
REVIEW OF ELECTRICITY SYSTEM PLANNING, MONITORING AND REPORTING

DRAFT REPORT

August 2011



Level 9, 38 Cavenagh Street DARWIN NT 0800
Postal Address GPO Box 915 DARWIN NT 0801
Email: utilities.commission@nt.gov.au
Website: www.utilicom.nt.gov.au

Table of Contents

Overview.....	1
Planning, monitoring and reporting	1
Draft recommendations.....	2
<i>System planning</i>	2
<i>System monitoring</i>	3
<i>System reporting</i>	3
<i>Distribution network planning</i>	4
<i>Distribution network monitoring</i>	5
<i>Distribution network reporting</i>	5
Implementation considerations	6
<i>Options for implementing draft recommendations</i>	6
<i>Assessment of costs and benefits of proposals</i>	6
Background.....	7
Planning, monitoring and reporting	8
Purpose of this review.....	9
<i>Terms of reference and scope of review</i>	9
Issues Paper and submissions	10
<i>Summary of submissions</i>	10
Purpose of this Draft Report	11
<i>Timetable for review</i>	11
<i>Review of Electricity System Planning and Market Operation Roles and Structures</i>	12
Power system – planning, monitoring and reporting	13
Power system planning.....	13
<i>System planning practices</i>	13
<i>Effectiveness of Territory system planning</i>	14
<i>Views in submissions</i>	15
<i>Further thinking – system planning</i>	16
<i>Draft recommendations – system planning</i>	20
Power system monitoring.....	22
<i>System monitoring practices</i>	23
<i>Effectiveness of Territory system monitoring</i>	24
<i>Views in submissions</i>	24
<i>Further thinking – system monitoring</i>	25

<i>Draft recommendations – system monitoring</i>	27
Power system reporting	28
<i>Power system reporting practice</i>	28
<i>Effectiveness of existing system reporting framework</i>	29
<i>Views in submissions</i>	31
<i>Further thinking – system reporting</i>	32
<i>Draft recommendations – system reporting</i>	35
Distribution network – planning, monitoring and reporting	37
Distribution network planning	37
<i>Distribution network planning practices</i>	37
<i>Effectiveness of Territory distribution planning</i>	38
<i>Views in submissions</i>	39
<i>Further thinking – distribution planning</i>	40
<i>Draft recommendations – distribution planning</i>	42
Distribution network monitoring	43
<i>Distribution network monitoring practices</i>	43
<i>Effectiveness of Territory distribution network monitoring</i>	44
<i>Views in submissions</i>	44
<i>Further thinking – distribution network monitoring</i>	45
<i>Draft recommendations – distribution network monitoring</i>	46
Distribution network reporting	47
<i>Distribution network reporting practices</i>	47
<i>Effectiveness of Territory distribution network reporting</i>	48
<i>Views in submissions</i>	48
<i>Further thinking – distribution network reporting</i>	49
<i>Draft recommendations – distribution network reporting</i>	51
Implementation	53
Requirements of the terms of reference	53
<i>Options for implementing draft recommendations</i>	53
<i>Assessment of costs and benefits of proposed arrangements</i>	53

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To facilitate publication on the Commission's website, submissions should be provided electronically by CD, DVD or email in Adobe Acrobat or Microsoft Word format. However, if this is not possible, submissions can be made in writing.

Inquiries

Any questions should be directed to the Executive Officer, Utilities Commission at any of the following:

Utilities Commission
GPO Box 915
DARWIN NT 0801

Telephone: 08 8999 5480

Fax: 08 8999 6262

Email: utilities.commission@nt.gov.au

CHAPTER 1

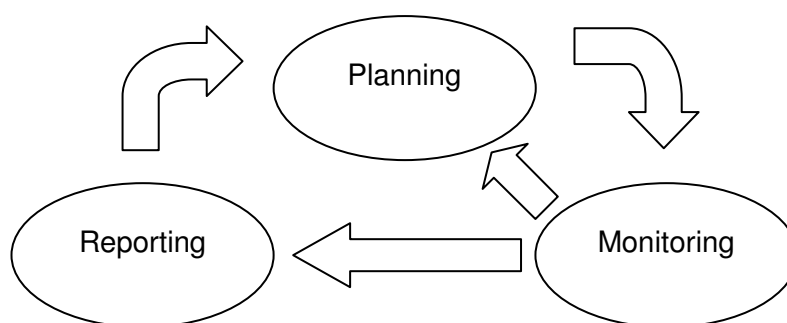
Overview

- 1.1 The Commission has terms of reference from the Treasurer to review and report on the adequacy of current performance monitoring and reporting arrangements under the *Electricity Reform Act*. The objective of this review is to recommend a course of action that ensures that planning, monitoring and reporting promote acceptable performance outcomes.
- 1.2 The Commission initiated this review in December 2010 with the release of an Issues Paper. Submissions were made by the Power and Water Corporation and Northern Territory Major Energy Users Group. These submissions informed the development of the draft recommendations in this report.
- 1.3 The Commission is seeking submissions from interested parties on the draft recommendations in this report, and any other matters they consider relevant to the terms of reference for this Review. Submissions are requested by Friday 2 September 2011.

Planning, monitoring and reporting

- 1.4 Planning, monitoring and reporting are an inter-related set of activities for managing the current and future performance of electricity supply infrastructure to achieve price, quality, safety, reliability and security of supply outcomes that are in the long term interests of customers.
- 1.5 Planning identifies the electricity supply infrastructure investments needed to achieve the price and reliability of supply levels established through the regulatory bargain. Monitoring activities will confirm the reliability performance achieved against the accepted targets. Reporting provides authoritative data on the reliability performance of the electricity supply chain and component assets which may be used to hold the supplier accountable against the regulatory bargain, to inform future planning decisions, and potentially to revise reliability targets to suit a nominated price and revenue level.
- 1.6 A coordinated framework of planning, monitoring and reporting will support an electricity supply that meets the service level and price level expectations of the regulatory bargain by establishing a virtuous circle of decision making, constant evaluation, information dissemination and accountability. Figure 1.1 shows the relationship between planning, monitoring and reporting.

Figure 1.1: Relationship between planning, monitoring and reporting



- 1.7 Effective planning, monitoring and reporting arrangements will support the regulatory bargain, and the optimisation of the price, reliability and risk relationship between the supplier and customers so that acceptable reliability performance is maintained according to customer needs, and that customers pay a fair price for that level of service.
- 1.8 A clearly documented and rigorously followed planning, monitoring and reporting framework is important to provide appropriate levels of accountability and visibility of reliability and price outcomes. If the planning decisions are consistent with achieving the reliability targets, then those planning decisions should be confirmed by independent oversight (e.g. the economic regulator) and will support revenue claims.

Draft recommendations

System planning

Draft recommendation 1(a)

- 1.9 The Commission recommends the development and implementation of planning instruments that replicate the purpose and characteristics of the national electricity market (NEM) planning instruments, including the following key components:
- credible and dependable forecasts of future electricity demand and supply to identify possible future generation and transmission capacity constraints;
 - assessments of system adequacy, taking account of maintenance and outage plans;
 - based on clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
 - authoritative data on the current and future condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.
- 1.10 This planning information should be updated regularly to provide a program of information collection, analysis and disclosure of power system security and reliability of supply prospects. The NEM approach provides an appropriate model, with an annual and comprehensive update of longer term demand forecasts and supply prospects, and supported by a more regular update of the shorter term supply-demand balance.

Draft recommendation 1(b)

- 1.11 The Commission recommends the development and application of clearly defined power system (generation and transmission) reliability standards and performance targets to support system planning.
- 1.12 The Commission's Review of Electricity Standards of Service proposed that reliability performance outcomes be established for generation, transmission and distribution networks, including establishing a Territory Reliability Standard (based on a certain level of unserved energy) and network feeder reliability targets.

Draft recommendation 1(c)

- 1.13 The Commission recommends the development of a regulatory mechanism for procuring generation of last resort services, and determining who might be responsible for being generator of last resort.

System monitoring*Draft recommendation 2(a)*

- 1.14 The Commission recommends that all electricity entities be required to develop and maintain a robust compliance process for the power system (generation and transmission). The monitoring of compliance against standards is an important feature of system monitoring. PWC is working to establish processes consistent with good compliance practice based on AS3806. These efforts are supported. The Commission will continue to make compliance a priority.

Draft recommendation 2(b)

- 1.15 The Commission recommends the implementation of a mechanism requiring the investigation of relevant power system incidents. The Commission has been working with the System Controller and PWC to develop an incident investigation and reporting framework to be established in the System Control Technical Code.

Draft recommendation 2(c)

- 1.16 The Commission recommends the development of a clear process for oversight and regular review of the technical obligations and parameters for the power system established through the regulatory framework (i.e. the System Control Technical Code).

System reporting*Draft recommendation 3(a)*

- 1.17 The Commission recommends the development and implementation of a framework for the reporting of comprehensive and authoritative power system information. This information would support system reliability performance that is consistent with the reliability and price expectations of the regulatory bargain. Information that should be reported includes:
- system planning information, including demand forecasts, the adequacy of system capacity relative to forecast demand, adequacy of fuel supplies and other major security risks, and knowledge of planning and investment commitments;
 - health of the system information, including on system performance trends, regulatory and technical compliance and the findings of investigations into power system incidents; and
 - the reliability outcomes experienced by customers.

1.18 The Commission recommends that the system reporting framework involve a similar suite of instruments or reports as is available in the NEM. The scope and content of these instruments is defined in the National Electricity Rules. The annual power system review could serve as the forum for releasing relevant power system information, compiling the categories of information contained in the NEM reports. The key requirement is that the content of the reports is consistent with good industry practice, and that the data are available at a convenient time in the planning cycle.

Draft recommendation 3(b)

1.19 The Commission recommends that the system reporting framework ensure appropriate independence in the preparation of reporting instruments. To ensure that system reporting is both comprehensive and accurate parties should be held accountable for the information reported, for example by requiring the responsible entity to certify that the material presented is accurate (on a best endeavours basis). The purpose is to highlight the importance attached to the dissemination of accurate system planning and performance data.

1.20 The system data reported should be subject to oversight by an appropriate body to confirm that assumptions and forecasts are reasonable.

Distribution network planning

Draft recommendation 4(a)

1.21 The Commission recommends the development and implementation of distribution network planning instruments that replicate the purpose and characteristics of the annual planning instruments required of DNSPs in the NEM. The key components of these instruments would be:

- credible and dependable forecasts of future electricity demand and supply to identify possible future sub-transmission and distribution network capacity constraints;
- based on clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
- authoritative data on the current and future capability and condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.

1.22 This distribution planning information should be updated regularly to provide a program of information collection, analysis and disclosure of power system security and reliability of supply prospects.

Draft recommendation 4(b)

1.23 The Commission recommends the development and application of clearly defined distribution network reliability standards and performance targets to support network planning.

1.24 The Commission's Review of Electricity Standards of Service proposed that reliability performance outcomes be established for generation, transmission and distribution networks, including establishing a Territory Reliability Standard (based on a certain level of unserved energy) and network feeder reliability targets.

- 1.25 Reliability and security of supply standards and planning criteria should be regularly reviewed to ensure that planning criteria reflect the desired reliability and price outcomes.
- 1.26 The Commission recommends the introduction and use of Regulatory Investment Tests for Distribution and Transmission to ensure that network developments are subject to a cost-effectiveness evaluation.

Distribution network monitoring

Draft recommendation 5(a)

- 1.27 The Commission recommends that the DNSP continue efforts to develop and maintain a robust compliance process.

Draft recommendation 5(b)

- 1.28 The Commission recommends the implementation of a mechanism for the investigation of relevant distribution network incidents.

Draft recommendation 5(c)

- 1.29 The Commission recommends a review of the processes and triggers for oversight and review of the technical obligations and parameters for the distribution network established through the regulatory framework (i.e. the Network Connection Technical Code).
- 1.30 Monitoring the operating practices and processes of the DNSP is essentially focused on compliance against standards and the review of events affecting the reliability or security of the distribution network. Regular review and reporting on compliance with technical obligations and parameters is necessary, and appropriate priority should be given to monitoring compliance with technical obligations and parameters for the power system established through the regulatory framework.

Distribution network reporting

Draft recommendation 6(a)

- 1.31 The Commission recommends the development and implementation of a framework for the reporting of comprehensive and authoritative distribution network information. This information is needed to support network performance that is consistent with the reliability and price expectations of the regulatory bargain. Information to be reported should include:
- a network planning and performance report, with the contents reflecting the purpose and characteristics of national arrangements; and
 - reliability outcomes experienced by customers.

- 1.32 There has been considerable work on reporting arrangements for the NEM. The Commission considers that the national network reporting requirements (the national annual planning reports and AER network performance reports) provide a sound basis for arrangements in the Territory.

Draft recommendation 6(b)

- 1.33 The Commission recommends that the reporting framework ensure appropriate independence and accountability in the preparation of reporting instruments, for example by requiring the responsible entity to certify that the material presented is

accurate (on a best endeavours basis). The purpose is to highlight the importance attached to the dissemination of accurate network planning and performance data.

Implementation considerations

1.34 The terms of reference require the Commission to recommend a course of action and provide detailed plans for implementation of that recommendation.

Options for implementing draft recommendations

1.35 The options for implementing the draft recommendations include:

- to establish a planning, monitoring and reporting framework using existing heads of power, such as those contained in the *Electricity Reform Act, s45*, and potentially the heads of power existing to apply a standards of service framework;
- to introduce the proposed arrangements through an Electricity Industry Code requiring the development of a planning, monitoring and reporting framework consistent with the Commission's proposals.

