

Review of the Regulatory Investment Test for Transmission

RIT-T Review

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COAG
Energy Council

Contents

1	Executive summary	4
2	Recommendations	8
3	Scope of Review	8
4	Context—An introduction to the RIT-T	9
4.1	Purpose of the RIT-T	9
4.2	Specific features of the RIT-T	10
4.3	Overview of the RIT-T process.....	11
4.4	Interaction of the RIT-T within the broader regulatory and planning framework	14
4.4.1	Interconnectors and the RIT-T	15
4.5	Past reviews of the RIT-T	16
5	Context—the changing market environment	17
5.1	Changing demand patterns.....	17
5.2	Changing technology	17
5.3	Increased renewable generation and decreased scheduled generation.....	18
5.4	System security issues.....	18
6	Key Issues	19
6.1	Timeliness and efficiency of process	19
6.2	Information accessibility	23
6.3	Costs and benefits	25
6.3.1	Option value.....	25
6.3.2	Environmental policies.....	26
6.4	Regulatory Oversight and decision making	28
6.5	Effectiveness of the RIT-T for interconnector projects	31
6.5.1	Inclusion of competition and non-market benefits.....	33
6.5.2	Accounting for system security.....	35
6.6	Are planning and decision-making processes fit-for-purpose for interconnector projects?....	37
6.6.1	Existing strategic planning and development processes	40



6.6.2	Scope for RIT-T to take account of broader benefits in considering interconnector proposals	42
6.6.3	A broader role for jurisdictions in planning and approvals?	43
6.7	Other issues – alignment of incentives.....	44
7	Areas for reform and conclusions.....	46
	Appendix A: RIT-T Review Terms of Reference	47
	Appendix B: Consultation questions	50
	Appendix C: Consultation.....	52
	Submissions received	52
	Other public consultation	52
	Appendix D: Interactions with recent reform and concurrent planned processes	53
	Appendix E: Origins of the RIT-T	55

1 Executive summary

On 19 August 2016 the Council of Australian Governments (COAG) Energy Council tasked officials to undertake a review of the regulatory test that applies to investments in new electricity transmission assets (RIT-T) in the National Electricity Market (NEM). COAG noted the important role interconnectors play in a transitioning energy sector. The purpose of this review is to assess whether the RIT-T remains effective in the current electricity market environment and where appropriate recommend improvements to the process.

Transmission assets constitute the 'backbone' of the national electricity grid and investments to reinforce or augment these networks play a critical role in addressing, among other issues, system congestion, reliability and safety concerns. Interconnectors—transmission assets that span more than one region in the NEM—are particularly important, offering a wide range of distributed benefits including enhancements to power system security. They allow frequency control and other ancillary services to be sourced from across the interconnected system, rather than solely rely on one region. Additionally, they increase wholesale electricity market competition through inter-regional trade and the sharing of the benefits of renewable energy resources across regions. Such benefits however do not come without cost and where assets are regulated those costs are recovered from consumers as part of the network component of their electricity bills.

The RIT-T is designed to identify the most efficient regulated investment in transmission infrastructure, whether intra- or inter-regional in scale, and ultimately protect consumers from paying more than necessary for their supply of electricity.

In line with the terms of reference agreed by the Senior Committee of Officials, this review has considered the appropriateness, effectiveness and efficiency of the test with a focus on the following areas: the balance between timeliness and rigour; the extent to which the RIT-T's current design is able to capture the full costs and benefits associated with transmission projects; whether the RIT-T is being applied appropriately; whether the RIT-T is appropriate to facilitate strategic interconnection investment decisions and the effectiveness of current governance arrangements.

Broadly, the review has found that the RIT-T in its current form remains the appropriate mechanism to ensure that new transmission infrastructure in the NEM is built in the long term interests of consumers. Further, it remains an appropriate mechanism for the assessment of interconnection investments.

Officials have identified a number of potential areas for improvement in both the test and wider transmission planning arrangements. These include:

1. *Review of the Australian Energy Regulator's (AER) RIT-T application guidelines, with a view to better reflect the net system benefits of options, including those relating to system security and renewable energy and climate goals*—It is recommended that guidelines be updated by the AER to provide greater clarity around the incorporation of option values, the appropriate reflection of renewable energy and climate

goals, and to better accommodate high impact, low probability events such as the ‘black system’ event experienced recently in South Australia. A lack of consideration of option values in the application of the test may be creating barriers to providers of demand-side or non-network solutions developing credible options. Further, while this review has confirmed that the RIT-T is capable of capturing environmental policies, a lack of consistency in the incorporation of future carbon and renewable energy policy assumptions may be compromising the identification of the most efficient investment options. Finally, current methodologies may need to be adapted to better weight high impact, low probability events in line with public expectations regarding mitigation.

2. *Improvements to the level and accessibility of information relating to transmission networks*

a) Engage non-network providers in planning and transmission annual planning reports (TAPR).

It is recommended that the AER involve non-network service providers in its existing ongoing annual compliance review of the TAPR to improve the quality and increase the value of the annual planning reports. Improving the quality of the information in TAPRs could ensure that non-network businesses can identify and meaningfully engage with the network businesses about potential investment opportunities.

b) Explore the alignment of the regulatory investment tests.

It is recommended that the AER explore the requirements under the complementary Regulatory Investment Test for Distribution (RIT-D) that do not extend to transmission but may warrant further examination. These include requirements to consult with non-network providers and to produce non-network options reports under certain circumstances. The objective would be to ensure that the market is effectively tested for competitive options. Any changes that are identified would need to go through the required rule change process with standard consultation periods as required.

3. *Further explore the merits of increasing the AER’s level of oversight for the RIT-T process*—It is recommended that the Australian Energy Market Commission (AEMC), as part of an existing rule change request, explore the merits of increased oversight for the RIT-T process, including making the provisions associated with the application of the RIT-T by transmission network business’ civil penalty provisions, and strengthening linkages between the economic regulatory framework and the regulatory investment test. The merits will be explored as part of the current rule change request submitted by the Australian Energy Council which is considering the proposed contestability of energy services, demand response and network support, and will be subject to the standard rule change process including stakeholder consultation. Increased oversight could address concerns around network businesses having a strong incentive to select network options over non-network options or alternative NEM wide solutions. The additional oversight could allow the AER to better consider if the full value of the RIT-T should be allowed in a network business’ regulatory asset base.

The review considered, but found no evidence to warrant, options to streamline the test by shortening consultation and/or lessening requirements around the cost-benefit analysis in certain circumstances. The

underlying issues which have led to protracted processes, in some cases, appear to stem from contention between project proponents, interested stakeholders and proponents of competing options rather than the design of the test or its governance. Any paring back of current timeframes would compromise the ability of the test to effectively identify and assess all credible options. However, to the extent that delays relate to the complex task of assessing the relative costs and benefits of options, clearer guidelines and improved information should lead to a more efficient and streamlined RIT-T process.

The review further considered, but found no evidence to warrant, changes to the categories of costs and benefits which are captured in the RIT-T or to its current confinement to a partial equilibrium analysis focused on costs and benefits to those producing, transporting and consuming electricity in the NEM. What is needed are enhancements to modelling tools and processes to better capture system security benefits, such as changes in the costs of procuring ancillary services and the implications of high impact, low probability events such as that experienced recently in South Australia, as the proportion of renewables in the NEM progressively increases. The Australian Energy Market Operator (AEMO) is currently exploring these matters more generally through its power system security work program.

The review found that existing network planning processes and the RIT-T remain appropriate for the consideration of, and application to, the potential development of interconnectors. Importantly, the RIT-T is able to take account of the potential market benefits which are commonly identified as potentially accruing from such investments – including environmental and competition benefits – and allows for a robust cost-benefit analysis to be made. Clarifying and improving AER's application guidelines as proposed will assist with this process.

While outside the terms of reference for this review, the Energy Project Team (EPT) notes it would be open to jurisdictions and/or the Energy Council to bring forward interconnector investment outside the regulated framework, taking account considerations broader than those under the RIT-T. The RIT-T is only required for large transmission projects seeking regulated returns, to ensure the long-term costs to customers are warranted. Funded projects are exempt. Careful consideration would need to be given to key design questions were such an approach to be considered, including what would be the decision making criteria; who is the decision maker; and importantly, who would pay for these investments. Given such an approach would represent a significant market intervention with the potential to impose large costs on consumers (through either taxes or network charges) and affect market and other stakeholder interests over the longer term, it is not recommended. However, if the Energy Council were open to considering the approach further, then it would be prudent to await the outcomes of the Energy Security Review and the 2017 climate review, given they are likely to have implications for the long term planning and investment needs of the NEM.

Officials note that some additional observations were made by stakeholders which sat outside the scope of this review but may warrant further investigation through other processes. These include a concern among consumer groups and some generators that network incentives are weighted towards capital expenditure which can be incorporated within their regulatory asset base rather than the most cost effective solution to meet an identified need. Stakeholders from these groups criticised the current weighting of risks noting, among other issues, that while generation competes with networks it does not do so on a level playing field.



Addressing this issue would require changes to the economic regulatory framework applying to network businesses. Some of these issues will be considered by the AEMC in its annual review of the economic regulatory framework and the pending rule change request on contestability of energy services that it recently received from the Australian Energy Council.

The findings of this review are consistent with previous reviews of the RIT-T, where it has consistently been found to be a robust and appropriate mechanism to assess transmission network investments and to provide an appropriate balance between rigour and timely investment decisions. Similar to this review, previous reviews have also recommended minor changes to improve the overall effectiveness of the RIT-T process.

The RIT-T consultation paper was published on the COAG Energy Council website and open for submissions for a three week period from 30 September to 20 October 2016. Also, a number of targeted consultations were conducted to seek feedback on the consultation questions, including the timeliness and efficiency of the process, design features of the analysis undertaken for the test, implementation of the test and oversight of the test.

The Review was oversighted by the COAG Energy Council Energy Project Team and undertaken by the RIT-T project team comprising of representation from the Commonwealth, state governments and market bodies (AEMC, AEMO and AER).

2 Recommendations

Recommendations	Action by	Timeline
1. Review of the AER's RIT-T application guidelines, with a view to better reflect the net system benefits of options, including those relating to system security and renewable energy and climate goals.	AER	Commence in 2017 following the final determination of the replacement expenditure planning arrangements rule change.
2. Improvements to the level and accessibility of information relating to transmission networks. a) Involve non-network service providers in its existing ongoing annual compliance review of the transmission annual planning reports. b) Explore the requirements under the complementary RIT-D that do not extend to transmission but may warrant further examination. Where extensions are identified, any required rule change process will be undertaken.	AER	Starting from 2017, AER to involve non-network service providers in its existing regular annual planning review process. Exploration of the extending RIT-D requirements to the RIT-T to be completed by end 2017.
3. Further explore the merits of increasing the AER's level of oversight for the RIT-T process.	AEMC	January 2017 as part of the contestability of energy services, demand response and network support rule change determination process submitted to the AEMC on 21 October 2016.

3 Scope of Review

This review is the latest of a number of investigations that have considered the RIT-T—which are outlined briefly in section 4.5. All of these past reviews have found the RIT-T to broadly be an appropriate and effective mechanism for delivering effective transmission investment in the NEM. The past reviews also made a number of recommendations to refine the RIT-T's design.

In light of the substantial changing market environment, the COAG Energy Council tasked officials to review the RIT-T to ensure it remains fit for purpose and is able to perform effectively in the context of the changing market. In particular, this review considers:

- Whether there is scope to make the RIT-T process more efficient and timely; and
- Whether the RIT-T's design remains appropriate to current and future needs with particular regard to interconnection investment given the important role they play in the NEM.

A consultation paper was released on 30 September 2016 with submissions due on 20 October 2016. Fourteen submissions were received as part of this consultation process.

The Terms of Reference for the review are at **Appendix A** and consultation questions **Appendix B**. Stakeholders that contributed to the review are listed at **Appendix C**.

Consideration of RIT-T arrangements in this review took into account both augmentation and replacement transmission infrastructure expenditure, in light of the pending rule change request to include replacement infrastructure in RIT-T obligations¹.

There are also a number of reforms and rule change processes that are being progressed in response to the changing market environment and other related processes that are operating concurrent to this review. These processes are detailed in **Appendix D**.

4 Context—An introduction to the RIT-T

4.1 Purpose of the RIT-T

The RIT-T is a cost-benefit process that is applied to all new transmission network investments that have an estimated cost greater than \$6 million.² It was designed to replicate investment outcomes in a competitive market environment. It does this through identifying the costs and benefits³ associated with a new project, along with any alternatives.

¹ The AER has submitted a rule change request to the AEMC proposing a change to the NER to extend the RIT-T to replacement expenditure. The Replacement expenditure planning arrangements rule change is available at: <http://www.aemc.gov.au/Rule-Changes/Replacement-Expenditure-Planning-Arrangements>. The AEMC expects to commence consultation on this request in October 2016.

