2016 South Australian Connection Point Forecasts

ElectraNet

March 2016

Version 1

Security Classification: Public

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Feedback

ElectraNet welcomes consumer feedback on the forecasts, including suggestions for improving the value of the information provided in the future to all interested parties. Feedback can be provided to:

Consultation@electranet.com.au

If you would like further information on the forecasts please direct any enquires to:

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Glossary of Terms

Term	Description
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
DAPR	Distribution Annual Planning Report
DNSP	Distribution Network Service Provider
ESCOSA	Essential Services Commission of South Australia
ESOO	Electricity Statement of Opportunities
ETC	Electricity Transmission Code (South Australia)
GSOO	Gas Statement of Opportunities
NEFR	National Electricity Forecasting Report
NEM	National Electricity Market
NER	National Electricity Rules
NGM	National Grid Metering
NPS	Northern Power Station
NTNDP	National Transmission Network Development Plan
POE	Probability of Exceedance
PPS	Playford Power Station
PV	Photovoltaic
RIT-T	Regulatory Investment Test for Transmission
Rules	National Electricity Rules
TAPR	Transmission Annual Planning Report
TNSP	Transmission Network Service Provider

1. Introduction

ElectraNet is the principal electricity Transmission Network Service Provider (TNSP) in South Australia and operates the South Australian transmission network in the National Electricity Market (NEM).

A critical planning input for the delivery of reliable transmission services to South Australian electricity consumers is a forecast of electricity demand. Due to the long lead times in the delivery of transmission infrastructure, it is necessary to forecast electricity demand and network loading conditions into the future. In the NEM this is typically done over a 10-year timeframe.

Since 2010-11, energy consumption from the grid in South Australia has been declining. Maximum demand[1] from the grid has also reduced, but not at the same rate and not consistently across the state. The reduction in demand for grid supplied electricity has increased the focus on demand forecasts to support the effective planning and management of the electricity grid. Distributed photovoltaic (PV) systems are reducing grid demand during the day. On clear sunny afternoons, transmission network connection points are experiencing reducing demand and in some cases are injecting more power into the grid than they are consuming[2].

The purpose of this report is to present the transmission connection point forecasts that ElectraNet intends to use in its 2016 South Australian Transmission Annual Planning report (TAPR) and also to highlight the trend of reducing midday demand. The most recent revisions to the demand forecast has not resulted in changes to ElectraNet's capital forecasts from last year.

Additional information on the maximum, average and minimum daily load shapes in 2015 at each transmission connection point is included in Appendix A along with how the 2015 maximum, averages and minimums would look if they were to occur in 2020 with forecast growth in PV[3]. This information is intended to inform the consideration and provision of non-network services in future Regulatory Investment Tests for Transmission (RIT-T). Copies of the data in Appendix A are available in spreadsheet format on request.

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[1]   Electricity demand is the amount of electrical power (rate at which energy flows) being consumed at any given time.

[2]   See Table 3-2 and Appendix A for examples of connection point that are injecting power.

[3]   PV forecasts are supplied by SA Power Networks

2. Background

ElectraNet is a specialist in electricity transmission, providing energy and infrastructure solutions across Australia. We power people's lives by delivering safe, affordable and reliable solutions to power homes, businesses and the economy.

Our network safely transports electricity over long distances to metropolitan, regional and remote areas. It is made up of over 5,600 circuit kilometres of transmission lines and cables that operate at voltages of 275 kV, 132 kV and 66 kV, as well as 89 high-voltage substations with modern centralised monitoring, control and switching facilities.

Our direct customers include power generators, the State's electricity distributor SA Power Networks, and large industry. The services we provide also impact on the cost and reliability of electricity for consumers that are connected to SA Power Networks' distribution network.

The role of ElectraNet in the electricity supply chain is illustrated below.

Figure 2-1: Role of ElectraNet in the electricity supply chain
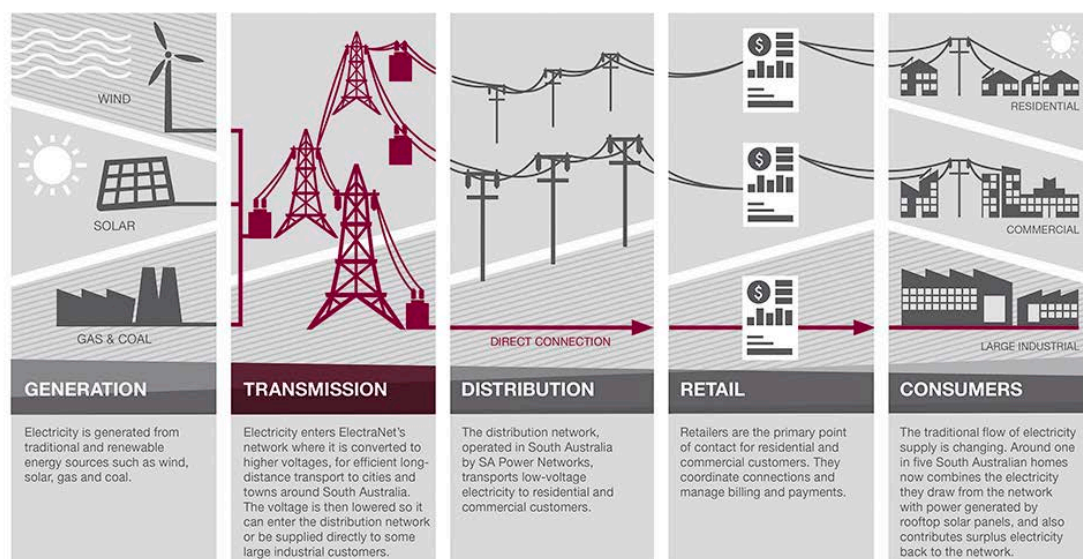
3. Connection point forecasts

Planning of the transmission network is based on maximum expected electricity demand rather than energy consumption to ensure sufficient capacity to reliably meet forecast demand for electricity.

A decline in large industrial demand forecasts, the rapid uptake of rooftop solar PV systems and energy efficiency measures have all had an impact on reducing energy consumption via the transmission network and, to a lesser extent, maximum demand.

The Australian Energy Market Operator's (AEMO) 2015 National Electricity Forecasting Report (NEFR) forecasts South Australian state-wide 10% probability of exceedance (POE)[4] maximum demand to marginally increase over the short term (3-year outlook), then generally to hold steady for the remainder of the 10-year outlook under a medium economic growth scenario.

However, the development of new loads, in particular potential new mining loads under higher economic growth scenarios, would see maximum demand supplied by the transmission network increase, requiring transmission network augmentation in parts of the network.

3.1 SA Power Networks

ElectraNet considers that its customers are best placed to understand their electricity needs. Given this, and in accordance with the National Electricity Rules clause 5.11.1, ElectraNet annually receives 10 year maximum demand forecasts from SA Power Networks and its direct connect customers.

ElectraNet and SA Power Networks work together to determine and agree on any adjustments to SA Power Networks' forecasts that are considered necessary to account for embedded generators and major customer loads connected directly to the distribution network. ElectraNet may make additional amendments to the forecasts received from SA Power Networks or replace them entirely. ElectraNet is not proposing to do this for the 2016 TAPR.

In 2013-14, SA Power Networks engaged ACIL Allen to produce an improved demand forecasting approach and tool. This tool is based on a "best-practice" demand forecasting methodology and produces weather-corrected POE forecasts and reconciliation of 'bottom up' connection point forecasts to a 'top down' state-wide forecast.

SA Power Networks has reconciled the connection point forecasts to the trend of AEMO's 2015 NEFR state-wide forecasts and has hence incorporated AEMO's view of state-wide population growth, energy efficiency and economic development into its forecasts. Major customer demand forecasts have been considered outside of the model and have been added afterwards[5].

This report uses 10% POE forecasts. That is, one year in ten, the annual maximum demand is expected to exceed the forecast[6].

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[4] 10% POE indicates a value that is expected to be exceeded once every ten years, on average.
[5] SA Power Networks Distribution Annual Planning Report: October 2014
[6] In accordance with our connection agreement with SA Power Networks, and to avoid the need for pre-contingent load shedding, ElectraNet uses peak demand forecasts for category 1 radial connection points.

The forecasts ElectraNet will be using in the 2016 TAPR are presented in Appendix A.

3.2 ElectraNet direct connect customers

Large customer loads that are directly connected to the transmission network provide maximum demand forecasts for their respective connection points. ElectraNet has not made any modifications to these demand forecasts.

These individual demand forecasts have been combined into the aggregated demand forecasts shown in Table 3-1. The power factors at the relevant connection points are maintained in accordance with National Electricity Rules requirements (S5.3.5).

ElectraNet's direct connect customers are:

• BHP Billiton (Davenport 275 kV connection point and a 132 kV connection point at Pimba);

• Defence Centre Woomera (Woomera 132 kV connection point);

• Alinta Energy (Leigh Creek Coalfield 33 kV connection point and Northern Power Station and Playford Power Station 132 kV supplied house supplies)[7];

• Arrium (Middleback 132 kV and 33 kV connection points);

• Orora (Roseworthy 11 kV connection point);

• SA Water (3.3 kV connection points at Morgan-Whyalla 1, 2, 3 & 4, Mannum-Adelaide 1, 2 & 3, Millbrook, and 11 kV connection points at Murray Bridge-Hahndorf 1, 2 & 3 water pumping stations);

• Hillgrove Copper (Back Callington 11 kV connection point);

• Santos (Stony Point 11 kV connection point); and

• AGL (Torrens Island Power Station 66 kV house supplies).

To avoid the inadvertent release of confidential information, information about the loads at Snuggery Industrial and Mt Gunson, which are dominated by individual large customers, have not been included in Appendix A. However, demand forecasts for these points are included in the table below.

Table 3-1: Combined direct connect customers' demand forecast (MW)

Year	2015-16	2016-17	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25
Combined total (MW)	321	321	321	321	321	321	321	321	321	321

3.3 Minimum demand

Appendix A includes for each connection point the last three years actual[8] and the ten year forecasts for maximum demand. Daily load traces of maximum, average and

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[7] Alinta Energy's Northern Power stations will cease operation in 2016 along with the associated mine. Playford has been out of service since 2012

[8] Actual demands are not weather corrected

minimum demands for each connection point and at the higher regional level are also included.

The daily minimum traces identify that numerous connection points are reaching zero grid demand or are injecting power back into the network.

Table 3-2 identifies those connection points that recorded negative demand (injection) largely as a result of distributed PV systems in 2014-15.

Table 3-3 identifies additional connection points that might see this phenomenon occur by 2019-20 based on current PV forecasts and without further material changes to the minimum demand.

Table 3-2: Connection points injecting power at time of maximum PV generation

Connection point	Category	2015 Minimum	2015 Maximum
Baroota	1	-0.4	7.1
Kadina East	2	-0.6	25.4
Kanmantoo	1	-0.1	1.3
Stony Point Distribution	1	0.0	0.1

Table 3-3: Connection points that may inject power at time of maximum PV generation by 2020

| Connection point	Category	2015 Minimum	2015 Maximum
Angas Creek	4	1.6	16.3
Ardrossan West	2	0.1	11.7
Brinkworth	4	0.3	4.2
Clare North	4	0.7	10.4
Dalrymple	1	0.1	7.6
Davenport West	4	2.2	25.4
Mannum	4	1.5	13.9
Mt Barker/Mt Barker South	4	8.6	81.0
Neuroodla	1	0.1	0.8
Southern Suburbs	4	71.4	578.6
Templers	4	2.8	26.3
Waterloo	4	0.7	13.5
Wudinna	2	1.2	14.0
Yadnarie	2	0.7	7.2

4. AEMO Forecasts

4.1 National Electricity Forecasting Report

AEMO publishes an annual state-wide demand forecast for South Australia. Since 2012, AEMO has published the South Australian forecast as part of the National Electricity Forecasting Report.

In 2015, AEMO forecast that state-wide demand would increase at an annual average rate of 0.4 per cent per annum until 2017-18. From 2018-19, AEMO's 10% POE demands are forecast to experience growth of around 0.6 per cent. Figure 4-1, presents AEMO's 2015 NEFR 10% POE medium forecasts for the three South Australian categories of residential and commercial demand, industrial demand and operation demand which is the sum of the previous two. Also shown is the previous three years of estimated actual maximum demand.

Figure 4-1: AEMO's 2015 SA Medium Demand 10% POE forecast
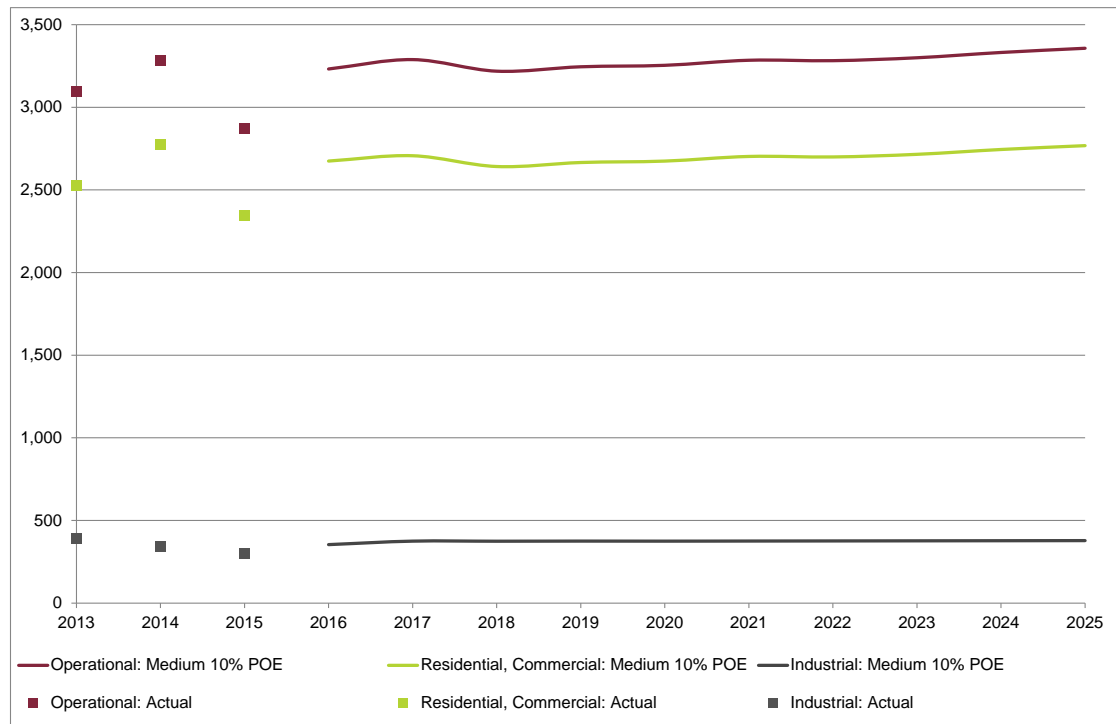
Source: AEMO 2015 NEFR SA Operational Demand

For the first time, AEMO included a forecast of minimum demand. Due to the rapid rise of distributed solar PV in South Australia (and indeed across Australia), a midday trough is now apparent in daily load profiles. In recent years this has, at a state-wide level, led to minimum demand on mild, sunny, public holidays lower than the over-night minimum.

AEMO has predicted that if current forecasts for PV growth continue, grid supplied minimums will reach zero by 2023-24. ElectraNet have presented minimum demand traces across the network to demonstrate that this is already occurring at localised levels on the network.

4.2   Connection Point Forecasting

In October 2015, AEMO published connection point forecasts for South Australia. Additional information on AEMO's methodology for connection point forecasting can be found on AEMO's website[9].

Similar to the methodology of SA Power Networks, the AEMO connection point forecasts are reconciled to AEMO's most recent NEFR state-wide forecasts. AEMO's connection point forecasts are shown in Appendix A.

5.   Reconciliation

ElectraNet uses both the AEMO state-wide forecasts and SA Power Networks' connection point forecasts depending on the particular needs of a planning study. To ensure consistency across ElectraNet's planning activities, it is necessary to reconcile the material inputs used by these planning studies. The demand forecasts are one such input into planning studies that can influence the results of our analysis. To ensure consistency across our activities, ElectraNet reconciles the various demand forecasts produced by the differing parties.

5.1   Connection point reconciliation

To ensure consistency between forecasts in ElectraNet's planning with AEMO, appendix A compares the ElectraNet/SA Power Networks connection point forecasts with AEMO's connection point forecasts. This identifies any material divergences that may influence on ElectraNet's capital forecasts. Despite some differences, the differences do not lead to different capital forecasts over the planning horizon.

5.2   State-wide reconciliation

To further ensure consistency of the forecasts, ElectraNet reconciles SA Power Networks' connection point forecasts with AEMO's NEFR state-wide forecast. SA Power Networks has implicitly applied – at the state-wide level – the same growth rates as AEMO in performing its forecast reconciliation process, hence the reconciliation does not identify any material discrepancy between the two forecasts.

6.   Future work

In the 2015 NEFR, AEMO has included a forecast of state-wide minimum demand in South Australia. At the state-wide level, with current PV growth assumptions, grid demand in South Australia is expected to reach zero by 2023 at certain times of the day and year.

A number of connection points in South Australia have already reached midday demands of zero or are now injecting power. ElectraNet will consider the potential for the injection at individual connection points to grow and assess if, and if so, when, this may create local network issues.

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9   http://aemo.com.au/Electricity/Planning/Forecasting/AEMO-Transmission-Connection-Point-Forecasting
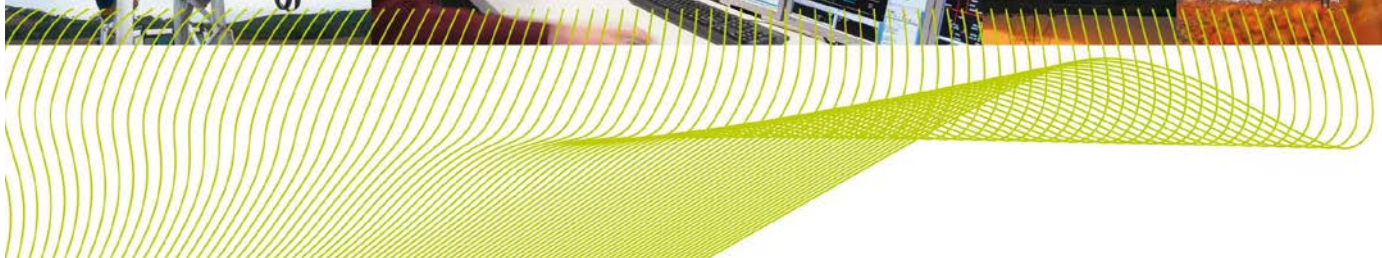
2016 South Australian Connection Point Forecasts

Appendices

March 2016

Security Classification: Public

Appendix A Connection Point Forecasts

The information contained in this Appendix identifies the actual recorded maximum demand at each connection point (or group of connection points) since summer 2012-13 as well as the ten year forecast.

Also provided is the maximum demand load shape for each connection point based on the recorded maximum demand for each half hour period of the 2014-15 summer. Therefore, these half hour period maximums could be from many different days of the summer. Typically maximums across the network have occurred during the months of January and February. The daily load profile is intended to inform non-network service providers of the likely characteristics that a non-network solution would need to provide.

Also provided is the average demand load shape and the minimum demand load shape, calculated on the same basis above over summer 2014-15.

The forecast effect of continued growth in PV is demonstrated by showing how the additional PV is expected to impact on the 2015 demand traces. The demand traces also highlight the connection points for which PV still has the potential to provide peak lopping.

Demand traces have been smoothed to take into account the effects of load shifting which creates spurious maximums and the effects of embedded generators.

Whilst some differences exist between ElectraNet and SA Power Network's forecasts with those of AEMO's, these differences are not leading to differences in the capital forecast and have not been considered material.
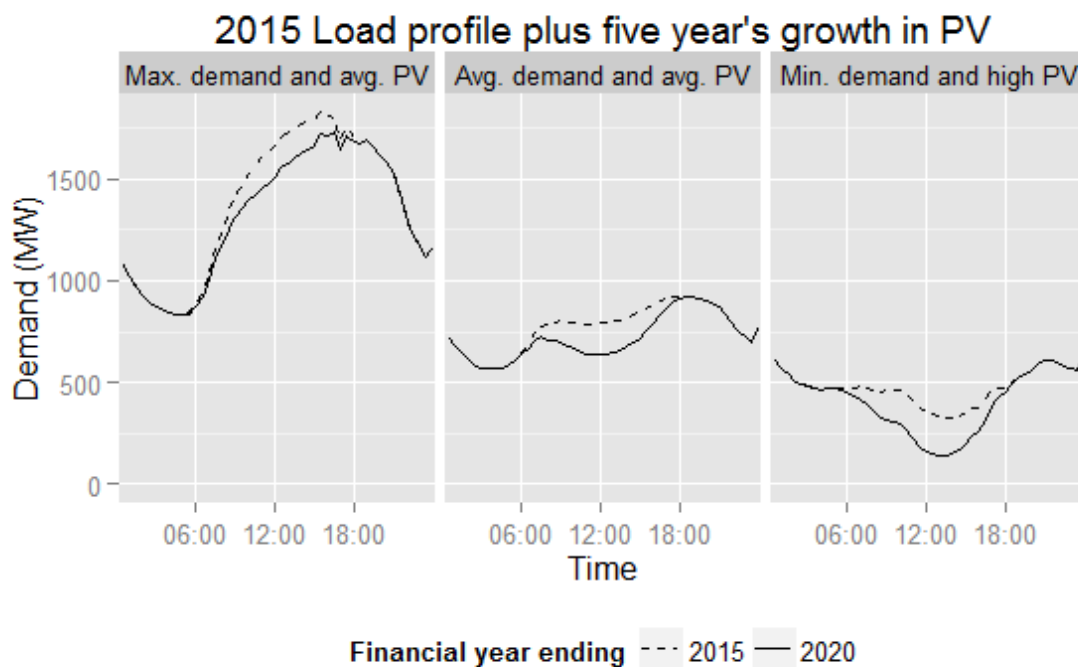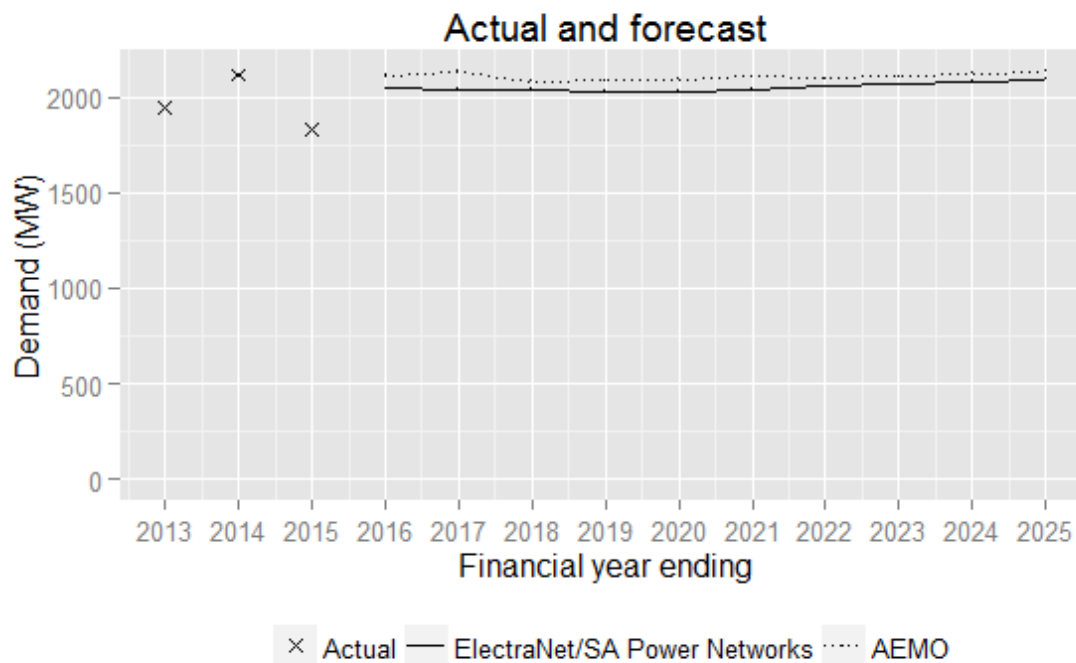
6.1   Adelaide Metro

