ELECTRICITY STATEMENT OF OPPORTUNITIES

FOR THE NATIONAL ELECTRICITY MARKET

Published: **August 2014**

AEMO
AUSTRALIAN ENERGY MARKET OPERATOR

Purpose

The purpose of this publication is to provide technical, market data and information which can be used to assess opportunities in the National Electricity Market.

AEMO publishes the Electricity Statement of Opportunities in accordance with clause 3.13.3(q) of the National Electricity Rules (Rules). This publication has been prepared by AEMO using information available at 13 June 2014, unless otherwise specified. Information made available after 17June 2014 may have been included in this publication where practical.

Disclaimer

AEMO has made every effort to ensure the quality of the information in this publication but cannot guarantee that information, forecasts and assumptions are accurate, complete or appropriate for your circumstances. This publication does not include all of the information that an investor, participant or potential participant in the National Electricity Market might require, and does not amount to a recommendation of any investment.

Anyone proposing to use the information in this publication (including information and reports from third parties) should independently verify and check its accuracy, completeness and suitability for purpose, and obtain independent and specific advice from appropriate experts.

Accordingly, to the maximum extent permitted by law, AEMO and its officers, employees and consultants involved in the preparation of this publication:

- make no representation or warranty, express or implied, as to the currency, accuracy, reliability or completeness of the information in this publication; and
- are not liable (whether by reason of negligence or otherwise) for any statements, opinions, information or other matters contained in or derived from this publication, or any omissions from it, or in respect of a person's use of the information in this publication.

Acknowledgement

AEMO acknowledges the support, co-operation and contribution of all participants in providing data and information used in this publication.

EXECUTIVE SUMMARY

For the first time in the National Electricity Market's (NEM) history, as a result of decreasing operational consumption, no new capacity is required in any NEM region to maintain supply-adequacy over the next 10 years.

The 2014 Electricity Statement of Opportunities (ESOO) assesses the adequacy of existing and committed electricity supply to meet operational consumption in all NEM regions; this indicates when additional investment in generation or demand-side participation may be required to maintain electricity supply reliability.[1]

This means that, provided existing generation remains available, new capacity is not required to maintain system reliability under high, medium, and low economic growth scenarios. This situation is summarised in Table 1.

Table 1: Summary of supply adequacy shortfalls

	Low scenario		Medium scenario		High scenario	
Region	**Timing**	**Shortfall**	**Timing**	**Shortfall**	**Timing**	**Shortfall**
Queensland	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	34 MWh 0.0001%[a]
New South Wales	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-
Victoria	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-
South Australia	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-
Tasmania	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-

[a] Below the 0.002% reliability requirement.

Surplus capacity assessment

More than 7,500 MW would need to be removed from the market to affect supply-adequacy in 2014–15.

There is potentially between 7,650 MW and 8,950 MW of surplus capacity across the NEM in 2014–15. Approximately 90% of this is in New South Wales, Queensland, and Victoria.

As operational consumption grows, the level of surplus capacity decreases. However, even with 10 years of consumption growth, by 2023-24 between 1,100 MW and 3,100 MW of capacity could still be withdrawn from each of New South Wales, Queensland, and Victoria without breaching the reliability standard.[2]

An assessment of this surplus capacity is given in Chapter 2, and the results are presented in Table 2 below. The range of values reflects differing consumption growth rates under high, medium, and low economic growth scenarios.

[1] AEMC. *Reliability Standards*. 1 July 2012. Available at: http://www.aemc.gov.au/getattachment/f93100d9-72d2-46fb-9c25-ac274a04ae58/Reliability-Standards-(to-apply-from-1-July-2012).aspx. Viewed 17 June 2014.

[2] These studies have considered only the impact on system reliability, and assume that only base load capacity is withdrawn. The studies do not consider market prices, profitability, or other costs and incentives that impact commercial decisions to withdraw generation assets.

Table 2: Surplus capacity by region across high, medium, and low growth scenarios

Region	2014–15	2023–24
Queensland	Between 2,200 MW and 2,850 MW	Between 1,100 MW and 3,650 MW
New South Wales	Between 2,800 MW and 3,100 MW	Between 1,500 MW and 3,450 MW
Victoria	Between 1,950 MW and 2,200 MW	Between 1,450 MW and 3,100 MW
South Australia	Between 550 MW and 600 MW	Between 350 MW and 1,050 MW
Tasmania	Between 150 MW and 200 MW	Between 250 MW and 750 MW
Total	Between 7,650 MW and 8,950 MW	Between 4,650 MW and 12,000 MW

CONTENTS

TABLES

FIGURES

CHAPTER 1 – PURPOSE

The ESOO provides an adequacy assessment of electricity supply to meet consumption across the NEM over a 10-year outlook period, and under a range of scenarios.

It provides information about supply and demand trends to support efficient decision-making by industry participants, investors, and policy-makers, in the long-term interests of Australian electricity consumers.

1.1 Changes to the 2014 ESOO

The 2014 ESOO modelling methodology is consistent with that used in 2013. Input data was updated to reflect the latest demand forecasts developed for the 2014 National Electricity Forecasting Report (NEFR)[3], and committed and existing generator availabilities as at 1 July 2014.

Following the 2013 ESOO, AEMO began publishing quarterly supply–demand snapshots to keep the market informed of generation fleet changes, consumption trends, and the resulting impacts on supply adequacy.

The 2014 ESOO summarises those snapshots to provide a comprehensive report, and includes additional commentary and analysis using AEMO's latest generator survey results and electricity consumption forecasts. As part of the generator survey, participants were able to comment on which projects were now unlikely to proceed.

Chapter 4 provides links to these and other supporting information sources.

1.2 Scenario modelling

The 2014 ESOO considers the three scenarios listed in Table 3. Additional detail about each of these scenarios is available on AEMO's Planning Assumptions page.[4]

Table 3: 2014 ESOO scenario reference table

2014 ESOO and NEFR reference	2014 AEMO scenario name	Economic growth	Energy consumption	Carbon	Consumer engagement
High scenario	High energy consumption from centralised sources	High	High	Zero cost from 2014–15 Low cost from 2021–22	Low engagement
Medium scenario	Medium energy consumption from centralised sources	Medium	Medium	Zero cost from 2014–15 Medium cost from 2021–22	Highly engaged
Low scenario	Low energy consumption from centralised sources	Low	Low	Zero cost from 2014–15 High cost from 2018–19	Highly engaged

[3] AEMO. Available at: http://www.aemo.com.au/Electricity/Planning/Forecasting/National-Electricity-Forecasting-Report. Viewed 17 June 2014.
[4] AEMO. *2014 Scenario Descriptions.* Available at: http://www.aemo.com.au/Electricity/Planning/Related-Information/Planning-Assumptions. Viewed 17 June 2014.

CHAPTER 2 – THE NEM-WIDE OUTLOOK

The ESOO assesses the adequacy of existing and committed electricity supplies to meet projected consumption across the NEM by identifying Low Reserve Capacity (LRC) points. These indicate when additional investment in generation or demand-side response may be required to maintain electricity supply reliability within the NEM reliability standard.[5]

2.1 NEM supply adequacy results

Table 4 summarises the LRC points and the highest annual unserved energy (USE) observed in each scenario. USE is only observed in Queensland, and only under the high growth scenario. Even under this scenario, USE outcomes remain well within the reliability standard threshold of 0.002% of annual electricity consumption.

Table 4: Regional LRC timing and highest annual USE per scenario

	Low		Medium		High	
Region	**First LRC**	**USE**	**First LRC**	**USE**	**First LRC**	**USE**
Queensland	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	34 MWh 0.0001%
New South Wales	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-
Victoria	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-
South Australia	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-
Tasmania	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-

AEMO's adequacy modelling accounts for the hourly generation output of wind farms, and includes any contributions toward avoiding USE. However, at times of maximum demand (when the majority of USE occurs), only a percentage of wind generation is typically available.[6]

Information about projected monthly energy, utilisation of inter-regional support to meet electricity consumption, and modelled interconnector flow is available in the regional data files on the ESOO webpage.[7]

As the 2014 ESOO modelling only considers existing and committed projects, potential changes to the Renewable Energy Target (RET) and carbon price are not expected to have an immediate impact on the supply adequacy results. However, any changes to these policies will affect the future mix of generation projects by altering the incentives for either new technology investment or withdrawal of existing capacity.

The 2014 NEFR projections assume that a zero carbon price from 2014–15 persists for three to six years, depending on scenario.

Comparison with the 2013 ESOO

Consistent with the 2013 ESOO, the 2014 modelling shows no reserve deficits under the low growth scenario. Under medium growth conditions, the previous LRC point in Queensland (2019–20) is deferred by at least four years to beyond 2023–24. No other LRC points exist under the medium growth scenario.

[5] AEMC. *NEM Reliability Standard – Generation and Bulk Supply*. Available at: http://www.aemc.gov.au/getattachment/f93100d9-72d2-46fb-9c25-ac274a04ae58/Reliability-Standards-(to-apply-from-1-July-2012).aspx. Viewed 17 June 2014.
[6] For more information on the treatment of wind generation, see Section 3.1.1 of the *ESOO Methodology*.
[7] Available at: http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities. Viewed 17 June 2014.