1.36 Arrangements of this nature are probably more appropriately established through explicit and specific instruments. This approach would reflect the policy intent of the regulatory framework, and would create more certainty about the form and nature of the arrangements.

Assessment of costs and benefits of proposals

1.37 This assessment of the costs and benefits of the proposed arrangements is necessarily qualitative as the data to quantify the costs and benefits are not currently available.

1.38 The Commission recognises that the draft recommendations will increase the level and cost of planning, monitoring and reporting by the Territory electricity industry. However, the proposed arrangements are not for the sake of information gathering but, in line with good industry practice, as a necessary means to ensure a well run electricity sector that delivers an appropriate level of service at an appropriate price to customers. The obligations are no more than should already be in place in a well-governed industry providing essential services.

1.39 The proposals have been developed based on good industry practice for Australia, and would support better reliability outcomes over time by providing a coordinated and consistent framework for decision making, constant evaluation, information dissemination and accountability.

CHAPTER 2

Background

- 2.1 The electricity supply industry in the Northern Territory is regulated through the *Electricity Reform Act*, *Electricity Networks (Third Party Access) Act*, *Utilities Commission Act* and associated legislation. This regulatory framework was introduced on 1 April 2000.
- 2.2 The regulatory framework is primarily focused on regulating the activities of electricity industry participants and customers in the Darwin-Katherine, Alice Springs and Tennant Creek power systems – referred to as the market systems. Key elements of the framework are:
- third party access to the Darwin-Katherine, Alice Springs and Tennant Creek electricity networks;
 - all customers became contestable from 1 April 2010; and
 - an independent economic regulator, the Utilities Commission, to regulate monopoly electricity services, licence market participants and enforce regulatory standards for market conduct and service performance.
- 2.3 The Power and Water Corporation (PWC) is the main electricity business in the market systems, generating the majority of electricity used, operating the electricity networks and supplying retail services. PWC is also a major electricity supplier in regional and remote parts of the Territory, and is the water and sewerage service provider throughout the Territory.
- 2.4 PWC is a vertically integrated Territory Government owned corporation with generation, network and retail business units operating as separate businesses.¹ The commercial relationship and transactions between each unit is subject to oversight and regulation by the Commission.² PWC is also subject to oversight by a shareholding Minister (currently the Treasurer) and a portfolio Minister (currently the Minister for Essential Services).
- 2.5 In the three market systems, PWC has been the only electricity retailer in recent years, supplying electricity to about 72 000 customers at 30 June 2010.³ The Commission granted a standard electricity retail licence to QEnergy Ltd in February 2011. The Commission understands that QEnergy intends retailing to larger electricity users.
- 2.6 PWC is also the main electricity generator, with about 89 per cent of generation capacity in the market systems. There are four other generators producing electricity in

¹ This paper refers to the separate business units as PWC Retail, PWC Networks and PWC Generation.

² Regulatory instruments include the licensing framework and the Northern Territory Electricity Ring-Fencing Code.

³ Utilities Commission, March 2011, 2009-10 Power System Review, table 3.2.

the Darwin-Katherine and Alice Springs systems. However, these businesses generate electricity under contract for PWC rather than selling directly to an electricity retailer or to customers, and PWC provides the fuel used for electricity generation.⁴

- 2.7 PWC Networks owns and operates the Darwin-Katherine, Alice Springs and Tennant Creek electricity networks, which comprise 666 kilometres (km) of transmission lines and 5156 km of distribution lines.⁵
- 2.8 The System Control function is undertaken by PWC. The System Controller has statutory responsibilities for monitoring and controlling the operation of the power system to ensure the system and distribution network operates reliably, safely and securely in accordance with the System Control Technical Code.
- 2.9 Electricity supply in regional and remote centres of the Territory is managed through a contract for service model, with supply arrangements agreed between the service purchaser (most often the Territory Government) and a service provider (in most cases, PWC or a PWC subsidiary). These systems include the 72 communities and 82 outstations where essential services are provided through the Territory Government Indigenous Essential Services program; three mining townships, where electricity is supplied by the associated mining company; and eight remote townships.⁶

Planning, monitoring and reporting

- 2.10 Planning, monitoring and reporting are an inter-related set of activities for managing the current and future performance of electricity supply infrastructure to achieve the price, quality, safety, reliability and security of supply outcomes that are in the long term interests of customers.⁷
- 2.11 Planning should identify the investments needed to deliver a certain level of service for a certain cost and price – this is known as the service/price contract or regulatory bargain. Monitoring activities are to confirm the performance achieved against targets established through the regulatory bargain. Reporting provides feedback to electricity businesses, regulators, governments and the community on performance and planning decisions, and informs future planning decisions.
- 2.12 The concept of the regulatory bargain is often applied to electricity networks, but is equally applicable where a firm or industry sector has monopoly power and measures are in place to ensure that incentives that drive capital efficiency do not lead to a reduction in service performance. Effectively, the regulatory bargain involves an optimisation of the price, service and risk relationship between the supplier and

⁴ Utilities Commission, 2009-10 Power System Review, March 2011, pages 14-15. These generators are located at Pine Creek (between Darwin and Katherine), Shoal Bay (at the Darwin City Council dump) and Brewer Estate (in Alice Springs).

⁵ Utilities Commission, March 2011, 2009-10 Power System Review, table 5.1.

⁶ The three mining townships are Nhulunbuy, Alyangula and Jabiru. The eight remote townships are Timber Creek, Borroloola, Daly Waters, Elliot, Newcastle Waters, Kings Canyon, Yulara and Ti-Tree.

⁷ This purpose is consistent with the objects of the Electricity Reform Act [s3] and the National Electricity Objective [s7].

customers so that acceptable service performance are maintained according to customer needs, and that customers pay a fair price for that level of service.⁸

- 2.13 In a non-competition environment, the regulatory bargain and accountability are critical to service/price outcomes. A coordinated planning, monitoring and reporting framework will assist in making electricity businesses accountable for performance and price outcomes by establishing a clear relationship between planning decisions and performance outcomes. Further, the feedback loop provides the authoritative data needed to revise performance targets to suit a particular price and revenue level. If the planning outcome appears consistent with achieving the service targets, then the planning decisions should be supported by independent oversight (i.e. the regulator) and will support revenue claims.
- 2.14 Although planning, monitoring and reporting activities have the common purpose of achieving a safe, reliable, secure and cost effective electricity supply in each part of the electricity supply chain, there is a separate focus and approach taken for:
- the power system – generation and transmission networks, which perform the functions of production and transport of bulk electricity from the generator to the distribution network; and
 - the distribution network, which performs the function of transporting the bulk electricity to individual customers.
- 2.15 This distinction has evolved due to the differing operating characteristics and priorities of the power system and distribution network. For example, maintaining reliability is more critical for the power system than for the distribution network because poor system reliability has the potential to affect significantly more customers, at a significantly greater cost. This review distinguishes between the power system and distribution network.

Purpose of this review

- 2.16 The Commission has terms of reference from the Treasurer to review and report on the adequacy of current performance monitoring and reporting arrangements under the *Electricity Reform Act*, and appropriate network and generation reliability standards for performance monitoring.
- 2.17 The objective of this review is to recommend a course of action that ensures that planning, monitoring and reporting promote acceptable performance outcomes.

Terms of reference and scope of review

- 2.18 The Commission is to assess the effectiveness of existing planning, monitoring and reporting arrangements for the Territory electricity systems, and identify options for ensuring that planning, monitoring and reporting facilitate system performance that is consistent with applicable service standards.

⁸ Energy Networks Association, ENA Service Standard and Regulatory Policy and National Reliability Reporting Framework, March 2007; and Essential Services Commission of South Australia, South Australian Distribution Service Standards 2010-12 Final Decision, November 2008, pages 7-8.

2.19 The Commission is to consider:

- the relationship between performance, planning decisions, capital and maintenance programs and applicable standards of service;
- the ability of electricity service providers to make informed investment and operating decisions;
- the ability of parties responsible for oversight of performance to identify potential poor performance and to ensure compliance with good industry practice;
- policy and practice in other jurisdictions, in particular the merits of producing a Territory equivalent to the Australian Energy Regulator (AER) State of the Market report and the Australian Energy Market Operator (AEMO) Statement of Opportunities report;
- the level of regulatory oversight of system planning and monitoring arrangements that are appropriate for the Territory;
- the adequacy of incentives for efficient and timely investment in network and generation assets;
- any practical constraints on the design and implementation of planning, monitoring and reporting arrangements and enforcement of good industry practice in operation and maintenance in the Territory; and
- all relevant economic and policy developments, including current and forecast economic conditions, the proposed national emissions trading scheme and the expanded renewable energy target.

2.20 The Commission is to recommend an efficient and effective course of action and provide detailed plans for the implementation of that recommendation.

Issues Paper and submissions

2.21 The Commission initiated this review in December 2010 by releasing an Issues Paper seeking comment from interested parties on the options and considerations for power system and distribution network planning, monitoring and reporting arrangements.

2.22 The Issues Paper surveyed planning, monitoring and reporting arrangements in the NEM and Territory, and provided the Commission's preliminary thinking on a possible future approach for the Territory.

Summary of submissions

2.23 The Commission received submissions to the Issues Paper from PWC and Northern Territory Major Energy Users (NTMEU) Group.

Northern Territory Major Energy Users

2.24 The NTMEU provided a comprehensive submission to the Issues Paper, addressing the matters raised in the Issues Paper and outlining matters of concern to NTMEU members. In brief the NTMEU submission:

- supports the focus on planning, monitoring and reporting and considers that the Issues Paper identified many of the key elements of a successful planning, monitoring and reporting program. The NTMEU residual concern is whether all of the critical aspects identified are sufficiently comprehensive.
- notes that the Issues Paper uses the NEM model as a template for good practice, but cautions that the NEM is a work in progress and may not yet represent world best practice.

- questions whether the industry structure in the Territory adequately reinforces incentives for reliable and cost effective service delivery. The NTMEU concern is that PWC does not have adequate incentive to embed the controls and processes that have now become the norm in the NEM, such as condition monitoring and preventative maintenance practices.
- considers that an essential aspect of the PWC processes must be towards looking at reliability of supply from the perspective of consumers, rather than seen as purely supply side issues. Such a change is an integral part of the processes that are being explored through this Review.

Power and Water Corporation

2.25 The PWC submission provided overarching comments on the themes of planning, monitoring and reporting raised in the Issues Paper. In brief the PWC submission:

- considers that structural and organisational issues would have informed and provided guidance to some of the organisational impacts implicit in the Review.
- anticipates that any recommendations or revised approaches will be focused on benefits to electricity consumers rather than having data sets, reports and regulatory obligations some with overlapping information and requirements. An appropriate balance also needs to be achieved between the required investments and funding levels.

Purpose of this Draft Report

2.26 This Draft Report sets out the Commission's draft proposals for system and distribution planning, monitoring and reporting arrangements in the Territory, and discusses implementation considerations.

2.27 This Draft Report covers:

- Chapter Three deals with planning, monitoring and reporting for the power system;
- Chapter Four deals with planning, monitoring and reporting for the distribution network; and
- Chapter Five deals with implementation considerations.

2.28 The Commission is seeking comment from interested parties on these draft proposals by Friday 2 September 2011.

Timetable for review

2.29 The Commission's timetable for the review is set out in table 2.1 below. The Commission will submit a final Report to the Treasurer by October 2011.

Table 2.1: Timetable for Review of System Planning, Monitoring and Reporting

Date	Action
3 December 2010	Release of Issues Paper
14 January 2011	Submissions on Issues Paper
5 August 2011	Release of Draft Report
2 September 2011	Submissions on Draft Report
October 2011	Final Report submitted to the Treasurer

Review of Electricity System Planning and Market Operation Roles and Structures

2.30 The Commission has separate terms of reference from the Treasurer to review and report on the efficiency of system planning and market operation arrangements to identify a course of action that ensures the allocation of functions to do with system planning and market operation promote efficient and reliable electricity system performance.

2.31 A Draft Report for the Review of Electricity System Planning and Market Operation Roles and Structures has been released together with this paper. This will allow an effective and informed discussion of the allocation of the functions and responsibilities associated with system planning and market operation.

CHAPTER 3

Power system – planning, monitoring and reporting

- 3.1 The power system comprises the generation facilities and transmission network infrastructure for producing electricity and delivering that electricity to the distribution network.

Power system planning

- 3.2 Power system planning involves identifying a credible future view of system demand and supply to guide decisions about managing and developing system infrastructure so as to deliver a safe supply of bulk electricity that meets reliability, security and quality standards at the lowest long term cost.
- 3.3 Planning activities should support the identification and coordination of the most economic future investments for augmentation and expansion generation and transmission capacity to meet expected customer demand and maintain reliability on a cost effective basis.

System planning practices

- 3.4 System planning involves looking forward to the medium (the next two or three years) and long term (up to 20 years) to compare the capacity of the power system with the forecast future demand, and to assist identification of generation and transmission network infrastructure investment opportunities.
- 3.5 System demand is determined by household, business and industrial electricity consumption patterns, which are influenced by weather, population growth and household formation, economic growth, the development of energy intensive industrial projects and demand management initiatives.
- 3.6 The purpose of a system demand forecast is to identify expectations of maximum or 'peak' demand. Forecasts of peak demand are used to inform decisions about system capacity (sometimes known as the supply-demand balance) and the management of the power system to ensure a reliable and secure electricity supply.
- 3.7 AEMO is responsible for coordinating system planning in the NEM, using a suite of instruments to help guide targeted investment and the future development of Australia's electricity infrastructure and resources. In particular, AEMO prepares independent modelling and advice on strategic planning and credible future electricity demand and supply scenarios for the NEM, including developing peak demand forecasts.
- 3.8 These forecasts inform decisions about the generation capacity operating and in reserve that must be available in the next half hour and over the day (i.e. operational decisions) and may be needed to meet future electricity demand (i.e. decisions about maintenance scheduling and potential new investment opportunities).

