



# REVIEW OF WHOLESALE ELECTRICITY GENERATION MARKET ARRANGEMENTS FOR THE NORTHERN TERRITORY

A report to the Minister on an inquiry undertaken in  
accordance with Part 7 of the *Utilities Commission Act*

## FINAL REPORT

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February 2014

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## Table of Contents

Table of Contents.....	i
Purpose of this Report .....	ii
Acronyms and Abbreviations .....	iii
<b>Commission’s Recommendations</b> .....	<b>1</b>
Draft Report and Consultation Process.....	5
<b>Key Findings</b> .....	<b>7</b>
Establishing a Northern Territory Electricity Market .....	10
<i>ATTACHMENT A – Terms of Reference from the Regulatory Minister</i> .....	21
<i>ATTACHMENT B – Final Report Wholesale Electricity Market Review by Oakley Greenwood</i> .....	23
<i>ATTACHMENT C – High level comparison of key market design options</i> .....	24

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## **Purpose of this Report**

This Final Report, prepared by the Utilities Commission (Commission), recommends wholesale electricity generation market arrangements to improve electricity supply in the Northern Territory in accordance with objectives set out in the Terms of Reference provided with a notice for inquiry from the Treasurer, who is the Regulatory Minister (Minister), issued on 23 September 2013 in accordance with Part 7 of the *Utilities Commission Act* (the Act).

The Final Report should be of interest to market participants and potential market participants in the Territory, the wider Australian electricity industry, relevant government agencies and parties who contributed to the consultation process for the review.

## **Tabling of Final Report in Legislative Assembly**

The Minister must cause a copy of this Final Report to be tabled in the Legislative Assembly within six sitting days after receiving the report.

The Report will be made publicly available on the Commission's website once tabled by the Minister.

## **Reform Package for the Northern Territory electricity industry**

The review of wholesale electricity generation market arrangements for the Territory is part of a wider reform program initiated by the Territory Government to improve the efficiency of the electricity industry.

## **Inquiries**

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## Acronyms and Abbreviations

<b><i>Term</i></b>	<b><i>Definition</i></b>
AACL	ACIL Allen Consulting
The Act	Utilities Commission Act
AEMO	Australian Energy Market Operator
AEMC	Australian Energy Market Commission
AER	Australian Energy Regulator
ALEC	Arid Lands Environment Centre
Commission	Utilities Commission of the Northern Territory
DME	Northern Territory Department of Mines and Energy
EDL	Energy Developments Limited
ESAA	Energy Supply Association of Australia
ETU	Electrical Trades Union
IMO	Independent Market Operator (Western Australia)
LMP	Locational Marginal Pricing
NEM	National Electricity Market
NTEM	Northern Territory Electricity Market (proposed market design)
NER	National Electricity Rules
PWC	Power and Water Corporation
PWC Generation	The generation business unit of PWC. To be established as a stand-alone government owned corporation from 1 July 2014
PWC Retail	The retail business unit of PWC. To be established as a stand-alone government owned corporation from 1 July 2014
RAM	Reliability Assurance Mechanism
WA WEM	Western Australian Wholesale Electricity Market

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## Commission's Recommendations

### *Introduction*

1. This Final Report outlines the Commission's review and recommendations related to an inquiry on appropriate electricity wholesale market arrangements for the Northern Territory. The review was undertaken in accordance with Part 7 of the *Utilities Commission Act*.
2. In undertaking the review and framing its recommendations, the Commission has made several assumptions regarding the structure of the Territory electricity market:
  - structural separation between Power and Water Corporation (PWC) Generation and PWC Retail (the Territory Government is now proceeding with implementation of such structural separation from 1 July 2014);
  - legal separation of PWC Gas Unit from PWC Generation; and
  - functional independence of System Control from PWC Networks.
3. The Commission's recommendations are based on its key findings regarding the market model that would be suitable for, and applicable to, the Territory.
4. The Terms of Reference (included at Attachment A) for the review require that the Commission makes recommendations on preferred wholesale electricity market arrangements for the Territory. The Commission is also required to provide recommendations regarding the design and rules that could be adopted initially in the Darwin-Katherine generation market.
5. The Terms of Reference also specify that the preferred wholesale market arrangements are to be:
  - based on the achievement of specified market objectives;
  - compatible with the Territory Government's package of electricity supply industry reforms, including greater alignment of the Territory's regulatory framework with the National Electricity Market (NEM), transfer of network regulation to the Australian Energy Regulator (AER) and adoption of the National Electricity Rules (NER); and
  - suitable for the Territory's circumstances and capable of cost-effectively replacing sole reliance on bilateral contracting.
6. Other sections of this report detail the Commission's consideration of the issues relevant to the review. The Commission has concluded that the market design and framework as proposed by its consultant for the review, Oakley Greenwood, represents an appropriate set of wholesale market arrangements for the electricity industry in the Territory consistent with the Terms of Reference. A copy of Oakley Greenwood's final report is provided at Attachment B to this report.
7. The Commission's specific recommendations arising from the review are as follows.

### *Market Design*

8. The Commission recommends the adoption in the Territory (initially in the Darwin-Katherine system, with later application to Alice Springs and Tennant Creek), of a Northern Territory Electricity Market (NTEM) as outlined in this Final Report, with the following key characteristics:
  - (a) separate reliability assurance and energy trading mechanisms; with

- (b) the reliability assurance mechanism (RAM) to involve:
- i. a central reliability assurance contracting body, setting minimum requirements for generating and controllable demand side investment to meet pre-determined reliability standards for the Territory;
  - ii. a regular tendering process for owners of generating and demand side capacity to submit offers to contract with the reliability body or submit notice that contracts have been entered into with customers for an equivalent amount of capacity;
  - iii. term of contracts to reflect a balance between investment certainty and prevailing supply/demand balance; and
  - iv. reliability assurance contracts to be financial in nature and to impose a financial penalty on holders of a contract which does not have capacity available for operation when reserve is low.

- (c) the energy trading mechanism to involve:

- i. a security constrained gross dispatch pool, similar to the NEM;
- ii. dispatch based on availability submissions from generators with prices initially required to be no more than demonstrable short run cost (with guidelines on how to assess costs);
- iii. a marginal clearing price from real time operation; and
- iv. settlement of the pool to allow for gross or net volumes at the discretion of market participants.

9. The Commission notes that implementation of a market with these characteristics will require the resolution of many issues of detail (as discussed in this Final Report) concerning both the application of the proposed RAM and energy trading approaches. These details, which were the subject of many submissions on the Draft Report, will need to be further analysed as part of the NTEM design and implementation phase (refer recommendations below). On the basis of the current considerations, the Commission makes the following recommendations:
- (a) Ancillary Services to be incorporated into the NTEM on a contract basis (rather than co-optimised with energy trading);
  - (b) Marginal Loss Factors for the NTEM to be based on NER processes; and
  - (c) market power of PWC Generation to be controlled through bid price restrictions.

