AEMC

REVIEW

Australian Energy Market Commission

ISSUES PAPER

Review of the national framework for transmission reliability

28 March 2013

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Issues Paper

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About the AEMC

The Council of Australian Governments (COAG), through its then Ministerial Council on Energy (MCE), established the Australian Energy Market Commission (AEMC) in July 2005. In June 2011, COAG established the Standing Council on Energy and Resources (SCER) to replace the MCE. The AEMC has two main functions. We make and amend the national electricity, gas and energy retail rules, and we conduct independent reviews of the energy markets for the SCER.

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Executive Summary

Transmission networks facilitate the supply of electricity to end use consumers from a system of generators within each region of the National Electricity Market (NEM) and via interconnections with other regions. Transmission networks play a key role in ensuring the overall security of the power system and in ensuring that customers are provided with a reliable supply.

The level of reliability that transmission networks provide affects the level of investment that transmission businesses need to undertake. Determining an appropriate level of reliability therefore involves a trade-off between the cost of building and maintaining the network and the value of the service to customers. Transmission reliability levels also affect the ability of generators to access the wholesale market and may have impacts on where generators choose to locate their plant.

The way that transmission reliability levels are regulated currently differs in each jurisdiction in the NEM. This includes differences in how reliability levels are expressed, set, delivered, governed, and reported on. This lack of consistency and transparency means that it is difficult to compare the level of reliability that different transmission networks are required to provide. It also makes it more difficult to plan investments across transmission networks in different jurisdictions, which could lead to inefficient investments.

Purpose of this paper

The Australian Energy Market Commission (AEMC or Commission) has been requested to provide advice on a national framework for developing, describing and reporting on electricity transmission reliability in the NEM. This advice has been requested by the Standing Council on Energy and Resources (SCER) as part of a broader package of energy market reforms agreed to by the Council of Australian Governments in late 2012.

Under SCER's terms of reference, the approach for setting transmission reliability requirements under the national framework must reflect economically efficient outcomes and take into account local conditions and the value placed on reliability by customers. The national framework must also provide for the option of jurisdictions transferring responsibility for applying the framework to the Australian Energy Regulator (AER). The national framework however must also be capable of being applied by the jurisdictions.

This paper sets out the first stage of this advice and outlines a number of issues that we are seeking stakeholder comments on.

In developing our advice, we intend to build on work undertaken by the AEMC under the *Transmission Reliability Standards Review* which was finalised in 2010, and SCER's 2011 response to this review. We also note that a range of other work has been

undertaken in recent months to consider the appropriate regulatory frameworks for transmission networks, which may have impacts for the national framework which is developed.

SCER has also requested the AEMC provide advice on a national framework for distribution reliability, which will be undertaken in parallel with this piece of advice. We will be seeking to maintain a high level consistency between the reliability frameworks which are proposed for distribution and transmission networks where this is appropriate, recognising the different roles they perform in power systems.

Alternative models for governing and delivering transmission reliability in the NEM

There are a number of alternative models for governing and delivering transmission reliability. Each of these models has implications for:

- how reliability standards for transmission network service providers (TNSPs) are determined;
- how TNSPs plan and undertake investments needed to meet these standards;
- the application and consistency with the framework for the economic regulation of TNSPs and the recovery of costs incurred to comply with the relevant standards; and
- the institutional arrangements which are in place to support the regulatory framework.

A summary of the three main models currently used in the NEM is set out in Figure 1. As stakeholders use a range of terms and interpretations to refer to these approaches, for the purposes of our advice to SCER, we intend to use the following terms:

- **A redundancy approach**, which is based around specifying the level of redundancy that TNSPs must build into their network. Generally, no formal assessment is undertaken to assess the value placed on reliability by customers in determining the reliability standards that TNSPs should meet under this approach. This could lead to TNSPs being required to provide a level of reliability which is higher or lower than is economically efficient. However, this approach provides stakeholders with a clear indication of the level of reliability that TNSPs are required to provide and also provides a clear trigger for investment.

  This approach is used in New South Wales, Queensland and Tasmania.

- **An economic approach**, where the level of reliability is based on a project by project cost benefit assessment which compares the value placed on reliability by customers against the costs of investments. Under this approach, reliability standards are not determined in advance of the need to invest, as the level of reliability which is provided is an outworking of the cost benefit assessment

process. This approach requires the explicit consideration of the value of customer reliability. The economic efficiency of the outcome is hence dependent on the quality and application of the project assessment. The lack of pre-determined standards may also provide less certainty for stakeholders regarding future reliability levels.

This approach is used in Victoria.

- **An economic redundancy approach**, which reflects a combination of the redundancy and economic approaches. Under this approach, the level of reliability is determined through a cost benefit assessment process which compares the value placed on reliability against the cost of investment. The resulting reliability standards are determined in advance of the need to invest and are fixed for a given period. This provides clarity and certainty as to the level of reliability that TNSPs are required to provide.

  This approach is used in South Australia.

The Commission's approach

The objective of our advice to SCER will be to develop a model for delivering transmission reliability that can be applied in all NEM jurisdictions. The adoption of a national framework would require changes to the way transmission reliability is currently regulated and delivered in all jurisdictions. It could also have implications for the way that revenue for TNSPs is determined and the institutional arrangements that are in place.

The Commission has previously recommended that a national framework for transmission reliability should be based on reliability standards which are economically derived, but expressed in terms of the level of redundancy that TNSPs should build to. This provides certainty and transparency as to the level of reliability that is required of TNSPs while also promoting economically efficient transmission planning and investment. This is consistent with the ex ante incentive based economic regulatory framework that has generally been adopted for economic infrastructure. It is also consistent with our terms of reference, which requires the national framework to take account of the trade-off between the cost of investing in and maintaining transmission networks and the value placed on reliability by customers.

We consider there are two broad sets of issues to resolve in further developing this national framework:

- determining the extent to which flexibility should be provided in the framework to allow investments to be advanced or deferred on an economic basis, and how this should be accommodated within the wider regulatory frameworks; and

- more detailed issues around how the national framework would operate in practice.

The potential for flexibility to allow investments to be advanced or deferred on an economic basis

A concern sometimes cited with an economic redundancy approach relates to the fact that, while reliability standards are initially determined on an economic basis, standards are fixed for a defined period, which can be related to the period of a revenue determination.

This has led to suggestions that a national framework should provide greater flexibility to allow TNSPs to respond to changes in the costs and benefits of meeting their reliability standards in the time period between when their standards are set and when they need to invest to meet them.

Grid Australia has recently developed a proposal for how this flexibility could be accommodated under a national framework. This would involve allowing TNSPs to advance or defer the timing of an investment that would be otherwise needed to meet their reliability standards, where it can be shown that the economics of the investment have changed materially since the standards were set. Other bodies, including the Australian Energy Market Operator and the Productivity Commission, have suggested that all investments should be made on the basis of project by project economic assessments.

Under these types of approaches, reliability standards form more of a benchmark that performance would be assessed and reported against, rather than hard standards that would have to be met. The implications of providing flexibility in the national framework on the AER's revenue determination process are key issues for stakeholder consideration in this review.

Operation of the national framework

In addition to these high level issues, we are also seeking stakeholder comments on a range of issues relating to the detail of how a national framework for transmission reliability would operate in practice.

These issues relate to:

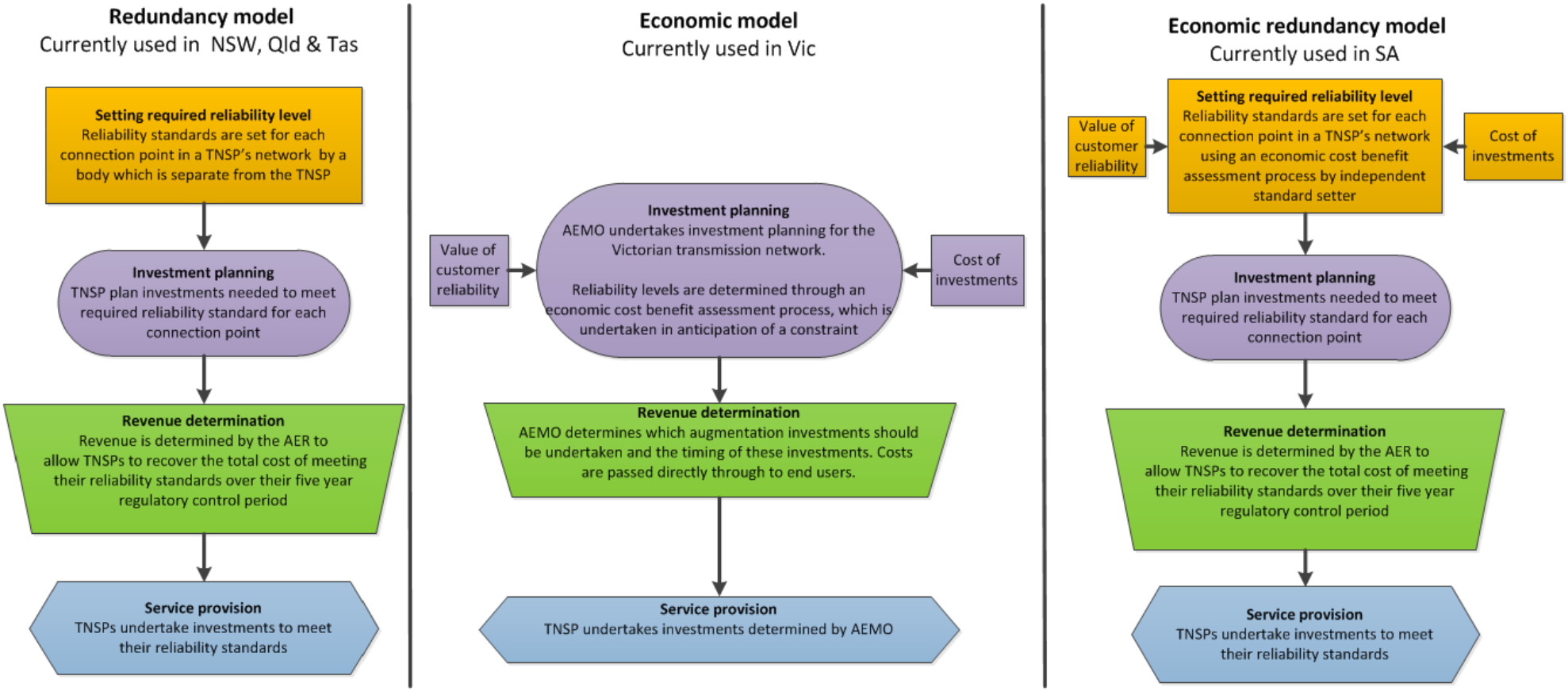
- the consistent expression of reliability standards across the NEM;
- the process for determining economically efficient reliability levels;
- the governance arrangements that should apply, including the process for jurisdictions to transfer the responsibility for applying the framework to the AER should they choose to do so; and
- the accountability and compliance obligations under the national framework, including the potential reporting requirements that could apply.

Next steps

Submissions will close on this issues paper on **Friday, 3 May 2013**. To help to focus responses we have set out a number of questions throughout the report for comment. We would also welcome comments on any other matters set out in the report.

A draft report will be published in August 2013 and will set out our draft advice on how a national framework for transmission reliability would operate for stakeholder comment. A final report would then be published in November 2013 and considered by SCER at its December 2013 meeting.

Figure 1 Summary of the current models for transmission reliability in the NEM



Contents

1 Introduction

The Australian Energy Market Commission (AEMC or Commission) has been requested by the Standing Council on Energy and Resources (SCER) to provide advice on a national framework for developing, describing and reporting on electricity transmission reliability in the National Electricity Market (NEM). This paper commences the first stage of the development of our advice and sets out our proposed scope and approach, as well as a number of issues for stakeholder comment.

1.1 Terms of reference for the review

On 8 February 2013, the AEMC received terms of reference from SCER to undertake a review to develop national frameworks and methodologies for setting electricity transmission and distribution reliability requirements. Under this review there are two separate workstreams:

- the development of a national framework and methodology for transmission reliability in the NEM ("transmission workstream"); and
- the development of a national framework and methodology for distribution reliability in the NEM ("distribution workstream").

While each workstream will develop discrete pieces of advice for SCER, we intend to have high level consistency, where appropriate, in the frameworks and methodologies which are developed for transmission and distribution reliability and the associated standards. These two workstreams will be undertaken in parallel to facilitate this.

1.1.1 Transmission workstream of the review

Under the transmission workstream of the review, the AEMC is required to:

- develop a national approach for expressing transmission reliability, which builds on the approach agreed to by SCER in its response to the AEMC's *Transmission Reliability Standards Review*;
- develop a national approach for setting transmission reliability levels, which takes into account the trade-off between the cost of investing in and maintaining transmission networks and the value placed on reliability by customers;
- assess the costs and benefits of the above approaches in line with the National Electricity Objective (NEO), with particular focus on assessing the outcomes delivered by different approaches with regard to the balance between customers' willingness to pay and the costs of delivering different reliability outcomes;
- with the Australian Energy Market Operator (AEMO), and in consultation with jurisdictions, develop a mechanism for measuring and regularly updating the

value of customer reliability, which takes into account an appropriate range of customer types, geographical differences and demographic differences;

- consider options to take into account local circumstances which may require different levels of reliability;
- develop a consistent approach to reporting on transmission reliability across the NEM, with any weightings and assumptions applied to different network elements made explicit;
- advise on appropriate changes to the institutional arrangements for setting transmission reliability levels, either by jurisdictions or the Australian Energy Regulator (AER), and how these arrangements should operate in an integrated national transmission system; and
- ensure that any proposed framework and methodology makes explicit the opportunity for jurisdictions to transfer responsibility for applying the framework to the AER.

Required considerations

In undertaking the transmission workstream, the AEMC is required to have regard to the following factors:

- SCER's November 2011 response to the AEMC's *Transmission Reliability Standards Review*;[1]
- relevant aspects of the AEMC's *Transmission Frameworks Review*;[2]
- AEMO's 2012 *Economic Planning Study Report* for the NEM;[3] and
- the potential interactions between a national framework for transmission reliability and AEMO's role as national transmission planner.