² The Australian Energy Council has submitted a rule change request to the AEMC proposing to reduce this threshold to \$50,000. Investments between \$50,000 and \$6 million would be subject to a shortened form of RIT-T process. <http://www.aemc.gov.au/Rule-Changes/Contestability-of-energy-services-demand-response>.

³ NER, section 5.16.1 – costs and benefits include costs of construction of or providing options, operating and maintenance costs, costs of complying with laws and regulation (including the impact of environmental policies such as the Renewable Energy Target on the costs and benefits of different options), reductions in generation dispatch costs, reductions in voluntary and involuntary load curtailment/shedding requirements, reductions in transmission

It is conducted by transmission network businesses, and is used to identify the investment option which addresses an identified need and which maximises the net economic benefit to all those who produce, consume and transport electricity in the NEM.⁴ The origins of the RIT-T are briefly outlined at **Appendix E**.

The role of the RIT-T is to avoid inefficient regulated investment in new transmission assets, including interconnectors, in the NEM. It recognises that network projects which are included in a transmission network business' regulated asset base must be paid for by energy consumers over the life of the asset—generally from 30 to 50 years; and that in some cases, a network investment is not the best option.

Simply put, the RIT-T plays the role of gate-keeper—ensuring that consumers only pay for investments that are economically efficient and optimal overall for the NEM. It aims to ensure that all credible options for addressing an identified need are considered, and that the relative merits of network and non-network options are considered on an equal footing.

Importantly, the RIT-T only applies to investments that will benefit from regulated revenues; that is, regulated revenues recovered from electricity consumers. It does not apply to investments that are funded from other sources, for example augmentations paid for by generators, merchant interconnectors, or investments funded by governments.

The RIT-T is designed to be a consultative and transparent process for transmission planning. The test allows for public consultation and comment within a transparent framework.

4.2 Specific features of the RIT-T

The RIT-T must be undertaken in accordance with the provisions set out in the NER,⁵ the RIT-T and the RIT-T application guidelines published by the AER.

The RIT-T requirements are set out in Chapter 5 of the NER. Consistent with this, the AER has published the RIT-T and associated guidelines—the *Final, regulatory investment test for transmission, June 2010* and *Final, regulatory investment test for transmission application guidelines, June 2010*.⁶

Under the RIT-T, proposed transmission infrastructure investment is objectively evaluated against other credible network or non-network alternatives. This recognises that the option which maximises net market benefits could be the network investment proposed by a network business, a different network option, or a non-network option (such as local generation, storage or demand management and other new emerging technologies which arise).

losses, deferral of new plant requirements and competition benefits (capturing for example, the efficiency benefits of increased competition between generators), among others. Also allowed is new classes of benefits to be considered, subject to the AER's approval.

⁴ National Electricity Rules, 5.16.1 Principles, (b)

⁵ National Electricity Rules version 84, <http://www.aemc.gov.au/Energy-Rules/National-electricity-rules/Current-Rules>.

⁶ Australian Energy Regulator, Regulatory investment test for transmission and application guidelines 2010. <https://www.aer.gov.au/networks-pipelines/guidelines-schemes-models-reviews/regulatory-investment-test-for-transmission-rit-t-and-application-guidelines-2010>.

The RIT-T only measures the economic impacts for ‘parties who produce, consume and transport electricity in the NEM’—that is, only those costs and benefits which are captured in the NEM are included in the RIT-T assessment. Consistent with the principles of a cost-benefit analysis, the focus of the RIT-T is on economic costs and benefits rather than price outcomes and flow-on effects. However, the RIT-T does allow consideration of projects that may lead to fewer price spikes. For example, a project may deliver a reduction in price spikes due to it allowing the dispatch of lower fuel cost plant. In such cases, the fuel cost saving associated with this project would be a valid market benefit for inclusion in the assessment.

The RIT-T also recognises that a preferred option may satisfy the test despite imposing a net economic cost, in cases where it is the most efficient solution to address an identified need for reliability corrective action.⁷

Although classes of market benefits are defined in the RIT-T, the NER also allow for new categories of market benefit to be considered.⁸ Network businesses are required to obtain approval from the AER prior to considering such benefits as part of the RIT-T. No approval has been sought to date.

The AER can be asked to determine whether a preferred option satisfies the RIT-T, but its role is limited largely to ensure compliance with the legislative requirements. The AER also has a role in resolving any disputes raised by interested parties to the requirements (see section 4.3) and is responsible for regularly revising the investment cost thresholds for application of the test.

4.3 Overview of the RIT-T process

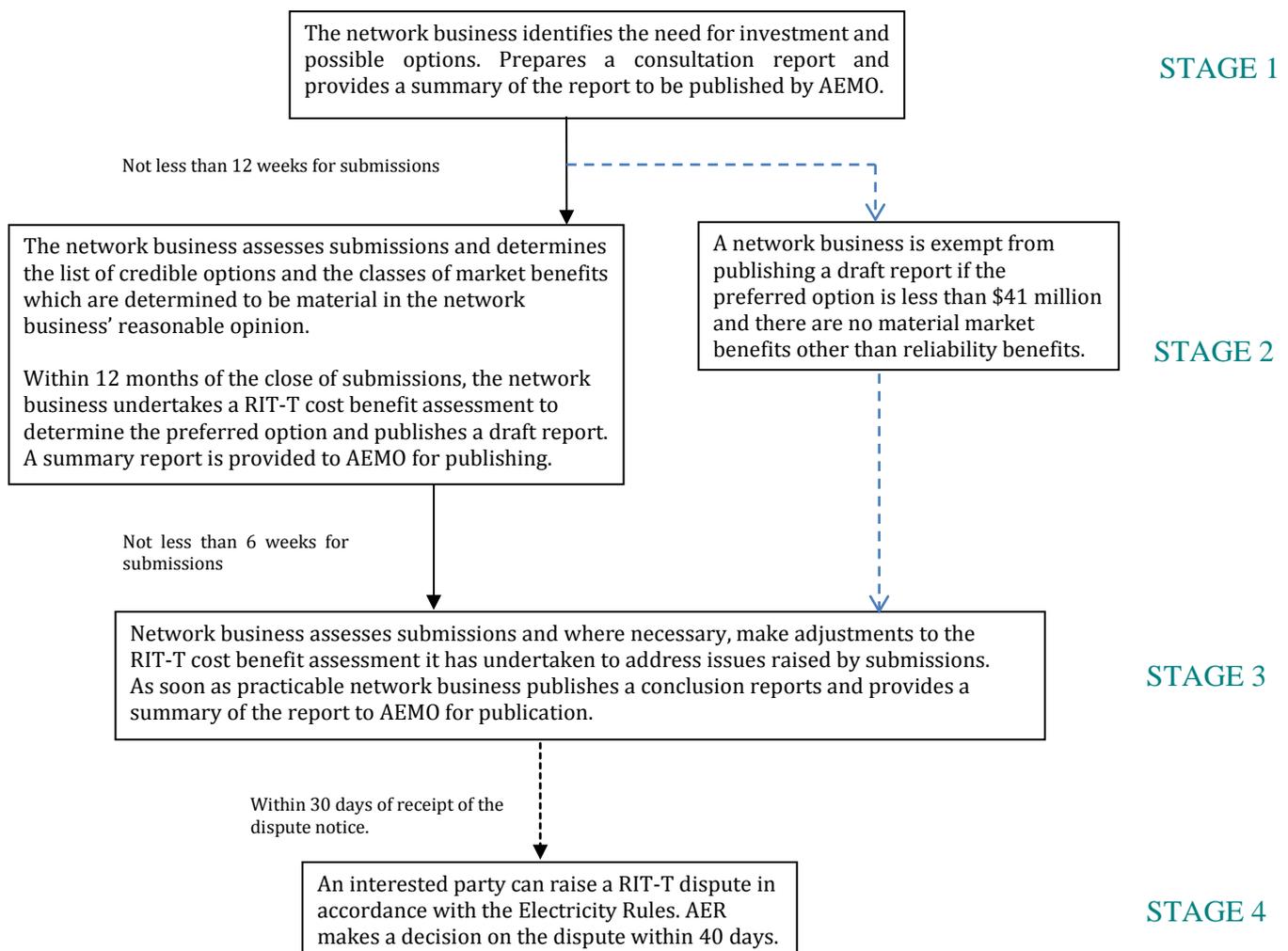
The NER set out four main stages comprising the RIT-T consultation process⁹, which can vary in both duration and complexity depending on the size the project. As outlined following and in Figure 1, the process tends to be more detailed and lengthy for higher value projects with multiple proponents and stakeholders, such as interconnectors.

⁷ For example, in November 2013, ElectraNet issued a Project Assessment Conclusions Report for a proposed upgrade to the Dalrymple substation. Two credible options to take reliability corrective action were identified in order to meet an increased reliability standard. Both options had a negative net market benefit and the least negative option was taken as preferred to ensure reliability.

⁸ NER 5.6B(c)(4) – classes include changes to: fuel consumption; changes in voluntary load curtailment; changes to involuntary load shedding; changes in costs to NEM parties due to differences in investment timing, capital costs, operational and maintenance costs; changes to ancillary service costs; competition benefits; any additional option value; and any other benefit the TNSP considers relevant and agreed by the AER.

⁹ National Electricity Law, 5.16.4 Regulatory investment test for transmission procedures.

Figure 1 RIT-T assessment and consultation process



Stage one: Project Assessment Consultation Report

The network business publishes a consultation report, setting out the:

- a. need for investment, and assumptions used in identifying this need
- b. potential options identified

- c. classes of market benefits which it considers to be material for the RIT-T assessment
- d. technical requirements that a non-network option would need to meet to address the investment need.

The consultation report must be provided to all registered participants, AEMO and interested parties on the credible options and issues addressed. A summary of the report must be provided to AEMO for publication on its website. The network business must provide at least 12 weeks for submissions from the date AEMO publishes the summary.

Stage two: Project Assessment Draft Report

Within twelve months of consultation report submissions closing, the network business must publish a draft report summarising the results of the RIT-T assessment.

In preparing the draft report, the network business must consider submissions received to determine which investment options are credible and what classes of market benefits will be considered. A credible option is one that addresses the identified need, is commercially and technically feasible, and can be implemented within the required timeframe.

The network business must undertake a RIT-T assessment comparing the various credible options to find the preferred option — that being the option which maximises net economic benefits. The draft report must be made available to registered participants, AEMO and interested parties, with a summary to be published on the AEMO website. The network business must provide at least 6 weeks for submissions.

A network business is exempt from this draft report stage where the preferred option entails costs of less than \$41 million and the only material market benefits are reliability benefits.

Stage three: Project Assessment Conclusions Report

The network business must consider the submissions received and make adjustments to the RIT-T assessments if required. As soon as practicable, the network business must publish a conclusions report summarising the RIT-T assessment, and its response to submissions received and a summary of the conclusions report must be provided to AEMO for publication on its website.

Stage four: Dispute resolution

Within 30 days of publishing the conclusions report an eligible party (the AEMC, AEMO, a registered participant, connection applicant, intending participant or interested party) may dispute conclusions made in the report to the AER. Within 40 days of the receipt of the notice, the AER must make a determination either rejecting the dispute or publishing a determination setting out whether the network business will be required to amend the conclusions report. The timeframe for the AER to consider a dispute can be extended by an additional period of up to 60 days. The AER may only require amendment where it finds that the RIT-T proponent has:

- not correctly applied the RIT-T in accordance with the Rules
- erroneously classified the preferred option as being for reliability corrective action
- not correctly assessed whether the preferred option will have a material inter-network impact
- made a manifest error in calculations.

The AER has not been required to resolve a RIT-T dispute to date.

4.4 Interaction of the RIT-T within the broader regulatory and planning framework

The RIT-T is a key element of a wider planning framework established under the National Electricity Law (NEL) and NER to promote efficient investment in transmission infrastructure in the NEM.

The framework includes, among other elements, annual obligations on each network business¹⁰ to publish a transmission annual planning report, and NEM-wide planning and reporting functions and responsibilities of the energy market bodies to help participants identify constraints and investment opportunities in the market early and so encourage timely investment. Briefly:

- The AEMO prepares the *Electricity Statement of Opportunities* (ESOO). The ESOO provides technical and market data to help inform stakeholder decision-making and highlight investment opportunities in the NEM over a 10-year outlook period.
- AEMO also prepares the *National Electricity Forecasting Report* (NEFR) which is an independent electricity consumption and demand forecast over a 20 year outlook period for each of the five NEM regions.
- AEMO, in consultation with industry, must also prepare the *National Transmission Network Development Plan* (NTNDP), which presents an independent, strategic view of the efficient development of the NEM transmission grid over a 20-year planning horizon. The NTNDP takes account of all committed and proposed projects and, to the extent practicable co-optimises network and non-network investment in order to maximise net market benefits.
- Transmission network businesses are required to undertake a *Transmission Annual Planning Report* (TAPR) for their network regions, which assesses the adequacy of the transmission network to meet future reliability and security needs over the next 10 years, taking account of the most recent NTNDP. TAPRs identify project needs prior to the RIT-T process and well in advance of actual investments. As such, they are an important mechanism for proponents of non-network options to identify potential opportunities early to do the necessary groundwork to have their option considered as part of the RIT-T process.
- AEMO also carry out independent, technical reviews of emerging transmission network investment requirements in jurisdictions.