3.9 The key characteristics of system planning instruments and the approach to system planning for the NEM are:

- providing data to support the identification of the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards on a cost effective basis;
- a focus on identifying the possible future generation and transmission capacity constraints given defined security and reliability standards, rather than directing an investment in a specific project;
- a top down and coordinated approach across the power system and industry participants to developing credible and dependable forecasts of future supply and demand conditions. The involvement of an impartial and expert body in developing forecasts is the accepted way of giving forecasts the required authority. System demand forecasts are critical to planning;
- integration with the management of existing infrastructure assets. There needs to be across-the-board confidence that existing assets will deliver the advertised reliability outcomes; and
- coordination of planning activities across the supply chain – no one business can have a complete knowledge of possible future investment actions (those influencing supply) or of customer demand and, in particular, the location, time profile and growth rate of future demand.

Effectiveness of Territory system planning

3.10 The annual power system review is the nearest Territory equivalent to the planning instruments used in the NEM, providing information on the adequacy and performance which might be used to guide investment and operation decisions in the Territory's power systems.⁹ Key components of the power system review are demand forecasts and estimates of future available generation capacity.

Demand forecasts

3.11 The purpose of the demand forecasts published by the Commission for the power system review is to advise the electricity industry and community of future electricity demand and capacity scenarios. The Commission relies on forecasts and data held by electricity supply industry participants (that is, PWC).

3.12 For the 2009-10 Review, the Commission obtained expert advice to determine if PWC's system demand forecasts for the Darwin-Katherine, Alice Springs and Tennant Creek systems were suitable for planning purposes, finding that:¹⁰

... the PWC system demand forecasts for the purposes of testing system adequacy for the period 2010-11 to 2019-20 are probably too low. However, a conclusive opinion of system demand growth over the period requires a comprehensive analysis using the elements common to the preparation of robust demand forecasts.

3.13 The Commission identified a number of areas for continuous improvement to the PWC forecasts, but noted that PWC is taking steps to address deficiencies in the forecasting

⁹ The annual power system review is prepared under *Electricity Reform Act*, s45.

¹⁰ Utilities Commission, 2009-10 Power System Review, page 21.

process. The Commission expects that PWC will in the future develop a consolidated system demand forecast that is sufficiently robust for system planning purposes, including accurately assessing the supply-demand balance.

Reliability and security standards

- 3.14 For system planning to provide an adequate foundation for the routine delivery of reliable and cost effective electricity services, there needs to be a clearly defined target reliability standard that relates to the reliability experienced by customers.
- 3.15 The Territory's regulatory framework does not clearly specify a mechanism for identifying and applying a reliability standard for the power system. This effectively gives significant discretion to system planners about the target level of reliability and associated infrastructure investment, which makes it difficult to hold industry participants accountable for the cost and reliability of supply.
- 3.16 The need to address the lack of a reliability standard set as part of the regulatory bargain was recognised in the Commission's Review of Electricity Standards of Service, which proposed that a target for generation reliability should be established to identify a maximum level of unserved energy (USE)¹¹ for the power systems, representing the statistical risk of the electricity supply not meeting customer demand over time.¹²

Views in submissions

- 3.17 The Issues Paper sought comment about whether:
- the reliability and security standards established by the Territory's regulatory framework can be made more explicit so as to effectively support appropriate investment and performance outcomes;
 - the reliance on PWC Generation, as the only market participant, to invest in new generation capacity warrants development of a last resort provider mechanism to provide certainty that investment in generation capacity will be adequate to maintain reliability of supply; and
 - further or alternative arrangements are required to assist in achieving efficient and effective distribution network investment outcomes that ensure capacity will be adequate to maintain reliability of supply, on a cost effective basis.

Northern Territory Major Energy Users

- 3.18 The NTMEU responded to the questions posed in the Issues Paper with the following comments relevant to system planning:¹³
- specific standards of performance for generation and transmission networks are necessary and should be set relative to outcomes (i.e. unserved energy). This would allow the service provider to make informed choices about balancing cost to reliability;

¹¹ Unserved energy (USE) is the amount of energy that cannot be supplied because there is insufficient generation capacity, demand side participation or network capability to meet demand.

¹² Utilities Commission, Final Report: Review of Electricity Standards of Service for the Northern Territory, November 2010, page 3.

¹³ Northern Territory Major Energy Users, submission to Issues Paper, pages 15-18.

- an outcomes based performance target needs to be supported by best practice plant management so that operating practices and asset reliability and availability are consistent with a desired performance target;
- reliability settings should reflect the reliability of the supply chain so that the level of reliability expected of generation is consistent with the reliability performance of the distribution network;
- if PWC Generation or another party (such as PWC System Control) is required to prepare short, medium and long term projected assessments of system adequacy (PASA) and/or a Statement of Opportunities then this would provide long term advice to generation providers of the potential for investment in generation;
- every opportunity must be taken to create the basics for a competitive market so that new entrants have the ability to make informed decisions about whether to enter the NT market.

Power and Water Corporation

3.19 PWC responded to the questions posed in the Issues Paper with the following comments relevant to system planning:¹⁴

- PWC is working to improve its forecasting capabilities, and is considering adopting practices common to robust electricity forecasting such as weather correction, econometric modelling and external validation where these capabilities are appropriate and cost effective;
- PWC is contemplating the merging of various forecasting methodologies, taking into account the different business imperatives and technical requirements of each business unit;
- PWC faces increased costs because it is the generator of last resort;
- regulation of [generation and transmission network] service performance currently occurs through the Standards of Service Code, while the PSR should identify any gaps in generation investment and when new capacity is required in the Territory;
- if the Commission were to take a greater role in generation investment, this would conflict with the current responsibilities of the PWC Board and management; and
- the PWC Statement of Corporate Intent¹⁵ provides the PWC strategic direction, and is based on the priorities and service and reliability targets in each Business Unit's five year business plan and 20 year outlook (which are approved by the Managing Director).

Further thinking – system planning

3.20 The Commission's further thinking in this area is that the focus of planning is the components of planning needed to support the identification and coordination of the most economic future options for optimal augmentation and expansion of the power system.

¹⁴ Power and Water Corporation, submission to Issues Paper, page 3.

¹⁵ The Power and Water Corporation Statement of Corporate Intent is a contract between the shareholding Minister and PWC about technical and financial performance prepared as a requirement of the *Government Owned Corporations Act*.

Development of demand forecasts

3.21 Electricity businesses require demand forecasts to inform operational and investment decisions, making robust demand forecasts a critical requirement for system planning. The development of robust demand forecasts is a complex and technically challenging task.

3.22 The Commission's thinking on forecasting is informed by the 2009-10 Power System Review which assessed the adequacy of existing electricity demand forecasting practices and highlighted the importance of consistent forecasts by generation and electricity networks.¹⁶ Based on good industry practice, some of the elements common to forecasting electricity demand are:

- bottom up – top down reconciliation of forecasts, which involves reconciling distribution network, transmission network and system forecasts;
- weather corrected data, which establishes the temperature sensitivity of electricity demand to account for variability in annual peak demand and energy use due to increased prevalence of temperature dependent equipment (e.g. air conditioners);
- production of probability of exceedance (PoE) 50 per cent and PoE 10 per cent forecasts, which is a statistical approach for stress testing the system infrastructure capability to meet peak demand in a one in two year weather scenario (50 per cent POE) and one in 10 year weather scenario (10 per cent POE);
- combination of econometric forecasts and trend analysis, which involves developing demand forecasts using an econometric model that includes assumptions about factors affecting electricity demand and use (e.g. population growth, housing activity, gross state product, air conditioner penetration and energy efficiency). The modelling results are then usually reconciled against an analysis of historical demand trends;
- identifying spot loads. Major spot loads (i.e. energy intensive industry projects) have a significant impact on network forecasts, and some impact on system forecasts. Industry practice is for communication between network operators and planners to recognise the certainty and timing of major loads, and to use a contingent project approach when forecasting;
- combinations of internal and external expertise. Industry practice is to use both in house expertise (especially at a network level) and external expertise (especially at a system level) to develop an integrated forecast with a level of independence;
- common forecasts for capital and revenue budgeting. A common set of forecasts is applied to capital expenditure programs and determining required revenues; and
- changes in load shape – system load factor. A change to the system load profile and load factor can influence generation utilisation, which can have longer term impacts on electricity demand.

3.23 Practice elsewhere in Australia is for system demand forecasts to be developed by an independent market and system operator based on the data held by multiple generators, TNSPs, DNSPs and retailers. As a vertically integrated electricity business and the sole market participant, PWC has been in a unique situation for Australia of having access to comprehensive information on historical and prospective peak

¹⁶ Utilities Commission, 2009-10 Power System Review, March 2011.

demand and energy consumption. This situation makes PWC the party best able to develop demand forecasts.

- 3.24 PWC is working to improve its forecasting capabilities, including considering adopting practices common to robust electricity forecasting such as weather correction, econometric modelling and external validation where these capabilities are appropriate and cost effective.¹⁷

Reliability and security standards

- 3.25 System planning requires a reliability standard or target to provide the basis for assessing infrastructure adequacy and reliability of supply prospects, and for guiding the investment response needed to meet customer expectations of service performance and cost.
- 3.26 The NTMEU agrees that specific standards of performance are necessary, whether they are related to generation or networks. Such standards need to be set in relation to what customers see, such as unserved energy and individual feeder performance. These types of standards have relevance to customers and would allow industry participants to make informed choices about balancing cost to reliability.¹⁸
- 3.27 In the NEM, under the provisions of the Reliability Standard, each region's annual USE can be no more than 0.002 per cent of its annual energy consumption. Compliance is assessed by comparing the 10-year moving average annual USE for each region with the Reliability Standard.¹⁹
- 3.28 Generators and AEMO use the Reliability Standard as the benchmark or threshold for identifying a need for new generation capacity. Effectively, the Reliability Standard represents the reliability target that needs to be achieved, without specifying a particular investment outcome or make up of the generation fleet.
- 3.29 PWC notes that regulation of service performance already occurs through annual Standards of Service reporting, while the annual Power System Review should identify any gaps in generation investment and when new capacity is required.²⁰
- 3.30 However, the existing standard of service framework does not explicitly link reliability performance to a reliability standard, which limits its usefulness as a basis for system planning and the identification of optimal investment decisions.
- 3.31 Moreover, the lack of a clear reliability standard limits the ability of the power system review to assess potential gaps in generation investment and the need for new investment due to the potential for differing judgements by the Commission and PWC (or other generator) about what level of capacity (and the resulting reliability performance) is appropriate.

¹⁷ Power and Water Corporation, submission to Issues Paper, page 3.

¹⁸ Northern Territory Major Energy Users, submission to Issues Paper, page 15.

¹⁹ National Electricity Rules 3.9.3A

²⁰ Power and Water Corporation, submission to Issues Paper, page 3.

Projected assessment of system adequacy

- 3.32 A projected assessment of system adequacy (PASA) is the term for the comprehensive program of information collection, analysis and disclosure of medium term and short term power system security and reliability of supply prospects in the NEM.²¹ AEMO uses the short and medium term PASA to ensure that adequate levels of reserve are in the system at all times, and by generators and TNSPs to plan augmentation, maintenance and other outages up to 2 years in advance.²²
- 3.33 Producing a PASA gives industry participants regular data about the supply-demand balance, taking into account dynamic factors such as generation plant maintenance schedules. The PASA is a continuous flow of information that is primarily used to guide operating decisions, but also can support planning activities. In particular, the PASA provides a mechanism for tracking the system supply-demand balance against forecasts.

Business decision making

- 3.34 System planning involves the coordinated provision of comprehensive information on current and future system conditions under specified reliability standards and performance expectations. This should be a primary source of information for decision making by industry participants.
- 3.35 PWC suggested that if the Commission (or presumably any other party) were to take a greater role in generation investment, this would conflict with the current responsibilities of the PWC Board and management.²³ PWC investment decisions are the responsibility of the Board and management, and would be informed by the need to meet defined reliability standards and other regulatory obligations.
- 3.36 The Commission notes that a commercial business such as PWC makes decisions to maximise shareholder returns whereas system planning should reflect the long term interests of customers. Therefore, the decisions of the PWC Board and management, and the long term interests of customers, may not align. The system planning framework and associated instruments should balance these private and public interests, including by establishing clear performance objectives that can be used to hold industry participants accountable for their investment decisions.

Safety net arrangements

- 3.37 There is no obligation of generators in the Territory or in the NEM to invest in new capacity simply because a shortfall is forecast. The expectation in the NEM is that a capacity shortfall will push up wholesale energy prices, thereby attracting new investment. Notwithstanding this, AEMO has a responsibility to ensure adequate

²¹ National Electricity Rules 3.7.1

²² Australian Energy Market Operator, July 2010, An Introduction to Australia's National Electricity Market, page 17.