In addition to the factors outlined above, for both the distribution and transmission workstreams of the review, the AEMC is required to have regard to:

- the NEO;
- relevant amendments in the AEMC's final rule determination for the *Economic Regulation of Network Service Providers* rule change request;

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1 Ministerial Council on Energy, *Transmission Reliability Standards Review: Ministerial Council on Energy Response to Australian Energy Market Commission Final Report*, MCE, 16 November 2011.

2 The AEMC is currently undertaking the *Transmission Frameworks Review*. A final report on the review will be provided to SCER by 31 March 2013. Further details on this review, including relevant reports, can be found on the AEMC website at www.aemc.gov.au.

3 AEMO, *Economic Planning Study Report,* AEMO, 20 November 2012. In this report, AEMO considered how the timing of augmentation projects could be deferred where an economic cost-benefit assessment approach is taken to network investment across the NEM.

- the potential implications of any national frameworks for distribution and transmission reliability on the AER's revenue determination process, including the implications for the Service Target Performance Incentive Scheme (STPIS) for distribution and transmission businesses;
- the AER's recently commenced development of Capital Expenditure Guidelines for transmission and distribution networks;
- the Productivity Commission's *Inquiry into Electricity Network Regulation*; and
- any other relevant reviews, rule change requests and information.

1.2 Purpose of the review

The frameworks which govern the way that electricity distribution and transmission reliability levels are set and delivered are currently the responsibility of each jurisdiction. This remains one of the few areas of the electricity market where a nationally consistent approach has not been adopted. SCER notes that this has resulted in different frameworks in each NEM jurisdiction. This has made it difficult to accurately compare and assess the level of reliability that distribution network service providers (DNSPs) and transmission network service providers (TNSPs) are required to provide and the level of reliability which is provided in practice across jurisdictions.[4]

SCER also notes that differences in the way that distribution and transmission reliability levels are regulated affects the level of distribution and transmission investment that is needed, which has longer term impacts for end use customer electricity prices.[5]

In December 2012, the Council of Australian Governments (CoAG) endorsed a range of energy market reforms, which included an in principle agreement to adopt new best practice frameworks for reliability standards for electricity distribution and transmission networks.[6] CoAG also agreed to transfer responsibility for applying the frameworks to the AER if agreed to by jurisdictions.[7]

To facilitate CoAG's decision, SCER has tasked the AEMC with developing a nationally consistent framework for expressing, delivering and reporting on distribution and transmission reliability outcomes.[8] The AEMC is required to ensure the approach that is developed reflects economially efficient outcomes in the long term interests of consumers. SCER has also agreed to recommend to CoAG that the Australian Energy

4 SCER, *Terms of reference: National Reliability Standard Framework and Methodology,* SCER, 4 February 2012, pp. 3-4.

5 Ibid.

6 CoAG, *CoAG Energy Market Reforms - Implementation Plan,* 7 December 2012, p. 4.

7 Ibid.

8 SCER, *Electricity Market Reform- Putting Consumers First*, SCER report to CoAG, CoAG, 7 December 2012, p. iii.

Market Agreement be amended to provide jurisdictions with the ability to transfer the application of the reliability frameworks to the AER.[9]

SCER notes that a national approach to the way that distribution and transmission reliability requirements are regulated could provide for an improved understanding of the level of reliability in each NEM jurisdiction.[10] SCER also notes that it could also provide for a more "economically efficient, transparent and robust methodology for setting the level of reliability that distribution and transmission networks provide" which reflects the trade-off between the cost of investment and the value placed on reliability by end use customers.[11] This could lead to greater efficiency in the way investment is undertaken by DNSPs and TNSPs and more efficient electricity prices for customers.[12]

1.2.1 Previous work on transmission reliability

A range of work has been undertaken by the AEMC and the AEMC Reliability Panel to develop a national framework for transmission reliability in the NEM over the last few years. A summary of this work is outlined in Box 1.1 below.

The AEMC's most recent report, the Updated Final Report on the *Transmission Reliability Standards Review,* set out high level recommendations for a national framework for expressing, setting and reporting transmission reliability standards in the NEM.[13]

In November 2011, SCER formally responded to the AEMC's *Transmission Reliability Standards Review* and broadly supported the proposed framework the AEMC had recommended. SCER requested the AEMC develop an implementation plan for the framework and provide further detail on the proposed design of the framework.

Box 1.1: Historical work on the development of a national framework for transmission reliability

The development of a national framework for transmission reliability in the NEM has been an area targeted for reform since 2006. Outlined below is a summary of the work that has been undertaken to date.

Energy Reform Implementation Group: Energy Reform- The Way Forward for Australia (2006 to 2007)

The Energy Reform Implementation Group (ERIG) was established by CoAG in February 2006 to develop proposals for achieving a fully national electricity

9 Ibid.

10 SCER, *Terms of reference: National Reliability Standard Framework and Methodology,* SCER, 4 February 2013, p. 4.

11 Ibid.

12 Ibid.

13 A copy of the Updated Final Report can be found on the AEMC website at www.aemc.gov.au

transmission grid, improving the efficiency and competitiveness of the electricity sector, and to ensure transparent and effective financial markets to support energy markets.

ERIG reported to CoAG in January 2007 and recommended that a consistent national framework for transmission reliability standards be developed to promote an efficient national transmission grid. In particular, ERIG noted that there was a lack of specificity in current transmission reliability standards, there may be conflicts of interest where TNSPs are responsible for setting reliability criteria or interpreting reliability criteria, and that a lack of specificity in transmission reliability standards may lead to uncertainty for investors in generation. ERIG recommended that the AEMC Reliability Panel be tasked with developing a national framework that could be applied by the NEM jurisdictions.[14]

In April 2007, CoAG endorsed ERIG's recommendations but suggested that caution should be noted due to the different physical characteristics of the network, existing regulatory treatments in balancing reliability and costs to consumers, and as reliability standards underpin security of supply.[15]

AEMC Reliability Panel: Towards a Nationally Consistent Framework for Transmission Reliability Standards (2007 to 2008)

In July 2007, the Ministerial Council of Energy (MCE) directed the AEMC to review electricity transmission network reliability standards, with a view to developing a consistent national framework for network security and reliability, following CoAG's endorsement of ERIG's Final Report. The AEMC then requested the AEMC Reliability Panel to undertake a review of jurisdictional transmission reliability standards and provide advice to the AEMC.

The AEMC Reliability Panel provided its Final Report to the AEMC in September 2008 and set out recommendations for high level features for a national framework for transmission reliability. Under this framework, standards would be economically derived using a customer value of reliability and be capable of being expressed on a N-x basis using a common national template. Each jurisdiction would also have the option of appointing an independent national body to set the jurisdiction's transmission reliability standards.

AEMC: Transmission Reliability Standards Review (2008)

In September 2008, the AEMC provided its Final Report to the MCE after considering the AEMC Reliability Panel's Final Report. The AEMC endorsed the majority of the AEMC Reliability Panel's recommendations and provided further detail on how the framework would be applied and implemented. In particular,

14 ERIG, *Energy Reform: The Way Forward for Australia*, A report to the Council of Australian Governments by the Energy Reform Implementation Group, January 2007.

15 CoAG, *Council of Australian Governments response to the final report of the Energy Reform Implementation Group*, CoAG, 13 April 2007.

the AEMC recommended that the AEMC Reliability Panel should be the body to set transmission reliability standards for a jurisdiction when the jurisdiction refers this function to the national level and that it should also set the national reference standard template.

AEMC: Update to Transmission Reliability Standards Review (2010)

In November 2010, the AEMC published an Updated Final Report on its *Transmission Reliability Standards Review*. This update was prepared by the AEMC in light of the time that had passed since its 2008 Final Report and to take into account the establishment of AEMO in July 2009. The establishment of AEMO led to the introduction of a national transmission planner function for AEMO and also affected the jurisdictional transmission planning processes for Victoria and South Australia. The Updated Final Report also provided further detail on how the national framework would be applied in practice, including the institutional arrangements that should apply.

The AEMC did not formally commence work on developing this implementation plan for SCER due to the range of other work that was being undertaken on the appropriate regulatory arrangements for transmission networks, including the *Transmission Frameworks Review*. SCER notes that since its November 2011 response to the AEMC's *Transmission Reliability Standards Review* there has been further consideration of the regulatory frameworks for transmission networks.[16]

We also note that the Productivity Commission and the Queensland Government have been considering the appropriate reliability frameworks for TNSPs in the NEM and Queensland respectively as part of broader reviews.

In light of these recent changes, SCER has requested the AEMC to undertake work under this review to further develop the proposed national framework for transmission reliability. As discussed in Chapter 2, we intend to use the recommendations set out in the AEMC's 2010 Updated Final Report on the *Transmission Reliability Standards Review* as a starting point for the transmission workstream of the review, while considering whether any of these recommendations should be reconsidered or further examined in light of recent developments in the NEM.

1.3 Linkages to other current reviews

There is a range of other work which is currently being undertaken which may have implications for the advice developed under the transmission workstream. A summary of this work is outlined below.

16 SCER notes that this includes: the AEMC's *Transmission Frameworks Review;* recent changes to the National Electricity Rules for the revenue determination process for TNSPs under the *Economic Regulation of Network Service Providers* rule change request; and recent work by AEMO on investment to meet transmission reliability requirements in the NEM.

1.3.1 AEMC distribution workstream of the Review of the National Frameworks for Transmission and Distribution Reliability

As discussed above, the AEMC has also been requested by SCER to develop a national framework and methodology for electricity distribution reliability requirements in the NEM under the distribution workstream of this review. Similar to the transmission workstream, this will include providing advice on a national approach to developing, describing and reporting on distribution reliability in the NEM.

This work will build on work undertaken on the AEMC's *Review of Distribution Reliability Outcomes and Standards*. In particular, the draft report for the national workstream of this review, which was published in November 2012, set out a high level national framework for distribution reliability which will be further developed. The NSW workstream of this review provided advice on the costs and benefits of different levels of distribution reliability in NSW and developed a value of customer reliability (VCR) for NSW customers.[17]

An interim report on the distribution workstream will be published in May 2013 and a final report will be published in September 2013.

Where possible, we will seek to maintain consistency in the national frameworks which are developed for transmission reliability and distribution reliability. Further discussion on how we intend to ensure this consistency is set out in Chapter 2.

1.3.2 AEMC Transmission Frameworks Review

The AEMC is currently undertaking the *Transmission Frameworks Review* which is providing advice to SCER on the arrangements for the provision and utilisation of electricity transmission services and the implications of the market arrangements governing transmission investment in the NEM.

The objective of the review is to ensure that incentives for generation and network investment and operating decisions are effectively aligned to deliver efficient overall outcomes. The AEMC's Second Interim Report on the review was published in August 2012 and set out draft recommendations and options for stakeholder comment. A final report will be provided to SCER in March 2013.

The Second Interim Report presented an alternative approach for the provision and utilisation of the transmission network by generators, termed optional firm access. Under this model, TNSPs would be required to meet both their jurisdictional reliability standards and a new standard relating to the level of firm access purchased by generators to provide them with financially firm access to their regional reference price. How TNSPs meet these two sets of standards and the interactions this may have with the revenue determination process will be further considered under the final report for the *Transmission Frameworks Review*.

17 Further details on the AEMC's *Review of Distribution Reliability Standards and Outcomes* can be found on the AEMC website at www.aemc.gov.au.

1.3.3 Productivity Commission Inquiry on Electricity Network Regulation

The Productivity Commission is currently undertaking an inquiry into electricity network frameworks following terms of reference from the Commonwealth Treasurer. The Productivity Commission released its draft report in October 2012 and set out a proposed approach for a national framework for transmission reliability. Under this approach, all jurisdictions in the NEM would adopt an enhanced version of the transmission planning framework currently in place in Victoria. This approach would be based on AEMO undertaking all transmission planning across the NEM and determining the level of reliability that should be provided using project by project economic cost benefit assessments.

A final report on the inquiry will be provided to the Commonwealth Government in April 2013.

We intend to consider the Productivity Commission's proposed approach as part of the transmission workstream of this review.

1.3.4 AEMO review of the value of customer reliability

In March 2013, AEMO formally commenced work on its review of the value of customer reliability with the publication of an issues paper. AEMO has been requested to undertake this review by the SCER, following SCER's response to the AEMC's 2010 *Review of the Effectiveness of NEM Security and Reliability Arrangements in light of Extreme Weather Events*.

Under this review, AEMO will undertake a review of existing methodologies to measure the VCR and then commission surveying to develop VCRs for use across the NEM. A final report is expected to be published by AEMO in late 2013.

This review by AEMO interacts with both the distribution and transmission workstreams of the AEMC's review as SCER has requested that reliability levels under the national frameworks for distribution and transmission reliability be set with reference to the value placed on reliability by customers. As a result, the successful implementation of these national frameworks will in part depend on the availability of relevant and regularly updated VCRs for each transmission and distribution network in the NEM.

1.3.5 Economic Regulation of Network Service Providers rule change

In November 2012, the AEMC published its final rule determination and final rule in response to rule change requests submitted by the AER and the Energy Users Rule Change Committee on the economic regulation of network service providers. These rule change requests covered issues relating to the rate of return, capital expenditure incentives, capital and operating expenditure allowances, and the regulatory determination process.

The main interactions between this rule change and the transmission workstream of this review relate to changes to the National Electricity Rules (NER or rules) that were made to improve incentives for efficient capital expenditure and to clarify the powers of the AER to review and amend capital and expenditure allowances.

Under these changes, the AER will be able to undertake ex post reviews of the efficiency of past capital expenditure and preclude inefficiently incurred expenditure from being rolled into the regulatory asset base, where a network service provider has spent above its capital expenditure allowance. The AER will also be required to publish annual benchmarking reports, which set out the relative efficiencies of network service providers.

