant replacing higher priced plant.

Farrier Swier notes that, in addition to these economic efficiencies, lower prices can also redistribute wealth from generators in previously higher priced regions and consumers in lower priced regions to generators in lower priced regions and consumers in higher priced regions. However, it states that the current calculation of market benefits within the *regulatory test* prevents such an interpretation.

#### *Calculating competition benefits*

Farrier Swier contends that the extent to which an augmentation will reduce market power depends on a number of factors<sup>28</sup>. It concludes that the best approach to calculating *competition benefits* is by using market simulation modelling.

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<sup>27</sup> SNOVIC 400 is the existing interconnector between Snowy and Victoria regions. This augmentation raised the transfer capacity from the Snowy region to Victoria region from 1500 MW to 1900 MW.

<sup>28</sup> Farrier Swier notes that these factors may include the level of forward contracting or hedging, the degree of vertical integration of generation and supply, the shape of the supply curve, capacity margins, elasticity of demand, transmission incentives, market design and definition of transmission capacity.

Farrier Swier argues that applying market simulation modelling to the calculation of *market benefits* allows the impact of an augmentation on generator market power to appropriately reflect the response of market participants to the changed environment.

On the other approaches put forward in the ACCC's Discussion Paper, Farrier Swier does not believe that they are adequate methods to calculate *competition benefits*. In particular it notes that:

- the Powerlink public benefits approach appears to impose a potentially significant analytical burden on NSPs for no useful purpose;
- the HHI and modified HHI analyses do not adequately describe the changes in prices and do not assist in quantifying *competition benefits*;
- CAISO's work on building a relationship between prices and the residual supply is interesting but could quickly become bogged-down in statistical detail;
- the 'commercial benefits' approach is at odds with the welfare economics basis of the *regulatory test*; and
- the various elements of the Stanwell Competition Index are vaguely defined and as a result cannot be assessed adequately.

#### **5.4.2 Frontier Economics' report**

Frontier Economics was asked to consider whether a workable method for estimating *competition benefits* could be developed. It was asked to calculate the *competition benefits* of the existing SNOVIC 400 upgrade by considering the change in generator market power with and without the augmentation for the 2004/05 financial year.

##### ***Definition of competition benefits***

Prior to calculating the *competition benefits* of SNOVIC 400 Frontier Economics reconsidered the ACCC's proposed definition. Frontier Economics believes that the ACCC's definition of *competition benefits* does not fit neatly into the conventional *market benefits* definition in the *regulatory test*. Frontier Economics' proposes an alternative definition which focuses on measuring the additional benefits of an augmentation to the market if competitive bidding assumptions were relaxed. That is, the additional benefits over and above conventionally measured *market benefits* that are expected to flow from considering the likely bidding behaviour of generators.

Frontier Economics' definition of *competition benefits* involves calculating expected *market benefits* after the augmentation given the likely Nash Equilibrium bidding behaviour and subtracting:

- expected *market benefits* given likely Nash Equilibrium bidding behaviour before the augmentation; and
- expected *market benefits* of the augmentation assuming competitive bidding both before and after the augmentation using conventionally measured *market benefits*.

### *A methodology for determining competition benefits*

Frontier Economics' calculations were undertaken using SPARK, its game theoretic model for electricity markets, which calculates the *competition benefits* of an augmentation assuming Cournot-Nash generator bidding.

The modelling assumptions adopted by Frontier Economics included: generator operations (capacity, variable costs, outages, ramp rates, etc); transmission transfer capabilities and losses; the contract position of strategic participants; demand points; modelling periods; and equilibrium selection in the situation where multiple equilibriums exist.

Its market modelling technique utilises a three-stage approach:

- determining the likely pattern of dispatch for energy constrained hydro units and the level of contract cover of the strategic participants across the year for the scenarios adopted. Frontier Economics used its medium to long-term dispatch/investment electricity market model, WHIRLYGIG<sup>29</sup>;
- analysing the likely market outcomes, having regard to the presence of any generator market power, under each scenario. In this step, Frontier Economics uses its electricity market model SPARK; and
- using the results of the second stage to calculate the *competition benefits* from the transmission augmentations.

The *competition benefits* are then determined using a five step approach by calculating the:

- demand weighted average price outcome and the cost of meeting demand under the base case;
- demand weighted average price outcome after the augmentation without including a demand response (i.e the price change that occurs due to the augmentation);
- demand weighted average price outcome including a demand response in order to estimate the slope of the supply curve;
- equilibrium price and quantity of demand that balances supply and demand after the augmentation, and the resulting production costs; and
- total surplus in both the base case (Step 1) and the post-augmentation equilibrium case (Step 4) to determine net benefits of the augmentation.

Frontier Economics does not separate out the *competition benefits* from the other *market benefits*. However, it notes that an estimate of the *competition benefits*, consistent with the ACCC's definition could be determined by subtracting the cost-savings attributable to the augmentation from a competitive dispatch modelling exercise.

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<sup>29</sup> WHIRLYGIG models the efficient operation of generators to meet demand over a medium to long-term modelling time horizon (i.e. the economic dispatch). WHIRLYGIG is a mathematical optimisation model. Its objective is to minimise the total cost of meeting system demand. If the model is run in the short-term, where no new capacity is required, it seeks to minimise operating costs.

Frontier Economics notes that its initial assessment did not test the sensitivity of the conclusions to the key assumptions when estimating the *competition benefits* for SNOVIC 400, given the purpose of its consultancy was to develop and document a workable approach to measuring *competition benefits*. Furthermore, it adds that its framework ignores any dynamic *competition benefits*, and only calculates the *competition benefits* over a one year time horizon.

## 5.5 ACCC's considerations

### 5.5.1 Defining competition benefits

During the course of its consultation, the ACCC has considered a number of ways of defining *competition benefits*. In the economics literature the term *competition benefits* does not appear to have a well accepted meaning. Therefore, the ACCC must first develop a definition of *competition benefits* within the *regulatory test* framework.

#### *Competition benefits and economic efficiency*

There are two distinct interpretations of *competition benefits*. The economic interpretation specifies *competition benefits* as those benefits arising from increases in the market efficiency caused by greater generator competition. That is, the total increase in consumers' and producers' surplus that occurs as a result of increased competition when prices move closer to marginal cost. The social interpretation defines it as the benefits to consumers of lower prices from enhanced generator competition.

As discussed in its Draft Decision, the ACCC continues to be of the view that the calculation of *competition benefits* should only be concerned with the consideration of efficiency gains, not wealth transfers. This is consistent with the economic interpretation. The ACCC's position stems from its obligations under clause 5.6.5A of the Code in promulgating the *regulatory test* which states that the ACCC must:

have regard to the need to ensure that the *regulatory test* is consistent with the basis of asset valuation determined by the ACCC for the purposes of clause 6.2.3.

Clause 6.2.3 sets out the principles that are applicable to the regime under which the ACCC is to regulate transmission revenue. Clause 6.2.3 provides that:

- (d) The regulatory regime to be administered by the ACCC must be consistent with the objectives outlined in clause 6.2.2 and must also have regard to the need to:
  - (1) provide *Transmission Network Owners* and/or *Transmission Network Service Providers* (as appropriate) with incentives and reasonable opportunities to increase efficiency;

Those objectives in clause 6.2.2 are:

- (b) an incentive-based regulatory regime which:
  - (1) provides an equitable allocation between *Transmission Network Users* and *Transmission Network Owners* and/or *Transmission Network Service Providers* (as appropriate) of efficiency gains reasonably expected by the ACCC to be achievable by the *Transmission Network Owners* and/or *Transmission Network Service Providers* (as appropriate); and
  - (2) provides for, on a prospective basis, a sustainable commercial revenue stream which includes a fair and reasonable rate of return to *Transmission Network Owners* and/or

*Transmission Network Service Providers* (as appropriate) on efficient investment, given efficient operating and maintenance practices of the *Transmission Network Owners* and/or *Transmission Network Service Providers* (as appropriate);

- (c) prevention of monopoly rent extraction by *Transmission Network Owners* and/or *Transmission Network Service Providers* (as appropriate);
- (d) an environment which fosters an efficient level of investment within the *transmission* sector, and upstream and downstream of the *transmission* sector;
- (e) an environment which fosters efficient operating and maintenance practices within the *transmission* sector;
- (f) an environment which fosters efficient use of existing infrastructure.

The ACCC is of the view that clauses 6.2.2 and 6.2.3 of the Code provide that the regime it administers must foster the efficient operation, provision and expansion of the transmission network. Increases in the efficiency of the market can and do result in reductions in prices. However, lower prices are not an objective that the ACCC is required to pursue. If the writers of the Code had intended that reduced prices for consumers were to be an over-riding objective, then that would have been expressly stated. It is likely that they considered that promoting efficiency would provide the benefits of the market as a whole. That is, with greater efficiencies, benefits would accrue to both consumers and producer of electricity, not just consumers.

The Code's objective of promoting efficiency was paramount in the ACCC's promulgation of the *regulatory test* (v.1), where it stated that in developing the *regulatory test* the ACCC has relied on the two key principles of economic efficiency and competitive neutrality. The ACCC also considers that including wealth transfers in the definition of *competition benefits* would be inconsistent with the stated principle of competitive neutrality, given that such an approach would effectively mean weighting increases in consumer surpluses higher than increases in producer's surpluses.

Most parties who commented on the ACCC's Draft Decision support the principle that *competition benefits* should be limited to those benefits arising from increased efficiency. The ACCC considers that defining *competition benefits* in this way meets the MCE's objectives<sup>30</sup>. The ACCC's approach to limiting *competition benefits* to increases in economic efficiency is consistent with the preferred approach of Professor Stephen Littlechild, outlined in his presentation at the Market Review Forum, and is also consistent with the calculation of other *market benefits* in the *regulatory test*<sup>31</sup>

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<sup>30</sup> MCE communiqué, *op cit*.

<sup>31</sup> Professor Littlechild stated in his paper, that a conventional view is that competition means price equal to marginal (or average) cost, in contrast to monopoly which means marginal revenue equal to marginal cost hence price above marginal cost (and above average cost). On this view, the *competition benefits* of a transmission investment are primarily the advantages of having lower prices (which reflect less market power) in the wholesale generation market. Set aside the resulting transfer of income between generators (investors) and consumers, which is presumably not considered in a public benefits test. The benefit of competition is then presumably the greater output that is induced by the lower prices, valued at the difference between price and marginal cost. This is the so-called welfare triangle.

For these reasons, the ACCC considers that the calculation of *competition benefits* must be limited to considering those benefits arising from increases in market efficiency, or increases in total economic surplus, attributable to greater competition between generators in NEM.

### ***A workable definition of competition benefits***

Due to the complexities of modelling *market benefits*, the ACCC believes that defining *competition benefits* as the increases in market efficiency attributable to greater competition between generators is unlikely to present a workable definition. As a result, in its Draft Decision, the ACCC defined *competition benefits* as the change in the benefits arising from:

- the augmented network with bidding assumed to be the same as in the status quo network; and
- the augmented network with bidding which accurately and fully reflects any market power in the augmented network.

The ACCC's proposed definition was derived from the work of Dr Darryl Biggar who has developed his definition with reference to the observed bidding behaviour of generators and the NEM dispatch model (see Appendix C). He notes that for the purposes of the *regulatory test* assessment NSPs have typically assumed that generators bid into the market at SRMC. By definition assuming SRMC bidding precludes the calculation of *competition benefits*, hence, not all the benefits of transmission investments have been captured. Dr Biggar argues that approximating the actual bidding behaviour of generators will provide the true economic benefits of an augmentation.

Regarding Frontier Economics' comments on the ACCC's definition, Dr Biggar suggests that both definitions are consistent and are likely to provide identical outcomes. The ACCC considers that Frontier Economics' definition provides a pragmatic solution to the modelling complexities. The ACCC, therefore, believes that it is necessary to ensure that its definition of *competition benefits* does not prohibit different modelling methodologies which will provide identical outcomes to the ACCC's definition.

Further, the definition set out in the Draft Decision expressly referred to network augmentations. In line with the ACCC's earlier arguments to replace references to augmentations with options, it has amended the definition of *competition benefits* to refer to options and not augmentations.