#### *Roles and Responsibilities*

10. The Commission recommends that the following key roles, necessary to support implementation of the NTEM, be established within the residual PWC (the remainder of PWC after separation of the generation and retail business units) but with appropriate independence:
- (a) System Controller – builds on the existing System Control role to include real time power system operation and management of pre-dispatch under the NTEM;
  - (b) Market Operator – manages participant registration, prudential requirements, market settlement and metering data under the NTEM and should be closely linked to System Control;

- (c) Reliability Manager – manages reliability assurance tenders and contracts, with reference to defined reliability and technical standards and should be closely linked to the Market Operator; and
  - (d) Gas Supplier – manages the current gas contracting role.
11. The Commission notes that two additional key roles will need to be established to support implementation of the NTEM. These roles involve market monitoring and enforcement, and market rule-making, including setting of reliability and technical standards. The Commission recommends that involvement of relevant NEM bodies (AER and the Australian Energy Market Commission (AEMC)) in carrying out these roles be explored as part of the NTEM implementation process. The Commission further recommends that consideration be given to involvement of the Australian Energy Market Operator (AEMO) in some aspects of the System Control and Market Operator functions.

#### *Rules*

12. The Commission recommends that the NER form the basis for the establishment of formal rules and procedures for the NTEM. A high-level overview of changes to the NER that would be necessary to accommodate the NTEM is detailed in this Final Report. The Commission notes relatively simple amendments to existing Territory regulatory arrangements (System Control Technical Code, Network Technical Code, and Electricity Retail Supply Code) could possibly enable interim establishment of energy trading arrangements that are more robust and transparent than current arrangements and that have the basic features of the proposed NTEM energy trading procedures. The Commission recommends that such interim arrangements be considered as part of the design and implementation phase, although it notes that these arrangements would not be a long-term alternative for a competitive electricity market, particularly due to the absence of a capacity mechanism, and may therefore not provide the level of certainty required to attract new-entrant market participants.

#### *Implementation and Transition*

13. The Commission recommends that NTEM implementation be closely integrated with other key elements of the current electricity industry reform process in the Territory, including structural and regulatory reform.
14. The Commission emphasises that attention to detail will be important in ensuring effective wholesale market arrangements are established in the Territory, even though the proposed NTEM draws significantly on NEM arrangements, and key market roles could be placed within the residual PWC (following structural separation of PWC Generation and PWC Retail). Consequently, the NTEM implementation timeframe will need to be realistic (one to two years) and the process will need to be adequately resourced. The NEM institutions (AER, AEMC and AEMO) should be involved as much as possible in the implementation process, particularly given the desirability of these institutions taking up roles within the NTEM.
15. The Commission recommends establishment of a dedicated planning and implementation team, with representation from key agencies, to oversee NTEM implementation. One aspect of the project team's role would be to consider and make recommendations to the Territory Government on legislative requirements to give effect to the NTEM. Other major tasks (as detailed in this report) would include:

- overseeing the establishment of relevant market bodies within the residual PWC business (System Control, Market Operator, Reliability Manager, Gas Supplier);
  - establishing market rules (based on the NER), including provisions for NTEM energy trading and reliability assurance arrangements, and provisions for various technical standards suitable for the Territory (reliability, power system performance, connection/plant performance) and for commercial provisions;
  - establishing ancillary services and network support contracts; and
  - liaising with the AER, AEMC and AEMO regarding implementation issues and the involvement of these organisations in aspects of NTEM operation.
16. A planning and implementation team should consider and make recommendations to the Territory Government at an early stage, on whether or not it would be appropriate to proceed with interim market arrangements, based on amendments to existing Territory regulatory arrangements, as noted above. While an interim market could provide a useful learning experience for relevant market participants, the required resources and timeframe (estimated at least six months) for its development might detract from longer term NTEM development and alignment with the NER, both of which the Commission considers to be highly desirable in future.
  17. While the NTEM as recommended by the Commission is a market arrangement specific to the Territory, it is closely based on key aspects of the NEM, and the Commission recommends that the rules to give effect to the NTEM be based on the NER. There is the prospect that NEM institutions might most usefully be involved in aspects of NTEM operation. Furthermore, the Territory Government has already committed to transferring economic regulation of electricity networks in the Territory to the AER under the NER, and it is likely that other provisions of the NER (for example, system planning and reporting, retail market operation and the consumer protection framework) could be applied to the Territory. Therefore, the Commission recommends that the possibility of the Territory formally joining the NEM be kept under review by the Territory Government.
  18. The Commission would be prepared to take up a role in implementation of the NTEM. This would require the appropriate authorisation in accordance with the Act, together with necessary resourcing.

## Background

19. The Commission is an independent statutory authority responsible for economic regulation of the electricity supply industry in the Territory, and is governed by the Act, the *Electricity Reform Act* and associated legislation.
20. Part 7 of the Act requires the Commission to conduct an inquiry into any matter that the Minister, by written notice, refers to the Commission. Part 7 also establishes processes for the conduct of such an inquiry.
21. On 23 September 2013, the Commission received notice from the Minister under Part 7 of the Act requesting that the Commission conduct a review into wholesale electricity market arrangements that are appropriate for the Territory, and to recommend preferred arrangements. The Terms of Reference were subsequently amended by the Minister on 8 November 2013 to provide for a reporting date of 28 February 2014. .



22. The referral from the Minister identified that, in undertaking the review, the Commission should consider the following market objectives:
  - (a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services of the Territory;
  - (b) to facilitate competition among generators and retailers in the Territory's electricity system, including by enabling efficient entry of new competitors;
  - (c) to minimise the long-term cost of electricity supplied to customers from the Territory's electricity system; and
  - (d) to encourage the use of measures that more efficiently manage the volume of electricity used including the variations between peak and average loads.
23. The referral from the Minister noted that the NEM is an established best practice regulatory framework that has been developed over a decade and provides a reference point for the Territory's future regulatory framework.
24. The referral also noted that the Commission should have consideration for the Territory Government's package of electricity supply industry reforms, including greater alignment of the Territory's regulatory framework with the NEM, transfer of network regulation to the AER and adoption of the NER.
25. The Minister requested that the Commission consider the applicability of other wholesale market arrangements (including the NEM and the South West Interconnected System of Western Australia that may be suitable to the Territory's circumstances and capable of cost-effectively replacing sole reliance on bilateral contracting. The Commission was to provide recommendations regarding the design and rules that could be adopted initially in the Darwin-Katherine generation market.
26. The review Terms of Reference provided the key guidance to the Commission in undertaking the inquiry. However, the Commission has also had regard to section 6(2) of the Act in undertaking the review; section 6(2) requires that, in performing its functions, the Commission must have regard to the need to:
  - (a) promote competitive and fair market conduct;
  - (b) prevent misuse of monopoly or market power;
  - (c) facilitate entry into relevant markets;
  - (d) promote economic efficiency;
  - (e) ensure consumers benefit from competition and efficiency;
  - (f) protect the interests of consumers with respect to reliability and quality of services and supply in regulated industries;
  - (g) facilitate maintenance of the financial viability of regulated industries; and
  - (h) ensure an appropriate rate of return on regulated infrastructure assets.
27. The Commission engaged the consultant firm Oakley Greenwood to assist in the review due to its significant experience with market design both in Australia and internationally.

## **Draft Report and Consultation Process**

28. On 23 December 2013, the Commission released for consultation its Draft Report on the Review of Wholesale Electricity Generation Market Arrangements together with a

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draft report from Oakley Greenwood on suitable market arrangements for the Northern Territory's wholesale electricity market.