These changes to the rules should assist the AER in its assessment of capital expenditure undertaken by TNSPs to meet their reliability standards in future regulatory control periods.

1.4 Consultation during the review

In conducting both the transmission and distribution workstreams of the review, SCER has requested the AEMC to consult broadly with stakeholders. The range of stakeholders is to include but not be limited to:

- the AEMO;
- the AER;
- jurisdiction specific reliability setting bodies;
- Energy Ministers and their officials;
- network businesses; and
- consumer representatives.

In undertaking the transmission workstream of the review, the AEMC intends to work closely with stakeholders in developing our advice particularly in light of the range of work undertaken on this area over the past few years. Public consultation will be undertaken on this issues paper and our draft report on the transmission workstream.

Under SCER's terms of reference, the AEMC is also required to formally present on our work to date to SCER's officials in April 2013, August 2013, and September 2013.

1.4.1 How to make a submission on the issues paper

The closing date for submissions to this issues paper is close of business on Friday, 3 May 2013.

Submissions must be on letterhead (if submitted on behalf of an organisation), signed and dated. Submissions should quote project number "EPR0028" and may be lodged online at www.aemc.gov.au or by mail to:

Australian Energy Market Commission

PO Box A2449

Sydney South NSW 1235

1.5 Structure of the paper

The remainder of the issues paper is structured as follows:

- Chapter 2 sets out the proposed approach, scope and principles for the transmission workstream of the review;
- Chapter 3 provides a summary of the current approaches to transmission reliability in the NEM;
- Chapter 4 outlines issues relating to the role of transmission reliability standards under a national framework and the interactions between transmission reliability standards and the revenue determination process;
- Chapter 5 outlines issues relating to the expression of transmission reliability standards and the standard setting process;
- Chapter 6 outlines issues relating to governance arrangements under a national framework;
- Chapter 7 outlines issues relating to the accountability and compliance obligations under a national framework; and
- Chapter 8 sets out the next steps for the transmission workstream of the review.

2 Approach, scope and principles for the transmission workstream

This Chapter sets out the proposed approach, scope and principles for the transmission workstream of the review for comment.

2.1 Approach

Our advice to SCER will be based on how a national framework for transmission reliability can be applied in all NEM jurisdictions, to promote efficient reliability outcomes and ensure that TNSPs are accountable for meeting their reliability requirements. The adoption of this framework would require changes to the way transmission reliability is currently regulated and delivered in all NEM jurisdictions. It could also have implications for the way that revenue for TNSPs is determined and the institutional arrangements that are in place.

We intend to build on the work undertaken to date by the AEMC and AEMC Reliability Panel to develop a national framework, as well as SCER's 2011 response to the AEMC's 2010 Updated Final Report on the *Transmission Reliability Standards Review.*

As the recommendations made in the AEMC's Updated Final Repot were at a relatively high level, one of the key tasks for our advice to SCER will be to provide further detail on how the framework will work in practice and also interact with other elements of the regulatory frameworks for transmission networks.

As discussed in Chapter 1, we also intend to take into account recent developments in the NEM since our recommendations were made and SCER developed its response, including current and ongoing reviews on the appropriate regulatory frameworks for transmission networks at national and jurisdictional levels.

2.1.1 Consistency with the distribution workstream of the review

Where possible, we will seek to maintain high level consistency with the national framework for distribution reliability requirements under the distribution workstream of this review. Some of the common areas that SCER has requested advice on across both workstreams include:

- a nationally consistent approach to setting standards which takes into account the trade-off between the cost of investing and maintaining networks and the value placed on reliability by customers;
- the development of a mechanism for measuring and regularly updating VCRs; and
- the ability for jurisdiction to transfer responsibility for the frameworks to the AER.

A consistent approach to the reliability frameworks which are developed for distribution and transmission networks will allow stakeholders to more easily understand the levels of reliability required of the networks, as well as the role of distribution and transmission networks in the overall level of reliability received by end use customers. A consistent approach may also assist in joint transmission and distribution planning where a constraint can be addressed by either work on the transmission or distribution network or a combination of work on both networks.

In addition, where there is consistency in the institutional arrangements that apply to the reliability frameworks for transmission and distribution networks, there is the potential for greater efficiencies in how standards are set, governed, and reported on.

However, while we consider that there could be benefits in maintaining high level consistency between the frameworks for transmission and distribution, we also note that transmission and distribution networks have fundamental differences in how they operate and their respective roles in the electricity supply chain. These differences include, but are not limited to, differences in:

- **Customers**: Both transmission and distribution networks ultimately seek to transport electricity to end use customers. However, distribution networks have a closer relationship with end users and they are responsible for the majority of supply interruptions, while transmission networks generally have a closer relationship with generators and large users as the availability and reliability of transmission networks play a key role in their decisions to invest and the location of their investments.

- **Investment planning and types of investment undertaken, including the potential for inter-regional investment planning**: Distribution networks generally undertake a large number of relatively small investments while transmission networks generally undertake a small number of large investments. The transmission network can also be considered as a single integrated network, as a constraint in one region may be able to be addressed through investment in another region, while similar considerations do not generally apply to the same extent to distribution networks.

- **The type and level of performance reporting that can be undertaken:** The performance of distribution networks in terms of supply interruptions (eg number or duration of supply interruptions) can be easily observed and distribution networks are responsible for the majority of supply interruptions due to the large and radial nature of distribution networks.

  In contrast, the contribution of transmission networks to supply interruptions is limited as transmission networks are designed to provide a higher level of reliability due to the potentially widespread consequences of a failure on a transmission network. This also generally means that under-investment in transmission networks may not translate to short term observable reductions in reliability to the same extent that may occur for distribution networks.

These differences mean that it is difficult to effectively design outputs based performance reporting for transmission networks. As a result, the type of performance reporting that is appropriate for transmission networks is different in nature from the type of performance reporting that is appropriate for distribution networks.

These differences mean that while consistency at a high level in how the national frameworks for transmission and distribution reliability are applied is possible, the detail of how each framework operates and the types of standards and incentives that should apply, will need to differ.

The Commission will be developing the national frameworks for transmission and distribution reliability in parallel. We would welcome stakeholder views on which components of the frameworks should be consistent and for which components consistency may not be appropriate.

Question 1 Consistency with the distribution workstream

a) Which components of the national framework for transmission reliability should be made consistent with the national framework which will be developed for distribution reliability?

b) Which components of the framework for transmission reliability should differ from the framework for distribution reliability?

2.2 Scope

We consider that the scope of a national framework for transmission reliability should include the following features:

- **Expression of standards:** How standards are described across the NEM.
- **Methodology for setting standards:** The process used to set standards, including the factors which are taken into account in setting standards.
- **Institutional and governance arrangements:** The bodies which are responsible for setting standards and monitoring compliance under the national framework. This also relates to the incentives and penalties in place for transmission networks to meet their reliability standards.
- **Reporting arrangements:** The process for reporting and publishing the standards that each TNSP is required to meet, as well as information on the level of reliability which is provided.

While these components would comprise the key features of the national framework, the framework will also have implications for how TNSPs plan and undertaken investments and how these investments are funded through the revenue determination

process. These implications will need to be carefully considered under the transmission workstream.

It should be noted that while our advice to SCER will set out a proposed framework for transmission reliability, it will not provide advice on the appropriate level of reliability that should be provided by transmission networks. The intention of the framework is not to result in a consistent level of transmission reliability across the NEM. Rather, the purpose of the framework is to provide a nationally consistent approach to how reliability standards are developed, described and reported on.

Question 2 Scope of the national framework for transmission reliability standards

a) Are there any components of the proposed scope for the national framework for transmission reliability that should be considered out of scope?

b) Should any additional components be included in the scope of the framework?

2.3 Principles for the transmission workstream

Outlined below are our proposed principles for the transmission workstream. These principles have been based on those used in the AEMC's 2010 Updated Final Report and the AEMC's draft report on the national workstream of the *Review of Distribution Reliability Outcomes and Standards*, but have been refined and further developed.

The Updated Final Report included additional principles of "specificity of standards", "amenable", "accountability", "fit for purpose", "technology neutral" and "maintains the ability to achieve consistency between transmission and sub-transmission standards". The wording of these additional principles has been incorporated into the below principles to allow the principles to be streamlined.

- **Transparency**: The process for setting standards and the standards themselves should be transparent, and there should be the ability for stakeholder input on proposed changes to the standards. The process and reasons for setting transmission reliability standards should be clearly explained.

- **Governance**: The standards should be set by a body that is separate from the TNSP that must apply the standard. However, the framework should allow standards to be determined by the standard setter following consultation between the standards setter and the TNSP. The consequences of not following the standards should be clearly defined along with the processes for enforcing the standards. TNSPs should be held accountable for ensuring that the standards are met, as well as for compliance with requirements under relevant STPIS.

- **Economic efficiency**: Standards should be set using an economic assessment process that compares the cost of undertaking and maintaining transmission investments against the value customers place on reliability.

- **Fit for purpose**: Standards should be clearly specified by connection point or on some other readily understandable basis. The framework should not be a "one size fits all" approach. Rather it should allow for standards to differ across networks according to the value placed on reliability by customers and the costs of providing different levels of reliability

- **Effectiveness**: The framework should enable investment to proceed in a timely manner and meet customers' expectations relating to the value they place on reliability. The framework should allow standards to be met through innovative and efficient means and should not be biased towards network solutions where non-network options can provide a comparable level of reliability. The framework should allow joint planning to be undertaken between TNSPs and between TNSPs and DNSPs to deliver the appropriate level of reliability at each connection point.

In addition to these principles, the AEMC will also have overarching consideration to the NEO in developing our advice as required under the National Electricity Law and SCER's terms of reference.[18]

Question 3 Principles for the transmission workstream

Are the proposed principles for the transmission workstream appropriate in guiding the development of the AEMC's advice?

18 Under section 32 of the National Electricity Law, the AEMC must have regard to the NEO in performing or exercising any function or power under this Law, the Regulations, or the Rules.

3 Current approaches to transmission reliability in the NEM

This Chapter sets out a high level summary of current approaches to transmission reliability in the NEM. As discussed in Chapter 1, transmission reliability requirements remain a jurisdictional responsibility which has resulted in differences in the frameworks used for transmission reliability in each NEM jurisdiction.

3.1 Main approaches to transmission reliability in the NEM

There are a number of alternative models for governing and delivering transmission reliability. Each of these models has implications for:

- how reliability standards for TNSPs are defined and set;
- how TNSPs plan and undertake investments needed to meet these standards;
- the way that revenue is set to allow TNSPs to recover the cost of the investments required to comply with the relevant standards; and
- the institutional arrangements that are required to support the regulatory framework.

In the NEM there are currently three broad approaches to the way transmission reliability is delivered. The terms and interpretations that are used to refer to these approaches differ amongst different stakeholders. As a result, for the purposes of our advice to SCER we intend to use the following terms when discussing these approaches:

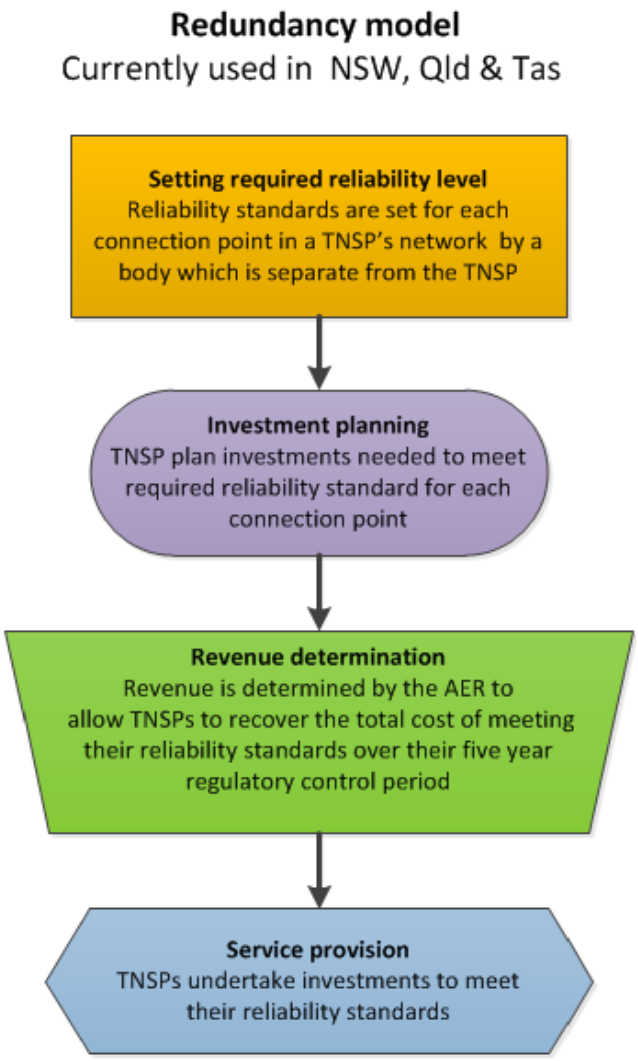
- a redundancy approach;
- an economic approach; and
- an economic redundancy approach.

3.1.1 A redundancy approach

This approach is commonly referred to as the "deterministic" or "N-x" approach, where "N" refers to the number of elements in a part of the network and "x" refers to the number of elements that can be out of service while still maintaining supply. The redundancy approach is based around providing adequate and secure supplies of electricity by building sufficient levels of redundancy in the network. The level of redundancy that is provided generally depends on the type of load being supplied. This approach is used in New South Wales, Queensland, and Tasmania.

A high level summary of how reliability is governed and delivered under this approach, and its interactions with the way revenue is determined and how TNSPs plan and undertake investments, is set out in Figure 3.1.

Figure 3.1 High level steps in governing and delivering reliability under the redundancy model



Under this approach, TNSPs plan to meet the required N-x level for each connection point in the network. No formal assessment is generally undertaken to assess the value placed on reliability by customers or the probability of an interruption to supply occurring in determining the level of reliability that should be provided.