²³ Power and Water Corporation, submission to Issues Paper, page 3.

generation capacity is available, and may contract for reserves if a generation capacity shortfall is forecast and there is no response evident by the market.²⁴

- 3.38 The Territory does not operate an equivalent market system, and the regulatory framework is silent on who might be the generator of last resort. In the absence of any generation competition in the Territory, PWC Generation has provided all major new generation capacity installed in the market systems in recent years (e.g. Weddell power station, Channel Island power station and Owen Springs power station).
- 3.39 The benefit of clarifying responsibility for being generator of last resort is greater certainty that investment in generation capacity will be adequate to maintain reliability of supply on a cost effective basis.
- 3.40 A safety net arrangement would be supported by effective system planning instruments. The NTMEU points out that if PWC Generation or other party (such as PWC System Control) were required to prepare and publish short and medium PASA and/or a statement of opportunities then this would provide long term advice to generation providers of the potential for investment in generation.²⁵

Draft recommendations – system planning

- 3.41 The Commission considers that to support the achievement of acceptable reliability performance outcomes, system planning for the Territory requires the development of system planning instruments that replicate the purpose and characteristics of the AEMO ESOO/PSA and NTNDP instruments for the NEM.
- 3.42 The Commission recommends the development and implementation of planning instruments that are based on the NEM approach, and include the key components of system planning:
- credible and dependable forecasts of future electricity demand and supply to identify possible future generation and transmission capacity constraints;
 - assessments of system adequacy, taking account of maintenance and outage plans;
 - clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
 - authoritative data on the current and future condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.
- 3.43 Effective system planning arrangements would support business decision making by clearly establishing the current performance and future expectations of the power system. Other benefits of more specific planning arrangements are:
- the documentation of investment options and the underlying assumptions would support the revenue (and tariff) claims of industry participants; and

²⁴ National Electricity Rules 3.20.3(b): AEMO may determine to enter into reserve contracts to ensure that the reliability of supply in a region or regions meets the relevant power system security and reliability standards established by the Reliability Panel for the region and, where practicable, to maintain power system security.

²⁵ Northern Territory Major Energy Users submission, page 17.

- the planning outcomes would provide a benchmark for holding the business accountable for performance, and adjusting performance targets or revenue levels in response to actual outcomes.

Reliability and security standards

3.44 The Commission recommends the development and application of clearly defined power system (generation and transmission) reliability standards that reflect the price/service performance outcomes would provide a target for system planning purposes. The Commission's Review of Electricity Standards of Service proposed that reliability performance outcomes be established for generation, transmission and distribution networks, including establishing a Territory Reliability Standard (based on a certain level of USE) and network feeder reliability targets.

Availability of planning information

- 3.45 Authoritative data on the current and future condition of infrastructure would support planning decisions. The ESOO/PSA and NTNDP documents in the NEM provide an annually updated insight into current and future power system performance.
- 3.46 The Commission recommends the development and production of a PASA document to establish a program of information collection, analysis and disclosure of power system security and reliability of supply prospects. This would give industry participants and the system operator regular data about the supply-demand balance taking into account dynamic factors such as generation plant maintenance schedules. Further, a PASA document could provide a useful mechanism for tracking outcomes against forecasts, and would assist in holding industry participants and the system operator accountable for their planning and operating decisions.

Safety net arrangements

- 3.47 Producing power system information requires considering what to do with the information, including what happens if no investment response looks likely where there is an emerging capacity shortfall. Therefore, consideration should be given to establishing a trigger for procuring generation of last resort services, and determining who might be responsible for being generator of last resort. A clearly defined and measured approach should help avoid the possibility of urgently made (and probably more expensive) generation investment decisions.
- 3.48 Effective system planning arrangements will support effective business decision making by clearly establishing the current performance and future expectations of the power system, and documenting the investment options for achieving the target reliability performance.

Draft recommendation 1(a)

The Commission recommends the development and implementation of planning instruments that replicate the purpose and characteristics of the NEM planning instruments released by AEMO. The key components of these instruments are:

- credible and dependable forecasts of future electricity demand and supply to identify possible future generation and transmission capacity constraints;
- assessments of system adequacy, taking account of maintenance and outage plans;
- based on clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
- authoritative data on the current and future capability and condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.

This planning information should be updated regularly to provide a program of information collection, analysis and disclosure of power system security and reliability of supply prospects. The NEM approach appears appropriate, with an annual and comprehensive update of longer term demand forecasts and supply prospects, and supported by a more regular update of the shorter term supply-demand balance (i.e. a medium term PASA document).

Draft recommendation 1(b)

The Commission recommends the development and application of clearly defined power system (generation and transmission) reliability standards and performance targets to support system planning.

The Commission's Review of Electricity Standards of Service proposed that reliability performance outcomes be established for generation, transmission and distribution networks, including establishing a Territory Reliability Standard (based on a certain level of unserved energy) and network feeder reliability targets.

Draft recommendation 1(c)

The Commission recommends the development of a regulatory mechanism for procuring generation of last resort services, and determining who might be responsible for being generator of last resort.

Power system monitoring

3.49 Monitoring of the power system provides the system operator and industry participants with information about the operation and performance of electricity infrastructure. Monitoring activities assist to identify whether the performance of power system assets is consistent with the targets established through the regulatory bargain, and to identify components of the system requiring remediation or augmentation.

3.50 Oversight of system performance relative to the reliability and security standards and technical parameters provides critical information about the health of the power system

and component assets. This information is useful for identifying possible improvements to operating practices, informing maintenance schedules, for system planning purposes (e.g. augmentation) and potentially to adjust reliability standards and targets.

System monitoring practices

- 3.51 Monitoring helps make an electricity business accountable for their performance against relevant obligations and standards, and provides information that should support future planning.
- 3.52 An example of monitoring is the investigation of power system incidents where equipment failure, natural events or operator error cause a significant deviation from normal operating conditions. AEMO reviews and reports on operating incidents to assess the adequacy of the provision and response of facilities or services and the appropriateness of actions taken to restore or maintain power system security.²⁶ This supports the ongoing effective operation of the power system and ensures there is visibility and recognition of incidents.
- 3.53 Compliance is another monitoring activity. For example, the System Controller can require generators to test and demonstrate the performance capabilities of their equipment.²⁷ Monitoring compliance with technical obligations is intended to establish a discipline on the generator to operate within the technical envelope and give the system operator the confidence that the system security and reliability standards can be maintained. As noted by System Control in an October 2009 review of the System Control Technical Code:²⁸

Compliance with Technical Standards and Codes is crucial to ensuring power system security, and ensures safe and reliable operation of a power system within the technical envelope of all the components. When this is not the case, the risk of major power system incidents will substantially increase.

Absence of reliable detail about operating capability of power system equipment has a similar effect, resulting in increased risk of power system incidents and increased conservatism by the Power System Controller in order to achieve safe and secure operation of the power system. This in turn reflects directly upon the efficiency of the power system.

²⁶ National Electricity Rules 4.8.15

²⁷ System Control Technical Code, version 3, May 2010, s6.24.

²⁸ PWC System Control, System Control Technical Code Review, 14 October 2009, page 4. System Control is required to develop a system control technical code by the Electricity Networks (Third Party Access) Code cl.27A. The System Control Technical Code is developed by System Control and approved by the Commission. The current version (3) has been in place since May 2010. A copy is available from, http://www.nt.gov.au/ntt/utilicom/electricity/technical_regulation.shtml.

Effectiveness of Territory system monitoring

3.54 The Davies Enquiry²⁹ which was a response to the equipment failures at the Casuarina zone substation in late 2008 indicates that a key factor contributing to the asset failures and associated power outages was a lack of routine monitoring of asset health by the DNSP. The consequence was that the assets did not perform as expected, thereby adversely affecting system reliability and security.

3.55 Similarly, in investigating the 30 January 2010 Darwin-Katherine System Black, the System Controller found that:³⁰

...performance of the 132kV protection schemes and 132kV circuit breakers remained a concern. Priority maintenance of the circuit breakers occurred to resolve this situation.

...performance of the protection schemes was less than expected. Extensive investigations identified malfunctioning relays and these were progressively replaced over the following months. Overall the protection schemes have been declared as nearing end of life and PWC Power Networks have indicated a replacement project is underway, although is unlikely to be completed by the 2010/2011 storm season. While the equipment remains fully functional, this issue does impact power system security going forward.

3.56 The Commission has been advised by PWC that it is taking steps to improve asset management and monitoring practices to better understand asset and system health.

Views in submissions

3.57 The Issues Paper sought comment about:

- whether the practices of the AER for monitoring compliance with behavioural and technical obligations should guide the development of compliance monitoring arrangements and practice in the Territory;
- if existing regulatory arrangements and the approach to monitoring equipment capability and performance promote confidence that the capability of electricity infrastructure is well understood and that assets will perform as expected;
- the need for more comprehensive incident reporting arrangements; and
- if routine and comprehensive monitoring of system performance is important to provide critical information about system security and reliability trends.

²⁹ Mervyn Davies, February 2009, Final Report: Independent Enquiry into Casuarina Zone Substation Events and Substation Maintenance Across Darwin. Refer Power and Water Corporation website, http://www.powerwater.com.au/data/assets/pdf_file/0018/12348/Mervyn_Davies_Final_Report.pdf.

³⁰ System Control, Darwin Katherine Power System Investigation Report Arising from Black System of 30 January 2010, July 2010, page 23.

Northern Territory Major Energy Users

3.58 The NTMEU responded to the questions posed in the Issues Paper with the following comments relevant to system monitoring:³¹

- monitoring alone is insufficient to ensure that the sought after outcomes are achieved. The definition of monitoring should encompass the monitoring of the processes and practices so that if processes and practices are less than best practice, then best practice will be implemented;
- whilst the NTMEU agrees with an appropriate testing regime, it points to the need not to overlook that it is not so much the testing that is critical, but the outcomes as seen by consumers that is a key element of assessment;
- testing regimes should be benchmarked against best performance in the NEM as an explicit requirement; and
- the NTMEU fully supports the requirement that incident reporting arrangements be formalised by PWC into a standard operating procedure. However, these should be reviewed publicly and formally approved by the Commission.

Power and Water Corporation

3.59 PWC responded to the questions posed in the Issues Paper with the following comments relevant to system monitoring:³²

- PWC is mindful of the need to ensure that the benefits to consumers outweigh the costs. This, presumably, is also an important consideration for the Commission; and
- PWC agrees that clearly documented requirements and processed for investigation and reporting on incidents should support ongoing improvements in the reliability and security of the power system. However, thresholds and triggers for reviews must be set to ensure only appropriate incidents are reviewed and reported.

3.60 PWC made several statements recognising the role of an effective compliance framework in ensuring that technical parameters are met, including annual licence returns, compliance reporting and service performance reporting.

Further thinking – system monitoring

3.61 The purpose of system monitoring is to put an appropriate focus on the operating practices and processes of industry participants responsible for the achievement of defined reliability and security standards and the associated reliability outcomes. Monitoring should be focused on compliance practices and the review of events affecting the reliability or security of the power system.

3.62 Monitoring of system capability relative to the technical parameters is a core function of the system operator (i.e. System Control), primarily by:

- routine examination of compliance by system participants with technical parameters, which in the Territory are outlined in the System Control Technical Code and Network Connection Technical Code; and
- investigation and reporting on power system incidents.

³¹ Northern Territory Major Energy Users submission to Issues Paper, pages 19-21.

³² Power and Water Corporation submission to Issues Paper, page 5-6

- 3.63 The Commission is aware that there is a cost to businesses associated with monitoring of performance. However, the Commission notes that best practice requires monitoring and measurement of operating activities and performance as a routine part of day to day business operations, including to provide the system health data used to determine the capital and maintenance actions required to meet reliability targets.
- 3.64 Effectively, the monitoring framework for the power system should establish mechanisms that work to identify potential risks to security and reliability and learn from mistakes. For example, the duration of the Darwin-Katherine system black of 31 January 2010 was exacerbated by switching errors and inadequate operating practices. The episode highlighted improvements to operating practices that should support improved reliability and security of supply.

Technical compliance

- 3.65 The Commission has been working closely with PWC since late 2009 to assist PWC to develop appropriate compliance processes for achieving and demonstrating compliance with regulatory obligations and technical performance requirements.
- 3.66 In particular, the Commission has placed a priority focus on compliance with technical requirements, and PWC has reported on procedural compliance by generators and System Control with the System Control Technical Code.
- 3.67 Similarly the System Controller has signalled a more robust compliance approach by establishing an obligation in the System Control Technical Code for generators to test and demonstrate the performance capabilities of their equipment.³³
- 3.68 In the NEM, the AER is responsible for monitoring of the technical compliance of industry participants and the system operator (AEMO), and undertakes regular audits to determine if they have adequate compliance programs, and if their operating practices and equipment meet NEM technical parameters.³⁴
- 3.69 The monitoring of the technical compliance of the system operator and industry participants with the defined technical parameters provides a level of oversight that should assist the industry participants and system operator to identify actions that will contribute to the reliable and secure operation of the power system.

Incident reporting

- 3.70 The Territory's regulatory framework does not establish comprehensive incident reporting arrangements. In the NEM there are clear processes for responding to power system incidents, with AEMO required to review and report on operating incidents to assess the adequacy of the provision and response of facilities or services and the appropriateness of actions taken to restore or maintain power.³⁵
- 3.71 The absence of an equivalent processes in the Territory gives rise to the possibility that the cause of incidents may not be fully explored and that possible improvements to the

³³ System Control Technical Code, version 3, May 2010, s6.24.

³⁴ National Electricity Rules, 4.15. Also refer Australian Energy Regulator, June 2009, Compliance and Enforcement – Statement of Approach.

³⁵ National Electricity Rules, 4.8.15.

operating practices or the overarching technical parameters may not be identified or progressed.

- 3.72 Good industry practice involves the routine investigation of all incidents affecting reliability or security of supply by the business involved (i.e. the generator or DNSP). If the incident is a major outage affecting thousands of customers or there is evidence of a pattern of minor outages, then the system operator or an independent expert would investigate the event.
- 3.73 A further benefit of establishing an obligation on the system operator to investigate and report on certain incidents is to provide greater visibility of events that adversely affect system reliability, thereby making the industry participants involved more accountable for the operation of the power system.