29. The Commission sought submissions from stakeholders on the Draft Report and, in particular, comments on the following key areas of interest:
  - the proposed establishment of an NTEM with separate reliability assurance and energy trading mechanisms;
  - establishment of a RAM to ensure relatively stable market prices based on cost of production, and of a Reliability Manager;
  - an energy trading mechanism;
  - establishment of an independent market operator function;
  - clarification of the roles and independence of System Control;
  - the development of market rules, using the NER as a template;
  - proposed implementation options, including possible interim arrangements and transition path; and
  - any other areas of interest in the Draft Report.
30. The Commission also undertook further consultation and briefings with Territory Government stakeholders and System Control. It also consulted with potential generators with interest in entering the Territory market, with these discussions noted as commercial-in-confidence.
31. Submissions closed on 28 January 2014. A number of late submissions were received and the Commission has also considered these submissions.
32. The Commission received 10 submissions from the following stakeholders:
  - Power and Water Corporation (Generation, System Control and Retail business units provided input into the submission);
  - Australian Energy Market Operator (AEMO);
  - QEnergy Limited (QEnergy);
  - Energy Developments Limited (EDL);
  - Northern Territory Department of Mines and Energy (DME);
  - Energy Supply Association of Australia (ESAA);
  - Electrical Trades Union (ETU);
  - ACIL Allen Consulting (AACL);
  - Environment Centre NT (ECNT); and
  - Arid Lands Environment Centre Incorporated (ALEC).
33. This is a significant number of submissions for a review by the Commission and indicates a strong level of interest in the subject matter and findings of the review. The Commission thanks each of the organisations that made submissions to the Draft Report. All submissions are available on the Commission's website.
34. The submission from PWC identified some commercial-in-confidence information. This information was redacted prior to publication.
35. This Final Report identifies issues raised in the submissions on the Draft Report, details the Commission's further consideration of these issues, and provides the Commission's findings and recommendations in relation to the Terms of Reference of the review. Oakley Greenwood's final report also clarifies issues raised in submissions received on the Draft Report.

36. In preparing this Final Report, the Commission has considered each of the submissions received. Where appropriate, the Commission has, either by direct quotation or by reference to themes or arguments, mentioned certain submissions in the text to assist stakeholders to understand the positions it has reached; however, a failure to reference an argument or submission does not mean that the Commission has not taken that argument or submission into account in its deliberations.
37. The Commission notes that, while most submissions sought clarification of various aspects of the proposed market design and some submissions recommended alternative approaches, there was broad agreement that there are significant benefits from introducing competition to the Territory's wholesale electricity generation market.
38. Oakley Greenwood and the Commission consulted with a range of stakeholders, authorities and individuals with previous experience working in the Territory and individuals with specific expertise in wholesale electricity market design.
39. The Commission notes that submissions were received from the ESAA, the peak industry body for the stationary energy sector in Australia and representing the policy positions of the Chief Executives of 36 electricity and downstream natural gas businesses; and from AEMO, operator of the NEM, with significant experience in electricity market design.

## Key Findings

40. The Commission notes that appropriate structural separation and wholesale market reform work hand in hand. It would be difficult to apply wholesale market reform without structural separation.
41. Previous reviews by the Commission have identified an over-supply of (inefficient investment in) generation plant<sup>1</sup>, which is likely to result in higher wholesale electricity prices paid for by customers on cost-reflective tariffs. The Commission's view is that this is primarily due to the absence of generation competition and electricity market processes that incentivise industry participants to determine efficient levels of energy supply and generation investment.
42. As a developing economy, with potential to grow rapidly in large steps, there are opportunities for new electricity generation and retail participants to enter the Territory market, but current bilateral contracting arrangements (between PWC Generation and retailers) constitute a potential barrier to entry of new participants into the market.
43. There is a need for processes used by PWC for generation pricing and generator commitment and dispatch to be made more transparent and better aligned with good industry practice.
44. The NEM is widely recognised as an example of good industry practice in relation to wholesale market arrangements. However, due to the current characteristics of the Territory market, applying the energy-only NEM design would not result in efficient outcomes for generation investment in the Territory as long as prices can be influenced

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<sup>1</sup> The 2011-12 Power System Review identified that the three regulated systems are expected to have sufficient generation capacity to maintain supply under any credible electricity demand scenario. The Darwin-Katherine system is not expected to need new capacity until 2019-20 while Alice Springs and Tennant Creek systems will not require new capacity until 2020-21.

by a single dominant generator (PWC Generation). It is necessary for regulatory measures to be put in place to control the real or perceived market power that might lead to inappropriate prices.

45. Until such time as the Territory market matures and competitive forces drive investment decisions, a mechanism is required to ensure that appropriate generation capacity is available to deliver the supply level required to meet predetermined power system reliability standards. This mechanism should be separate from the mechanism used to determine real-time energy prices and should focus on forward contracting for capacity and reserve. The wholesale market model recommended by the Commission in this Final Report (termed NTEM) thus specifies separate reliability assurance and energy trading mechanisms.
46. The processes currently used by PWC for generator dispatch (security constrained economic dispatch) are broadly consistent with processes used in other Australian wholesale markets, including the NEM, and these processes do not need to be re-invented. The recommended model seeks to expand, document and make transparent the decisions made in relation to generator dispatch.
47. The Commission notes that the model requires the establishment of new roles to manage reliability assurance and market operation, including functions that manage participant registration, prudential requirements, market settlement and metering data. For practical and cost-effective purposes, it is reasonable for these roles to be grouped with an independent System Control, with potential for the roles to transfer to AEMO at a later stage. Such a grouping of roles was also supported by AEMO and PWC in submissions. The Commission is conscious that additional resourcing and skills would be required by System Control to administer the new roles. There is significant benefit in engaging with AEMO to support the establishment and administration of these roles.
48. The Commission considers that the design to establish an NTEM meets the four market objectives identified in the Terms of Reference for the review. Certain parts of the design were chosen because of the ability to use the NEM as a template for market rules with which market participants in the NEM (and potential Territory market participants) are familiar.
49. The Commission's view is that the NTEM satisfies the market objectives as follows:
  - (a) *to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services of the Territory*

The proposed market design seeks to drive economic efficiency gains through a mix of competitive forces and regulation (to control market power and to ensure reliability standards are met). Allowing generators to tender for the provision of capacity to meet predetermined reliability standards will focus industry participants on providing economically efficient levels of electricity supply. Placing the planning requirements for the capacity of the power system with an operator which is independent of market-exposed concerns will also promote greater focus on the level of electricity supply that efficiently balances demand.

- (b) *to facilitate competition among generators and retailers in the Territory's electricity system, including by enabling efficient entry of new competitors*

The proposed market design will improve the transparency of processes used between generators and other electricity industry participants (System Control, networks and retailers) and should provide potential new generators with greater confidence that they will be able to compete with other incumbent generators,

including government owned utilities, on a level playing field. The proposed arrangements will also facilitate competition between generators and thereby boost retail competition in the Territory.

- (c) *to minimise the long-term cost of electricity supplied to customers from the Territory's electricity system*

The proposed market design should provide the necessary forward planning to ensure that generating capacity meets load requirements in an efficient manner. The planning function of the proposed capacity mechanism, if properly implemented, should address the over-investment that now exists in the Territory's electricity generation sector, thereby placing downward pressure on long-term electricity costs. Greater competition between rival generators will also focus participants on minimising their own costs to receive payment from the market.

- (d) *to encourage the use of measures that more efficiently manage the volume of electricity used including the variations between peak and average loads*

The proposed market design will assist in driving wholesale electricity costs in the Territory to efficient levels. Provided that retail prices paid by consumers are based on efficient costs (including wholesale costs), then consumers receive appropriate signals about electricity consumption and demand response. The reliability assurance mechanism of the proposed design could incorporate demand response measures, although the details of this would need to be explored during the design and implementation phase.