¹⁰ In Victoria, AEMO performs most of the planning functions including producing the transmission annual planning report, undertaking RIT-Ts, and undertaking procurement of transmission augmentations. These functions are carried out by network businesses in other jurisdictions.

Finally, the AEMC's *last resort planning power*¹¹ allows it to direct one or more network businesses to apply the RIT-T to augmentation projects where they are likely to relieve a forecast constraint on a national transmission flow path. The purpose of the power is to ensure timely and efficient inter-regional transmission investment for the long term interests of consumers should the other planning mechanisms fail to deliver the necessary investment in a timely fashion. For example where AEMO has identified a material constraint in the NTNDP but the relevant transmission network business does not address the constraint in its TAPR. The AEMC must exercise its power in accordance with requirements in the NER and the last resort planning power guidelines.

To date, there have been no circumstances in which the AEMC has identified a need to invoke this power.

4.4.1 Interconnectors and the RIT-T

In a planning sense there is no such physical asset as an “interconnector”. It is thus not always a straightforward task to draw a clear demarcation between ‘interconnection’ projects and others.

The key distinguishing features between interconnector projects and other projects are that the former involve transmission lines that cross regional boundaries and involve more than one network planner, thereby introducing coordination requirements and connection between pricing regions.

The RIT-T has only been applied to two interconnector projects since it was introduced in its current form in 2010— the upgrade of the Queensland-New South Wales interconnector (QNI) and the recent upgrade to the Heywood interconnector between South Australia and Victoria. The majority of interconnector projects in Australia predate the RIT-T, with decisions to construct or not construct, not necessarily determined only on economic grounds.

Prior to the 1990s, there were only two relatively small interconnectors between the states; the Snowy interconnector between NSW and Victoria was built in 1961 and the Heywood interconnector between Victoria and South Australia was built in 1989. The governments of a number of states became interested in new interconnectors in the early 1990s for different reasons, including strengthening energy security, promotion of greater competition among generators, and (in the case of Tasmania) developing a linkage with mainland Australia.

In 1996, NSW and South Australia proposed an interconnector. While this interconnector initially failed the applicable regulatory test, it was later found to satisfy the updated regulatory test in 2001. However, the interconnector was never built.

In 1997, the NSW and Queensland governments approved QNI, which was constructed and went into initial operation in 2001. In parallel, the merchant interconnector, DirectLink, was built between NSW and Queensland and began operation in 2000. In 2004, an application to convert DirectLink to a regulated network service was submitted, and was subsequently approved in 2006.

¹¹ National Electricity Rules, 5.22 Last resort planning power.

Also in 1997, the Tasmanian Government committed to participate in the NEM via an interconnector with Victoria. Development of Basslink, as a merchant interconnector, commenced in 2000, with commercial operation starting in 2006.

In 1999 another merchant interconnector—Murraylink—was proposed between Victoria and South Australia and it entered commercial operation in 2002. TransEnergie, the then operator of Murraylink did not agree with the assessment of the interconnector between NSW and South Australia and applied for a review of this decision to the National Electricity Tribunal and then the Supreme Court. Concurrently, TransEnergie applied to have Murraylink converted to a regulated network service, which was approved in 2003.

4.5 Past reviews of the RIT-T

There have been a number of reviews that have considered the RIT-T in its current form. All of the reviews found the RIT-T remained appropriate and effective, but proposed some refinements to its operation.

In 2008, the Allen Consulting Group provided a report to the AEMC as part of the AEMC's review of energy market frameworks in light of climate change policies. This report considered how the application of RIT-T may be able to incorporate climate policies (including the increased Renewable Energy Target and the proposed Carbon Pollution Reduction Scheme). In particular, the report outlined the additional benefits that may be quantified as market benefits within the RIT-T in respect to increased renewable generation.

In 2013, the Productivity Commission produced its electricity network regulation inquiry, which took a holistic view of network regulation in the NEM. The review looked at the efficient delivery of network services and investment, and whether the current regulatory regime can deliver those outcomes. The Commission made a series of recommendations about the RIT-T, including expanding it to cover asset repair and replacement, increased oversight by the AER and applying a threshold for the application of a more robust RIT-T.

Also in 2013, the AEMC produced the final report for the Transmissions Frameworks Review which looked at whether the current framework is likely to deliver the most efficient future network investment. An outcome of this review was the recommendation to move to the optional firm access model¹² which would have resulted in modifications to the analysis required under the RIT-T. But in 2015 the AEMC determined in its Optional Firm Access, Design and Testing (OFA) final report that, under current market conditions, the costs of implementing OFA outweigh the benefits. This final report recommended that the AEMC implement a biennial reporting regime on drivers of change that could impact on future generation and transmission investments and the benefits of the OFA model. In February 2016, the COAG Energy Council requested the AEMC to undertake this reporting.

¹²Optional Firm Access is an integrated package of market arrangements developed by the AEMC, which creates the ability for generators to 'insure' against the risk of network congestion.

Like the Productivity Commission inquiry, the OFA final report also recommended the RIT-T be extended to apply replacement expenditure for major transmission flow paths. The AER has submitted a rule change request to the AEMC on this issue, which is currently open for consultation.

5 Context—the changing market environment

In reviewing the RIT-T, it is important to recognise the significant changes in the NEM since the test was introduced in its current form, and the dynamic market environment in which it can be expected to be applied going forward.

5.1 Changing demand patterns

Changing demand patterns in the NEM are of particular relevance to infrastructure investment. Given the long life of transmission assets of 30 to 50 years, forecasting the capacity required across a region over the longer term is central to ensuring that the most efficient investment option is selected. While AEMO produces network demand forecasts, systematic changes in demand (both peak and average) are difficult to predict.

Electricity demand patterns have changed significantly since the RIT-T was introduced in its current form. Both peak and average demand had been increasing year on year up to 2010. However from around 2010, grid demand began falling due to a number of factors including the uptake of rooftop PV, improved energy efficiency, as well as price impacts. Few forecasts predicted this fundamental change in the market.¹³

Electricity demand from the grid has now flattened with AEMO's 20 year grid demand forecast to remain flat, despite projected 30 per cent growth in population and average growth in the Australian economy. While peak demand varies across regions, in most regions it is expected to remain flatter than historical levels and more similar to average demand.¹⁴

This stark change in grid demand patterns has implications for infrastructure investment and the analysis in the RIT-T, which is often based on AEMO's demand scenarios. With overall grid demand forecast to remain flat over the next couple of decades, a greater proportion of investment is likely to be directed to replacement expenditure and managing challenges resulting from increased intermittent or distributed generation across the NEM.

5.2 Changing technology

The flattening of demand across the NEM is part of a wider transformation underway in energy markets, driven by a range of factors including changing technologies, alternative energy supply options, new business models and improvements in energy efficiency.

¹³ State of the Energy Market 2015, Australian Energy Regulator, p. 24

¹⁴ National Electricity Forecasting Report 2016, Australian Energy Market Commission, p. 3

The adoption of new technologies, such as distributed generation, battery storage and energy management systems are already challenging the status quo. In some locations such as Kangaroo Island and areas of rural Victoria and Western Australia, networks are already assessing whether non-network solutions, including standalone generation systems, will be more efficient in servicing some communities than building or replacing grid infrastructure.

It is critical that the laws and rules governing energy markets evolve in such a way that they enable technology change. An important aspect considered in this review is to ensure that alternatives to network augmentations and new builds are able to be appropriately considered under the RIT-T.

5.3 Increased renewable generation and decreased scheduled generation

The NEM has seen increased penetration of renewable generation—both distributed and large-scale—driven by changing technology, falling costs associated with cleaner generation, and climate policies¹⁵, in particular the Australian Government legislated Renewable Energy Target. Australia's commitment to reduce emissions by 26 to 28 per cent below 2005 levels by 2030 will also have implications for the future generation mix.

In addition, more customers are likely to take up solar and have it installed along with storage over the next 10-20 years as the economics become more favourable. In the next 10 years, battery storage costs are estimated to fall by around 60 per cent and solar panel costs by around 35 per cent¹⁶. The net result of these developments is likely to be a more decentralised electricity network and the replacement of some of Australia's emissions intensive generation with lower emission alternatives.

5.4 System security issues

The electricity landscape is currently undergoing transformative change as synchronous sources of generation are displaced by non-synchronous generation, changing the technical characteristics of the power system.

As wind and PV generation increases and withdrawal of thermal synchronous generation continues, secure operation of the grid will become more challenging, particularly when demand is low and output from intermittent generation is high. This is already apparent in South Australia where more than 45 per cent of installed capacity is currently made up by these technologies—wind energy production can range from less than 1 per cent of the state's consumption at any point in a day to over 100 per cent while on average serving 30 per cent of consumption needs. These characteristics are likely to become more prevalent as the proportion of intermittent generation in other regions increases.

¹⁵ Currently in Australia, Commonwealth Government and state and territory governments have differing climate policies. The Australian Government has a legislated renewable energy target of 33,000 GWh by 2020, which is estimated to be about 23.5 per cent of electricity generation, the Australian Capital Territory has a legislated target of 100 per cent renewable energy by 2020, Queensland are investigating a 50 per cent renewable energy target by 2030, South Australia have revised its target upwards to generating 50 per cent of the state's energy from renewable sources by 2025 and Victoria have established a renewable energy target of 20 per cent by 2020.

¹⁶ Energy Networks Association (2015) Key findings from the Electricity Network Transformation Roadmap – Interim Program Report, available at: http://www.ena.asn.au/sites/default/files/key_finding_snapshot_03122015.pdf.

The fact non-synchronous generation does not provide the same system services delivered by coal or gas-fired power stations presents challenges to AEMO's ability to maintain power system security, and is already requiring AEMO and the AEMC to review frameworks and processes designed to stabilise the grid (see **Appendix D**).

In this changing environment the system security and reliability requirements for the NEM in relation to system security may become a much more significant aspect of the market benefits captured within the RIT-T analysis process.

The current reviews of system security may give rise to new categories of identified network needs that could be the subject of a RIT-T. For instance, if the NER are amended to require that a NEM region should be able to operate on a stand-alone basis, then a RIT-T could be applied to determine the most efficient means of meeting this standard.

6 Key Issues

This section considers the key issues associated with whether the RIT-T's design and application are working effectively to deliver optimal network investments.

The general view of most stakeholders was that the RIT-T remained an appropriate tool, balancing the need for timely investment with adequate time for consultation. That said, stakeholders raised a number of specific issues relating to both the process broadly, as well as to the treatment of interconnector more specifically. These issues are expanded on in the sections below.

6.1 Timeliness and efficiency of process

The RIT-T process identifies and analyses credible network and non-network options to address an identified network investment need. Consistent with the terms of reference, consideration was given to whether there is scope to streamline the test, while still ensuring it is able to deliver efficient network investment outcomes and promote the long term interests of consumers.

In particular, there is a perception the application of the RIT-T has proved challenging in the past for interconnection projects in terms of timeliness. In this context, it is important to remember that the RIT-T is only the initial step in the process for developing and commissioning major new transmission infrastructure. The recent Heywood interconnector upgrade (see Box 1) illustrates the long timeframes involved in commissioning a significant new transmission project.

Box 1 Heywood Upgrade RIT-T experience

When there is arguably a clear case for an interconnector, for example the Heywood interconnector upgrade, the RIT-T process remains the same as it would be for any other project. The transmission network business first identifies the need for the project and then proceeds to identify all of the credible options. This includes a range of different interconnector builds to ensure that the one which maximises net economic benefits is selected. For example, a large interconnector may result in more benefits than a medium size interconnector, but not be justified because it does not result in substantially higher benefits.

The process requires all credible network and non-network options to be assessed and modelled to quantify the costs and market benefits. The modelling is complex, especially in the case of interconnectors which link different regions and is therefore a lengthy process, particularly depending on the number of scenarios and options considered.

Following the release of the project assessment consultation report, interested parties can submit relatively broad solutions to meet the specified need. The NER (and AER RIT-T application guidelines) specify requirements the proposals must contain including the technical specifications the option requires. The transmission network business must then assess each option identified, including undertaking modelling on each of the options presented to make sure the best option is selected.

The Heywood Interconnector upgrade RIT-T was undertaken by ElectraNet and AEMO. The purpose of the interconnector is to increase transfer capability across regions.

For the Heywood interconnector upgrade, the RIT-T assessment considered nine credible investment options.

- Stage 1 of the process commenced in October 2011, with the publication of the RIT-T project specific consultation paper.
- The Project assessment conclusions report (Stage 3) was released on 9 January 2013.
- It was not until 4 September 2013 that the project was approved for ElectraNet.