### ***When to take competition benefits into account***

Because of the complexities involved in modelling *competition benefits*, the ACCC believes they should necessarily be limited to market driven augmentations which are *new large network assets* or *new large distribution assets*. The cost and complexity involved in modelling *competition benefits*, and their likely impact on the outcome of a *regulatory test* assessment, makes it difficult for the ACCC to justify compelling NSPs to consider them when assessing *new small network assets* or *new small network assets*.

Further, the ACCC considers that the *market benefit* of a project will only include *competition benefits* where the relevant NSP determines that it is appropriate, in all the circumstances, to take them into account. The object of this provision is to give the relevant NSP the ability to decide whether it is appropriate to include competition benefits in its assessment. It is the

ACCC's intention that this judgment should be made by the relevant NSP rather than a Dispute Resolution Panel or the ACCC in an appeal under clause 5.6.6 of the Code.

A few interested parties raise concerns that the definition of competition benefits still does not go far enough and should capture the second round effects of a more competitive electricity market. The ACCC acknowledges that a more efficient electricity market may also increase the efficiency of downstream markets (e.g. the production of aluminium). However, the ACCC believes that the *regulatory test* should continue to only consider those costs and benefits of efficiencies arising in the electricity market. That is a partial equilibrium analysis. To do otherwise would require the use of general equilibrium modelling, which would add significant complexity to the application of the *regulatory test*. The ACCC believes that the additional complexity of conducting such modelling and the associated cost could not be justified by the anticipated benefits of doing so.

Regarding VENCORP's suggestion that the definition of *competition benefits* should include explanatory notes, the ACCC aims to provide further guidance to the market through its ongoing work, which is discussed in section 5.5.2. Concerning Ergon Energy's (Retail) suggestion that the reference to market power be replaced with *revised bidding strategy* in the definition of *competition benefits*, the ACCC believes that reference to market power is still appropriate.

Taking into account the views expressed by interested parties in response to the ACCC's Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

- (6) *Competition benefits* means the change in benefit between the scenario where, after implementation of the option:
- (a) generator bidding is assumed to be the same as it was before the option was implemented; and
  - (b) generator bidding reflects any market power after the implementation of the option.
- or another reasonable measure that can be demonstrated to produce an equivalent change in benefit.
- (7) The *market benefit* of an option will only include *competition benefits* where:
- (a) the option is a *new large network asset* or a *new large distribution network asset*; and
  - (b) the *Network Service Provider* responsible for undertaking the analysis of the option determines that it is appropriate, in all the circumstances, to take *competition benefits* into account in assessing the *market benefit* of the option.

### 5.5.2 Calculating competition benefits

In its Draft Decision the ACCC expressed its view that the only practicable way of calculating *competition benefits* is through market simulation techniques. There was general support for the ACCC's approach from interested parties, providing that it only considered the increases in economic efficiency.

The strength of market modelling is that it explicitly enables the modelling of a generator's bidding behaviour with and without an augmentation, which is consistent with the ACCC's *competition benefits* definition. In supporting market simulations, the ACCC recognises that there are difficulties inherent in any modelling exercise. Assumptions are made and the level of model complexity will affect the outcome of the analysis. However, the ACCC notes that the current *regulatory test* requires NSPs to model the effects of a network or non-network option on the market.

As has been noted in the submissions, there are a number of methodologies that can be used to simulate generator bidding in the market. Farrier Swier provides examples of possible approaches to modelling the strategic behaviour of firms, including adopting the following approaches:

- Cournot-Nash - which assumes that firms employ quantity strategies (each firm chooses its production quantity, taking as given the output being produced by all other firms);
- Bertrand equilibrium - in which firms compete on price and it is assumed that the winner takes all (if firm can capture the entire market by pricing below others and can expand output to meet such demand); and
- Supply Function Equilibrium - in which the strategies of firms are actual price-quantity bid functions, rather than the inflexible quantities given by the Cournot model<sup>32</sup>.

With a preference for market simulation techniques, the ACCC engaged Frontier Economics to conduct an analysis of *competition benefits* using market simulation modelling on the SNOVIC 400 upgrade. The methodology adopted by Frontier Economics calculates competition benefits assuming Cournot-Nash bidding.

Frontier Economics' work is a first step in developing a workable methodology for calculating *competition benefits* and the ACCC is encouraged by the results. However, further work is required, such as undertaking sensitivity testing of key input variables and assumptions, and modelling the longer term effects on generator entry decisions. The ACCC will continue to work on this issue following the release of this Decision, however, it does not see this work affecting its definition of *competition benefits*. The aim of this additional work is to provide further guidance to the market on how *competition benefits* should be calculated.

Drayton raised concerns about the ACCC's comments on the RSI analysis. Because RSI is a technique based on historical bidding patterns, and not expected future bidding behaviour, the ACCC considers that the method used by Frontier Economics is more appropriate. However,

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<sup>32</sup> Bushnell et al, 1999. *An international comparison of models for measuring market power in electricity*, Energy Modelling Forum, Stanford University and Newberry D, 2002, *Mitigating market power in electricity networks*, Department of Applied Economics, University of Cambridge.

the ACCC is keeping an open mind on this issue and does not rule out the use of RSI analysis for calculating *competition benefits*.

**5.5.3 Other amendments to recognise competition benefits**

As noted earlier, the benefits of transmission augmentations have largely been confined to fuel costs savings, maintaining reliability requirements, and deferring generation and other transmission investments assuming SRMC generator bidding. The benefits of enhanced competition between generators, which by definition cannot be measured assuming SRMC bidding, have been ignored.

It is therefore important that the ACCC make it explicit that the *regulatory test* can be used to calculate these benefits. Therefore, in addition to defining *competition benefits* the ACCC will make amendments to the notes supporting the *regulatory test* which enable NSPs to consider forecasts of ‘actual market bidding behaviour’.

Taking into account the views expressed by interested parties in response to the ACCC’s Draft Decision, the ACCC promulgates the following amendments to the *regulatory test*.

- (14) *Modelled project* means a project modelled using either ‘least-cost market development’ modelling or ‘market-driven market development’ modelling:  
.....
  - (b) Market-driven market development modelling means modelling spot price trends based on existing generation and demand and includes new generation developed on the same basis as would a private developer (where the net present value of the spot price revenue exceeds the net present value of generation costs). The forecasts of spot price trends should reflect a range of market outcomes, ranging from short-run marginal cost bidding behaviour to simulations that approximate non-competitive bidding or imperfect competition, with power flows to be those most likely to occur under actual systems and market outcomes.

## 6. Conclusion

Taking into account submissions received from interested parties in response to its Draft Decision, the ACCC promulgates this *regulatory test* (v.2) in accordance with clause 5.6.5A of the Code.

For comparative purposes, a copy of the *regulatory test* (v.1) is provided in Appendix B, along with a table comparing the previous version of the *regulatory test* with the new version.

## ***Regulatory test - version 2***

### **Preamble**

The Australian Competition and Consumer Commission (ACCC) promulgates this *regulatory test* in accordance with clause 5.6.5A of the National Electricity Code (Code).

In this test “option” includes, but is not limited to, an *augmentation*, a *new large network asset* and a *new small network asset*.

### **The regulatory test**

- (1) An option satisfies the *regulatory test* if:
  - (a) in the event the option is necessitated solely by the inability to meet the minimum network performance requirements set out in schedule 5.1 of the Code or in relevant legislation, regulations or any statutory instrument of a participating jurisdiction - the option minimises the present value of *costs*, compared with a number of *alternative options* in a majority of *reasonable scenarios*;
  - (b) in all other cases - the option 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*.

### **For the purposes of this test:**

- (2) *Costs* means the total cost of an option (or an *alternative option*) to all those who produce, distribute or consume electricity in the National Electricity Market.

In determining the *costs*, the analysis may include, but need not be limited to, the following:

- (a) costs incurred in constructing or providing the option;
  - (b) operating and maintenance costs over the operating life of the option;
  - (c) the cost of complying with existing and anticipated laws, regulations and administrative determinations such as those dealing with health and safety, land management and environment pollution and the abatement of pollution (including greenhouse gas abatement). An environmental tax should be treated as part of a project’s cost. An environmental subsidy should be treated as part of a project’s benefits or as a negative cost.
  - (d) other costs that are determined to be relevant to the case concerned.
- (3) *Alternative options* means:
    - (a) For an option proposed in accordance with paragraph 1(a) of this test:

- (i) a genuine alternative to the option being assessed, in that it:
    - (A) has a clearly identifiable proponent; and
    - (B) meets the requirements referred to in paragraph 1(a);
  - (ii) a practicable alternative to the option being assessed in that it is technically feasible.
- (b) For an option proposed in accordance with paragraph 1(b) of this test:
- (i) a genuine alternative to the option being assessed, in that it:
    - (A) delivers similar outcomes to those delivered by the option being assessed; and
    - (B) becomes operational in a similar timeframe to the option being assessed;
  - (ii) a practicable alternative to the option being assessed in that it is:
    - (A) technically feasible; and
    - (B) commercially feasible, which is to be demonstrated by determining whether an objective operator, acting rationally according to the economic criteria prescribed by this test, would be prepared to construct or provide the *alternative option*.

The existence of a genuine proponent for the *alternative option* should be taken into account when determining practicability, however, absence of such a proponent will not exclude a project from being an *alternative option* for the purposes of the regulatory test.

- (4) *Reasonable scenarios* means scenarios incorporating:
- (a) reasonable forecasts of:
    - (i) electricity demand (modified where appropriate to take into account demand-side options, variations in economic growth, variations in weather patterns and reasonable assumptions regarding price elasticity);
    - (ii) the efficient operating costs of competitively supplying energy to meet forecast demand from existing, *committed*, *anticipated* and *modelled* projects including demand side and generation projects;
    - (iii) the avoidable costs of *committed*, *anticipated* and *modelled* projects including demand side and generation projects and whether all avoidable costs are completely or partially avoided or deferred;

- (iv) the cost of providing sufficient ancillary services to meet the forecast demand; and
  - (v) the capital and operating costs of other regulated network and *market network service* projects that are augmentations consistent with the forecast demand and generation scenarios
- (b) scenarios defined as market development scenarios; and
  - (c) sensitivity testing.
- (5) *Market benefit* means the total benefits of an option (or an *alternative option*) to all those who produce, distribute and consume electricity in the National Electricity Market. That is, the change in consumers' plus producers' surplus or another measure that can be demonstrated to produce an equivalent ranking of options in a majority of *reasonable scenarios*. For clarity, *market benefit* does not include the transfer of surplus between consumers and producers.

In determining the *market benefit*, the analysis may include, but need not be limited to the following benefits:

- (a) changes in fuel consumption arising through different generation dispatch;
  - (b) changes in voluntary load curtailment caused through reduction in demand-side curtailment;
  - (c) changes in involuntary load shedding caused through savings in reduction in lost load, using a reasonable forecast of the value of electricity to consumers, or deferral of reliability entry plant;
  - (d) changes in costs caused through:
    - (i) deferral of market entry plant. This must be excluded if reliability benefits are determined using deferral of reliability entry plant;
    - (ii) differences in capital costs;
    - (iii) differences in the operational and maintenance costs; and
    - (iv) deferral of transmission investments;
  - (e) changes in transmission losses;
  - (f) changes in ancillary services;
  - (g) *competition benefits*; and
  - (h) other benefits that are determined to be relevant to the case concerned.
- (6) *Competition benefits* means the change in benefit between the scenario where, after implementation of the option:

- (a) generator bidding is assumed to be the same as it was before the option was implemented; and
- (b) generator bidding reflects any market power after the implementation of the option

or another reasonable measure that can be demonstrated to produce an equivalent change in benefit.

- (7) The *market benefit* of an option will only include *competition benefits* where:
  - (a) the option is a *new large network asset* or a *new large distribution network asset*; and
  - (b) the *Network Service Provider* responsible for undertaking the analysis of the option determines that it is appropriate, in all the circumstances, to take *competition benefits* into account in assessing the *market benefit* of the option.
- (8) In determining *costs* or *market benefits*, any cost or benefit which cannot be measured as a cost or benefit to producers, distributors and consumers of electricity in terms of financial transactions in the market should be disregarded. The allocation of costs and benefits between the electricity and other markets must be based on principles consistent with the Transmission Ring-Fencing Guidelines and/or Distribution Ring-Fencing Guidelines (as appropriate). Only direct costs and benefits (associated with a partial equilibrium analysis) should be included and any additional indirect costs or benefits (associated with a general equilibrium analysis) should be excluded from the assessment.
- (9) In determining the *costs* or *market benefits*, it should be considered whether the *proposed option* will enable:
  - (a) a *Transmission Network Service Provider* to provide both prescribed and other services; or
  - (b) a *Distribution Network Service Provider* to provide both prescribed distribution services and other services.