The Commission endorses a view expressed in submissions that “*energy efficiency should be treated as a resource and encouraged, to compete to ensure the market achieves its full potential for competitiveness and efficiency*”<sup>2</sup>.

50. The Commission acknowledges that other alternative designs may meet (or partly meet) the objectives specified in the Terms of Reference for a wholesale market, some of which were noted in submissions, and Oakley Greenwood have included further comments in their final report about the alternatives raised. The Commission engaged Oakley Greenwood because of its experience with market designs, including alternatives used in Australia and overseas. While alternative market designs were addressed as part of this review, to explore the alternatives fully would require significantly more time than was allowed for the review. The Commission considers that the design proposed by Oakley Greenwood is appropriate, as it applies relatively simple design elements that can be implemented using the NER as a template.
51. The Commission acknowledges that any change to wholesale electricity market arrangements is a major undertaking for any electricity industry and its stakeholders. Ensuring the appropriate rules are established and well understood by market participants is complex and the effort required for detailed design and implementation should not be underestimated. The Commission notes that to review each element of the NER and apply Territory-specific provisions to implement the NTEM would require dedicated resources and time, most likely at least one to two years. Oakley Greenwood has identified amendments that would be required to adapt the NER to the NTEM in

<sup>2</sup> Environment Centre NT submission, page 2, received Friday 24 January 2014.

relation to real-time pricing. Other aspects of the NTEM not covered by the NER would need Territory-specific rules to be established.

52. The Commission considers that a full review of the NER to determine its applicability to the Territory will be essential, and the size of this task is significant. As identified by AEMO in its submissions, "...*the interconnected nature of the NEM Rules will need to be studied, and selective deletion of redundant sections will require considerable skill and effort*<sup>3</sup>". The Commission's view is that, in reviewing the NER and considering the potential role for national bodies in the administration and regulatory control of the NTEM, there is also benefit in exploring other aspects of the NER that could benefit the Territory, such as power system planning and reporting, retail market operations and the customer protection framework.
53. Oakley Greenwood identified an option for implementing an interim energy trading mechanism of the NTEM that would involve amendments to the existing System Control Technical Code, Network Technical Code and Electricity Retail Supply Code. The Commission considers that this approach is feasible and may expedite the introduction of an energy trading mechanism.
54. A design and implementation team should consider and make recommendations to the Territory Government at an early stage on whether or not it would be appropriate to proceed with interim market arrangements. While an interim market could provide a useful learning experience for relevant market participants, the required resources and timeframe (estimated at six months) for its development might detract from longer term NTEM development. Other aspects of the NTEM, including the RAM, would need to be considered separately.
55. The interim market option could be a useful learning experience for relevant market participants and begin a culture of change in the Territory electricity industry. However, the interim market is not a long-term alternative for a competitive electricity market and may detract from longer term NTEM development by diverting focus and resources from the more complex task and alignment with the NER, both of which the Commission considers to be highly desirable in the future. The adoption of an interim market also may not give potential market participants the necessary certainty to enter the market.

## **Establishing a Northern Territory Electricity Market**

56. The NTEM proposed by the Commission for a wholesale electricity market seeks to achieve the following market objectives specified in the review Terms of Reference:
  - (a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services of the Territory;
  - (b) to facilitate competition among generators and retailers in the Territory's electricity system, including by enabling efficient entry of new competitors;
  - (c) to minimise the long-term cost of electricity supplied to customers from the Territory's electricity system; and

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<sup>3</sup> Australian Energy Market Operator submission, page 3, received on Tuesday 28 January 2014.

- (d) to encourage the use of measures that more efficiently manage the volume of electricity used including the variations between peak and average loads.
57. In developing the NTEM, the Commission has also had regard to various Territory Government policy decisions, including structural separation of PWC Generation and PWC Retail to stand-alone government owned corporations and the Territory Government's intention to adopt national arrangements for network price regulation.
58. The NTEM aims to facilitate entry of independent (merchant) third-party generators and retailers, including integrated gen-tailers. Several alternative market designs including the single buyer model, nodal pricing and mandatory contracting were proposed in submissions to the review (for example by EDL, AEMO and AACL). While these models might feasibly be applied in the Territory, the Commission's view is that they are unlikely to achieve the market objectives to the same extent as the NTEM.
59. In proposing the NTEM, the Commission gave due consideration to relevant characteristics of the Territory market, including the dominance of a single generator, the size of the market, and the potential for rapid growth of the Territory's economy and, hence, large steps in electricity demand. In considering options for economic dispatch, the Commission identified several characteristics which allowed for less constrained arrangements than occur in other markets, including the relative predictability of weather-determined electricity demand, the dominance of gas-fired generation plant, the short start-up times for gas-fired technology and the relative flexibility of contractual and administrative arrangements for changes in gas supply volumes for changes in generation.
60. The Commission had regard to ensuring that reliability of supply is to be maintained at an acceptable standard and that costs must be appropriate for the relatively small size of the electricity sector in the Territory.
61. In proposing the NTEM, and consistent with the Terms of Reference, the Commission considered the applicability of the existing Australian wholesale markets of the NEM and the Western Australian Wholesale Electricity Market (WA WEM). In reviewing these models and the characteristics of the Territory market, some energy-only trading arrangements were not considered appropriate at this time and processes such as day-before trading were not considered necessary in the Territory.
62. A high-level comparison of these markets to the status quo and proposed NTEM is included in Attachment C, which compares the level of regulatory control, advantages, disadvantages and establishment and ongoing resource requirements of the various models.
63. The Commission proposes the following key features of the NTEM:
- (a) separate reliability assurance and energy trading mechanisms;
  - (b) a security constrained gross dispatch pool managed by System Control;
  - (c) dispatch to be based on availability submissions from generators with prices initially required to be no more than demonstrable short run costs (with guidelines on how to assess costs);
  - (d) a marginal clearing price from real-time operations; and
  - (e) settlement of the pool to allow for gross or net volumes at the discretion of market participants.

64. The Commission also had regard, in establishing an NTEM, to the future possibility of removing some elements (for example reliability assurance mechanism) and more fully adopting provisions of the NER once the Territory market matures and there is less real or perceived risk of single generator dominance.
65. Submission comments on design features of the NTEM are considered in more detail below.

### **Separate reliability assurance mechanism**

66. The NTEM proposes a separate investment mechanism, the RAM.
67. The RAM would be based on financial contracts with a central body for a pre-determined, robust and economically justified generation reliability standard.
68. Further consideration of the details of the RAM approach and consultation with key stakeholders would be required in a design and implementation phase. However, the Oakley Greenwood report provides strong justification for the RAM and the key elements of its operation.

### *Submissions*

69. The submissions received were broadly supportive of the establishment of the RAM. Some submissions noted that the choice of an integrated or separate mechanism influences aspects of market design and careful decisions need to be made about what is appropriate with respect to the jurisdiction.
70. The ESAA and AEMO noted that reliance on an integrated energy-only mechanism like the NEM to send price signals for investment in capacity risks inefficient outcomes due to the size of the market. AEMO noted that the capacity signals from the energy-only design used in the NEM would be difficult to emulate in the Territory context and, therefore, an alternative mechanism was necessary.
71. AEMO did note that a capacity arrangement specific to the Territory would increase costs to implement and operate and potentially create risks to parties seeking to participate. AEMO also noted that capacity mechanisms are complex in design and require frequent review and adjustment.
72. QEnergy agreed with the rationale for a separate RAM in the NTEM. QEnergy noted that capacity markets are more expensive to establish without necessarily improving reliability, but agreed *“that a credible argument has been presented that the signalling mechanism necessary to operate an integrated reliability assurance and energy trading mechanism would be difficult to control in the Northern Territory given the market concentration within PWC Generation<sup>4</sup>”*.
73. AACL expressed agreement with the establishment of a NTEM founded on a separate RAM, but this should only be used *“as an interim measure until there is adequate competition and a more mature market<sup>5</sup>”*.