In total, for the Heywood interconnector upgrade it was around two years from the time the need was identified to the point of final approval, with stages 1 to 3 completed in around 15 months – compared to the more than five years that will have passed before the extension is fully operational. The long timeframe to completion reflect other factors such as the need to secure relevant Commonwealth and state planning, environmental and construction approvals, and to design and build the project.

There were mixed views expressed in submissions about the appropriateness of current timeframes for the RIT-T process. Some considered the process too short, and thought there was insufficient lead time between

when the RIT-T process occurred and when the investment was needed, making it difficult for non-network options to be developed for consideration in the process.

Another view was that the process could be shortened. It was claimed that the process takes too long from identifying a need to gaining regulatory approval. It was also suggested that imposing a maximum timeframe to the RIT-T consultation process could be appropriate.

‘The current process is too long – firstly in identifying a need, secondly in requiring both networks involved in agreeing to research and cost the options, thirdly in reaching an optimum solution and fourthly gaining regulatory approval.’

p7, Major Energy Users

The majority of submissions received considered that, while the RIT-T process was lengthy, this was both necessary and appropriate for such long-lived assets. They considered the process ensured investment decisions benefited from a fair, transparent, iterative process to deliver long-term value to customers.

‘The RIT-T process represents a balance between allowing adequate time for consultation, and enabling timely implementation of options (both network and non-network) to enable reliability standards to be met and/or market benefits achieved...[g]iven the wide range of benefits associated with interconnector investment, and the cost of the network assets involved, ENA considers the current framework, although lengthy, remains appropriate’

p15, Energy Networks Association

Assessment

In considering the RIT-T process, there is a trade-off between the timeliness of investments and providing sufficient time to allow for all options to have been adequately investigated and considered. Overall EPT considers the RIT-T process continues to strike an appropriate balance.

Importantly, under the RIT-T process, only around 22 weeks¹⁷ is actually specified as the minimum time that must be spent on the process—which allows for submissions and dispute resolution applications to be made. The underlying issues which have sometimes led to protracted processes, appear to stem from contention between project proponents, interested stakeholders and proponents of competing options rather than the design of the test or its governance.

The balance between timely investment decisions and robust analysis of the possible options are important considerations for the regulatory framework and project proponents especially for large and complex interconnector transmission investment decisions. If the RIT-T process is shortened, then there is a risk that the process will not be robust and larger barriers emerge to alternative options being considered. It would also

¹⁷ See section 4.3 - the RIT-T specifies a minimum of 18 weeks in total for submissions, with another month allowed for a dispute to be lodged.

mean that third party scrutiny is reduced which may lead to a less efficient outcome. Additional costs resulting from the selection of a less efficient investment outcome are borne entirely by consumers.

An additional factor relevant to consideration of the appropriate timeliness/robustness balance, particularly for large investments, is the rapidly changing market environment. The changing generation mix, profiles, load centres and demand forecasts create significant uncertainty in the market, making committing to large, long-lived investments a risky proposition. Uncertainty favours incremental upgrades and non-network solutions. Given the flat demand forecasts, network overinvestment will be more detrimental to consumers' energy costs than in the past.

Finally, it is important to recognise the RIT-T is just the first step in a lengthy process. Commissioning new large-scale transmission lines, including interconnectors, is complex, requiring obtaining easements, permits, design, construction and can take up to 7 years after the RIT-T is completed. This means that, in practice, streamlining the RIT-T alone is unlikely to significantly reduce the lead-time for major projects, including interconnectors. As noted, the RIT-T for the Heywood interconnector upgrade took slightly less than two years to complete, but the subsequent project build will extend the overall time taken to more than five years.

Similarly, ElectraNet commenced its RIT-T process for the South Australian Energy Transformation proposed interconnector on 7 November 2016, and expects to publish its stage 2 draft project assessment conclusion report in mid-2017, with the whole process completed by around end 2017. But ElectraNet also forecasts that any of the interconnector options identified would not be able to be commissioned until 2020-21 due to the other requirements involved.

Noting the above, EPT's view is that attempting to streamline the RIT-T by shortening consultation or analysis in certain circumstances is not warranted. Paring back current minimum timeframes is likely to result in a reduced scope for the test to effectively identify and assess all credible options, but would have little impact on the overall timeframe for commissioning new transmission projects.

This conclusion does not ignore the fact that it is important that strategic benefits from the development of interconnection in the national interest are implemented in a timely manner. But consumers bear the final cost of any regulated transmission investment in the NEM and it remains appropriate that a thorough cost-benefit analysis be undertaken to ensure that the most efficient option is selected. Notably, where an investment is essential and urgent the RIT-T already contains exemptions allowing this to occur.

That said, clearer guidelines and increased quality of information will help to improve the RIT-T process. Proposed recommendations outlined in sections 6.2, 6.4 and 6.5.2, should improve stakeholders' understanding of the RIT-T and so allow for a more effective and streamlined process overall. Better understanding of the RIT-T process may lead to less time spent in negotiations between parties and on identifying and modelling credible options.

Finally, EPT appreciates the concerns raised by some stakeholders about the lack of time given to work-up non-network options for consideration in the RIT-T, but considers this is more an issue with the level and accessibility of information rather than the timeliness of the process per se. This issue is considered further under section 6.2, Information accessibility.

6.2 Information accessibility

As outlined in section 4.4, the RIT-T is part of a broader regulatory and planning framework, largely geared around ensuring there is sufficient information provided to the market to enable timely and efficient investment decisions to be made.

During the review, a concern raised by non-network providers was a lack of information and engagement by network service providers. It was claimed this made it difficult for non-network providers and other stakeholders to make informed decisions about non-network and/or demand side options and to undertake the necessary work required to engage in a RIT-T process.

As outlined in section 4.4, transmission network businesses are required to undertake a TAPR for their network regions. The report assesses the adequacy of the transmission network to meet future reliability and security needs over the next 10 years. The TAPR also identifies emerging limitations driven by peak demand and planned asset renewals and reports on outcomes of joint planning between interconnected transmission network businesses. Where a constraint is forecast for the 12 month period, a statement about whether the business plans to issue a request for augmentation or non-network options to address the constraint, as well as the expected time of request, will be issued.

Several stakeholders considered that including early, improved and additional information in the TAPR, such as line specifications and tower types, could better allow providers to fully consider viable non-network options.

It was also noted that, unlike the RIT-T, the RIT-D required proponents to consult with non-network providers regarding non-network options as well as produce a report and engagement register¹⁸. It was suggested there would be merit in aligning the distribution and transmission tests to improve consultation arrangements.

'The NER require that RIT-D proponents explicitly consider non-network options in ways that RIT-T proponents are not similarly obliged ... [yet] there are situations where both types of networks should consider non-network options.'

p4, EnerNOC

However, transmission business representatives suggested caution noting that the potential benefits of more information being provided needs to be weighed against the costs it would involve.

¹⁸ NER 5.17.4 (a)(1),(e),(g)

'Additional calls from some stakeholders for more non-confidential transmission network service provider information to be made available needs to be balanced against the costs and resources of network service providers to do so ...'

p3, Energy Networks Association

Assessment

Ensuring that non-network providers are able to access sufficient information for them to engage and develop credible options in a timely manner is critical to the effective operation of the RIT-T.

In relation to this, EPT notes that a range of activities are already underway regarding access to information. Specifically, AER has commenced a process of reviewing TAPRs, including working with transmission network businesses and AEMO to ensure that reporting requirements under the NER are being met including, for example, that transmission network businesses are providing information on emerging network constraints and proposed solutions. The AER will involve non-network service providers in its existing ongoing annual compliance review of the transmission annual planning reports to improve the quality and increase the value of the annual planning reports.

Other work could potentially feed into the AER's TAPR review process. The AEMC has recently proposed the introduction of system limitations reports to be produced at the same time as the distribution annual planning reports and consideration could be given to introducing a similar system limitations reports for transmission network businesses. While the proposed system limitations report mainly contains information included in the annual planning reports, it provides it in a more useful and consistent format.

The AER rule change request to extend the RIT-T to replacement expenditure also proposes increasing the information that must be provided in TAPRs regarding replacement decisions; and the Australian Energy Council contestability rule change proposes imposing additional information disclosure obligations on network service providers.

The rule change requests being considered by the AEMC have the potential to address at least some of the issues raised by stakeholders about information barriers to effective competition between network and non-network options. But EPT notes that information gaps may still remain and, given the importance of access to information, further action should be considered. The inconsistency between the RIT-T and RIT-D requirements is unusual and should be further explored. There would also be value in the AER strengthening its stakeholder engagement to include non-network providers in its review of TAPRs.

Recommendations

EPT recommends that the AER reviews:

Improvements to the level and accessibility of information relating to transmission networks

- It is recommended that the AER involve non-network service providers in its existing ongoing annual compliance review of the TAPRs to improve the quality and increase the value of the annual

planning reports. Improving the quality of the information in TAPRs could ensure that non-network businesses can identify and meaningfully engage with the network businesses about potential investment opportunities. This recommendation proposes an addition to existing work and will not require a rule change request.

- It is recommended that the AER explore the requirements under the complementary RIT-D that do not extend to transmission but may warrant further examination. These include requirements to consult with non-network providers and to produce non-network options reports under certain circumstances. The objective would be to ensure that the market is effectively tested for competitive options.

6.3 Costs and benefits

The RIT-T was designed to replicate investment outcomes in a competitive market environment by transparently identifying the costs and benefits associated with a new project, along with any alternatives. The NER¹⁹ outlines the costs and benefits considered relevant to this objective, including the costs of construction, operating and maintenance costs, costs of complying with laws (including the impact of environmental policies), and reductions in generation dispatch costs, amongst others.

During consultation, concerns were raised by some stakeholders regarding whether the RIT-T adequately captured relevant costs and benefits. Particular concerns raised related to option value, and environmental policy benefits which are discussed below, as well as the inclusion of system security and broader economy-wide benefits when considering interconnector proposals specifically—which are considered later in section 6.5.

6.3.1 Option value

The current RIT-T framework allows ‘option value’ to be considered as a class of market benefits. An option value refers to “a benefit that results from retaining flexibility in a context in which certain actions are irreversible (sunk), and new information may arise in the future as to the payoff from taking a certain action.”

For example, a network business may choose to make a smaller network investment, at a point in time, but leaving open the option to upgrade the network, or have non-network investment, in the future dependent on better information on demand, and if additional value could be realised.

For there to be option value associated with a particular option, a number of conditions need to be satisfied:

- Uncertainty in future outcomes and prospect of new/improved information to assist decision making;
- Access to recourse, that is, flexibility to change the course of action at a later date;
- The project must be modular in scope; and
- Long project time frame.

¹⁹ National Electricity Rules, 5.16.1 Principles

The RIT-T currently permits network businesses to develop more flexible credible options by, for example specifying actions that may be taken both now or into the future. The value associated with these more flexible options can then be calculated under a range of uncertain future scenarios. This analysis can then capture any 'option value' associated with that flexibility while also ensuring that there is no double counting of these benefits²⁰.

In addition, the RIT-T application guidelines leave it open for network businesses to identify any additional option value not already captured in the other classes of market benefit. The guidelines note that, "if transmission network businesses are able to develop a notion of option value beyond that captured by probability weighting of credible options over a range of reasonable scenarios, they are not precluded from applying this approach to determining option value."

However, a number of stakeholders do not consider that option value is adequately explained in the AER RIT-T application guidelines with some concerned that not all option values are able to be adequately captured. It is clear there is uncertainty amongst some stakeholders as to how the option value of a project should be determined.

'Additional guidance, potentially through the RIT-T application guidelines, on how 'option value' should be appropriately considered would be beneficial.'

p2, AusNet Services

'...the option value of a flexible or hybrid solution is not sufficiently valued. Other benefits are either captured under market benefits tests or should be priced in by a functioning ancillary services market or the general economic interest test.'

p3, GreenSync

Assessment

Ensuring option values are appropriately captured within the RIT-T is important, particularly given the changes underway in the market and the resultant uncertainty regarding future developments.

While option values can already be included within the RIT-T, it is clear there is significant uncertainty as to how this should be done. Insufficient consideration of option value under the application of RIT-T risks imposing unnecessary costs on electricity consumers which is clearly not an ideal outcome.

6.3.2 Environmental policies

Importantly, the effects of environmental policies can already be taken into account in the RIT-T, provided the policy is reasonably understood and predictable. Specifically environmental policies are taken into account in

²⁰ Discussed in sections 3.2, 3.6 and A.9 of the RIT-T application guideline.

the benefits calculation of a RIT-T, which assesses how removing network congestion lowers the total cost of delivering an environmental policy set by government. The RIT-T application guidelines currently provide detailed guidance on the how to account for the evolving technology and policy environment²¹.

But, in their submissions, stakeholders expressed uncertainty regarding how environmental policies should be taken into account in practice, or whether international commitments – such as Australia’s COP 21 commitments – should be recognised at all in RIT-T analysis.

