Issues Paper

Regulatory investment test for transmission

September 2009

AUSTRALIAN ENERGY REGULATOR

Contents

Glossary and definitions

ACCC	Australian Competition and Consumer Commission
ACG	Allen Consulting Group
AEMC	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
COAG	Council of Australian Governments
CPRS	carbon pollution reduction scheme
DNSP	distribution network service provider
Electricity Rules	National Electricity Rules
ERIG	Energy Reform Implementation Group
MCE	Ministerial Council on Energy
NEM	National Electricity Market
NEMMCO	National Electricity Market Management Company
NSP	network service provider
REC	renewable energy certificate
RET	renewable energy target
RIT-D	regulatory investment test for distribution
RIT-T	regulatory investment test for transmission
TNSP	transmission network service provider

1 Introduction

The Australian Energy Regulator (AER) is responsible for the economic regulation of electricity transmission and distribution services in the national electricity market (NEM) as well as some gas transportation services. The AER also monitors the wholesale electricity and gas markets and is responsible for compliance with and enforcement of the National Electricity Rules (Electricity Rules) and National Gas Rules.

Under recent amendments to the Electricity Rules, the AER must publish the regulatory investment test for transmission (RIT-T). The RIT-T arose out of the Australian Energy Market Commission's (AEMC) national transmission planning arrangements review. The RIT-T will replace the existing regulatory test for transmission investments.[1]

The purpose of the RIT-T is to identify the transmission investment option which maximises net economic benefits and, where applicable, meets the relevant jurisdictional or Electricity Rule based reliability standards. The RIT-T will provide a single framework for all transmission investments and remove the current distinction in the existing regulatory test between reliability driven projects and projects motivated by the delivery of market benefits.

In conjunction with the RIT-T, the AER must develop and publish RIT-T application guidelines for the operation and application of the RIT-T (the application guidelines). The application guidelines are designed to provide guidance to businesses applying the RIT-T and enhance transparency and consistency in investment decision making. The AER has prepared this issues paper as the first step in its consultation process in developing the RIT-T and application guidelines.

2 Electricity Rules requirements

Under clause 5.6.5B of the Electricity Rules, the AER is required to develop and publish the RIT-T and application guidelines by 1 July 2010. The RIT-T and application guidelines must comply with the principles set out in the Electricity Rules and must be developed in accordance with the transmission consultation procedures.

Under the transmission consultation procedures in the Electricity Rules the AER must publish the proposed RIT-T and application guidelines with an explanatory statement and invite written submissions. Within 80 business days of publishing the proposed RIT-T and guidelines, the AER must publish the final RIT-T and guidelines. The AER may also publish any issues, consultation and discussion papers as it considers appropriate.

3 Consultation procedure

The release of this issues paper is part of a preliminary consultation process on the development of the RIT-T and application guidelines being undertaken by the AER.

[1] The existing regulatory test will continue to apply to projects which address a need on the distribution network. The AEMC is currently considering a new project assessment process for distribution, the regulatory investment test for distribution (RIT-D). If introduced, the proposed RIT-D will replace the regulatory test.

The AER will engage in the following consultation process:

- publish the issues paper and invite written submissions
- publish the proposed RIT-T, application guidelines and an explanatory statement and invite submissions
- publish the final RIT-T and application guidelines by 1 July 2010.

The AER may also hold workshops or public forums during the development of the RIT-T and application guidelines.

4 Invitation for written submissions

Interested parties are invited to review the matters raised in this issues paper and provide written submissions. Interested parties are also welcome to provide submissions on relevant issues not discussed in the paper.

The AER prefers that all submissions be publicly available to facilitate an informed and transparent consultative process. Submissions will therefore be treated as public documents unless otherwise requested. Parties wishing to submit confidential information are requested to:

- clearly identify the information that is subject of the confidentiality claim
- provide a non-confidential version of the submission, in addition to a confidential one.

All non-confidential submissions will be placed on the AER's website. The AER does not generally accept blanket claims for confidentiality over the entirety of the information provided and such claims should not be made unless all information is truly regarded as confidential. The identified information should genuinely be of a confidential nature and not otherwise publicly available. In addition to this, parties must identify the specific documents or relevant parts of those documents which contain confidential information. The AER does not accept documents or parts of documents which are redacted or 'blacked-out'.

For further information regarding the AER's use and disclosure of information see the ACCC/AER *Information Policy*, October 2008, which is available on the AER's website.

Any submissions must be received by close of business 13 November 2009 and should be addressed to:

Mr Tom Leuner
General Manager
Markets
Australian Energy Regulator
GPO Box 520
MELBOURNE VIC 3001
Email: AERInquiry@aer.gov.au

5 History of the regulatory test and RIT-T

The regulatory test (and RIT-T) is a cost benefit test used by network businesses in the NEM to assess the efficiency of proposed investment options. As noted the RIT-T will replace the regulatory test for transmission investment. This chapter sets out some of the history of the development of the regulatory test and RIT-T. This information may assist in understanding the factors which have influenced the development of the RIT-T.

5.1 The customer benefits test

Prior to the development of the regulatory test, the National Electricity Code included a customer benefits test. This test was applied by the National Energy Market Management Company (NEMMCO), the Inter-Regional Planning Committee and transmission businesses to assess transmission developments within and between regions. The test was designed to ensure network investments would only be undertaken if customers benefited from the investment.

In 1998 NEMMCO assessed the proposed South Australia—New South Wales interconnector using the customer benefits test. During its assessment, NEMMCO identified a number of problems with the test including conflicting assessment criteria. In response to these concerns, the Australian Competition and Consumer Commission (ACCC), as an independent party, was requested to review the customer benefits test.

5.2 The regulatory test

In 1999 the ACCC developed the first regulatory test to replace the customer benefits test. After the initial stages of its operation, the ACCC undertook a comprehensive review of the regulatory test and in 2004 released the regulatory test version two. Following changes to the Electricity Rules in 2006, the AER released version three of the regulatory test in November 2007. This review is discussed further below.

The regulatory test is applied by network service providers (NSPs) and is based on a cost-benefit analysis framework which is used to assess and rank different investment options. When developing the regulatory test, the ACCC and the AER relied on the principles of economic efficiency and competitive neutrality. Given this, the test is designed to ensure that network and non-network investments (such as generation and demand side investment) are considered equally.

The regulatory test consists of two limbs:

- *The reliability limb*—applied to investments which are required to meet service standards obligations in the Electricity Rules, jurisdictional legislation, regulations or statutory instruments. A reliability augmentation will satisfy the test if it is the least cost option compared to a range of alternatives in a majority of reasonable scenarios.

- *The market benefits limb*—applied to non-reliability driven investment. New investment will satisfy the test if it maximises the net present value of the market benefits having regard to alternative options, timing and market development.

The ACCC undertook considerable analysis to develop regulatory test versions one and two. Significant issues considered by the ACCC in promulgating these versions of the regulatory test included the development of an effective cost benefit analysis framework and the treatment of competition benefits under this framework.