If it does, the costs and market benefits associated with the other services should be disregarded. The allocation of costs between prescribed and other services must be consistent with the Transmission Ring-Fencing Guidelines. The allocation of costs between prescribed distribution services and other services must be consistent with the relevant Distribution Ring-Fencing Guidelines.
- (10) The present value calculations must use a commercial discount rate appropriate for the analysis of a private enterprise investment in the electricity sector. The discount rate used should be consistent with the cash flows being discounted.
- (11) The analysis must include modelling a range of reasonable *market development scenarios*, incorporating varying levels of demand growth at relevant load centres (reflecting demand side options), alternative project commissioning dates and various potential generator investments and realistic operating regimes. These scenarios may

include alternative construction timetables as nominated by the proponent providing that relevant reliability standards would be met.

*Market development scenarios* must include:

- (a) *Committed projects*;
- (b) *Anticipated projects*;
- (c) *Modelled projects*; and
- (d) any other technically feasible projects identified during the consultation process.

(12) *Committed project* means a project which satisfies all the following criteria:

- (a) the proponent has obtained all required planning consents, construction approvals and licenses, including completion and acceptance of any necessary environmental impact statement;
- (b) construction of the proposal must either have commenced or a firm commencement date must be set;
- (c) the proponent has purchased/settled/acquired land (or commenced legal proceedings to acquire land) for construction of the proposed development;
- (d) contracts for supply and construction of the major components of the plant and equipment (such as generators, turbines, boilers, transmission towers, conductors, terminal station equipment) should be finalised and executed, including any provisions for cancellation payments; and
- (e) the financing arrangements for the proposal, including any debt plans, must have been finalised and contracts executed.

(13) *Anticipated project* means a project which:

- (a) does not meet each of the criteria in note 12; and
- (b) is in the process of meeting one or more of the criterion in note 12.

(14) *Modelled project* means a project (other than a committed project or anticipated project) modelled using either ‘least-cost market development’ modelling or ‘market-driven market development’ modelling:

- (c) Least-cost market development modelling means modelling projects based on a least-cost planning approach akin to conventional central planning. The proposals to be included would be those where the net present value of benefits, such as fuel substitution and reliability increases, exceeds the costs.
- (d) Market-driven market development modelling means modelling spot price trends based on existing generation and demand and includes new generation developed on the same basis as would a private developer (where the net present value of the spot price revenue exceeds the net present value of

generation costs). The forecasts of spot price trends should reflect a range of market outcomes, ranging from short run marginal cost bidding behaviour to simulations that approximate non-competitive bidding or imperfect competition, with power flows to be those most likely to occur under actual systems and market outcomes.

- (15) The calculation of the *costs* or *market benefits* must encompass sensitivity testing on key input variables. Sensitivity testing may be carried out on, but not limited to, the following, and should be appropriate to the size and type of project:
- (a) *Market benefits*:
    - (i) Using all reasonable methodologies; and
    - (ii) Testing reasonable forecasts of the value of electricity to consumers.
  - (b) Capital and operating costs of *alternative options*.
  - (c) Discount rate (the lower boundary should be the regulated cost of capital).
  - (d) Market demand.
  - (e) Generation bidding behaviour using:
    - (i) SRMC; and
    - (ii) Approximates of realistic bidding if measuring competition benefits.
  - (f) Commissioning dates of:
    - (i) Alternative projects;
    - (ii) Committed projects;
    - (iii) Anticipated projects; and
    - (iv) Modelled projects.
  - (g) Market based regulatory instruments that may be used to address greenhouse and environmental issues.
  - (h) Other sensitivity testing determined to be relevant and material to the case concerned.
- (16) Any relevant information which may have a material impact on the determination of *costs* or *market benefits* which comes to light at any time before an assessment is finalised must be considered and made available to interested parties.
- (17) This version of the *regulatory test* (version 2) comes into operation from the date of its promulgation, subject to the following transitional provisions.

The version of the *regulatory test* in operation immediately prior to the promulgation of version 2 of the *regulatory test* continues to apply in relation to:

- (a) possible options for which a *Distribution Network Service Provider* has commenced consultation under clause 5.6.2(f) or an economic cost effectiveness analysis under clause 5.6.2(g) prior to the promulgation of version 2 of the *regulatory test*;
- (b) a *new small network asset* for which a *Transmission Network Service Provider* has set out the matters required under clause 5.6.2A(b)(4) and (5) in an Annual Planning Report published before 30 June 2004. The ACCC can substitute a later date if a *Transmission Network Service Provider* does not publish its Annual Planning Report by 30 June 2004 (as required by clause 5.6.2A(a) of the Code);
- (c) a *new small network asset* not identified in an Annual Planning Report for which a *Transmission Network Service Provider* has published a report required under clause 5.6.6A(c) prior to the promulgation of version 2 of the *regulatory test*;
- (d) a *new large network asset* for which a *Transmission Network Service Provider* has published an application notice under clause 5.6.6(b) prior to the promulgation of version 2 of the *regulatory test*.

## **Appendix A Submissions**

The following submissions were received by the ACCC in response to the Draft Decision:

- AGL Electricity Limited
- Australian Greenhouse Office
- CS Energy
- Drayton Analytics
- ElectraNet SA
- EnergyAustralia
- Energy Retailers Association of Australia
- Energy Solutions Australia Pty Ltd
- Ergon Energy (DNSP)
- Ergon Energy (Retail)
- Institute of Public Affairs
- InterGen
- Loy Yang
- National Electricity Market Management Company
- NRG Flinders
- Origin Energy
- Powerlink
- Professor Gavan McDonell
- SPI PowerNet
- Transend
- TransGrid
- TXU
- VENCorp
- Wambo Power Ventures Pty Ltd

## Appendix B *regulatory test: Version 1*

### Preamble

The Australian Competition and Consumer Commission promulgates this *regulatory test* in accordance with clause 5.6.5(q)(1) of the National Electricity Code (the Code).

The *regulatory test* is to be applied:

- (a) to *transmission system* or *distribution system* augmentation proposals in accordance with clause 5.6.2 of the Code (*augmentation*);
- (b) by NEMMCO and the Inter-regional Planning Committee to augmentation options identified under clause 5.6.5 of the Code other than applications for new interconnectors in accordance with clause 5.6.6 of the Code (*augmentation option*); and
- (c) by NEMMCO and the Inter-regional Planning Committee to applications for new interconnectors across regions in accordance with clause 5.6.5 and 5.6.6 of the Code (*new interconnectors*).

In this test, *augmentations*, *augmentation options* and *new interconnectors* are called *proposed augmentations*.

### The *regulatory test*

The Commission has determined that the *regulatory test* is as follows:

*A new interconnector or an augmentation option* satisfies this test if it maximises the *net present value* of the *market benefit* having regard to a number of alternative projects, timings and market development scenarios; and

An *augmentation* satisfies this test if –

- (a) in the event the *augmentation* is proposed in order to meet an objectively measurable service standard linked to the technical requirements of schedule 5.1 of the Code – the *augmentation* minimises the net present value of the *cost* of meeting those standards; or
- (b) in all other cases – the *augmentation* maximises the net present value of the *market benefit*

having regard to a number of alternative projects, timings and market development scenarios.

For the purposes of the test:

- (a) *market benefit* means the total net benefits of the *proposed augmentation* to all those who produce, distribute and consume electricity in the National Electricity Market. That is, the increase in consumers' and producers' surplus or another measure that can be demonstrated to produce equivalent ranking of options in most (although not all) credible scenarios;

- (b) *cost* means the total cost of the *augmentation* to all those who produce, distribute or consume electricity in the National Electricity Market. Any requirements in notes 1 to 9, inclusive, on the methodology to be used to calculate the *market benefit* of a *proposed augmentation* should also be read as a requirement on the methodology to be used to calculate the *cost* of an *augmentation*;
- (c) the net present value calculations should use a discount rate appropriate for the analysis of a private enterprise investment in the electricity sector;
- (d) the calculation of the *market benefit* or *cost* should encompass sensitivity analysis with respect to the key input variables, including capital and operating costs, the discount rate and the *commissioning* date, in order to demonstrate the robustness of the analysis;
- (e) a *proposed augmentation* maximises the *market benefit* if it achieves a greater *market benefit* in most (although not all) credible scenarios; and
- (f) an *augmentation* minimises the *cost* if it achieves a lower *cost* in most (although not all) credible scenarios.

**Notes on the methodology to be used in the *regulatory test* to a proposed augmentation**

- (1) In determining the *market benefit*, the following information should be considered:
  - (a) the cost of the *proposed augmentation*;
  - (b) reasonable forecasts of:
    - i. electricity demand (modified where appropriate to take into account demand side options, variations in economic growth, variations in weather patterns and reasonable assumptions regarding price elasticity);
    - ii. the value of energy to electricity consumers as reflected in the level of VoLL;
    - iii. the efficient operating costs of competitively supplying energy to meet forecast demand from existing, *committed*, *anticipated* and *modelled projects* including demand side and generation projects;
    - iv. the capital costs of *committed*, *anticipated* and *modelled projects* including demand side and generation projects and whether the capital costs are completely or partially avoided or deferred;
    - v. the cost of providing sufficient ancillary services to meet the forecast demand; and
    - vi. the capital and operating costs of other regulated network and market network service provider projects that are augmentations consistent with the forecast demand and generation scenarios.
  - (c) the proponent's nominated *construction timetable* must include a *start of construction*, *construction time* and *commissioning*, where:

- i. *start of construction* means the date at which construction is required to commence in order to meet the *commissioning* date, taking into consideration the *construction time* nominated by the proponent;
- ii. *construction time* is the time nominated by the proponent to order equipment and build the project and does not include the time required to obtain environmental, regulatory or planning approval; and
- iii. *commissioning* means the date, nominated by the proponent, on which the project is to be placed into commercial operation.

(2) In determining the *market benefit*, it should be considered whether the *proposed augmentation* will enable:

- (a) a *Transmission Network Service Provider* to provide both *prescribed* and other services; or
- (b) a *Distribution Network Service Provider* to provide both *prescribed distribution services* and other services

If it does, the costs and benefits associated with the other services should be disregarded. The allocation of costs between *prescribed* and other services must be consistent with the *Transmission Ring-Fencing Guidelines*. The allocation of costs between *prescribed distribution services* and other services must be consistent with the relevant *Distribution Ring-Fencing Guidelines*.

- (3) The costs identified in determining the *market benefit* should include the cost of complying with existing and anticipated laws, regulations and administrative determinations such as those dealing with health and safety, land management and environment pollution and the abatement of pollution. An environmental tax should be treated as part of a project's cost. An environmental subsidy should be treated as part of a project's benefits or as a negative cost. Any other costs should be disregarded.
- (4) In determining the *market benefit*, any benefit or cost which cannot be measured as a benefit or cost to producers, distributors and consumers of electricity in terms of financial transactions in the market should be disregarded. The allocation of costs and benefits between the electricity and other markets must be based on principles consistent with the *Transmission Ring-Fencing Guidelines* and/or *Distribution Ring-Fencing Guidelines* (as appropriate). Only direct costs and benefits (associated with a partial equilibrium analysis) should be included and any additional indirect costs or benefits (associated with a general equilibrium analysis) should be excluded from the assessment.
- (5) In determining the *market benefit*, the analysis should include modelling a range of reasonable alternative market development scenarios, incorporating varying levels of demand growth at relevant load centres (reflecting demand side options), alternative project *commissioning* dates and various potential generator investments and realistic operating regimes. These scenarios may include alternative *construction timetables* as nominated by the proponent. These scenarios should include projects undertaken to ensure that relevant reliability standards are met.