The N-x reliability level for each connection point is determined in advance of a constraint occurring, which provides a clear trigger for investment if a constraint occurs. It also provides stakeholders with a degree of certainty as to the level of reliability that TNSPs are required to provide. Clear and pre-determined reliability standards also allow the AER to set an ex ante revenue allowance, which provides incentives for TNSPs to operate more efficiently by spending less than their aggregate revenue allowance.

On the other hand, the redundancy approach may limit the degree of flexibility that TNSPs have in determining the level of reliability that is provided for each connection point. It can also mean that a large proportion of the network may only be used for a few hours each year during peak periods. A lack of assessment of the level of reliability

valued by customers may mean that TNSPs are required to provide a level of reliability which is higher or lower than is economically efficient.

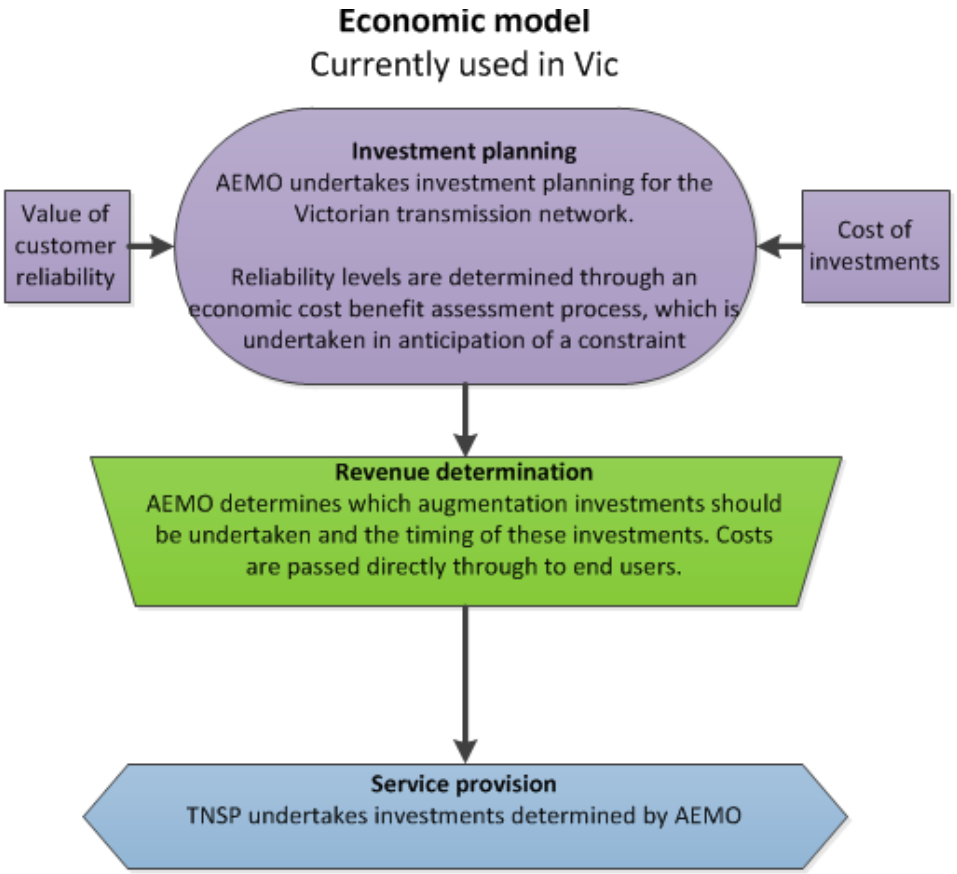
3.1.2 An economic approach

This approach is commonly referred to as the "probabilistic" approach and is used in Victoria. In contrast to the redundancy approach discussed above, under the economic approach there are no pre-determined levels of reliability for each connection point. Rather, the level of reliability that is provided for each connection point is determined on a project by project basis when a constraint or supply limitation is forecast to occur.

The identification of a constraint generally occurs using an initial screening study against N-x criteria. The level of reliability that is provided is linked to the value placed on reliability by the customers at each connection point. In general, where customers place a high value on reliability, a higher level of reliability will be provided.

A summary of how this approach is applied in Victoria and its implications for the way revenue is determined and how investment planning is undertaken is set out in Figure 3.2.

Figure 3.2 High level steps in governing and delivering reliability under the economic model



Once a constraint is identified, the likely impact on customers of doing nothing in terms of potential interruptions to supply is calculated by taking into account the

probability of an interruption and the resulting load that would be shed or "energy at risk". The potential impact on customers is quantified by multiplying the energy at risk by the value placed on reliability for the composition of customer types in the areas that would be affected. This cost is then compared against the cost of different investment options to address the constraint.

Where the cost of an investment is lower than the potential cost to customers of doing nothing to address the constraint, an investment will proceed. The investment that is selected is generally the investment that has the highest net benefit, or in other words, the lowest cost relative to the potential cost to customers of doing nothing.

As the economic approach explicitly takes into account the value placed on reliability by customers, this approach may mean that customers receive a level of reliability that more closely reflects their willingness to pay for reliability, if the measure that is used is accurate. This may result in TNSPs providing a more economically efficient level of reliability.

However, the economic efficiency of the outcome is dependent on the quality and application of the project assessment. As the level of reliability is an outworking of the economic assessment process, stakeholders may also have less certainty about the level of reliability they will receive over the longer term and the level which is required to be provided by the TNSP. It is also difficult to compare the level of reliability provided.[19]

A lack of pre-determined reliability standards also means that it is difficult to determine an ex ante revenue allowance as the level of investment a TNSP will need to undertake over the regulatory control period is uncertain. As a result, under this approach an alternative mechanism is required to set revenue, which impacts the ability to provide incentives for efficient investment.

As outlined in Figure 3.2, this issue is addressed in Victoria by AEMO undertaking all transmission planning and procurement for augmentations to the network. The costs of augmentations in Victoria are passed directly through to customers, on the basis that the investment decision maker (ie AEMO) has no financial incentive to select an inefficient investment option to address a constraint or to not invest at all. The AER determines a revenue allowance for operational expenditure and replacements.

This approach could also lead to lower levels of reliability than would be provided under the redundancy approach in rural areas where it may be difficult to justify investments due to the low population density and resulting low overall cost to customers if there is a supply interruption. Where a network element fails during a peak demand period, it may also be more likely that customers will receive an interruption to supply due to the lower level of network redundancy that may be provided.

19 This issue could be addressed by specifying the outputs of the economic assessment process in terms of the level of redundancy that TNSPs will build to.

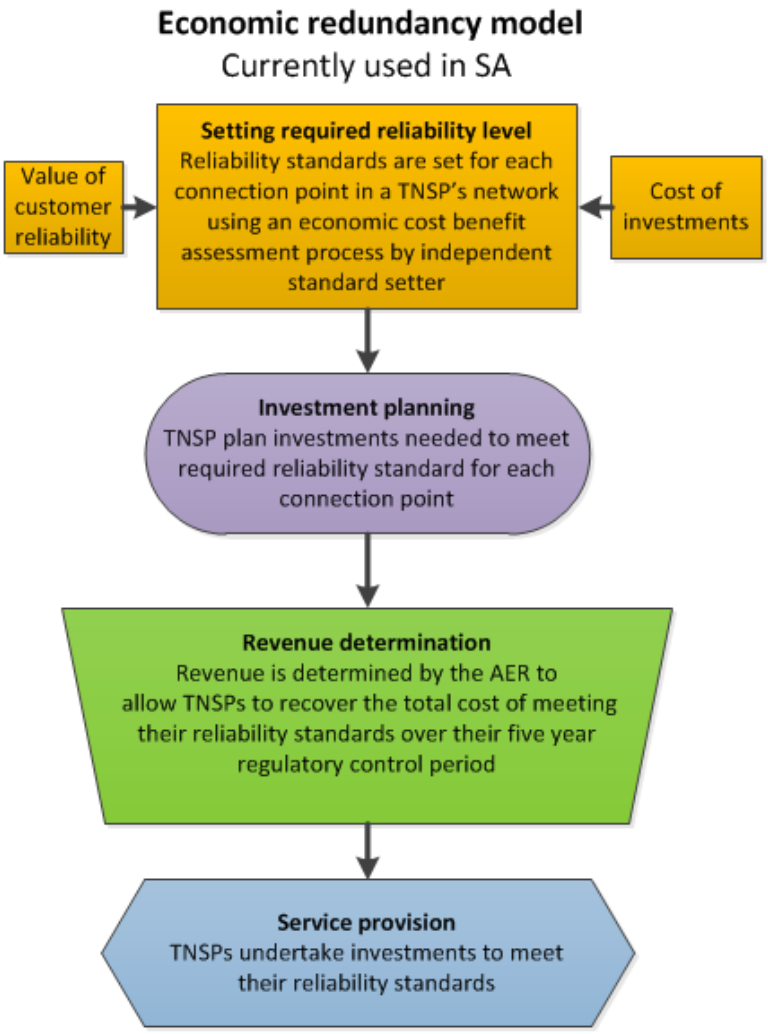
3.1.3 An economic redundancy approach

This approach reflects a combination of the redundancy approach and the economic approach and is currently used in South Australia.

Under this approach, transmission reliability standards are expressed on an N-x basis and are determined in advance of a constraint for each connection point, similar to the redundancy approach. However, an economic approach is used to determine which N-x level of reliability should be allocated to each connection point. This is done by comparing the cost of meeting higher or lower levels of reliability for each connection point against the value that customers at that connection point would place on the resulting level of reliability that would be provided.

A summary of how transmission reliability is governed and delivered under this approach is set out in Figure 3.3.

Figure 3.3 High level steps in governing and delivering reliability under the economic redundancy model



In general, where the cost of providing a higher level of reliability than is currently provided is lower than the benefits that customers would receive from the improved

level of reliability, a connection point would be allocated a higher level of reliability. In contrast, where the cost of maintaining the current level of reliability is greater than the benefit to customers of this level of reliability, a connection point would be allocated a lower level of reliability.[20]

Once the N-x level of reliability has been determined for each connection point for key types of equipment such as transformers or transmission lines for a defined period of time, generally no further assessment using the VCR is undertaken when a constraint arises. Rather, as generally occurs under the redundancy approach, a least cost method is used to determine the investment option that should be undertaken to meet a constraint.

The explicit consideration of the costs and benefits of providing a reliable supply of electricity would allow reliability standards to be set to reflect economically efficient levels. However, where there is a subsequent material change in the costs and benefits, standards may no longer fully reflect efficient levels.

This approach provides certainty to stakeholders on the level of reliability that would be provided on a connection point. Pre-determined reliability standards which are set for a defined time period also allow ex ante revenue determinations to be set by the AER, which promotes incentives for efficient investment.

However, as the VCR is used in setting reliability standards, there remain similar risks in relation to an increased likelihood of supply interruptions at peak periods where a network element fails and lower levels of reliability in rural areas, as discussed in relation to the economic approach.

3.2 Jurisdictional approaches to transmission reliability in the NEM

Outlined below is a summary of the current frameworks used to regulate transmission reliability in each NEM jurisdiction. A more detailed summary of jurisdictional arrangements is set out in Appendix A. An outline of recent reviews of jurisdictional arrangements is also set out in Box 3.1.

3.2.1 Summary of transmission reliability frameworks in the NEM jurisdictions

The table below provides a high level summary of the approach, expression and governance arrangements pertaining to transmission reliability standards in the NEM jurisdictions.

20 However, in South Australia reliability levels for a connection point cannot be reduced below current levels following a review of reliability standards.

Table 3.1 Summary of transmission reliability frameworks in the NEM jurisdictions

NEM jurisdiction and relevant TNSP	Approach to transmission planning	Standard	Source of standard	Governance body
New South Wales TransGrid	Redundancy	N-1 everywhere, except CBD of Sydney where a higher standard is required	Transmission Network Design and Reliability Standard, which serves as a direction from the NSW Government.	NSW Government (NSW Trade and Investment)
Queensland Powerlink	Redundancy	N-1 everywhere	Transmission authority (licence) issued under s 34 of the Electricity Act (Queensland) 1994.	Queensland Government (Director-General of the Department of Energy and Water Supply)
Tasmania Transend	Redundancy	Load interruption standard has two elements: 1. for an intact system, a N-1 standard generally applies. 2. where a network element is out of service, the unserved energy limit for a credible contingency event is 18 000 MWh.	Electricity Supply Industry (Network Performance Requirements) Regulations 2008 enforced through licence conditions.	Office of the Tasmanian Economic Regulator
Victoria SP AusNet	Economic	The transmission reliability standard applied to each connection point is a function of economic assessments based on sector specific VCRs for that point.	National Electricity Law	AEMO
South Australia ElectraNet	Economic redundancy	Five categories of reliability standard specified at connection points ranging from N to N-1 for line and transformer capacity, which will apply from 1 July 2013.	Electricity Transmission Code	Essential Services Commission of South Australia with advice from AEMO (on request).

Box 3.1: Recent reviews of jurisdictional transmission reliability standards

The transmission reliability standards in NSW, Queensland and South Australia have recently been reviewed or are currently in the process of being reviewed. Each of these reviews considered whether economic cost benefit assessments should be used to a greater extent in determining the level of transmission reliability that should be provided.

New South Wales

TransGrid recently commissioned a review of its transmission network planning approach where it evaluated the merits of applying an economic approach to achieving its reliability standards.[21] It noted that the NSW approach is not a 'pure' transmission reliability standard and recognises that an N-1 standard may not be economic in some circumstances and therefore a level of risk of loss of supply may be acceptable. Its review concluded that the case for an economic approach cannot be made at this time and that the NSW planning standards are based on sound engineering and risk management principles.[22] However, TransGrid notes that its planning standards must deliver value for money.[23]

Queensland

At present, the Queensland Government is currently engaged in a systematic review of its electricity sector.[24]As part of this review, the Queensland Government engaged an independent review panel to investigate the impact of Queensland's electricity network (including the transmission network) on prices and provide solutions for a secure and cost-effective network.