It is more likely that LRC points will occur under the high growth scenario as it projects the largest growth in consumption. Even under the high growth scenario, however, all previously reported LRC points are delayed beyond 2023–24. Table 5 compares 2013 and 2104 high scenario results, showing deferrals of at least eight years in Queensland, four years in South Australia, and three years in both New South Wales and Victoria.

Table 5: Comparison of 2013 ESOO and 2014 ESOO high scenario results

Region	Queensland	New South Wales	Victoria	South Australia	Tasmania
2013 ESOO LRC point	2016–17	2021–22	2021–22	2020–21	Beyond winter 2023
2014 ESOO LRC point	Beyond 2023–24	Beyond 2023–24	Beyond 2023–24	Beyond 2023–24	Beyond 2023-24

Surplus capacity assessment

The high levels of reserve currently available in the NEM suggest that some existing capacity could be removed from the market without affecting system reliability.

AEMO undertook a study to calculate how much generation capacity could be removed from the NEM without affecting system reliability.

The study only considers the impact of removals on system reliability, and assumes that only base-load capacity is withdrawn. It does not consider market prices, profitability, or other costs and incentives that affect commercial decisions to withdraw generation assets. The study does not consider which units may be withdrawn and does not look at local impacts on transmission networks. It is possible that local reliability issues could result from transmission constraints depending on which units were retired.

AEMO compared total available capacity, including simulated forced outages, to total consumption for each region, including interconnector flows. Capacity was then subtracted until the reliability standard (0.002% USE) was met. Any withdrawn capacity was not taken into account when calculating surplus capacity. AEMO calculated surplus capacity for the three ESOO scenarios.

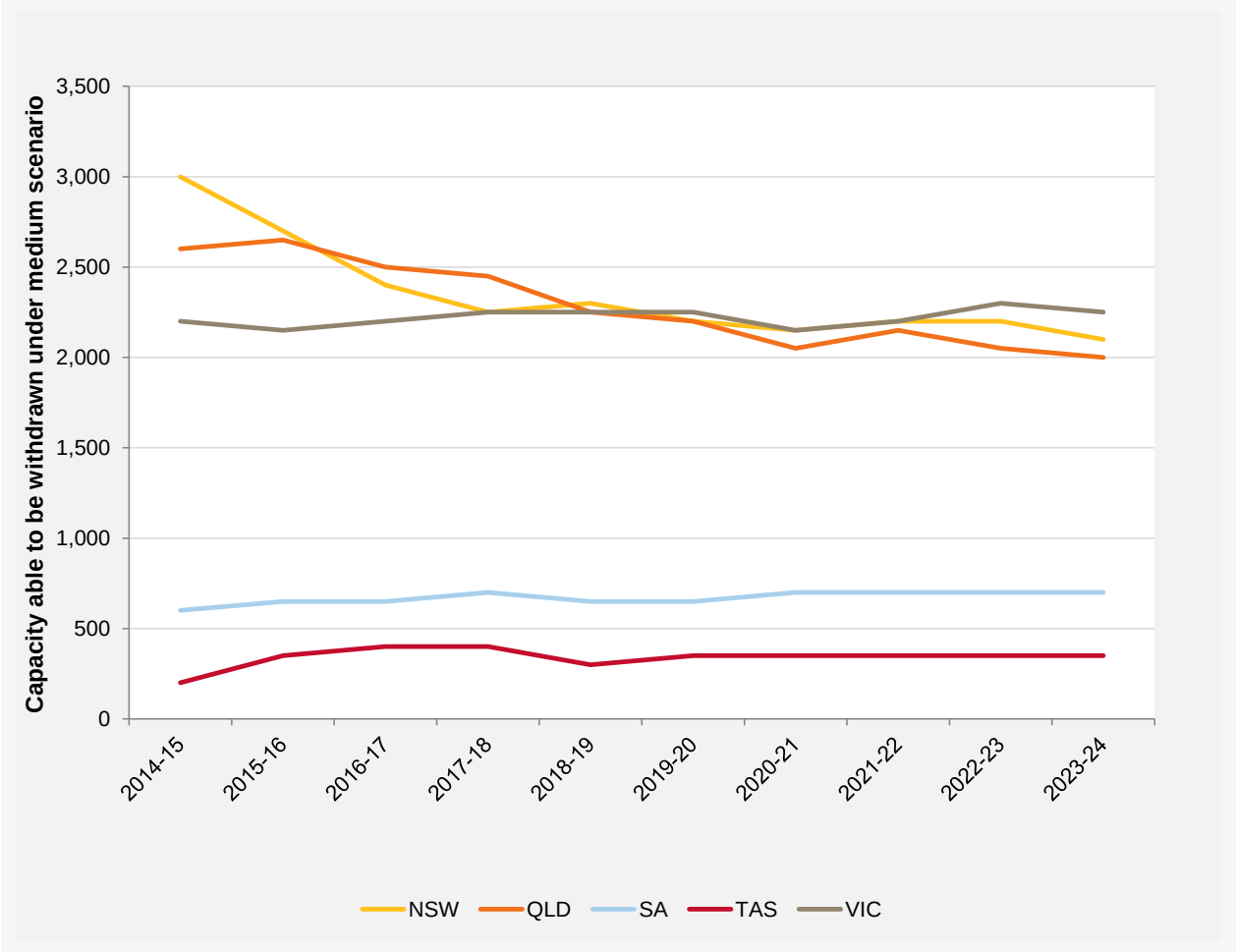
Figure 1 shows the amount of capacity that can be removed for each individual region under the medium scenario.

Table 6 shows that with existing capacity, there could be as much as 8,950 MW of surplus capacity across the NEM in 2014–15. Approximately 90% of this is in New South Wales, Queensland, and Victoria.

Even after 10 years, between 4,650 MW and 10,200 MW of capacity could still be withdrawn from New South Wales, Queensland, and Victoria in 2023–24 without breaching the reliability standard.

Surplus capacity in South Australia, Tasmania, and Victoria remains relatively stable across the 10-year outlook, consistent with consumption forecasts in these regions.

Figure 1: Surplus capacity under medium scenario



The range of possible surplus capacity represents the different operational consumption growth rates per scenario. The low scenario forecasts a decline in operational consumption, which means that less generation would be needed. The high scenario forecasts growth in operational consumption, which means that more generation would be needed, resulting in less surplus capacity.

Table 6: Surplus capacity by region (MW)

Region	2014–15	2023–24
Queensland	2,200 – 2,850	1,100 – 3,650
New South Wales	2,800 – 3,100	1,500 – 3,450
Victoria	1,950 – 2,200	1,450 – 3,100
South Australia	550 – 600	350 – 1,050
Tasmania	150 – 200	250 – 750
Total	7,650 – 8,950	4,650 – 12,000

2.2 Consumption trends

Changes to LRC points since the 2013 ESOO are primarily linked to the lower forecast growth in electricity consumption reported in the 2014 NEFR.[8]

The 10-year average annual growth rate for the 2014 NEFR medium scenario is 0.3%, which is lower than the 1.3% forecast in the 2013 NEFR. The 2014 NEFR high scenario forecasts are lower than the 2013 NEFR medium scenario forecasts.

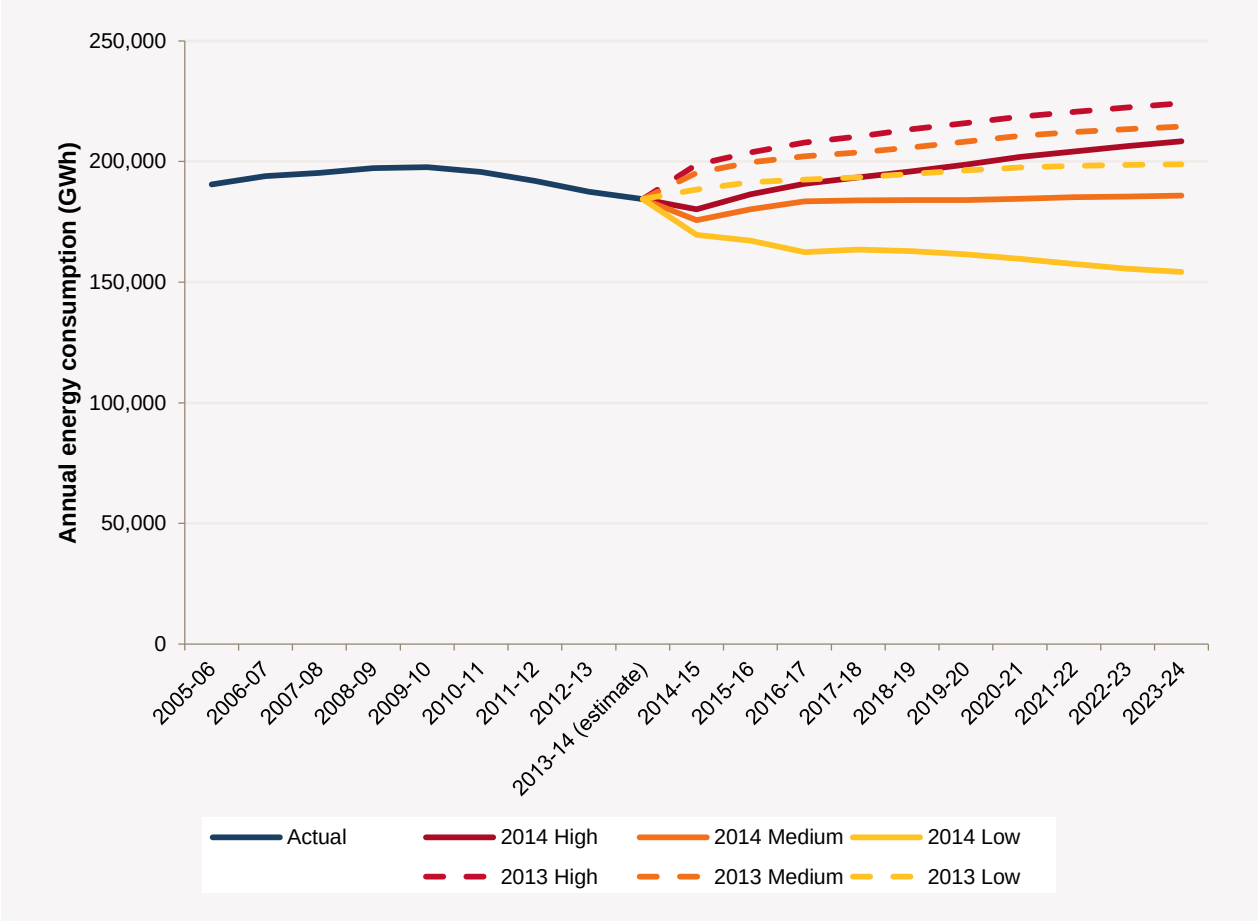
Reasons for reduced electricity consumption in the short-term (2013–14 to 2016–17) include:

- A decline in energy-intensive industries, including closure of the Point Henry aluminium smelter in Victoria.
- Strong growth (24% average annual) in rooftop PV installations, particularly in Queensland and Victoria.
- Strong growth (10% average annual) in total energy efficiency savings.

Figure 2 compares the 2013 and 2014 NEFR annual energy forecasts for the NEM. It also shows that actual energy consumption from the grid has declined for the last five consecutive years, and the 2014–15 forecast is 13,936 GWh lower than the 2005–06 equivalent.

Even under the high growth scenario, consumption is not projected to return to 2008–09 peak levels until 2018–19. Under the medium growth scenario, this does not occur within the forecast period.

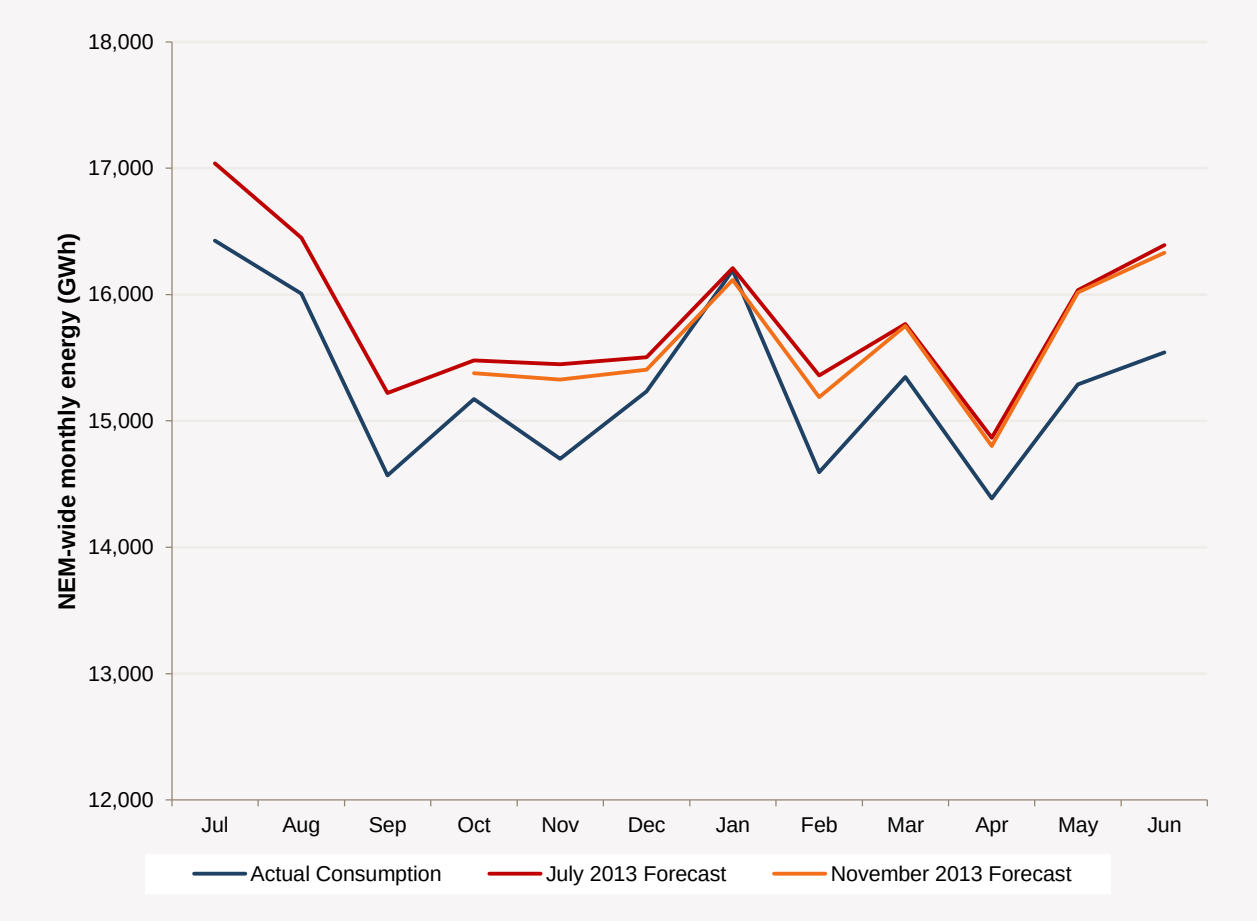
Figure 2: Comparison of 2013 and 2014 NEFR annual NEM energy forecasts



[8] AEMO. Available at: http://www.aemo.com.au/Electricity/Planning/Forecasting/National-Electricity-Forecasting-Report. Viewed 17 June 2014.

Figure 3 compares the 2013 NEFR and the November 2013 NEFR Update forecasts with actual 2013–14 consumption. It shows that 2013–14 operational consumption is 2.95% lower than forecast, using 2013 NEFR medium scenario forecasts for July 2013 to September 2013, and November 2013 NEFR Updates for October 2013 to June 2014.

Figure 3: Forecast and actual consumption 2013–14



2.3 Generation investment trends

NEM installed capacity[9] is 50,289 MW, and comprises a range of technologies (54% coal, 20% gas, 6% wind, 16% water, 4% other). This total includes the following changes since the 2013 ESOO:

- 170 MW of new generation capacity commissioned.
- 1,385 MW of thermal baseload generation capacity placed in storage.
- Minor revisions to summer, winter, or year-round generation capacity due to plant maintenance or plant capability reassessment.

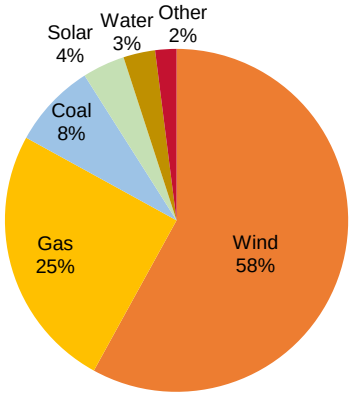
[9] Including scheduled, semi-scheduled, and non-scheduled installed capacity.

The Musselroe Wind Farm (168 MW) was the only large-scale generation plant commissioned in 2013–14. The Mildura demonstration solar plant (1.5 MW) in Victoria and the Capital East Solar Farm (0.13 MW) in New South Wales were also commissioned in this period.

Committed projects total 1,165 MW capacity, with expected commissioning between July 2014 and January 2016. This capacity includes:

- 219 MW of large-scale solar generation comprising:
  - Kogan Creek in Queensland (44 MW[10]).
  - Broken Hill in New South Wales (53 MW).
  - Nyngan in New South Wales (102 MW).
  - Royalla in New South Wales (20 MW).
- 940.2 MW of wind generation comprising:
  - Gullen Range Wind Farm in New South Wales (165.5 MW).
  - Mt Mercer Wind Farm in Victoria (131.2 MW).
  - Snowtown Stage 2 in South Australia (270 MW).
  - Stage 1 Boco Rock Wind Farm[11] in New South Wales (113 MW).
  - Taralga Wind Farm in New South Wales (106.7 MW).
  - Portland Stage 4 Cape Nelson North and Cape Sir William Grant Wind Farm in Victoria (47.15 MW).
  - Bald Hills Phase 1 Wind Farm (106.6 MW) in Victoria.
- Wilga Park Power Station (gas) has 6 MW of additional capacity committed.