Actual and forecast

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2012-13	1944.6
2013-14	2115.7
2014-15	1826.9

Financial Year	Forecast - MW
2015-16	2042.1
2016-17	2041.6
2017-18	2041.2
2018-19	2027.1
2019-20	2026.4
2020-21	2039.3
2021-22	2052.3
2022-23	2065.6
2023-24	2078.6
2024-25	2092.1

6.1.1 ACR

Actual and forecast
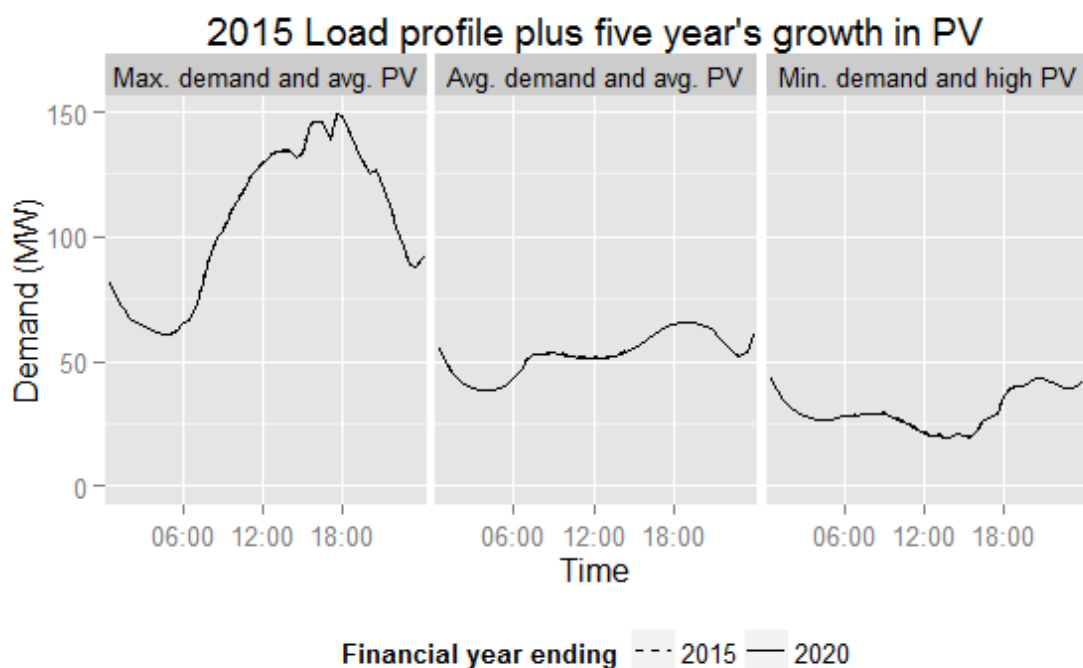

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	180.9	
2013-14	193.1	
2014-15	149.1	
Financial Year	Forecast - MW	Forecast - PF
2015-16	206	0.95
2016-17	206	0.95
2017-18	206	0.95
2018-19	206	0.95
2019-20	205	0.95
2020-21	206	0.95
2021-22	206	0.95
2022-23	206	0.95
2023-24	206	0.95
2024-25	206	0.95

6.1.2   Eastern Suburbs

Actual and forecast

× Actual — ElectraNet/SA Power Networks ⋯⋯ AEMO

2015 Load profile plus five year's growth in PV
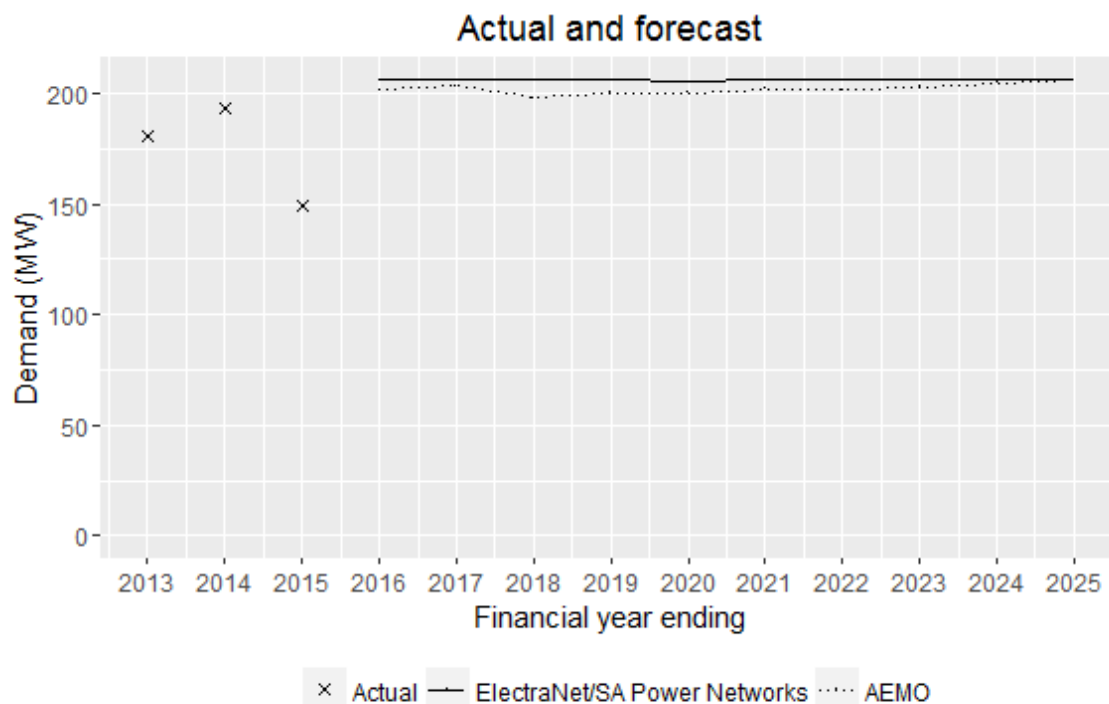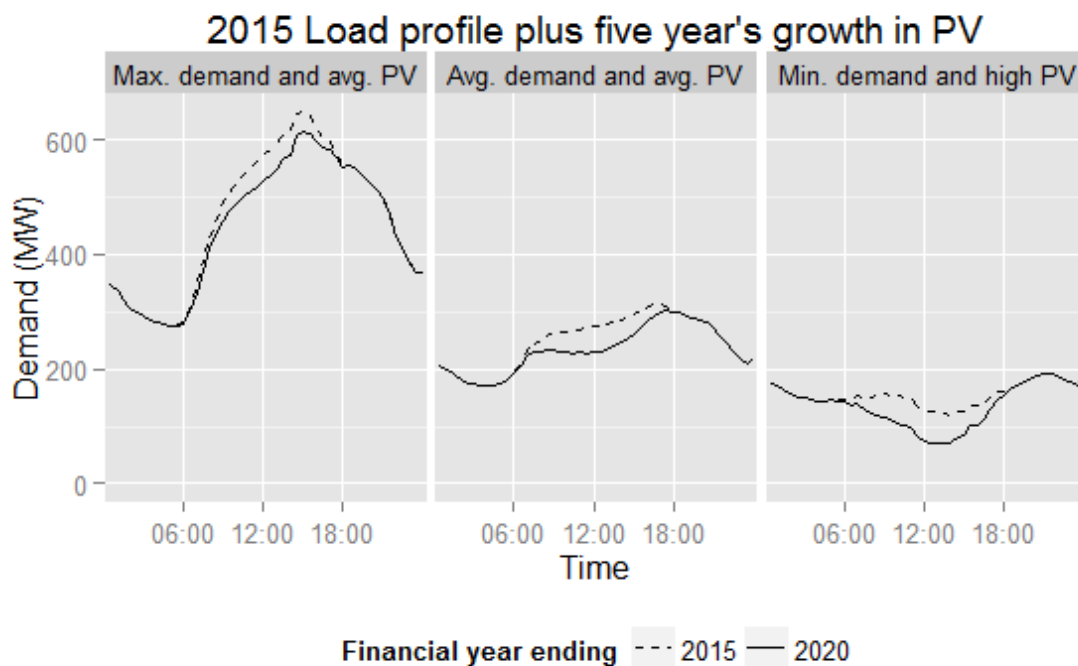
Financial year ending --- 2015 — 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	641.1	
2013-14	658.9	
2014-15	648.8	
Financial Year	Forecast - MW	Forecast - PF
2015-16	718.1	0.99
2016-17	715.4	0.99
2017-18	712.9	0.99
2018-19	710.2	0.99
2019-20	707.6	0.99
2020-21	710.4	0.99
2021-22	713.3	0.99
2022-23	716.2	0.99
2023-24	719.1	0.99
2024-25	722.2	0.99

6.1.3   Northern Suburbs
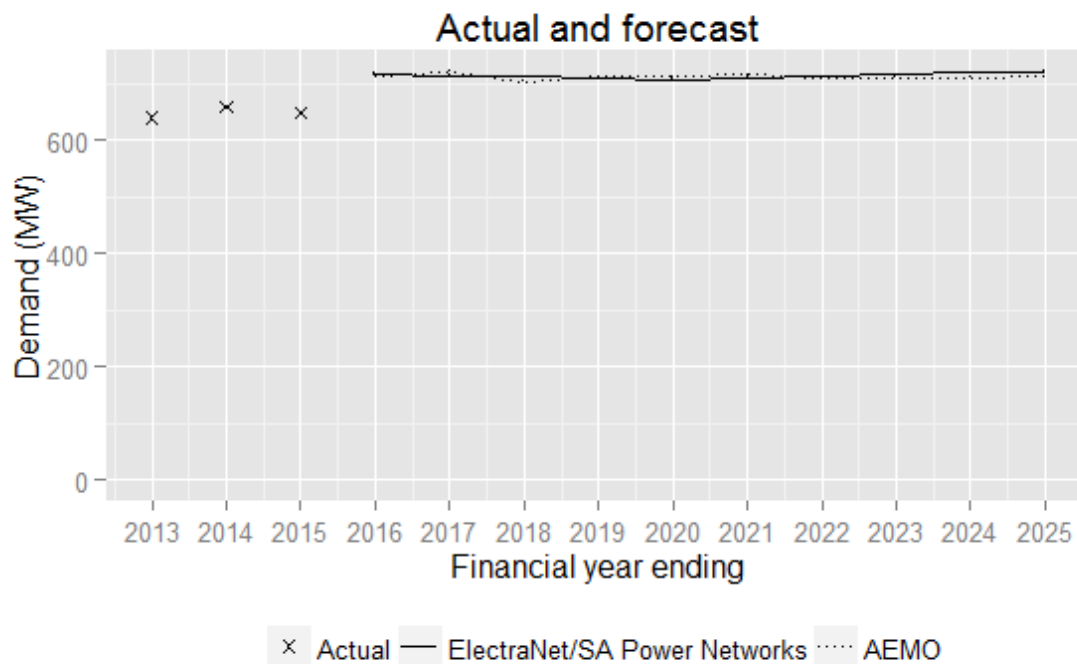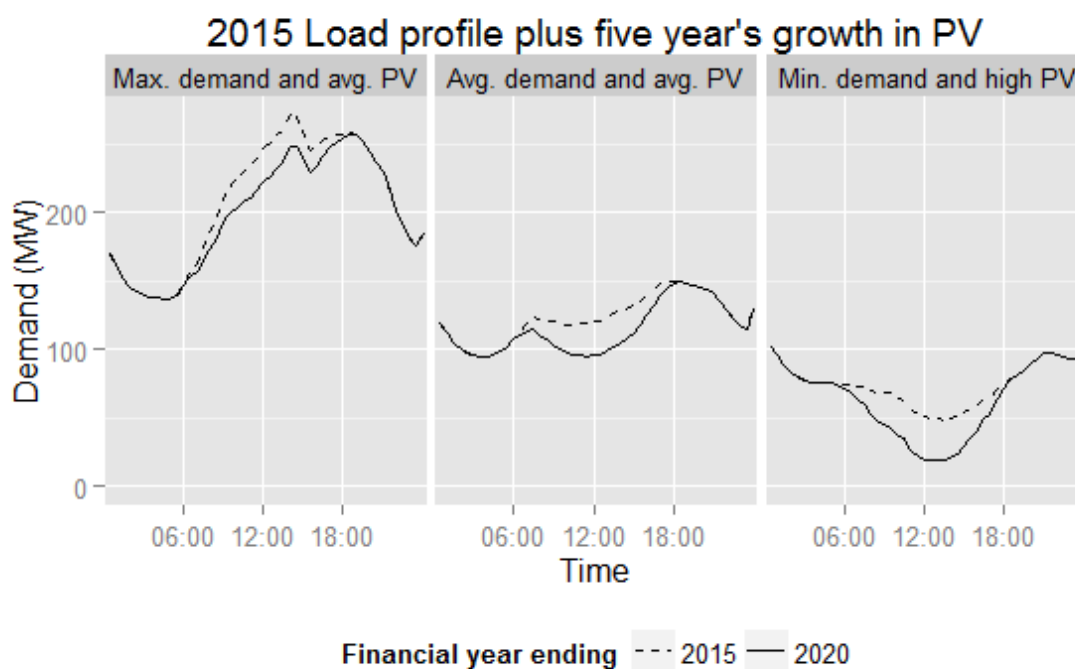
Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	326.9	
2013-14	303.0	
2014-15	271.0	
Financial Year	Forecast - MW	Forecast - PF
2015-16	319.2	1.00
2016-17	323.1	1.00
2017-18	327.0	1.00
2018-19	322.5	1.00
2019-20	326.3	1.00
2020-21	332.2	1.00
2021-22	338.1	1.00
2022-23	344.0	1.00
2023-24	349.7	1.00
2024-25	355.5	1.00

6.1.4   Southern Suburbs

Actual and forecast

× Actual — ElectraNet/SA Power Networks ⋯ AEMO

2015 Load profile plus five year's growth in PV

Max. demand and avg. PV   Avg. demand and avg. PV   Min. demand and high PV
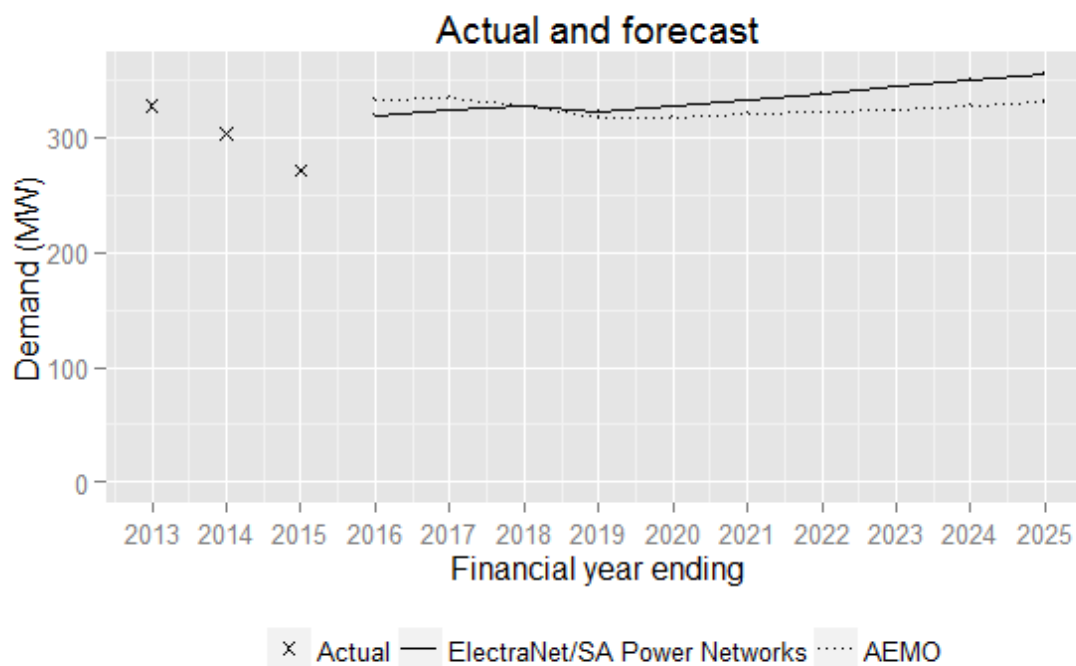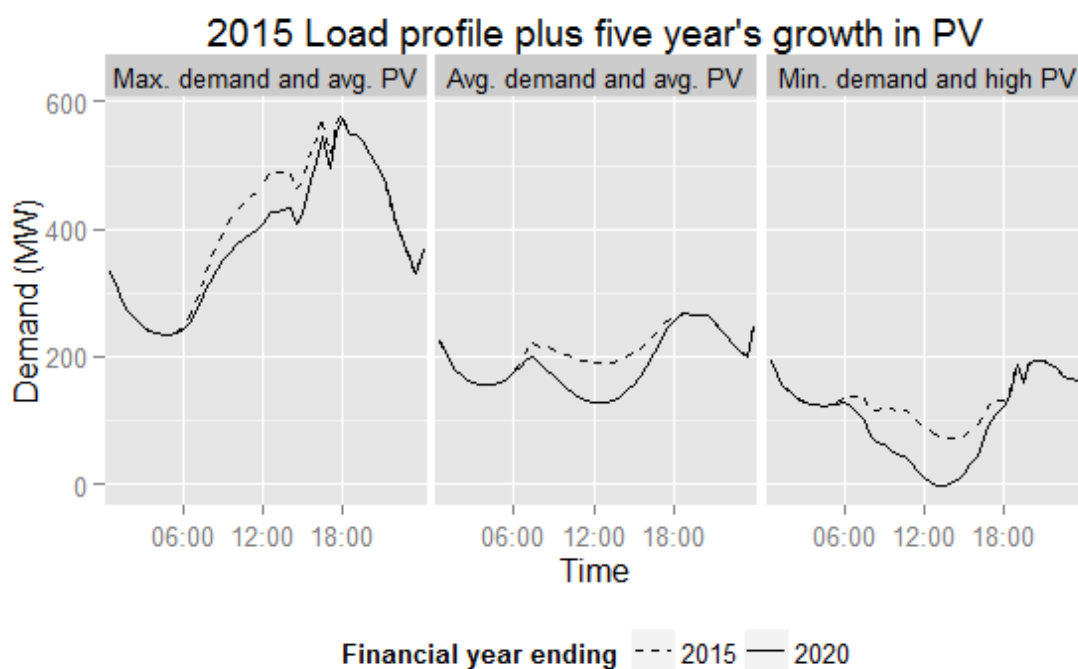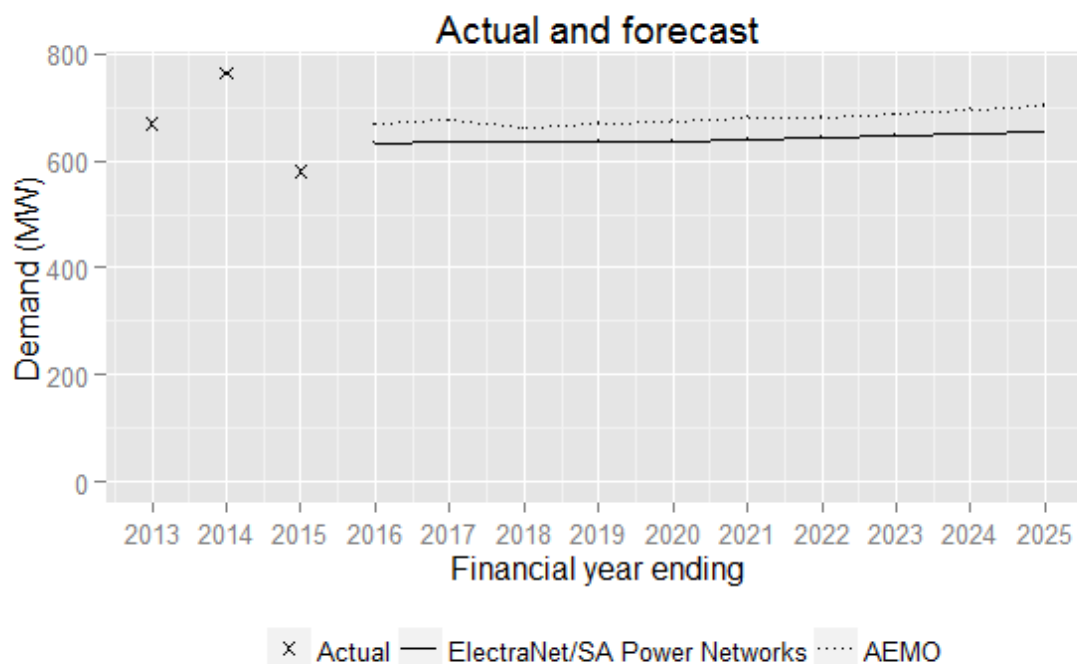
Financial year ending --- 2015 — 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	667.8	
2013-14	762.8	
2014-15	578.6	
Financial Year	Forecast - MW	Forecast - PF
2015-16	632.7	0.99
2016-17	634.2	0.99
2017-18	635.2	0.99
2018-19	635.8	0.99
2019-20	636.8	0.99
2020-21	640.0	0.99
2021-22	643.3	0.99
2022-23	646.7	0.99
2023-24	650.1	0.99
2024-25	653.5	0.99

6.1.5 Western Suburbs

Actual and forecast
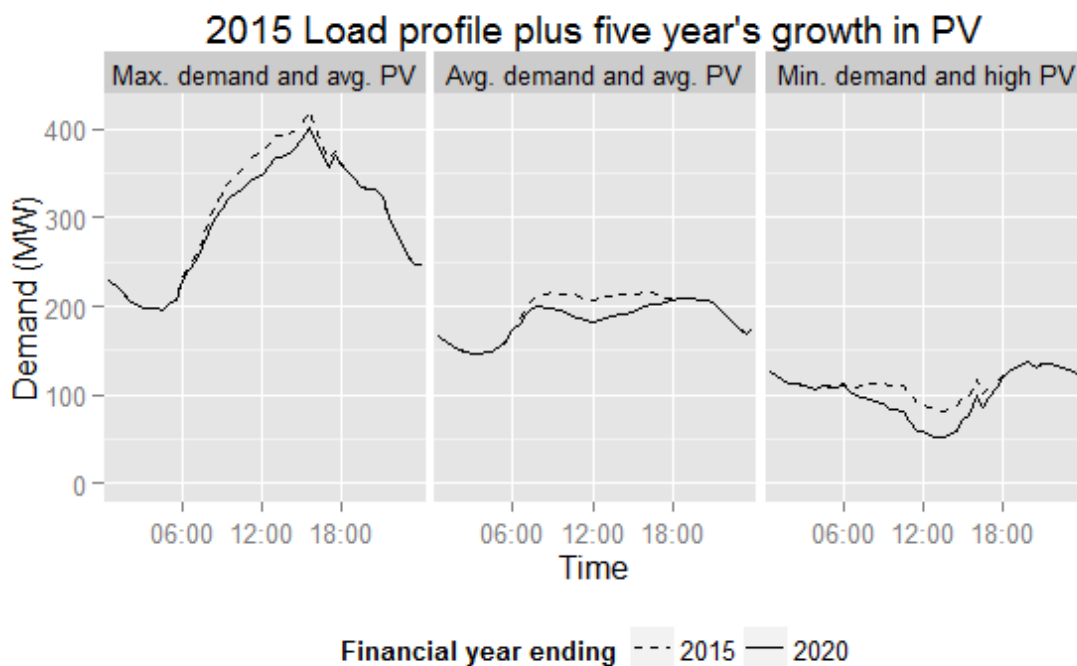

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	409.5	
2013-14	445.8	
2014-15	419.1	
Financial Year	Forecast - MW	Forecast - PF
2015-16	417.3	0.99
2016-17	414.1	0.99
2017-18	411.3	0.99
2018-19	403.6	0.99
2019-20	400.7	0.99
2020-21	401.9	0.99
2021-22	403.1	0.99
2022-23	404.4	0.99
2023-24	405.7	0.99
2024-25	407.1	0.99