Development of the approach to the cost benefit analysis framework

When developing the regulatory test, the ACCC sought to develop a framework which was competitively neutral with respect to other non-network investments and was consistent with the standard principles used in economic cost benefit studies.[2] It considered that there was merit in moving away from the inherently volatile customer benefits test to a test based on the traditional principles associated with cost benefit analysis.

The ACCC considered that cost benefit analysis is a widely applied technique to assess and rank the economic viability of investment decisions. The ACCC noted that:[3]

> [t]he cost/benefit framework is robust and supports economically efficient decision making, that is, where incremental benefits are greater than incremental costs. A decision criteria that emphasised certain individual benefits and ignored other individual costs may well result in an over investment in networks. Consequently, the Commission maintains its view that the regulatory test should not be based on the customer benefits criterion but should be based on the cost/benefit framework which emphasises an assessment of net public benefits in aggregate.

Consistent with traditional cost benefit analysis, the test is only concerned with increases in economic efficiency. Appendix A reproduces a simple model from the ACCC's 2004 decision on the regulatory test to explain increases in economic efficiency.

The ACCC also relied on the traditional approach to cost benefit analysis which limits the extent of the costs and benefits analysed. The regulatory test only includes costs and benefits which are directly related to the proposed project (i.e. a partial equilibrium analysis) and any second round effects on other areas of the economy (i.e. a general equilibrium analysis) are not taken into account.[4]

Inclusion of competition benefits

One of the major issues raised by interested parties throughout the development of the regulatory test was the inclusion of competition benefits in the cost benefit analysis

---

2 ACCC, *Regulatory test for new interconnectors and network augmentations*, 15 December 1999, p. 4.

3 ACCC, *Regulatory test for new interconnectors and network augmentations*, 15 December 1999, p. 6.

4 ACCC, *Regulatory test for new interconnectors and network augmentations*, 15 December 1999, p. 12.

framework. Competition benefits are those benefits that arise from an increase in competition between generators across the NEM.

Competition benefits were not explicitly recognised in the first version of the regulatory test and assessments undertaken by transmission network service providers (TNSPs) were largely confined to fuel cost savings, reliability requirements and deferral of generation and transmission investments.

In developing version two of the regulatory test, the ACCC recognised that there were additional benefits which may not have been measured:[5]

> An augmentation to the transmission network is likely to affect how generators bid into the NEM. In particular, an augmentation to the transmission network is likely to increase competition between existing generators, causing them to submit offers which are closer to short run marginal cost.

It considered that, depending on whether a TNSP assumed competitive or non-competitive bidding behaviour, there could be a significant change in the size and timing of market benefits associated with an augmentation.[6]

Competition benefits are defined under the current regulatory test (version three) as the net changes in market benefit arising from the impact of the option on participant bidding behaviour. The definition and methods for calculating competition benefits were discussed extensively in the ACCC's decision on version two of the regulatory test, and are addressed in the AER's current regulatory test application guidelines (which accompany version three of the regulatory test).[7]

5.3 Further amendments to the regulatory test

In May 2005 the Ministerial Council on Energy (MCE) released its statement on NEM electricity transmission.[8] The MCE noted that the ACCC had undertaken significant work to amend the regulatory test. Version two of the regulatory test incorporated competition benefits to recognise the economic benefits associated with mitigating market power. However, the MCE considered that the Electricity Rules should include regulatory test principles to provide certainty in the AER's development of the regulatory test.

In October 2005 the MCE lodged a rule change proposal with the AEMC to amend the Electricity Rules to include a series of regulatory test principles.[9] Under the proposal the AER was required to follow these principles when promulgating the regulatory test. The MCE considered that these principles would provide greater certainty to NSPs in undertaking new investment, while leaving sufficient discretion to the AER to perform its regulatory role.

---

5 ACCC, *Draft decision—Review of the regulatory test for network augmentations*, March 2004, p. 51.

6 ACCC, *Draft decision—Review of the regulatory test for network augmentations*, March 2004, p. 51.

7 AER, *Regulatory test application guidelines*, November 2007

8 MCE, *Statement on NEM Electricity Transmission*, May 2005.

9 MCE, *National Electricity Rules—Rule change application reform of the regulatory test principles*, 2005.

The AEMC accepted the MCE's proposed regulatory test principles and amended the Electricity Rules in November 2006.[10] Under the principles, the broad approach to the regulatory test remained, however the AER was required to incorporate new concepts for new large transmission network investments assessed under the market benefits limb of the test. For these investments, the principles included requirements that TNSPs gather information on alternative options and also assess the likelihood of alternative options. The AER was also required to develop guidelines to assist NSPs in applying the regulatory test.

The AER issued version three of the regulatory test and regulatory test application guidelines in November 2007. The amendments to this version of the test were limited to ensuring consistency with the Electricity Rules and simplifying or clarifying areas of the existing test.

5.4 Development of the RIT-T

In 2006, the Council of Australian Governments (COAG) established the Energy Reform Implementation Group (ERIG) to review the operation of Australia's energy sector.[11] ERIG considered that the investment decision making criteria in the regulatory test were appropriate and should be retained. However it recommended that the reliability and market benefits limbs of the test should be amalgamated.

ERIG also proposed establishing a National Transmission Planner and National Transmission Network Development Plan to deliver an integrated national plan for the long term efficient development of the grid.[12]

The AEMC developed options to implement ERIG's transmission planning recommendations in its national transmission planning arrangements review.[13] As part of this review, the AEMC proposed a new framework and process for assessing transmission investment to replace the current regulatory test. This framework included the development of a RIT-T which would provide a single cost benefit analysis framework to apply to all transmission investment. The RIT-T would remove the distinction between reliability driven projects and projects motivated by the delivery of market benefits. Proposed transmission projects would be assessed against both local reliability standards and their ability to deliver benefits to the market.

In June 2009, the AEMC amended the Electricity Rules to implement its proposed framework and process for assessing transmission investment.[14] Under these amendments transmission investment will be subject to assessment under the RIT-T developed by the AER and new consultation requirements in clauses 5.6.6 of the Electricity Rules from 1 August 2010.

The amalgamation of the reliability limb and the market benefits limb is reflected in clause 5.6.5B(b) of the Electricity Rules. Under this clause the RIT-T must identify the option that maximises the present value of net economic benefit to all those who produce, consume and transport electricity in the NEM.

---

10 AEMC, *Reform of the Regulatory Test Principles*, Final Determination, 2006.
11 ERIG, *Energy reform—the way forward for Australia*, 2007.
12 ERIG, *Energy reform—the way forward for Australia*, 2007, p. 13.
13 AEMC, *National transmission planning arrangements*, Final report to MCE, 2008.
14 AEMC, *Regulatory investment test for transmission*, Final Rule determination, 2009

6 RIT-T issues

This part of the paper sets out some of the requirements for the RIT-T under the Electricity Rules and seeks interested parties' views on each of the issues raised.

Clauses 5.6.5B(a)– 5.6.5B(c) of the Electricity Rules set out principles that the RIT-T must comply with. These principles provide that the purpose of the RIT-T is to identify the transmission investment option that maximises the net economic benefits to all those who produce, consume and transport electricity in the NEM. The option identified under a RIT-T may have a net economic cost where the identified need is reliability corrective action.