Figure 4: Proposed generation



The 56 MW Moree Solar PV project was classified as a committed project after the ESOO modelling work had commenced. While this project was not included in the current ESOO analysis, it is not expected to change the modelling results as the LRC points are already beyond the 10-year analysis horizon.

AEMO is also tracking 25,329 MW of proposed[12] new generation capacity. As shown in Figure 4, this includes 58% (14,589 MW) wind, 25% (6,300 MW) gas, 8% (2,000 MW) coal, 4% (1,152 MW) solar, 2% (599 MW) water, and 3% (689 MW) other[13] generation.

The carbon legislation repeal is not expected to affect the adequacy results presented in this ESOO, but may affect the future mix of generation projects by changing incentives for both new investment and withdrawal of existing capacity.

AEMO will continue to monitor the status of generation projects, and keep the market informed through the Generator Information page and quarterly supply–demand snapshots.

[10] The 44 MW Kogan Creek capacity is not additional to the 730/744 MW summer/winter capacities of Kogan Creek; rather, it is a contribution towards total generation.
[11] This wind farm was committed after AEMO's generation information pages were released in June 2013, and prior to ESOO modelling commencement. AEMO used the revised capacity advised by Continental Wind Partners (113 MW) in the ESOO adequacy modelling, with previously advised commissioning and energisation dates, which have since been updated in the August 2013 Generation Information pages.
[12] Proposed includes publicly announced and advanced projects only.
[13] "Other" comprises geological heat and biomass fuels.

2.3.1 List of NEM generation capacity changes

This section provides detail on capacity changes resulting from generation plant being placed into dry storage or other capacity reassessments.

Announcements about generation placed in storage since the 2013 ESOO total 1,385 MW:

- Swanbank E Power Station (385 MW gas) in Queensland is to withdraw from service in October 2014.
- Wallerawang C Power Station (1,000 MW coal) in New South Wales withdrew Unit 7 (500 MW) from service in January 2014. Unit 8 (500 MW) was also withdrawn from service in March 2014 on a three-month recall.

These changes are in addition to availability changes of the Playford B, Tarong, Morwell, and Collinsville power stations reported in the 2012 and 2013 ESOOs. Tarong Power Station Units 4 and 2 will return to service in July 2014 and June 2015 respectively.

Minor revisions to summer, winter, or year-round capacity due to plant maintenance or reassessment of plant capability are detailed in Table 7.

Table 7: Minor revisions to generation capacity since the 2013 ESOO

Generator	Region	Capacity change (MW)	Reason
Bayswater Power Station	New South Wales	-20	Reassessment of plant capacity.
Loy Yang A	Victoria	-90	Revised rating in summer due to operational experience in ambient conditions.
Macarthur Wind Farm	Victoria	-105	Revised rating in summer due to actual behaviour of wind generation assets during high temperature days.
Morwell/Energy BrixPower Station	Victoria	-10	Revised rating in summer due to the Morwell mine fire destroying conveyors and restricting coal supply.

2.4 Opportunities for investment

Given current consumption forecasts and generation fleet, new generation or demand-side response is not required to maintain electricity supply reliability within the NEM Reliability Standard.

However, investment opportunities may still arise through renewable energy generation incentive schemes, localised network issues or pockets of demand growth, or to manage system security issues arising from the intermittency of some renewable generation sources.

There are two major federal schemes that provide incentives to invest in large-scale generation: the RET, which is currently under review; and the carbon pricing mechanism, which was repealed in July 2014.

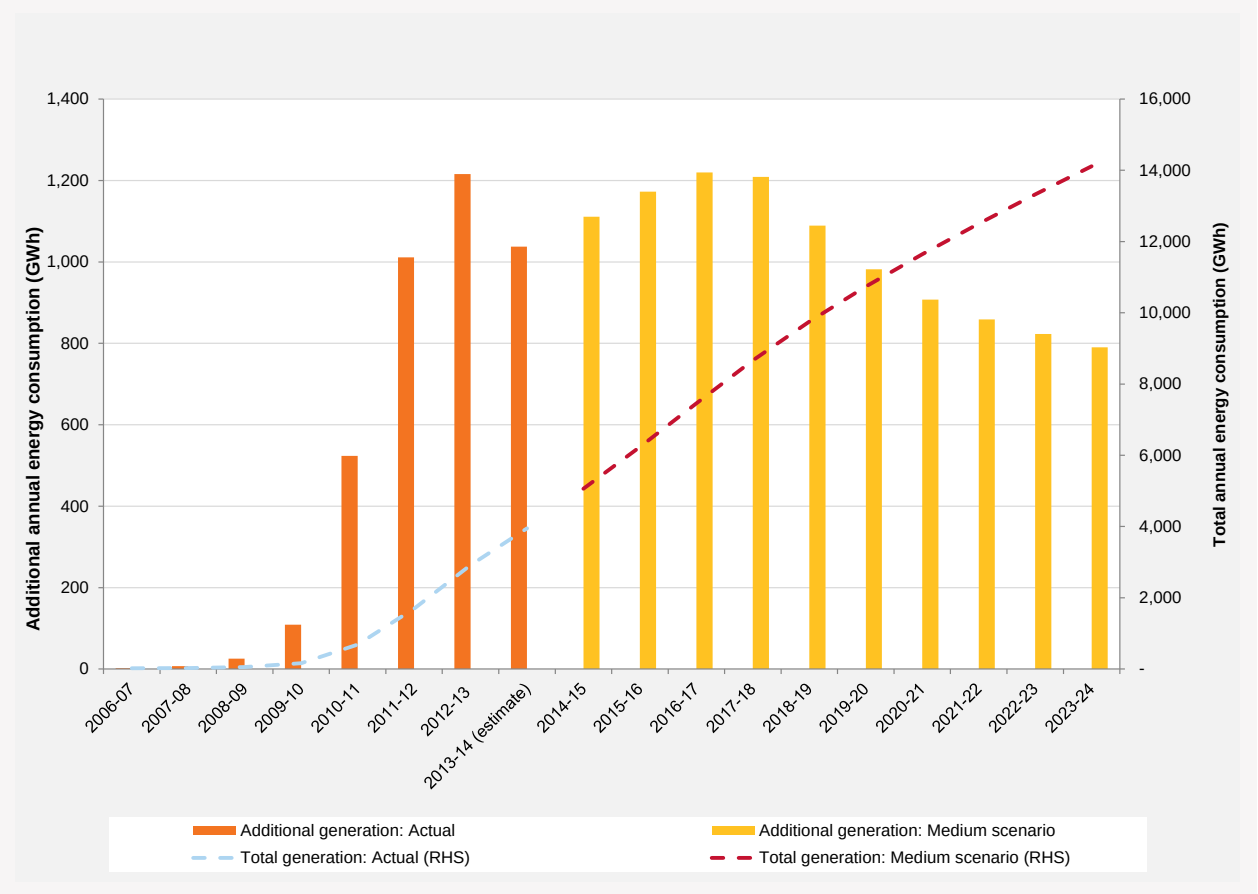
Some states and territories have additional incentive schemes, such as the Australian Capital Territory which incentivises renewable generation above federally-mandated targets.

Changes to these schemes may affect investor appetite for renewable generation investment, alter incentives for withdrawing existing plant, or affect the timing and technology of proposed future projects. AEMO will continue to monitor generation fleet changes, and keep the market informed through the Generator Information page, and quarterly supply–demand snapshots.

If the current rate of uptake in renewable generation continues, or there is a major withdrawal of existing capacity, opportunities to manage security or other issues associated with high proportions of non-synchronous generation may emerge. This may be through providing additional peaking capacity or new storage technologies, such as large-scale pumped storage hydro plants or smaller-scale battery storage.

Generation investment opportunities may also be affected by investment off the grid. The 2014 NEFR assumes continued high rooftop PV installation numbers over the next four years before a decline in growth. Figure 5 shows that by 2023–24, there will be enough annual installation of rooftop PV to generate approximately 790 GWh. This is equivalent to removing approximately 90 MW of demand from grid-supplied consumption.

Figure 5: Generation from rooftop PV



Storage technologies may assist rooftop PV by storing electricity for use when the sun is not shining. While such technologies are not currently commercially viable, a number of developments are advancing this field. If the price of storage technology and rooftop PV generation reduces, this may result in downward pressure on the cost of delivered electricity.