6.2   Eastern Hills

Actual and forecast
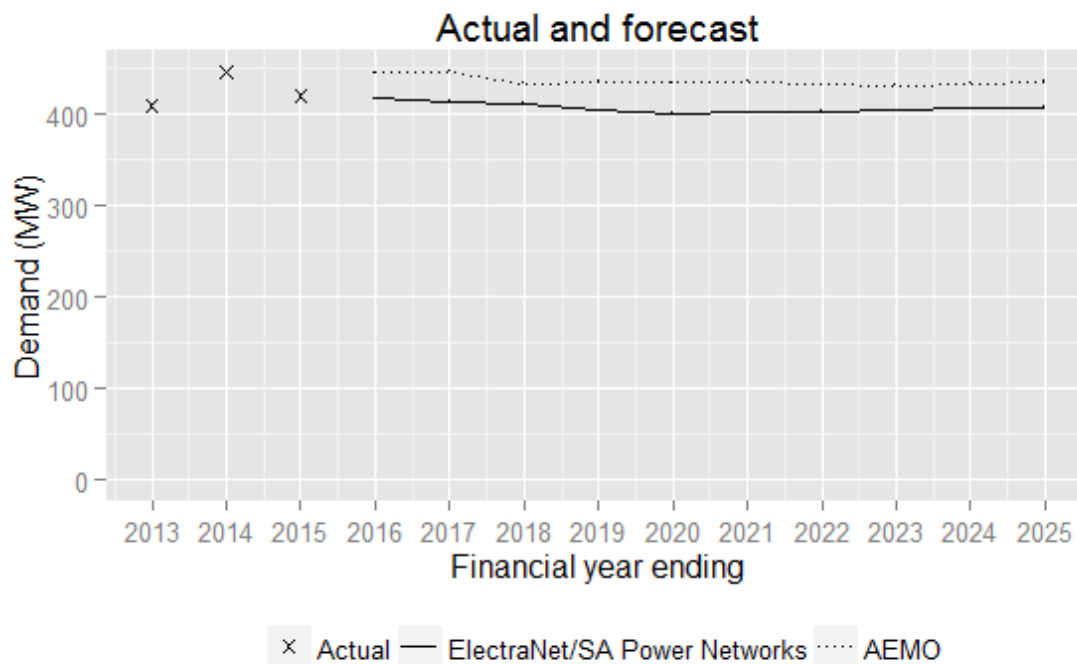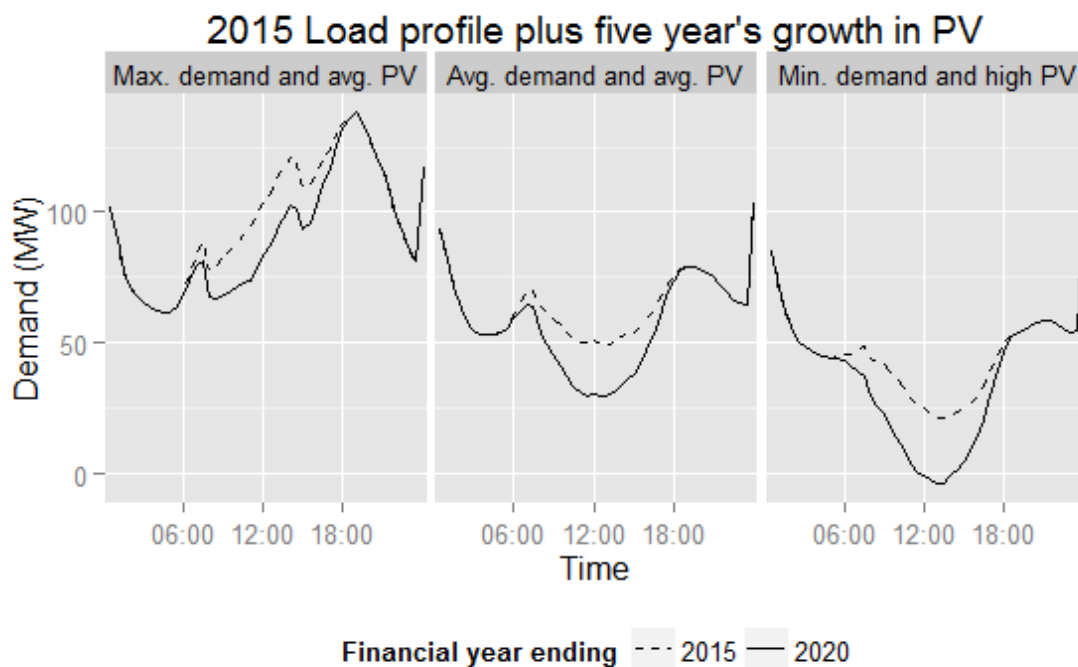

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2012-13	154.7
2013-14	166.1
2014-15	138.1

Financial Year	Forecast - MW
2015-16	167.0
2016-17	168.8
2017-18	170.2
2018-19	171.7
2019-20	173.2
2020-21	175.6
2021-22	178.1
2022-23	180.5
2023-24	182.8
2024-25	185.2

6.2.1   Angas Creek

Actual and forecast

× Actual   — ElectraNet/SA Power Networks   ⋯ AEMO

2015 Load profile plus five year's growth in PV

Financial year ending   --- 2015   — 2020
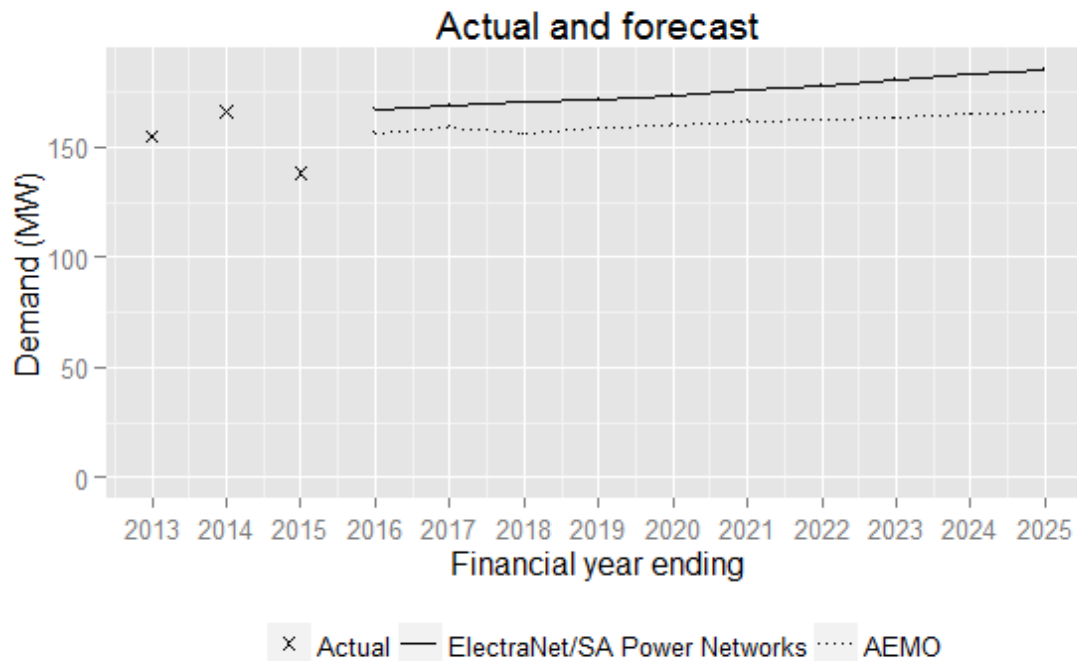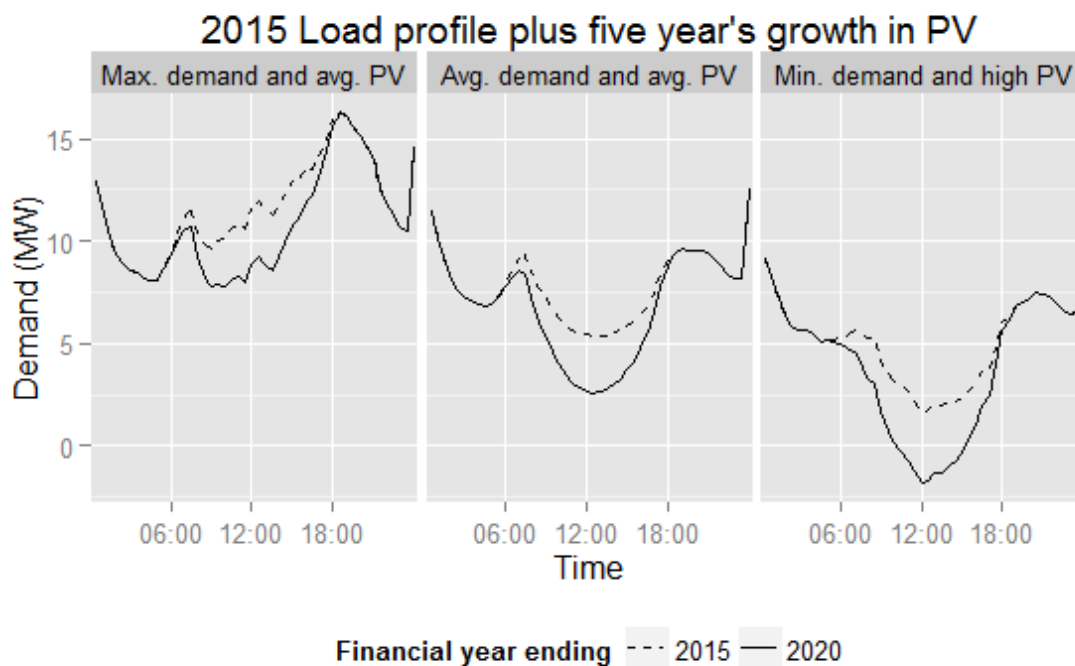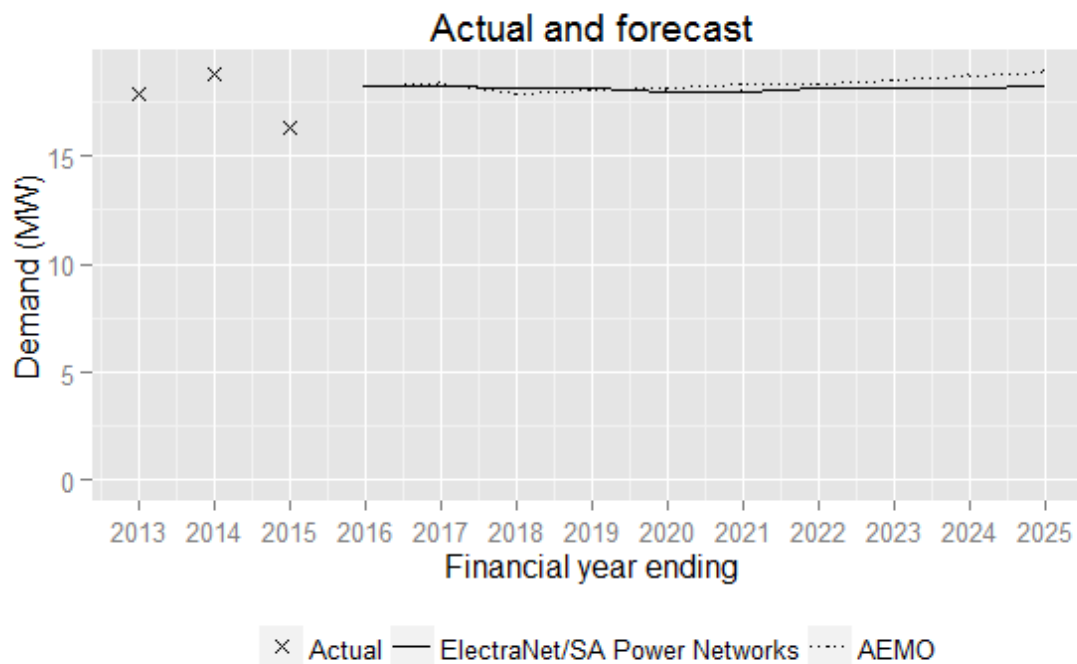
Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	17.8	
2013-14	18.8	
2014-15	16.3	
Financial Year	Forecast - MW	Forecast - PF
2015-16	18.2	0.96
2016-17	18.2	0.96
2017-18	18.1	0.96
2018-19	18.1	0.96
2019-20	18.0	0.96
2020-21	18.0	0.96
2021-22	18.1	0.96
2022-23	18.1	0.96
2023-24	18.1	0.96
2024-25	18.2	0.96

6.2.2   Kanmantoo

Actual and forecast

$\times$ Actual   —— ElectraNet/SA Power Networks   ···· AEMO

2015 Load profile plus five year's growth in PV
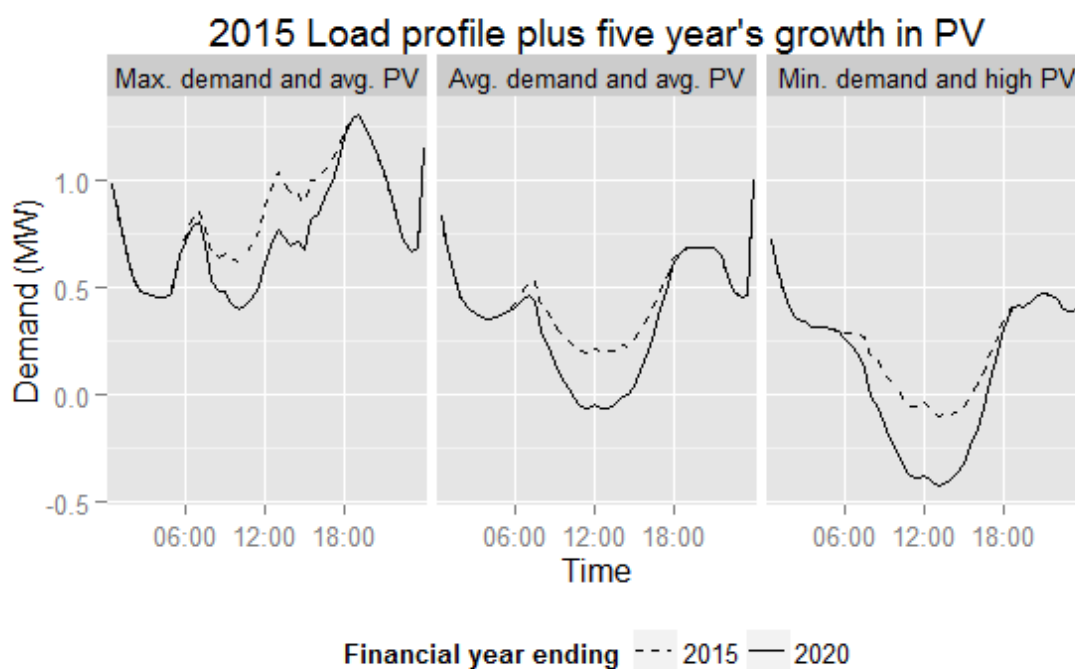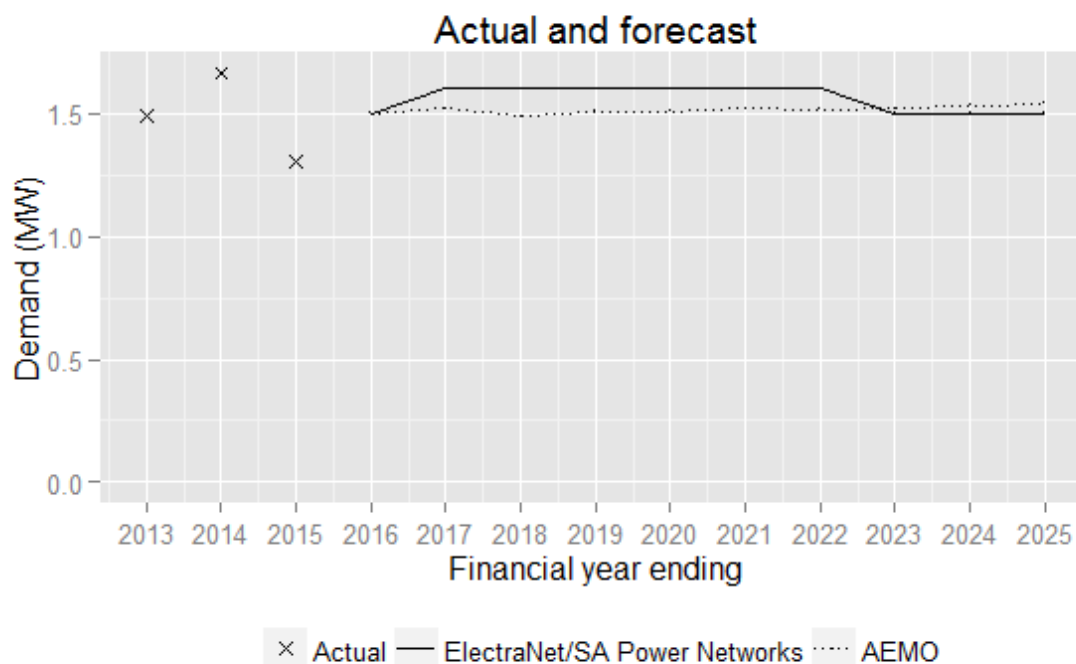

Financial year ending   --- 2015   —— 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	1.5	
2013-14	1.7	
2014-15	1.3	
Financial Year	Forecast - MW	Forecast - PF
2015-16	1.5	0.94
2016-17	1.6	0.94
2017-18	1.6	0.93
2018-19	1.6	0.93
2019-20	1.6	0.93
2020-21	1.6	0.93
2021-22	1.6	0.92
2022-23	1.5	0.92
2023-24	1.5	0.92
2024-25	1.5	0.92

6.2.3 Mannum

Actual and forecast
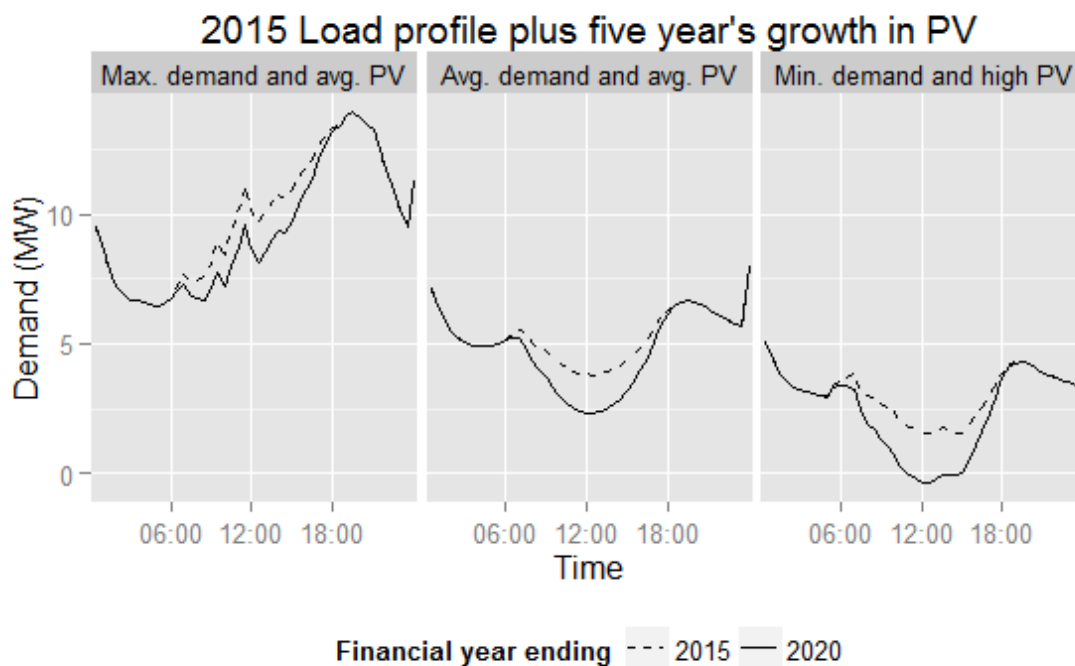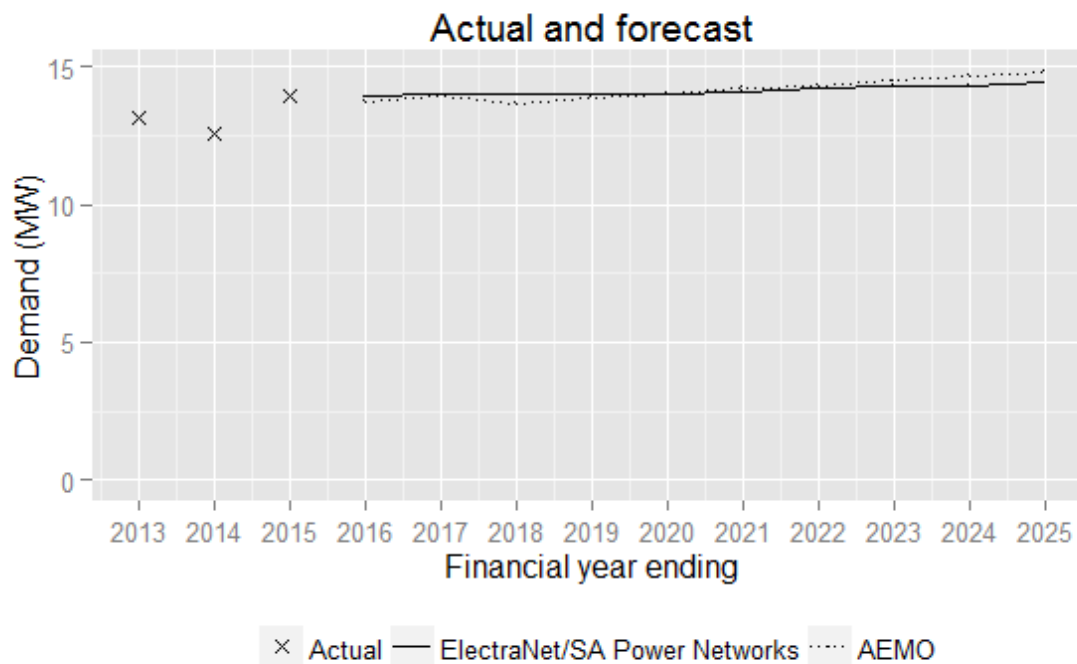

