



Final

Regulatory investment test for transmission

June 2010

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Amendment record

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Nature and Authority

Introduction

This publication sets out the Australian Energy Regulator's (AER) *regulatory investment test for transmission* (RIT-T).

Authority

Clause 5.6.5B of the *National Electricity Rules* (the Electricity Rules) requires the AER to develop and publish, in accordance with the *transmission consultation procedures*, the RIT-T.

Purpose

The purpose of the RIT-T, as set out at clause 5.6.5B(b) of the Electricity Rules, is to identify the *credible option* that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the *market* (the *preferred option*). For the avoidance of doubt, a *preferred option* may, in the relevant circumstances, have a negative net economic benefit (that is, a net economic cost) where the *identified need* is for *reliability corrective action*.

Application

A *transmission network service provider* must apply the RIT-T:

- (a) to the proposed *transmission investments* as required by clause 5.6.5C of the Electricity Rules;
- (b) in accordance with the requirements relating to the *credible option* set out at clause 5.6.5D of the Electricity Rules;
- (c) as required by the procedures set out at clause 5.6.6 of the Electricity Rules; and
- (d) to a level of analysis which is proportionate to the scale and likely impact of each *credible option* being implemented.

Note: The AER's *regulatory investment test for transmission application guidelines* provide guidance on the operation and application of, and the process to be followed in applying, the RIT-T.

Definitions and interpretation

In the RIT-T,

- (a) the words and phrases in italics have the meaning given to them in:
 - (i) the glossary, or
 - (ii) if not defined in the glossary, the Electricity Rules.
- (b) a reference to a paragraph is a reference to a paragraph in the RIT-T.

Process for revision

The AER may amend or replace the RIT-T from time to time in accordance with the *transmission consultation procedures* and clause 5.6.5B of the Electricity Rules.

Version history and effective date

A version number and an effective date of issue will identify every version of the RIT-T.

The regulatory investment test for transmission

- (1) The *preferred option* is the *credible option* that maximises the *net economic benefit* to all those who produce, consume and transport electricity in the *market* compared to all other *credible options*.

Where the *identified need* is for *reliability corrective action*, a *preferred option* may have a negative *net economic benefit* (that is, a net economic cost).

Net economic benefit equals the *market benefit* less *costs*.

Costs and benefits

Costs

- (2) *Costs* are the present value of the direct costs of a *credible option*. In determining *costs*, the *transmission network service provider* must quantify the following classes of costs:
- (a) costs incurred in constructing or providing the *credible option*;
 - (b) operating and maintenance costs in respect of the operating life of the *credible option*;
 - (c) the costs of complying with laws, regulations and applicable administrative requirements regarding the construction and operation of the *credible option*; and
 - (d) any other costs that the *transmission network service provider* determines to be relevant and are agreed to by the AER in writing before the *project specification consultation report* is made available to other parties.

Note: A *transmission network service provider* is not required to separately quantify each class of cost.

- (3) If the *transmission network service provider* establishes that there is a material degree of uncertainty in the *costs* of a *credible option*, the *cost* is the probability weighted present value of the direct costs of the *credible option* under a range of different cost assumptions.

Market benefits

- (4) *Market benefit* must be:
- (a) the present value of the benefits of a *credible option* calculated by:
 - (i) comparing, for each relevant *reasonable scenario*:
 - (A) the *state of the world* with the *credible option* in place to

(B) the *state of the world* in the *base case*,

and

- (ii) weighting the benefits derived in sub-paragraph (i) by the probability of each relevant *reasonable scenario* occurring.

Note: Where a *transmission network service provider* has no material evidence for assigning a higher probability for one *reasonable scenario* over another, all *reasonable scenarios* may be weighted equally.

- (b) a benefit to those who consume, produce and transport electricity in the *market*, that is, the change in producer plus consumer surplus.