6.1 Scope of the RIT-T

The Electricity Rules set out detailed requirements for the RIT-T. Clause 5.6.5B sets out the purpose of the RIT-T, the nature of analysis required under the RIT-T and the classes of costs and market benefits that a TNSP must consider for each credible option. Under this clause the RIT-T must:

- be based on a cost benefit analysis of various credible options under a range of reasonable scenarios of future supply and demand
- not require a disproportionate level of analysis to the scale and likely impact of each credible option
- be able to be applied in a predictable, transparent and consistent manner
- require TNSPs to consider the prescribed classes of costs and market benefits (see below)
- require a TNSP to quantify all classes of market benefits determined material in the TNSP's reasonable opinion
- provide that any cost or market benefit which cannot be measured as a cost or market benefit to generators, distribution network service providers, TNSPs or consumers of electricity may not be included in a RIT-T analysis
- specify methods permitted for estimating market costs and benefits, and any specific inputs for determining the discount rate or rates
- specify that a sensitivity analysis is required of any modelling relating to the cost benefit analysis.

Given the high level of prescription in the Electricity Rules, the AER considers that it is likely that the RIT-T will adopt much of the detail in the Electricity Rules. However the AER has scope to specify:

- additional classes of costs and market benefits
- the methods permitted for estimating costs and market benefits

- the methods permitted for estimating market benefits which occur outside the TNSP's region, and
- the appropriate method and value for specific inputs for determining discount rates.

These issues are discussed further below.

6.2 Classes of market costs and benefits

The Electricity Rules prescribe a list of costs (clause 5.6.5B(c)(8)) and market benefits (clause 5.6.5B(c)(4)) that must be included in the RIT-T. The RIT-T must require TNSPs to:

- consider the following classes of market benefits that could be delivered by the credible option:
  - changes in fuel consumption arising through different patterns of generation dispatch
  - changes in voluntary load curtailment
  - changes in involuntary load shedding
  - changes in other parties' costs due to differences in timing of new plant, capital, operating and maintenance costs
  - differences in the timing of transmission investments
  - changes in network losses and ancillary services costs
  - competition benefits
  - any additional option value gained or foregone from implementing that credible option with respect to the likely future investment needs of the market
  - other classes of market benefits that are determined relevant and specified as a class of market benefit in the RIT-T
- quantify the following classes of costs for the credible option:
  - the costs incurred in constructing or providing the credible option
  - operating and maintenance costs
  - the costs of complying with laws, regulations and applicable administrative instruments in relation to the construction and operation of the credible option, and
  - any other class of costs identified by a TNSP (and agreed to by the AER) or specified in the RIT-T.

Additional classes of costs or benefits

The AER's initial view is that these classes of costs and benefits can largely be prescribed in the RIT-T. However there may be additional classes of costs or market benefits which should be included in the RIT-T. One area where an additional class of costs or market benefits may be warranted is in the treatment of the proposed expanded renewable energy target (RET). This is discussed separately below.

Q 1. Are there any additional classes of costs or market benefits (other than those set out in the Electricity Rules) which should be included in the RIT-T?

Clarification on classes of market benefits

There may also be merit in defining or providing additional guidance in the RIT-T on several of the classes of costs and market benefits that are set out in the Electricity Rules. For example competition benefits and option value are two areas where additional clarification in the RIT-T and application guidelines may be warranted.

Competition benefits

Competition benefits are defined in the regulatory test (version three) as net changes in market benefit arising from the impact of the option on participant bidding behaviour. The AER considers that there may be merit in retaining this definition in the RIT-T.

As such, the AER welcomes interested parties' views on the current definition in the regulatory test. As noted, the definition and methods for calculating competition benefits were discussed extensively in the ACCC's decision on version two of the regulatory test, and are addressed in the AER's current regulatory test application guidelines (which accompany version three of the regulatory test).[15]

Option value

The AER notes that the Electricity Rules require the RIT-T to adopt a scenario-based approach for assessing investment options. The RIT-T assists TNSPs identify the option that is likely to maximise the net present value of benefits to the market compared to a range of alternatives. To undertake this analysis a TNSP must consider a number of options under a range of reasonable scenarios of future supply and demand.

The RIT-T must also require a TNSP to consider any additional option value, but only to the extent that this benefit has not already been included in other classes of market benefits. The AER considers that this new class of market benefit for option value may require additional clarification in the RIT-T or the application guidelines.

The AEMC's final rule determination on the RIT-T noted that 'uncertainties may be insufficiently considered in traditional tools for valuing investment and may lead to sub-optimal investment'.[16] It considered that traditional tools may regard the future passively and overlook possible consequent decisions or contingent investments. It also noted that when an irreversible investment is made, the option to defer is no

[15] AER, *Regulatory test application guidelines*, November 2007.
[16] AEMC, *Regulatory investment test for transmission*, Final Rule determination, 2009, p. 40.

longer available and that this lost option value is an opportunity cost that may be material. The AEMC therefore argued that an approach based on real option valuation may more accurately capture the value of a deferred decision than an approach based on analysis of probability-weighted net present value.[17]

The AEMC cited possible benefits which could be considered as option value under a RIT-T analysis. It considered that improved information associated with a deferral in network investment is a possible benefit which could be captured by option value. To further illustrate the benefits option value is intended to capture, the AEMC also provided an example of increasing the capacity of a radial line above the level required by the reliability planning standards to allow for new generators to connect without any future investment. Under this example possible design options might be to:

(a) build the shared network beyond present needs

(b) build the shared network to meet present needs, or

(c) build the shared network to meet present needs but with the ability to expand quickly and at lower cost.

The AEMC noted that:[18]

> example (c) might be a more beneficial option than (a), even if the aggregate cost is higher, because it has optionality. Option (c) allows the decision to be deferred until the underlying uncertainty is reduced. This, in itself, has a value.

In its supplementary submission to the AEMC's draft rule determination on the RIT-T, the AER attached a note from Frontier Economics which provided comments on the inclusion of option value in the RIT-T.[19] Frontier noted that a reasonable scenario approach would seek to estimate the market benefits of different options under different states of the world. In contrast, a real options approach would not look at different states of the world, but instead would use probability distributions for each of the variables considered in a scenario analysis. Frontier and the AER considered that a real options approach is a different way of calculating market benefits, rather than a distinct type of market benefit not captured under a scenario based approach.

The AER acknowledges that employing a real options approach derives a more precise estimate of market benefits for an option than a scenario approach and may be an improvement on the current regulatory test. However, the AER's preliminary view is that the benefits associated with flexibility will often be captured through a reasonable scenario approach required under the Electricity Rules and the consideration of a suitably wide range of credible options.