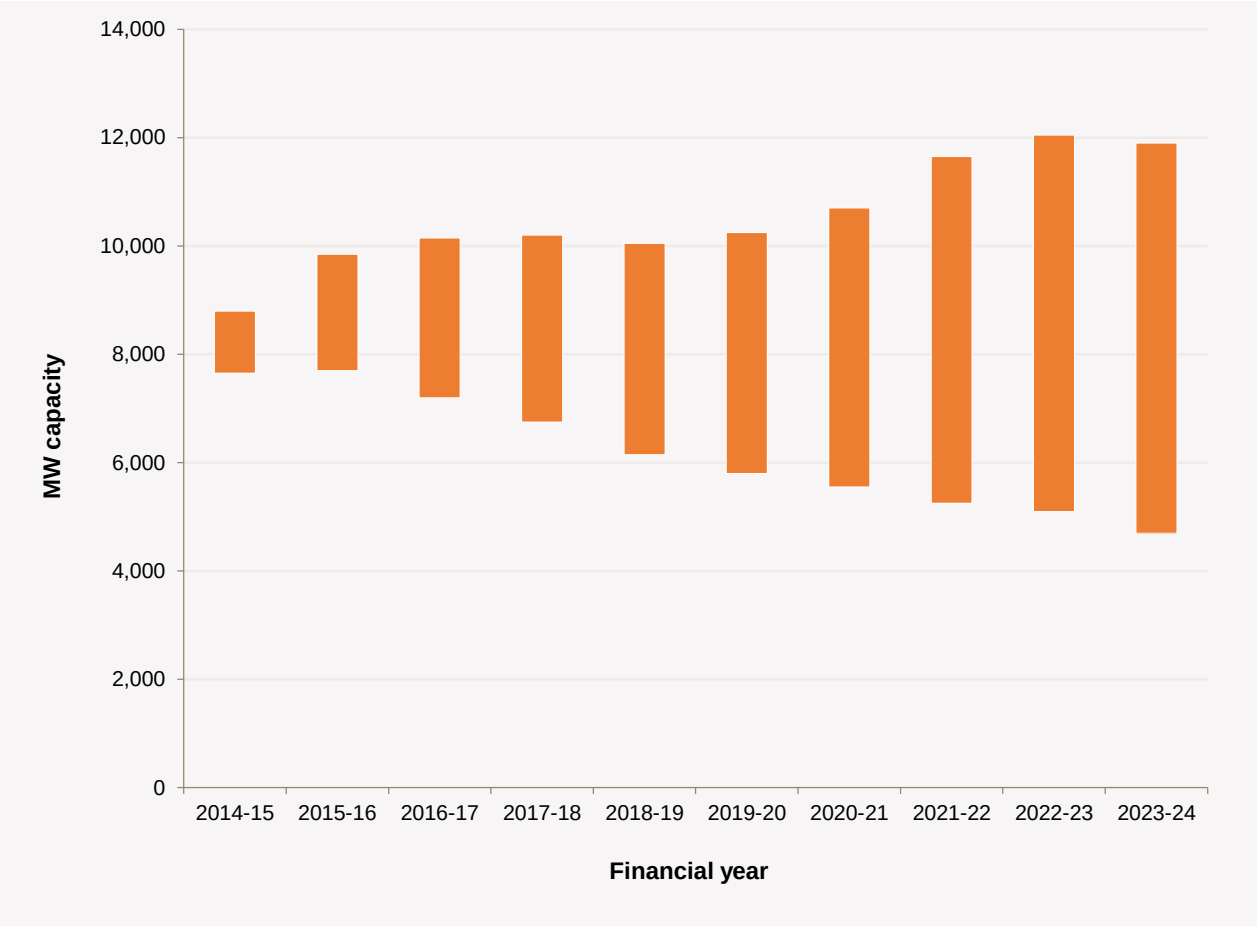
AEMO is monitoring the uptake of both rooftop PV and storage technologies, and will adjust the supply–demand balance modelling if required.

CHAPTER 3 – REGIONAL OUTLOOK

This section provides a supply adequacy overview for each NEM region. In this ESOO, no NEM region has an LRC point within the 10-year outlook period, because there is currently sufficient generation capacity to meet the 2014 NEFR consumption forecasts under all scenarios.

A range of divestments are possible while still meeting the reliability standard. The amount of capacity that could potentially be divested across the NEM as a whole is presented in Figure 6.

Figure 6: Surplus capacity in the NEM



As evident in the figure above, uncertainty around the level of capacity required in the NEM tends to increase, creating a wider band of possible surplus capacity. The total amount of surplus capacity which can be removed per NEM region is outlined below.

3.1 Queensland

Table 8 shows that under the high scenario, USE in Queensland will not exceed the reliability standard for the 10-year outlook period. Compared to the 2013 ESOO high scenario this represents a delay of at least seven years.

This change is primarily attributed to reduced maximum demand in Queensland. The maximum demand for Queensland's 10% POE in the 2014 NEFR is lower than the 50% POE in the 2013 NEFR and, from 2018–19 until the end of the forecast period, is lower than the 90% POE in the 2013 NEFR. This is further compounded by an increase in demand-side participation.

Figure 7: Surplus capacity in Queensland

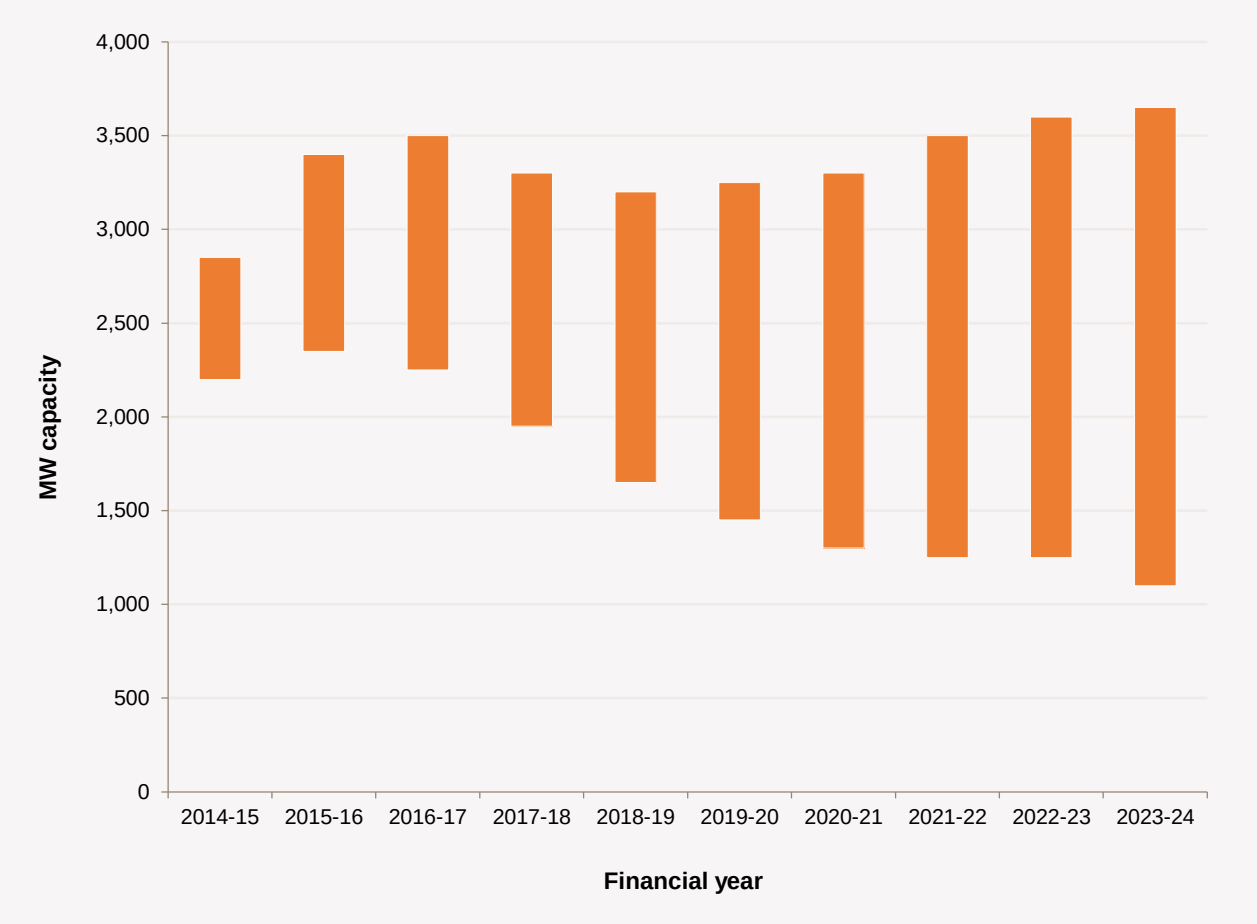


Table 8: Queensland supply–demand outlook summary

	Low		Medium		High	
Region	**First LRC**	**USE**	**First LRC**	**USE**	**First LRC**	**USE**
Queensland	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	34 MWh 0.0001%

Generation investment interest in Queensland is focused on gas-powered generation, which includes the Braemer 3 and 4, Darling Downs 2, and the Westlink Power proposals. The large-scale Aldoga and Blackstone Power Station proposals by EnergyAustralia in Gladstone and Ipswich are no longer being pursued.

Queensland has almost 2,000 MW of wind generation proposed in 10 projects, the largest of which are the Kennedy (650 MW) and Coopers Gap (350 MW) wind farm projects.

The recently proposed Kidston Pumped Storage Hydro Project (200 MW) in Far North Queensland is designed to provide power during times of maximum demand.

Construction of the Solar Boost Project at Kogan Creek is still in progress, contributing 44 MW toward the total generation of Kogan Creek's 750 MW capacity to be completed next year.

Table 9 shows the current capacity of existing and withdrawn generation in Queensland, and committed and publicly announced projects.