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	13.1	
2013-14	12.6	
2014-15	13.9	
Financial Year	Forecast - MW	Forecast - PF
2015-16	13.9	0.95
2016-17	14.0	0.95
2017-18	14.0	0.95
2018-19	14.0	0.95
2019-20	14.0	0.95
2020-21	14.1	0.95
2021-22	14.2	0.95
2022-23	14.3	0.95
2023-24	14.3	0.95
2024-25	14.4	0.95

6.2.4   Mobilong

Actual and forecast
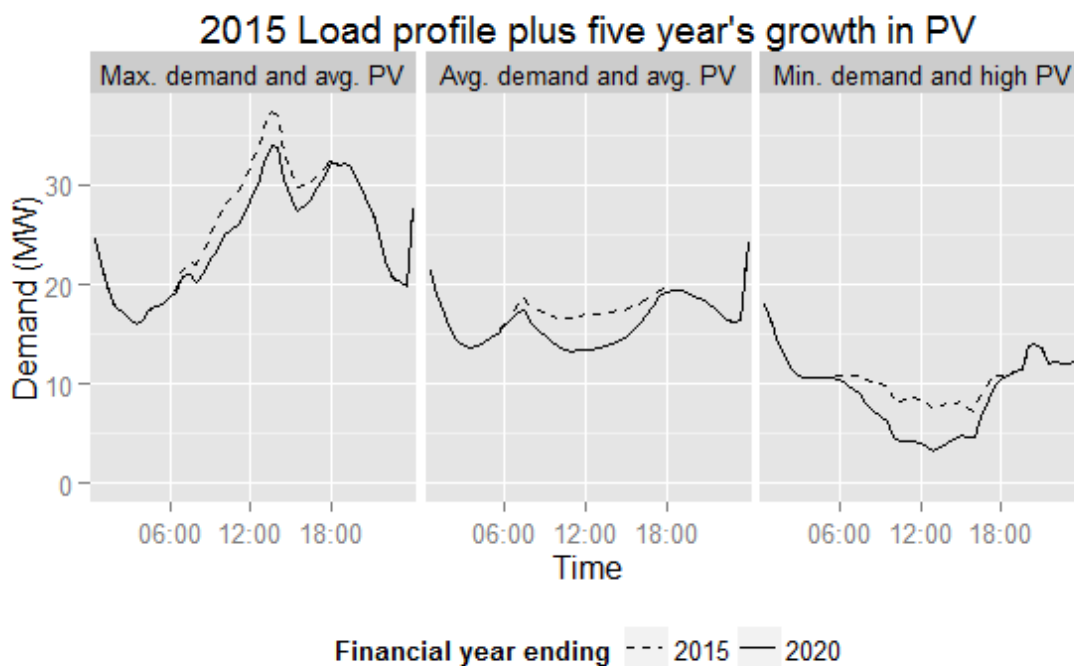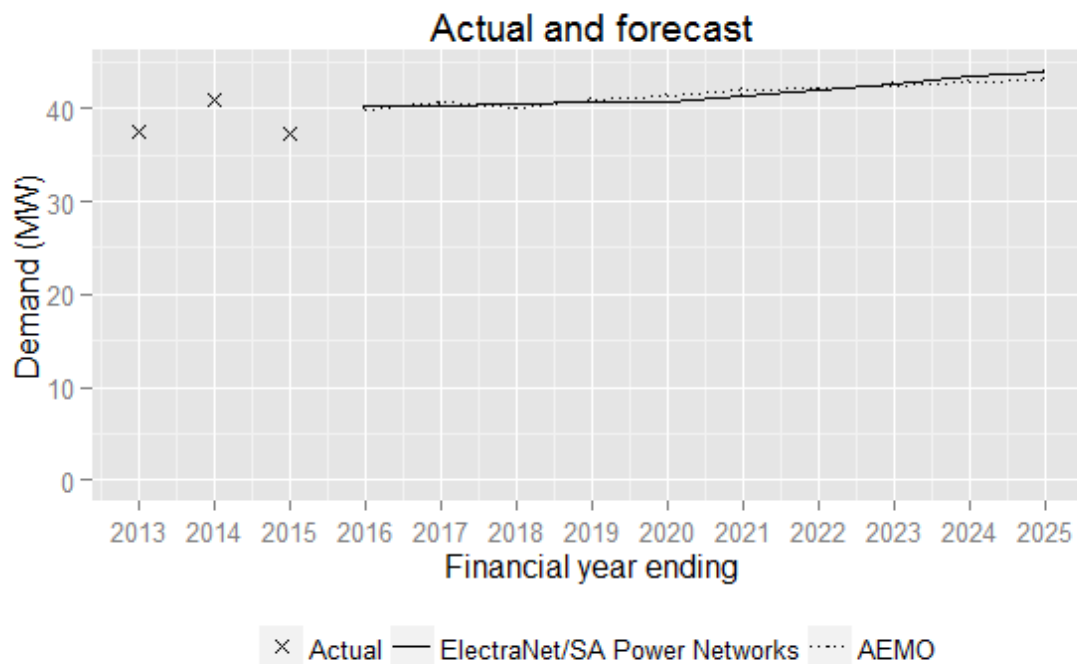

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	37.5	
2013-14	41.0	
2014-15	37.3	
Financial Year	Forecast - MW	Forecast - PF
2015-16	40.2	0.94
2016-17	40.3	0.94
2017-18	40.4	0.94
2018-19	40.6	0.94
2019-20	40.7	0.94
2020-21	41.4	0.94
2021-22	42.0	0.94
2022-23	42.7	0.94
2023-24	43.4	0.94
2024-25	44.0	0.94

6.2.5 Mt Barker/Mt Barker South

Actual and forecast

× Actual — ElectraNet/SA Power Networks ⋯⋯ AEMO

2015 Load profile plus five year's growth in PV
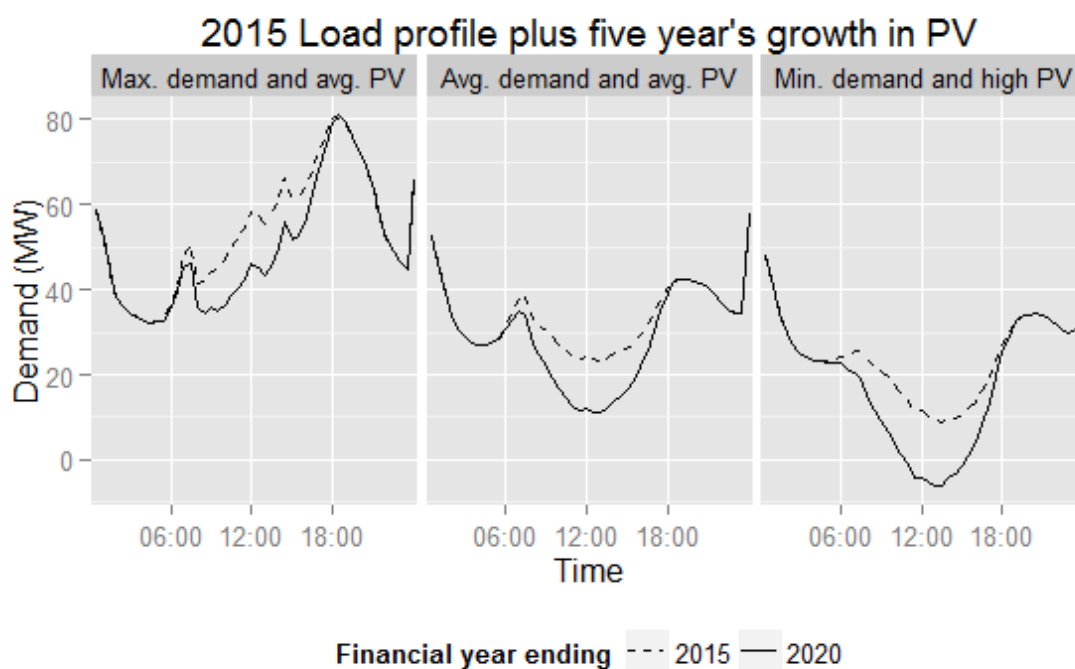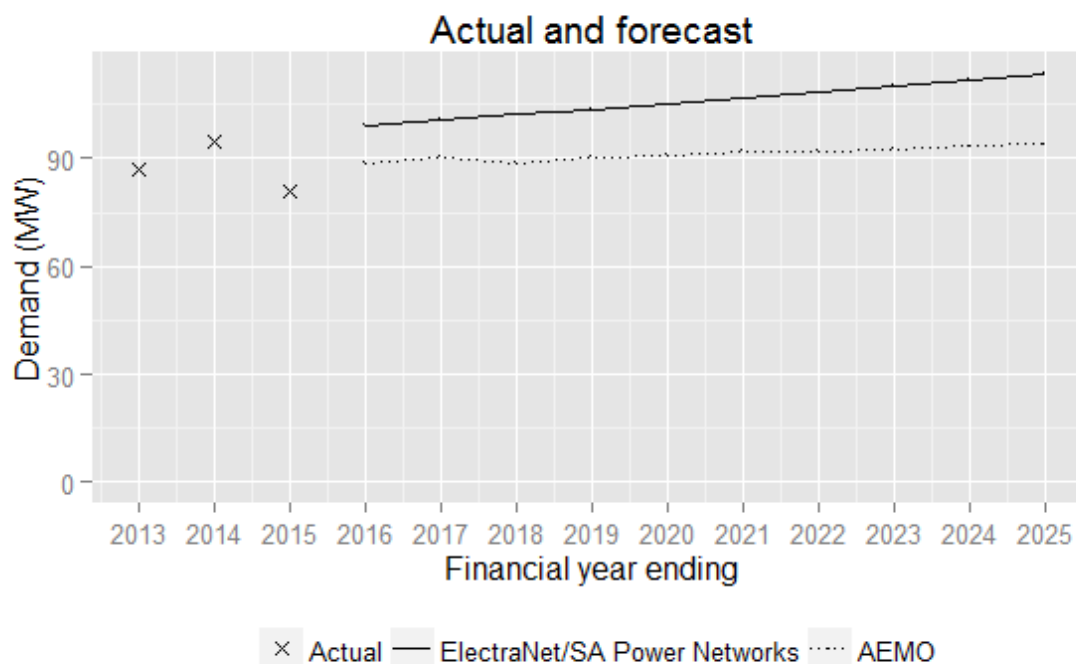

Financial year ending --- 2015 — 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	87.0	
2013-14	94.8	
2014-15	81.0	
Financial Year	Forecast - MW	Forecast - PF
2015-16	99.3	0.95
2016-17	100.8	0.95
2017-18	102.3	0.95
2018-19	103.6	0.95
2019-20	105.1	0.95
2020-21	106.8	0.95
2021-22	108.5	0.95
2022-23	110.3	0.95
2023-24	112.0	0.95
2024-25	113.7	0.95

6.3   Eyre Peninsula

Actual and forecast
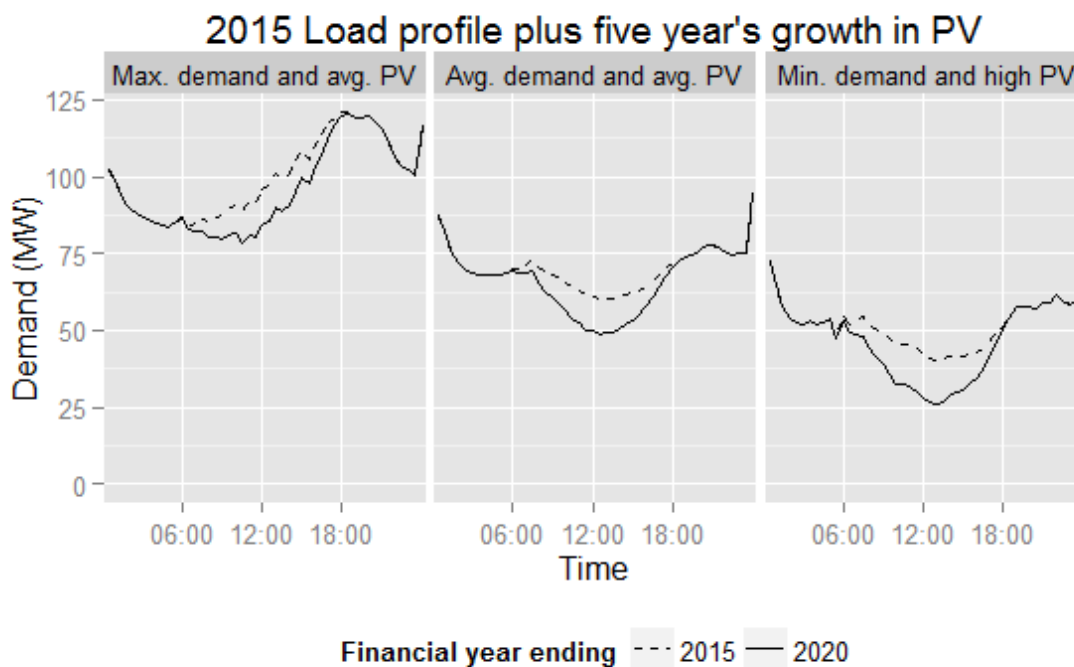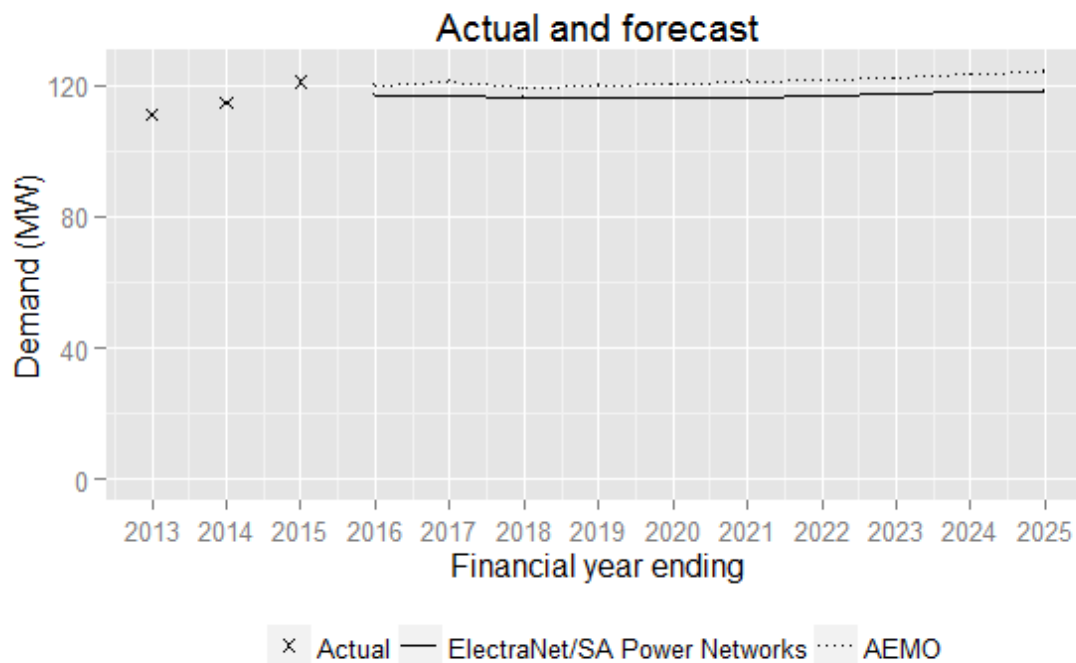

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2012-13	111.0
2013-14	114.6
2014-15	120.9

Financial Year	Forecast - MW
2015-16	117.0
2016-17	116.6
2017-18	116.3
2018-19	116.0
2019-20	115.9
2020-21	116.2
2021-22	116.7
2022-23	117.1
2023-24	117.7
2024-25	118.1

6.3.1 Port Lincoln

Actual and forecast
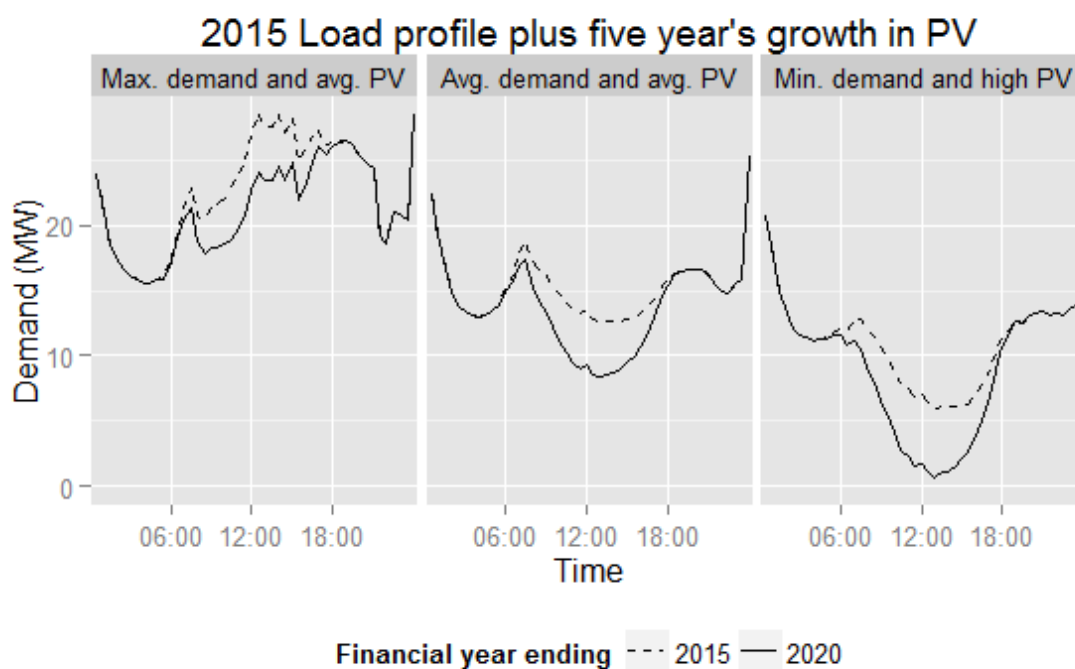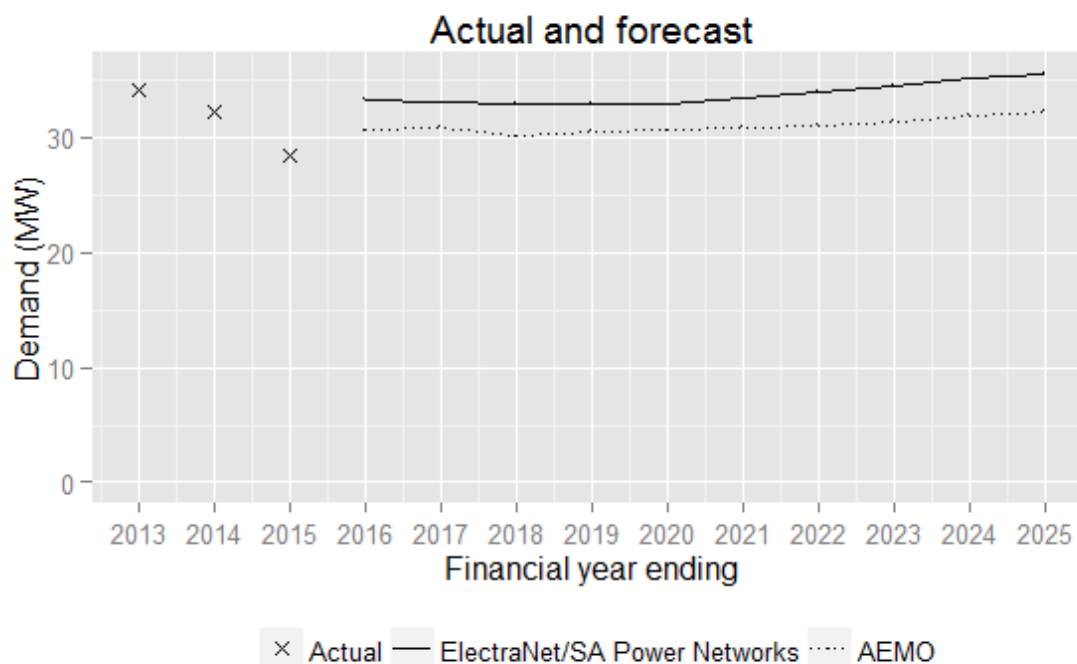

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

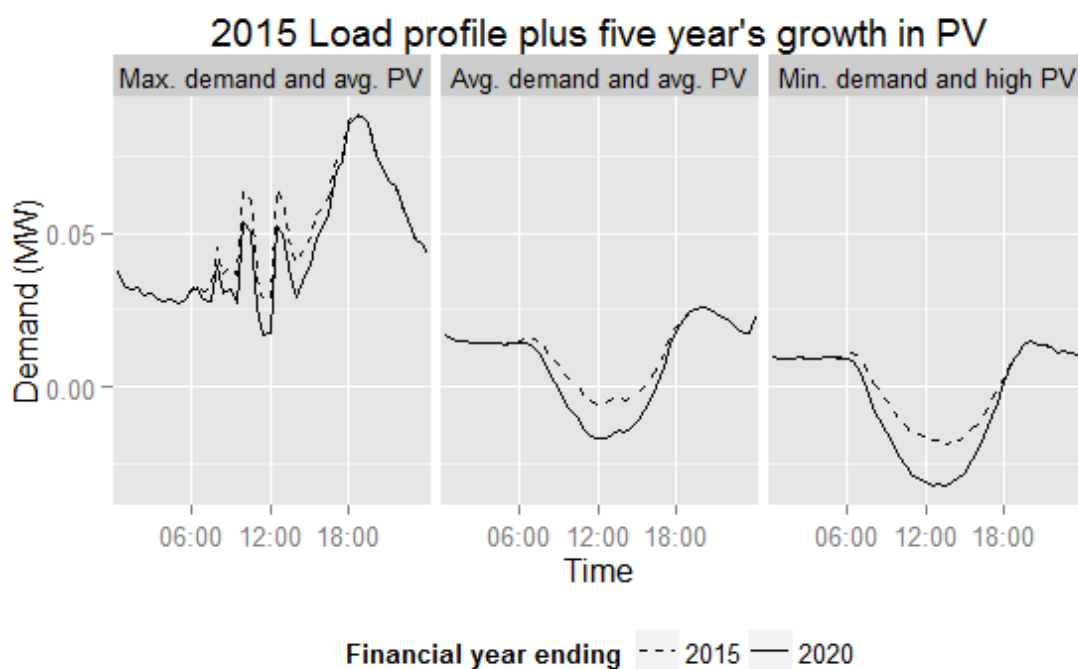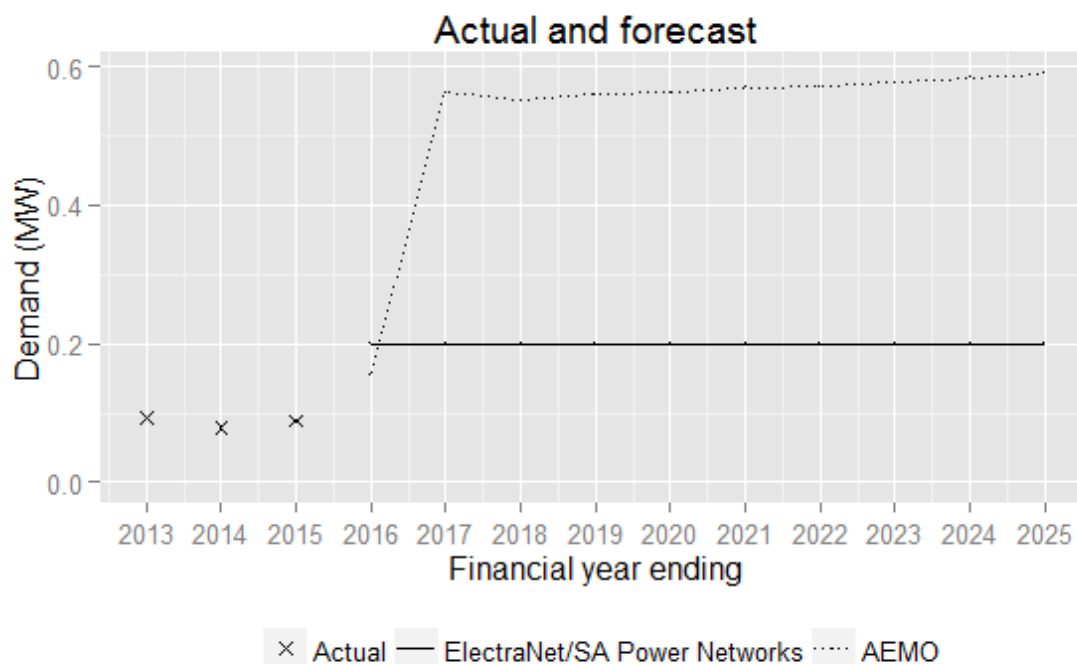| Financial year	Actual (MW)	
2012-13	34.2	
2013-14	32.3	
2014-15	28.4	
Financial Year	Forecast - MW	Forecast - PF
2015-16	33.3	0.96
2016-17	33.1	0.96
2017-18	33.0	0.96
2018-19	33.0	0.96
2019-20	32.9	0.96
2020-21	33.4	0.96
2021-22	34.0	0.96
2022-23	34.5	0.96
2023-24	35.1	0.96
2024-25	35.6	0.96