‘Some uncertainty can arise on inclusion of future policy positions in modelling... an implicit carbon price is an example... a mechanism to clarify assumption that have no precedent would be helpful...’

p4, AusNet Services

‘Australia has an international commitment to reduce carbon emissions...it would be appropriate to confirm whether the RIT-T and its operation is consistent with, and able to recognise, [its] ... emissions reduction commitment.’

p2, Hydo Tasmania

A broader concern expressed by some stakeholders is that uncertainty regarding how environmental policies can be captured in the RIT-T may be impeding investments, particularly interconnectors.

‘The current RIT-T design does not take into account international emissions reduction commitments or the rapid evolution of the electricity system, which is delaying the investment case for a ... interconnector’

p3, Clean Energy Finance Corporation

However, other stakeholders cautioned against using the RIT-T as a method to facilitate renewable energy development and realise energy potential, noting that its role is to ensure efficient investment for the benefit of consumers.

‘A RIT-T should be the last step in a broader process aimed at reducing congestion to maximise the efficiency of the supply of electricity to meet demand.’

pp2-3, Australian Energy Council

Assessment

As noted, the RIT-T is capable of capturing the economic value of environmental policy. It is reasonable to assume policies will be developed to ensure Australia will meet its international commitment to a 26-28 per cent emissions reduction target by 2030, even though there is no current government carbon price. Notably, AEMO, in its planning documents, with COAG Energy Council acceptance, assumes that NEM measured

²¹ See, for example, pages 21-25 of the guidelines which discusses how to incorporate environmental targets in a RIT-T assessment.

emissions will reduce pro-rata to 2030, and that post 2030 international targets will decline at a similar gradient. This assumption is then operated within the model as a fixed carbon constraint over the period.

The effect of the Renewable Energy Target can also be incorporated in the RIT-T analysis. Where a state government has also introduced a renewable target has a legislated mechanism to bring it to fruition, such as the ACT's 100 per cent target, it is similarly possible to incorporate this into the model, by effectively adding it to the national RET target. But where the target is aspirational only, a judgement regarding the probability a mechanism to achieve the target will be implemented will be needed²².

However, given the current uncertainty and the growing importance of renewable energy and climate policy in the NEM, this is clearly an area where further clarification on how purposes would be beneficial. The review considers there would be value in the AER reviewing the relevant sections of its RIT-T application guidelines, and provide updated guidance on how environmental factors can be captured in a RIT-T assessment.

Recommendation

EPT recommends that the AER conducts a:

Review of the AER RIT-T application guidelines, with a view to better reflect the net system benefits of options, including those relating to system security and renewable energy and climate goals.

It is recommended that guidelines be updated by the AER to provide greater clarity around the incorporation of option values, the appropriate reflection of renewable energy and climate goals. A lack of consideration of option values in the application of the test may be creating barriers to providers of demand-side or non-network solutions developing credible options. Further, while this review has confirmed that the RIT-T is capable of capturing environmental policies, a lack of clarity regarding how uncertainty surrounding future carbon and renewable energy policy assumptions and mechanisms should be addressed may be compromising the identification of the most efficient investment options.

6.4 Regulatory Oversight and decision making

The RIT-T is used to inform investment decisions. When applied, it should allow timely identification and implementation of the most beneficial means of addressing emerging network constraints in the setting of the broader policy framework in which the market operates.

Proponents under the RIT-T, generally the transmission network business, are responsible for assessing and making decisions on strategic NEM-wide investments. Currently, energy bodies have only limited regulatory oversight in determining if the most efficient option is chosen.

²² For example, AEMO currently considers the Victorian Renewable Energy Target to be very likely to be implemented and so incorporates this into its base cases. As the Queensland target is in early stages of its development, AEMO presently does not incorporate this at this time.

Some stakeholders noted that network businesses have a strong incentive in selecting network options over non-network options or alternative NEM wide solutions, as this will increase their regulatory asset base. The concern was that unless counterbalanced, this incentive may affect the robustness of the cost-benefit analysis.

Similarly, in its 2013 Inquiry Report, Electricity Network Regulatory Frameworks, the Productivity Commission highlighted an issue with the application of the RIT-T was the presence of information asymmetries, which limited third parties' ability to provide meaningful scrutiny of network planning reports and RIT-T analysis and which would counterbalance the incentive of network businesses to favour network investments. In the absence of a robust and independent enforcement mechanism, the concern was that tests might be conducted inadequately, resulting in inefficient investment outcomes.

During consultation, some stakeholders considered that there should be more oversight of the RIT-T process to ensure cost-benefit analysis is undertaken in a robust manner.

'...there have been some questionable implementations which should have attracted more rigorous oversight and intervention.'

p4, GreenSync

Assessment

Beyond the public consultation required, oversight of RIT-T processes largely relies upon interested parties seeking dispute resolution from the AER under stage 4 of the RIT-T process.²³ To date, no party has sought to engage in dispute resolution. Under its general compliance monitoring role the AER has powers to review and assess RIT-T assessments undertaken by transmission network businesses to ensure they are compliant with the requirements of the NER. As a regulator, the AER's primary role is to ensure that businesses follow the right process and correctly apply the RIT-T. To that end, it has sufficient scope under its existing powers to review RIT-T assessments consistent with its role.

However, under the NER and NEL, enforcement mechanisms for the AER to address potential non-compliance issues are limited. Notably the AER:

1. cannot issue infringement notices for breaches of the RIT-T provisions in the NER;
2. does not have the power to adjust the regulated asset base of transmission network businesses where they have not complied with the RIT-T and associated NER provisions.

The lack of enforcement mechanisms makes it difficult for the AER to take action against transmission network businesses for breaches of the NER requirements of the RIT-T. The only enforcement option open to the AER would be to apply to the court that the transmission network business be made to re-apply the RIT-T. But in practice, this is often not a viable solution.

There may be merit in exploring options to increase the level of oversight for the RIT-T process. Options include making the provisions associated with the application of the RIT-T by transmission network business'

²³ NER section 5.16.5

civil penalty provisions, and strengthening linkages between the economic regulatory framework in chapters 6 and 6A of the NER and the regulatory investment test.

Making provisions associated with the application of the RIT-T by transmission network business' civil penalty provisions would enable the AER to issue infringement notices for identified breaches associated with the application of the RIT-T. This would assist in promoting compliance with the RIT-T framework by drawing attention to identified breaches.

Strengthening the linkages between the economic regulation framework in chapters 6 and 6A of the NER and the RIT-T would allow the AER to consider if the full value of the investment should be included in a network business' regulatory asset base in circumstances where the business has not complied with the RIT-T requirements. Currently, the AER's interpretation of the NER is that all capital expenditure incurred by a transmission network business to build regulated assets is added into a business' regulatory asset base, except where the transmission business' total capital expenditure during a regulatory control period exceeds the capital expenditure allowance set by the AER as part of the revenue determination. This potentially gives rise to circumstances where a project's costs can be rolled into a transmission network business' asset base even though business proceeded with the project without a RIT-T (and one was required) or where there is a substantial increase in the project costs identified in a RIT-T.

These options will be explored as part of the Australian Energy Council's proposed rule change to the AEMC to potentially change a number of aspects of chapters 5, 6 and 6A of the NER, including making the RIT-T binding by preventing capital expenditure above the RIT-T threshold being rolled into the transmission network business' regulatory asset base unless it has passed a RIT-T and giving the AER powers to remove investments from the regulatory asset base if they have not been subject to a RIT-T.²⁴

Changes to strengthen the link between the economic regulation framework in chapter 6A and the RIT-T, including those outlined above, would require an amendment to the NER. These matters will be consulted on and considered as part of the Australian Energy Council's rule change request to ensure they are consistent with the broader incentive regulation framework.

Recommendation

EPT recommends the AEMC:

Further explore the merits of increasing the AER's level of oversight for the RIT-T process

It is recommended that the AEMC, as part of the existing rule change request, explore the merits of increased oversight for the RIT-T process, including making the provisions associated with the application of the RIT-T by transmission network business' civil penalty provisions, and strengthening linkages between the economic regulatory framework and the regulatory investment test. The merits will be explored as part of the current

²⁴The Contestability of energy services - demand response and network support rule change is available at: <http://www.aemc.gov.au/Rule-Changes/Contestability-of-energy-services-demand-response>.

rule change request and standard rule change process including stakeholder consultation, considering the proposed contestability of energy services, demand response and network support submitted by the Australian Energy Council. The potential increased level of oversight could address concerns that network businesses have a strong incentive in selecting network options over non-network options or alternative NEM wide solutions and it will strengthen linkages between the economic regulation framework in chapters 6 and 6A of the NER. The additional oversight could allow the AER to consider if the full value of the RIT-T should be allowed in a network business' regulatory asset base.

6.5 Effectiveness of the RIT-T for interconnector projects

Interconnectors form a fundamental element of transmission network infrastructure. They provide a range of benefits including, but not limited to:

- Economic dispatch—enabling the lowest cost generation in the NEM to reach more customers, lowering the overall cost of electricity to consumers;
- Sharing of network support services—for example allowing for ancillary services to be transferred between regions
- Managing variability of generators and demand—mitigating the risk of supply shortfall in a region through the ability to raise capacity quickly through imports from other regions.

With the changing nature of the market some suggest the role of interconnectors is also changing. A recent report by KPMG²⁵ outlined a range of developments potentially altering the role interconnectors are expected to play in the NEM. The factors identified include:

- a. Concern over energy security—Uncertainty about future generation investment and increased local intermittency could heighten energy security concerns. Interconnection can be used to mitigate energy security risks.
- b. Potential for greater price differentials—Price differentials between states within the NEM are material. Changes in the generation mix will create greater potential for price differential between States, and therefore greater benefits from inter-regional flows. This is reinforced by the existing oversupply in the NEM, uncertainty around retirement of fossil fuel generation, deployment of renewable energy to meet the Renewable Energy Target and various rebate and energy efficiency schemes.
- c. Geographic separation of renewable energy supply and energy demand—Interconnection could be needed to maximise the value of renewable potential in some jurisdictions with low energy demand and a compelling energy resource, for example Tasmania.

²⁵ KPMG, The changing role of electricity interconnectors, August 2016, p4.

- d. Greater price volatility—increasing the share of intermittent renewable energy in the generation mix will lead to greater short-term wholesale price volatility. Greater volatility in wholesale prices increases the benefits from interconnection.
- e. Increased demand for ancillary services—the value of ancillary services will increase due to increased intermittency of generation. Interconnectors can play a key role in delivering system security across the national grid.

The RIT-T process for an interconnector project is currently the same as it is for other transmission projects—that is, a need is identified and various options that can fill this need are selected and analysed. This is not surprising, given interconnectors in physical terms are essentially large transmission projects albeit ones that link NEM regions. However, given the broader market developments outlined above, a relevant question is whether the RIT-T process remains appropriate and fit for purpose for interconnector investments going forward.

Stakeholder groups were generally positive regarding the operation of the RIT-T, including in relation to interconnectors. In particular, the need for cost-benefit analysis for regulated assets to protect consumers from inefficient investment, was generally accepted.

‘The current framework appropriately balances regulated and non-regulated transmission asset investment and provides an open process to consider investments.’

p 1, Australian Energy Council

‘Energy network planning and regulation are both complicated and complex tasks, which must be approached in an appropriately rigorous and measured fashion. When properly implemented, regulatory tools such as the RIT-T are an important part of such an approach.’

p5, Energy Consumers Australia

‘Interconnectors are costly and have long lives. It is appropriate that proposed investments in such assets are assessed comprehensively to avoid locking in long term costs in the Regulatory Asset Base to address issues which may be short term in nature.’

p2, AGL Energy

There were some suggestions, however, that the test as it currently stands has some shortcomings in its ability to take account or evaluate specific issues. A number of stakeholders made suggestions regarding how the test might be refined or improved generally and specifically in relation to its application to interconnector projects.

'The RIT-T might not be the most appropriate test for interconnectors. Wider benefits across regions should be included in the test, for example, competition benefits, the value of renewable energy and synchronous base load generation.'

p2, Major Energy Users

Assessment

The economic assessment of an interconnector is complicated given the need to look at 'marginal' markets, competition benefits, emerging technologies, option valuing, effects of changing operational parameters and changing government policy modelled over a long future horizon.

The review considers that broadly, the RIT-T as currently framed remains an appropriate framework for the consideration of interconnection investment. The RIT-T is based on sound principles of traditional economic cost benefit analysis and ensures that there is a robust assessment of proposed regulated investment to protect consumers.

No compelling evidence was found, or presented during consultation, that would warrant large changes to the RIT-T process for inter-regional interconnection projects within the scope of this review. As noted, stakeholders did, however, raise a number of specific issues regarding the application of RIT-T for inter-regional projects. A number of these issues, including the appropriate treatment of environmental policies and option values, apply to the application of the RIT-T more broadly, and are explored earlier in sections 6.1–6.3.