These market development scenarios should include:

- (a) projects, the implementation and construction of which have commenced and which have expected commissioning dates within three years (*committed projects*);
  - (b) projects, the planning for which is at an advanced stage and which have expected commissioning dates within 5 years (*anticipated projects*);
  - (c) generic generation and other investments (based on projected fuel and technology availability) which are likely to be commissioned in response to growing demand or as substitutes for existing generation plant (*modelled projects*); and
  - (d) any other projects identified during the consultation process.
- (6) Modelled projects should be developed within market development scenarios using two approaches: ‘least-cost market development’ and ‘market-driven market development’.
- (a) The least-cost market development approach includes modelled projects based on a least-cost planning approach akin to conventional central planning. The proposals to be included would be those where the net present value of benefits, such as fuel substitution and reliability increases, exceeds the costs.
  - (b) The market-driven market development approach mimics market processes by modelling spot price trends based on existing generation and demand and includes new generation developed on the same basis as would a private developer (where the net present value of the spot price revenue exceeds the net present value of generation costs). The forecasts of spot price trends should reflect a range of market outcomes, ranging from short run marginal cost bidding behaviour to simulations that approximate actual market bidding and prices, with power flows to be those most likely to occur under actual systems and market outcomes.
- (7) In determining the *market benefit*, the *proposed augmentation* should not pre-empt nor distort potential unregulated developments including network, generation and demand side developments. To this end:
- (a) a *proposed augmentation* must not be determined to satisfy this test more than 12 months before the *start of construction* date;
  - (b) a *proposed augmentation* will cease to satisfy this test if it has not commenced operation by 12 months after the *commissioning* date unless there has been a delay clearly due to unforeseen circumstances;
  - (c) unless there are exceptional circumstances, *new interconnectors* must not be determined to satisfy this test if *start of construction* is within 18 months of the project’s need being first identified in a network’s annual planning review or NEMMCO’s statement of opportunities (or in some similar published document in the period prior to 13 December 1998).
- (8) The consultation process for determining whether a *proposed augmentation* satisfies this test must be an open process, with interested parties having an opportunity to

provide input and understand how the benefits have been measured and how the decision has been made. Specific consultation is required on:

- (a) identifying *committed projects* and *anticipated projects*;
  - (b) setting input assumptions such as fuel costs and load growth;
  - (c) modelling market behaviour and considering whether the market development scenarios are realistic;
  - (d) the proponent's *construction timetable*;
  - (e) understanding how benefits will be allocated; and
  - (f) understanding how a decision has been made.
- (9) Any information which may have a material impact on the determination of *market benefit* and which comes to light at any time before the final decision must be considered and made available to interested parties.

## Proposed amendments

## Change from Previous version

### Preamble

The Australian Competition and Consumer Commission promulgates this *regulatory test* in accordance with clause 5.6.5A of the National Electricity Code (the Code).

In this test “option” includes, but is not limited to, an *augmentation, new large network asset* and *new small network asset*.

### Preamble

Amended “clause 5.6.5(q)(1)”

to “clause 5.6.5A”

Removed wording:

“The regulatory test is to be applied:

- (a) to *transmission system* or *distribution system* augmentation proposals in accordance with clause 5.6.2 of the Code (*augmentation*);
- (b) by NEMMCO and the Inter-regional Planning Committee to augmentation options identified under clause 5.6.5 of the Code other than applications for new interconnectors in accordance with clause 5.6.6 of the Code (*augmentation option*); and
- (c) by NEMMCO and the Inter-regional Planning Committee to applications for new interconnectors across regions in accordance with clause 5.6.5 and 5.6.6 of the Code (*new interconnectors*).”

Amended “In this test, *augmentations, augmentation options* and *new interconnectors* are called *proposed augmentations*.”

to

“In this test “option” includes, but is not limited to, an *augmentation, new large network asset* and *new small network asset*”

<p><b>regulatory test</b></p> <p>(1) An option satisfies the <i>regulatory test</i> if:</p> <p>(a) in the event the option is necessitated solely by the inability to meet the minimum network performance requirements set out in schedule 5.1 of the Code or in relevant legislation, regulations or any statutory instrument of a participating jurisdiction - the option minimises the present value of <i>costs</i>, compared with a number of <i>alternative options</i> in a majority of <i>reasonable scenarios</i>;</p> <p>(b) in all other cases - the option maximises the expected net present value of the <i>market benefit</i> (or in other words the present value of the <i>market benefit</i> less the present value of <i>costs</i>) compared with a number of <i>alternative options</i> and timings, in a majority of <i>reasonable scenarios</i>.</p>	<p><b>regulatory test</b></p> <p>Removed wording:</p> <p>The Commission has determined that the regulatory test is as follows:</p> <p><i>A new interconnector or an augmentation option</i> satisfies this test if it maximises the <i>net present value</i> of the <i>market benefit</i> having regard to a number of alternative projects, timings and market development scenarios; and</p> <p>An <i>augmentation</i> satisfies this test if –</p> <p>(a) in the event the <i>augmentation</i> is proposed in order to meet an objectively measurable service standard linked to the technical requirements of schedule 5.1 of the Code – the <i>augmentation</i> minimises the net present value of the <i>cost</i> of meeting those standards; or</p> <p>(b) in all other cases – the <i>augmentation</i> maximises the net present value of the <i>market benefit</i></p> <p>having regard to a number of alternative projects, timings and market development scenarios.</p>
<p><b>For the purposes of this test:</b></p> <p>(2) <i>Costs</i> means the total cost of an option (or an <i>alternative option</i>) to all those who produce, distribute or consume electricity in the National Electricity Market.</p> <p>In determining the <i>costs</i>, the analysis may include, but need not be limited to, the following:</p> <p>(a) costs incurred in constructing or providing the option;</p> <p>(b) operating and maintenance costs over the operating life of the option;</p> <p>(c) the cost of complying with existing and anticipated laws, regulations and administrative determinations such as those dealing with health</p>	<p>Inserted: “an option (or an <i>alternative options</i>)”</p> <p>Deleted: “Any requirements in notes 1 to 9, inclusive, on the methodology to be used to calculate the <i>market benefit</i> of a <i>proposed augmentation</i> should also be read as a requirement on the methodology to be used to calculate the <i>cost</i> of an <i>augmentation</i>;”</p> <p>Inserted: “In determining the <i>costs</i>, the analysis may include, but need not be limited to, the following:</p> <p>(a) costs incurred in constructing or providing the option;</p> <p>(b) operating and maintenance costs over the operating life</p>

<p>and safety, land management and environment pollution and the abatement of pollution (including greenhouse gas abatement). An environmental tax should be treated as part of a project's cost. An environmental subsidy should be treated as part of a project's benefits or as a negative cost.</p> <p>(d) other costs that are determined to be relevant to the case concerned.</p>	<p>of the option;</p> <p>(c) the cost of complying with existing and anticipated laws, regulations and administrative determinations such as those dealing with health and safety, land management and environment pollution and the abatement of pollution (including greenhouse gas abatement). An environmental tax should be treated as part of a project's cost. An environmental subsidy should be treated as part of a project's benefits or as a negative cost.</p> <p>(d) other costs that are determined to be relevant to the case concerned.</p>
<p>(3) <i>Alternative options</i> means:</p> <p>(a) For an option proposed in accordance with paragraph 1(a) of this test:</p> <p>(i) a genuine alternative to the option being assessed, in that it:</p> <p>(A) has a clearly identifiable proponent; and</p> <p>(B) meets the requirements referred to in paragraph 1(a);</p> <p>(ii) a practicable alternative to the option being assessed in that it is technically feasible.</p> <p>(b) For an option proposed in accordance with paragraph 1(b) of this test:</p> <p>(i) a genuine alternative to the option being assessed, in that it:</p> <p>(A) delivers similar outcomes to those delivered by</p>	<p>Not in previous version</p>

<p>the option being assessed; and</p> <p>(B) becomes operational in a similar timeframe to the option being assessed;</p> <p>(ii) a practicable alternative to the option being assessed in that it is:</p> <p>(A) technically feasible; and</p> <p>(B) commercially feasible, which is to be demonstrated by determining whether an objective operator, acting rationally according to the economic criteria prescribed by this test, would be prepared to construct or provide the <i>alternative option</i>.</p> <p>The existence of a genuine proponent for the <i>alternative option</i> should be taken into account when determining practicability, however, absence of such a proponent will not exclude a project from being an <i>alternative option</i> for the purposes of the regulatory test.</p>	
<p>(4) <i>Reasonable scenarios</i> means scenarios incorporating:</p> <p>(a) reasonable forecasts of:</p> <p>(i) electricity demand (modified where appropriate to take into account demand-side options, variations in economic growth, variations in weather patterns and reasonable assumptions regarding price elasticity);</p> <p>(ii) the efficient operating costs of competitively supplying energy to meet forecast demand from existing, committed, anticipated and modelled projects including demand side and generation projects;</p> <p>(iii) the avoidable costs of committed, anticipated and modelled projects including demand side and generation projects and</p>	<p>Not in previous version</p>

<p>whether all avoidable costs are completely or partially avoided or deferred;</p> <p>(iv) the cost of providing sufficient ancillary services to meet the forecast demand; and</p> <p>(v) the capital and operating costs of other regulated network and market network service projects that are augmentations consistent with the forecast demand and generation scenarios</p> <p>(b) scenarios defined as market development scenarios; and</p> <p>(c) sensitivity testing.</p>	
<p>(5) <i>Market benefit</i> means the total benefits of an option (or an <i>alternative option</i>) to all those who produce, distribute and consume electricity in the National Electricity Market. That is, the change in consumers' plus producers' surplus or another measure that can be demonstrated to produce an equivalent ranking of options in a majority of <i>reasonable scenarios</i>. For clarity, <i>market benefit</i> does not include the transfer of surplus between consumers and producers.</p> <p>In determining the <i>market benefit</i>, the analysis may include, but need not be limited to the following benefits:</p> <p>(a) changes in fuel consumption arising through different generation dispatch;</p> <p>(b) changes in voluntary load curtailment caused through reduction in demand-side curtailment;</p> <p>(c) changes in involuntary load shedding caused through savings in reduction in lost load, using a reasonable forecast of the value of electricity to consumers, or deferral of reliability entry plant;</p> <p>(d) changes in costs caused through:</p> <p>(i) deferral of market entry plant. This must be excluded if reliability benefits are determined using deferral of</p>	<p>Inserted: “(or an <i>alternative option</i>)”</p> <p>Amended: “in most (although not all) credible scenarios”</p> <p>To: “in a majority of <i>reasonable scenarios</i>”</p> <p>Inserted: “In determining the <i>market benefit</i>, the analysis may include, but need not be limited to the following benefits:</p> <p>(a) changes in fuel consumption arising through different generation dispatch;</p> <p>(b) changes in voluntary load curtailment caused through reduction in demand-side curtailment;</p> <p>(c) changes in involuntary load shedding caused through savings in reduction in lost load, using a reasonable forecast of the value of electricity to consumers, or deferral of reliability entry plant;</p> <p>(d) changes in costs caused through:</p> <p>(i) deferral of market entry plant. This must be excluded if reliability benefits are determined using deferral of</p>

<ul style="list-style-type: none"> <li>reliability entry plant;</li> <li>(ii) differences in capital costs;</li> <li>(iii) differences in the operational and maintenance costs; and</li> <li>(iv) deferral of transmission investments;</li> <li>(e) changes in transmission losses;</li> <li>(f) changes in ancillary services;</li> <li>(g) <i>competition benefits</i>; and</li> <li>(h) other benefits that are determined to be relevant to the case concerned.</li> </ul>	<ul style="list-style-type: none"> <li>reliability entry plant;</li> <li>(ii) differences in capital costs;</li> <li>(iii) differences in the operational and maintenance costs; and</li> <li>(iv) deferral of transmission investments;</li> <li>(e) changes in transmission losses;</li> <li>(f) changes in ancillary services;</li> <li>(g) <i>competition benefits</i>; and</li> <li>(h) other benefits that are determined to be relevant to the case concerned.</li> </ul>
<p>(6) <i>Competition benefits</i> means the change in benefit between the scenario where, after implementation of the option:</p> <ul style="list-style-type: none"> <li>(a) generator bidding is assumed to be the same as it was before the option was implemented; and</li> <li>(b) generator bidding reflects any market power after the implementation of the option.</li> </ul> <p>or another reasonable measure that can be demonstrated to produce an equivalent change in benefit.</p>	<p>Not in previous version</p>
<p>(7) The <i>market benefit</i> of an option will only include <i>competition benefits</i> where:</p> <ul style="list-style-type: none"> <li>(a) the option is a <i>new large network asset</i> or a <i>new large distribution network asset</i>; and</li> <li>(b) the <i>Network Service Provider</i> responsible for undertaking the analysis of the option determines that it is appropriate, in all the</li> </ul>	<p>Not in previous version</p>