Draft recommendations – system monitoring

- 3.74 The purpose of system monitoring is to provide oversight of the operating practices and performance of electricity businesses as part of the feedback loop of planning, monitoring and reporting. Monitoring is essentially focused on compliance and the review of events affecting the reliability or security of the power system to support improvement in operating practices, to inform future planning and potentially to adjust reliability standards and targets. Good compliance practice is documented in Australian Standard 3806 (compliance programs).
- 3.75 The monitoring of the technical compliance of industry participants with defined technical parameters should encourage electricity businesses and the system operator to identify actions that will contribute to the reliable and secure operation of the power system.
- 3.76 Similarly, the routine investigation and reporting of the cause and implications of power system incidents is appropriate to provide greater visibility of events that adversely affect system reliability (i.e. customers), thereby making the industry participants involved more accountable for the operation of the power system.

Response to monitoring

- 3.77 At present, PWC Networks is responsible for initiating amendments to the Networks Connection Technical Code and Network Planning Criteria, and the System Controller has primary responsibility for initiating amendments to the System Control Technical Code.³⁶ The Commission is responsible for approving amendments to these Codes.
- 3.78 Effectively the onus is on PWC Networks and the System Controller to respond to inadequate rules by seeking approval from the Commission to change those rules. There is the potential that the perceived effort involved in seeking an amendment to a Code or the possibility of competing priorities may deter an improvement being sought or progressed.
- 3.79 There have been two revisions to the System Control Technical Code initiated by the System Controller since 2002, while the Network Connection Technical Code has not been amended since being approved by the Commission in 2003. No set of rules

³⁶ The PWC System Control Licence gives the Commission the ability to request the System Controller make amendments to the System Control Technical Code.

dealing with electricity supply is so appropriate that they can exist for such extended periods without needing improvement or revision to reflect changing operating circumstances. A mechanism or trigger for regular review of technical parameters established by the regulatory framework is warranted.

Draft recommendation 2(a)

The Commission recommends that all electricity entities be required to develop and maintain a robust compliance process for the power system (generation and transmission). The monitoring of compliance against standards is an important feature of system monitoring. PWC is working to establish processes consistent with good compliance practice based on AS3806. These efforts are supported. The Commission will continue to make compliance a priority.

Draft recommendation 2(b)

The Commission recommends the development and implementation of a mechanism for the investigation of power system incidents.

Draft recommendation 2(c)

The Commission recommends the development of a clear process for oversight and the regular review of technical obligations and parameters for the power system established through the regulatory framework.

Power system reporting

3.80 Power system reporting involves the routine release of comprehensive and authoritative data to industry participants, prospective participants, customers, regulators and policy-makers to:

- support planning and monitoring activities by providing data to assist identification of the optimal investment options, and to facilitate coordination of investment actions;
- advise on system performance against the price and service expectations of the regulatory bargain; and
- assist in holding electricity businesses accountable for reliability performance outcomes.

Power system reporting practice

3.81 There are a range of reporting arrangements adopted across Australia's three electricity markets (i.e. the NEM, the Territory and Western Australia) and individual jurisdictions to provide information on the power system.

3.82 AEMO releases a suite of planning instruments and information that contain information that can help guide targeted investment and the future development of Australia's electricity infrastructure and resources. In particular, AEMO prepares

independent modelling and advice on strategic planning and credible future electricity demand and supply scenarios for the NEM through:³⁷

- the National Transmission Network Development Plan (NTNDP), which provides a strategic view of the efficient development of the NEM transmission grid for the next 20 years under a range of credible scenarios;
- Electricity Statement of Opportunities (ESOO), which provides 10 year projections of electricity supply and demand and highlights opportunities for new investment in each NEM region based on a range of economic scenarios. The ESOO serves as a guide to the environment for potential new investment by indicating areas of the NEM which may benefit from additional generation to accommodate future demand;
- Power System Adequacy (PSA), which provides a two year outlook of operational issues and the supply-demand balance. The PSA supports the ESOO, but has a more operational focus;
- Victorian Annual Planning Report, a mechanism for joint planning for development of the Victoria transmission and distribution networks, and to provide the electricity sector with confidence that the transmission network will be upgraded as required to meet future demand and to ensure ongoing system reliability;
- South Australian Supply and Demand Outlook (SASDO), a report previously prepared by the South Australian Electricity Supply Industry Planning Council. The 2010 SASDO was released in June 2010 to report to 2019-20 on annual and seasonal electricity forecasts, supply developments and sources and volumes of fuel required to support forecast generation.

3.83 The form and approach of reporting has undergone extensive change in recent years, including due to the transfer of jurisdiction specific reporting functions to AEMO and an increased focus on the capability of the power system to meet summer time peak demand.

Effectiveness of existing system reporting framework

3.84 The annual power system review is the nearest Territory equivalent to the planning instruments used in the NEM to provide information which might be used to guide investment and operation decisions in the Territory's power systems. The power system review is prepared by the Commission to fulfil the requirements of the *Electricity Reform Act* [s45] to:

- develop forecasts of overall electricity load and generating capacity, in consultation with participants in the electricity supply industry;
- review and report on the performance of the Territory's systems;
- advise on matters relating to the future capacity and reliability of the Territory's system relative to forecast load; and
- publish an annual review of the prospective trends in the capacity and reliability of the Territory's system relative to projected load growth.

³⁷ Australian Energy Market Operator, Annual Report 2010, pages16-18

3.85 The power system review is an evolving project, with the future content and approach informed by this review and good industry practice. Other system related reporting includes:

- half yearly reports to the Commission by the System Controller on the technical performance of the power systems and major incidents. The Commission has drawn on these reports in preparing the power system review and the Commission's annual report, but they have not been generally publicly available;³⁸
- quarterly reports to system participants by the System Controller on the technical performance of the power systems and major incidents relevant to the participant;³⁹
- investigation reports for major system faults and incidents.⁴⁰ These reports are provided to affected system participants. There is no guidance on when the System Controller might investigate an incident, and no requirement for reports to be publicly available;
- compliance reporting by industry participants to the Commission. A review of procedural compliance by System Control with the System Control Technical Code was completed for 2009-10. The Commission's annual report includes commentary on the results of compliance reporting; and
- standards of service and reliability reporting, with generation reliability performance statistics reported under the Electricity Standards of Service Code and as part of the annual power system review. The standards of service reports are available on the Commission's website.

3.86 The test of the effectiveness of system reporting is whether the reported information supports good system planning and desired performance outcomes, especially by providing visibility of reliability outcomes and by making the system operator and industry participants accountable for the outcomes of their decisions and actions.

3.87 In this context, the Commission's concerns about the planning and monitoring arrangements also apply to reporting arrangements. For example, the 2008-09 Review noted that:⁴¹

...an informed assessment of the adequacy of system capacity should take account of the maintenance history and condition of generation plant, the potential for major equipment failure with extended replacement times, the duration and timing of planned overhauls and maintenance, the frequency of unplanned outages and the level of redundancy in supporting systems.

3.88 Subsequently, the 2009-10 Review noted that:⁴²

The reserve plant margin being maintained in the Darwin-Katherine system for the period 2012 to 2016 may be greater than what is reasonably necessary to maintain

³⁸ System Control Technical Code, s.7.4. System Control is required to prepare and submit the Half Yearly System Performance Reports for the Darwin-Katherine, Alice Springs and Tennant Creek systems.

³⁹ System Control Technical Code, s7.4

⁴⁰ System Control Technical Code (v3), s.6.23

⁴¹ Utilities Commission, March 2010, 2008-09 Power System Review, page 28

⁴² Utilities Commission, March 2011, 2009-10 Power System Review, page 26

reliability of supply... The need for the planned level of generation capacity and reserves could be prompted by doubts about the condition and reliability of existing generation plant, particularly at Channel Island. If so, the Commission considers that these doubts should be reflected in the generation maintenance program to recognise the availability and reliability of generation plant and to support the generation capital investment program.

3.89 The 2008-09 and 2009-10 Reviews document the Commission's ongoing concern about the quality and availability of information needed to assess the adequacy of the power system. However, this is primarily a reflection of the lack of rigour of the system planning and system monitoring arrangements – information not routinely asked for will not necessarily be available.

Views in submissions

3.90 The Issues Paper sought comment about whether:

- routine and comprehensive reporting of historical and forward looking information about the power system is necessary to support effective planning and operation decisions, and timely and cost effective investment outcomes;
- routine and comprehensive reporting on system adequacy, consistent with the approach adopted in the NEM by AEMO, should be adopted in the Territory;
- assessing the adequacy of the source and supply of fuel for electricity generation in the Territory is warranted given the importance of fuel availability to a reliable and secure electricity supply;
- reporting on performance and health, including the outcomes of investigations of compliance with technical performance standards would encourage and support the efforts of generators and the System Controller to operate electricity infrastructure according to the standards required by relevant reliability and security criteria; and
- reporting should facilitate the development and the coordination of planning activities throughout the electricity supply chain. This would involve reporting the key information necessary for investors to make informed and timely investment decisions.

Northern Territory Major Energy Users

3.91 The NTMEU responded to the questions posed in the Issues Paper with the following comments relevant to system reporting.⁴³

- a lack of useful reporting by PWC reduces transparency about outcomes. Increased reporting, which is independently assessed and where PWC is held accountable, will greatly increase customer involvement in the electricity supply arrangements. Equally important is that it will provide potential new entrants with sufficient knowledge to make informed decisions about entering the Territory market;
- the NTMEU is concerned about system adequacy projections. Assessments of system adequacy should be undertaken by an expert party with a measure of independence to avoid potential conflicts of interest. The long term needs of customers need to be to the forefront when considering future needs;

⁴³ Northern Territory Major Energy Users submission to Issues Paper, pages 21-24.

- the supply of gas is a critical element in ensuring reliability of the electricity supply, making the reporting on gas supplies essential; and
- there is a need for independent reporting of all significant incidents that occur in the power system. This approach follows that used in the NEM where AEMO and AER report on incidents that impact customers.

Power and Water Corporation

3.92 PWC responded to the questions posed in the Issues Paper with the following comments relevant to system reporting.⁴⁴

- PWC provides information and reports to the Commission that allows it to monitor, and where appropriate report, on the performance of the Territory's electricity system;
- the Commission needs to clearly articulate what reports are required, the content of these reports, the frequency of publication and who is required to produce these. Significant information from a number of System Participants, and primarily Power and Water, is required to produce forward looking and historical reports; and
- any proposal by the Commission to require reporting against new templates and the provision of new reports needs to consider the organisational impacts on Power and Water, and ultimately, whether there will be any benefits to electricity consumers.

Further thinking – system reporting

3.93 The delivery of a reliable and cost effective electricity supply requires effective system management, asset management and investment decisions. Good decision making requires industry participants and the system operator possess comprehensive and authoritative information about current and future asset condition and future electricity demand. The challenge is to produce and report this information.

3.94 System reporting should support system planning and monitoring by making available comprehensive and authoritative information that represents a primary source of information underpinning planning and operating decisions for the power system.

3.95 Good industry practice for reporting in Australia includes:

- the planning instruments produced by AEMO for the NEM, including the electricity statement of opportunities and national transmission network development plan and projected assessment of system adequacy;
- the AEMC Reliability Panel annual market performance review, which reports on the reliability of the power system and the power system security and reliability standards for the previous year;⁴⁵ and
- power system incident reports. These reports are prepared by AEMO in the NEM (as system operator) to identify potential changes to systems and practices that might improve the reliability and security of the power system.

⁴⁴ Power and Water Corporation submission to Issues Paper, page 7

⁴⁵ The report is required by the National Electricity Rules, 8.8.3(b). The AEMC has provided the Reliability Panel with standing terms of reference, <http://www.aemc.gov.au/Market-Reviews/Open/Annual-Market-Performance-Review-2010.html>.

- 3.96 System reporting should inform the energy industry, potential investors, policy makers and the community about the performance of the power system by relaying:
- planning information, including demand forecasts, the adequacy of system capacity relative to forecast demand, and knowledge of planning and investment commitments;
 - the performance and health of the system, which includes information on system performance trends, regulatory and technical compliance (including equipment capability relative to security standards) and the findings of investigations into power system incidents; and
 - outcomes experienced by customers.
- 3.97 The expectation is that this information will establish visibility of outcomes and hold participants accountable for their investment and operating actions and decisions.

Statement of opportunities and NTNDP

- 3.98 The ES00/PSA is a statement prepared by AEMO to provide information to assist generators, TNSPs and market participants in making an assessment of the future need for electricity generating or demand management capacity or augmentation of the power system.⁴⁶
- 3.99 The ES00/PSA examines the supply-demand outlook by comparing forecast energy and peak demand for the coming 10 years with known and committed capacity and minimum reserve levels.⁴⁷ The ES00/PSA provide information to assist industry participants assess the future need for electricity generating capacity, demand side capacity and augmentation of the network to support the operation of the NEM. A year by year supply-demand balance is presented for each region in the NEM as a snapshot forecast of the capacity of generation and transmission to satisfy demand for electricity into the future.⁴⁸
- 3.100 The NTNDP is prepared by AEMO to identify an appropriate course for the efficient development of the national transmission grid for a planning horizon of at least 20 years.⁴⁹ The NTNDP is expected to provide a nationally consistent view of transmission investment requirements to support growing demand for energy, including developing infrastructure investment alternatives.
- 3.101 The scope of the ES00/PSA and NTNDP are set out in the National Electricity Rules providing AEMO with standing terms of reference for each instrument. Together the ES00/PSA and NTNDP establish a comprehensive and authoritative set of planning information to guide efficient development of the NEM power system.

⁴⁶ National Electricity Rules, Chapter 10

⁴⁷ National Electricity Rules, 3.13.3 (q) and Australian Energy Market Operator, 2010 Electricity Statement of Opportunities, June 2010.