Given this, the AER welcomes interested parties' views on approaches to including option value within the reasonable scenario approach. The AER notes under clauses 5.6.5B(c)(5), 5.6.5B(c)(6) and 5.6.5B(c)(4)(ix) of the Electricity Rules a TNSP will

---

17 AEMC, *Regulatory investment test for transmission*, Final Rule determination, 2009, p. 41.

18 AEMC, *Regulatory investment test for transmission*, Final Rule determination, 2009, pp. 41–42

19 Frontier Economics, *Draft RIT-T Rule drafting—Additional comments for the Australian Energy Regulator*, 2009.

only consider option value where the TNSP reasonably considers that the additional option value is material, and only to the extent that it is not already included in other classes of market benefits.

Q 2. Do some classes of market benefits or costs set out in the Electricity Rules (such as competition benefits and option value) require further clarification in the RIT-T?

Q 3. Is the current definition of competition benefits in the regulatory test suitable for inclusion in the RIT-T? Are there any alternative definitions which the AER should consider?

Q 4. What methods for incorporating option value as a class of market benefits under the RIT-T should the AER consider?

6.3 Estimating market benefits and costs

Under clause 5.6.5B(c)(10) of the Electricity Rules the RIT-T must specify the methods permitted for estimating:

- the magnitude of the different classes of costs and market benefits and
- market benefits which may occur outside the TNSP's region.

The regulatory test (version three) provides guidance on the methodology that must be used in estimating costs and benefits. It states that:

> in estimating the magnitude of costs and benefits, a pool dispatch modelling methodology, or any other applicable methodology, should be used. If pool dispatch modelling methodology is used, it 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.

The AER's preliminary view is that it may be appropriate to include a similar provision in the RIT-T. The AER welcomes any views on this, as well as on appropriate methods for estimating market benefits which occur outside a TNSP's region.

Q 5. Should the current provision in the regulatory test regarding the methods that must be used in estimating costs and benefits be adopted in the RIT-T?

Q 6. What methods for estimating market benefits which may occur outside a TNSP's region are appropriate for inclusion in the RIT-T?

6.4 Determining discount rates

Clause 5.6.5B(c)(10)(ii) of the Electricity Rules require the RIT-T to specify the appropriate method and value for specific inputs, where relevant, for determining the discount rate or rates to be applied.

The regulatory test (version three) provides that the present value calculations must use a commercial discount rate appropriate for the analysis of a private enterprise investment in the electricity sector and should be consistent with the cash flows being discounted.

The current regulatory test application guidelines (which accompany version three of the regulatory test) provide further guidance on the discount rate which should be applied. The guidelines note that:

- the weighted-average cost of capital for regulated infrastructure ought to provide the lower bounds of the discount rate used in any sensitivity analysis
- the choice of parameters for regulated and unregulated electricity infrastructure used to derive the discount rate will vary and depend on the prevailing market conditions at the time of the regulatory test assessment
- the same discount rate should be used for assessing an option and all of its alternatives. Uncertainty in relation to the market benefits and costs of various options should be addressed through the use of appropriate reasonable scenarios, including reasonable scenarios reflecting the application of appropriate sensitivities.

The AER's preliminary view is that the RIT-T and accompanying application guidelines should adopt the same approach to specifying the method for determining the discount rate as is currently in the regulatory test (version three) and regulatory test application guidelines. However, the AER welcomes interested parties' views on this.

Q 7. Should the RIT-T and application guidelines adopt the same approach to specifying the appropriate discount rates to be applied as the regulatory test (version three) and application guidelines?

6.5 Issues relating to the treatment of climate change policies

Climate change policies, and in particular the expanded RET and proposed Carbon Pollution Reduction Scheme (CPRS), will have wide ranging effects on the operation of the NEM. The following provides the AER's preliminary views on how these policies might be considered under the RIT-T assessment framework. The AER seeks interested parties' comments on these views.

Carbon Pollution Reduction Scheme

The objective of the proposed CPRS is to reduce carbon emissions. By capping emissions and allowing trade in carbon permits, the market determines a carbon price.[20]

[20] Australian Government, *Carbon Pollution Reduction Scheme: Australia's low pollution future—White paper summary report*, December 2008, pp. 11–13.

As part of its review of energy market frameworks in light of climate change policies, the AEMC commissioned the Allen Consulting Group (ACG) to consider the application of the RIT-T following the introduction of the CPRS and expanded RET.[21] ACG considered that the CPRS could be considered under a RIT-T analysis by treating the purchase of carbon permits in the same way as any other generation input.[22]

The AER's preliminary view is that this approach is an appropriate means of incorporating the CPRS under a RIT-T analysis. In addition a TNSP may account for the expected change in generation investment patterns following the introduction of the CPRS through its analysis of reasonable scenarios of future supply and demand.

This approach would also not require any additional classes of costs or market benefits to be incorporated in the RIT-T. The cost of purchasing carbon permits associated with a generation option may be able to be considered as an operating and maintenance cost under clause 5.6.5B(c)(8)(ii). Similarly if a transmission investment would allow the additional dispatch of a low emission generator, then the reduction in the cost of purchasing carbon permits could be treated as a market benefit under clause 5.6.5B(c)(4)(iv).

While the RIT-T may not require additional classes of market benefits or costs to accommodate the CPRS, there may be merit in providing additional guidance and worked examples on the treatment of this policy in the application guidelines.

Q 8. Is the proposed approach an appropriate means of treating the CPRS under a RIT-T analysis?

Q 9. Are there any alternative approaches to treating the CPRS which the AER should consider?

Expanded Renewable Energy Target

The Australian Government has committed to a target of 20 per cent of Australia's electricity being sourced from renewable sources by 2020. To support this aim, the Government has implemented the expanded RET to encourage investment in renewable generation.[23] The expanded RET will provide a market for additional renewable energy generation, using a mechanism of tradeable renewable energy certificates (RECs).

RECs are created for each megawatt hour of eligible renewable electricity generated by accredited renewable energy power stations, or deemed to have been generated by eligible solar water heater installations or small generation unit installations.

Retailers are required to obtain and surrender RECs to cover a set proportion of their wholesale electricity purchases. If retailers fail to surrender a sufficient number of

21 The Allen Consulting Group, *Climate change policies and the application of the regulatory investment test for transmission,* prepared for the AEMC Review of energy market frameworks in light of climate change policies, December 2008, Melbourne.

22 The Allen Consulting Group, *Climate change policies and the application of the regulatory investment test for transmission,* prepared for the AEMC Review of energy market frameworks in light of climate change policies, December 2008, Melbourne, p. 9.

23 COAG, *Communiqué*, 30 April 2009, pp. 8–9.

RECs, they will be required to pay a penalty for the shortfall. This requirement will encourage increased investment in renewable energy generators and change patterns of generation dispatch.

In developing its preliminary views on the treatment of RECs under a RIT-T analysis, the AER has referred to the advice provided by ACG to the AEMC. It also sought advice from Frontier on the treatment of RECs in circumstances where it is likely that the expanded RET will be met, and alternatively in circumstances where it is likely that retailers will pay a penalty for the shortfall (and therefore the target may not be met).

The AER's preliminary view is that the RIT-T will be able to take account of the expanded RET. However, there may be merit in specifying an additional class of cost or market benefit to apply in circumstances where it is likely that retailers will pay the penalty rather than purchasing RECs. Further guidance and worked examples in the application guidelines may also be warranted.