Other issues relating more specifically to interconnectors, including taking account of high impact, low probability events and broader economic benefits and consideration of 'national interest' interconnectors are explored in sections 6.5.2.

6.5.1 Inclusion of competition and non-market benefits

The current RIT-T framework allows transmission network businesses to consider competition, environment and other non-market benefits.

At present, in relation to competition benefits, the RIT-T process is confined to looking at costs and benefits that occur within the electricity sector only. That is, economic costs and benefits to all those who produce, consume and transport electricity in the NEM.²⁶ This means that costs and benefits that may arise in the broader economy as a result of changed electricity prices, for example changes in the level of production, are not taken into account.

²⁶ National Electricity Rules, 5.16.1 Principles

A number of stakeholders suggested that consideration could be given to including wider economic benefits in the RIT-T for interconnector projects given their importance, including Energy Networks Association, Major Energy Users and Clean Energy Finance Corporation.

'Given the national significance of interconnectors in the NEM, there may be justification to evaluate such projects with general equilibrium analysis given the magnitude of the potential implications for the wider economy.'

p1, Energy Networks Association

'The calculation of wider benefits is complex, but it should be investigated further in order to appropriately capture the broader net benefits to the Australia economy of the services provided by the electricity sector.'

p2, Transgrid

This reflects concerns that constraining the RIT-T to consider only cost and benefits falling within the electricity market may omit some important indirect (or general equilibrium) benefits which would lead to more efficient levels of investment.

For example, a major interconnector project connecting regions with different prices, will lead to a reduction in these price differentials due to increased availability of supply. This change in price could affect the quantity of goods produced with electricity, as well as have implications for the allocation of capital and labour between the affected regions.

Assessment

The RIT-T contributes to the achievement of the national electricity objective, that is, the long term interests of electricity consumers, by acting as a gate-keeper to prevent electricity consumers paying for inefficient investment. Electricity consumers should only be required to pay for investments if the benefits to them exceed the costs to them. On that basis, there are good reasons to not include costs and benefits from sectors outside of the electricity sector.

This issue has been considered in significant detail recently by the Productivity Commission in its 2013 Electricity Network Regulation inquiry.²⁷ As the Commission noted, while it may be possible to do so, it is far from clear that attempting to do so would improve decision making in practice. Notably:

- Firm in other industries cannot capture the indirect benefits of their actions and so do not consider them in investment decisions. Including indirect effects in the RIT-T could therefore create distortions in efficient investment and result in over-investment in transmission.

²⁷ Electricity Network Regulation Inquiry, Productivity Commission 2013

- To correctly measure benefits, it would also require significant judgements to be made about the relevance of distortions across the economy resulting from the investment project. Double counting of benefits is a significant risk.

From a practical perspective, consideration of wider benefits through computable general equilibrium (CGE) modelling would greatly increase the complexity of the analysis in the RIT-T and likely lead to longer and more costly deliberations. This is because more complicated methodologies are required which may lead to lower levels of transparency of the assessment and increase the potential for more contention of the analysis. Stakeholders not familiar with the RIT-T process already argue the process is difficult to understand, and adding CGE modelling will only add to the complexities and costs of the analysis.

The current approach using partial equilibrium modelling (capturing effects in the electricity sector only), captures the majority of the direct effects and avoids many of the complexities and other challenges associated with inclusion of second order effects in other sectors. The inclusion of wider second-order effects through CGE modelling may not create a material changes in the benefits calculated.

Additionally, there is no guarantee that competition benefits in the NEM as a result of interconnector investment will be passed through to the contract market, which would depend on the willingness of participants to enter inter-regional contracts. In these circumstances, the modelled indirect benefits would be captured by an intermediary and any multiplier effects in terms of increased usage would be lost.

On balance, and consistent with the Productivity Commission's conclusion, EPT considers that allowing the inclusion of indirect economic benefits presents more challenges than it would advantages. This result is the same as the conclusion that the Productivity Commission reached in its 2013 inquiry.

6.5.2 Accounting for system security

In order to main system security, the RIT-T framework must ensure new project decisions reflect the changing technical characteristics of the grid.

During consultations, stakeholders noted this is particularly important in the case of interconnection projects. Interconnectors change the sources of supply and demand within a NEM region and therefore have potentially significant consequences for the market dynamics affecting participants within the interconnected regions. For instance, an interconnector proposal that undermines the commercial viability of local synchronous generation may limit the ability of a region to operate on a standalone basis. Conversely, an interconnector could also provide access to synchronous generation that would otherwise not have been available to the region.

One key determinant of system security is the availability of ancillary services. Credible options, including those that give access to ancillary services (for example interconnectors and new generation facilities with certain characteristics) are already able to be captured in the RIT-T. However, submissions highlight apparent uncertainty and confusion as to how the ancillary service benefits should be captured in calculations and what exact benefits can be included.

‘The RIT-T does not capture all benefits of a potential investment including system security benefits. At this point it is unclear whether the current market frameworks are sufficient to ensure provision of these services in the future and to the extent required.’

p1, Hydro Tasmania

Another issue relating to system security is how high impact, low probability events are taken into account through the RIT-T test for interconnector projects. The true economic costs of these outages are often difficult to quantify through metrics such as the Value of Customer Reliability (VCR), particularly given the associated challenges in ascertaining customers’ willingness to pay to avoid such outages which are typically widespread and prolonged in nature. Current modelling methodologies used to determine costs and benefits under the RIT-T focus may underweight such events. This is because they use a probabilistic approach which means under repeat tests the effect of high impact events may not be adequately taken into account due to the small probabilities of these events occurring. Example of such events, and their effects, include the recent South Australia black system event and the destructive 2011 Cyclone Yasi.

‘The current RIT-T framework is limited in its ability to evaluate benefits which are difficult to quantify, including...the insurance value of avoiding, High Impact, Low Probability events. The framework should be reviewed to better integrate the evaluation of security benefits and net market benefits.’

p2, Energy Networks Association

Assessment

As noted above, credible options that give access to ancillary services are able to be captured in the RIT-T, but the value of procuring these services were not considered material in the past. But increasing renewable generation and retirement of synchronous generators could lead to a need for greater frequency and voltage control ancillary services in the future, making these benefits a more significant consideration in any RIT-T applying to interconnection.

Enhanced modelling tools and processes will be required to better capture changes in the cost of procuring ancillary services. AEMO has considered the cost of procuring ancillary services in its review²⁸ of whether consumer benefits related to system security can be captured within the existing RIT-T framework. Based on AEMO’s findings to date, improvements to consider the cost of ancillary services in future RIT-T assessments can be made within the current RIT-T framework, although this does increase the complexity and timeliness of analysis.

Given the changes underway in the market, there would be benefit in clarifying the RIT-T guidelines for proponents regarding how to appropriately capture security benefits for proposed interconnector (and other non-network) projects.

²⁸ Australian Energy Market Operator, Future Power System Security Program, <https://www.aemo.com.au/Electricity/National-Electricity-Market-NEM/Security-and-reliability/FPSSP-Reports-and-Analysis>.

In relation to high impact, low probability events, the EPT notes that these events, while rare, they can cause significant economic loss and distress as well as impose other social costs. That said, it is important to also consider the additional cost that providing extra reliability, through a new interconnector for instance, will place on consumers. It is critical that the RIT-T is still able to appropriately weigh up the benefits and costs associated with this extra level of reliability. With this in mind, a consistent approach to quantifying the impact from these events, particularly for interconnector investments, would be beneficial.

Recommendation

EPT recommends that the AER:

Review the AER RIT-T application guidelines, with a view to better reflect the net system benefits of options, including those relating to system security and renewable energy and climate goals.

It is recommended that guidelines be updated by the AER to provide greater clarity to better accommodate high impact, low probability events such as the ‘black system’ event experienced recently in South Australia. Current methodologies may need to be adapted to better weight high impact, low probability events in line with public expectations regarding mitigation in light of the long term lifespan of these assets.

It is also recommended that the guidelines be updated by the AER to provide greater clarity around the inclusion of benefits related to system security and ancillary services. This reflects, with the increase in intermittent generation, the challenges associated with systems security.

Increased interconnection between jurisdictions may have a role in an environment characterised by more renewable generation. It can offer increased geographic diversity to manage localised conditions impacting on wind and solar generation. However, the pace of technological advancement, and cost reductions due to emerging economies of scale may undermine any assumptions about the cost of storage alternatives when forecasting five years out.

As noted in section 6.3.2 there is benefit in the AER providing guidance as to the best way to model carbon reduction into future scenarios in light of the uncertainty about long term policy. This would be particularly helpful given the apparent uncertainty around how environmental policies can be incorporated into the analysis for the RIT-T processes coupled with the long term nature of transmission investments.

6.6 Are planning and decision-making processes fit-for-purpose for interconnector projects?

A strong planning framework was highlighted as being of key importance for sensible network development, particularly in a fast changing environment and in light of consumers bearing the cost for inefficient investment and an absence of necessary investment.

‘The planning processes which precede the conduct of a RIT-T, including the National Transmission Network Development Plan as well as the Transmission Annual Planning Reports must fully account for

the implications of power system constraints and their likely emergence to ensure timely initiate of the RIT-T”.

p4, AusNet Services

‘Consumers wear the risk of inefficient planning decisions and construction of uneconomic assets.’

p4, Engie

Some stakeholders held concerns the existing planning arrangements, which rely on cooperation between five different transmission network businesses, may not deliver the holistic strategic perspective required to ensure the efficient evolution of the NEM. Each transmission network business has different commercial prerogatives and regulatory reset timetable, which creates challenges for coordination.

‘Networks have a vested interest in expanding their networks and so are perceived to have a bias towards network solutions...’

p10, Major Energy Users

‘While the RIT-T can capture benefits of a single project, the RIT-T may not be an adequate framework to assess competing and multiple investments.’

p1, Hydro Tasmania

There were some stakeholders that suggested AEMO or the AER may be better positioned to undertake a more strategic planning role in relation to interconnectors.

‘The MEU considers that AEMO (as the market operator and national planner) is best placed to identify a need for new interconnection and the best options to implement the sought after outcomes.’

p10, Major Energy Users

Generally, the argument for a more centrally planned approach to networks focuses on building more interconnection, which some stakeholders believe the current RIT-T framework does not facilitate. Some suggest that the RIT-T itself is unable to capture the broader strategic benefits associated with a more integrated, national electricity market, and so a more centrally planned approach, with greater involvement by the market bodies and/or Governments, should be adopted. In particular, some suggest that having more centralised planning will become increasingly important as the proportion of renewable energy in the NEM increases, given that interconnection limits may restrict the location of renewable energy sources and their ability to supply demand centres and consequently limit Australia’s ability to meet its emission reduction targets.

Conversely, those against adopting a more centrally planned national electricity market consider the current system is functioning effectively and that the absence of new interconnection projects does not reflect a failure in the current arrangements. Rather, they suggest that it may reflect that only efficient ones are being built and, unlike a central planning body, the transmission network businesses have both a financial incentive to make the most efficient decisions (so long as incentives are set correctly) and reliability of supply obligations within its jurisdiction.

'Energy Consumers Australia is...confident that a robust cost-benefit analysis of new NEM interconnectors will not unduly hamper the further development of a national market.'

p5, Energy Consumers Australia

Transmission network businesses joint planning/coordination mechanisms are being considered by the AEMC in the transmission connections and planning arrangements rule change for which a draft determination was released in November 2016.

Notably the majority of submissions did not, however, suggest that transmission network businesses were not well positioned to undertake this wider coordination. In particular transmission network businesses argued they were best positioned to have the responsibility for network planning in the RIT-T process.

'The ENA is of the opinion that these arrangements remain an appropriate model in the changing energy market.'

p5, Energy Networks Association

'[ElectraNet is of the] strong view that transmission network service providers remain the best placed to undertake the assessment of transmission investments, including interconnection investments.'

p1, ElectraNet

Assessment

Proposals for more centralised strategic network planning and oversight of transmission investment – particularly in relation to interconnectors - appears to be driven by two main factors.

First is the changing nature of the electricity market, particularly the increased penetration of renewable energy, driven in part by climate change policy and which has meant the nature of the role of transmission networks is also changing.

'the role of the transmission grid is evolving, from the secure transportation of bulk power generation, to include the secure integration of renewable generation and emerging technologies. This reflects a

changing paradigm characterised by declining electricity consumption from the grid, an increasing focus on renewable and embedded generation, and withdrawal of thermal synchronous generation.’²⁹

Second is the view held by some parties that the current process, whereby network providers are responsible for assessing interconnectors and must apply the RIT-T test, is problematic for interconnector investment and consider there is a lack of long term transmission network planning across the NEM. Perceived shortcomings include that planning arrangements and the RIT-T:

- are orientated towards incremental investments, even though the value of any given transmission augmentation is often dependent on augmentations elsewhere in the interconnected grid; and
- do not enable consideration of investments from a broader ‘strategic’ or ‘national interest’ perspective; and that a broader perspective would take into account contributions to achieving Australia’s emission reduction targets, and to wholesale market competition in one or more jurisdictions.