⁴⁸ Australian Energy Market Operator, July 2010, An Introduction to Australia's National Electricity Market, page 18.

⁴⁹ National Electricity Rules, 5.6A

- 3.102 Supporting the ESOO/PSA is the projected assessment of system adequacy, which is a comprehensive program of information collection, analysis and disclosure of medium term and short term power system security and reliability of supply prospects.⁵⁰
- 3.103 The PSA provides an assessment of generation adequacy for the coming two years, and system adequacy against operational criteria, such as capacity reserve, energy reserve and frequency control (i.e. operating matters relevant to maintaining system security and stability).⁵¹ AEMO also identifies any actions to address a potential capacity shortfall.
- 3.104 Importantly, AEMO is held accountable for the content of the ESOO/PSA, and must report annually to the AEMC Reliability Panel on the accuracy of the demand forecasts central to the estimates of future generation capacity needed.⁵² Also aiding the accountability of the system operator and the credibility of the NEM planning instrument is the annual Reliability Panel report on NEM and system operation in the previous year.
- 3.105 The Territory's annual power system review cover similar ground as the AEMO reports on generation and system adequacy, but requires further development to provide certainty about demand forecasts and appropriate adequacy levels. That is, the underlying activities required for system planning need to improve to reflect good industry practice, such as demand forecasting.

Health of system data

- 3.106 Health of system information is most useful to industry participants for determining whether the system is maintaining reliability and security of supply standards. The type and level of reporting should support compliance by individual industry participants and the system operator with regulatory and technical obligations. For example, public reporting of the findings of incident investigations provides visibility of major power outages, thereby establishing an incentive for changes to avoid similar events in the future. This supports monitoring activities.

Outcomes experienced by customers

- 3.107 As noted by the NTMEU, the outcomes experienced by customers are the most important factor for determining how the power system is performing. Therefore customers should be able to expect regular information on the system performance achieved. The Commission notes that the Queensland regulator required quarterly reports of reliability experienced by customers of the two local DNSPs, including generation, transmission and distribution network reliability outcomes for the period.

⁵⁰ National Electricity Rules, 3.7.1. Also refer Australian Energy Market Operator, 2010 Power System Adequacy, June 2010. For example, the energy adequacy assessment considers any restrictions to the amount of energy that is available due to factors including fuel shortages, cooling water restrictions and environmental limits.

⁵¹ AEMO, 2010 Power System Adequacy, June 2010. For example, the energy adequacy assessment considers any restrictions to the amount of energy that is available due to factors including fuel shortages, cooling water restrictions and environmental limits.

⁵² National Electricity Rules 3.13.3 (u)

Draft recommendations – system reporting

- 3.108 System reporting is the third element of the virtuous circle, and should support system planning and system monitoring activities by making comprehensive and authoritative planning and monitoring information available to industry participants and the community. This information should provide the basis for future planning decisions, including potentially adjusting reliability standards.
- 3.109 The Territory regulatory framework should adopt a suite of system planning instruments that replicate the purpose and characteristics of the AEMO ESOO/PSA and NTNDP instruments for the NEM. The purpose is to provide authoritative data to support the identification of the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards on a cost effective basis.
- 3.110 The power system review could fulfil this role, but only with further development so that the power system review is acknowledged to be an authoritative source of information for guiding operating and investment decisions for the power system.
- 3.111 The Commission notes the NTMEU view that a sound reporting structure and enforcement has the major benefit of creating an environment where new entrant generation and retail has the ability to identify where and how they might enter the Territory market. This means that such reporting is both comprehensive and accurate. To ensure that these essential criteria are met, there needs to be considerable independence in the preparation of reports.⁵³
- 3.112 A further benefit of system reporting is that it holds the system participant accountable for the information reported, potentially including through independent appraisal of planning and performance reports, by requiring explanation of variations in data over time, and by certification by the chief executive officer that the information meets all requirements.

⁵³ Northern Territory Major Energy Users submission to Issues Paper, page 25

Draft recommendation 3(a)

The Commission recommends the development and implementation of a framework for the reporting of comprehensive and authoritative power system information. This information would support acceptable reliability performance in the Territory's power systems.

Information that should be reported includes:

- system planning information, including demand forecasts, the adequacy of system capacity relative to forecast demand, adequacy of fuel supplies and other major security risks, and knowledge of planning and investment commitments. The planning instruments should replicate the purpose and characteristics of the AEMO ES00/PSA and NTNDP instruments for the NEM;
- health of the system information, including on system performance trends, regulatory and technical compliance and the findings of investigations into power system incidents; and
- the reliability outcomes experienced by customers.

It is recommended that the Territory's regulatory framework require a similar suite of instruments or reports as is available in the NEM. The important criteria are that the content of the reports is consistent with those available in the NEM, and that the data are available at a convenient time in the planning cycle.

Draft recommendation 3(b)

The Commission recommends that the reporting framework ensure appropriate independence in the preparation of reporting instruments. To ensure that reporting is both comprehensive and accurate there needs to be considerable independence in the preparation of reports, with parties held accountable for the information reporting. The responsible entity could be required to certify that the material presented is accurate (on a best endeavours basis). The data reported should be subject to oversight by an appropriate body to confirm that assumptions and forecasts are reasonable.

CHAPTER 4

Distribution network – planning, monitoring and reporting

- 4.1 The distribution network comprises the poles, wires, substations, transformers, switching, monitoring and signalling equipment used to transport bulk electricity from the transmission network to customers.

Distribution network planning

- 4.2 Distribution network planning involves identifying a credible future of network demand and supply to guide the decisions about managing and developing distribution network infrastructure so as to deliver a safe supply of electricity that meets reliability, security and quality standards at the lowest long term cost.
- 4.3 Distribution planning activities should support the identification of the most economic future investments for augmentation and expansion in the network (e.g. a suburb or industrial park) to maintain reliability on a cost effective basis. Distribution planning has a bottom up focus that looks at the capability of network infrastructure to meet current and future peak demand at the zone substation level, and potentially the feeder level.

Distribution network planning practices

- 4.4 Distribution network planning involves looking forward up to 10 years to compare the capacity of network infrastructure (e.g. substations, transformers and the poles and wires) with the forecast future peak demand, and to assist identification of the network infrastructure (or demand management) investment options.
- 4.5 Distribution network peak demand is influenced by the electricity consumption patterns in the substation service area. Therefore, a whole of network demand forecast is the aggregate of forecast loading/demand for individual substations, which is determined by factors including the household, business or industrial demand, residential subdivision development, air-conditioner penetration, if the area is CBD/urban/rural and the potential for large spot loads (energy intensive industry projects).
- 4.6 Forecasts of peak demand are used to inform decisions about infrastructure capacity and the management of the electricity network to ensure a reliable electricity supply to customers.
- 4.7 DNSPs operating elsewhere in Australia are generally obliged to report planning related information on an annual basis. The Ministerial Council on Energy announced in October 2010⁵⁴ that the AEMC was to develop Rules to establish a national (NEM)

⁵⁴ MCE Standing Committee of Officials, Bulletin No. 184, MCE Response: AEMC Review of a National Framework for Electricity Distribution Network Planning and Expansion, October 2010.

framework for distribution network planning and expansion, including requiring DNSPs to prepare distribution annual planning reports.

- 4.8 Oversight of the planning decisions and activities of a DNSP is a result of the natural monopoly characteristics of network infrastructure, and the potential for network related investment decisions to reflect a company's commercial interests, rather than the long term interests of customers. The purpose is to assist achievement of desired reliability outcomes expected through the regulatory bargain.

Effectiveness of Territory distribution planning

- 4.9 PWC Networks has supplied the Commission with a Network Planning and Reliability Report since 2009, in response to a Commission request for network planning and reliability information. Unlike other jurisdictions in Australia, the Territory's regulatory framework does not require the regular production of a report on network capability and future reliability performance.
- 4.10 The critical inputs to the planning activities of a DNSP are demand forecasts, the reliability standards to be achieved (i.e. the reliability outcomes that should be experienced by the customer) and asset capabilities including knowledge of the condition and management of assets).

Demand forecasts

- 4.11 The 2009-10 power system review looked at the demand forecasts developed by PWC Networks for each zone substation for 2010-11 to 2014-15. These forecasts were considered reasonable for the purpose of testing network infrastructure adequacy.
- 4.12 Nonetheless, the need for continuous improvement in the approach to demand forecasting for system planning purposes applies also to the development of network demand forecasts. As is the case with demand forecasts used for system planning purposes, basic load forecasts can be developed by conducting a trend analysis of historical loads to produce the future forecast. More sophisticated load forecasting practices and tools are now commonly used, with DNSP's applying standard weather corrections, econometric modelling, probabilistic techniques and scenario analysis.

Reliability and security standards

- 4.13 The Commission has foreshadowed specifying target network reliability outcomes as part of the network price determination process for the 2014-19 regulatory period. In particular, the Commission is considering establishing average and minimum performance standards for each of the feeder types in the distribution network.⁵⁵ PWC Networks would be responsible for translating these reliability targets into reliability criteria that are achieved through the capital and maintenance program.
- 4.14 Practice in Australia and in the Territory⁵⁶ is for the economic regulator to take into account the reliability and security standards applying to each network service provider

⁵⁵ Refer the Final Report for the Review of Electricity Standards of Service.

⁵⁶ The approach taken by the Commission in determining the revenues of PWC Network for the period July 2009 to June 2014 is available in a series of documents available from the Commission website, at http://www.nt.gov.au/ntt/utilicom/electricity/networks_pricing.shtml.

during the five yearly revenue determination process. These standards are set by each jurisdiction.

Asset management capability

- 4.15 A distribution network comprises an interconnected collection of assets and equipment that are spread across an extensive area. The management of this infrastructure is fundamental to the effective operation of the distribution network, and the delivery of a safe, reliable and cost effective electricity service.
- 4.16 Good asset management requires a firm to have coordinated information technology systems and practices that facilitate optimal and sustainable management of assets, their performance, risks and expenditures over their life cycles. A consequence of poor asset management is poor reliability of assets and poor customer reliability outcomes, such as more frequent and longer power outages.
- 4.17 PWC has an Asset Management Capability (AMC) project to acquire an integrated asset management system and geographic information system, supported by appropriate business processes, change management and data improvement. The AMC project should enable PWC to significantly improve the management of assets, risks and the delivery of services to customers by providing the systems and practices necessary to achieve good industry practice for asset management.

Views in submissions

- 4.18 The Issues Paper sought comment about whether:
- the reliability and security standards established by the Territory's regulatory framework can be made more explicit so as to effectively support optimal investment and performance outcomes; and
 - further or alternative arrangements are required to assist in achieving efficient and effective distribution network investment outcomes that ensure capacity will be adequate to maintain reliability of supply on a cost effective basis.

Northern Territory Major Energy Users

- 4.19 The NTMEU responded to the questions posed in the Issues Paper with the following comments relevant to distribution network planning:⁵⁷
- specific standards of performance for distribution networks are necessary, and should be set relative to outcomes experienced by customers. This would allow the DNSP to make informed choices about balancing cost to reliability;
 - introducing a regulatory investment test is an essential part of ensuring that investment is efficient and the outcome is provided at the least cost. A RIT-D would provide independent review of investment proposals, and provide a strong basis for limiting potentially sub-optimal network capital expenditure; and
 - there should be recognition that there may be a level where increased reliability is no longer cost effective. Traditionally this price point is referred to as the value of lost load or value of customer reliability. Unless such a price point exists it becomes impossible to carry out a comprehensive RIT evaluation. Therefore as part of the planning process, an appropriate price point must be developed.

⁵⁷ Northern Territory Major Energy Users submission to Issues Paper, pages 15, 18-19.

Power and Water Corporation

4.20 PWC responded to the questions posed in the Issues Paper with the following comments relevant to distribution network planning:⁵⁸

- PWC is working to improve its forecasting capabilities, and is considering adopting practices common to robust electricity forecasting;
- reliability and security standards are defined through the System Control Technical Code, Network Connection Technical Code and Network Planning Criteria. PWC Networks is reviewing the Network Planning Criteria, and plans to review the Network Connection Technical Code during 2011, and to revise and improve the five year Network Management Plan to incorporate the requirements of the annual power system review; and
- annual reporting against the Standards of Service Code demonstrates performance against reliability and security of supply standards;
- the network price determination process involves assessing the prudence and efficiency of the PWC Networks capital and maintenance programs. Adopting a forward looking building blocks approach would align with standard regulatory practice; and
- PWC continues to improve the planning, management and control of its capital and maintenance programs. Initially improved asset performance depends on the delivery of the current capital and maintenance programs. In the medium term, the PWC AMC project will provide PWC with a more detailed understanding of asset condition, criticality and capability.

Further thinking – distribution planning

4.21 Planning and developing the distribution network with the appropriate capacity is a necessary precursor to delivering reliable supply. Work undertaken for the AEMC as part of a Review of National Framework for Distribution Network Planning and Expansion included a survey of the common aspects of the distribution planning process:⁵⁹

- load forecasting. The DNSP will develop forecasts of maximum demand at zone substations (and possibly at feeder level), and forecasts of customer and annual energy consumption.
- constraints identification, to understand the current and future capability of individual assets against security and reliability standards. Network capacity, redundancy and performance should be adequate to meet peak demand conditions;
- options analysis, to assess the optimum timing and priority of augmentation, expansion or replacement projects. Companies have discretion about the nature and timing of an investment required to meet those criteria; and
- capital approval, programming and governance, starting with the process for approval of individual capital projects and capital programs, through to the final installation and commissioning, and ending with a post implementation report on

⁵⁸ Power and Water Corporation submission to Issues Paper, pages 3-4.