6.3.2 Stony Point Distribution

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2012-13	0.1
2013-14	0.1
2014-15	0.1

Financial Year	Forecast - MW	Forecast - PF
2015-16	0.2	0.90
2016-17	0.2	0.90
2017-18	0.2	0.90
2018-19	0.2	0.90
2019-20	0.2	0.90
2020-21	0.2	0.90
2021-22	0.2	0.90
2022-23	0.2	0.90
2023-24	0.2	0.90
2024-25	0.2	0.90

6.3.3 Whyalla Central

Actual and forecast

$\times$ Actual — ElectraNet/SA Power Networks ···· AEMO

2015 Load profile plus five year's growth in PV
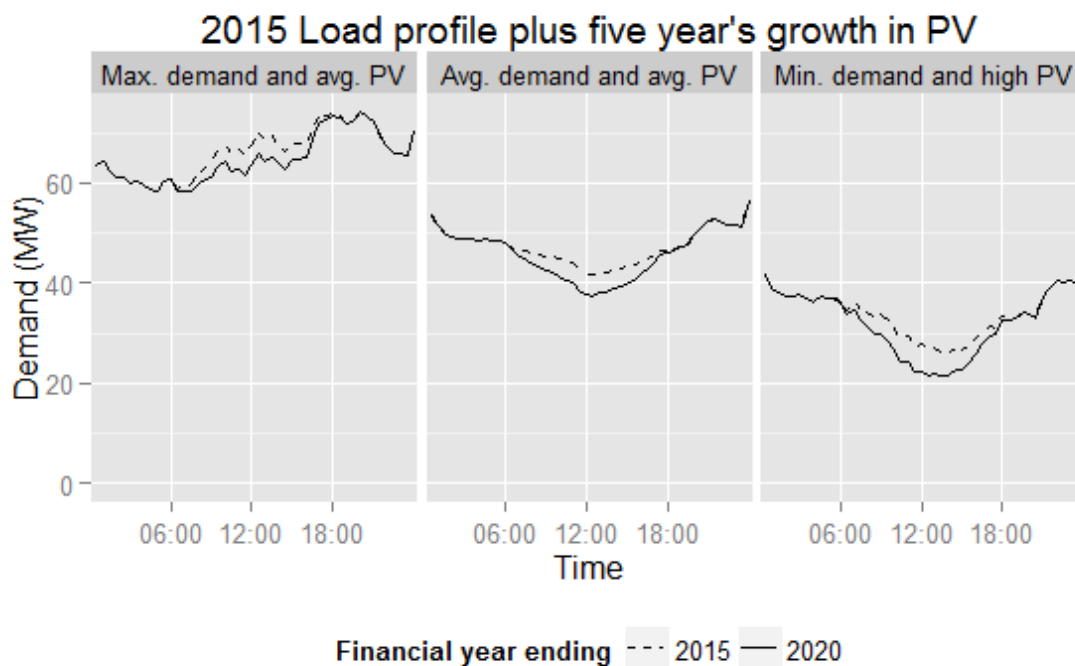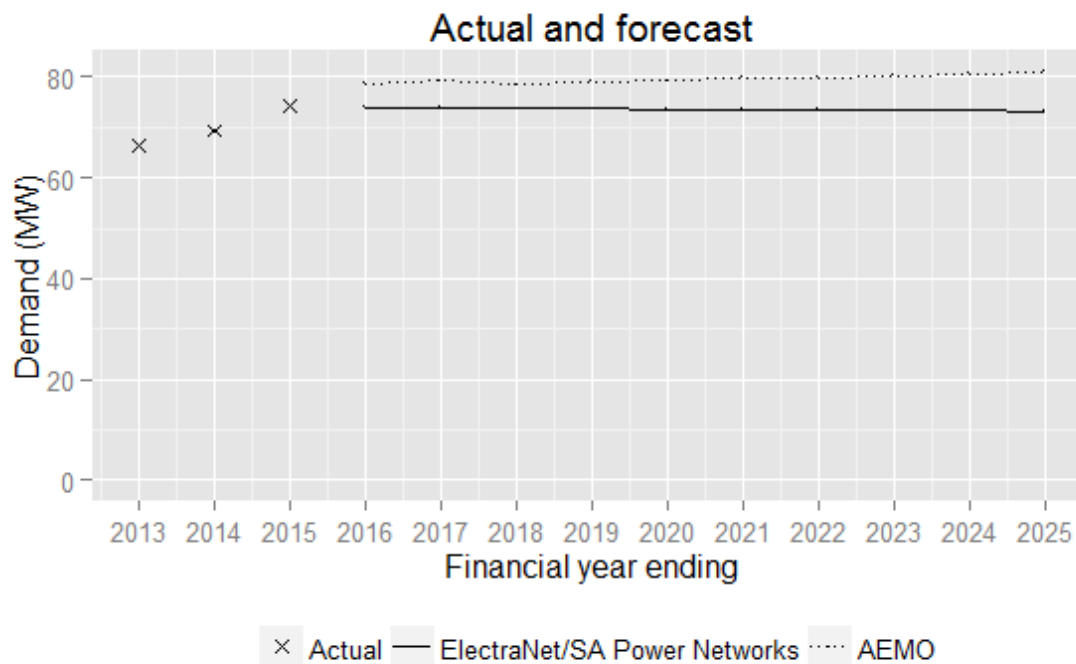

Financial year ending --- 2015 — 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

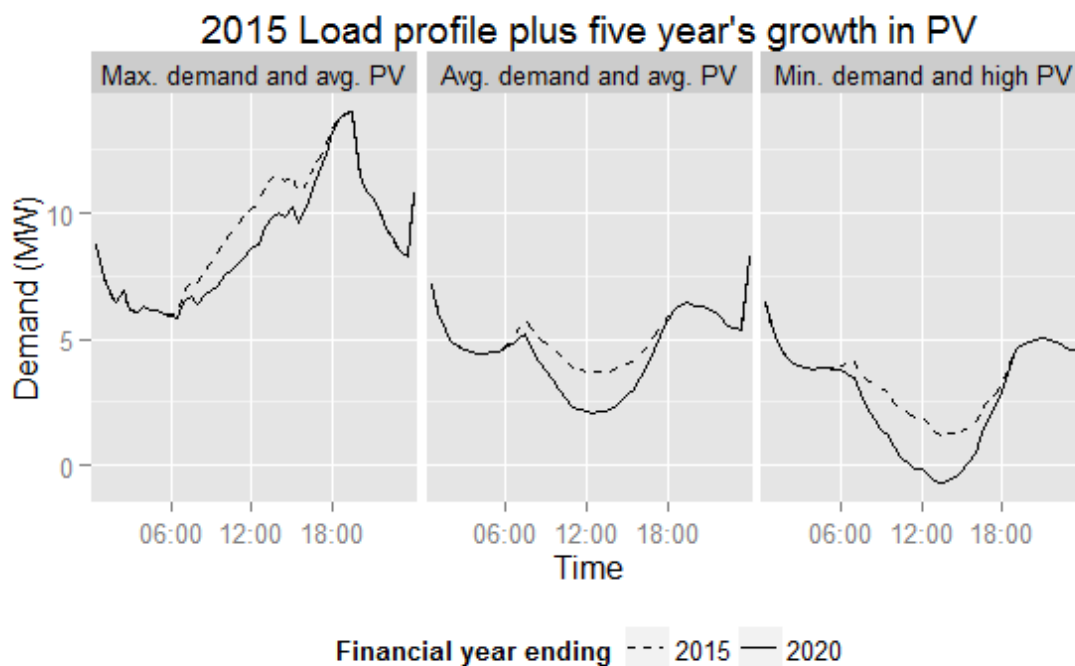| Financial year	Actual (MW)	
2012-13	66.4	
2013-14	69.4	
2014-15	74.1	
Financial Year	Forecast - MW	Forecast - PF
2015-16	74.0	0.95
2016-17	73.9	0.95
2017-18	73.8	0.95
2018-19	73.7	0.95
2019-20	73.6	0.95
2020-21	73.5	0.95
2021-22	73.5	0.95
2022-23	73.4	0.95
2023-24	73.3	0.95
2024-25	73.2	0.95

6.3.4 Wudinna

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	14.1	
2013-14	15.3	
2014-15	14.0	
Financial Year	Forecast - MW	Forecast - PF
2015-16	13.8	1.00
2016-17	13.6	1.00
2017-18	13.5	1.00
2018-19	13.3	1.00
2019-20	13.2	1.00
2020-21	13.1	1.00
2021-22	13.1	1.00
2022-23	13.1	1.00
2023-24	13.1	1.00
2024-25	13.1	1.00

6.3.5   Yadnarie

Actual and forecast
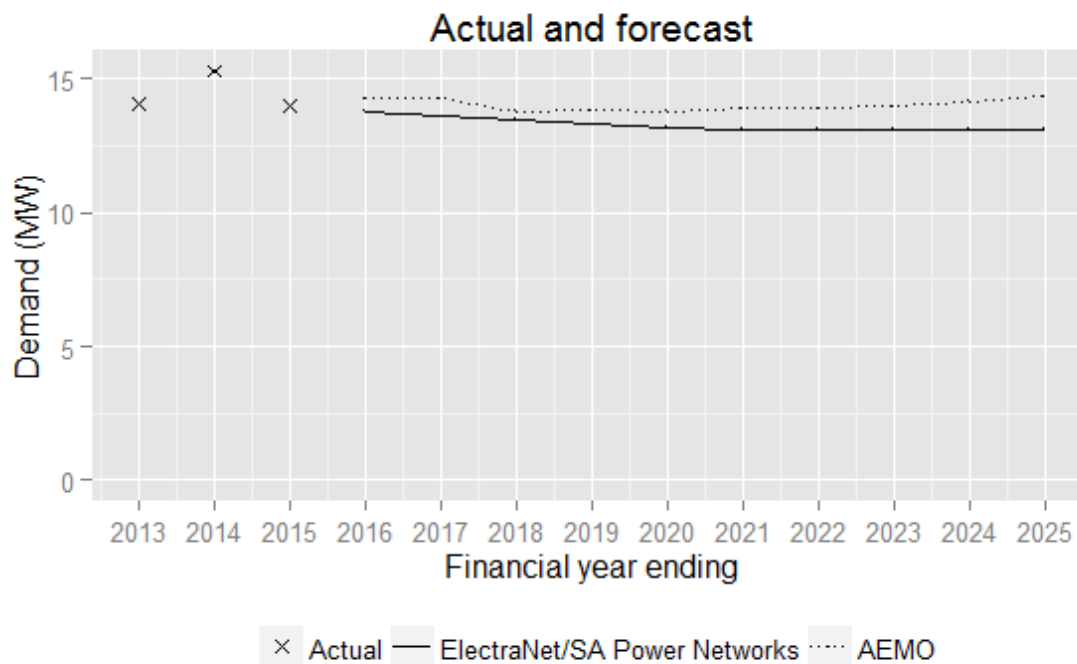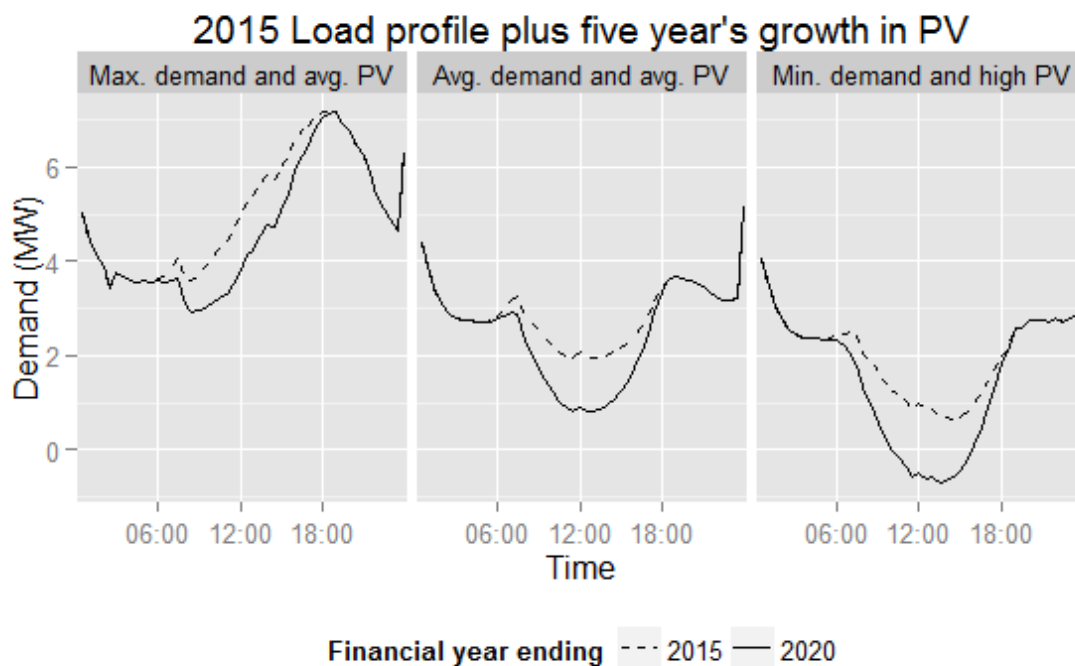

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	8.0	
2013-14	8.2	
2014-15	7.2	
Financial Year	Forecast - MW	Forecast - PF
2015-16	7.8	0.99
2016-17	7.8	0.99
2017-18	7.8	0.99
2018-19	7.8	0.99
2019-20	7.9	0.99
2020-21	7.9	0.99
2021-22	7.9	0.99
2022-23	7.9	0.99
2023-24	8.0	0.99
2024-25	8.0	0.99

6.4 Mid North

Actual and forecast
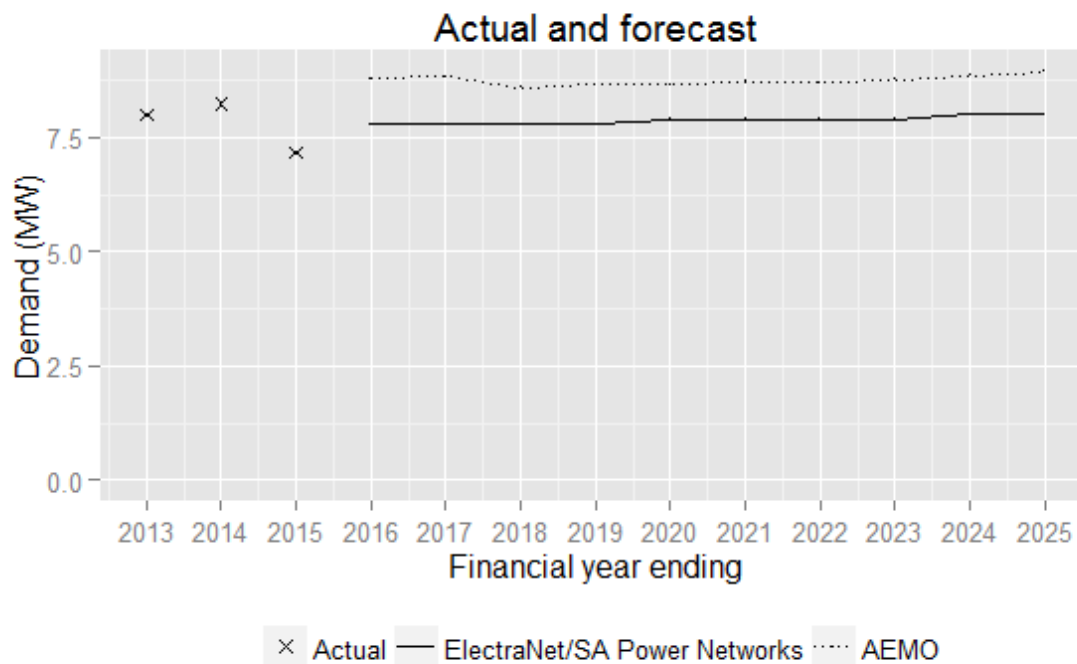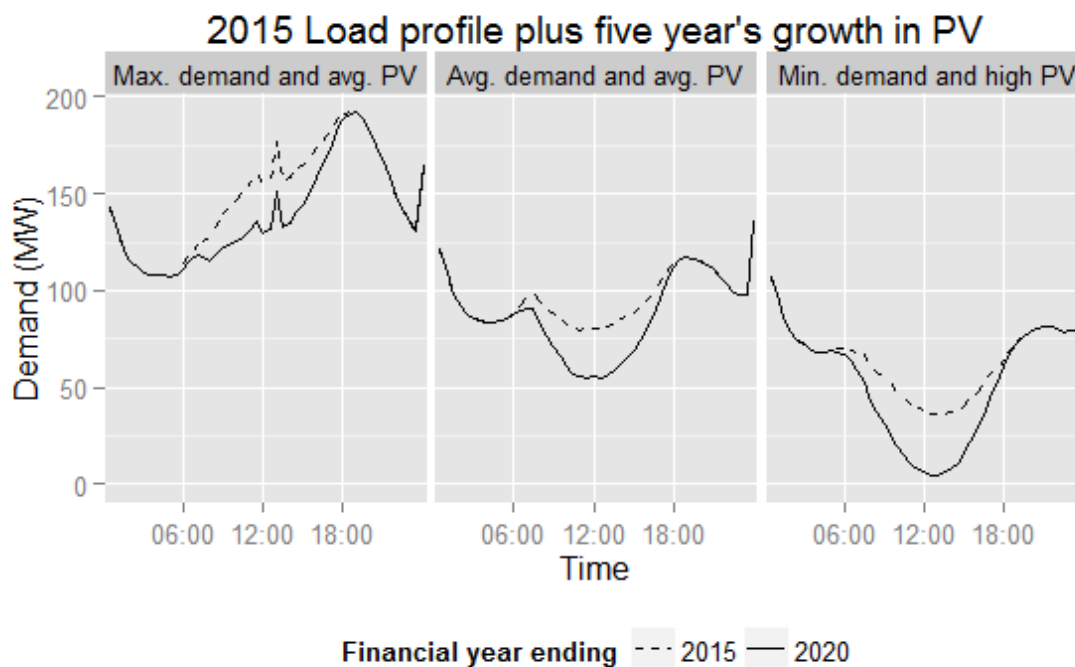

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2012-13	225.5
2013-14	233.0
2014-15	192.0
Financial Year	Forecast - MW
2015-16	207.8
2016-17	221.9
2017-18	221.6
2018-19	221.4
2019-20	221.2
2020-21	222.5
2021-22	223.6
2022-23	224.9
2023-24	226.3
2024-25	227.5

6.4.1   Ardrossan West

Actual and forecast

2015 Load profile plus five year's growth in PV

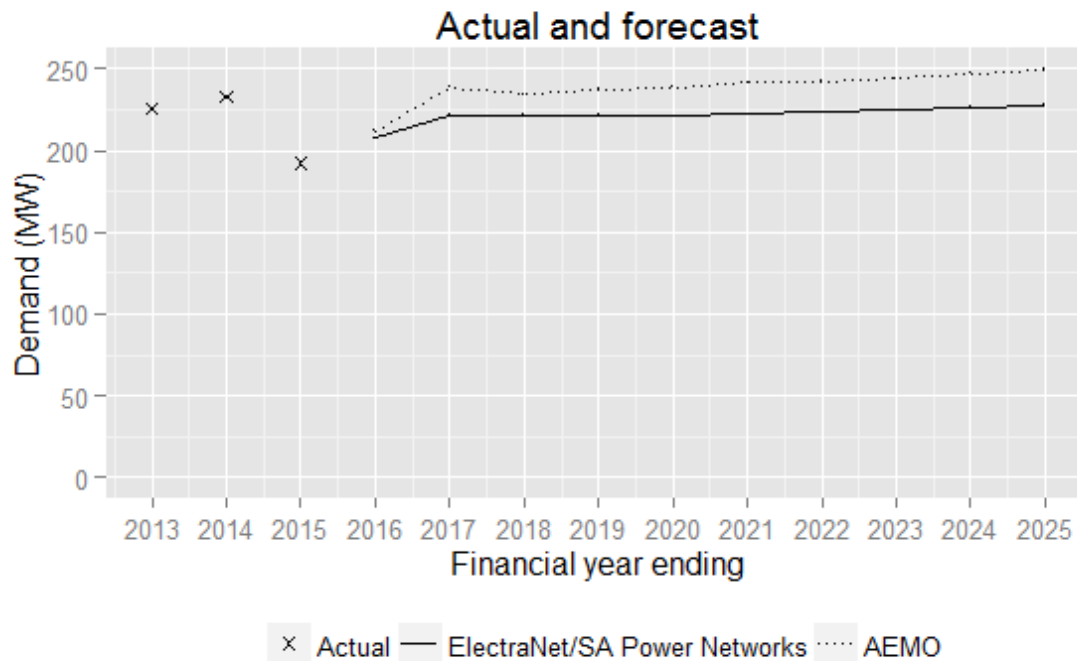Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	11.6	
2013-14	11.9	
2014-15	11.7	
Financial Year	Forecast - MW	Forecast - PF
2015-16	12.1	0.96
2016-17	12.2	0.96
2017-18	10.2	0.96
2018-19	10.3	0.96
2019-20	10.4	0.96
2020-21	10.7	0.96
2021-22	11.0	0.96
2022-23	11.4	0.96
2023-24	11.7	0.96
2024-25	12.0	0.96