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<sup>4</sup> QEnergy submission, page 2, received on Tuesday 28 January 2014.

<sup>5</sup> ACIL Allen Consulting submission, page 3, received on Thursday 23 January 2014.



74. Both PWC and AEMO agreed that there was logic in the Reliability Manager and Market Operator functions being kept with System Control. AEMO also noted that transferring these functions to AEMO could be considered.
75. QEnergy noted the importance of the Reliability Manager making market payments that match those collectable from customers, so intermediaries are not disadvantaged by having to fund capacity payments.
76. Some submissions noted concerns over the proposed operation of the RAM, in particular that the Draft Report provided a broad and theoretical approach and did not contain adequate details. AEMO noted that the linkage between RAM incentives and real-time dispatch is not fully clear, in particular how the real-time market price will indicate a true value of scarcity. AEMO also noted that the allocation of the charge on wholesale customers is a key design issue that needs to be considered in more detail.
77. PWC noted that it was supportive of the establishment of the RAM, but that *“from a PWC Generation perspective, the major concern of the proposed RAM is that it creates a potential risk of stranded assets<sup>6</sup>”*, so that it might not receive adequate revenue under a RAM arrangement. QEnergy noted that if the RAM was seen as a barrier to entry, whether through having to publish costs or the limiting of prices, the mechanism may need to be reviewed.
78. ESAA and EDL’s submissions noted issues with the over-supply of capacity in the WA WEM and the resulting price outcomes. ESAA also noted over-supply issues in the NEM and that this over supply costs either consumers or taxpayers, so that these issues must be considered prior to finalising the market design.
79. EDL acknowledged the RAM proposed in the NTEM was intended to avoid an exacerbated over-supply issue but suggested that the *“mechanisms are tested to ensure they deliver economically efficient, safe and reliable production and supply of electricity<sup>7</sup>”*.

#### *Commission’s consideration*

80. The Commission agrees with the comments of the ESAA, AEMO and QEnergy, that due to the characteristics of the Territory electricity supply industry, applying the energy-only market design (integrated mechanism) used in the NEM for a potential Territory market would not result in efficient outcomes.
81. The Commission notes that the market model in which the RAM is separate from the energy trading mechanism, as recommended by Oakley Greenwood, can be categorised as a mixed competition/regulation approach. The level of regulatory control required is a result of the market characteristic of a single dominant market generator.
82. The Commission agrees with the AACL comment that, once competition is introduced to the market and if greater alignment (perhaps even integration) with the NEM occurs, then adopting an energy-only integrated mechanism may be feasible. The Commission agrees that once the Territory market matures, removal of the RAM may be appropriate.

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<sup>6</sup> Power and Water Corporation (FINAL) submission, page 3, received on 19 February 2014.

<sup>7</sup> Energy Developments Limited submission, page 2, received on Tuesday 28 January 2014.

83. However, the Commission agrees with comments from AEMO and acknowledges that the details and costs associated with implementing separate capacity and energy trading arrangements needs to be addressed in the design and implementation phase.
84. The Commission agrees that the Reliability Manager function should sit with System Control group in the initial years of the NTEM. The Commission notes that engaging with AEMO would be beneficial so as to utilise AEMO's experience.
85. The Commission notes, in response to QEnergy, that the detailed design of the RAM will need to balance certainty of price for investors against the benefits of capacity price reflecting supply and demand. The Commission acknowledges that, in offering certainty for potential investors, there will also need to be certainty provided for retailers entering retail supply contracts.
86. In response to PWC concerns about stranded assets, the Commission notes that PWC Generation has excess capacity due to excess assets in all three Territory generation market systems and, under the proposed RAM design, entrance of new competitors could lead to (or exacerbate) further over-supply. If competition is introduced, PWC will have to write-down its non-performing or obsolete assets. The Commission notes that PWC Generation should only receive a return on an efficient asset base and the Territory Government has identified that introducing competition to the wholesale electricity market is desirable.
87. In response to AEMO comments, the Commission notes that any administered capacity arrangement will be unable to reflect the full cost of scarcity; this is part of the design dilemma in adopting a separate capacity mechanism. The Commission acknowledges that operational aspects of the RAM need to be taken into consideration and addressed in a design and implementation phase.
88. The Commission appreciates the risk of a cost-based obligation being perceived as a barrier to entry for new generation, but views the risk of no, or alternative, measures to protect against the potential exercise of market power by PWC Generation as being a greater risk.

### **Separate Energy Trading Mechanism**

89. The Commission proposes that the physical operation of the power system occur through a simple security constrained gross dispatch pool managed by System Control.
90. Dispatch would be based on availability submissions from generators with prices initially required to be no more than demonstrable short-run costs (with guidelines on how to assess costs to be established). A marginal clearing price from real-time operations would be set, and settlement of the pool to allow for gross or net volumes would be at the discretion of market participants.
91. System Control would be responsible for the physical operation of the power system. The setting of a marginal clearing price from real-time operations and settlement functions would be performed by the Market Operator, a new role.
92. Oakley Greenwood's final report discussed the potential options available for physical operation of the power system and what is appropriate for the Territory, and provides an outline of the proposed security constrained gross dispatch pool process.

### *Submissions*

93. There were various submissions with views on the role of System Control in relation to the energy trading mechanism but there was generally support, including from PWC, for the view that independence of System Control is paramount for the credibility of the energy trading mechanism and successful operation of the NTEM. AEMO further suggested that some functions could be taken up by AEMO, in line with other recommendations to transfer to national institutions.
94. QEnergy supported the mandating of bids to demonstrable short-term marginal costs.
95. Several submissions noted concerns regarding the energy trading mechanism, related primarily to the need for detailed design features for the operation of the mechanism.
96. PWC Generation noted that limiting bid prices to short-run costs would mean PWC Generation could not recover its fixed costs.
97. AEMO noted that the institution that regulates bid prices has not been identified and that *“the task of regulating bidding to actual short run cost in a market context should not be underestimated”*<sup>8</sup>. It also identified some operational issues that may emerge and suggested some alternatives to regulate the outcome of the bid process rather than inputs, such as hedge contracts.

### *Commission’s consideration*

98. The Commission notes that, if System Control were to take on the NTEM role as proposed in this Final Report, its current arrangements would need to be expanded and revised to ensure independent power system and market operations that are separate from network and outage management functions.
99. The Commission acknowledges AEMO concerns on bid price restrictions, but due to the unique circumstances in the Territory, the proposed approach appeals as a simple and pragmatic method of controlling the market power of PWC Generation. This is an issue that needs further consideration, including of alternatives proposed by AEMO, during a design and implementation phase.
100. The Commission notes the simple design for the proposed energy trading mechanism might need to change in response to the more widespread use of alternative fuels and technologies, especially in the longer term. Market arrangements need to be capable of adaptation to such changes. However, the Commission notes that, given current costs of possible alternatives, gas will be the predominant fuel source into the future and weather patterns are expected to remain relatively unchanged.
101. Consideration should be given to engaging with AEMO on establishing the Market Operator role during a detailed design and implementation phase. If Territory Government’s intention is to adopt the NER in the future, there is benefit in early involvement of national bodies such as AEMO in the establishment of the NTEM.
102. The Commission notes that, in any efficient market, full costs can only be expected to be recovered for the efficient level of capacity. This means that PWC Generation would not receive a rate of return for assets that are in excess of meeting the predetermined reliability standards.