⁵⁹ This list of activities was developed with reference to good industry practice in the NEM, including as documented by SKM for the AEMC, May 2009, Advice on Development of a National Framework for Electricity Distribution Network Planning and Expansion Final Report.

the project cost, timing and effectiveness. The approach to program and project management is at the discretion of the company.

Reliability and security standards

4.22 A critical element of distribution planning is reliability and security standards which explicitly reflect a desired reliability outcome.

4.23 PWC Networks is required to adopt an N or N-1 network reliability criteria:⁶⁰

- the transmission network connecting major power stations to zone substations should be designed to meet the N-1 criterion, so that there is no loss of load with the loss of a network component; and
- the remainder of the network may be designed to the N criterion, so that the loss of a network component may cause the loss of all loads in the area.

4.24 PWC Networks investment decisions are guided by the Network Planning Criteria:⁶¹

The purpose of planning criteria is to help strike a balance between the user's need for a safe, secure, reliable, high quality electricity supply and the desire for this service to be provided at minimal cost.

4.25 PWC Networks is reviewing the Network Planning Criteria, and plans to review the Network Connection Technical Code during 2011. Before amending the Network Connection Technical Code or Network Planning Criteria in a material way, PWC Networks is required to undertake public consultation on the proposed amendments. Amendments are approved by the Commission.⁶²

Regulatory test

4.26 Economic regulation practice involves external oversight and involvement of distribution planning through the network price determination process, or a regulatory investment test (referred to as the RIT-T for transmission and the RIT-D for distribution network projects).

4.27 The NTMEU considers that the introduction of a regulatory investment test (for both distribution network and transmission network assets), together with a public assessment of the need for new investment, would provide a strong basis for limiting otherwise unfettered capital expenditure by a DNSP.⁶³

4.28 The RIT is part of an assurance that options for major developments are properly considered. The test is essentially a cost-effectiveness test to ensure that the least cost option is selected for implementation, after considering demand forecasts, operating risks and development alternatives including demand management.

4.29 The five yearly assessments by the Commission of the PWC Networks' capital base and proposed capital and maintenance programs as part of the network price determination process provides oversight of investment levels relative to reliability

⁶⁰ Network Connection Technical Code (v2), April 2003, s.2.7.

⁶¹ Network Planning Criteria (v2), April 2003, page 3.

⁶² Electricity Networks (Third Party Access) Code cl.9

⁶³ Northern Territory Major Energy Users submission to Issues Paper, page 18.

performance. This assessment may take account of the application of the regulatory investment test in accepting project expenditure for inclusion in the regulated asset base.

Asset management capability

- 4.30 The DNSP is responsible for the operation and management of the network. Planning and asset management require decisions about the selection, design/acquisition, operation, maintenance and renewal/disposal of assets. Get these decisions right and the outcome should be a reliable power supply at the lowest cost.

Draft recommendations – distribution planning

- 4.31 The Commission considers that distribution network planning is a core responsibility of the DNSP – PWC Networks. The critical requirement for effective distribution planning that supports acceptable reliability performance outcomes is that PWC Networks has asset management capabilities that reflect good industry practice. The PWC AMC project should provide the necessary asset management capabilities.
- 4.32 Good asset management should give PWC Networks the authoritative data needed to support optimal decisions (i.e. planning) for the augmentation and expansion of distribution network infrastructure to maintain security and reliability standards on a cost effective basis.
- 4.33 Inherent in asset management is the availability of robust demand forecasts, and authoritative data on the current and future capability and condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of the network on a cost effective basis.
- 4.34 Clearly defined distribution network reliability performance standards are needed to serve as a target for distribution planning purposes. The Commission's Review of Electricity Standards of Service proposed that reliability performance outcomes be established for generation, transmission and distribution networks, including establishing a Territory Reliability Standard (based on a certain level of USE) and network feeder reliability targets. Planning criteria should align with desired reliability outcomes.
- 4.35 A critical element of distribution planning is reliability and security standards which explicitly reflect a desired reliability outcome that is recognised as part of the regulatory bargain. Planning criteria should be explicitly linked to a desired reliability performance outcome and should be dynamic to reflect potential changes to customer expectations over time. A clear link between planning criteria, investment decisions and reliability outcomes would assist making PWC Networks accountable for reliability performance outcomes and the levels of capital and maintenance investment.
- 4.36 It is recommended that a Regulatory Investment Test be introduced for major network augmentation, based on the tests developed by the AER under the National Electricity Rules

Draft recommendation 4(a)

The Commission recommends the development and implementation of a framework that requires the routine publication of network planning data that replicates the purpose and characteristics of the annual planning instruments required of DNSPs in the NEM. The key components of these instruments would include:

- credible and dependable forecasts of future electricity demand and supply to identify possible future generation and transmission capacity constraints;
- based on clearly defined security and reliability standards that reflect the customer price and service level outcomes of the regulatory bargain; and
- authoritative data on the current and future capability and condition of infrastructure to inform decisions about the most economic future options for augmentation and expansion of infrastructure to maintain security and reliability standards across the supply chain on a cost effective basis.

Planning information should be updated regularly to provide a program of information collection, analysis and disclosure of power system security and reliability of supply prospects.

Draft recommendation 4(b)

The Commission recommends the development and application of clearly defined distribution network reliability standards and performance targets are needed to support network planning. The Commission's Review of Electricity Standards of Service proposed that reliability performance outcomes be established for generation, transmission and distribution networks, including establishing a Territory Reliability Standard (based on a certain level of unserved energy) and network feeder reliability targets.

Reliability and security of supply standards and planning criteria should be regularly reviewed to ensure that planning criteria reflect the desired reliability outcomes.

A Regulatory Investment Test should be introduced to ensure that network developments are subject to a cost-effectiveness evaluation.

Distribution network monitoring

4.37 Monitoring of the distribution network performance provides information about the operation and performance of network infrastructure. Monitoring activities assist to identify whether the performance of network assets is consistent with the targets established through the regulatory bargain, and to identify components of the network requiring maintenance or augmentation.

Distribution network monitoring practices

4.38 The Australian practice is for the DNSP to take primary responsibility for monitoring the condition and capability of network assets and to comply with technical performance requirements.

4.39 Oversight of network performance relative to reliability and security standards and technical parameters provides information about the health of the network and component assets. This information is useful for identifying possible improvements to

operating practices, informing maintenance schedules, for planning purposes (e.g. augmentation) and potentially to adjust reliability standards and targets.

- 4.40 For example, monitoring by the DNSP can highlight deficiencies in asset management policies and ageing or deteriorating assets that might have an adverse affect on reliability or security of supply.

Effectiveness of Territory distribution network monitoring

- 4.41 PWC Networks has made substantial improvements in asset management following the Davies Enquiry, with condition based monitoring of network assets now an established asset management practice.⁶⁴
- 4.42 However, improved condition assessment techniques and procedures have shown the condition of assets to be worse than anticipated, extending the time required for the initial condition assessment and remediation. PWC is taking steps to improve its understanding of the distribution networks, including by developing a system to provide a detailed understanding of asset condition, criticality and capability. This knowledge supports development of improved asset management strategies and detailed plans to achieve service level, reliability and supply security targets.⁶⁵
- 4.43 The benefits accruing from the PWC efforts to improve asset management capability are a more reliable and cost effective distribution network. A better knowledge of network health should assist identification of the optimal investment decisions. However, the benefits will likely become visible in the next five years and will require ongoing adherence to good industry asset management and monitoring practices.

Views in submissions

- 4.44 The Issues Paper sought comment about:

- whether the practices of the AER for monitoring compliance with behavioural and technical obligations should guide the development of compliance monitoring arrangements and practice in the Territory;
- if existing regulatory arrangements and approach to monitoring equipment capability and performance promote confidence that the capability of electricity infrastructure is well understood and that assets will perform as expected;
- the need for more comprehensive incident reporting arrangements; and
- if routine and comprehensive monitoring of distribution network performance is important to provide critical information about system security and reliability trends.

Northern Territory Major Energy Users

- 4.45 The NTMEU response to the questions posed in the Issues Paper about system monitoring are applicable to distribution monitoring (the response is summarised in paragraph 3.60).

⁶⁴ Refer Power and Water Corporation website for information on improvements resulting from the Davies Enquiry, http://www.powerwater.com.au/about_us/major_projects/power_supply_update,

⁶⁵ Power and Water Corporation, submission to Issues Paper, page 4.

Power and Water Corporation

4.46 PWC responded to the questions in the Issues Paper with comments indicating that monitoring is a compliance focused activity, and that PWC is developing a corporate-wide compliance framework, and is improving compliance processes.⁶⁶

Further thinking – distribution network monitoring

4.47 Monitoring highlights opportunities for improvement in operating practices and processes to support the achievement of desired reliability outcomes. Monitoring is essentially focused on compliance and the review of events to determine network health.

4.48 Monitoring is a central aspect of asset management. Oversight of the effectiveness of asset management can occur through:

- demonstrating compliance with technical parameters for network operation;
- investigation and reporting on distribution network incidents; and
- measuring performance trends.

Technical compliance

4.49 The Commission has been working closely with PWC since late 2009 to develop appropriate compliance processes for achieving and demonstrating compliance with regulatory obligations and technical parameters. The Commission has placed a priority on compliance with technical requirements, and PWC has reported on procedural compliance by generators and System Control with the System Control Technical Code.

4.50 The AER has a role in monitoring of the technical compliance of industry participants and the system operator in the NEM, and undertakes regular audits to determine if they have adequate compliance programs, and if their operating practices and equipment meet NEM technical parameters.⁶⁷ Oversight of technical compliance should assist the industry participants and system operator to identify actions that will contribute to the reliable and secure operation of the power system.

Incident reporting

4.51 Good industry practice involves the routine investigation of all incidents affecting reliability or security of supply by the business involved (i.e. the generator or DNSP). If the incident is a major outage affecting thousands of customers or there is evidence of a pattern of minor outages, then the system operator or an independent expert would investigate the event or pattern of events.

4.52 The purpose of establishing an obligation requiring the investigation of certain incidents is to provide greater visibility of events that adversely affect system reliability, thereby making the industry participants involved more accountable for the operation of the power system.

⁶⁶ Power and Water Corporation, submission to Issues Paper, page 5-6.

⁶⁷ National Electricity Rules, 4.15. Also refer Australian Energy Regulator, June 2009, Compliance and Enforcement – Statement of Approach.

Measuring performance trends

- 4.53 Electricity businesses collect reliability performance data to measure performance trends over time. This data is often reported by economic regulators, with a focus on electricity networks performance.
- 4.54 Such data show the reliability performance of each feeder, each feeder category (CBD, urban, short rural and long rural) and the network as a whole, and information about the performance over time.
- 4.55 The performance trend can inform the DNSPs capital and maintenance programs and investment plans, by highlighting areas of good and poor performance and drawing attention to factors potentially affecting reliability (e.g. asset age and condition, animals, environmental and weather conditions, and vegetation). The Commission considers that measuring performance trends is consistent with good industry practice, and that reliability performance data should be collected and analysed by electricity businesses irrespective of any regulatory obligation to do so.

Draft recommendations – distribution network monitoring

- 4.56 Monitoring highlights opportunities for improvement in operating practices and processes to support the achievement of desired reliability outcomes. Monitoring is essentially focused on compliance and the review of events to determine network health. This oversight assists the identification of actions that may contribute to the reliable and secure operation of the distribution network.
- 4.57 Similarly, the routine investigation and reporting of the cause and implications of distribution network incidents is appropriate to provide greater visibility of events that adversely affect system reliability (i.e. customers), thereby making the DNSP more accountable for the operation of the distribution network.
- 4.58 Monitoring, including incident reporting, should not require the DNSP to do anything that it should not already be doing in the normal course of business. Compliance with technical obligations and investigating and documenting the cause and implications of incidents supports achieving desired reliability outcomes on a cost effective basis.

Draft recommendation 5(a)

The Commission recommends that the DNSP be required to develop and maintain a compliance process. A robust compliance process is an important feature of network monitoring. PWC is working to establish processes consistent with good compliance practice based on AS3806. These efforts are supported. The Commission will continue to make compliance a priority.

Draft recommendation 5(b)

The Commission recommends the development and implementation of a mechanism for the investigation of relevant distribution network incidents.

Draft recommendation 5(c)

The Commission recommends a review of the processes and triggers for oversight and review of the technical obligations and parameters for the distribution network established through the regulatory framework (i.e. the Network Connection Technical Code).

Monitoring the operating practices and processes of the DNSP is essentially focused on compliance and the review of events affecting the reliability or security of the distribution network. Regular review and reporting on compliance with technical obligations and parameters is necessary.

Distribution network reporting

4.59 Distribution network reporting involves the routine release of comprehensive and authoritative data for industry participants, prospective participants, customers, regulators and policy-makers to:

- support planning and monitoring activities by providing data to assist identification of the optimal investment options, and to facilitate coordination of investment actions;
- advise on network performance against the price and service expectations of the regulatory bargain; and
- assist in holding electricity businesses accountable for reliability performance outcomes

Distribution network reporting practices

4.60 Reporting on distribution network performance is generally required at a jurisdiction level, with DNSPs generally required by state based legislation to prepare annual planning reports. An obligation for DNSPs to prepare annual planning reports is to be introduced in the National Electricity Rules.⁶⁸

⁶⁸ Ministerial Council on Energy, October 2010, Standing Committee of Officials Bulletin No. 184 MCE Response: AEMC Review of a National Framework for Electricity Distribution Network Planning and Expansion.