On 24 November 2012, the independent review panel published its interim report. In this report, it recommended that the 'N-1' condition in Powerlink's transmission licence be removed and replaced with minimum performance standards to be met on a best endeavours basis. The independent review panel suggested that this would allow Powerlink to adopt an approach to network planning that combines a N-1 standard with an economic approach. The Queensland Government will consider the panel's recommendations, following the publication of the panel's final report.

South Australia

In March 2012, the Essential Services Commission of South Australia (ESCOSA) completed its review of the *Electricity Transmission Code*. As part of this review, ESCOSA decided to reduce the number of categories of reliability that connection

21 TransGrid, Annual Planning Report 2012, 29 June 2012, p. 85.

22 Ibid, p. 86.

23 Ibid.

24 http://www.dews.qld.gov.au/policies/electricity-sector-reform (accessed 23 January 2013)

points in South Australia are allocated to from six to five and also determined that the current N-1 reliability standard for central Adelaide should not be enhanced at this time.

In December 2012, ElectraNet proposed amendments to introduce flexibility to transition to the new reliability standards under the revised *Electricity Transmission Code*. Specifically, ElectraNet proposed clauses that would empower ESCOSA to grant dispensation to ElectraNet to comply with a reliability standard if it can be demonstrated that a network or non-network solution to achieve compliance with a reliability standard should be deferred on an economic cost benefit basis.[25] ESCOSA is currently considering ElectraNet's proposal.

3.3 National requirements for transmission reliability

In addition to the jurisdictional requirements discussed above, TNSPs are also subject to service standards under any relevant Service Target Performance Incentive Scheme (STPIS) in place as part of their revenue determination. The STPIS is designed to provide incentives for TNSPs to improve the quality of the services they provide and to also avoid TNSPs seeking to reduce their costs by reducing service quality. Under the rules, these financial rewards or penalties can range between one and five per cent of a TNSP's maximum allowed revenue for each year of the regulatory control period.[26]

STPIS requirements are developed and monitored by the AER and currently include requirements relating to a:

- **service component**: This measures the average circuit outage rate, loss of supply event frequency in minutes, average outage duration, and the proper operation of equipment.

- **market impact component**: This measures the number of dispatch intervals where an outage on a TNSP's network results in a network outage constraint with a marginal value greater than $10/MWh.

- **network capability component:** This measures improvements in the capability of transmission assets through operational expenditure and minor capital expenditure. In particular, improvements which improve the capability of the transmission system at times which are most important to determining spot prices, or when transmission network users place the greatest value on the reliability of the system, are measured under this component.

The STPIS for transmission is largely complementary to reliability standards, focussed on maximising the capability of the network, particularly at times when this would be highly valued by users.

25 http://www.escosa.sa.gov.au/projects/190/electranet-s-proposed-amendments-to-revised-electricity-transmission-code.aspx (accessed 29 January 2013).

26 NER clause 6A.7.4(b)(3).

In addition to the STPIS, TNSPs are also required to comply with performance standards under Chapter 5 of the rules. Compliance with these standards is monitored by AEMO as part of its broader system management role.

4 Role of transmission reliability standards and interactions with the revenue determination process

This Chapter outlines the issues relating to the role of transmission reliability standards under the national framework and the interaction between transmission reliability standards and the revenue determination process.

4.1 Potential benefits of fixed transmission standards

The AEMC's 2008 Final Report and 2010 Updated Final Report on the *Transmission Reliability Standards Review* recommended a national framework developed on the basis of reliability standards which are economically derived and expressed on an N-x basis. Such an approach was considered to provide certainty and transparency as to the level of reliability that is required to be provided by TNSPs through standards being fixed. At the same time, economic efficiency in transmission investment would be promoted by the standards being set on the basis of a cost benefit assessment.

In South Australia, where a similar model is already in place, this cost benefit assessment is undertaken every five years, with standards being set for the duration of a regulatory control period. However, suggestions have been raised that the costs and benefits associated with meeting reliability standards could change materially in the time period between when standards are set and when the resulting investments are undertaken.

For example, as discussed in Chapter 3, in NSW, South Australia and Queensland the use of economic cost benefit assessments on a project by project basis has been recently debated. Similarly, as highlighted in Chapter 1, a draft finding by the Productivity Commission was that all investments in the NEM should be determined on the basis of project by project cost benefit assessments similar to the current Victorian model.

An implication of a move towards project by project assessments would be to change the role of reliability standards in some jurisdictions from a strict compliance obligation that TNSPs must plan and adhere to as a condition of their licence, to more of a benchmark or initial screening test.

Question 4 Potential benefits of fixed transmission standards

a) Do fixed transmission standards offer benefits in terms of certainty and transparency?

b) Would a five-yearly review process adequately reflect changes in the costs and benefits associated with meeting reliability standards?

4.2 Providing for flexibility in transmission reliability

In the AEMC's 2008 Final Report, it was acknowledged that it might be appropriate to provide flexibility such that TNSPs could advance or defer the timing of an investment that would be otherwise needed to meet reliability standards, where it can be shown that the economics of the investment have changed since the standards were set.

Grid Australia has recently developed a more detailed proposal as to how this flexibility could be accommodated under a national framework. In its submission to the Productivity Commission's draft report on the *Inquiry on Electricity Network Regulation*, Grid Australia proposed that under a national framework reliability standards could be departed from if:

1. a RIT-T is applied. This would exclude investments which are exempt under the RIT-T, such as investments where the estimated capital cost of the most expensive and technically and economically feasible option is less than $5 million, and maintenance and replacement investments, amongst others; and

2. defined criteria are met, such as a material change in input assumptions since the reliability standards were set.[27]

Grid Australia has proposed that only if these two conditions occurred would TNSPs undertake a further cost benefit assessment and that this would occur at the time of the investment decision. Grid Australia has suggested that this cost benefit assessment should also take into account the risk of pre-contingent load shedding and high impact, low probability events.[28] In all other situations TNSPs would undertake investments to meet their reliability standards.

Under Grid Australia's proposal, TNSPs would also be required to plan to meet their reliability standards in their annual planning reports and other forward planning documents, as well as in developing ex-ante expenditure forecasts.[29] This appears to assume that revenue determinations would also be set on the basis of compliance with the relevant reliability standards, even though in practice TNSPs would be able to advance or defer investments during the regulatory control period.

Grid Australia suggests that this approach would mean that reliability standards are used as a guide for planning purposes and also to provide transparency and accountability. However, Grid Australia suggests the ability to alter the timing of an investment and depart from the reliability standards would improve the efficiency of investments.[30]

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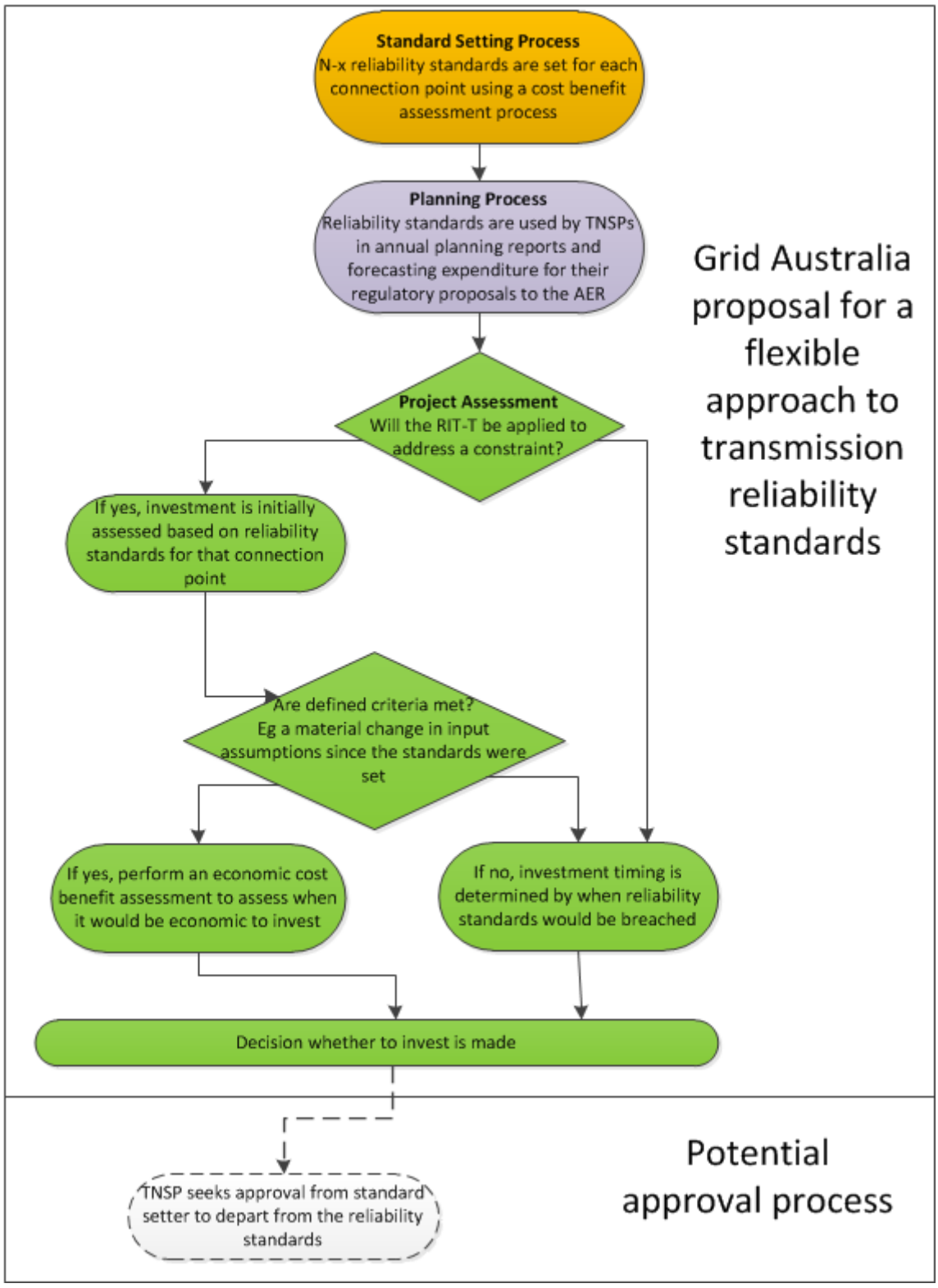
27 Grid Australia, *Submission to the Productivity Commission's draft report on its Inquiry on Electricity Network Regulation,* 20 November 2012, pp. 25-28.

28 Grid Australia, *Submission to the Productivity Commission's draft report on its Inquiry on Electricity Network Regulation,* 20 November 2012, p. 27.

29 Ibid.

30 Grid Australia, *Submission to the Productivity Commission's draft report on its Inquiry on Electricity Network Regulation,* 20 November 2012, pp. 27-28.

Figure 4.1 Proposed process for a flexible approach to transmission reliability standards



Grid Australia has not proposed what "defined criteria" would have to be met to warrant a material change in circumstances. It is assumed that this could include factors such as a material change in the expected cost of augmentation or in the VCR from when the reliability standards were set. It is also unclear whether TNSPs would

need to seek approval from a jurisdictional authority or the AER prior to departing from the reliability standards or demonstrate that these criteria had been met.

The criteria for when standards can be departed from would form a crucial part of any framework as it would effectively define the role and importance of the standards.

For instance, where there are relatively broad criteria, this would reduce the role of the standards and a case could be made for a more limited standard setting process as it is likely that a further more detailed cost benefit assessment would be done at the time of most investment decisions. Conversely, where the criteria are tightly defined, a more rigorous standard setting process would be warranted as further assessment would be unlikely. This choice represents determining the appropriate balance between transparent and defined standards and flexibility to determine the most efficient level of investment.

As discussed in Chapter 3, ESCOSA is currently considering a request from ElectraNet to adopt a more flexible approach to transmission reliability standards. Similar to the approach proposed by Grid Australia, ElectraNet has proposed that ESCOSA should be able to grant a dispensation from compliance with a transmission reliability standard, if it can be demonstrated that the cost of compliance with the relevant reliability standard should be deferred on an economic-cost benefit basis.[31] We are seeking stakeholder views on whether TNSPs should only be able to depart from their reliability standards following the approval of the relevant standard setter.

Question 5 Providing for flexibility in transmission reliability

a) Is there merit in having a flexible approach to reliability standards under the national framework?

b) Should Grid Australia's proposed criteria of the need to conduct a RIT-T and a material change in circumstances be used to determine when TNSPs are able to undertake a further economic assessment which would allow them to depart from their transmission reliability standards?

c) How should a "material change in circumstances" be defined?

d) Should any other requirements be met before TNSPs are able to depart from their standards?

4.3 Implications for the revenue determination process of a flexible approach to reliability

Where reliability standards remain unchanged over a regulatory control period, this provides the AER with a degree of confidence in determining the revenue that would

31 Further details on ElectraNet's proposal, including relevant documents, can be found at: http://www.escosa.sa.gov.au/projects/190/electranet-s-proposed-amendments-to-revised-electricity-transmission-code.aspx

be required for the TNSP to meet the standards. However, under a flexible approach, TNSPs would be able to depart from these levels where it can be shown that it would be economic to do so. Grid Australia's high level proposal outlining this approach has not considered the potential impact on the revenue determination process.

A more flexible approach to compliance with reliability standards could mean that a TNSP's expenditure is less than the revenue allowance set by the AER where a TNSP is able to defer an investment that would be otherwise required to meet the standards.

Conversely, where a TNSP seek to advance an investment as it is considered economic, the TNSP's expenditure may be greater than the revenue allowance set by the AER. However, it is generally less likely that TNSPs would seek to advance an investment than defer an investment, as TNSPs have incentives to maximise their returns. In practice it is also more difficult to advance an investment than defer an investment due to the limited timeframe to undertake detailed investment planning before a constraint or supply limitation is forecast to occur.

We note that when setting revenue allowances there is always some uncertainty regarding the actual investments that will take place over a regulatory control period and that this remains a regulatory risk that the AER will always need to address to some degree.[32] The impact of a flexible approach to reliability standards on revenue would depend largely on the criteria used to define when this flexibility should be used.