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<sup>8</sup>Australian Energy Market Operator submission, page 3, received on Tuesday 28 January 2014.

## Other Issues Raised in Submissions

### *Alternative models for establishing a NTEM*

103. Several submissions identified alternative models that could be considered for establishing wholesale electricity arrangements for the Territory.
104. EDL suggested that the independent power producer model (single buyer model) may be suitable and AEMO noted that nodal pricing could be used. The ACL also suggested that mandatory contracting could be a viable alternative to establishing a wholesale market. The Commission believes that, while these models might feasibly be applied in the Territory, they are unlikely to achieve the market objectives specified in the Terms of Reference to the same extent as the NTEM.
105. EDL commented that the single buyer model “*can result in economically efficient, safe and reliable production and supply of electricity and this has been demonstrated in the Northern Territory and other jurisdictions*”<sup>9</sup>. This model requires the central market body to enter long-term contracts with generators for supply of capacity and passes costs through to the customer base, similar to Power Purchase Agreements. The Commission notes that this model does provide simplicity but that it arguably lacks transparency, is subject to political interference, inhibits innovative arrangements between generators and customers, and also implies long-term contingent liabilities for government. This model is also incompatible with full retail contestability that was implemented in the Territory in 2010.
106. AEMO suggested that nodal pricing or locational marginal pricing (LMP) be used to resolve issues related to network congestion. LMP is a method of determining prices in which market clearing prices are calculated for various locations on the grid called nodes. Neither of the established markets in Australia uses nodal dispatch price, although the NEM sets regional prices. In the NEM, this has led to a number of situations where prices are distorted when network congestion occurs. The Commission notes that the more precise or accurate the pricing for network congestion, the more complex the design must be. For this reason and because a nodal solution would be unique to the NTEM within Australia, the Commission does not consider LMP to be warranted, especially for the start of the NTEM.
107. ACL noted that mandatory contracting could be used as an alternative. This requires a level of financial contracting in the real-time energy market that each wholesale customer must present as a condition to qualify for participation in the energy market. In practice, this approach is cumbersome in the presence of retail contestability, restricts the nature of contracts that can be used in the market and is incompatible with merchant generation.
108. The Commission is of the view that these alternative models do not improve the transparency of the processes currently used in the Territory, are overly complicated for the Territory’s needs at the present time, or would not facilitate merchant market participants.

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<sup>9</sup>Energy Developments Limited submission, page 3, received on Tuesday 28 December 2014.

### *Cost and Benefits*

109. Several submissions suggested that detailed cost-benefit analysis should be undertaken to quantify the benefits and costs associated with a wholesale electricity market in the Territory. The ETU's submission queried the necessity of reform to the Territory's electricity industry, suggesting that *"the threshold question of 'what are the faults with the current system' needs to be clearly addressed and publically articulated by the government. This has not yet occurred<sup>10</sup>".*
110. The Commission notes that the four market objectives specified in the Terms of Reference for the review, as discussed elsewhere in this Final Report, highlight key benefits that market reform is designed to bring to the Territory – efficient delivery of a reliable and sustainable electricity supply to Territorians, to be achieved in part through harnessing competitive forces in the generation and retail sectors. The Commission has concluded that the NTEM is best able to deliver on these objectives in comparison to other market options. The NTEM incorporates simple design features as far as possible (for example, elements of the energy trading system) that will help to reduce implementation costs for the Territory. The NTEM implementation process as recommended by the Commission will provide an opportunity to analyse costs in more detail than has been possible in the current review.
111. This Final Report provides a high-level comparison of several market options for the Territory, including status quo arrangements, NEM, WA WEM, and the NTEM. This comparison discusses relative costs and benefits of these various options.
112. It is important to note that the Terms of Reference for the review observed that the current reliance in the Territory on direct (bilateral) contracting between generators and retailers, and the associated regulatory arrangements, was a barrier to private sector entry into the Territory's generation market. The Commission was required to provide recommendations for wholesale market arrangements to facilitate competition amongst generators and retailers in the Territory's electricity system.
113. The Commission notes that articulating the rationale for the overall reform program for the Territory's electricity supply industry is a matter for the Territory Government. The Commission's focus in this review is on one element of that overall program.

### *Structural separation of PWC*

114. Some submissions made comments relating to the structural separation of PWC which will see the retail and generation business units of PWC established as stand-alone corporations.
115. The Commission notes that work related to the structural separation of PWC does not directly relate to the Commission's Terms of Reference, although the proposed NTEM cannot proceed in the absence of separation of the retail and generation business units of PWC as currently being progressed by the Territory Government.

### *Opportunities for demand side participation*

116. The ESAA's submission noted that alternatives to centralised generation are important and demand response may have a role to play in implementing this. The ESAA noted

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<sup>10</sup> Electrical Trades Union submission, page 2, received on Thursday 23 January 2014.

that “*maintaining a level playing field between generation and demand response is not a straightforward process as evidenced by regulatory developments in both the NEM and WEM in recent times*<sup>11</sup>”.

117. The Commission acknowledges customer responses that lower demand at times of high system demand may reduce generation operating costs, lower wholesale peak prices, avoid the need to build new generation plant and improve reliability. In principle, the proposed RAM (capacity mechanism) could incorporate demand response, as occurs in the WA WEM. However, the matter would need to be considered in detail during the design and implementation phase.

#### *Opportunities for renewable resource participation*

118. The ECNT, DME and ALEC submissions called for greater emphasis on the role of renewable generation technologies. The DME submission suggests the need for “*more detailed consideration of the opportunities for renewable energy to compete in the wholesale generation market as either a generator or gen-tailer*<sup>12</sup>”.
119. The Commission notes that, in undertaking its functions, it does not favour one technology over another. The design proposed is intended to be “indifferent” to the technology of generation resources – that is, no technology should be at a relative advantage or disadvantage over another.
120. The uptake of renewables and changes in technology were taken into consideration as a characteristic of the Territory market that indicates a RAM is required. The Commission’s view is that the proposed NTEM facilitates entry for renewable generation.

#### **Next Steps and Implementation**

121. Oakley Greenwood undertook a high-level review of the NER to identify the relevant sections appropriate to the NTEM (refer Attachment C of Oakley Greenwood’s final report). If the Territory Government’s policy direction is to move towards the NEM, a detailed review to consider the interdependencies of various NER provisions and an opportunity to adopt other aspects of NEM practice would be required.
122. A planning and implementation team should at an early stage consider, and make recommendations to the Territory Government, on whether or not it would be appropriate to proceed with interim market arrangements, based on amendments to existing Territory regulatory arrangements, as noted above. While an interim market could provide a useful learning experience for relevant market participants, the required resources and timeframe (estimated at six months) for its development might detract from longer term NTEM development and alignment with the NER, both of which the Commission considers to be highly desirable in future.
123. While the NTEM as recommended by the Commission is a market arrangement specific to the Territory, it is based closely on key aspects of the NEM, and the Commission recommends that the rules to give effect to the NTEM be based on the NER.