(5) Subject to paragraph 7 and 8, the *market benefit* must include the following benefits:

- (a) changes in fuel consumption arising through different patterns of *generation dispatch*;
- (b) changes in voluntary *load curtailment*;
- (c) changes in involuntary *load shedding*, with the *market benefit* to be considered using a reasonable forecast of the value of electricity to consumers;
- (d) changes in costs for parties, other than the *transmission network service provider*, due to:
 - (i) differences in the timing of new *plant*;
 - (ii) differences in capital costs; and
 - (iii) differences in the operational and maintenance costs;
- (e) differences in the timing of *transmission investment*;
- (f) changes in *network losses*;
- (g) changes in *ancillary services* costs;
- (h) competition benefits being net changes in market benefit arising from the impact of the *credible option* on participant bidding behaviour;
- (i) any additional option value (meaning any option value that has not already been included in other classes of *market benefits*) gained or foregone from implementing the *credible option* with respect to the likely future investment needs of the *market*;
- (j) negative of any penalty paid or payable (meaning the penalty price multiplied by the shortfall) for not meeting the renewable energy target, grossed-up if not tax deductible to its value if it were deductible; and

- (k) other benefits that the *transmission network service provider* determines to be relevant and are agreed to by the AER in writing before the *project specification consultation report* is made available to other parties.
- (6) *Market benefit* must not:
 - (a) include the transfer of surplus between consumers and producers;
 - (b) include the *costs* which meet the criteria in paragraph 2; or
 - (c) include *competition benefits* or any additional option value where they have already been accounted for in other elements of the *market benefit*.
 - (7) A *transmission network service provider* must quantify all classes of *market benefits* which are determined to be material in the *transmission network service provider's* reasonable opinion.
 - (8) A *transmission network service provider* must consider all classes of *market benefit* as material unless it can, in the *project assessment draft report* or in respect of a proposed *preferred option* which is subject to the exemption in clause 5.6.6(y) of the Electricity Rules, in the *project specification consultation report*, provide reasons why:
 - (a) a particular class of *market benefit* is likely not to affect materially the outcome of the assessment of the *credible options* under the *regulatory investment test for transmission*; or
 - (b) the estimated cost of undertaking the analysis to quantify the *market benefit* is likely to be disproportionate to the scale, size and potential benefits of each *credible option* being considered in the report.
 - (9) Where the *credible option* is for *reliability corrective action*, the quantification of the *market benefits* associated with changes in voluntary *load curtailment* and changes in involuntary *load shedding* must only apply in so far as the *market benefit* delivered by the *credible option* exceeds the minimum standard required for *reliability corrective action*. If there is no minimum standard all of the *market benefits* associated with changes in voluntary *load curtailment* and changes in involuntary *load shedding* for each *credible option* must be quantified.

Further requirements for costs and benefits

- (10) Any *cost* or *market benefit* which cannot be measured as a *cost* or *market benefit* to *generators*, *distribution network service providers*, *transmission network service providers* and consumers of electricity may not be included in any analysis under the RIT-T. The allocation of *costs* and *market benefits* between electricity and other markets must be based on the *cost allocation principles*.

Method permitted for estimating the magnitude of the different classes of market benefits

(11) In estimating the magnitude of *market benefits*, a market dispatch modelling methodology must be used and must incorporate:

- (a) a realistic treatment of plant characteristics, including for example minimum generation levels and variable operation costs; and
- (b) a realistic treatment of the *network constraints* and losses,

unless the *transmission network service provider* can provide reasons why this methodology is not relevant in the *project assessment draft report* (or in respect of a proposed *preferred option* which is subject to the exemption in clause 5.6.6(y) of the Electricity Rules, in the *project specification consultation report*).

(12) The method for estimating *market benefits* must capture any benefits which occur outside the *region* in which the *transmission network service provider's network* is located.

(13) Where the analysis separately identifies the quantum of any *competition benefits* (either as a proportion or a component of the total *market benefit*) the analysis must identify the methodology used to estimate it.

Appropriate method for determining the discount rate to be applied

(14) 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 must be consistent with the cash flows being discounted.

Reasonable scenarios

(15) *Reasonable scenario* means a set of variables or parameters that are not expected to change across each of the *credible options* or the *base case*, and may include the following variables or parameters, appropriate to the *credible option* under consideration:

- (a) a reasonable forecast of electricity demand reflecting assumptions regarding economic growth and climatic patterns;

Note: adjustments to demand forecasts or elasticities arising through demand-side options should be reflected in the *states of the world* for those options rather than the *reasonable scenarios*

- (b) efficient unit operating costs of existing, *committed*, *anticipated* and *modelled projects* including demand-side and generation projects;
- (c) avoidable unit costs of *committed*, *anticipated* and *modelled projects*, including demand-side and generation projects;