<p>circumstances, to take <i>competition benefits</i> into account in assessing the <i>market benefit</i> of the option.</p>	
<p>(8) In determining <i>costs</i> or <i>market benefits</i>, any cost or benefit which cannot be measured as a cost or benefit to producers, distributors and consumers of electricity in terms of financial transactions in the market should be disregarded. The allocation of costs and benefits between the electricity and other markets must be based on principles consistent with the Transmission Ring-Fencing Guidelines and/or Distribution Ring-Fencing Guidelines (as appropriate). Only direct costs and benefits, not including wealth transfers, (associated with a partial equilibrium analysis) should be included and any additional indirect costs or benefits (associated with a general equilibrium analysis) should be excluded from the assessment.</p>	<p>No changes from previous version</p>
<p>(9) In determining the <i>costs</i> or <i>market benefits</i>, it should be considered whether the <i>proposed augmentation</i> will enable:</p> <p>(c) a <i>Transmission Network Service Provider</i> to provide both prescribed and other services; or</p> <p>(d) a <i>Distribution Network Service Provider</i> to provide both prescribed distribution services and other services</p> <p>If it does, the costs and market benefits associated with the other services should be disregarded. The allocation of costs between prescribed and other services must be consistent with the Transmission Ring-Fencing Guidelines. The allocation of costs between prescribed distribution services and other services must be consistent with the relevant Distribution Ring-Fencing Guidelines.</p>	<p>Deleted words:</p> <p>“Any relevant information which may have a material impact on the determination of market benefit and which comes to light at any time before the final decision must be considered and made available to interested parties”</p>
<p>(10) The present value calculations must use a commercial discount rate appropriate for the analysis of a private enterprise investment in the electricity sector. The discount rate used should be consistent with the cash flows being discounted.</p>	<p>Added</p> <p>The discount rate used should be consistent with the cash flows being discounted.</p>

<p>(11) The analysis must include modelling a range of reasonable market development scenarios, incorporating varying levels of demand growth at relevant load centres (reflecting demand side options), alternative project commissioning dates and various potential generator investments and realistic operating regimes. These scenarios may include alternative construction timetables as nominated by the proponent providing that relevant reliability standards would be met.</p> <p>Market development scenarios must include:</p> <ul style="list-style-type: none"> <li>(a) <i>committed projects</i>;</li> <li>(b) <i>anticipated projects</i>;</li> <li>(c) <i>modelled projects</i>; and</li> <li>(d) any other technically feasible projects identified during the consultation process.</li> </ul>	<p>Deleted: “In determining the <i>market benefit</i>”</p> <p>Amended: “These market development scenarios should include:</p> <ul style="list-style-type: none"> <li>(a) projects, the implementation and construction of which have commenced and which have expected commissioning dates within three years (<i>committed projects</i>);</li> <li>(b) projects, the planning for which is at an advanced stage and which have expected commissioning dates within 5 years (<i>anticipated projects</i>);</li> <li>(c) generic generation and other investments (based on projected fuel and technology availability) which are likely to be commissioned in response to growing demand or as substitutes for existing generation plant (<i>modelled projects</i>); and</li> <li>(d) any other projects identified during the consultation process.”</li> </ul> <p>To: “Market development scenarios must include:</p> <ul style="list-style-type: none"> <li>(a) committed projects;</li> <li>(b) anticipated projects;</li> <li>(c) modelled projects; and</li> <li>(d) any other technically feasible projects identified during the consultation process.</li> </ul>
<p>(12) <i>Committed project</i> means a project which satisfies all the following criteria:</p> <ul style="list-style-type: none"> <li>(a) the proponent has obtained all required planning consents, construction approvals and licenses, including completion and acceptance of any necessary environmental impact statement;</li> <li>(b) construction of the proposal must either have commenced or a firm commencement date must be set;</li> <li>(c) the proponent has purchased/settled/acquired land (or commenced legal proceedings to acquire land) for construction of the proposed development;</li> <li>(d) contracts for supply and construction of the major components of the plant and equipment ( such as generators, turbines, boilers,</li> </ul>	<p>Deleted</p> <ul style="list-style-type: none"> <li>(a) projects, the implementation and construction of which have commenced and which have expected commissioning dates within three years (<i>committed projects</i>);</li> </ul>

<p>transmission towers, conductors, terminal station equipment) should be finalised and executed, including any provisions for cancellation payments; and</p> <p>(e) the financing arrangements for the proposal, including any debt plans, must have been conducted and contracts executed.</p>	
<p>(13) <i>Anticipated project</i> means a project which:</p> <p>(a) does not meet each of the criteria in note 12; and</p> <p>(b) is in the process of meeting one or more of the criterion in note 12.</p>	<p><b>Deleted</b></p> <p>(b) projects, the planning for which is at an advanced stage and which have expected commissioning dates within 5 years (<i>anticipated projects</i>);</p>
<p>(14) <i>Modelled projects</i> means a project modelled using either ‘least-cost market development’ modelling or ‘market-driven market development’ modelling:</p> <p>(a) Least-cost market development modelling means modelling projects based on a least-cost planning approach akin to conventional central planning. The proposals to be included would be those where the net present value of benefits, such as fuel substitution and reliability increases, exceeds the costs.</p> <p>(b) Market-driven market development modelling means modelling spot price trends based on existing generation and demand and includes new generation developed on the same basis as would a private developer (where the net present value of the spot price revenue exceeds the net present value of generation costs). The forecasts of spot price trends should reflect a range of market outcomes, ranging from short run marginal cost bidding behaviour to simulations that approximate non-competitive bidding or imperfect competition, with power flows to be those most likely to occur under actual systems and market outcomes.</p>	<p>Deleted “The” from (a) Least-cost.... and (b) Market driven....</p>

<p>(15) The calculation of the <i>costs</i> or <i>market benefits</i> must encompass sensitivity testing on key input variables. Sensitivity testing may be carried out on, but not limited to, the following, and should be appropriate to the size and type of project:</p> <p>(a) <i>Market benefits:</i></p> <p>(i) Using all reasonable methodologies; and</p> <p>(ii) Testing reasonable forecasts of the value of electricity to consumers.</p> <p>(b) Capital and operating costs of <i>alternative options</i>.</p> <p>(c) Discount rate (the lower boundary should be the regulated cost of capital).</p> <p>(d) Market demand.</p> <p>(e) Generation bidding behaviour using:</p> <p>(i) SRMC; and</p> <p>(ii) Approximates of realistic bidding if measuring competition benefits.</p> <p>(f) Commissioning dates of:</p> <p>(i) Alternative projects;</p> <p>(ii) Committed projects;</p> <p>(iii) Anticipated projects; and</p> <p>(iv) Modelled projects.</p> <p>(g) Market based regulatory instruments that may be used to address</p>	<p>Deleted: “, including capital and operating costs, the discount rate and the <i>commissioning</i> date, in order to demonstrate the robustness of the analysis”</p> <p>Inserted</p> <p>(a) <i>Market benefits:</i></p> <p>(i) Using all reasonable methodologies; and</p> <p>(ii) Testing reasonable forecasts of the value of electricity to consumers.</p> <p>(b) Capital and operating costs of <i>alternative options</i>.</p> <p>(c) Discount rate (the lower boundary should be the regulated cost of capital).</p> <p>(d) Market demand.</p> <p>(e) Generation bidding behaviour using:</p> <p>(i) SRMC; and</p> <p>(ii) Approximates of realistic bidding if measuring competition benefits.</p> <p>(f) Commissioning dates of:</p> <p>(i) Alternative projects;</p> <p>(ii) Committed projects;</p> <p>(iii) Anticipated projects; and</p> <p>(iv) Modelled projects.</p> <p>(g) Market based regulatory instruments that may be used to address</p>
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<p>greenhouse and environmental issues.</p> <p>(h) Other sensitivity testing determined to be relevant and material to the case concerned.</p>	<p>greenhouse and environmental issues.</p> <p>(h) Other sensitivity testing determined to be relevant and material to the case concerned.</p>
<p>(16) Any relevant information which may have a material impact on the determination of <i>costs</i> or <i>market benefits</i> which comes to light at any time before an assessment is finalised must be considered and made available to interested parties.</p>	<p>Inserted “<i>costs</i> or” into section</p>
<p>(17) This version of the regulatory test (version 2) comes into operation from the date of its promulgation, subject to the following transitional provisions.</p> <p>The version of the regulatory test in operation immediately prior to the promulgation of version 2 of the regulatory test continues to apply in relation to:</p> <p>(a) possible options for which a <i>Distribution Network Service Provider</i> has commenced consultation under clause 5.6.2(f) or an economic cost effectiveness analysis under clause 5.6.2(g) prior to the promulgation of version 2 of the regulatory test;</p> <p>(b) a <i>new small network asset</i> for which a <i>Transmission Network Service Provider</i> has set out the matters required under clause 5.6.2A(b)(4) and (5) in an Annual Planning Report published before 30 June 2004. The ACCC can substitute a later date if a <i>Transmission Network Service Provider</i> does not publish its Annual Planning Report by 30 June 2004 (as required by clause 5.6.2A(a) of the Code);</p> <p>(c) a <i>new small network asset</i> not identified in an Annual Planning Report for which a <i>Transmission Network Service Provider</i> has published a report required under clause 5.6.6A(c) prior to the</p>	<p>Not in previous version.</p>

<p>promulgation of version 2 of the regulatory test;</p> <p>(d) a <i>new large network asset</i> for which a <i>Transmission Network Service Provider</i> has published an application notice under clause 5.6.6(b) prior to the promulgation of version 2 of the regulatory test.</p>	
	<p>Deleted:</p> <p>(7) In determining the <i>market benefit</i>, the <i>proposed augmentation</i> should not pre-empt nor distort potential unregulated developments including network, generation and demand side developments. To this end:</p> <p>(d) a <i>proposed augmentation</i> must not be determined to satisfy this test more than 12 months before the <i>start of construction</i> date;</p> <p>(e) a <i>proposed augmentation</i> will cease to satisfy this test if it has not commenced operation by 12 months after the <i>commissioning</i> date unless there has been a delay clearly due to unforeseen circumstances;</p> <p>(f) unless there are exceptional circumstances, <i>new interconnectors</i> must not be determined to satisfy this test if <i>start of construction</i> is within 18 months of the project's need being first identified in a network's annual planning review or NEMMCO's statement of opportunities (or in some similar published document in the period prior to 13 December 1998).</p> <p>(8) The consultation process for determining whether a <i>proposed augmentation</i> satisfies this test must be an open process, with interested parties having an opportunity to provide input and understand how the benefits have been measured and how the decision has been made. Specific consultation is</p>

	<p>required on:</p> <ul style="list-style-type: none"><li>(a) identifying <i>committed projects</i> and <i>anticipated projects</i>;</li><li>(b) setting input assumptions such as fuel costs and load growth;</li><li>(c) modelling market behaviour and considering whether the market development scenarios are realistic;</li><li>(d) the proponent's <i>construction timetable</i>;</li><li>(e) understanding how benefits will be allocated; and</li><li>(f) understanding how a decision has been made.</li></ul>
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# Appendix C A Definition of Competition Benefits

Dr Darryl Biggar (Consultant)

## Australian Competition and Consumer Commission

It is generally accepted that a transmission augmentation may enhance the overall welfare of participants in the electricity industry (i.e., generators and consumers). It is also generally accepted that in some cases a portion of that total welfare enhancement is due to the effect of the transmission augmentation on competition between generators. But what, exactly, is the best way to isolate that component of the total welfare enhancement of a transmission augmentation that can be attributed to enhanced competition?

### First principles

In order to keep this discussion as simple as possible, let's focus on the short-term in which generator and consumer locations and fuel choices are fixed and the transmission network can be taken as fixed.

The NEM dispatch engine operates as follows. Each five minutes it accepts bids and offers from electricity producers and dispatchable load. The dispatch engine then finds the "dispatch" (i.e., the quantity of electricity to be produced or consumed in that five minute interval for each generator and dispatchable load) which maximises the total surplus from trade (i.e., the sum of producers' surplus and consumers' surplus) subject to the physical limitations imposed by the transmission network at that moment in time.<sup>33</sup>

Any augmentation to the transmission network therefore has two primary effects on the dispatch in the short-term:

- (a) First, an augmentation to the transmission network changes the physical limitations on the transmission network. The effect of changing these physical limits is normally to allow the dispatch engine to find a dispatch with a higher total surplus.
- (b) Second, an augmentation to the transmission network may affect how generators bid into the NEM. In particular, an augmentation to the transmission network may increase competition between existing generators, causing them to submit offers which are closer to short-run marginal cost.