ElectraNet

6.4.2   Baroota

Actual and forecast
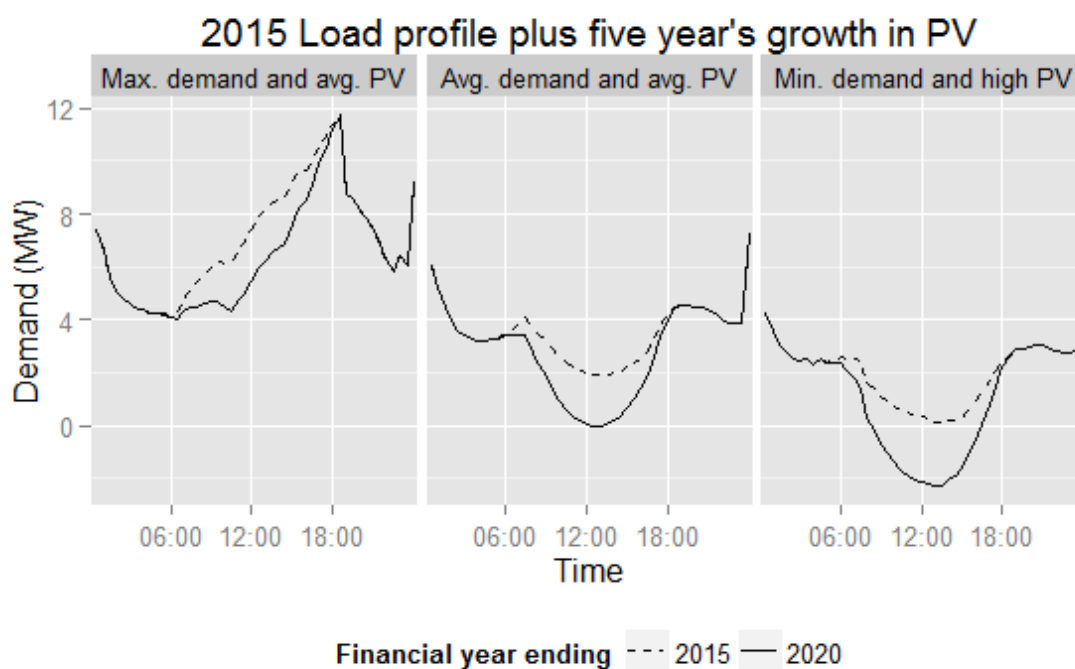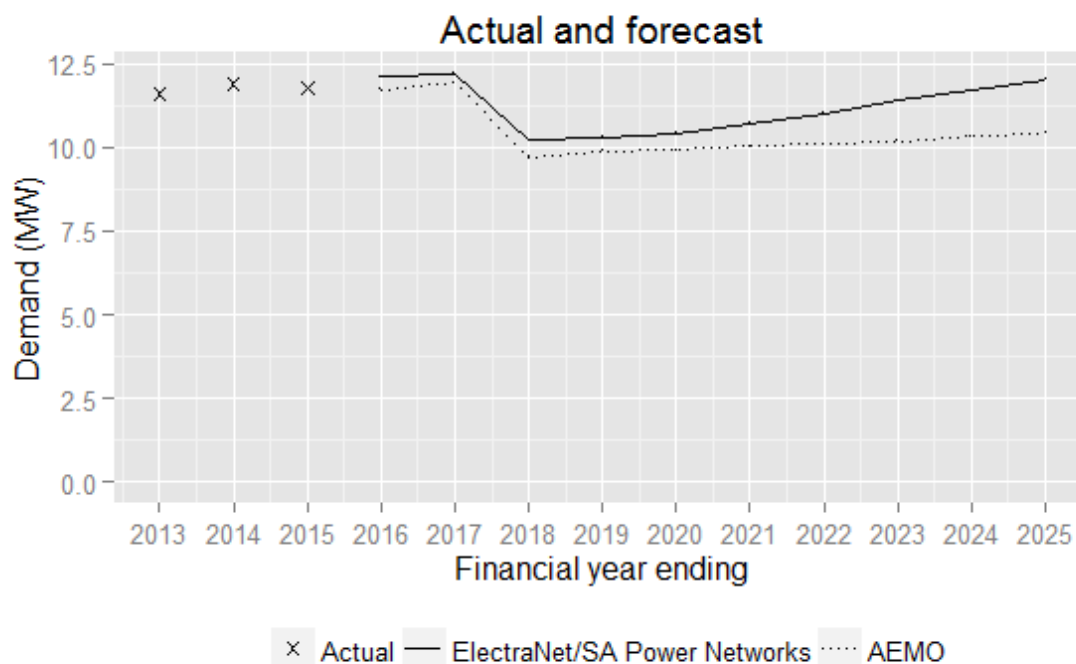
2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	7.7	
2013-14	7.8	
2014-15	7.1	
Financial Year	Forecast - MW	Forecast - PF
2015-16	7.7	0.99
2016-17	7.7	0.99
2017-18	7.7	0.99
2018-19	7.6	0.99
2019-20	7.6	0.99
2020-21	7.6	0.99
2021-22	7.6	0.99
2022-23	7.6	0.99
2023-24	7.6	0.99
2024-25	7.6	0.99

6.4.3 Brinkworth

Actual and forecast
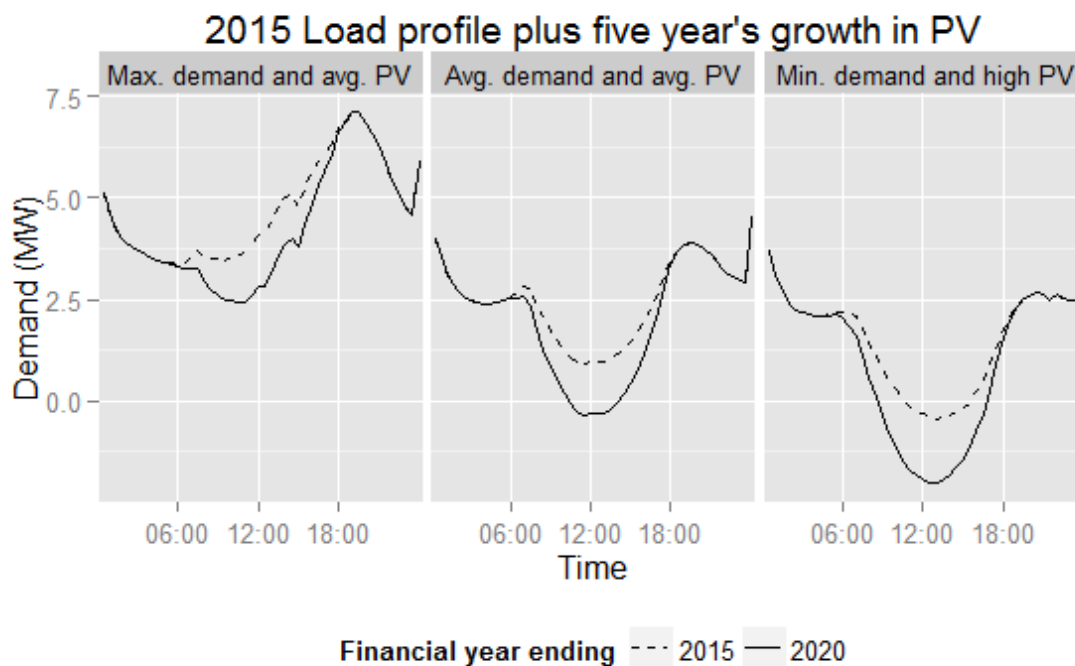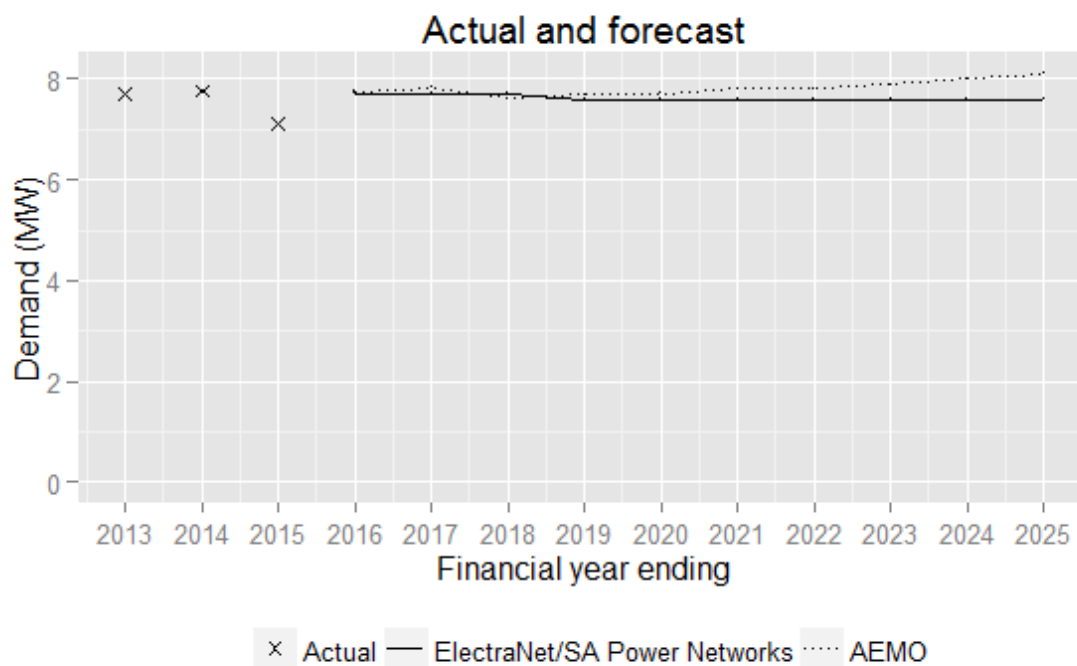

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	4.7	
2013-14	4.7	
2014-15	4.2	
Financial Year	**Forecast - MW**	**Forecast - PF**
2015-16	4.6	1.00
2016-17	4.5	1.00
2017-18	4.5	1.00
2018-19	4.4	1.00
2019-20	4.3	1.00
2020-21	4.3	1.00
2021-22	4.3	1.00
2022-23	4.2	1.00
2023-24	4.2	1.00
2024-25	4.2	1.00

6.4.4   Clare North

Actual and forecast

2015 Load profile plus five year's growth in PV
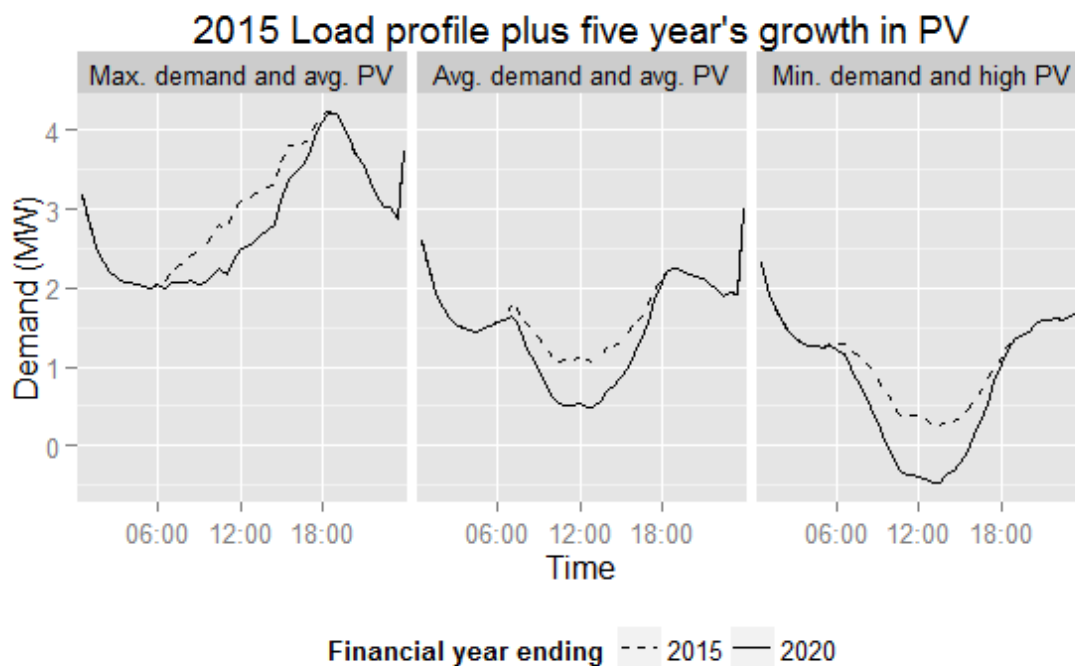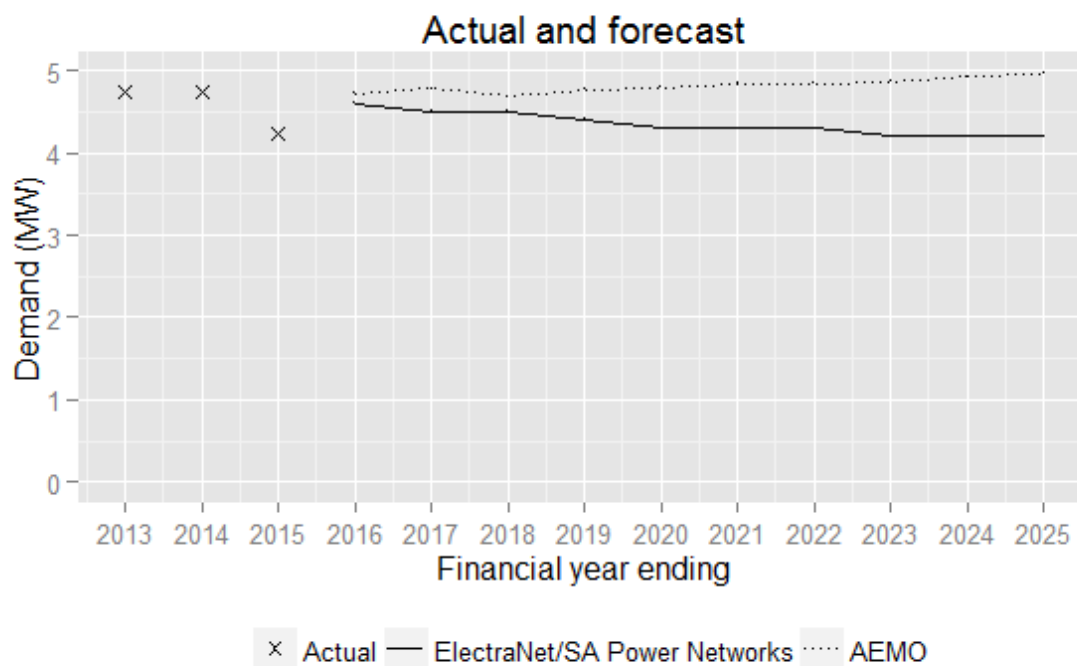
2016 SOUTH AUSTRALIAN CONNECTION POINT FORECASTS

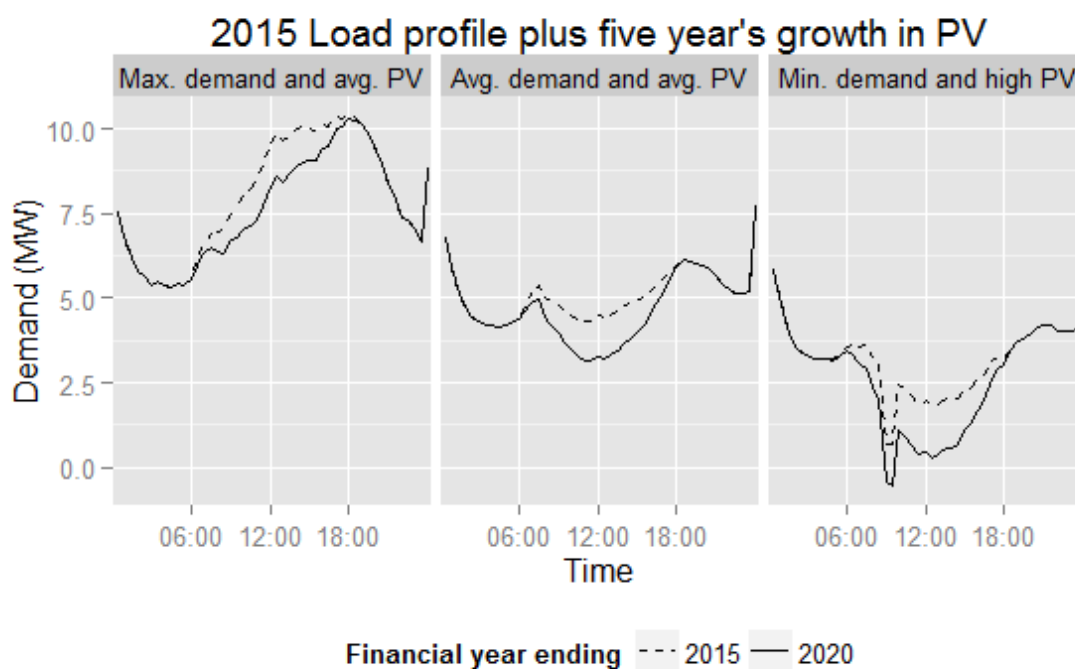Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	12.4	
2013-14	12.4	
2014-15	10.4	
Financial Year	Forecast - MW	Forecast - PF
2015-16	12.6	0.94
2016-17	12.6	0.94
2017-18	12.6	0.94
2018-19	12.5	0.94
2019-20	12.5	0.94
2020-21	12.6	0.94
2021-22	12.7	0.94
2022-23	12.7	0.94
2023-24	12.8	0.94
2024-25	12.9	0.94

6.4.5   Dalrymple

Actual and forecast

× Actual —— ElectraNet/SA Power Networks ⋯⋯ AEMO

2015 Load profile plus five year's growth in PV
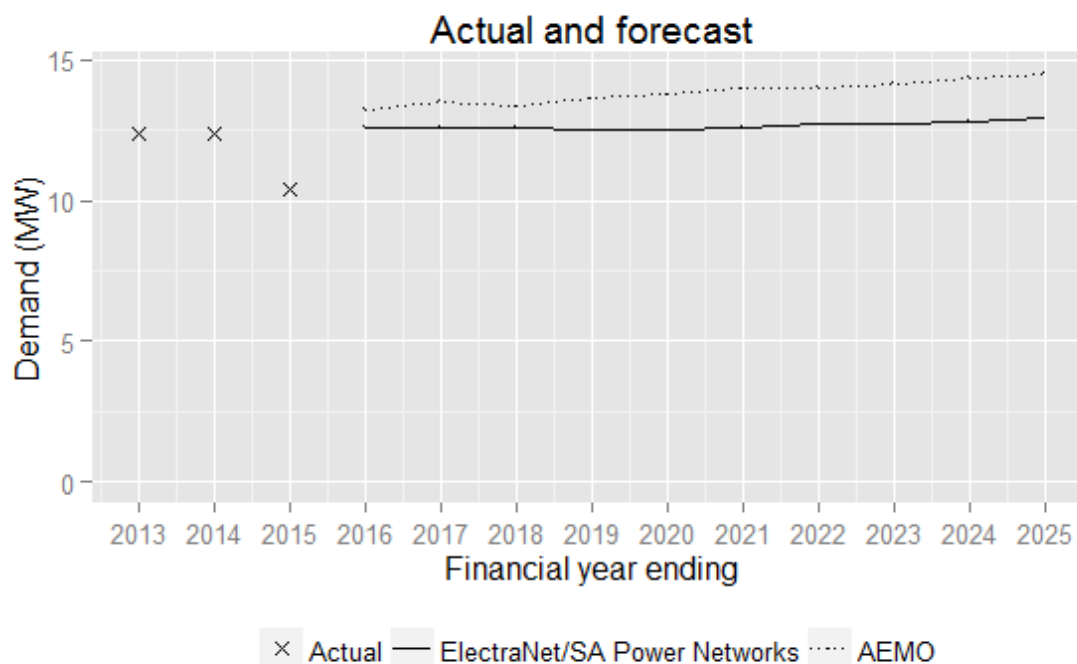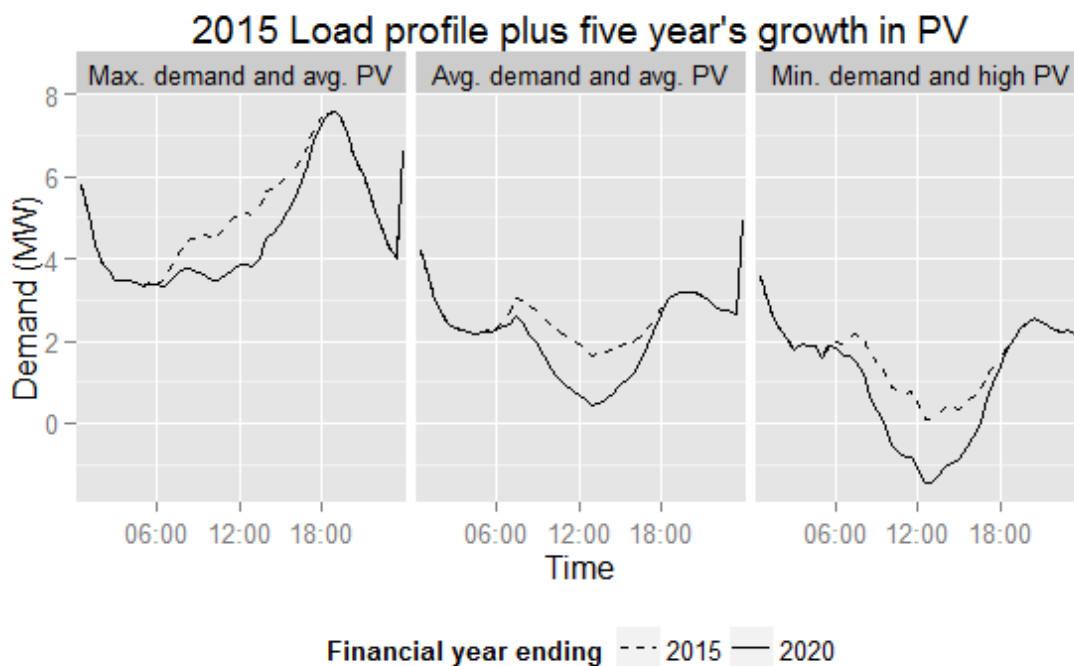

Financial year ending --- 2015 —— 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	8.0	
2013-14	7.9	
2014-15	7.6	
Financial Year	Forecast - MW	Forecast - PF
2015-16	7.9	0.98
2016-17	7.8	0.98
2017-18	9.9	0.98
2018-19	9.9	0.98
2019-20	9.9	0.98
2020-21	10.0	0.98
2021-22	10.1	0.98
2022-23	10.2	0.98
2023-24	10.4	0.98
2024-25	10.5	0.98