Further detail on this proposed approach is set out below with worked examples provided in appendix B.

Treatment under the RIT-T where it is likely that the expanded RET will be met

The AER's preliminary view is that where it is considered likely that the expanded RET will be met, the policy will not require any special treatment under the RIT-T. Similar to the proposed treatment of the CPRS, a TNSP can account for the expected changes in generation investment patterns following the introduction of the expanded RET through its analysis of reasonable scenarios of future supply and demand. This analysis would look at (among other factors) any differences in generation (capital and operating) costs.

REC purchase costs can be ignored under a RIT-T analysis. Where the target is expected to be met, the costs of each investment option will be reflected in the existing classes of costs and benefits considered under the RIT-T. Including the cost of RECs in a RIT-T analysis would amount to double-counting.[24] The value of RECs above the cost of renewable generation amounts to a wealth transfer between market participants.

Treatment under the RIT-T where it is likely that retailers will pay the penalty

The treatment of the policy under the RIT-T is more complex where it is forecast that there will be insufficient RECs to meet the target, requiring retailers to pay a penalty (or buy out price). This outcome will arise where the REC price required to encourage investment in renewable generation to meet the RET is higher than the penalty (or buy out price).

In these circumstances, a RIT-T analysis must consider that the capped penalty provides a clear alternative to additional renewable energy investment and should be considered in the scenario analysis. The existence of the penalty will affect the

[24] The AER considers that this is consistent with the explanation provided in the Allen Consulting Group report, *Climate change policies and the application of the regulatory investment test for transmission*, prepared for the AEMC Review of energy market frameworks in light of climate change policies, December 2008, Melbourne, pp. 5–6.

assessment of future generation investment patterns and also the costs and benefits of generator dispatch under different investment options. Although the existing classes of costs and benefits considered under the RIT-T should capture the costs of renewable generation in the market (as discussed above), variations in renewable generation output will affect the quantum of penalty payments required by market participants—a cost that may not otherwise be covered in the existing classes of costs and benefits.

The AER's preliminary view is that the additional cost imposed on the market from the expanded RET could be captured by including the capped penalty for a REC shortfall in the scenario analysis. This could be achieved by treating any penalty payment under each scenario (projected REC shortfall x penalty value) as an additional cost. This approach may require an additional class of market benefits or costs to be included in the RIT-T. Further guidance on this approach as well as worked examples may also need to be included in the application guidelines.

Q 10. Is the proposed approach conceptually sound and an appropriate means of treating the expanded RET under a RIT-T analysis?

Q 11. Are there any alternative approaches to treating the expanded RET which the AER should consider?

7 RIT-T application guideline issues

Clause 5.6.5B(d) of the Electricity Rules requires the AER to publish guidance for the operation and application of the RIT-T. This part of the paper sets out the Electricity Rule requirements for the guidelines including:

- the operation and application of the RIT-T
- the process to be followed in the application of the RIT-T, and
- resolving RIT-T disputes.

It also seeks interested parties views on each of the matters raised.

7.1 Operation and application of RIT-T

Under clause 5.6.5B(f), the application guidelines must provide guidance and worked examples as to:

- what constitutes a credible option
- the acceptable methodologies for valuing costs
- what may constitute an externality
- the classes of market benefits
- the suitable modelling periods and approaches to scenario development
- the acceptable methodologies for valuing market benefits
- the appropriate approach to undertaking sensitivity analysis
- the appropriate approaches to assessing uncertainty and risks
- when a person is sufficiently committed to a credible option for reliability corrective action to be characterised as a proponent.

The AER has also identified a number of specific areas in chapter 6 of this paper where additional guidance on the operation of the RIT-T may be useful. These include:

- the treatment of climate change policies
- incorporating option value in a RIT-T analysis
- methods for quantifying competition benefits, and
- the appropriate methods for specifying discount rates.

The AER has existing regulatory test application guidelines (which accompany version three of the regulatory test).[25] These guidelines provide information on:

- determining costs
- calculating and modelling market benefits (including competition benefits)
- the appropriate method for determining the discount rate
- selecting likely alternative options, and
- scenario and sensitivity analysis.

Some of this information may be useful in developing the RIT-T application guidelines.

The AER is interested in whether there are any other areas where additional guidance, information or worked examples would assist in applying the RIT-T and whether there is specific information or examples which would assist to understand the RIT-T.

Q 12. Are there any additional areas (other than those set out in the Electricity Rules) that should be addressed in the application guidelines?

Q 13. Are there any areas where interested parties have views on the form or substance of the matters that the applications guidelines should address?

Q 14. Do aspects of the current regulatory test application guidelines provide useful information which should be adopted in the RIT-T application guidelines?

7.2 Process to be followed in applying the RIT-T

Under clause 5.6.5B(e)(2)(ii) the application guidelines must include guidance on the process to be followed in applying the RIT-T. The AER notes that there is significant detail on the RIT-T process set out in clause 5.6.6 of the Electricity Rules. This process is summarised below.

The AER's preliminary view is that the application guidelines will set out the process required under the Electricity Rules. However, the AER is interested in what additional guidance on the RIT-T process would assist interested parties and should be included in the application guidelines.

Process set out in the Electricity Rules

The operation and application of the RIT-T consists of two stages; a project specification consultation report stage and a project assessment report stage. A flowchart of the process is set out in appendix C.

Stage one: Project specification consultation report

Clause 5.6.6(c) sets out the information that a TNSP must include in its project specification consultation report. A TNSP must make the report available to all

[25] AER, *Regulatory test dispute resolution guidelines*, November 2007.

registered participants, the Australian Energy Market Operator (AEMO) and other interested parties. It must also provide a summary to AEMO to publish on its website and allow at least 12 weeks for submissions.

Stage two: Project assessment report stage

Draft report

The TNSP must consider submissions from interested parties, and publish the project assessment draft report within 12 months of the consultation period. Clauses 5.6.6(k)–5.6.6(l) sets out the information that must be included in the draft report.

The TNSP must provide a summary of the report to AEMO to publish on its website and allow at least six weeks for submissions. The TNSP must also meet with interested parties who request a meeting where the TNSP considers that it is reasonably necessary.

Under clause 5.6.6(y) a TNSP is exempt from publishing a draft report where:

- the estimated capital cost of the preferred option is less than $35 million
- the TNSP has identified in its consultation report its preferred option, its reasons for that option and noted that it will be exempt from publishing the draft report for its preferred option
- the TNSP considers that the preferred option and any other credible option does not have material market benefits, and
- there were no submissions on the consultation report which identified additional credible options that could deliver a market benefit.

Where an exemption applies, the TNSP will address any issues raised during the consultation report stage in the conclusions report.

Conclusions report

As soon as practicable after the consultation period for the draft report, the TNSP must make a project assessment conclusions report available. The conclusions report must set out the matters detailed in the draft report, a summary of submissions and the TNSP's response to those submissions.

Q 15. Are there any particular areas where further guidance on the RIT-T assessment process would be useful?

7.3 Dispute resolution

The application guidelines must include guidance on how disputes raised regarding the RIT-T and it application will be addressed and resolved.