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<sup>11</sup> Energy Supply Association of Australia, page 4, received on Tuesday 4 February 2014.

<sup>12</sup> Northern Territory Department of Mines and Energy submission, page 1, received on 29 January 2014.

### Submissions

124. Submissions were all broadly supportive of using the NER as a template for the market rules for the NTEM noting the reduction of time and costs from adopting an existing set of rules. It was also noted that using national institutions and rules where possible should reduce barriers to entry and provide more confidence to participants.
125. PWC noted that some parts of the NER would not be appropriate for the Territory and recommended tailoring parts of the NER to suit Territory-specific features.
126. AEMO cautioned against underestimating the effort needed to redraft and implement the NEM Rules to suit the NTEM.
127. DME suggested that further consideration also be given to the timeline for transitional arrangements to the NTEM considering the costs and risks and the extent to which the current processes of PWC are required to be made “more rigorous”.
128. Most of the submissions received noted that careful consideration and adequate time are required for any implementation option. PWC was supportive of the implementation timeline proposed in the Draft Report but noted that more details are required for the interim market arrangement.
129. QEnergy noted that it would prefer that the interim implementation option be adopted as it would allow for a quicker set-up and entrance of competing generators to the Territory, so long as it supports a longer-term path to adopt national arrangements.
130. The ESAA agreed that the NTEM could initially be set-up through amendments to the existing regulatory arrangements in the Territory. It noted that that the timeframe should not be ‘artificially’ set, but rather based on the findings of the consultation process.
131. ALEC requested that “*government consider the characteristics of the smaller grids in the development of the NTEM rather than overlay the Darwin-Katherine model across the entire Territory*”<sup>13</sup>.

### Commission’s consideration

132. The Commission agrees that, while the NER provides a suitable template for the NTEM, not all provisions are directly applicable to Territory circumstances. Furthermore, implementation of the RAM component of the NTEM will require a specific set of rules that cannot use the NER as a template. The Commission notes that this matter will need to be considered as part of the design and implementation phase.
133. The Commission agrees with AEMO that significant effort will be needed to redraft and implement the NEM rules to suit the NTEM, and that the experience of AEMO and NEM jurisdictions with the definition and implementation of rules should guide the timeline for similar work in the Territory. Any Territory specific provisions will need to be made with consideration to possible future migration to national arrangements.
134. The Commission notes that the implementation timeframe will be dependent on various other reforms, such as structural separation and, in addition, organisational

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<sup>13</sup> Arid Lands Environment Centre Incorporated submission, page 2, received on Tuesday 28 January 2014.

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arrangements such as creation of the Market Operator and Reliability Manager functions.

135. The complexities associated with development of rules for the NTEM suggest that an implementation timeframe of one to two years should be assumed. The Commission notes that in reviewing the NER, and considering the potential role for national bodies in the administration and regulatory control of the NTEM, there is also benefit in exploring other aspects of the NER that could benefit the Territory, such as system planning and reporting, retail market operation and the customer protection framework.
136. The Commission notes that the option of amending the existing regulatory arrangements to implement the energy trading mechanisms in an interim manner is possible, but it is not a long-term competitive market model, particularly as it does not provide a reliability assurance mechanism. Adoption of such an interim market model may not give potential market participants the necessary certainty they require to enter the market and this could delay implementation of the NTEM by diverting the implementation focus and resources.
137. At an early stage of the design and implementation phase, a decision on whether or not to adopt the interim market arrangement needs to be made. While there are benefits for relevant market participants undertaking a trial of the energy trading mechanism under the interim arrangements, it might detract from longer term NTEM development.
138. The applicability of the Commission's findings to the other two small regulated networks, Tennant Creek and Alice Springs, has yet to be considered. However, the proposed energy trading mechanism's simple design could be replicated in those smaller systems as it is an expansion of current processes with an energy balancing component added. The alternative of a separate design in the small network areas would also require separate regulatory processes and resourcing, that may be less efficient than applying the NTEM. There is also scope to reduce the flexibility provided for in the design by, for example, presuming new investors will be contracted and thereby making a simpler and lower cost design for these locations.
139. The Commission notes that if the recommendations in this report are adopted, a design and implementation phase will be required with a dedicated implementation team established to work through the necessary details and further stakeholder consultation.



## ATTACHMENT A—Terms of Reference from the Regulatory Minister

### INDEPENDENT REVIEW OF WHOLESALE GENERATION MARKET Terms of Reference

#### Background

The electricity supply industry in the Northern Territory is dominated by the Power and Water Corporation (PWC). The Territory Government wishes to provide greater impetus to the application of competitive forces in the generation and retail sectors of the industry. These sectors are already contestable in the sense that legal impediments to the entry of new participants have been removed, with the Utilities Commission (the Commission) being responsible for the licensing of new entrants. At the present time, however, there are no competitors to PWC in the generation sector, while in the retail sector two licensees may compete with PWC to sell electricity to all customers. However, PWC continues to be the primary retailer for smaller customers, including households and small business, as the current tariff structures and community service obligations in respect of these customers render them commercially unattractive.

A significant impediment to competition in the generation and retail sectors is the lack of operational wholesale market arrangements in the Territory, such as exists in the National Electricity Market (NEM) and in the South West Interconnected System of Western Australia (SWIS). At present, competing retailers in the Territory contract bilaterally with PWC Generation for the supply of electricity to meet customers' requirements. It is acknowledged that the current reliance in the Territory on direct (bilateral) contracting between generators and retailer, and the associated regulatory arrangements, is by far the most significant regulatory barrier to private sector investment in and entry into the Territory's generation market.

#### Referral

Pursuant to section 31 of the *Utilities Commission Act*, the Commission is to conduct a review into wholesale electricity market arrangements that are appropriate for the Territory, and to recommend preferred arrangements.

#### Review Objective

The preferred wholesale market arrangements recommended by the Commission should be based on the achievement of the following market objectives:

- (a) to promote the economically efficient, safe and reliable production and supply of electricity and electricity related services of the Territory;
- (b) to facilitate competition among generators and retailers in the Territory's electricity system, including by enabling efficient entry of new competitors;
- (c) to minimise the long-term cost of electricity supplied to customers from the Territory's electricity system; and
- (d) to encourage the use of measures that more efficiently manage the volume of electricity used including the variations between peak and average loads.

It is recognised that the NEM is an established best practice regulatory framework which has been developed over a decade and provides a reference point for the Territory's future regulatory framework.

### **Review Scope**

The Commission should consider the applicability of the NEM and SWIS models. In its consideration of appropriate wholesale market design, the Commission should have consideration for the Government's package of electricity supply industry reforms, including greater alignment of the Territory's regulatory framework with the NEM, transfer of network regulation to the Australian Energy Regulator and adoption of the National Electricity Rules. Any proposed market design arrangements would need to be compatible with these reforms.

The Commission is to consider wholesale market arrangements that are suitable to the Territory's circumstances and capable of cost effectively replacing sole reliance on bilateral contracting.

The Commission is to provide recommendations regarding the design and rules that could be adopted initially in the Darwin-Katherine generation market.

In recommending the appropriate wholesale market arrangements, the Commission is to develop the proposed rules in consultation with relevant stakeholders

### **Timing**

In accordance with section 34 of the *Utilities Commission Act*, the Commission is to provide its Final Report to the Minister by 28 February 2014.

### **Review Process**

The Commission is to undertake the review in the manner it considers appropriate, including consultation with key stakeholders.