6.4.6   Dorrien

Actual and forecast

× Actual —— ElectraNet/SA Power Networks ⋯⋯ AEMO

2015 Load profile plus five year's growth in PV
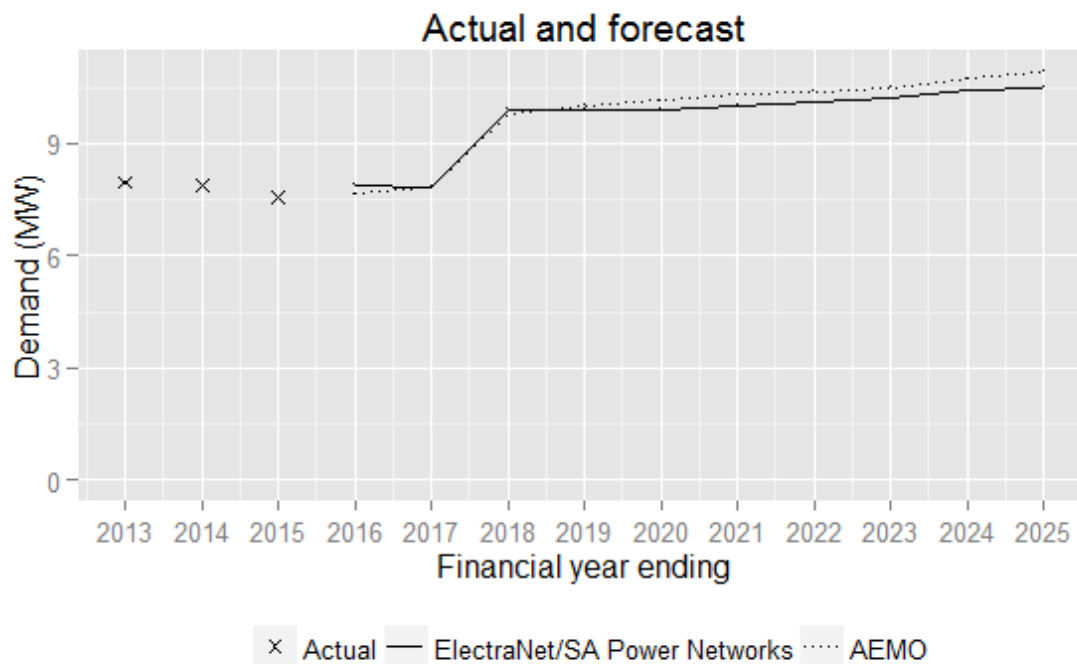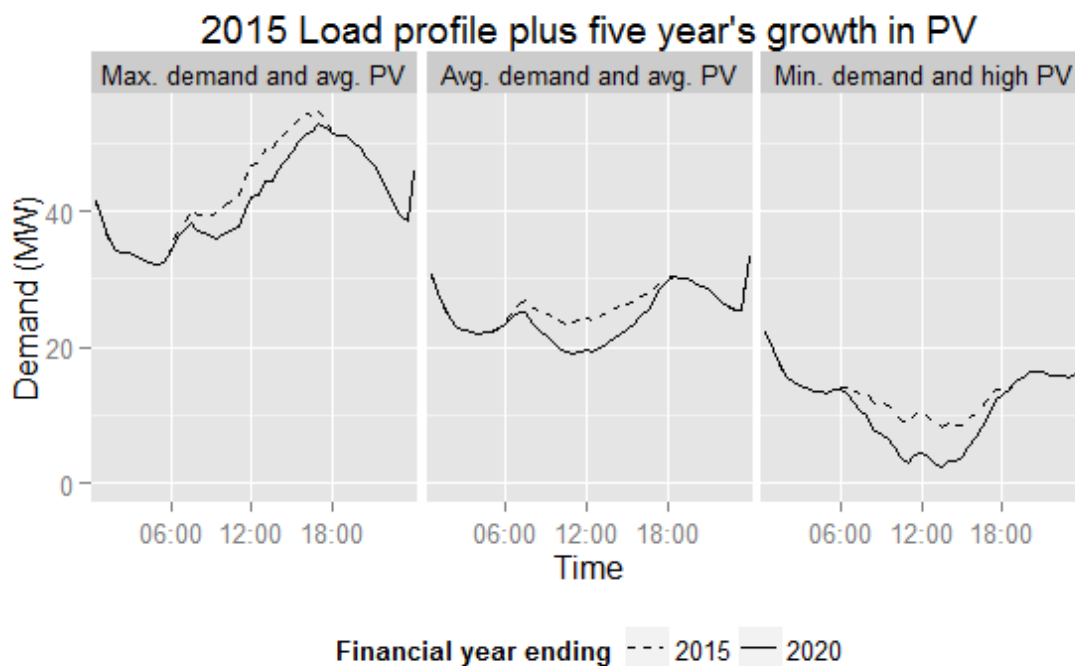

Financial year ending --- 2015 —— 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	57.2	
2013-14	56.6	
2014-15	54.6	
Financial Year	Forecast - MW	Forecast - PF
2015-16	59.0	0.95
2016-17	58.8	0.95
2017-18	58.6	0.95
2018-19	58.3	0.95
2019-20	58.1	0.95
2020-21	58.2	0.95
2021-22	58.3	0.95
2022-23	58.4	0.95
2023-24	58.5	0.95
2024-25	58.6	0.95

6.4.7   Hummocks

Actual and forecast
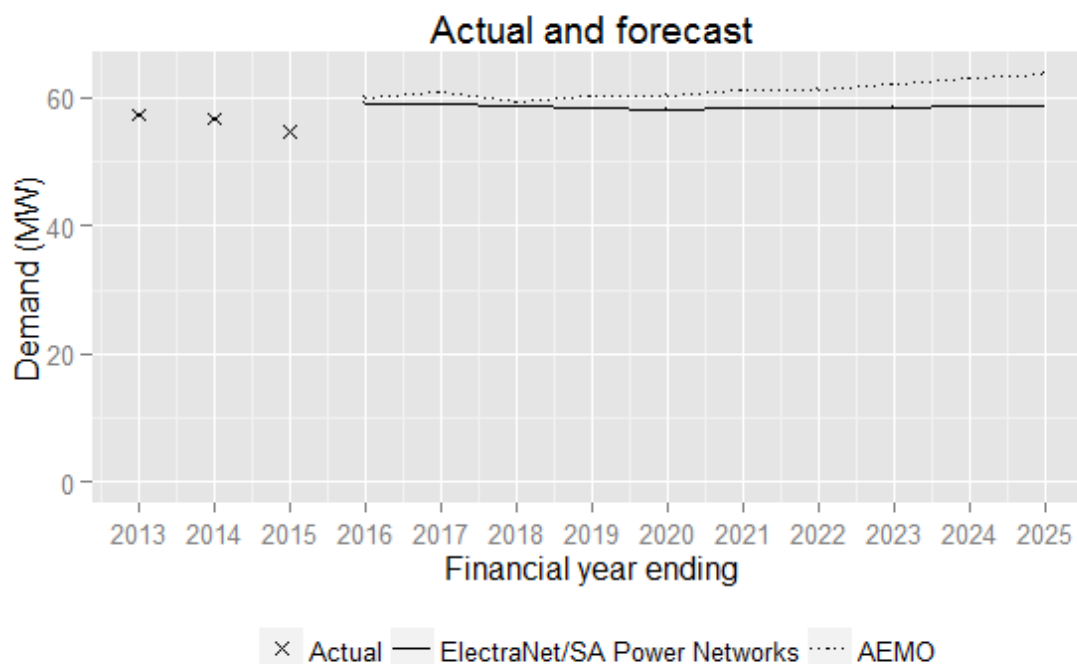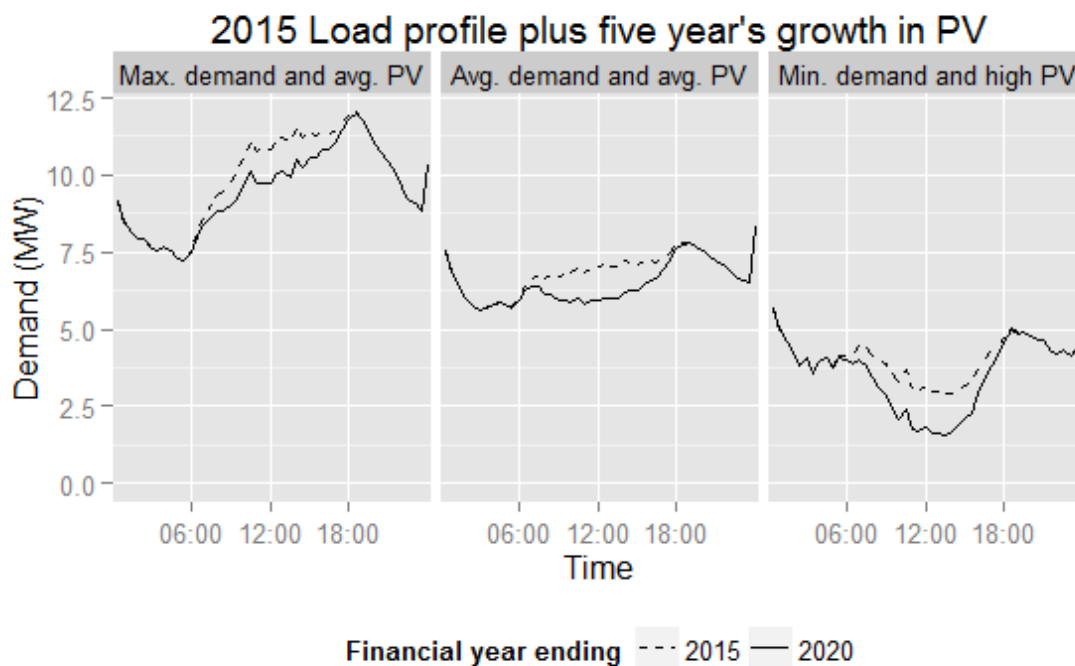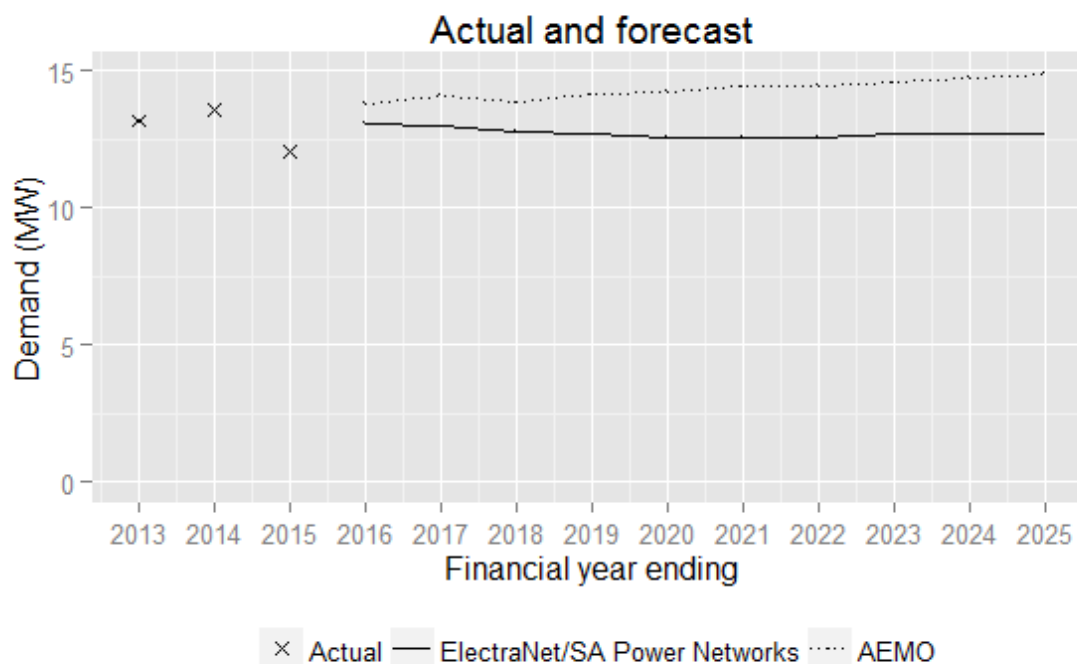

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	13.2	
2013-14	13.6	
2014-15	12.0	
Financial Year	Forecast - MW	Forecast - PF
2015-16	13.1	0.92
2016-17	13.0	0.92
2017-18	12.8	0.92
2018-19	12.7	0.92
2019-20	12.6	0.92
2020-21	12.6	0.92
2021-22	12.6	0.92
2022-23	12.7	0.92
2023-24	12.7	0.92
2024-25	12.7	0.92

6.4.8 Kadina East

Actual and forecast

× Actual — ElectraNet/SA Power Networks ⋯ AEMO

2015 Load profile plus five year's growth in PV
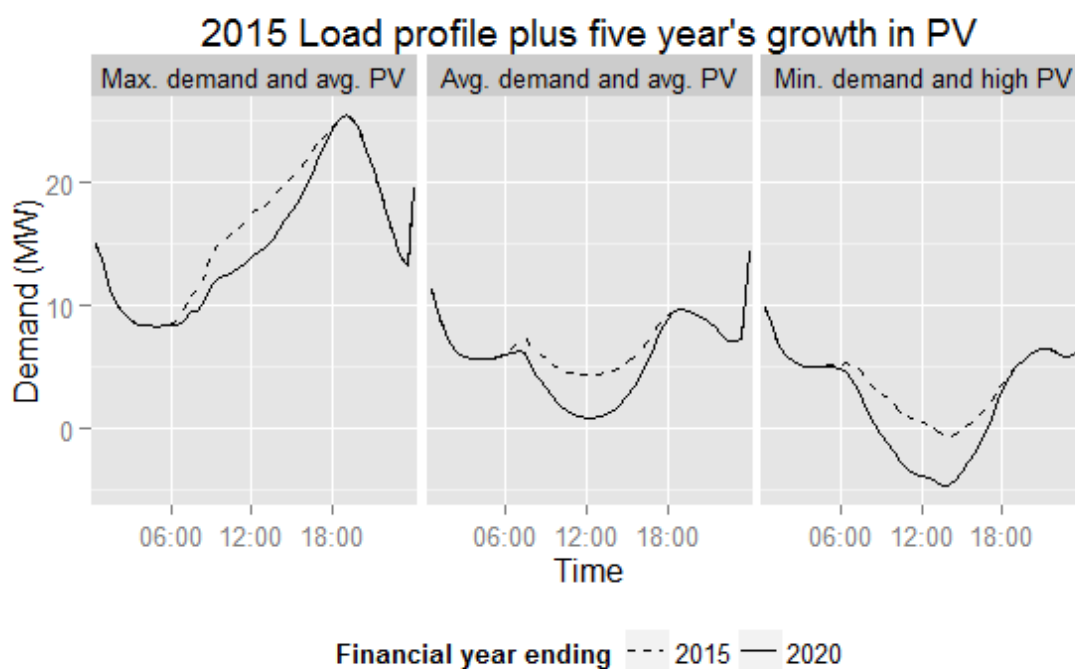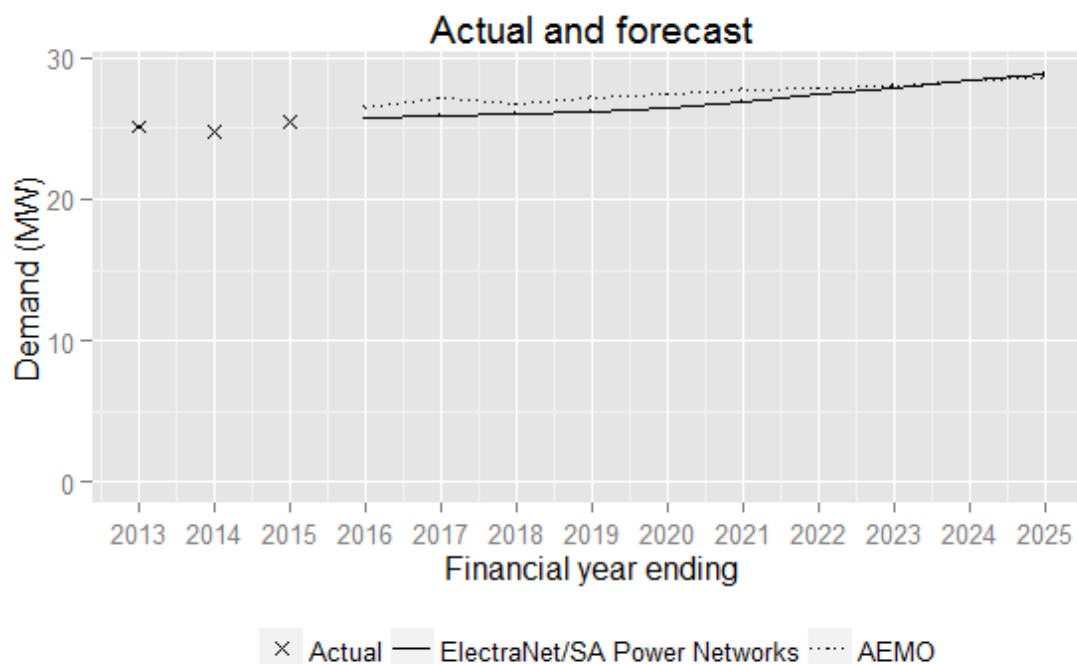

Financial year ending - - - 2015 —— 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	25.1	
2013-14	24.8	
2014-15	25.4	
Financial Year	Forecast - MW	Forecast - PF
2015-16	25.7	0.95
2016-17	25.9	0.95
2017-18	26.1	0.95
2018-19	26.2	0.95
2019-20	26.4	0.95
2020-21	26.9	0.95
2021-22	27.4	0.95
2022-23	27.9	0.95
2023-24	28.4	0.95
2024-25	28.9	0.95

6.4.9 Port Pirie/Bungama

Actual and forecast

× Actual — ElectraNet/SA Power Networks ⋯ AEMO

2015 Load profile plus five year's growth in PV
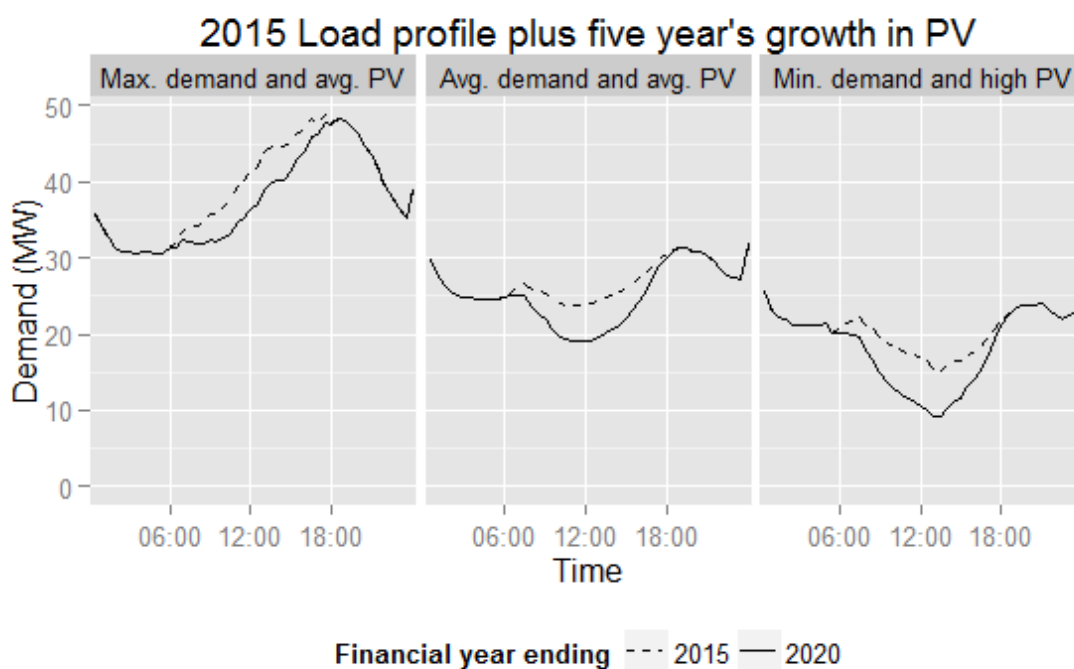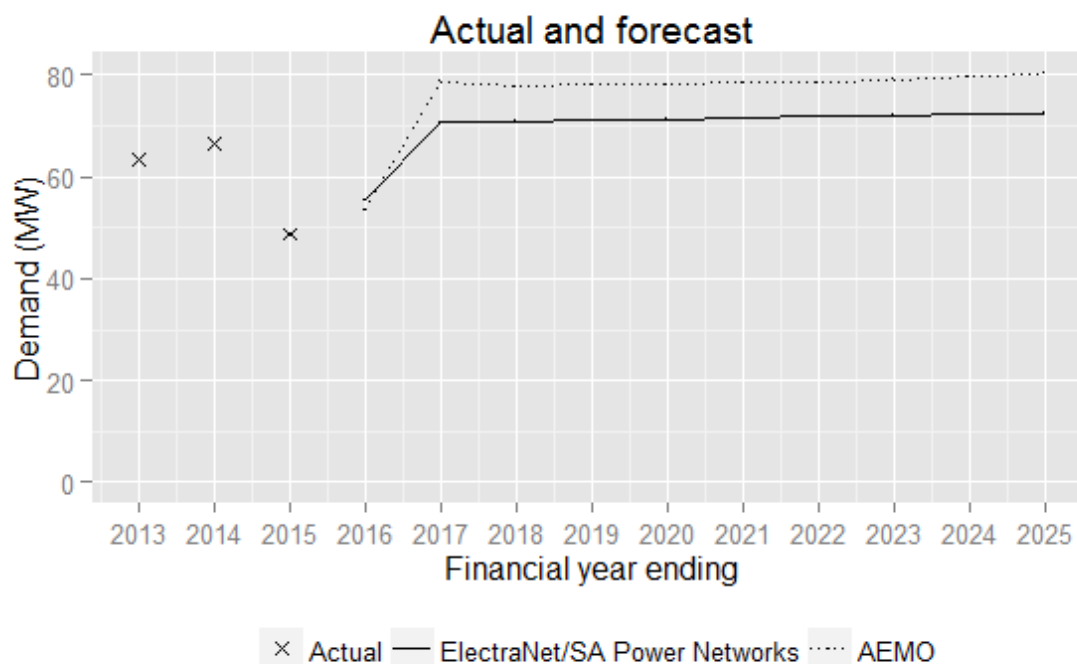

Financial year ending --- 2015 — 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	63.4	
2013-14	66.6	
2014-15	48.8	
Financial Year	Forecast - MW	Forecast - PF
2015-16	55.5	0.94
2016-17	70.7	0.93
2017-18	70.9	0.93
2018-19	71.2	0.93
2019-20	71.4	0.93
2020-21	71.6	0.93
2021-22	71.8	0.93
2022-23	72.0	0.93
2023-24	72.3	0.93
2024-25	72.5	0.93