The Electricity Rules set out the process that must be followed by disputing parties and the AER in resolving RIT-T disputes. Clause 5.6.6A permits registered participants, the AEMC, AEMO and other interested parties to dispute the conclusions made by the TNSP regarding:

- the application of the RIT-T
- the basis on which the TNSP has classified the proposed option as being for reliability corrective action, or
- the TNSP's assessment regarding whether the preferred option will have a material inter-network impact.

Disputes cannot be raised about matters which are treated as externalities by the RIT-T or relate to an individual's property rights.

The disputing party must lodge a written dispute notice with the AER which specifies the grounds for the dispute, as well as provide a copy of the dispute notice to the TNSP. This notice must be lodged within 30 days of the date of publication of the project assessment conclusions report.

Within 40 days (or up to 100 days for more complex disputes), the AER must either:

- reject the dispute notice if the grounds are misconceived or lacking in substance, or
- make a determination directing a TNSP to amend the project assessment conclusions report or stating that no amendments are required.

The AER can only make a determination directing a TNSP to amend a project assessment conclusions report where it determines that:

- the TNSP has not correctly applied the RIT-T
- the TNSP has incorrectly classified an investment as being a reliability augmentation or incorrectly assessed that the preferred option will have a material inter-network impact, or
- there was a manifest error in the TNSPs calculations.

In making a determination, the AER:

- must only consider information that the TNSP could reasonably be expected to have considered
- must publish its reasons for making a determination
- may request further information, and
- may disregard any matter raised that is misconceived or lacking in substance.

The AER has already published regulatory test dispute resolution guidelines.[26] These guidelines set out the process for raising disputes on the application of the regulatory test (version three) and provide information on:

- the requirements for lodging a dispute
- procedure for resolving a dispute
- matters considered by the AER in its determinations
- procedural fairness requirements and confidentiality issues, and
- cost determinations.

While the Electricity Rules requirements regarding disputes have changed significantly since the publication of these guidelines, some aspects of the guidelines may provide a useful basis for considering the development of the dispute resolution provisions of the RIT-T application guidelines. As such, the AER is interested in whether the information in the current regulatory test dispute resolution guidelines provides useful information on the process for raising and resolving regulatory test disputes.

Q 16. What guidance on the dispute resolution process would be helpful to interested parties? Are there any particular areas where more detailed guidance on the process would be useful?

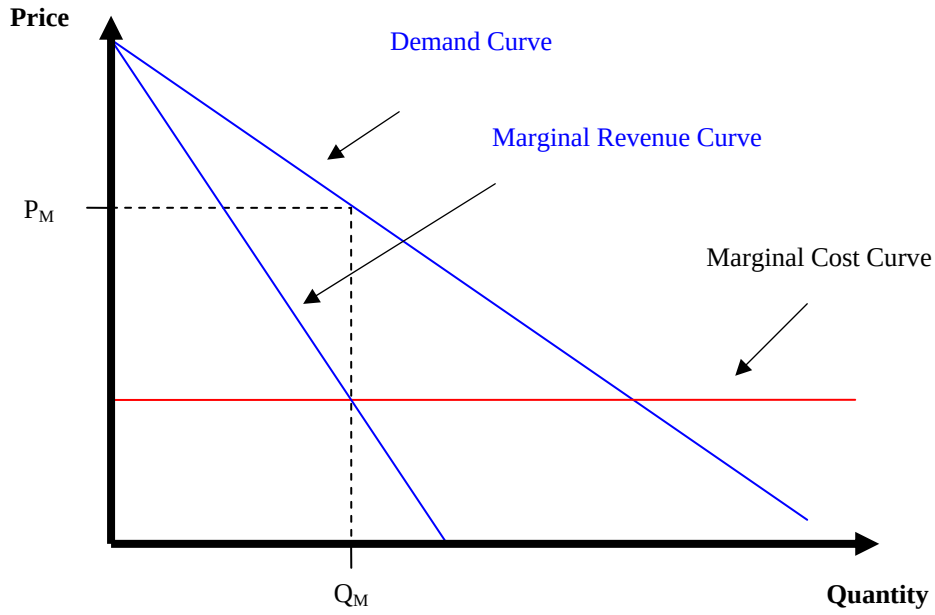
Q 17. Do the current regulatory test dispute resolution guidelines provide useful information on the current process for raising and resolving regulatory test disputes?

[26] AER, *Regulatory test dispute resolution guidelines*, November 2007.

Appendix A: A simple model of economic efficiency

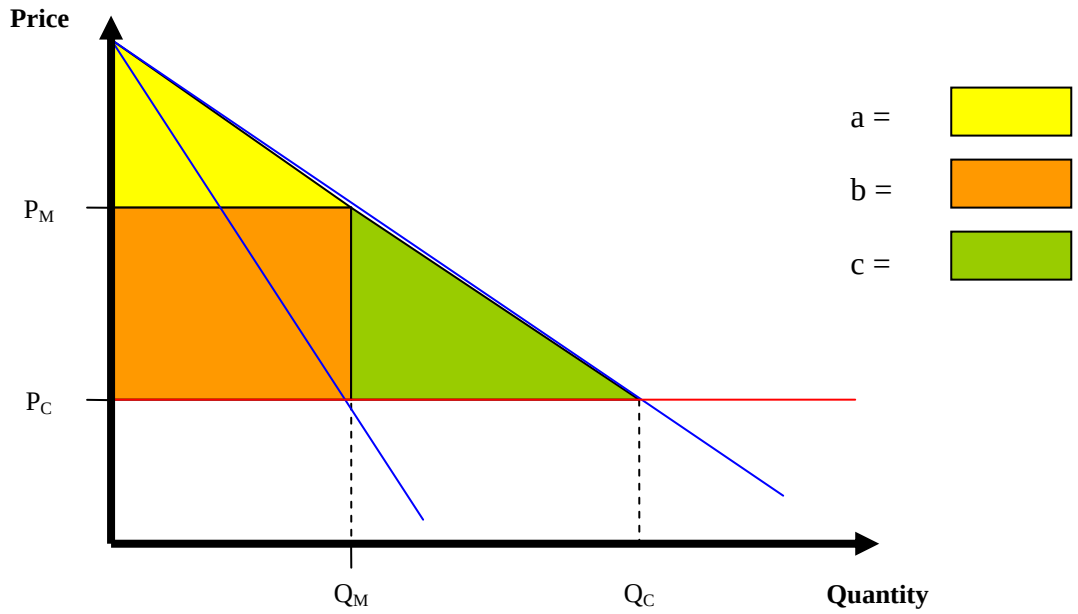
Assume initially that the supply of electricity in a market is provided by a single generator. Suppose for simplicity that the monopolist faces a horizontal Marginal Cost (MC) curve. Assume also that there are no constrains on the generator's ability to exercise its market power. It will set a price which maximises its profits by reference to the intersection of the Marginal Revenue and MC curves. The market clearing price and quantity for electricity will be given by PM and QM respectively as illustrated in figure 1.