Table 9: Queensland generation and project capacity by generation type (MW)

Status/Type	Coal	CCGT[a]	OCGT[b]	Gas other	Solar	Wind	Water	Biomass	Other	Total
Existing	8,406	1,627	1,103	30	0.4	12	664	364	879	13,085
Committed	-	-	-	-	44	-	-	-	-	44
Publicly announced	-	-	2,545	-	679	1,999	200	158	-	5,581
Withdrawn	540	385	-	-	-	-	-	-	-	925

[a] Combined-cycle gas turbine.
[b] Open-cycle gas turbine.

3.2 New South Wales

In the high economic growth scenario, no LRC point is observed within the 10-year outlook period as USE remains within the reliability standard. This represents an LRC point delay of at least two years compared to the 2013 ESOO. New South Wales has sufficient surplus generation capacity to meet growing local consumption and exports to Queensland.

Table 10: New South Wales supply–demand outlook summary

	Low		Medium		High	
Region	LRC point	USE	LRC point	USE	LRC point	USE
New South Wales	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-

Generation investment interest in New South Wales is focused on wind generation, with 27 projects, mainly through the Liverpool Range, Uungula, Rye Park, Yass Valley, and Sapphire proposals.

The committed projects, Gullen Range (166 MW) and Taralga (107 MW), are due to be completed in 2014; and Boco Rock Stage 1 (113 MW) is to be completed in 2015. The Golspie Wind Farm is no longer being pursued.

There has been a significant reduction in the number of gas-powered generation proposals, with 1,470 MW of total generation capacity no longer being pursued. This includes the Bannaby, Buronga, Leafs Gully, Narrabri 1 and 2, and Parkes Peaking proposals.

Solar generation investment remains strong in New South Wales, with 11 projects. These include three committed projects: Royalla (20 MW) to be completed in 2014; and Broken Hill (53 MW) and Nyngan (102 MW), to be completed in 2015.

Figure 8: Surplus capacity in New South Wales

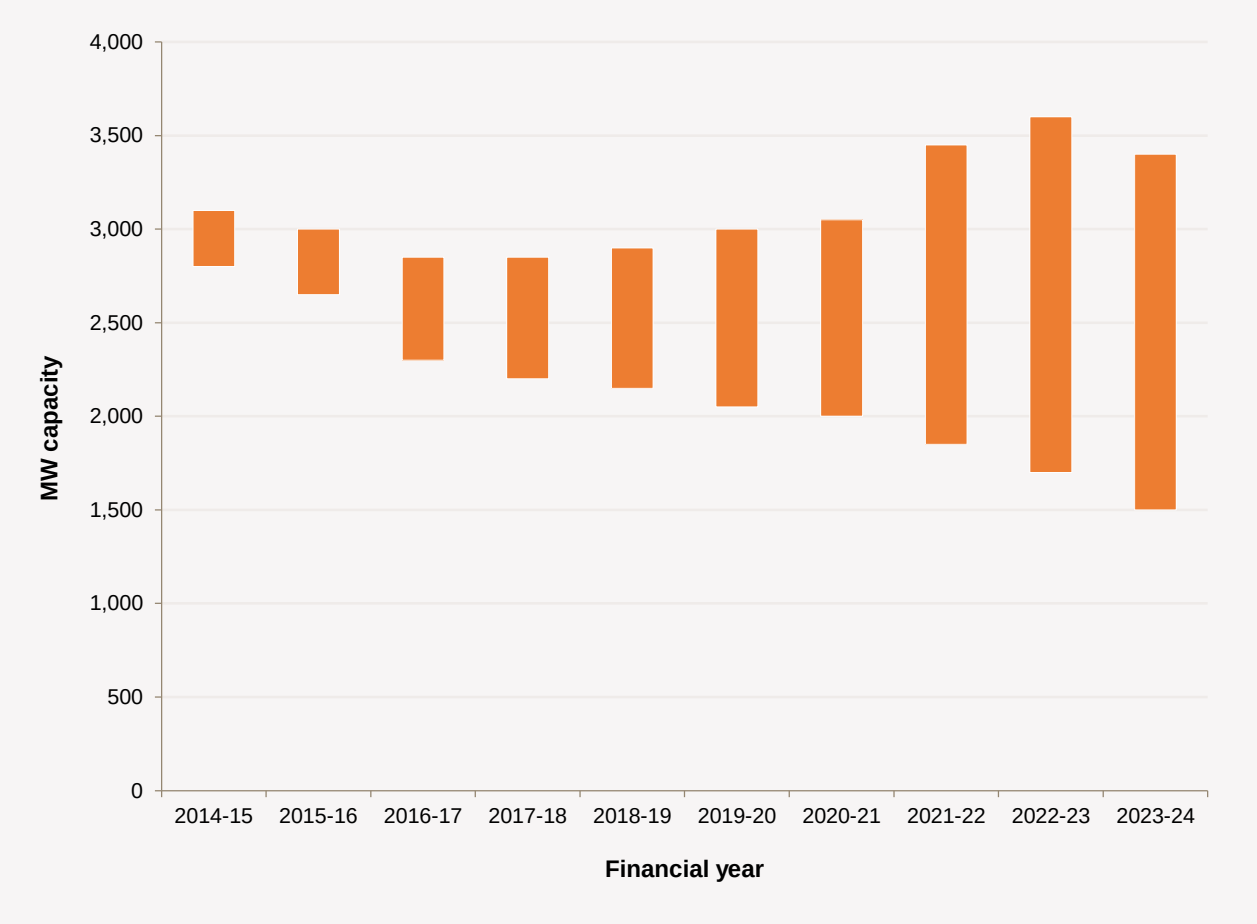


Table 11 shows the current capacity of existing and withdrawn generation, and committed and publicly announced projects.

Table 11: New South Wales generation and project capacity by generation type (MW)

Status/Type	Coal	CCGT[a]	OCGT[b]	Gas other	Solar	Wind	Water	Biomass	Other	Total
Existing	11,384	598	1,388	19	0.13	281	2745	129	291	16,835
Committed	-	-	-	6	175	385	-	-	-	566
Publicly announced	2,000	-	1,370	15	323	4,817	-	8	-	8,533
Withdrawn	1,000	-	-	-	-	-	-	-	-	1,000

[a] Combined-cycle gas turbine.
[b] Open-cycle gas turbine.

3.3 Victoria

Victoria's robust interconnection with neighbouring regions reduces likelihood of network limitations leading to USE.

Table 12 shows that in the high growth scenario, there is no LRC point in Victoria in the outlook period. This is a delay of at least two years compared to the 2013 ESOO high scenario.

Table 12: Victoria supply–demand outlook summary

	Low		Medium		High	
Region	**LRC point**	**USE**	**LRC point**	**USE**	**LRC point**	**USE**
Victoria	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-

Generation investment interest in Victoria is focused on wind generation, with 28 project proposals. These are dominated by the Penshurst, Darlington, Moorabool, Dundonnell, Willatook, and Ararat proposals. Committed projects include Mount Mercer (131 MW), due to be commissioned mid-2014, and Bald Hills (107 MW) and the Portland Stage 4 Cape Nelson North and Cape Sir William Grant (47 MW) wind farms, to be completed in 2015.

Gas-powered generation proposals comprising 1,650 MW are all likely to draw gas from the Otway basin. These include Mortlake Stage 2 (550 MW), Shaw River (500 MW), and Tarrone GT (500-600 MW).

The Kerang Solar Power Plant (30 MW) is no longer being pursued.