We can separate these two effects by first, considering the new optimal dispatch from a new transmission augmentation, *holding constant* the bids and offers of all generators and dispatchable load. We could subsequently consider the dispatch that results (holding constant the network with the new augmentation) from changing the bids and offers of generators and load.

The former benefits – those benefits that result from a re-allocation of generation and load, holding constant the bids and offers – we could call the "efficiency benefits" from the

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<sup>33</sup> And certain other constraints such as ramp rates on generators, the availability of ancillary services and so on.

transmission augmentation. The latter benefits – those benefits that result from any changes in the bids and offers from the augmentation, holding constant the network with the augmentation is in place – we could call the “*competition benefits*”.<sup>34</sup>

Under this approach, the total benefits resulting from any transmission augmentation is broken down into two parts – the “efficiency benefits” arising from the re-dispatch of generation and load made possible by the new augmentation, and the “*competition benefits*” arising from the change in the bid and offer curves brought about by the new augmentation.

In principle, a *regulatory test* (at least one which operated over the very short term) would operate in an identical manner. A project satisfies the *regulatory test* if it maximises the “market benefit” having regard to a number of alternative projects. In this context the “market benefit” referred to in the *regulatory test* is essentially the same as the “total surplus” (the sum of consumers’ surplus and producers’ surplus) which is maximised by the NEM dispatch engine.

We can therefore define the various key terms, including *competition benefits*:

**Key Definitions:**

For a given potential project, the “**total benefits**” of the project is defined to be the difference in total surplus in the following two network scenarios:

- (a) the “status quo network” with bidding which accurately and fully reflects any market power in the status quo network; and
- (b) the “augmented network” in which the existing network is augmented with the proposed project with bidding which accurately and fully reflects any market power in the augmented network.

The “**efficiency benefits**” of the project is defined to be the difference in total surplus in the following two network scenarios:

- (a) the “status quo network” with bidding which accurately and fully reflects any market power in the status quo network; and
- (b) the “augmented network” with bidding assumed to be the same as in the status quo network.

The “***competition benefits***” of the project is defined to be the difference in total surplus arising from the following two network scenarios:

- (a) the “augmented network” with bidding assumed to be the same as in the status quo network.; and

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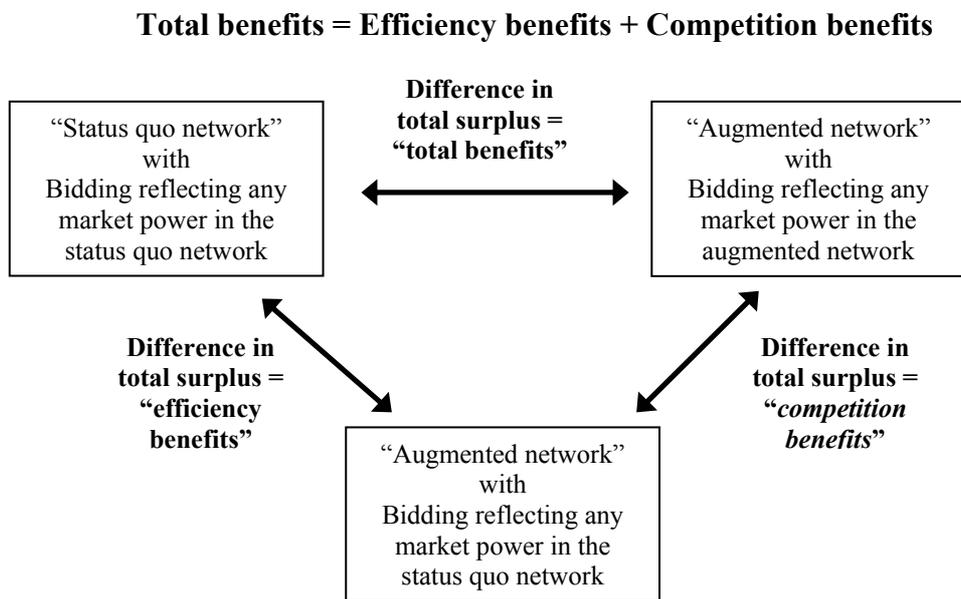
<sup>34</sup> I could, of course, equally define the *competition benefits* as arising from the change in total surplus arising from the change in bidding under the status quo network (i.e., without the augmentation) and the efficiency benefits as the change in the total surplus arising from the augmentation, assuming the bidding behaviour that would occur under the augmented network.

- (b) the “augmented network” with bidding which accurately and fully reflects any market power in the augmented network.

It immediately follows from this definition that for any project the total benefit is equal to the sum of the efficiency benefits and the *competition benefits*:

$$\text{Total benefits} = \text{Efficiency benefits} + \text{Competition benefits}$$

The relationship between total benefits, efficiency benefits and *competition benefits* can be illustrated in the following diagram:

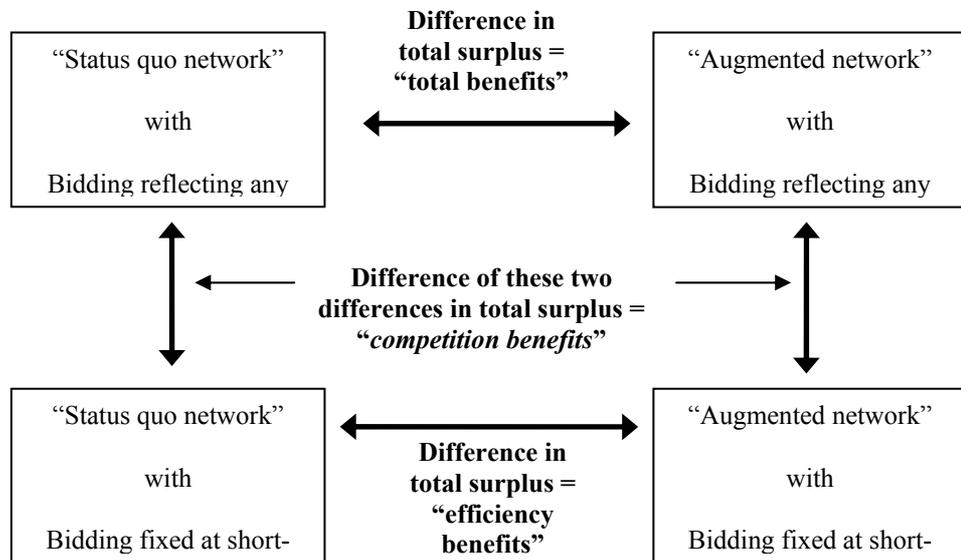


Under this approach, both the notion of “economic benefits” and “*competition benefits*” have an intuitive interpretation. In addition, in a short-run analysis it is straightforward to calculate the “efficiency benefits”: since the “status quo network” is the same as the existing network it is not necessary to explicitly and separately model the market power of generators in the status quo network – presumably that market power is already reflected in the actual bids which generators submit to NEMMCO. Given these actual bids it is a straightforward task to determine the short-run effect of a transmission augmentation holding constant the bids submitted by generators.

This is not the only way to define *competition benefits*. Frontier Economics has proposed an alternative approach under which the “Efficiency Benefits” are defined to be change in total surplus brought about by the augmentation assuming that bidding is held at marginal cost. The “Competition Benefits” are then defined as the difference between the “Total Benefits” and the “Efficiency Benefits”. This can be represented in the diagram below.

## Frontier Economics proposed definition of Competition Benefits

$$\text{Total benefits} = \text{Efficiency benefits} + \text{Competition benefits}$$



Under this approach the notion of *competition benefits* does not have an obvious economic interpretation. On the other hand, this approach does have the benefit that the concept of "Efficiency benefits" is closely related to the market benefits estimated in past applications of the *regulatory test* which have made use of marginal cost bidding. This approach therefore maintains comparability with past applications of the *regulatory test*.

# Appendix D Calculating Competition Benefits: A two town example

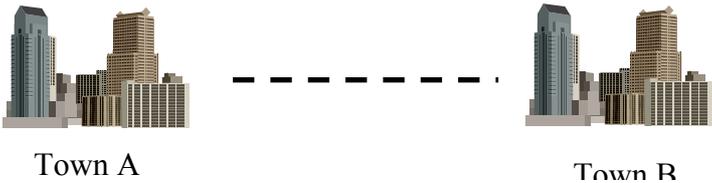
Dr Darryl Biggar (Consultant)

Australian Competition and Consumer Commission

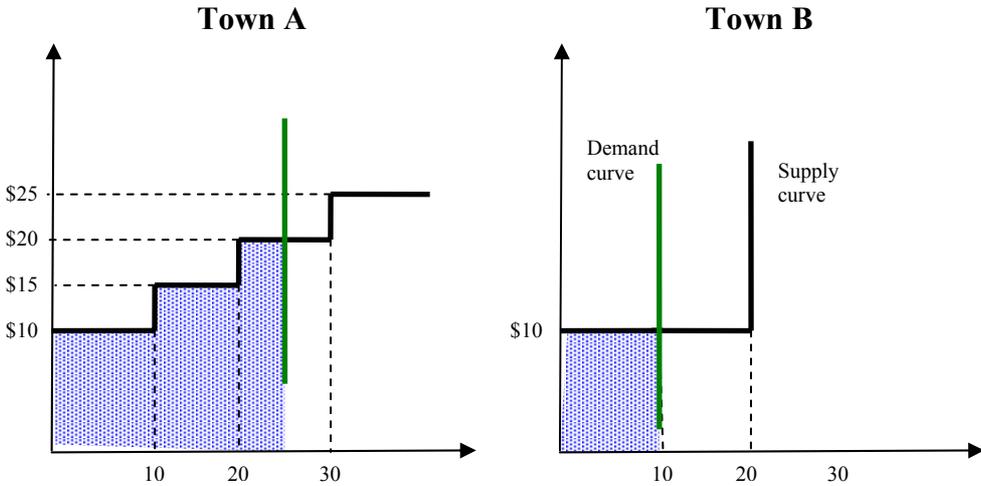
The examples used to illustrate the proposed definition, which were attached as appendix E and F of the draft decision, inadvertently included wealth transfers. This appendix presents these examples in the correct form:

## A Simple Example

Suppose that we have electricity industry comprising two towns with no electricity transmission links between them. Let's suppose that town A has a generation industry with 40 MW of generation capacity comprising 10 MW with a marginal cost of \$10/MWh, 10 MW at \$15/MWh, 10 MW at \$20/MWh and 10 MW at \$25/MWh. Town B is assumed to have 20 MW of generation capacity at \$10/MWh marginal cost.



We will assume first that both towns have a highly competitive generation industry. As a result all generators bid their short-run marginal cost curve.<sup>35</sup> The resulting industry supply curves are as indicated in the diagram below. Finally, let's suppose that there is 25 MW of load in town A and 10 MW of load in town B. The resulting market price is \$20/MWh in town A and \$10/MWh in town B as indicated in the diagram below.



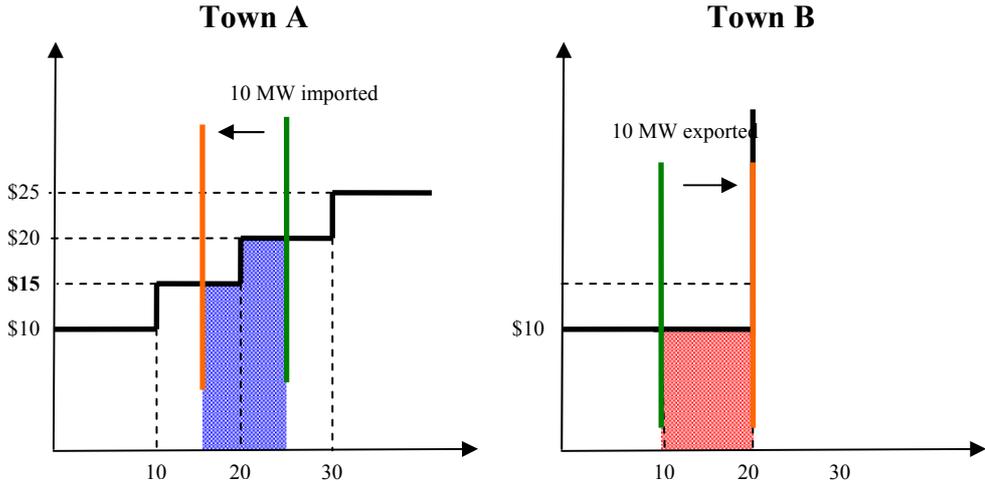
<sup>35</sup> For simplicity of exposition, let's assume no fixed costs so that there is no issue of fixed-cost recovery.