Figure 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. 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 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 PM to PC and an increase in quantity supplied from QM to QC.

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.

The gains and losses in the market are relatively straight forward. Consumers gain from the decrease in price from PM to PC and an increase in quantity from QM to QC, (areas b and c). The generator loses from the decrease in price and from PM to PC and QM to QC 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.

The figures given above are an example of what is referred to by economists as a partial equilibrium analysis. Partial equilibrium analysis is concerned with a sub-sector of an economy and assumes that all other relevant variables are held constant. 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 biggest departure of the regulatory test from the generally accepted principles of cost-benefit analysis is that it only considers benefits from a partial equilibrium perspective.

Appendix B: Proposed approach to the treatment of the expanded RET under a RIT-T analysis

Background

The following example sets out the proposed approach for the treatment of RECs under the RIT-T. RECs are the instrument through which the expanded RET will be achieved.

RECs are created for each megawatt hour of eligible renewable electricity generated by accredited renewable energy power stations, or deemed to have been generated by eligible solar water heater installations or small generation unit installations. Retailers are required to obtain and surrender RECs to cover a set proportion of their wholesale electricity purchases. Where a retailer fails to surrender enough RECs to cover their liability, they will be required to pay a charge or penalty for the shortfall. This shortfall charge satisfies the retailer's obligation to surrender RECs.

The AER's preliminary view is that the additional cost imposed on the market from the expanded RET could be captured by including the capped penalty for a REC shortfall in the scenario analysis. This could be achieved by treating any penalty payment under each scenario (projected REC shortfall × penalty value) as an additional cost. This approach may require an additional class of market benefits or costs to be included in the RIT-T.

Interpretation of REC prices

In a competitive market, the REC price should reflect the difference between the marginal cost of renewable generation required to meet the expanded RET and the wholesale electricity price.

The shortfall penalty for RECs reflects the maximum value placed on an increment of renewable energy, irrespective of the notional target under the expanded RET. Expressed slightly differently, the shortfall penalty can be described as the value of the positive externality produced by an increment of renewable generation given the ex ante targets set under the scheme. The penalty price effectively translates into a dollar per megawatt hour renewable energy subsidy reflecting the deemed per-unit benefit of additional renewable generation.

In the absence of any price cap on RECs, it is reasonable to assume that the expanded RET will be met: the price of a REC would simply rise to the level necessary to induce compliance with the target. With the shortfall penalty acting as a cap on REC prices, however, it cannot be assumed that the expanded RET will be met. It is possible that it will not be net beneficial to meet the target as the cost of meeting it could exceed the benefits, as indicated by the level of the penalty.

Treatment under a RIT-T analysis

An assumption that the expanded RET may not be met in all circumstances will affect the assessment of likely generation investment patterns following the introduction of the expanded RET. In a TNSP's assessment of reasonable scenarios of future supply

and demand, payment of the shortfall penalty must be considered as a clear alternative to additional renewable energy investment.

This raises the question of how to estimate net benefits under the RIT-T. Analysis of costs and benefits under the RIT-T is limited to costs and benefits accruing to participants in the NEM. Under this approach, any lost environmental benefits resulting from failure to meet the expanded RET cannot be incorporated in the analysis. The net market benefit analysis must therefore focus on the cost of complying with the scheme, made up the cost of all renewable generation and any shortfall penalty payments.

REC purchase costs can be ignored under a RIT-T analysis. The REC price should reflect the difference between the marginal cost of renewable generation required to meet the target and the wholesale electricity price, subject to the penalty cap. As the costs of each investment option (including the cost of generation) will be reflected in the existing classes of costs and benefits considered under the RIT-T, including the cost of RECs in a RIT-T analysis would amount to double-counting. The value of RECs above the cost of renewable generation amounts to a wealth transfer between market participants.

Although the existing classes of costs and benefits considered under the RIT-T should capture the costs of providing renewable generation in the market, variations in renewable generation output may affect the quantum of penalty payments required by market participants under the expanded RET—a cost that may not be covered in the existing classes of costs and benefits.

The costs imposed on the market can be demonstrated with the aid of a diagram showing the supply curve for RECs. When conducting a RIT-T analysis, there may be different quantities of RECs generated under the different scenarios and options considered. This will be reflected in a different REC supply curve for each scenario or option.

Figure 1

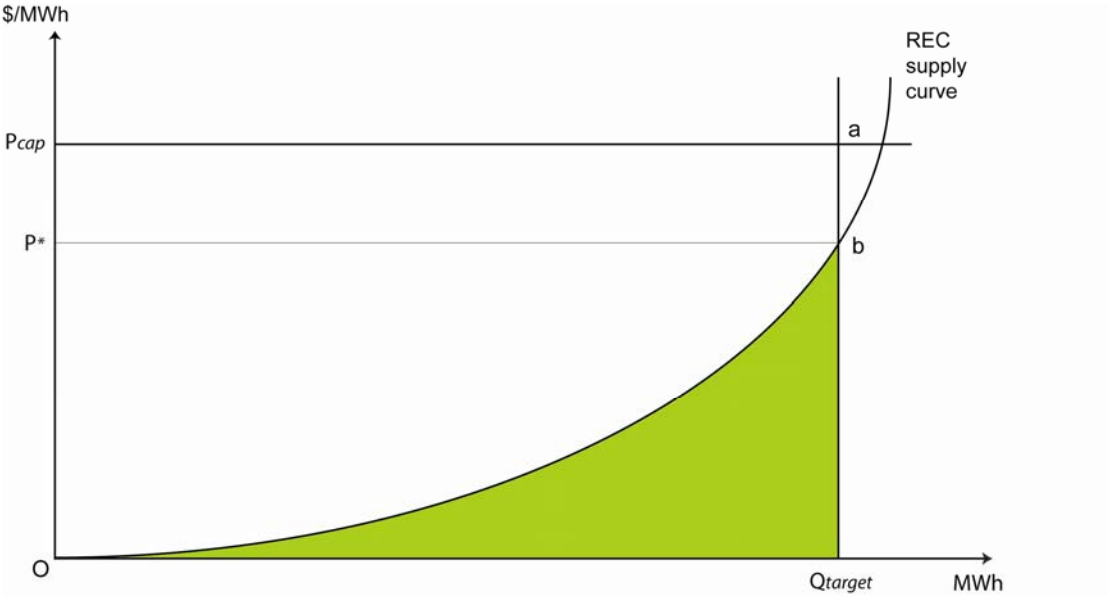


Figure 1 shows a supply curve scenario for RECs under a particular option assessed under the RIT-T. The penalty price (P^{cap}) and quantity targeted (Q^{target}) under the expanded RET are shown. The expanded RET is likely to be met under this scenario as the cost of the RECs required to meet the target (P*) is less than the shortfall charge imposed (P^{cap}).

The green shaded area (ObQ^{target}) under the supply curve represents part of the cost of development and generation of renewable energy under this scenario. These costs will be captured under the existing cost categories in the RIT-T. As penalty payments are not required under this scenario, analysis of the net market benefits can occur with regard solely to these costs.