These issues are considered in turn.

6.6.1 Existing strategic planning and development processes

EPT note that AEMO already has a strategic network planning role being responsible for developing the annual NTNDP in line with the NER.³⁰ The NTNDP provides an independent, strategic view of the efficient development of the transmission grid over a 20-year planning horizon under a range of credible scenarios. This document is considered by all stakeholders as an essential part of the strategic planning process for the NEM.

Under the NER, AEMO must consult³¹ on the content of the NTNDP each year, and take into account matters such as actual and forecast electricity flows, capabilities of the national transmission grid, network support and control ancillary services required to support capabilities, and relevant intra-jurisdictional developments. In developing the NTNDP, AEMO also refers to the TAPRs prepared by transmission network businesses.

...are taking account of market developments

Importantly, AEMO’s 2016 NTNDP examines the impact of the COP21 commitment to reduce emissions by 26-28 per cent below 2005 levels by 2030, as well as relevant legislated policies such as the Renewable Energy Target.³² Further transmission interconnection will also be considered as possible solutions to efficiently maintain system security and reliability, including high level cost benefit analysis of:

- A new South Australia-Victoria/NSW interconnector;

²⁹ AEMO, National Transmission Network Development Plan 2015 page 3.

³⁰ National Electricity Rules, 5.20 National transmission planning

³¹ AEMO publishes a document that summarises issues it considers to be material and gives preliminary views on how those issues should be resolved. It then invites submissions on the document, which are taken into account in the final publication of the NTNDP.

³² 2016 National Transmission Network Development Plan – response to 2016 consultation paper submissions.

- A new Victoria-Tasmania interconnector;
- Updating the functionality of the Murraylink interconnection between Victoria and South Australia; and
- A combination of new interconnectors between regions.

While AEMO is required to develop and publish the NTNDP under the national electricity rules, individual transmission network businesses remain responsible for applying the RIT-T to augmentations within their jurisdictions. This is because transmission network businesses remain accountable for maintaining reliability within the jurisdictions.

Principles of good governance suggest there should be close alignment between accountability for reliability and responsibility for transmission planning and investment decisions that, in turn, affect reliability.

... and are capable of considering investments in a holistic rather than incremental manner

The NTNDP clearly plays an important role in ensuring that network develops in a coordinated, efficient manner.

While the RIT-T is often applied on an incremental basis, there is nothing in it or the guidelines that precludes the adoption of a more holistic planning process. Notably, clause 5.15.2(a) of the NER defines a 'credible option' under the RIT-T as "an option (or group of options)" that meets the relevant criteria.

The Heywood upgrade, which was assessed under the RIT-T, is an example of a project that involved a number of discrete but complementary investments by two transmission network businesses. The project included³³:

- Installation of a 3rd 500/275kV transformer at Heywood in Victoria;
- Installation of a 500kV bus tie at Heywood;
- Series compensation of 275kV lines in South Australia; and
- Reconfiguration of the 132 kV network between Snuggery-Keith and Keith-Tailem Bend in South Australia.

Nothing in the RIT-T prevents a similar approach being taken by more than two transmission network businesses in respect of an even greater number of separate elements. Notably, in November 2016, ElectraNet published a Project Specification Report to commence the RIT-T process that will consider four options for additional interconnection with SA, including a new 1,500 Km line from Davenport in SA, through NSW, to Bulli Creek in Queensland.

While officials note the concerns regarding the potential difficulties in the individual transmission network businesses coordinating cross regional developments, the review found no evidence that this has created practical barriers to net beneficial investments being undertaken to date.

³³ AEMO, ElectraNet, *South Australia-Victoria (Heywood) Interconnector Upgrade, RIT-T: Project Assessment Conclusions Report, January 2013*, 29

...and AEMC's last resort planning power provides an important safeguard

The AEMC also has the *last resort planning power* under the NER that allows it to require one or more network service providers to apply the RIT-T to projects that are likely to relieve a forecast constraint on the national transmission flow path, including those allowing electricity to be transferred across states – that is, interconnectors.

Each interconnector has a certain capacity which establishes an upper limit to the electricity it can carry. In practice, however, limits elsewhere in the network can constrain these flows. So AEMC has regard to both the physical interconnectors and those flowpaths leading up to the interconnector.

The purpose of the last resort planning power is to ensure timely and efficient inter-regional transmission investment when other mechanisms to provide for the planning of such investments appear to have failed.

To date, AEMC has not used the power as they have found the transmission network businesses are adequately considering inter-regional investments to address flow constraints.³⁴ In their 2016 report, AEMC noted that TransGrid and Powerlink have committed to continue to monitor constraints on the QLD-NSW interconnector, and ElectraNet, with SA Government support, is proceeding with a RIT-T for the proposed SA-NSW interconnector.³⁵

6.6.2 Scope for RIT-T to take account of broader benefits in considering interconnector proposals

As detailed in section 6.5, the review finds that broadly, the RIT-T as currently framed remains an appropriate framework for the consideration of interconnection investments – given it ensures there is a robust assessment of proposed regulated investment to protect consumers.

In relation to the perceived shortcomings outlined above, the review has found the RIT-T can incorporate many of the types of benefits envisaged, including in relation to competition and environmental benefits (see sections 6.3 and 6.5). In particular:

- where governments have implemented mechanisms to achieve certain policy objectives – such as emissions reduction or increased electricity output from renewable generation sources – the RIT-T assessment will identify the most net beneficial option that satisfies those objectives.
- the RIT-T already incorporates 'competition benefits' from transmission augmentation incorporating the benefits arising from using generation with lower avoidable costs, and more competitive bidding behaviour leading to lower prices (and so increased demand for electricity) over the longer term.

The recommendation to review and clarify the AER application guidelines in relation to these and other matters should assist in addressing misconceptions regarding the application of the RIT-T.

³⁴ With the exception of the Heywood interconnector upgrade – the 2015 and 2016 NTNDPs did not identify augmentation requirements.

³⁵ Available at <http://www.aemc.gov.au/getattachment/fc33b57b-e6ab-4703-a27b-b7cea3cb752d/Decision-report.aspx>

6.6.3 A broader role for jurisdictions in planning and approvals?

The RIT-T is applied to transmission investments to ensure consumers, who must ultimately pay for them, are protected from paying for inefficient investments in high cost, long-life assets. While this review identified some areas for possible improvement, it has found that the existing framework of planning and approvals is functioning relatively well.

The NTNDP is an important vehicle for considering future transmission investment needs. As part of the development process, AEMO consults with industry and other key stakeholders. The NER also require AEMO to consider ‘such other matters as AEMO, in consultation with the participating jurisdictions, considers appropriate’ in preparing the NTNDP. Jurisdictions, possibly through the Senior Committee of Officials, could usefully better use this process to notify AEMO of key issues they think should be incorporated in formulating the NTNDP.

It is recognised there may be occasions where a jurisdiction or jurisdictions want a potential interconnector investment investigated or prioritised, notwithstanding it was not identified as an investment that may deliver net benefits through the broader planning processes. In such cases, it is open to jurisdictions to work with the relevant network service provider to ensure that a RIT-T for the identified project commences. A recent example is South Australia supporting ElectraNet in undertaking the current RIT-T for a range of interconnector options from South Australia to NSW or Victoria.

In the event a jurisdiction(s), taking account broader considerations than those considered under a RIT-T, want an interconnector proposal to proceed notwithstanding it would not satisfy the RIT-T, then options already exist to progress the proposal outside the traditional regulated regime. As previously noted, the RIT-T test only applies where the transmission asset in question is regulated – that is, where the cost of the investment is to be recovered from customers through regulated charges. Interconnectors can still be constructed outside the traditional regulated asset regime, but receive some form of jurisdictional support to ensure its viability and bring the investment forward. The Basslink is an example of such an interconnector, which was constructed as a merchant interconnector, but with the Tasmanian Government owned Hydro Tasmania providing facility payments to underwrite the interconnector revenues.

It has been suggested by some that, given the transition underway in the national electricity market, and the concerns expressed by some regarding the adequacy of current interconnection, that a new framework should be considered to ensure that strategic decisions can be made with regard to the development of new interconnectors where they are determined to be in the ‘national interest’.

While outside the terms of reference for this review, were such a new framework for ‘national interest’ interconnection to be actively considered, EPT notes a range of key design questions would need to be addressed. These include:

- *When would the power be exercised?* – outside of the RIT-T (and the related national electricity objective) which are intended to ensure customers get the best deal, when an interconnector investment would otherwise be in the ‘national interest’ would need to be defined;

- *Who would make the decision?* – given the basis for adopting such an approach would be to promote investments that are national in character, unanimous support from the Energy Council would be required;
- *Who would develop the interconnectors?* – contestability for the development of the interconnections would need to be considered to ensure investments at the lowest costs to consumers; and
- *Who pays for the investment?* – Consistent with above, given the intention that such investments would only be undertaken in the national interest, who bears the cost of any investment would need to be balanced against specific jurisdictional interests.

While this approach would allow the Energy Council greater scope to influence market development, as the discussion above highlights it is not at all clear that the operations, developments and outcomes of the existing planning and decision making framework are such as to warrant such a significant intervention.

Interconnectors involve very significant costs and long lives, and proceeding with them outside of the established RIT-T process may risk imposing significant unnecessary costs on consumers for long periods of time, particularly with the current uncertainty in the market. It is also important to recognise transmission and generation investments are interrelated such that changes in one will affect the viability of the other. Government's intervening in the market in support of interconnectors also risks increased sovereign risk and would distort investment in the NEM, affecting a broad range of stakeholders and potentially discouraging generation and other investments that would otherwise have occurred and which may have been more beneficial to specific regions and the market.

However, if the Energy Council were disposed to considering the merits of adopting a strategic decision making role further, then it would be prudent to await the outcomes of both the Energy Security Review (the Finkel review) and the Commonwealth 2017 review of climate policies. A key argument for considering whether driver underpinning the claimed need for Council involvement is to facilitate meeting Australia's emission reduction targets and those reviews will go directly to that issue, and so are likely to have implications for the long term planning and investment needs of the NEM.

6.7 Other issues – alignment of incentives

A number of stakeholders raised the concerns regarding the alignment of incentives within the overall RIT-T framework. While some of these concerns are not within the terms of reference for this review, they are captured here for possible further investigation in future reviews and rule changes.

In the current framework, the concern from some stakeholders is that transmission network businesses have a natural incentive to choose the credible option that increases their RAB. Two distinct suggestions have been raised which may help both to ease concerns around these incentives and also which may help to speed up the process.

'[An incentive scheme] that allows a [transmission network business] to benefit equally from investing in an (opex-based) non-network option as it would from investing in a (capex-based) asset build option.'

p1, EnerNOC

1. Mechanism to allow transmission network businesses to generate revenue from operating expenditure (opex) based credible options.

Some stakeholders have suggested that this would put opex-based options on equal footing with capital expenditure (capex) based network options. This would help to align the incentives for non-network options with those for network options that increase transmission network business' RAB.

However, this approach may also increase regulated revenues and therefore consumers' electricity prices. If there are concerns about unequal capex and opex incentives, there may be more efficient options for addressing that issue such as adopting a total expenditure (totex) approach as has recently been adopted by Ofgem in the UK.

'[An incentive scheme which provides] a base payment on the lowest value of benefits determined in any of the scenarios...The remainder of a project cost would be subject to market conditions and have a much higher level of WACC as the revenue is at risk and would not be funded by the customers.'

pp5-6 Engie

2. Mechanism for splitting the way investment are captured in the RAB.

This would lead to smaller amount of capital being captured in the RAB and the remainder captured at a higher WACC to reflect the risk of the investment. The choice of the source of funding for the riskier capital would be subject to competitive market forces. This proposal is similar to the proposed cap and floor designed interconnectors proposed between the UK and other countries from 2019.³⁶

These proposals would require significant changes to the economic regulation framework in chapter 6A of the NER. Due to the short timeframe for this report and the specific scope, these mechanisms could not be considered in more detail. These suggestions should be more appropriately considered as part of other reviews or rule changes related to the economic regulation framework set out in chapter 6A of the NER.

The COAG Energy Council has requested the AEMC to undertake annual reporting on the economic regulatory framework and as part of that review the AEMC will consider issues related to capex and opex incentives. The recent rule change submitted by the Australian Energy Council on contestability of energy services also raises some of these issues.

³⁶ The changing role of electricity interconnectors, a link to a stable future, KPMG 2016

The ENA electricity network transformation roadmap is also considering options for regulation business models and electricity pricing into the future. Also, the energy market transformation program which is being undertaken by COAG Energy Council is looking at efficient investment and operation of electricity infrastructure, which will look at the economic framework when shifting from a more centralise energy system to a more decentralised one.