Ex ante revenue allowances provide a strong incentive for TNSPs to minimise their overall costs over the regulatory control period. They also provide incentives for TNSPs to make efficient trade-offs across their network and prioritise projects.

However, the presence of incentives to reduce costs also require appropriate indicators and incentives to be in place to ensure that TNSPs do not sacrifice service quality in their drive to reduce costs. As discussed in Chapter 2, it is difficult to measure performance outputs for transmission networks, as they are designed to provide a high level of reliability. As a result, input standards are used as a proxy for output performance measures. Allowing TNSPs to adopt a more flexible approach to reliability standards, in the absence of any additional regulatory requirements, may increase the risk of TNSPs seeking to maximise their returns at the expense of service quality.

The RIT-T process would provide the AER with a degree of oversight in relation to a TNSP's investment planning, and we are interested in stakeholder views on whether this would provide sufficient transparency to address the regulatory risks of inefficient investment deferral.

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32 For example, one of the key difficulties that the AER currently faces in developing its revenue allowances for TNSPs is forecasting the likely level of demand that will occur over the regulatory control period. SCER has recently asked for advice from the AEMC on the implications of the differences between actual and forecast demand within the operation of the economic regulatory frameworks for network service providers. Further details on this request for advice can be found on the AEMC website at www.aemc.gov.au.

The fully economic approach to transmission reliability in Victoria has been implemented in conjunction with very different regulatory and institutional arrangements as compared to the other NEM jurisdictions. Augmentation investment decisions are made by AEMO, rather than the relevant TNSP, and the AER plays no role in setting revenues for augmentations to the network. This means that the financial incentives provided through ex ante revenue allowances that are present in other jurisdictions do not apply in Victoria.

In contrast, we note that the AER currently sets revenue allowances for Victorian DNSPs which adopt an economic approach to investments. Similar regulatory risks and uncertainties may arise for the AER in setting revenue allowances for the Victorian DNSPs to the risks that could arise if a more flexible approach to transmission reliability standards is adopted. However, the risk of DNSPs deferring investments in Victoria is likely to be lower than it is for TNSPs, as reductions in investment are more likely to lead to observable reductions in the level of reliability that is provided on distribution networks (with these being reflected in penalties under the STPIS for DNSPs).[33]

Question 6 Implications for the revenue determination process of a flexible approach to reliability

a) Is a flexible approach to transmission reliability consistent with setting ex ante revenue allowances for transmission augmentation?

b) Would the RIT-T process provide sufficient transparency to address the regulatory risks of inefficient investment deferral, or would wider changes be required?

4.3.1 Potential use of the contingent project mechanism

A possible option to address the implications of a flexible approach to reliability standards on the revenue determination process is to use the contingent project mechanism in clause 6A.8 of the rules.

A contingent project is a project which is considered by the AER as reasonably required to be undertaken, but is excluded from the capital expenditure allowance in a revenue determination as the requirement, timing or cost of the project is uncertain. For instance, the contingent project mechanism can be used to reduce risks associated with changes in load growth that may occur following the AER's revenue determination.

Under the contingent project mechanism, TNSPs may include proposed expenditure for a contingent project in their regulatory proposals and the trigger events that would lead to the project needing to be undertaken. Where a proposal for a contingent project has been accepted by the AER and a trigger event occurs during the regulatory control

33 It should be noted that if there is a corresponding reduction in demand, a reduction in investment may not lead to a worsening of reliability.

period, the TNSP may apply to the AER to amend the revenue determination to include the forecast capital expenditure and incremental operating expenditure for the project for the remainder of the regulatory control period.

If the contingent project mechanism is used to facilitate a more flexible approach to addressing transmission reliability, the trigger events for the AER to re-open a revenue determination could include:

- a cost benefit assessment which clearly demonstrates that it would economic to depart from the standard; and
- the approval of a departure from the reliability standard by the relevant standard setter.

The contingent project mechanism can currently only be applied to projects where the proposed capital expenditure for the project exceeds the larger of either $30 million or five per cent of the value of the maximum allowed revenue for the relevant TNSP for the first year of the relevant regulatory control period.[34] This threshold is significantly higher than the $5 million threshold that currently applies for the application of the RIT-T.[35]

The AER has 40 business days to approve an application for a contingent project where a trigger event has occurred, but may extend this period by up to a further 60 business days if there are issues of complexity or difficulty.[36] This time period includes a public consultation period on the TNSP's application. This timeframe may limit the amount of scrutiny that stakeholders and the AER are able to apply in assessing such applications. However, it should be noted that the contingent project mechanism is not intended to be used as a substitute for effective corporate governance to constrain capital expenditure or re-prioritise projects within the AER's broader revenue allowance

Therefore, if the scope of the contingent project mechanism was extended such that a flexible approach could be taken to investments lower than the current $30m threshold, this might lead to more projects being subject to lower levels of regulator scrutiny. This could occur as the AER has less time to assess proposed expenditure under the contingent project mechanism than it would if this expenditure was being considered as part of the revenue determination process. The increased use of the contingent project mechanism could also increase the administrative burden on the AER.

34 NER clause 6A.8.1(b)(2)(iii).

35 The threshold for contingent projects was recently increased from the higher of $10 million or five per cent of the maximum allowed revenue for the TNSP's first year of the regulatory control period, to reduce the administrative burden on the AER during the regulatory determination process and provide sufficient scrutiny of adequately large projects under the mechanism. See: AEMC 2012, *Economic Regulation of Network Service Providers, and Price and Revenue Regulation of Gas Services*, Final determination, 29 November 2012, Sydney, p. 204.

36 See NER clauses 6A.8.2(d) and (i).

More generally, a movement away from an ex ante revenue allowance for TNSPs to the increased use of regulator approved project by project assessments would represent a fundamental change to the form of incentive regulation currently in place in the NEM. The increased use of the contingent project mechanism could limit the effectiveness of the incentives that arise from the AER setting an ex ante revenue allowance, and has the potential to lead to responsibility for investment decision making being transferred from TNSPs to the AER. This raises concern about the potential implications that this may have for efficient service provision by TNSPs.

Question 7 Potential use of the contingent project mechanism

a) If a change in the revenue determination process is required, would the use of the contingent project mechanism be an appropriate way to address this?

b) What implications could the increased use of the contingent project mechanism have for the role of ex ante revenue determinations in incentivising efficient investment?

5 Expression of transmission reliability standards and the standard setting process

This Chapter outlines issues relating to the consistent expression of transmission reliability standards and the process for setting standards under the national framework, including the use of the VCR.

5.1 Expression of transmission reliability standards

One of the key features of a national framework would be consistency in the expression of standards across the NEM. This would allow reliability standards to be compared and understood on a common basis.

Under the approach recommended in 2010 by the AEMC, reliability standards for each transmission connection point in the NEM would be set using an economic cost benefit assessment process and would be expressed and reported on a N-x basis under a national reference standard template. As discussed in Chapter 3, this is similar to the approach currently used in South Australia.

A summary of how the South Australian transmission reliability standards are expressed is set out in Table 5.1 (overleaf). As can be seen, each connection point in ElectraNet's network has been allocated to one of five different categories of reliability under the South Australian transmission reliability standards.[37]

The level of reliability for all connection points in the NEM would need to be expressed in a manner which is consistent with the national reference standard template. Therefore, the national reference standard template would need to be able to accommodate the range of reliability outcomes and customer types across the NEM.

The template might therefore be based around set categories of reliability, similar to the approach used in South Australia, or it might seek to allow greater flexibility, for instance by setting out parameters that could be used to more precisely define the level of reliability at each connection point. Such an approach might also allow for comparability between pre-determined reliability standards and planning outcomes where a fully economic approach is used.

We anticipate that the detail of the national reference standard template would be developed through a separate consultation process as part of the implementation of the national framework, if the national framework is endorsed by SCER. The national framework would also be likely to include obligations for the national reference standard template to be reviewed on a periodic basis.

37 As discussed in Chapter 3, ESCOSA has recently decided to reduce the number of reliability categories for the South Australian transmission reliability standards from six to five. This change will apply from 1 July 2013.

Table 5.1 Summary of transmission reliability standards in South Australia to apply from 1 July 2013

Category	Level of standard
Category 1	N line. In the event of an interruption, restore "N" equivalent line capacity as soon as practicable and within two days of the commencement of the interruption. N transformer, restore "N" equivalent transformer capacity as soon as practicable and within eight days of the commencement of the interruption.
Category 2	N line, restore "N" equivalent line capacity as soon as practicable and within two days of the commencement of the interruption. N-1 transformer, restore "N-1" equivalent transformer capacity as soon as practicable and restore "N" equivalent transformer capacity within eight days of the commencement of the interruption.
Category 3	N-1 line, restore "N-1" equivalent line capacity as soon as practicable and restore "N" equivalent line capacity within one hour of the commencement of the interruption. N-1 transformer, restore "N-1" equivalent transformer capacity as soon as practicable and restore "N" equivalent transformer capacity within one hour of the commencement of the interruption.
Category 4	N-1 line, restore "N-1" equivalent line capacity as soon as practicable and restore "N" equivalent line capacity for connection points connected to Category 5 connection points within four hours and all other connection points within 12 hours of the commencement of the interruption. N-1 transformer, restore "N-1" equivalent transformer capacity as soon as practicable and restore "N" equivalent transformer capacity for connection points connected to Category 5 connection points within four hours and all other connection points within 12 hours of the commencement of the interruption.
Category 5	N-1 line into Adelaide Central, restore "N-1" equivalent line capacity as soon as practicable and restore at least 65 per cent of "N" equivalent line capacity within four hours of the commencement of the interruption. N-1 transformer into Adelaide Central, restore "N-1" equivalent transformer capacity as soon as practicable and restore at least 65 per cent of "N" equivalent transformer capacity within four hours of the commencement of the interruption.

However, as the national framework would also need to provide guidance on the high level structure of the national reference standard template, we are seeking stakeholder views on what the appropriate parameters of the national reference template should be and the extent to which these need to be defined at this point. For instance, the national reference standard template could specify the level of reliability that will be provided in terms of a defined measure of peak demand (eg 10 per cent probability of exceedance) for each connection point.

Question 8 Expression of transmission reliability standards under the national framework

a) Should the national reference standard template specify categories of reliability that each connection point should be allocated to or could greater flexibility be provided for by setting out parameters to be used to define the level of reliability at each connection point?

b) What parameters should be used to define connection point reliability in the national reference standard template?

5.2 Economic cost benefit assessment process

Under SCER's terms of reference, the approach for setting transmission reliability requirements under the national framework must reflect economically efficient outcomes.

The national framework would therefore need to specify a process through which the costs associated with providing differing levels of reliability at each connection point could be compared to the benefit to customers of receiving that level of reliability. The reliability standards for each connection point would then be expressed in a manner which is consistent with the national reference standard template.

Unlike in South Australia, where the level of reliability provided at a connection point cannot be reduced, we consider that where there are shown to be clear net benefits from a reduction in reliability following the economic assessment process, a connection point should be allocated a lower level of reliability.

A summary of how economic cost benefit assessments could be undertaken in practice under the national framework is set out in Box 5.1 overleaf.

The AEMC's 2010 Updated Final envisaged that the process and assumptions that would be used for undertaking the cost benefit assessment process would be set out in guidelines, and that these guidelines would be developed as part of the implementation of the national framework. We are therefore interested in stakeholder views regarding both the process and assumptions that would need to be used.

In particular, we are interested in stakeholder views on whether the cost benefit assessment process should allow for the consideration of very low probability but high impact events, which may cause protracted load curtailment. This issue has been highlighted by the Productivity Commission as requiring further consideration.[38]

As discussed in section 5.3 below, we are also seeking stakeholder comments on whether a range of VCR values for each connection point should be tested during the standard setting process.

38 Productivity Commission, 2012, *Electricity Network Regulatory Frameworks*, Draft Report, 18 October 2012, p. 507.

Box 5.1: Economic cost benefit process under the national framework

Under the national framework, the efficient level of reliability that should be provided on each connection point would be determined by comparing the cost of investment against the value placed on reliability by customers.

Such a process would assess the likely capital costs of investment and the expected level of unserved energy for each connection point. The economic assessments which are undertaken, including the assumptions used, should be transparent and publicly available.

The process would involve:

- calculating the expected number of hours that each connection point will be without power for each year, if the current level of reliability for the connection point is maintained. This would be based on the historic failure rates for the TNSP's network;
- multiplying the number of expected outage hours by the expected demand at each connection point to determine the expected megawatt hours (MWh) that would not be supplied in each year;
- assessing the value of unserved energy, by multiplying the expected lost MWh by the VCR for the connection point;
- determining the efficient capital cost of maintaining the current level of reliability at each connection point;
- where the value of unserved energy is higher than the cost of maintaining current reliability levels, the cost of upgrading the reliability of the connection point and the reduction in the value of unserved energy would be assessed. Where the value of unserved energy is lower than the cost of maintaining current reliability levels, the cost savings of reducing the level of reliability and the increase in the value of unserved energy would be assessed; and
- following this assessment for each connection point, the level of reliability for the connection point would be defined in accordance with the national reference standard template.

Question 9 Economic cost benefit assessment process

a) What would need to be specified in guidelines governing the economic cost benefit process?

b) Should the economic cost benefit process allow for the consideration of very low probability but extremely high impact events?

c) If so, should a different VCR be used in assessing very low probability, extremely high impact events?

5.3 Use of the value of customer reliability

The VCR will be a key input for the national framework, as it would quantify the benefits of different levels of reliability for customers. To ensure the VCR reflects customers' requirements at each connection point as closely as possible, discrete VCRs for each jurisdiction or transmission network, as well as a range of customer types, would need to be developed. Specific VCRs for each customer type would allow the VCR used in the economic assessment process to be weighted to reflect the specific composition of customer types at each connection point.