Figure 9: Surplus capacity in Victoria

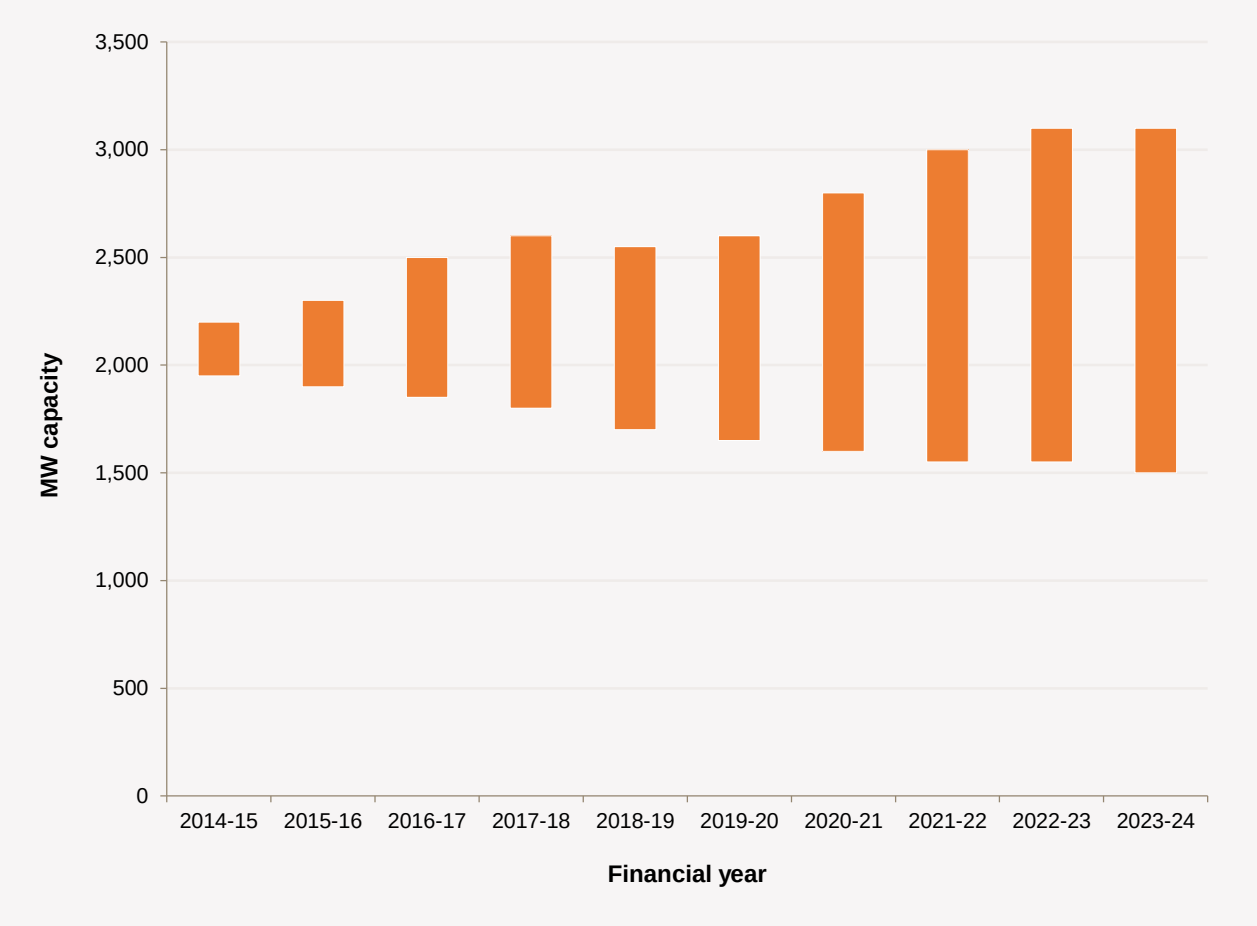


Table 13 shows the current capacity of existing and withdrawn generation, and committed and publicly announced projects.

Table 13: Victorian generation and project capacity by generation type (MW)

Status/Type	Coal	CCGT[a]	OCGT[b]	Gas other	Solar	Wind	Water	Biomass	Other	Total
Existing	6,599	21	1,904	516	1.5	939	2,296	53	0.78	12,330
Committed	-	-	-	-	-	285	-	-	-	285
Publicly announced	-	500	1,150	-	100	3,287	97	-	-	5,134
Withdrawn	75	-	-	-	-	-	-	-	-	75

[a] Combined-cycle gas turbine.
[b] Open-cycle gas turbine.

3.4 South Australia

Under the high scenario shown in Table 14, no LRC point is observed within the 10-year outlook period. This represents a delay of at least four years compared to the 2013 ESOO.

South Australia is particularly vulnerable to changes in wind and rooftop PV output, as it has the highest penetration of both until 2023–24 when overtaken by rooftop PV output in Queensland.

Table 14: South Australia supply–demand outlook summary

	Low		Medium		High	
Region	**LRC point**	**USE**	**LRC point**	**USE**	**LRC point**	**USE**
South Australia	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-

Generation investment interest in South Australia is focused on wind generation, with 16 project proposals. These are dominated by the Ceres, Woakwine, Palmer, and Hornsdale wind farm proposals. The Snowtown Stage 2 project (270 MW) is committed and under construction, and is scheduled to be completed in the second half of 2014. The Hallet Mt Bryan and the Robertstown wind farm projects are no longer being pursued.

The future of the Port MacDonnell (1 MW) wave energy project is uncertain following damage to its wave energy converter.

Two Torrens Energy geothermal proposals at Parachilna and Port Augusta are no longer being pursued.

Figure 10: Surplus capacity in South Australia

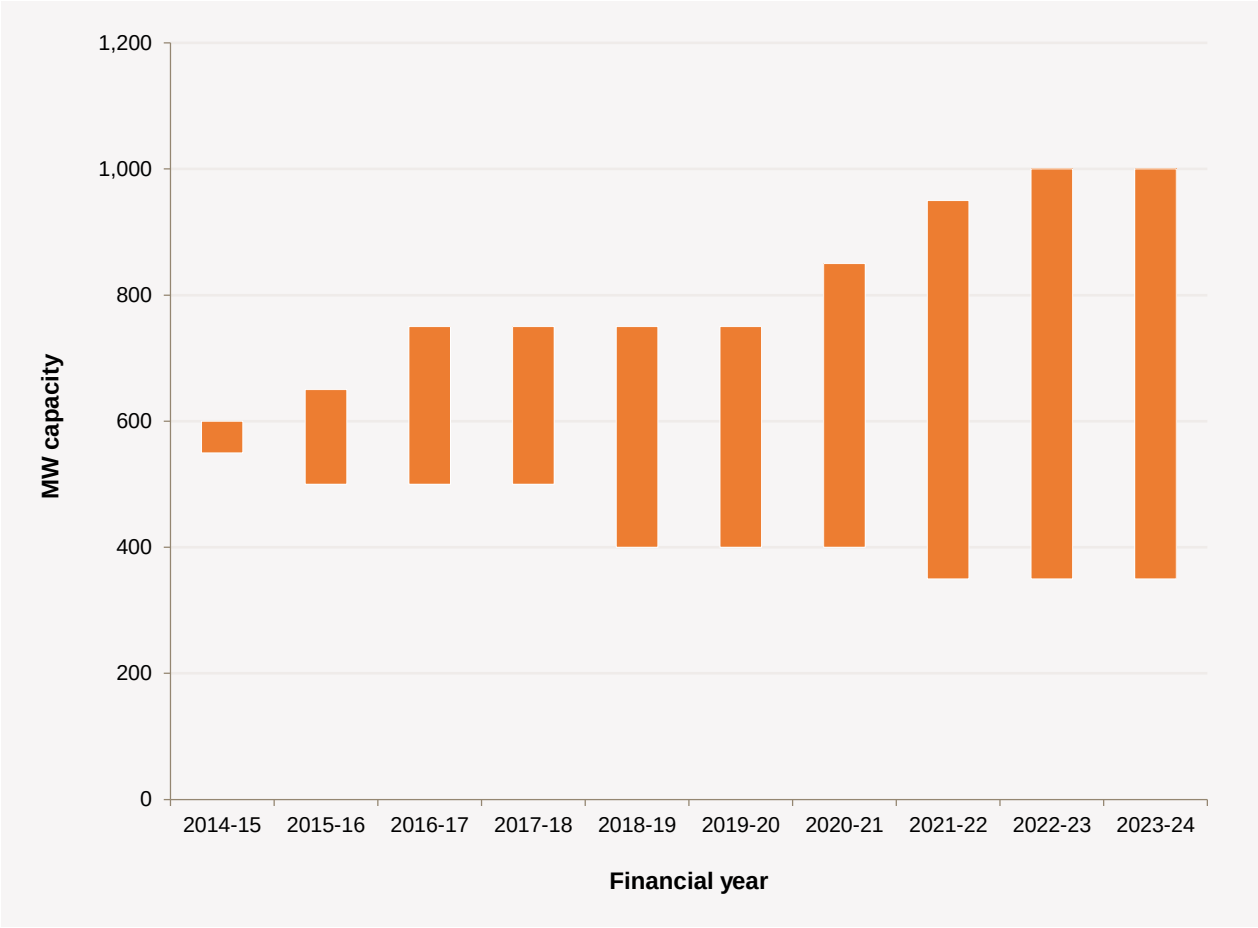


Table 15 shows the current capacity of existing and withdrawn generation, and committed and publicly announced projects.

Table 15: South Australian generation and project capacity by generation type (MW)

Status/Type	Coal	CCGT[a]	OCGT[b]	Gas other	Solar	Wind	Water	Bio-mass	Geo-thermal	Other	Total
Existing	786	662	778	1,280	-	1,203	2.5	13	-	270	4,995
Committed	-	-	-	-	-	270	1	-	-	-	271
Publicly announced	-	150	570	-	50	3,107	-	-	523	-	4,400
Withdrawn	240	-	-	-	-	-	-	-	-	-	240

[a] Combined-cycle gas turbine.
[b] Open-cycle gas turbine.

3.5 Tasmania

Tasmania has considerable surplus generation capacity and, as Table 16 shows, no LRC point is observed in any scenario.