It might well be the case that the expanded RET will be met (without any retailers paying penalties) under each option and scenario considered under a RIT-T analysis. If so, there is no need to account for the expanded RET or the REC market in the RIT-T analysis.

Figure 2

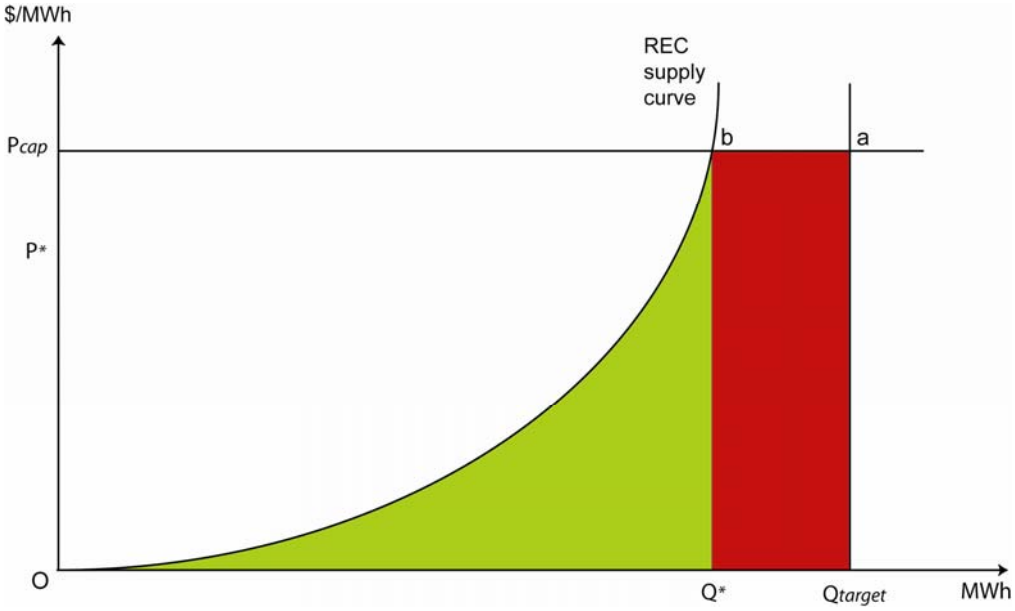


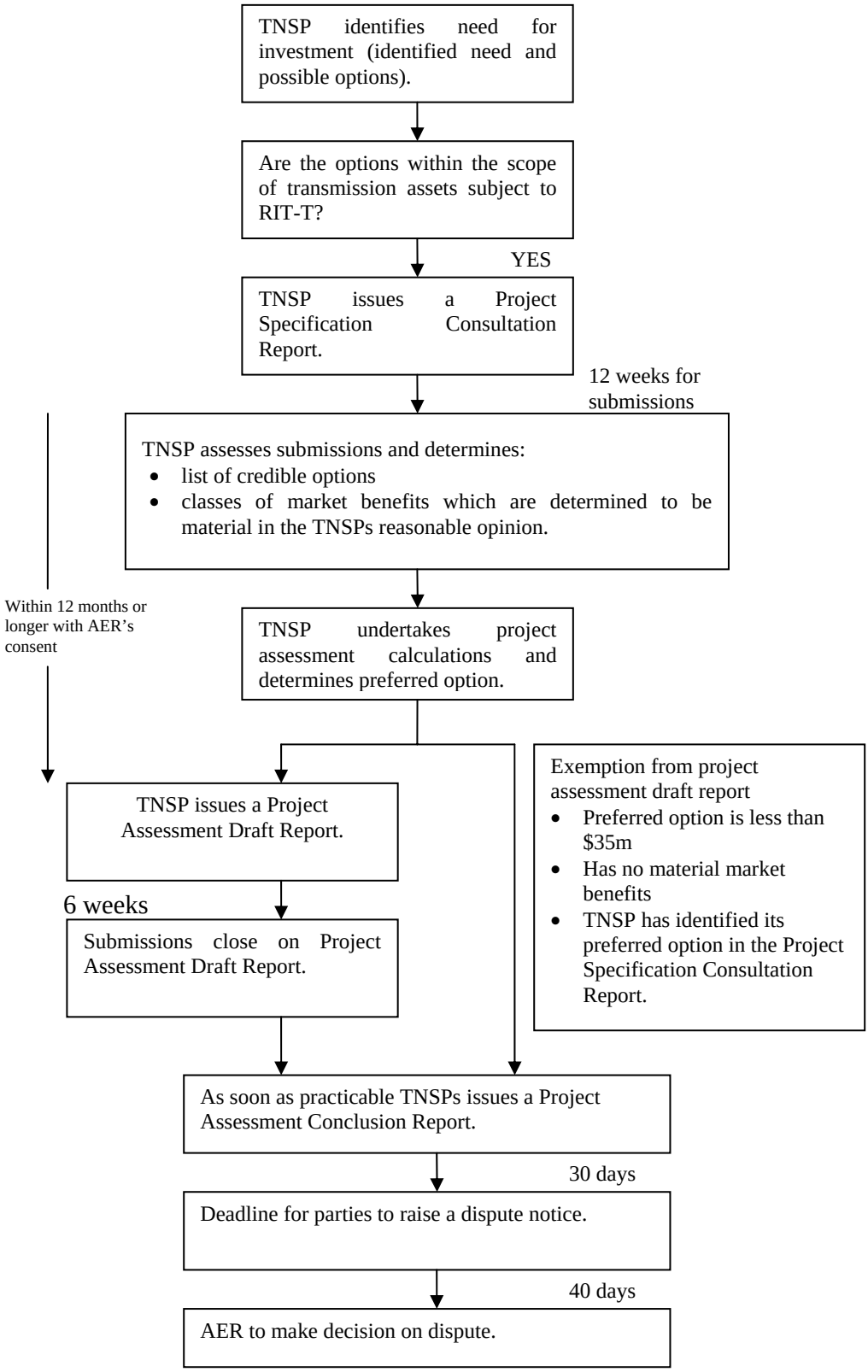
Figure 2 introduces the supply curve for RECs under a second scenario. The cost of RECs required to meet the expanded RET in this scenario is higher than the shortfall charge. Retailers are likely to pay the penalty price (P^{cap}) rather than fund the investment of renewable generation to produce RECs beyond Q* (the point where the cost of the marginal REC is equal to the penalty price).

In a RIT-T analysis, only the green area (ObQ^{*}) is likely to be captured under existing cost categories. This area represents costs associated with the development and generation of the renewable energy. The additional cost to the market, being the payment of a shortfall charge by retailers, is shown in red ($Q^{*}baQ^{target}$). It is necessary to include an additional class of costs in the RIT-T to capture this cost to the market.

In summary, the additional cost to the market of shortfall charges arising in the REC market will only need to be considered under a RIT-T analysis where:

- under at least one of the scenarios or options being considered, is it likely that the expanded RET will not be met; and
- the level of renewable generation differs between scenarios or options being considered.

Appendix C: RIT-T process flow chart



Source: AEMC, *Regulatory investment test for transmission*, Final Rule determination, 2009, p. 55.