VCRs would also need to be regularly updated by an independent body on a nationally consistent basis. The responsible body for undertaking this role would need to be further considered under both the transmission and distribution workstreams for this review.

The VCR is currently only regularly used and updated in Victoria. The AEMC developed a NSW VCR as part of the NSW workstream of the *Review of Distribution Reliability Outcomes and Standards*. The NSW VCR that was developed was $94,990/MWh. This is around 60 per cent higher than the indexed VCR of $57,880/MWh currently used in Victoria, which was developed in 2007.

As discussed in Chapter 1, AEMO is currently undertaking a review to develop national VCRs, following a request from SCER.[39] This review will include the development of a methodology for calculating VCRs across the NEM as well as region specific values. We note that the Productivity Commission has proposed a range of improvements to the VCR methodology currently used as part of its *Inquiry on Electricity Network Regulation*.

As AEMO is undertaking this work, we do not intend to develop our own VCRs as part of the transmission or distribution workstreams of this review. Instead, we intend to work closely with AEMO and jurisdictions as AEMO undertakes its review, which is

39 AEMO, 2013, *Value of Customer Reliability*, Issues Paper, 11 March 2013.

expected to be completed in late 2013.[40] We would also encourage stakeholders to participate in the consultation process as AEMO develops its advice.

Box 5.2: Challenges associated with determining VCRs

Although the VCR forms a key input in determining economically efficient reliability levels, here are no universally accepted methodologies to calculate the VCR, or similar measures such as willingness to pay. The VCR is based on the costs to customers of an interruption to supply. In contrast, willingness to pay is based on customers' willingness to pay to avoid supply interruptions or willingness to accept more supply interruptions in return for lower electricity costs. However, VCR and willingness to pay can be considered as inter-related measures as customers should be willing to pay at least the equivalent of the avoided cost of a supply interruption.

The VCR is calculated by surveying customers on the likely impact of interruptions to supply to them or their business. These results are then averaged across each customer type and then further averaged to develop a jurisdictional VCR. As a result, it is not possible to determine whether the value which is developed is truly reflective of the range of customers in a region. Within each connection point in a TNSP's network, there are likely to be a broad range of VCRs. Further, unless each customer which is surveyed is questioned in depth in relation to each of their responses, it is also not possible to accurately explain or determine the reasons for particular results. The VCR is also likely to vary with the time of day that an interruption occurs and the duration of the interruption.

The measurement of the VCR is therefore largely subjective and should be viewed as an aggregate approximation. While the VCR is taken into account in a number of different forums, including as part of the RIT-T, distribution and transmission investment planning in Victoria, and in considering the market price cap, its use needs to be assessed in light of this.

While not seeking to pre-empt the advice from AEMO's review, due to the potential range of VCR values and the difficulty of assessing this value, we are seeking stakeholder comments on whether it would be appropriate to test a range of values around each VCR for each connection point when determining reliability levels. For instance, this could include values which are materially higher and lower than the VCR for each connection point. Where it is shown that a particular level of reliability would have net benefits under the majority VCR scenarios, a change in the reliability level could be adopted. This could lead to a more rigorous process and robust outcomes.

40 This would be consistent with the timeframe for the implementation of the national framework if it is endorsed by SCER.

Question 10 Use of the value of customer reliability

a) Should a range of values around the VCR be used to assess reliability levels at connection points?

b) What range of VCR values should be used?

6 Governance under the national framework

This Chapter outlines issues relating to the governance and institutional arrangements under the national framework, including:

- the responsible body for setting standards and delegation of responsibility to a national body;
- the body for developing the guidelines for setting reliability standards;
- developing and approving the national reference standard template; and
- the implementation of the governance arrangements.

6.1 Responsible body for setting standards and delegation of responsibility to a national body

Jurisdictions currently maintain responsibility for transmission reliability standards. In December 2012, CoAG determined that jurisdictions should have the opportunity to transfer responsibility for applying the national framework to the AER.[41] This is consistent with the recommendations for a national framework for distribution reliability that were set out in the AEMC's 2012 draft report on the national workstream of the *Review of distribution reliability settings and outcomes*. Changes to the National Electricity Law to include this role as part of the AER's functions may be needed to facilitate this.

A single national standard setting body would be likely to increase the consistency with which the national framework was applied, and therefore the comparability of outcomes. It would also improve the potential for considering whether reliability standards in each jurisdiction could be more efficiently met through the use of inter-regional investments. This could in turn promote the development of an integrated transmission system.

The standard setting role would also complement the AER's current role in determining revenue allowances for TNSPs, as the investment required to meet standards forms a key part of the revenue determination process. This would assist the AER in determining the most efficient level of expenditure required across the TNSP's network over the regulatory control period, which would promote incentives for efficient investment.

Where a jurisdictional government delegates responsibility for setting standards to the AER, the AER could also be responsible for monitoring compliance with the standards. However, these two roles are separable.

As discussed in the national workstream of the *Review of distribution reliability settings and outcomes*, where the AER sets standards it would be difficult for it to do so other

41 CoAG, 2012, *CoAG Energy Market Reform- Implementation Plan*, 7 December 2012, p. 9.

than on an economic basis.[42] This could mean that the AER would be required to determine standards based on the highest net benefit and other factors, such as social or community expectations, would not be incorporated.

Irrespective of which body sets the standard, it is expected that the relevant TNSP would have a role in providing information to the standard setter on the load at each connection point and the options and costs of removing constraints during the economic cost benefit assessment process. However, this would not preclude the standard setter from seeking advice from other sources, such as from AEMO.

Question 11 Responsible body for setting standards and delegation of responsibility to a national body

What should be the AER's role under the national framework where a jurisdictional government has delegated responsibility for applying the framework?

6.2 Developing the guidelines for setting reliability standards

SCER has proposed that the AER should have responsibility for developing guidelines under the national framework.[43] Where responsibility for setting standards has been delegated by a jurisdiction to the AER, this would provide consistency in the role of the standard setter and guideline developer.

As the AER is also responsible for developing the RIT-T guidelines, this should ensure that a consistent approach to cost benefit assessments is undertaken under the standard setting process and the RIT-T. This would also minimise the regulatory burden on TNSPs and reduce the potential for significant differences in assessments when investments required to meet reliability standards are considered under the standard setting process and the RIT-T. Although we note that as the standard setting process would be undertaken for an entire TNSP's network, the cost benefit assessment process would be by necessity less detailed than the process used under the RIT-T to examine alternative options to address a specific constraint.

6.3 Developing and approving the national reference standard template

We are seeking comments on which bodies should be responsible for developing and approving the national reference standard template. Given its role as national transmission planner, it may be appropriate for AEMO to be involved in the development of the template.

42 AEMC, 2012, Review of distribution reliability outcomes and standards, Draft Report - National workstream, 28 November 2012, p. 31.

43 Ministerial Council on Energy, *Transmission Reliability Standards Review: Ministerial Council on Energy Response to Australian Energy Market Commission Final Report*, MCE, 16 November 2011, p. 9.

In light of the AER's responsibilities in setting standards under the national framework (if delegated by a jurisdiction) and developing guidelines for setting standards, it may be appropriate for the AER to also approve the national reference standard template. This could provide greater consistency between the national reference template and the standard setting process, which could promote a more integrated framework.

Question 12 Developing and approving the national reference standard template

Who should be responsible for developing and approving the national reference standard template?

6.4 Implementation of the governance arrangements

The implementation of the national framework will require changes to the rules to specify the detail of the framework and also potentially changes to the National Electricity Law. Where jurisdictions decide to adopt the national framework, jurisdictions will also need to make changes to their jurisdictional instruments.

In order to develop a national framework where jurisdictional bodies could act as the standard setter, more complex implementation arrangements would be required. In particular, the implementation of the national framework would need to consider whether a requirement for jurisdictional standard setters to comply with the processes in the national framework should be specified in the rules or in jurisdictional instruments.

In addition, if the recommended framework required an integrated approach to be taken to standard and revenue setting to allow a more flexible approach to reliability standards to be adopted, it may be more difficult to accommodate jurisdictional standard setters.

Where a jurisdiction decides to delegate responsibility for setting standards to the AER, we consider that jurisdictional governments would be required to formally allocate responsibility to the AER. To achieve this, it is likely that changes to jurisdictional instruments would be needed. We note that SCER will be amending the Australian Energy Market Agreement to allow jurisdictions to delegate this responsibility.[44]

We also note that where jurisdictions decide to adopt the national framework, the adoption of all aspects of the national framework, and with that the replacement of all relevant jurisdictional requirements, is likely to provide the greatest potential benefits for each jurisdiction due to the inter-related aspects of the framework. For instance, adopting the national reference standard template for the consistent expression of standards would have limited benefits if TNSPs are not required to report on these standards under the national framework. The adoption of the complete framework would also avoid duplication in reliability requirements across jurisdictional and

44 CoAG, *CoAG Energy Market Reforms - Implementation Plan,* 7 December 2012, p. 9.

national forums, which would reduce the regulatory burden for TNSPs and stakeholders.

7 Accountability and compliance obligations

This Chapter outlines issues relating to accountability and compliance under the national framework. It sets out issues for discussion relating to:

- the reporting requirements under the national framework, including the potential for reporting on the level of reliability provided in practice; and
- the compliance and accountability requirements which should apply under the national framework.

7.1 Reporting requirements

7.1.1 Reporting on standards

Following the setting of standards, we consider that the standard setter should be required to publish the standards that apply to each connection point. The publication of standards would assist stakeholders and investors to understand the level of reliability they can expect to receive in different parts of the NEM.

As discussed in Chapter 4, if the national framework allows TNSPs to adopt a more flexible approach to transmission reliability standards, the economic analysis and reasoning used to justify departures from the standards, in addition to the revised level of reliability that will be provided and expected timing for investment, could also be published by the standard setter.

7.1.2 Reporting on performance against standards

There remains a question as to whether any additional reporting requirements should be included in the national framework in relation to the level of reliability that TNSPs provide in practice.

Reporting on the actual level of reliability provided could serve as a useful accountability mechanism under the national framework. It could also assist stakeholders, as well as AEMO in its role as national transmission planner and the AER in setting revenue allowances, to identify potential under or over investment by TNSPs. However, we note it is difficult in practice to devise output based performance reporting requirements for TNSPs.

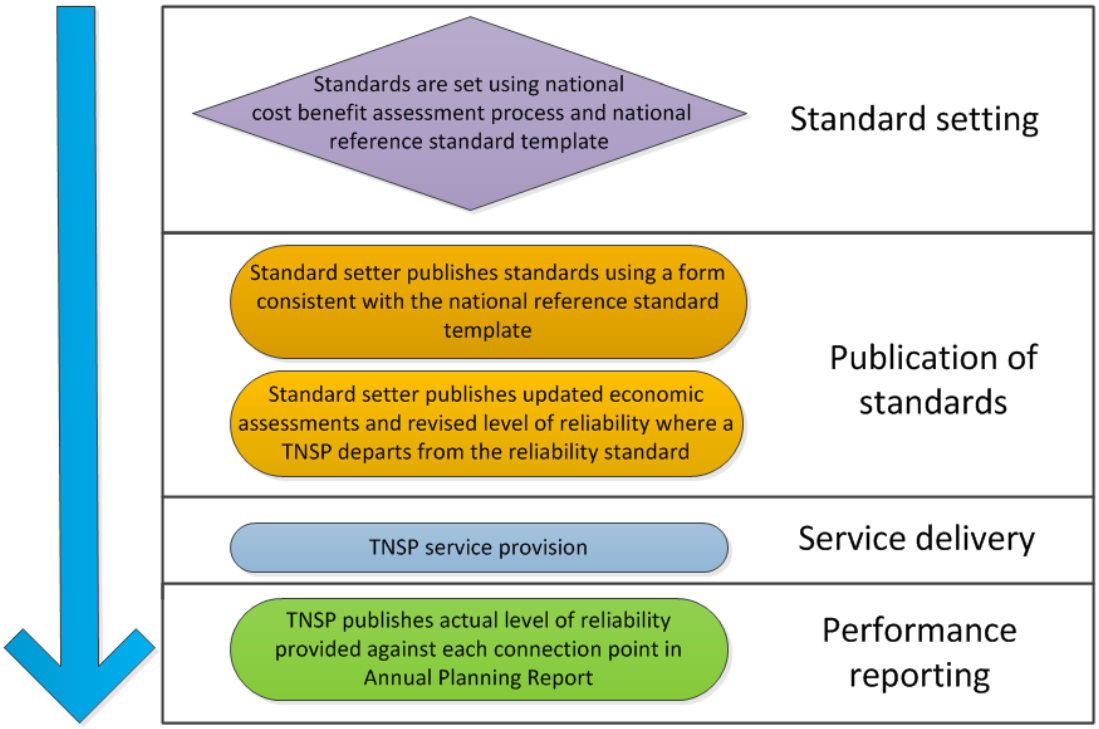
TNSPs could publish the level of reliability they provided compared to the level required for each connection point as part of their annual planning report. These planning reports must currently be published by 30 June each year.

Reporting would ideally need to be on a redundancy basis to allow it to be compared against the reliability standard, and where possible reporting should be done on a consistent basis to the national reference standard template. A summary of the potential reporting requirements under the national framework is set out in Figure 7.1.

Comments are sought from stakeholders on whether they consider that reporting on the level of reliability that is provided in practice each year, along side the required reliability standard for each connection point, should be published by TNSPs.

We are also interested in whether stakeholders consider any further reporting requirements would be useful, and if there are any outputs based performance measures that could be reported on by TNSPs. We note that in some jurisdictions TNSPs are currently required to report annually on their loss of supply events in terms of the number of system minutes where energy has not been supplied.

Figure 7.1 Potential reporting process under the national framework



Question 13 Reporting requirements

a) Should the national framework include reporting on the level of reliability that is provided in practice each year as well as reporting on the reliability standard for each connection point?

b) Should any other additional reporting requirements be included in the national framework?

7.2 Accountability and compliance obligations

Jurisdictions currently have a range of different accountability arrangements for TNSPs in relation to compliance with their transmission reliability standards. Generally, TNSPs are held accountable by jurisdictional governments and regulators.