In a context such as this, where demand is perfectly inelastic, the maximisation of total surplus is equivalent to the minimisation of total generation costs. Therefore we will explore the effect of a new transmission link between the towns on the total generation cost.

Given the assumptions above the total cost of generation sufficient to meet demand is \$350 (10x\$10+10x\$15+5x\$20) for town A and \$100 (10x\$10) for town B, for a total cost of \$450 (illustrated by the shaded area in the diagram above).

Now consider the effect of constructing a new transmission link between town A and B with at least 10 MW of capacity. For simplicity, let’s ignore the effect of losses on this transmission link. Now the new efficient dispatch is for the higher-cost generators in town A to shut-down or reduce their output and for the generators in town B to increase their output (by 10 MW). The new optimal dispatch is for town B to produce 20 MW and town A to produce 15 MW. The spot price of electricity in both towns is now equalised at \$15/MWh. The total cost of generation is now \$175 (10x\$10+5x\$15) for town A and \$200 (20x\$10) for town B, for a total cost of generation of \$375.

This is illustrated in the following diagram (in this diagram and those that follow the red shaded region indicates an area in which total surplus has dropped relative to the previous diagram and the purple shaded area indicates an area in which total surplus has increased relative to the previous diagram).



The effect of the transmission link is therefore to reduce the total cost of generation by \$75. So, using the definition above, the “efficiency benefit” of this transmission link is \$75. Since the generation sectors of each town are assumed to be competitive before and after the transmission link is constructed, there is no change in the bids submitted by the generators in response to the transmission link, so there is no “competition benefit” in this case. The total benefit of the link is just the benefit resulting from more efficient dispatch – in this case, \$75.

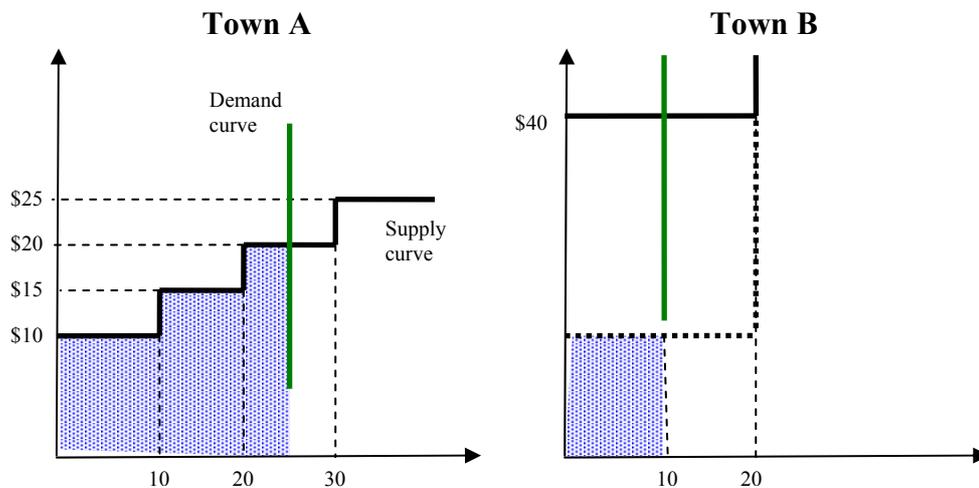
These results are summarised in the following table. Since we have assumed that this industry is competitive, the results under either the ACCC definition or the Frontier definition are the same:

**Table 1: Case A: Perfect competition in both towns**

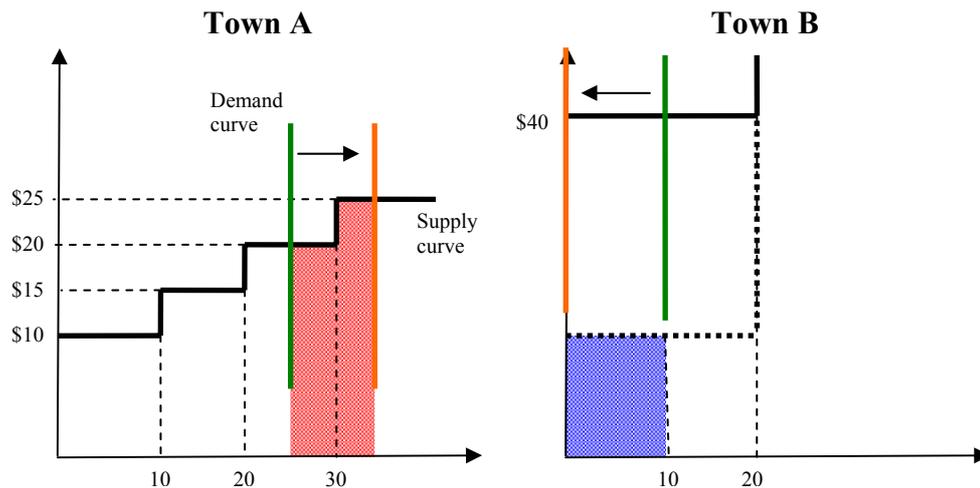
	<b>ACCC definition</b>	<b>Frontier definition</b>
Efficiency Benefit	\$75	\$75
Competition Benefit	\$0	\$0
Total Benefit	\$75	\$75

Let's change this example slightly to illustrate how a competition benefit might arise. Let's suppose now that the generation sector in town B consists of a single monopoly generator with 20 MW of capacity at \$10/MWh. Let's suppose that this generator initially charges a price of \$40/MWh to satisfy the local demand of 10 MW. This is equivalent, in this context, to submitting a bid with a marginal cost of generation at \$40/MWh.

Under these assumptions the total cost of generation is \$350 in town A (same as before) and \$100 (10x\$10) in town B for a total cost of \$450.



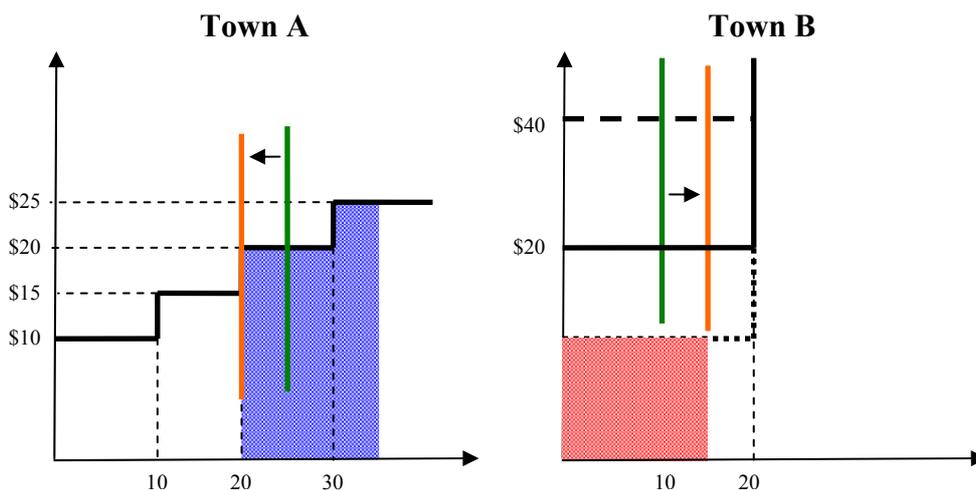
Now consider the effect of building a transmission link. Let's first suppose that we assume that the monopolist in town B does not change its bids after the link is constructed. Since the generation in town A is cheaper the new optimal dispatch is for town A to increase its output by 10 MW and for the generator in town B to shut down. The spot price in both regions equalises at \$25/MWh. The resulting dispatch has a total cost of generation of \$575 for town A (10x\$10+10x\$15+10x\$20+5x\$25) and zero for town B. The "efficiency benefit" is therefore \$-125 (\$450-\$575).



Intuitively, what does it mean for the “efficiency benefit” to be negative? In this case it reflects the fact that the effect of the market power, when combined with the augmentation is to increase the total cost of dispatch (and not reduce it as we would normally expect).

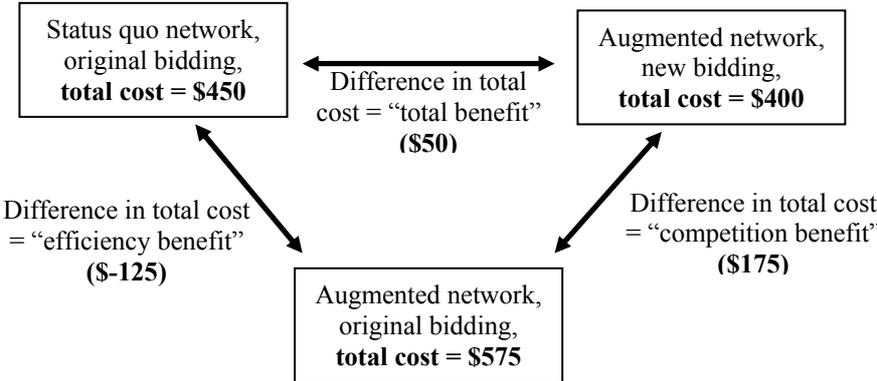
The monopolist in town B would be unlikely to lose all its business to generators in town A without some competitive response. If the monopolist cuts his price he will be dispatched for at least some of his output. If he cuts his price to (just under) \$25 he will be dispatched 5 MW, to \$20 he will be dispatched 15 units, and at \$15 he will be dispatched for his full 20 MW. Of these three choices, her most profitable option is to cut the price to (just under) \$20 and to sell 15 units.<sup>36</sup> The monopolist therefore decides to cut her bid from \$40 to \$20.

Now the optimal dispatch is for generators in town A to be dispatched 20 MW and for generators in town B to be dispatched 15 MW. The total cost of generation is \$250 (10x\$10+10x\$15) for town A and \$150 (15x\$10) for town B, for a total cost of \$400. Since this is lower than the previous total cost by \$175, the competition benefit is \$175.

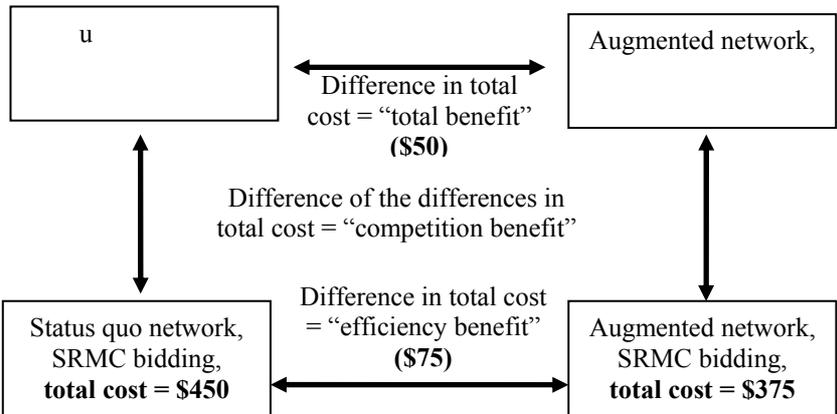


<sup>36</sup> The profit of the monopolist is (price minus marginal cost) times quantity. Since the marginal cost is \$10, cutting the price to (just under) \$25 gives a profit of  $(25-10) \cdot 5 = \$75$ ; cutting the price to \$20 gives a profit of  $(20-10) \cdot 15 = \$150$ ; cutting the price to \$15 gives  $(15-10) \cdot 20 = \$100$ . Of these, the greatest profit is earned at the price of \$20.

The calculation of the total benefit, the efficiency benefit and the competition benefit in this example can be illustrated in the following diagram:



Alternatively, we could calculate the efficiency benefit and the competition benefit using the definition proposed by Frontier (the total benefit remains the same). In this case, if we assume short-run marginal cost bidding, the total cost with and without the augmentation are as set out for the case of “perfect competition” above. The efficiency benefit is now \$75 and the competition benefit is \$-25. The negative competition benefit in this case reflects the fact that the market power in this example makes the augmentation of the transmission link less socially attractive than it would be in the absence of the transmission link.