- (d) the form of any market-based regulatory instrument that may be used to address greenhouse and environmental issues;
 - (e) the magnitude of a penalty (if any) for failing to meet an environmental target imposed on parties who produce, consume and transport electricity in the market, grossed up if not tax deductible to its value if it were deductible;
 - (f) reasonable forecasts of the value of electricity to consumers;
 - (g) discount rate (the lower boundary should be the regulated cost of capital);
 - (h) generation bidding behaviour using;
 - (i) short run marginal cost; and
 - (ii) approximates of realistic bidding;
 - (i) commissioning dates of *committed projects* and *anticipated projects*; and
 - (j) inclusion or exclusion of particular *anticipated projects* based on their degree of likelihood of being commissioned within the modelling period.
- (16) The number and choice of *reasonable scenarios* must be appropriate to the *credible options* under consideration. The choice of *reasonable scenarios* must reflect any variables or parameters that:
- (a) where the *identified need* is *reliability corrective action*, are likely to affect the ranking of the *credible options*; and
 - (b) for all other *identified needs*, are likely to affect the ranking of the *credible options*, or the sign of the net economic benefits of any of the *credible options*.
- Note: the 'sign of the net economic benefit' refers to whether the *credible option* is likely to have a positive or negative net economic benefit.
- (17) *State of the world* means a reasonable and mutually consistent description of all of the relevant market supply and demand characteristics and conditions that may affect the calculation of *market benefits* over the period of the assessment. This includes a reasonable forecast of:
- (a) electricity demand modified where appropriate to take into account demand-side options;
 - (b) the sum of efficient operating costs of supplying energy to meet forecast demand from existing, *committed*, *anticipated* and *modelled projects* including demand side and generation projects;

- (c) the sum of 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;
 - (d) the cost of providing sufficient *ancillary services* to meet the forecast demand to support the relevant *credible option*;
 - (e) the capital and operating costs of other network augmentations consistent with the forecast demand and generation scenarios; and
 - (f) the magnitude of a penalty (if any) for failing to meet an environmental target imposed on parties who produce, consume and transport electricity in the market, grossed up if not tax deductible to its value if it were deductible.
- (18) *Committed project* means a project where:
- (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 has either commenced or a firm commencement date has been set;
 - (c) the proponent has purchased/settled/acquired land (or commenced legal proceedings to acquire land) for the purposes of construction;
 - (d) contracts for supply and construction of the major components of the necessary plant and equipment (such as generators, turbines, boilers, transmission towers, conductors, terminal station equipment) have been finalised and executed, including any provisions for cancellation payments; and
 - (e) the necessary financing arrangements, including any debt plans, have been finalised and contracts executed.
- (19) *Anticipated project* means a project which:
- (a) does not meet all of the criteria in paragraph 18; and
 - (b) is in the process of meeting at least three of the criteria in paragraph 18.
- (20) *Modelled project* means a hypothetical project derived from market development modelling in the presence or absence (as applicable) of the relevant *credible option* or the *base case*.
- (21) Market development modelling must be:
- (a) undertaken on a ‘least-cost’ basis; and
 - (b) if appropriate, undertaken on a ‘market driven’ basis, where:

- (i) least-cost market development modelling derives *modelled projects* on the basis of a least-cost planning approach akin to conventional central planning. The *modelled projects* derived from such an approach would be those where the net present value of benefits, such as fuel substitution and reliability increases, exceed the costs, subject to meeting any minimum reserve requirements.
- (ii) market-driven market development modelling derives *modelled projects* on the same basis as that of a private developer. The *modelled projects* derived from such an approach would be those where the net present value of generation revenues (from the spot market or contracts) exceeds the net present value of generation costs. The forecasts of price trends should reflect realistic bidding behaviour, with power flows to be those most likely to occur under actual systems and market outcomes.

Glossary

anticipated project	has the meaning set out in paragraph 19.
base case	a situation in which no option is implemented by, on behalf of the <i>transmission network service provider</i> .
committed project	has the meaning set out in paragraph 18.
cost	has the meaning set out in paragraph 2.
market benefit	has the meaning set out in paragraph 4.
modelled project	has the meaning set out in paragraph 20.
National Electricity Rules	the rules as defined in the National Electricity Law.
net economic benefit	has the meaning set out in paragraph 1.
reasonable scenarios	has the meaning set out in paragraph 15.
RIT-T	The <i>regulatory investment test for transmission</i> defined in the National Electricity Rules.
state of the world	has the meaning set out in paragraph 17.