7 Areas for reform and conclusions

The review found that the design of the RIT-T in its current form remains the appropriate mechanism to ensure that new transmission infrastructure in the NEM is built in the long term interests of consumers. Further, it remains the appropriate mechanism for the assessment of any strategic interconnection investments to enhance system security and competition in the NEM. The review further considered, but found no evidence to warrant, changes to the categories of costs and benefits which are captured in the RIT-T or to its current confinement to a partial equilibrium analysis focused on costs and benefits to those producing, transporting and consuming electricity in the NEM.

These findings are consistent with previous reviews of the RIT-T, where it has consistently been found to be robust and an appropriate mechanism to assess transmission network investments and to provide an appropriate balance between rigour and timely investment decisions. Similar to this review, previous reviews have also recommended minor changes that look to affect improvements in the overall effectiveness of the RIT-T process.

The potential areas for improvement in both the test and wider planning transmission planning arrangements identified by the review are:

- Review of the AER's RIT-T application guidelines, with a view to better reflect the net system benefits of options, including those relating to system security and renewable energy and climate goals
- Improvements to the level and accessibility of information relating to transmission networks
- Further explore the merits of increasing the AER's level of oversight for the RIT-T process.

Officials note that some additional observations were raised by stakeholders which sat outside the scope of this review but may warrant further investigation through other processes. These include a concern among consumer groups and some generators that network incentives are weighted towards capital expenditure which can be incorporated within their regulatory asset base rather than the most cost effective solution to meet an identified need.

Appendix A: RIT-T Review Terms of Reference

On 19 August 2016 the Council of Australian Governments (COAG) Energy Council noted the important role interconnectors play in a transitioning energy sector and tasked officials to undertake a review of the regulatory test that applies to investments in new electricity transmission assets in the National Electricity Market (NEM)—the ‘RIT-T’—to ensure it is effective in the current market environment. Officials are required to report back to Ministers before the end of the year.

The RIT-T is a cost-benefit assessment to identify the investment option to address an identified need which maximises net economic benefit to all those who produce, consume and transport electricity in the NEM. The overarching role of the RIT-T is to ensure that consumers only pay for those investments that are economically efficient.

In considering the RIT-T in its broader context it is important to recognise that the test is used to inform investment decisions. When applied, it should allow timely identification and implementation of the most beneficial means of addressing emerging network constraints in the setting of the broader policy framework in which the market operates.

This is particularly important in a dynamic and changing energy environment where new technologies and services are being developed at a rapid pace and becoming increasingly available. Investment decisions made by network businesses should consider a range of solutions and take into account net economic benefits in the long term interests of consumers. For example, in some locations, network businesses are already assessing whether distributed generation is more efficient than building or replacing grid infrastructure. Similarly, in some cases, interconnectors may offer an efficient means for maintaining power system security across the interconnected system, as well as assisting in reducing wholesale and retail market costs through inter-regional trade and risk management.

The Review will examine whether:

- there is scope to make the RIT-T process more efficient and timely and
- the design of the current RIT-T remains appropriate to current and future needs, with particular regard to whether:
 - the RIT-T remains the appropriate mechanism for the assessment of strategic interconnection investment for the development of a truly national, efficient, interconnected NEM and
 - the parties responsible for assessing and making decisions on strategic interconnection investment are appropriate in the context of the development of a truly national, efficient, interconnected NEM.

In doing so, it will take into account the National Electricity Law (NEL), the National Electricity Rules (NER), applicable jurisdictional regulatory frameworks and relevant industry structures along with national and jurisdictional policies to reduce carbon emissions through increasing the proportion of renewable energy in the national energy mix.

The Review will be oversighted by the COAG Energy Council Energy Project Team and undertaken by a working group consisting of representatives from:

- Commonwealth (Chair) and state governments
- Australian Energy Regulator (AER)
- Australian Energy Market Operator (AEMO)
- Australian Energy Market Commission (AEMC).

The working group will prepare a report to energy ministers for consideration at the December 2016 COAG Energy Council meeting, which will include, but not be limited to:

- an overview of the current RIT-T and its application and effectiveness under the current NER and guidelines
- key issues or deficiencies identified in the current RIT-T process, including whether the current process presents any particular barriers to the continued development of a truly national, efficient, interconnected NEM and
- any proposals to amend the framework for carrying out the RIT-T together with a timetable and process for implementation.

Any proposals need to be consistent with:

- the retention of:
 - a cost-benefit assessment framework to ensure protection of the long-term interests of consumers and
 - a decision criterion based on the maximisation of net market benefits to those who produce, consume and transport electricity in the NEM and
- the fundamental principle of competitive neutrality between network investment and other options.

In developing the report, the working group will give consideration to the role of the RIT-T in a future characterised by reduced growth in demand forecasts, greater reliance on renewable sources of energy and rapid technological change. In this context they will consider:

- Do transmission investment decisions made using the RIT-T take into account the full value – given implemented government policies - of the options considered to those who produce, consume and transport electricity in the NEM?
- Could the NER provide clearer guidance as to how the future policy and economic context should be accounted for in assessing investment options under the RIT-T?
- Could further clarification be included in the NER on how the RIT-T should be conducted?
- Could the AER RIT-T application guideline be clarified and improved?
- Does the process in the NER for the RIT-T strike the right balance between speed and efficiency versus a comprehensive and consultative process?



- How well does the RIT-T interact with other aspects of the regulatory frameworks which are designed to deliver optimal NEM-wide investment solutions (for example, the incentives flowing from the economic regulation of transmission network businesses as well as planning functions of energy market bodies)?
- What has been the experience of the RIT-Ts carried out to date? What can we learn from international experiences?

Stakeholder views on these and other matters will be sought through a consultation paper in September/October 2016.

Appendix B: Consultation questions

Stakeholders were invited to respond to a series of questions as part of the consultation process conducted for this review.

1. Are there specific aspects of interconnector projects that present particular challenges to the application of the RIT-T?
2. Do existing transmission planning processes/incentives support the timely initiation of a RIT-T to assess options to relieve existing or emerging transmission constraints?
3. Do the RIT-T process and related planning frameworks adequately take in to account the evolving technology and policy environment? If not, how should they be included as part of the RIT-T process to support assessments/decisions about economically efficient options?
4. Does the RIT-T process adequately assess all benefits interconnectors provide, including the contribution to efficiently achieve national carbon reduction goals, wholesale market competition and power system security and stability?
5. Is the RIT-T, as currently framed, appropriate to the assessment of interconnection investments? If not, what changes and/or alternative mechanisms should be considered?
6. Are there any particular barriers to the timely and effective conduct of the RIT-T?
7. Does the current RIT-T process strike the right balance between speed and efficiency versus a comprehensive and consultative process?
8. Are compliance costs associated with applying the test commensurate with benefits consistent with the guidelines? If not, how could a better balance be achieved?
9. What has been your experience of the RIT-Ts carried out to date?
 - a. Do you consider that they have delivered timely and effective investment outcomes?
 - b. Do you consider the process has particular issues, problems or limitations?
10. Should the RIT-T process be streamlined for certain types of investment? If yes, by whom and on what grounds should those investment types be determined?
11. Do transmission investment decisions made using the RIT-T take into account the full value of the options considered to those who produce, consume and transport electricity in the NEM?



12. Is the current range of allowed costs and benefits appropriate? If not, what other costs or benefits should be captured in the test?
13. Is greater clarity required in the NER or guidelines on how implemented government policies should be accounted for in assessing investment options? Are there other aspects of the NER or guidelines, such as option value assessments, which could be clarified or improved?
14. Are the transmission businesses best placed to undertake the assessment of interconnection investments in the changing energy market? If not, who should be involved and who should be the final decision maker?
15. Is the level of oversight afforded to the test sufficient to ensure rigorous consideration of all credible options?



Appendix C: Consultation

Submissions received

AGL Energy
AusNet Services
Australian Energy Council
Clean Energy Finance Corporation
ElectraNet
Energy Consumers Australia
Energy Networks Association
Energy Users Association of Australia
EnerNOC
Engie
Greensync
Hydro Tasmania
Major Energy Users
Transgrid

Other public consultation

Australian Energy Council
Australian Pipeline Association (Murraylink)
ElectraNet
Energy Networks Association
Energy Users Association of Australia
EnerNOC
Powerlink
Sarlat Consulting
Transgrid

Appendix D: Interactions with recent reform and concurrent planned processes

The current and recent reforms summarised below are linked to the network planning framework and may have bearing on consideration for the RIT-T process and further work discussed in this report.

AEMC—rule change request on replacement expenditure planning arrangements

This rule change request submitted by the AER, among other things, proposes extending the RIT-T process to also include all replacement network transmission infrastructure rather than just new network transmission infrastructure subject to the existing cost threshold. The AER considers that this will help to increase the transparency of network replacements in an environment of flattened electricity network demand such that efficient network investment outcomes are reached.

AEMC – rule changes on contestability of energy services

The Australian Energy Council (AEC) rule change request seeks to require network businesses to procure some functions that they use in providing network services (for example, network support) from contestable markets and restrict the ability of network businesses to use regulated capital expenditure to invest in these services. Among the proposed changes, the AEC proposes to reduce the RIT-T/D threshold to \$50,000 (with a shortened process for those investments) and make the outcome of the test binding. While the AEC's main focus is on distribution networks, the AEC has requested the AEMC consider equivalent changes to the regulation of transmission network businesses.

AEMO—Future power systems security program

AEMO developed this program to address operational challenges arising from the changing generation mix in the electricity market, in particular to ensure efficient and adequate operational and market processes remain. This program focusses on maintaining system security over the next 10 years. Any changes in the value attached to system security or methods of quantifying system security may be relevant to valuations in the RIT-T process.

AEMO's Future Power System Security program seeks to understand the technical issues that arise as a result of the system security challenges and work with policy makers to develop solutions to ensure that the power system remains capable of delivering a secure and reliable electricity supply into the future. The program has identified a range of issues including frequency control and reduced system strength.

AEMC—Reporting on changes within the National Electricity Market

The AEMC has been tasked with two reporting functions to analyse conditions that influence transmission, generation and investment. These reports—one annual and one biennial—between them, will consist of analysis of the effectiveness of the economic regulatory framework in responding to increased uptake of

decentralised energy supply and the underlying factors that affect investment and if required further analysis and recommend changes to the transmission framework.

AEMC—System Security Market Frameworks Review

The AEMC has initiated a review into the regulatory frameworks that affect system security in the NEM. It is considering whether market frameworks are suitable to complement the increasing volume of renewable energy and to enable the maintenance of power system security. This review will also encompass and progress three recent rule change requests that relate to system security.

Independent review—Blueprint for energy security in the National Electricity Market

The COAG Energy Council has commissioned a review to be led by the Chief Scientist Dr Alan Finkel to develop a national blueprint to maintain energy security and reliability in the NEM. The review will outline national policy, legislative and rule changes required to maintain the security, reliability and affordability of the NEM in light of the transition taking place. Consistent with the National Electricity Objective, the review will examine the costs and benefits, including to consumers and industry, of the options to address any current or future vulnerabilities identified in the NEM.

Department of the Environment and Energy—2017 review of climate policies

During 2017, the Government will consider how to best calibrate emissions reduction policies beyond 2020, in close consultation with businesses and the community.

Appendix E: Origins of the RIT-T

The RIT-T, in its current form, was introduced in 2010 and forms just one part of the overall network planning process for the NEM.

Before the sweeping electricity market reforms of the 1990s and the creation of the NEM, state owned networks were responsible for all network planning across each of the electricity supply chain segments in respective states. With the introduction of the NEM and the National Electricity Code 1998, a new test was introduced to ensure that network planning was undertaken in a coordinated manner across the whole market. This test was a customer benefits test to ensure that network investment would only be undertaken if customers benefited from that investment.

In 1999, the customer benefits test was replaced by a regulatory test based on maximising net public benefits or market benefits to ensure costs were also incorporated in the test (version 1). However, the former market operator and other stakeholders identified a number of concerns with this test including consistency, definitions and competition benefits. The Australian Competition and Consumer Commission (ACCC) was tasked to review the test and in August 2004 the ACCC made a final decision to update the test (version 2).

A further revision was undertaken in 2007 (version 3) by the AER to include information for alternative options and also the introduction of the notion of likelihood in the consideration of alternative options.

In accordance with the AEMC's 2009 RIT-T Rule Change Determination, the AER replaced the regulatory test for transmission with the RIT-T in 2010. The main changes that stem from the rule change were the requirement to do the cost-benefit test with respect to relevant reliability criteria, rather than providing them at the lowest overall cost, the introduction of new consultation requirements, and the development of application guidelines to assist businesses and increase transparency. The other major change was to amalgamate the market benefits and reliability limbs of the regulatory test to a single cost benefit framework. This was specifically requested by the then Ministerial Council on Energy as one of the changes to the existing regulatory test framework. The purpose of this was to ensure national benefits would be considered for all transmission investments. The RIT-T is also more prescriptive in how to calculate costs and benefits.