Under the national framework, TNSPs would need to be accountable to the standard setter. However, there remain questions as to what accountability and compliance obligations TNSPs should face for not meeting their reliability standards, as these obligations were not considered in the AEMC's previous reviews.

As discussed in Chapter 4, if the national framework allows TNSPs to adopt a more flexible approach, reliability standards could serve more as a guide rather than hard standards that would need to be met. This raises questions as to what accountability and compliance obligations would be appropriate. For instance, it would not be appropriate to include punitive penalties such as the loss of licence or significant financial penalties for not meeting the reliability standards in any one year.

Increased flexibility in how standards are met is likely to reduce the ability for meaningful accountability measures to be developed. For instance, in Victoria where there are no reliability standards as the level of reliability is determined on a project by project basis, there is limited transparency in terms of the level of reliability that the TNSP is expected to provide.

Under a flexible approach, TNSPs' accountability may be limited to complying with the NER in terms of whether they have followed the required processes for the economic assessment process. This is similar to the arrangements currently in place in Victoria.

While TNSPs would face financial rewards and penalties under the STPIS in relation to service standards relating to the availability and capability of their network, this does not directly relate to the level of reliability that TNSPs provide. TNSPs would also face financial obligations under the proposed optional firm access model, which is being developed under the AEMC's *Transmission Frameworks Review*, where generators have purchased rights for financially firm access to the regional reference node.[45]

As discussed above, we are also consulting as to whether TNSPs should report on the level of reliability they have provided in practice each year as compared to the level of reliability required by their reliability standards for each connection point.

We note that the under the AEMC's proposed national framework for distribution reliability DNSPs would be required to undertake an audit each year to demonstrate they have processes in place to meet their reliability targets.[46] This would provide a degree of confidence that DNSPs are undertaking sufficient planning to meet these targets on average or in most circumstances.

45 AEMC, *Transmission Frameworks Review, Second Interim Report*, 15 August 2012, AEMC, p. 37.

46 AEMC, *Review of Distribution Reliability Standards and Outcomes: National workstream, Draft Report*, 28 November 2012, AEMC, pp. 43-44.

Question 14 Accountability and compliance obligations

a) Should any additional accountability and compliance obligations be included under the national framework?

b) Is a requirement for TNSPs to undertake an annual audit to demonstrate they have processes in place to meet their reliability standards appropriate?

8 Next steps and implementation

This Chapter outlines the next steps for the transmission workstream of this review and implementation considerations for the national framework.

8.1 Next steps

The indicative timetable for the remainder of the transmission workstream for this review is set out below. The process for submitting a written submission to this issues paper is set out in Chapter 1.

Table 8.1 Timetable for the transmission workstream of the review

Stage	Date
Close of submissions on the issues paper	Friday 3 May 2013
Publication of draft report	August 2013
Close of submissions on draft report	September 2013
Publication of final report	November 2013

The final report on the distribution workstream of this review is expected to be published in late September 2013. Further details on the timetable for the distribution workstream can be found on the AEMC website at www.aemc.gov.au.

8.2 Implementation considerations

In its December 2012 meeting communique, CoAG set out an implementation plan for its agreed energy market reforms, which included the implementation of national frameworks for distribution and transmission reliability. Under this implementation plan:

- SCER will consider the AEMC's final reports on both the distribution workstream and the transmission workstream of this review at its December 2013 meeting.
- If SCER reaches agreement on the proposed national frameworks for distribution and transmission reliability, SCER will then request the AEMC to develop a plan for the implementation of these national frameworks.
- At SCER's June 2014 meeting, SCER intends to then seek agreement to the proposed implementation plan for the national frameworks for distribution and transmission reliability

- SCER has then proposed that the frameworks would be in place and implemented by its December 2014 meeting, depending on the complexity of the implementation requirements.[47]

CoAG has also agreed to amend the Australian Energy Market Agreement to make explicit the opportunity for jurisdictions to transfer responsibility for applying the frameworks for transmission and distribution reliability to the AER.[48]

The implementation of the national framework would also require regulatory bodies to develop the national reference standard template and guidelines to support the setting of standards under the framework.

As part of this workstream, we will not be developing detailed implementation requirements for the national framework for transmission reliability. This work would be undertaken where SCER reaches agreement on the proposed framework in December 2013. If this occurs, we anticipate that a plan for the implementation of the national framework would include proposals for amendments to the rules, proposals for any relevant amendments to the National Electricity Law, as well as detailed guidance on changes to jurisdictional instruments for those jurisdictions which have agreed to adopt the national framework.

The AEMC intends to work closely with jurisdictional governments if requested to develop this plan. The development of this implementation plan would also provide an opportunity for stakeholders to comment on how the framework should be implemented.

We also note that the implementation of a national framework will depend in part of AEMO's work to develop a national approach to the VCR which is anticipated to be finalised in late 2013. In addition, where a common approach for certain aspects of the national frameworks for transmission reliability and distribution reliability are taken, it may be appropriate for a joint implementation plan to be developed for these frameworks.

47 CoAG, *CoAG Energy Market Reforms - Implementation Plan*, 7 December 2012, p. 9.

48 Ibid.

A Summary of current jurisdictional approaches to transmission reliability

Outlined below is a summary of the current approaches to transmission reliability across the NEM.

A.1 New South Wales

In NSW, the transmission network planning framework and the transmission reliability standard itself is stipulated in the "Transmission Network Design and Reliability Standard for NSW" and is set by the NSW Government.[49] TransGrid, the government owned TNSP for NSW and the Australian Capital Territory, has been directed by the NSW Government to implement this standard in planning its network.[50] In addition, under section 6B of the *Energy Services Corporations Act (NSW) 1995*, TransGrid must fulfil a range of general obligations, including operating "efficient, safe and reliable facilities for the transmission of electricity".

In NSW, a redundancy approach is taken to transmission reliability standards. The reliability standards are set at 'N-1' except for the Sydney central business district where a higher standard is required. Specifically, for the inner Sydney metropolitan area, a target reliability standard is jointly developed with Ausgrid, the relevant DNSP, so that the system is capable of meeting the peak load following an outage on either the distribution or transmission network.

The transmission reliability standards are closely linked to licence obligations imposed on the NSW DNSPs. That is, the transmission reliability standard is designed so that a TranGrid's network can be planned in a manner that enables the NSW DNSPs to meet their own licence requirements.

TransGrid is required to undertake planning over a one to five year timeframe and over a five to 20 year timeframe. The transmission reliability requirements in NSW do not include any jurisdictional reporting obligations on TransGrid beyond the publication of an annual planning report, which is also a requirement under the Rules.

A.2 Tasmania

In Tasmania, the transmission planning framework is expressed in legislation and regulations while adherence to this framework is ensured through licence conditions. In accordance with the *Electricity Supply Industry Act (Tasmania) 1995*, Transend - the government owned TNSP for Tasmania- must hold a licence in order to operate its transmission network. This licence is issued by the Office of the Tasmanian Economic Regulator (OTTER) and requires Transend to plan, propose and procure augmentations needed to meet jurisdictional transmission planning criteria.

49 Available at www.trade.nsw.gov.au and published in December 2010.

50 TransGrid, Annual Planning Report 2012, 29 June 2012, p. 16.

Transmission planning criteria are set out in the *Electricity Supply Industry (Network Performance Requirements) Regulations 2008*. These regulations set out minimum network performance requirements covering situations where there are load interruptions during normal operating conditions and for exposure when a network element has been withdrawn from service. Broadly, a N-1 standard applies in Tasmania. Section 5 of these regulations sets out the following minimum network performance requirements for Transend:

- In respect of an intact transmission system:
  - no more than 25 MW of load is to be capable of being interrupted by a credible contingency event;[51]
  - no more than 850 MW of load is to be capable of being interrupted by a single asset failure;[52]
  - load that is interrupted by a single asset failure is not to be capable of resulting in a black system;
  - the unserved energy to load that is interrupted consequent on damage to a network element resulting from a credible contingency event is not to be capable of exceeding 300 MWh at any time; and
  - the unserved energy to load that is interrupted by a single asset failure is not to be capable of exceeding 3000 MWh at any time.
- In respect of a transmission system that is not an intact transmission system, the active energy exposed to interruption by a credible contingency event is not to be capable of exceeding 18 000 MWh at any time.

To comply with its licence, Transend must inform the regulator of any material breaches of its legislative or regulatory obligations. Transmission network reliability is monitored and reported to the regulator in terms of "loss of supply" events during a financial year. Loss of supply is measured in "system minutes" which is calculated by dividing the total energy not supplied to customers during an event (MWh) by the Tasmanian maximum demand. There are targets set by the regulator regarding the maximum number of loss of supply events that the TNSP may attain over a financial year. Targets are set for the number of loss of supply events greater than 0.1 system minute and 1.0 system minutes.

51 The definition of a "credible contingency" is based on the Rules definition of an event which is considered by AEMO as reasonably possible in the surrounding circumstances, when taking into account the technical limits of the power system.

52 A "single asset failure" is defined as a single incident (other than a credible contingency) that results in the failure of one double transmission line circuit, one circuit breaker, or one substation busbar, to perform its intended function.

A.3 Queensland

In Queensland, the transmission planning framework is set by the Queensland government and compliance with the transmission reliability standard is captured through conditions set in transmission licences. Under section 34 of the *Electricity Act (Queensland) 1994*, a TNSP must operate, maintain and protect its transmission grid to ensure the adequate, economic, reliable and safe transmission of electricity.

According to the terms of its transmission licence, Powerlink - the government owned TNSP in Queensland - must plan its network so that it meets an 'N-1 criterion' to ensure that it is capable of supplying forecast demand even when its most critical element is out of service unless otherwise agreed by affected participants. These standards are relatively less detailed than other jurisdictions in the NEM which use a redundancy approach. It is also a condition of its transmission licence that Powerlink must submit an annual report on its operations to the Queensland Government. This reporting includes the number of loss of supply events on Powerlink's network for events greater than 0.2 system minutes and 1.0 system minutes.[53]

A.4 South Australia

In South Australia, the transmission planning framework is specified in the *Electricity Transmission Code*. A TNSP must comply with the code because it is a mandatory condition of its transmission licence issued by ESCOSA under the *Electricity Act (South Australia) 1996*. The *Electricity Transmission Code* obliges a TNSP to use its "best endeavours" to plan, develop and operate the transmission system to meet the standards set in the National Electricity Rules relating to quality and technical performance.

The transmission reliability standards are reviewed periodically by ESCOSA. The form of transmission reliability standard is a combination of N-x criteria and economic analysis. At the request of ESCOSA, AEMO reviews the reliability standard allocated to each connection point and undertakes economic analysis to assess the costs and benefits of the current reliability standard. AEMO's advice forms an input into ESCOSA's review of the *Electricity Transmission Code*, but is not binding on ESCOSA. Under the *Electricity Act (South Australia) 1996*, service standards must not be reduced below current levels, which has implications for how ESCOSA can undertake its review of the transmission reliability standards.

In South Australia, from 1 July 2013, each connection point will be classified under one of five categories of 'exit point reliability standards' and each category is defined on a N-x basis.

The *Electricity Transmission Code* sets out the obligations on a TNSP to assist in the development of, and compliance with, the specific exit point reliability standards

53 http://www.business.qld.gov.au/__data/assets/pdf_file/0018/9135/Transmission-Authority-2011-12-Annual-Report.pdf

applying to connection points. Under clause 2.16.1 of the *Electricity Transmission Code* ElectraNet is also required to report to ESCOSA by 31 August each year on actual performance with the standards, an explanation of the reasons for any non-compliance, and how it will continue to meet or improve its performance so as to meet the standards.

A.5 Victoria

The transmission planning framework in Victoria is set out in the National Electricity Law. As set out in sections 50C and 50F of the Law, AEMO has responsibility for planning and procuring augmentations in the Victorian transmission network.

While AEMO makes the investment decisions for the transmission network, SP AusNet - the privately owned TNSP in Victoria - is responsible for operating and maintaining the transmission network.

The approach to transmission planning in Victoria can generally be described as being economic in nature. However, at the initial stages when AEMO begins its planning it conducts screening studies, based on N-x indicators, to identify emerging network limitations. Once an emerging network constraint is identified, AEMO then conducts a cost-benefit assessment of a set of options to manage the constraint and the option delivering the greatest expected net benefit is the preferred option. The transmission reliability 'standard' in Victoria would more accurately be described as an outworking of this economic cost-benefit assessment.

As there are no reliability standards which are determined in advance of a constraint, the level of investment for augmentations that is required over a regulatory control period is uncertain.[54] As a result, the AER does not set ex ante revenue allowances for SP AusNet's augmentation capital expenditure. A lack of an ex ante revenue allowance for augmentations results in low incentives for efficient investment by SP AusNet. The risk of SP AusNet maximising its profits by reducing service quality is addressed by AEMO being responsible for planning and procuring transmission investments to augment the network.

The costs of augmentations in Victoria are passed directly through to customers, on the basis that the investment decision maker has no financial incentive to select an inefficient investment option to address a constraint. No further scrutiny of the cost of transmission augmentations is undertaken by the AER to determine the efficient level of expenditure. However, the AER is responsible for determining a revenue allowance for operational expenditure and replacements.

54 Information on the expected timing of augmentation investments is provided in the TNSPs' annual planning reports in all NEM jurisdictions, including Victoria.

Abbreviations

AEMC or Commission	Australian Energy Market Commission
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
CoAG	Council of Australian Governments
DNSPs	distribution network service providers
ESCOSA	Essential Services Commission of South Australia
NEM	National Electricity Market
NEO	National Electricity Objective
NSW	New South Wales
OTTER	Office of the Tasmanian Economic Regulator
RIT-T	Regulatory Investment Test for Transmission
rules	National Electricity Rules
SCER	Standing Council on Energy and Resources
STPIS	Service Target Performance Incentive Scheme
TNSPs	transmission network service providers
VCR	value of customer reliability