- 4.61 DNSPs elsewhere in Australia are required to produce annual network planning and performance reports to report on matters including the network operating environment (e.g. load growth forecasts, and summer time peak demand), network and asset management policies and practices, network reliability and performance and network capability and works planning. The content of these reports depends on the requirements imposed by the jurisdiction.⁶⁹
- 4.62 Reporting also includes annual standards of service performance reports on the performance of industry participants (mainly DNSPs and retailers) against the standards of service obligations imposed by each jurisdiction. The focus of these reports is the level of network reliability and customer service experienced by customers.⁷⁰

Effectiveness of Territory distribution network reporting

- 4.63 DNSPs operating elsewhere in Australia are generally obliged to report on an annual basis. PWC Networks has supplied the Commission with a Network Planning and Reliability Report since 2009, in response to a Commission request for network planning and reliability information. Unlike other jurisdictions in Australia, the Territory's regulatory framework does not require the regular production of a report on network capability and future reliability performance.
- 4.64 Reporting on distribution network planning and performance in the Territory occurs through the power system review and standards of service reports.

Views in submissions

- 4.65 The Issues Paper sought comment about whether:
- routine and comprehensive reporting of historical and forward looking information about distribution network is necessary to support effective planning and operation decisions, and timely and cost effective investment outcomes;
 - adopting more comprehensive and specific network reporting requirements would be beneficial by establishing an effective and flexible reporting framework that provides investors, customers and the Commission with a comprehensive understanding of network adequacy;
 - reporting on performance and health, including the outcomes of investigations of compliance with technical performance standards would encourage and support the efforts of PWC Networks and System Control to operate electricity infrastructure according to the standards required by relevant reliability and security criteria; and
 - reporting should facilitate the development and the coordination of planning activities throughout the electricity supply chain. This would involve reporting the

⁶⁹ Examples of jurisdictional requirements include, the Tasmanian Electricity Code cl.8.3.2 requires Aurora to prepare a Distribution System Planning Report; the NSW Electricity Supply (Safety and Network Management) Regulation 2008 requires NSW DNSPs and TNSP to prepare a Network Performance Report; and the Queensland Electricity Industry Code, cl.2.3 requires DNSPs to prepare a Network Management Plan.

⁷⁰ Examples of jurisdictional requirements include, the Independent Pricing and Regulatory Tribunal information papers on NSW DNSP and retailer operating statistics; Queensland Competition Authority reports on market customer statistics; and reporting by the AER of Victorian and Queensland DNSP reliability and quality of supply performance (following a transfer of this function from the state regulators).

key information necessary for investors to make informed and timely investment decisions.

Northern Territory Major Energy Users

4.66 The NTMEU responded to the questions posed in the Issues Paper with the following comments on distribution network reporting:⁷¹

- a lack of useful reporting by PWC reduces transparency about outcomes. Increased reporting, which is independently assessed and where PWC is held accountable, will greatly increase customer involvement in the electricity supply arrangements. Equally important is that it will provide potential new entrants with sufficient knowledge to make informed decisions about entering the Territory market;
- PWC Networks should be required to provide a comprehensive annual planning report which would be publicly available. To ensure that it is adequate for the needs of the electricity system it has to take into account the planning carried out by the System Controller and PWC Generation, with input from PWC Retail. Unless this integration is carried out the result will be a series of unconnected planning reports;
- an independent party needs to oversee the integration of information so that it is consistent over all elements. Independence in the coordination is essential to ensure that the outcome meets the core requirement of being consumer focused;
- there is a need for independent reporting of all significant incidents that occur in the power system (including the distribution network).

Power and Water Corporation

4.67 PWC responded to the questions posed in the Issues Paper, with the following comments relevant to distribution network reporting:⁷²

- PWC provides information and reports to the Commission that allow it to monitor, and where appropriate, report, on the performance of the Territory's electricity systems;
- the Commission needs to clearly articulate what reports are required, the content of these reports, the frequency of publication and who is required to produce these. Any proposals to require reporting against new templates and the provision of new reports needs to consider the organisational impacts on PWC and ultimately whether there will be benefits to electricity consumers.

Further thinking – distribution network reporting

4.68 A nationally consistent framework for reporting on distribution network planning decisions and performance is being developed.

4.69 The MCE announced in October 2010⁷³ that the AEMC was to develop Rules to establish a national (NEM) framework for distribution network planning and expansion, including requiring DNSPs to prepare distribution annual planning reports. The

⁷¹ Northern Territory Major Energy Users, submission to Issues Paper, pages 21-23.

⁷² Power and Water Corporation, submission to Issues Paper, page 7.

⁷³ Ministerial Council on Energy Standing Committee of Officials, Bulletin No. 184, MCE Response: AEMC Review of a National Framework for Electricity Distribution Network Planning and Expansion, October 2010.

proposed national arrangements would involve DNSPs reporting on an annual basis the following planning related information:⁷⁴

- forecasting information over the required planning period (typically five years). This would include capacity and load forecasts at the sub-transmission and zone substation level and, where they have been identified, overloaded primary distribution feeders;
- information on system limitations, including the location and timing, analysis of potential load transfer capability, impact on connection points, and potential solutions that may address each limitation;
- an explanation of the DNSP's planning methodology;
- information on investments that have been assessed under the RIT-D and all other committed projects with a capital cost of \$2 million or greater that were "urgent and unforeseen" or replacements and refurbishment projects;
- a description of the network, regional development plans, outcomes from joint planning undertaken with TNSPs and other DNSPs, performance standards and compliance against those standards, and a summary of the DNSP's asset management methodology; and
- a summary of the DNSP's activities and actions taken to promote non-network initiatives, including embedded generation, and inform on any significant investments in metering services.

4.70 In April 2011, the AER released a statement of approach on the priorities and objectives of electricity network service provider performance reports. The objectives of the reporting arrangements established by the AER are:⁷⁵

...performance reports will enhance the effectiveness of the regulatory regime and reflect the NEL [National Electricity Law] requirements to foster the achievement of the NEO [National Electricity Objective] through incentive based regulation. The AER considers this will be achieved through enhancing the transparency and accountability of NSPs, and facilitating performance improvements.

4.71 The AER priorities for network service provider reporting are to:⁷⁶

- report compliance with approved cost allocation methods, and elements of the regulatory determination, including service standards and incentive schemes;
- report forecast and actual outputs, including measures of network utilisation and asset age, to identify areas of performance that may be reviewed by the economic regulator;
- report forecast and actual capital and operating expenditure, and identify reasons for differences between forecast and actual expenditures;
- benchmark expenditure information to allow comparison of DNSP performance over time and between DNSP's, including in different jurisdictions;

⁷⁴ AEMC, Review of National Framework for Electricity Distribution Network Planning and Expansion, September 2009, page 27.

⁷⁵ Australian Energy Regulator, Statement of Approach: Priorities and objectives of electricity network service provider performance reports, April 2011, page 11.

⁷⁶ Australian Energy Regulator, Statement of Approach: Priorities and objectives of electricity network service provider performance reports, April 2011, page 12.

- compare the DNSPs' network operations, including service standard levels and demand management information;
- provide comprehensive, accurate and reliable information, enabling stakeholders to undertake analysis of performance and have confidence in the results of that analysis. Provide information over time to enable trends to be identified and comparisons of changes in performance, outputs and expenditures to be made between DNSPs;
- report DNSP profitability, comparing businesses within and across jurisdictions and regulatory control periods; and
- report information that can be utilised for future distribution determinations, including information on cost drivers, expenditure trends, service levels and variations in network performance.

4.72 Adopting nationally consistent reporting arrangements in the Territory would promote transparency about expenditure, decision making and service levels. This would assist in holding PWC Networks accountable for reliability outcomes and strengthen incentives for improved performance.

4.73 These national reporting arrangements would increase the reporting requirements for PWC Networks. However, as noted by the AER, information reporting costs will be incrementally higher for DNSP's not currently subject to information reporting of a comparable standard to developing industry practice. PWC Networks is not currently obliged to report an equivalent level of information as is being required of DNSPs in the NEM (and already applies to DNSPs in some NEM jurisdictions) to reflect developing industry practice. Therefore, adopting good industry practice will increase the level and cost of reporting by PWC Networks.

4.74 The cost of additional reporting would be offset by enhanced oversight of planning and performance, thereby reducing the risk of the distribution network being degraded to a point where urgent remedial expenditure is required to avoid systemic asset failure. This oversight may also encourage PWC Networks to adopt more efficient processes and technologies to provide network services that meet reliability and quality of supply targets on a cost effective basis.

Draft recommendations – distribution network reporting

4.75 More comprehensive and specific distribution network reporting requirements in the Territory would promote transparency about expenditure, decision making and service levels. This would assist in holding PWC Networks accountable for reliability performance outcomes relative the price and service expectations of the regulatory bargain and strengthen incentives for improved performance.

4.76 The overriding benefit would be enhanced oversight of planning and decision making, thereby reducing the risk of the distribution network being degraded to a point where urgent remedial expenditure is required to avoid systemic asset failure. The increased oversight may also encourage PWC Networks to adopt more efficient processes and technologies to provide network services that meet reliability and quality of supply targets on a cost effective basis.

4.77 The reporting framework would support network price determinations by providing regular, consistent and comprehensive data on network operation and performance.

4.78 There has been considerable work on reporting arrangements for the NEM. The Commission considers that the national network reporting requirements provide a sound basis for arrangements in the Territory. In particular, the Territory should be guided by the framework resulting from the AEMC Review of National Framework for Electricity Distribution Network Planning and Expansion and the AER statement of approach on network performance reporting.

Draft recommendation 6(a)

The Commission recommends the development and implementation of a framework for the reporting of comprehensive and authoritative distribution network information to support acceptable reliability performance outcomes in the Territory's distribution networks.

Information to be reported should include:

- a network planning and performance report, with the contents reflecting the purpose and characteristics of national arrangements; and
- reliability outcomes experienced by customers.

There has been considerable work on reporting arrangements for the NEM. The Commission considers that the national network reporting requirements (the national annual planning reports and AER network performance reports) provide a sound basis for arrangements in the Territory.

Draft recommendation 6(b)

The Commission recommends that the reporting framework ensure appropriate independence in the preparation of reporting instruments. To ensure that reporting is both comprehensive and accurate there should be appropriate independent oversight of the reports, with the ability to test the accuracy of statements and assumptions. The responsible entity could be required to certify that the material presented is accurate (on a best endeavours basis).

CHAPTER 5

Implementation

Requirements of the terms of reference

- 5.1 The terms of reference require the Commission to recommend a course of action and provide detailed plans for implementation of that recommendation.
- 5.2 Implementation considerations include:
- options for implementing draft recommendations; and
 - assessment of costs and benefits of the proposed arrangements.

Options for implementing draft recommendations

- 5.3 The options for implementing the draft recommendations include:
- to establish a planning, monitoring and reporting framework using existing heads of power, such as those contained in the *Electricity Reform Act*, s45, and potentially the heads of power existing to apply a standards of service framework;
 - to introduce the proposed arrangements through an Electricity Industry Code requiring the development of a planning, monitoring and reporting framework consistent with the Commission's proposals.
- 5.4 The proposed planning, monitoring and reporting arrangements might potentially be applied using authority under existing heads of power. For example, amongst other things, the *Electricity Reform Act*, s45 requires the Commission to report on the performance of the Territory's power system and distribution networks. The Commission may request industry participants to assist the Commission in this exercise. This provision might potentially provide the Commission with the ability to require the development and publication of reports detailing system and distribution network planning and monitoring information (as this information is relevant to performance).
- 5.5 However, arrangements of this nature are probably more appropriately established through explicit and specific instruments, such as an Electricity Industry Code. This approach would reflect the policy intent of the regulatory framework, and would create more certainty about the form and nature of the arrangements.
- 5.6 A more detailed course of action for implementation will be developed for the final report.

Assessment of costs and benefits of proposed arrangements

- 5.7 This assessment of the costs and benefits of the proposed arrangements is necessarily qualitative as the data to quantify the costs and benefits is not currently available to the Commission. The assessment is based on the Commission's knowledge of experience and practice elsewhere in Australia.

- 5.8 The Commission recognises that the draft recommendations will increase the level and cost of planning, monitoring and reporting by the Territory electricity industry. However, the proposed arrangements are not for the sake of information gathering but, in line with good industry practice, as a necessary means to ensure a well run electricity sector that delivers an appropriate level of service at an appropriate price to customers. The obligations are no more than should already be in place in a well-governed

Assessment of costs and benefits of planning activities

- 5.9 Planning involves costs for electricity businesses, such as by obtaining and maintaining the systems and capability to collect and report asset condition and performance data and to develop demand forecasts. However, these costs would be offset by the benefits arising from informed decisions that result in optimal investment outcomes.
- 5.10 Effective planning should result in effective asset management that involves a business investing in the right assets at the right time, exploiting assets appropriately and ultimately replacing assets at the end of their economic life. This approach should deliver a capital and maintenance program that delivers an electricity supply consistent with the reliability standards and the price and service expectations of the regulatory bargain.

Assessment of costs and benefits of monitoring activities

- 5.11 Monitoring, including incident reporting, should not require electricity businesses in the Territory or the System Controller to do anything that they would not already be doing as best practice in the normal course of operations. Compliance with technical obligations and investigating and documenting the cause and implications of power system incidents is a routine operating practice of a generator and system operator, and is critical to achieving desired reliability outcomes on a cost effective basis.
- 5.12 The data obtained through monitoring activities can provide forewarning of potential reliability or security problems along the electricity supply chain and should assist effective asset management.

Assessment of costs and benefits of reporting

- 5.13 Reporting involves costs to collect, analyse and report data. However, these costs should be offset by the benefits of having authoritative and comprehensive data when making investment decisions. Further, reporting should provide the electricity business with the data to properly justify and explain to customers, regulators and shareholders their revenue and price claims.