Consultation should include, but not be limited to:

- Australian Energy Market Operator;
- Australian Energy Market Commission;
- Western Australian Independent Market Operator;
- Economic Regulation Authority of Western Australia;
- Power and Water Corporation;
- Department of Treasury and Finance; and
- Other industry participants (or potential participants.)

In accordance with section 32 of the *Utilities Commission Act*, the Commission will publish a notice of the review, including the Terms of Reference, in the newspaper and send a copy to licensed entities.

## **ATTACHMENT B – Final Report Wholesale Electricity Market Review by Oakley Greenwood**

This document has been published as a separate component to the Commission's Final Report.

The report is available on the Commission's website [www.utilicom.nt.gov.au](http://www.utilicom.nt.gov.au) or by contacting the Commission on 08 89995480 or [utilities.commission@nt.gov.au](mailto:utilities.commission@nt.gov.au).

The Final Report from Oakley Greenwood includes the following components:

- strategic objectives for the wholesale electricity market arrangements;
- key market design components;
- market rules template;
- implementation options including an interim approach;
- identified Territory market characteristics;
- setting of reliability outcomes;
- market assumptions; and
- key roles, responsibilities and skill sets.

## **ATTACHMENT C – High level comparison of key market design options**

## HIGH LEVEL COMPARISON OF KEY MARKET DESIGN OPTIONS

Model	Status Quo	NTEM	NEM	WA WEM
<b>Overview</b>	Requires bilateral contracting between pairs of generators and retailers.	Competitive mandatory cost-based real-time energy market plus mandatory central capacity mechanism.	Competitive, energy-only design with voluntary financial contracts.	Competitive, mandatory cost-based balancing market, voluntary day-ahead physical contract market plus mandatory central capacity mechanism.
<b>Level Regulatory Control</b> (a policy decision by Government)	Minimal. Generation investment approved by Government as shareholder.	Moderate. Generation investment determined by a central independent body in accordance with prescribed standards.	Minimal oversight but no control of investment.  Unregulated generator bidding.	Moderate. Generation investment determined by a central independent body (Independent Market Operator) in accordance with prescribed standards.
<b>Advantages</b>	Supports full retail competition but <u>with difficulty</u> due to self-balancing arrangements.  No change to rules and minimal regulatory costs.	Transparent generation pricing disclosure.  Supports full retail competition.  Removes barriers to entry and allows both merchant generators and retailers, and vertically integrated entities.  Competition in the generation sector should lead to lower generation costs as competing generators are required to bid against each other (regulation required until there is competition).	Transparent generation pricing disclosure.  Supports full retail competition.  Removes barriers to entry and allows both merchant generators and retailers, and vertically integrated entities.  Competition in the generation sector should lead to lower generation costs as competing generators are required to bid against each other (but, in the short to medium terms, PWC will be dominant).	Transparent generation pricing disclosure.  Supports full retail competition.  Premised on bi-laterally contracted generators and retailers or vertically integrated entities but can function with merchant generators and retailers in balancing arrangements.  Competition in the generation sector should lead to lower generation costs as competing generators are required to bid against each other (but, in the short to medium terms, PWC will be dominant).

Model	Status Quo	NTEM	NEM	WA WEM
<p><b>Advantages</b> (continued)</p>		<p>Energy trading mechanism similar to the NEM and well-understood model and rules for those operating in the NEM.</p> <p>Aspects of the NTEM rules can be based on NER and some market information roles undertaken by AEMO.</p> <p>Able to migrate to full NEM arrangements in the future as market matures.</p> <p>Rules based on national rules and using national institutions where possible (AEMC and AEMO) should reduce barriers to entry and provided confidence to new market participants.</p>	<p>Well-understood model and rules for those operating in the NEM.</p> <p>NTG committed to adopting other aspects of the NER including network price regulation and national retail law.</p> <p>National rules to be adopted and seek to utilise existing national institutions (AEMC and AEMO).</p>	<p>Model familiar to generators and retailers in the WA WEM.</p> <p>Need to consider adopting rules similar to the WA WEM and seek to utilise existing WA institutions (Independent Market Operator).</p>
<p><b>Disadvantages</b></p>	<p>Lack of transparency in generation pricing.</p> <p>Has resulted in excess generation capacity at an unknown cost to consumers.</p> <p>Lack of competitive forces to drive efficiency.</p> <p>Barriers to entry for merchant generators and retailers due to self-balancing arrangements and unfamiliarity with current arrangements.</p>	<p>Bespoke capacity arrangement with additional costs to implement and operate.</p> <p>Rules to be developed but can be modelled on the NER.</p>	<p>Unregulated generator bidding in a market with one dominant generator.</p> <p>Possible price spikes with unregulated dominant generator bidding.</p> <p>Costs to establish and for market operators to become complaint with the NER, including wholesale metering requirements.</p>	<p>Does not move away from the bi-lateral contracting arrangements currently in place.</p> <p>The Territory Government has committed to adopting other aspects of the NER including network price regulation and national retail law. Adoption of WA WEM wholesale market arrangements would not be as conducive to other aspects of the NER and may create future migration to full NEM arrangements difficult.</p>

Model	Status Quo	NTEM	NEM	WA WEM
<b>Risk Allocation</b>	Minimal risk allocated to the contracted generators with all assets earning a rate of return regardless of required capacity and actual dispatch. Poor investment decision risk lies with customers.	Dispatch risk sits with generators.	Dispatch risk sits with generators but possible hedging arrangements.	Dispatch risk sits with generators.
<b>Establishment costs</b>	Nil establishment costs.	Moderate – costs associated with establishment of market rules, establishment of Reliability Manager and a Market Operator. Ability to build on expertise in other institutions (AEMC and AEMO).	High costs associated with full implementation of the NER.	High.
<b>Ongoing costs</b>	Minimal – no change.  Although even with no change to market arrangements, a regular review should be undertaken on the technical implementation skills required for the power system to function. The quality of performance affects efficiency and quality of outcome.	Ongoing costs associated with a Reliability Manager and a Market Operator (but option to restructure System Control). Should be industry-funded.  Party to regulate generation price bids to be identified (possibly the AER but not a role it currently undertakes).  Possible outsourcing and skill-sharing with national bodies such as AEMO could assist with minimising establishment and ongoing costs.	High compliance costs for market participants, particularly if the Territory Government adopts other aspects of the NER.	High compliance costs for market participants, particularly if the Territory Government adopts other aspects of the WA WEM market rules.  Would need to explore possible outsourcing arrangements with WA WEM bodies.

Model	Status Quo	NTEM	NEM	WA WEM
<b>Participant costs</b>	<p>Minimal – no change.</p> <p>Process for submitting and receiving bids for dispatch remains informal (combination of verbal and email communication).</p>	<p>Moderate (but costs that efficiently-run generators should be incurring in any appropriate market structure).</p> <p>Submissions for dispatch could use a formalised approach to current process or NEM software.</p> <p>Current wholesale metering could continue.</p> <p>Costs associated with excess generation capacity that is not dispatched borne by the customer in the form a levy.</p>	<p>High.</p> <p>Submissions for dispatch could use NEM software.</p> <p>New metering investment likely to be required.</p> <p>Costs associated with excess generation capacity that is not dispatched borne by the investor.</p>	<p>High.</p> <p>Submissions for dispatch could use WA WEM software.</p> <p>Costs associated with excess generation capacity that is not dispatched borne by the customer in the form of a levy.</p>