Table 16: Tasmania supply–demand outlook summary

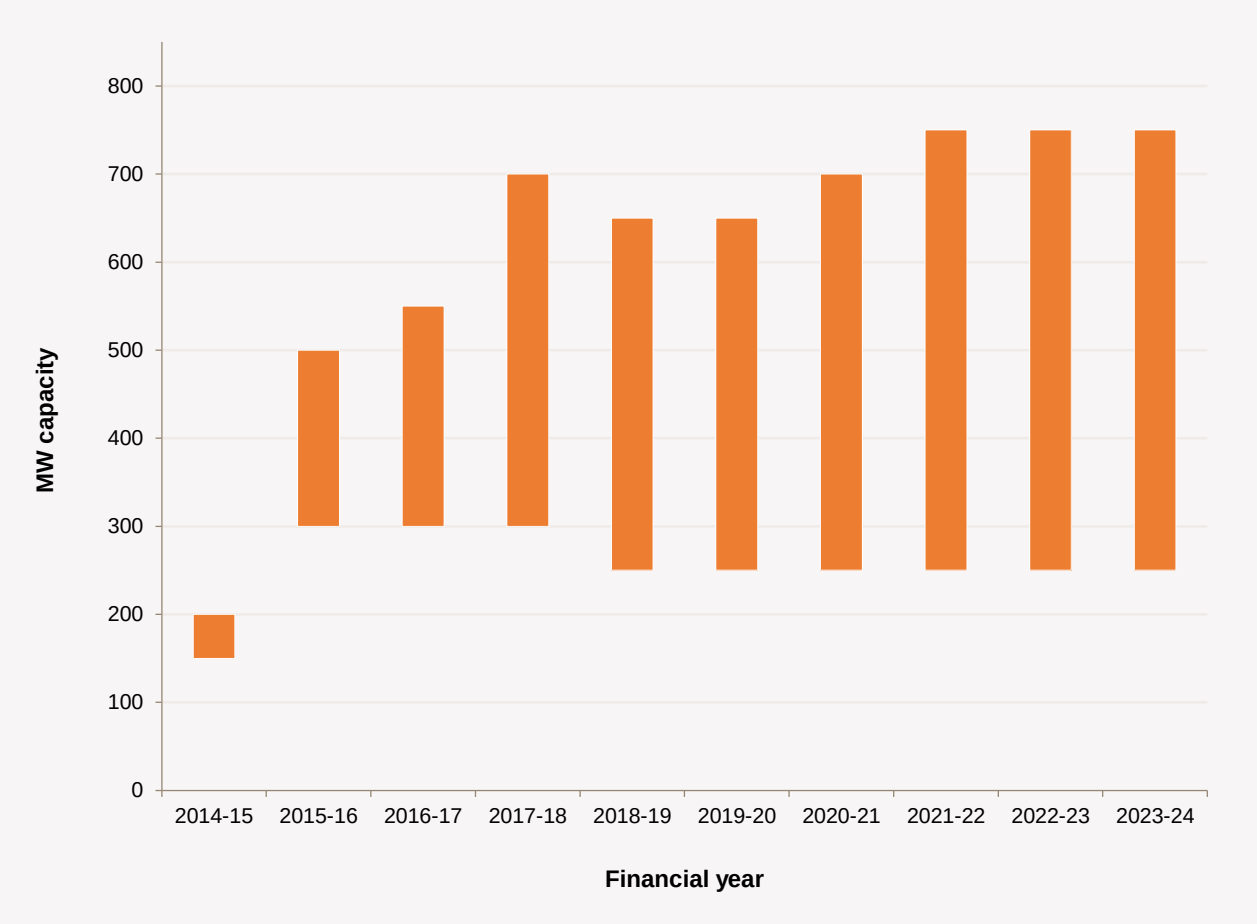
	Low		Medium		High	
Region	LRC point	USE	LRC point	USE	LRC point	USE
Tasmania	Beyond 2023–24	-	Beyond 2023–24	-	Beyond 2023–24	-

Tasmania's large fleet of hydro generation plant and modest local consumption insulate the region from short-term supply shortfalls. However, Tasmania's capacity for continuous generation may be affected under protracted drought conditions or if gas supplies are limited.

ESOO modelling does not account for energy limitations under such conditions. AEMO publishes a quarterly Energy Adequacy Assessment Projection (EAAP)[14] report that provides information about projected energy limitations and reliability in Tasmania and other NEM regions.

[14] AEMO. *Energy Adequacy Assessment Projection (EAAP).* Available at: http://www.aemo.com.au/AEMO%20Home/Electricity/Resources/Reports%20and%20Documents/EAAP. Viewed 17 June 2014.

Figure 11: Surplus capacity in Tasmania



Generation investment interest in Tasmania is focused on wind generation, with four projects announced. The three largest are the King Island (600 MW), White Rock (450 MW), and Cattle Hill (200 MW) proposals.

Table 17 shows the current capacity of existing and withdrawn generation, and committed and publicly announced projects.

Table 17: Tasmanian generation and project capacity by generation type (MW)

Status/Type	Coal	CCGT[a]	OCGT[b]	Gas other	Solar	Wind	Water	Biomass	Other	Total
Existing	-	208	178	-	-	373	2,281	5	-	3,045
Committed	-	-	-	-	-	-	-	-	-	-
Publicly announced	-	-	-	-	-	1,379	302	-	-	1,681
Withdrawn	-	-	-	-	-	-	-	-	-	-

[a] Combined-cycle gas turbine.
[b] Open-cycle gas turbine.

CHAPTER 4 – LINKS TO SUPPORTING INFORMATION

Table 18 provides links to additional information provided either as part of the 2014 ESOO accompanying information suite, or related AEMO planning information.

Table 18: Links to supporting information

Information source	Website address
2014 ESOO Constraints Workbook	http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities
2014 ESOO Methodology	http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities
2014 ESOO supplementary results and data files	http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities
2014 ESOO time-sequential modelling (Prophet) database	http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities
2014 National Electricity Forecasting Report	http://www.aemo.com.au/Electricity/Planning/Forecasting/National-Electricity-Forecasting-Report
Archive of previous ESOO reports	http://www.aemo.com.au/Electricity/Planning/Archive-of-previous-Planning-reports
Assessing Reserve Adequacy in the NEM	http://www.aemo.com.au/Electricity/Planning/Related-Information/Assessing-Reserve-Adequacy
Energy Adequacy Assessment Projection (EAAP)	http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/EAAP
Generator Information page	http://www.aemo.com.au/Electricity/Planning/Related-Information/Generation-Information
Historical Market Information page	http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities
Joining the NEM Guide	http://www.aemo.com.au/Electricity/Planning/Archive-of-previous-Planning-reports/Electricity-Statement-of-Opportunities-2011/2011-ESOO-Electronic-Information/~/media/Files/Other/planning/esoo/ESOO2011_CD/documents/Attachment_2%20pdf.ashx
MT PASA	http://www.aemo.com.au/Electricity/Data/Forecast-Supply-and-Demand/Medium-Term-Outlook
Maps and network diagrams	http://www.aemo.com.au/Electricity/Planning/Related-Information/Maps-and-Diagrams
New investor's guide	http://www.aemo.com.au/Electricity/Planning/Archive-of-previous-Planning-reports/2011-Victorian-Annual-Planning-Report/Appendices
Planning Assumptions (including information on modelling inputs)	http://www.aemo.com.au/Electricity/Planning/Related-Information/Planning-Assumptions
Power System Adequacy – Two-year Outlook	http://www.aemo.com.au/Electricity/Resources/Reports-and-Documents/Power-System-Adequacy
Scenario descriptions	http://www.aemo.com.au/Electricity/Planning/Related-Information/~/media/Files/Other/forecasting/2014_Planning_and_Forecasting_Scenarios.ashx

APPENDIX A – ESOO COMPONENT GUIDE

This appendix is designed to assist readers, as information previously included in the ESOO is now published in the suite of ESOO supporting documents, or in related AEMO planning reports.

Table 19 lists the information that AEMO is obliged to provide under the National Electricity Rules (NER), and states where it is located.

Table 19: ESOO checklist of compliance clauses

Clause	Summary of requirements	Where to find this information
NER, Chapter 3, Section 3.13.3(q)	By August in each year, AEMO must prepare and publish at a reasonable charge to cover the cost of production, a statement of opportunities, including at least the following information for the subsequent 10 year period:	
	• projections of aggregate MW consumption and energy requirements for each region.	2014 National Electricity Forecasting Report.[a] 2014 ESOO Generation Adequacy (Section 2) and Regional Outlook (Section 2.4).
	• generating capabilities of existing generating units and generating units for which formal commitments have been made for construction or installation.	Generation Information pages.[b]
	• planned plant retirements.	Generation Information pages[b] and ESOO Generation Investment (Section 2.3).[d]
	• a summary of network capabilities and constraints based upon Transmission Annual Planning Reports; and	Constraint Workbook.[c]
	• operational and economic information about the market to assist planning by: – Scheduled Generators, Semi-scheduled Generators and Market Participants; and – potential Scheduled Generators, Semi-scheduled Generators and Market Participants.	2014 National Electricity Forecasting Report.[a] NEM Historical Market Information report.[c]

[a] AEMO. Available at: http://www.aemo.com.au/Electricity/Planning/Forecasting/National-Electricity-Forecasting-Report. Viewed 17 June 2014.
[b] AEMO. Available at: http://www.aemo.com.au/Electricity/Planning/Related-Information/Generation-Information. Viewed 17 June 2014.
[c] AEMO. Available at: http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities. Viewed 17 June 2014.
[d] AEMO. Available at: http://www.aemo.com.au/Electricity/Planning/Electricity-Statement-of-Opportunities. Viewed 17 June 2014.