The results using each definition are summarised in the following table:

**Table 2: Case B: Perfect competition in town A, monopoly in town B**

	<b>ACCC definition</b>	<b>Frontier definition</b>
Efficiency Benefit	\$-125	\$75
Competition Benefit	\$175	\$-25
Total Benefit	\$50	\$50

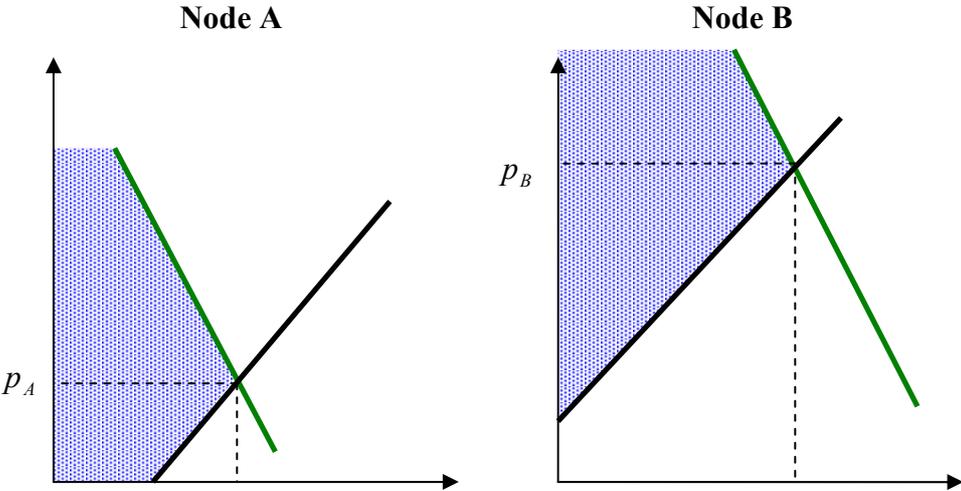
# Appendix E Calculating Competition Benefits: A general framework

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Australian Competition and Consumer Commission

Let’s now extend this analysis to the example set out in appendix F of the Draft Decision document. As before, there are two nodes which are not, initially connected by any transmission links. All transmission losses are ignored.

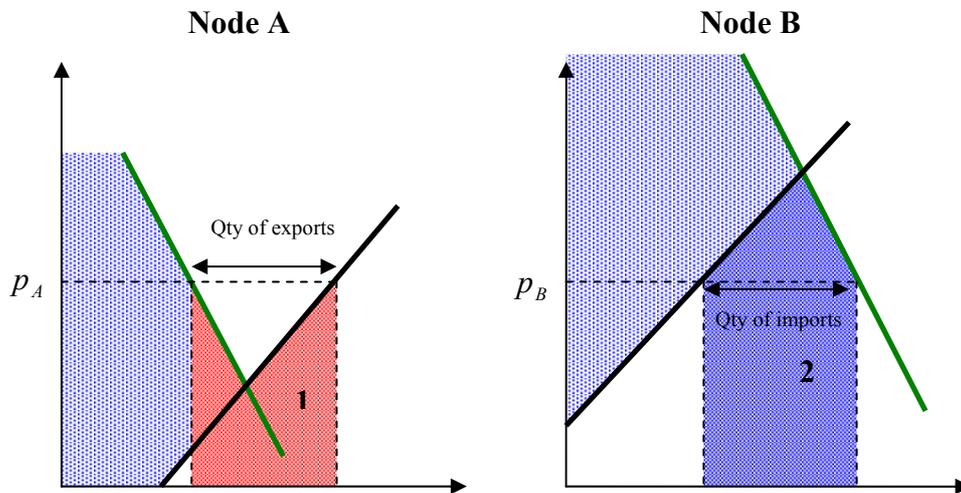
Let’s start by assuming that there is a perfectly competitive industry at each node. Each generator submits an offer curve (equal to its short-run marginal cost curve) and each consumer submits a bid curve. The resulting aggregate supply and demand curves at each node are as illustrated in the following diagram. The supply curves are in black and the demand curves are in green. The dispatch engine chooses the spot prices which maximise total surplus. These prices are where supply and demand intersect at each node. The total surplus at each node is the shaded region. (Total surplus is the area under the demand curve less the area under the supply curve).



Now consider what happens when a transmission link (of sufficient capacity) is constructed between node A and node B. Generators at node A can now increase their output and export to node B. At the same time, the generator at node B can reduce its output. This continues to the point at which the prices at each node are equalised.

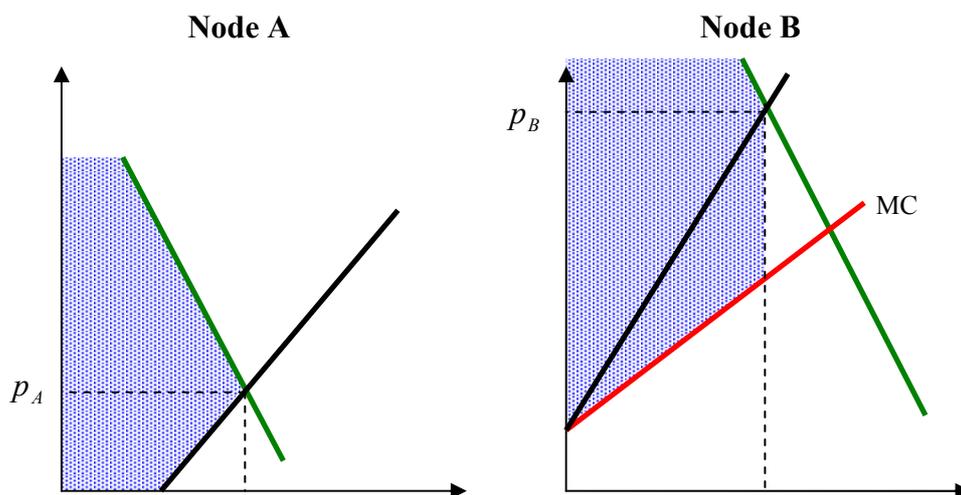
The resulting increase in total surplus at node B is indicated as the dark-blue shaded region, labelled “2”. The drop in surplus at node A is indicated by the dark-red shaded region, labelled “1”. Since the amount exported by node A is the same as the amount imported at node B, the two regions “1” and “2” have the same width. Since the height of region “1” is everywhere less than (or equal to) the common spot price and the height of region “2” is

everywhere greater than (or equal to) the common spot price, it is clear therefore that the size of the dark blue region (“2”) exceeds the size of the dark-red region (“1”). The amount of this difference is the efficiency benefit from this transmission augmentation.



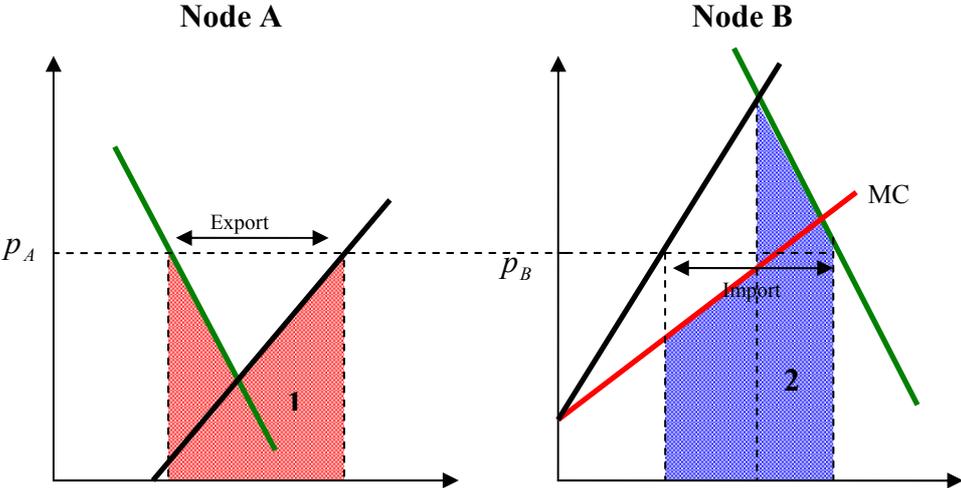
**Total benefit of the transmission link under perfect competition is the difference in the area of region 2 and region 1.**

Now consider the situation with a monopoly generator at node B. Let’s consider again the situation without the transmission link between the two nodes. Let’s suppose that this generator submits a bid curve which yields the profit-maximising combination of price and quantity and node B. This situation is illustrated in the following diagram. The total surplus at node B is the area below the demand curve and above the marginal cost curve:



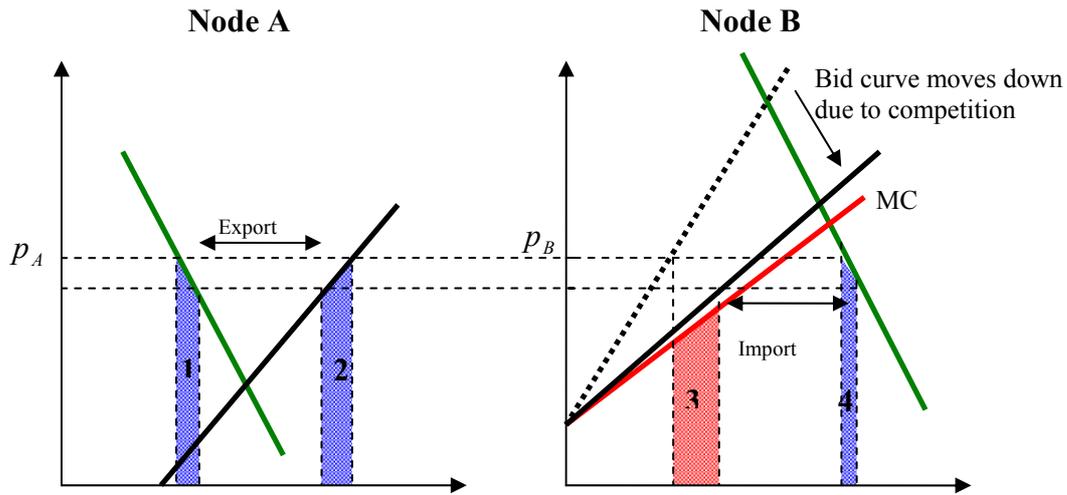
Now consider the impact of a transmission link between node A and node B large enough so that we can ignore the possibility of congestion. As before, we will consider first the impact of the transmission link on the total surplus, holding constant the bid curve of the generator. Since the transmission link is unconstrained, the price must be the same in both regions. The price rises at node A and decreases at node B relative to the situation above with no

transmission link. As a result, the output at node A increases and consumption decreases, reducing total surplus at node A by the region labelled “1”. Similarly, the output at node B declines and the consumption at node B increases, increasing total surplus by the area labelled “2”. The total efficiency benefit from this transmission augmentation is the area 2 less the area 1.



In the case of the simple example above, the demand curves were perfectly vertical. As a result we need only focus on the welfare effects of changing levels of production. The effect of building the transmission link (holding the bidding constant at node B) was to increase output at node A, reducing total surplus at node A by \$225 (area 1 above), and to reduce output at node B, increasing surplus by \$100 (area 2 above). The total efficiency benefit is therefore (as before) \$-125.

Now let’s relax the assumption that the bid of the monopolist at node 2 is held fixed. The monopolist will respond to the enhanced competition by increasing output. It does this by reducing its bid curve relative to marginal cost. As a result of the increased output, the price declines in both regions. The reduction in price at node A increases the quantity consumed, increasing welfare by the area labelled “1”. It also reduces the quantity produced at A, which also increases welfare, by the area labelled “2”. At Node B, the increased output by the monopolist reduces welfare by the amount of area “3”, but the reduced price increases consumption by the area labelled “4”. The level of *competition benefits* is the sum of these four areas (i.e., 1+2+4-3).



Again, applying this analysis to the simple example above, the effect of the change in bidding by the monopolist at node B is to increase output there from zero to fifteen units. This reduces welfare at node B by \$150 (area 3 above). At the same time, there is a reduction in output at node A by 15 units, increasing welfare by \$325 (area 2 above). The total competition benefit is therefore (as before), \$175.