6.4.10   Templers

Actual and forecast
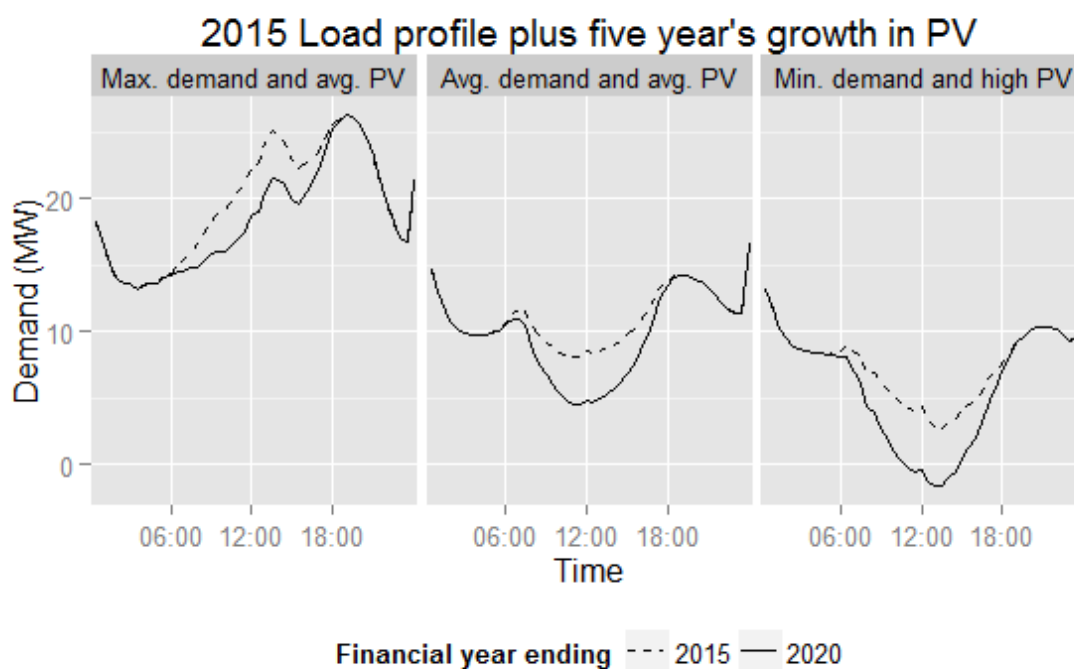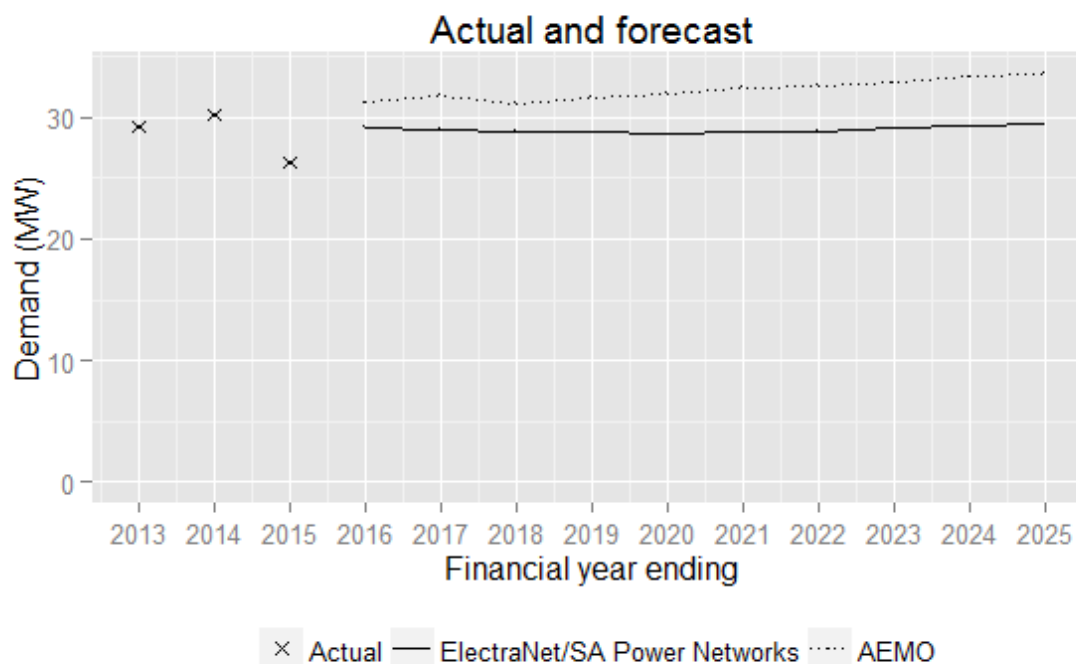

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	29.3	
2013-14	30.2	
2014-15	26.3	
Financial Year	Forecast - MW	Forecast - PF
2015-16	29.2	0.94
2016-17	29.0	0.94
2017-18	28.9	0.94
2018-19	28.8	0.94
2019-20	28.6	0.94
2020-21	28.8	0.94
2021-22	28.9	0.94
2022-23	29.1	0.94
2023-24	29.3	0.94
2024-25	29.4	0.94

6.4.11   Waterloo

Actual and forecast

× Actual —— ElectraNet/SA Power Networks ⋯⋯ AEMO

2015 Load profile plus five year's growth in PV

Financial year ending --- 2015 —— 2020
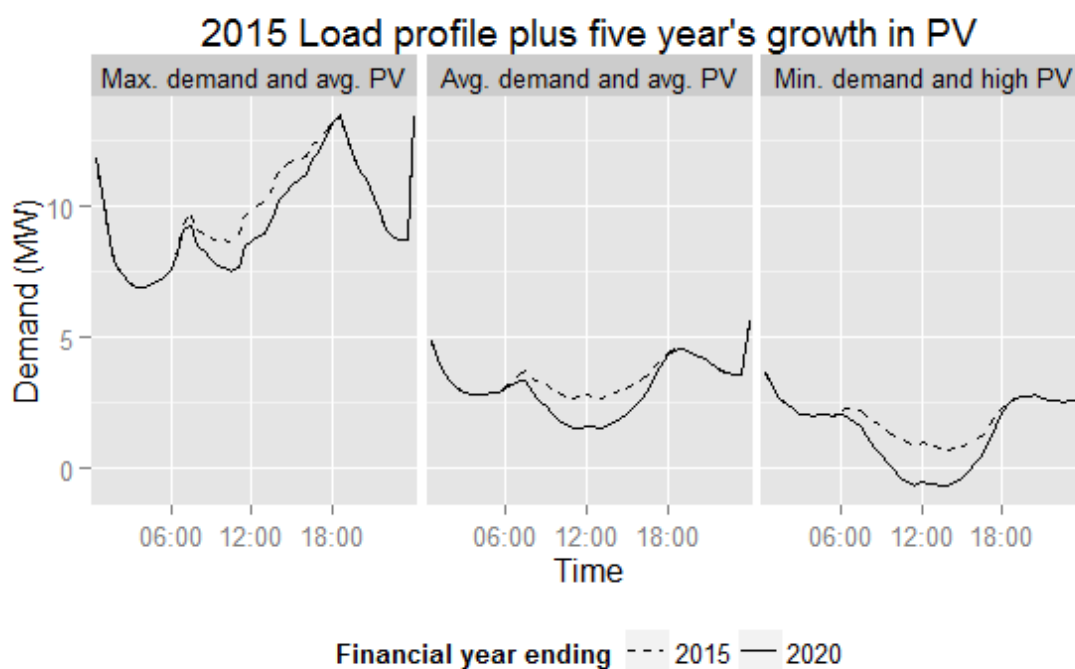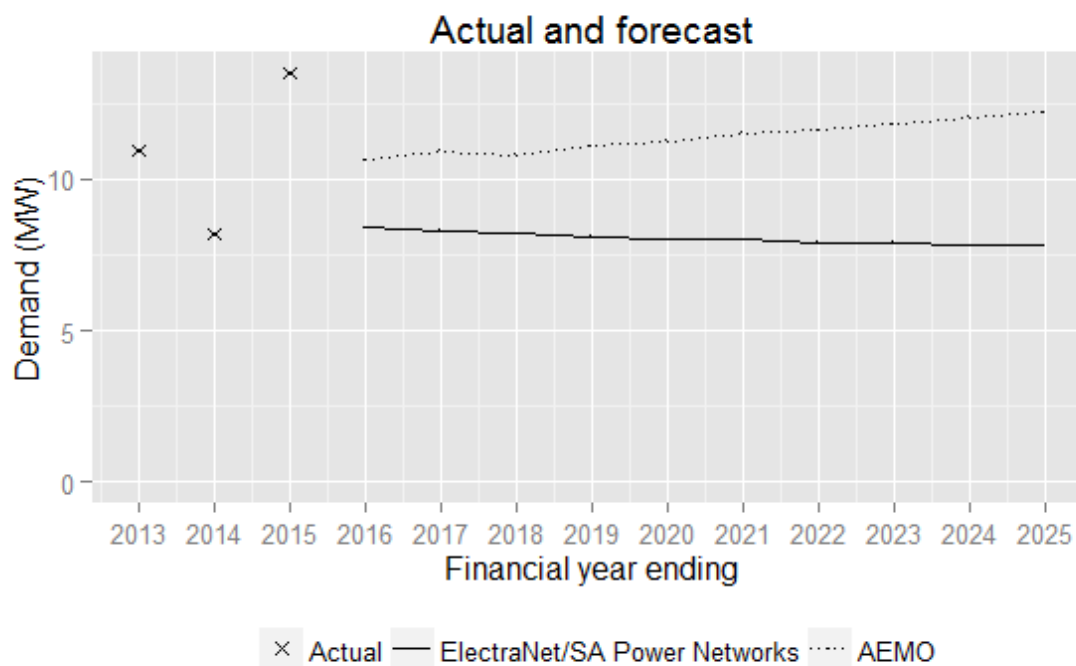
Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	10.9	
2013-14	8.2	
2014-15	13.5	
Financial Year	Forecast - MW	Forecast - PF
2015-16	8.4	0.96
2016-17	8.3	0.96
2017-18	8.2	0.96
2018-19	8.1	0.96
2019-20	8.0	0.96
2020-21	8.0	0.96
2021-22	7.9	0.96
2022-23	7.9	0.96
2023-24	7.8	0.96
2024-25	7.8	0.96

6.5   Riverland

Actual and forecast
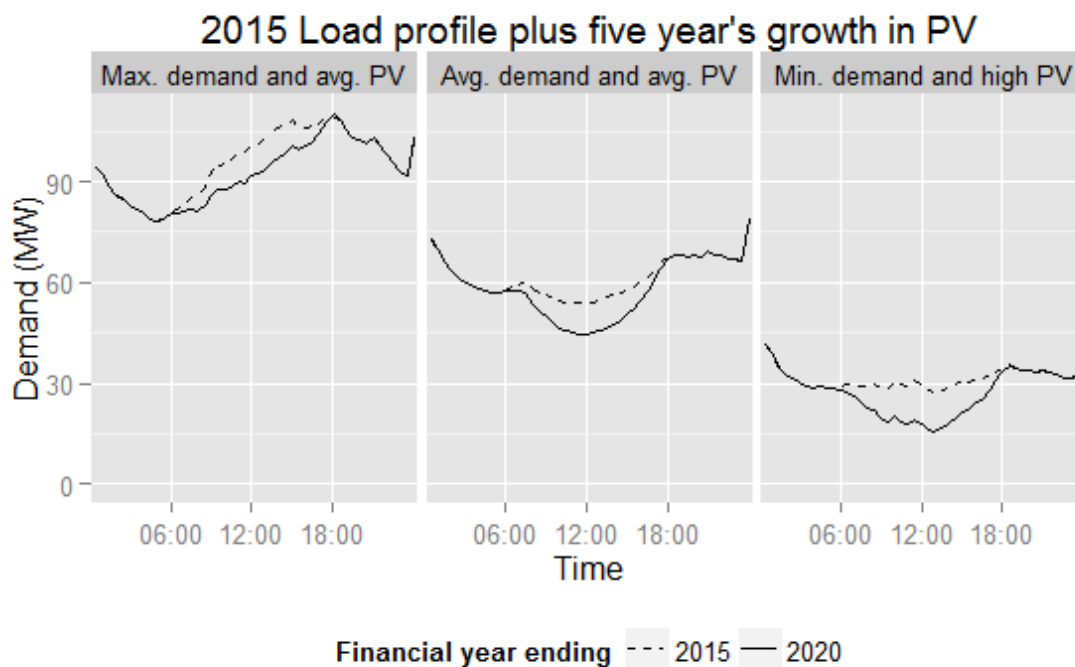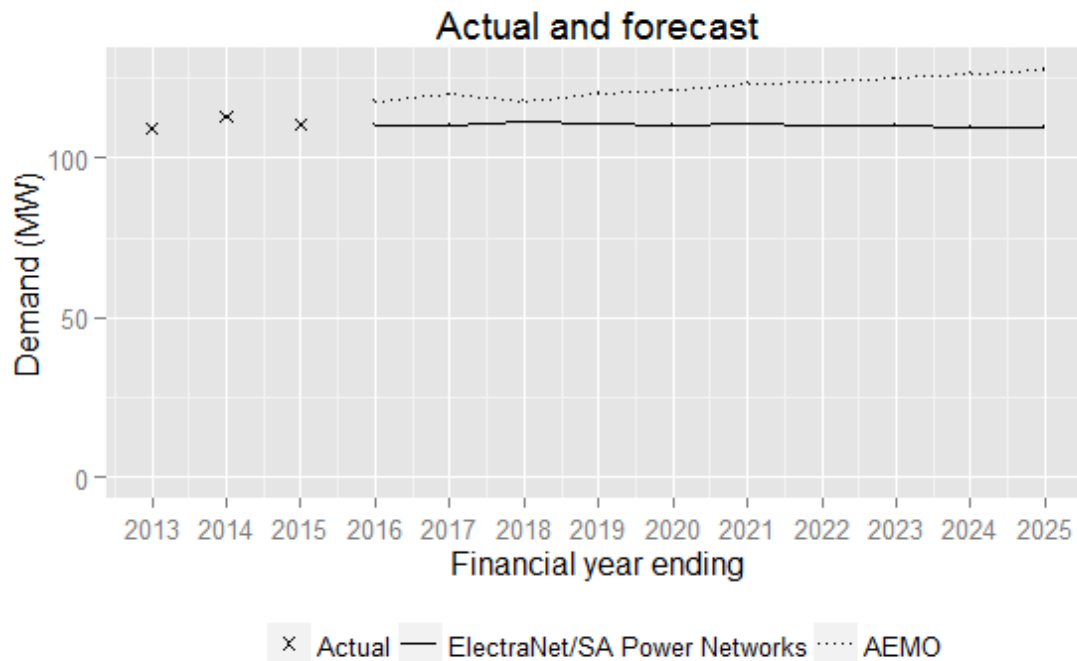

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2012-13	109.2
2013-14	113.1
2014-15	110.5

Financial Year	Forecast - MW
2015-16	110.4
2016-17	110.3
2017-18	111.2
2018-19	110.8
2019-20	110.4
2020-21	110.6
2021-22	110.0
2022-23	110.3
2023-24	109.7
2024-25	109.6

6.5.1   Berri

Actual and forecast

× Actual ⎯ ElectraNet/SA Power Networks ⋯ AEMO

2015 Load profile plus five year's growth in PV

Financial year ending - - - 2015 ⎯ 2020
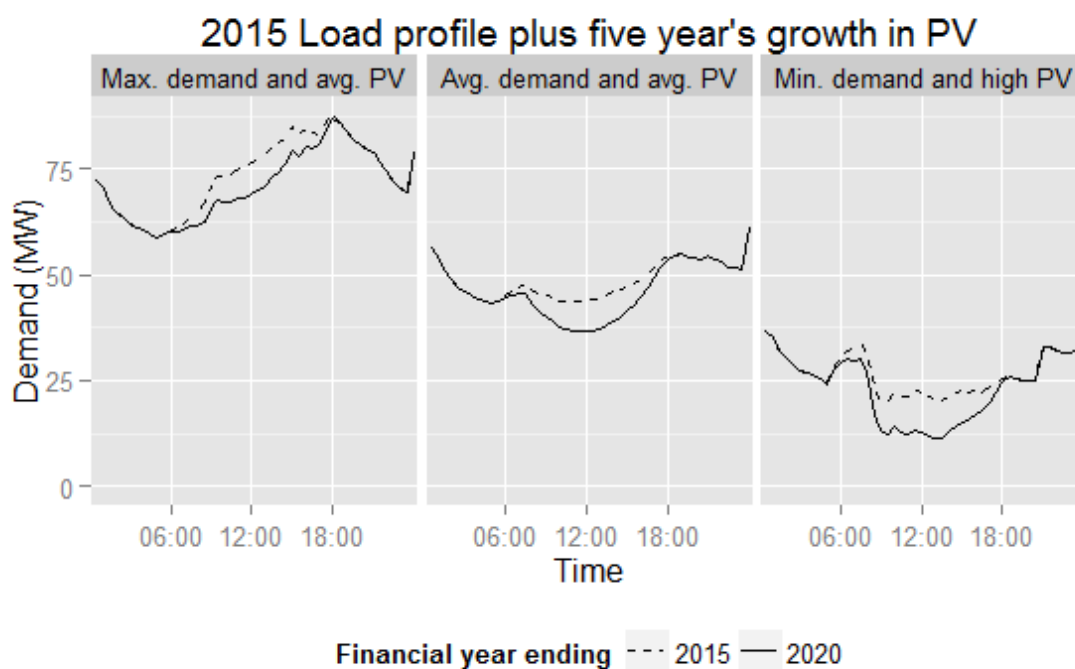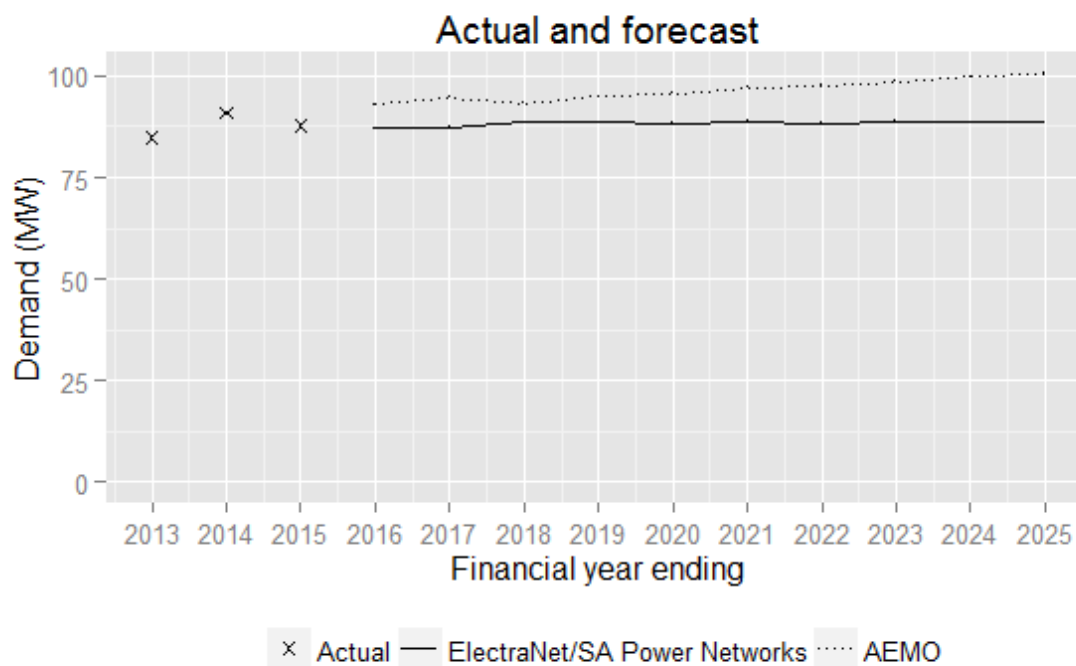
Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

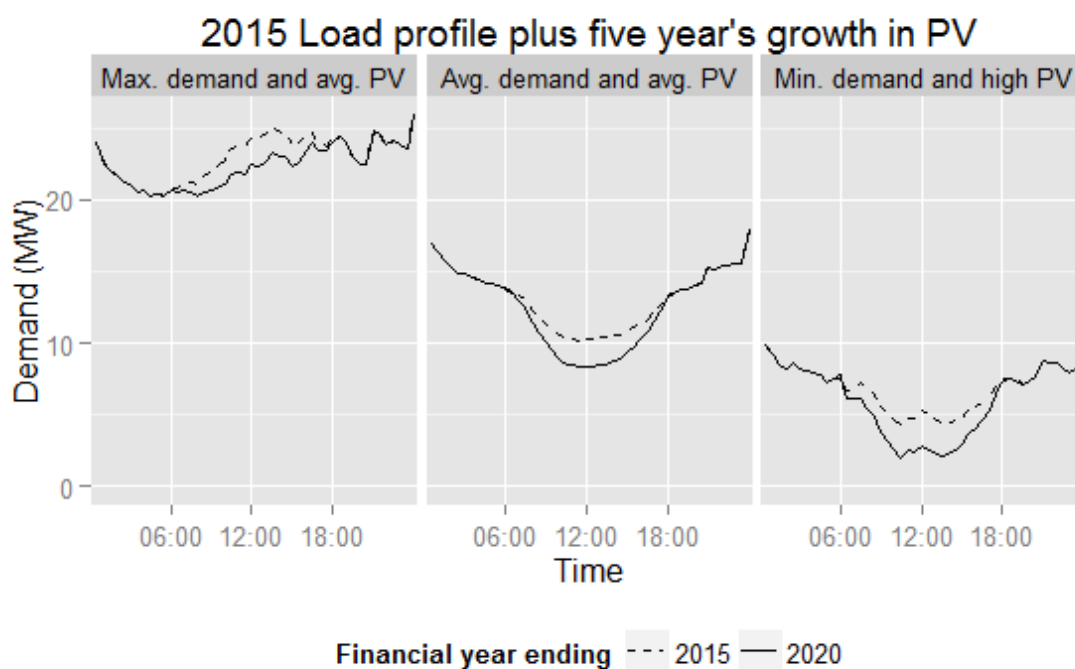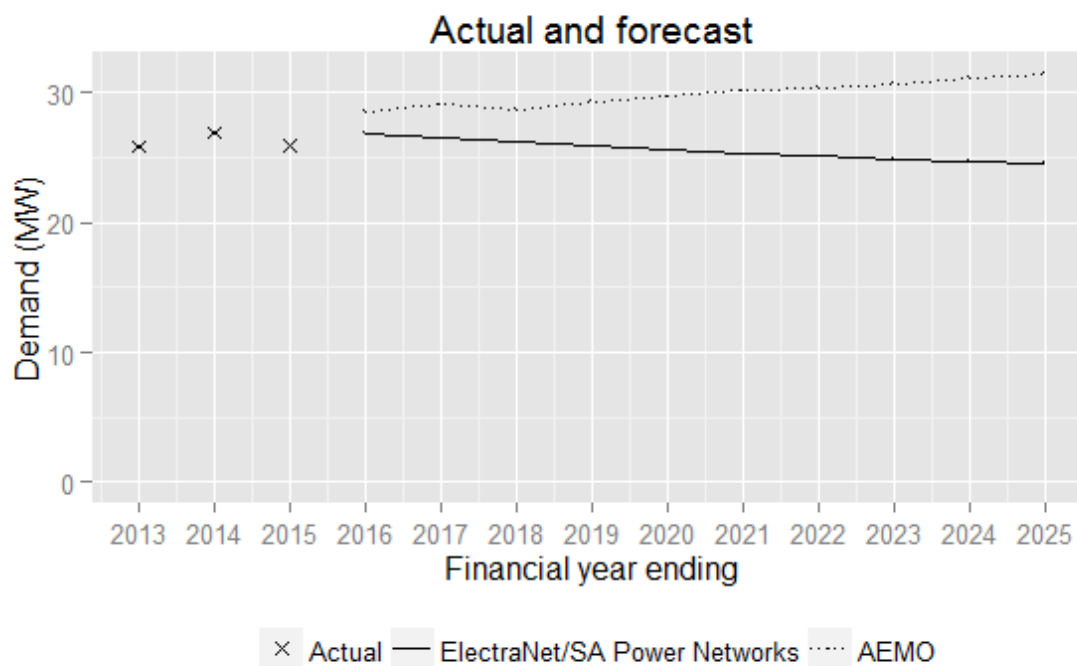| Financial year	Actual (MW)	
2012-13	85.0	
2013-14	91.0	
2014-15	87.6	
Financial Year	Forecast - MW	Forecast - PF
2015-16	87.2	0.96
2016-17	87.4	0.96
2017-18	88.6	0.96
2018-19	88.5	0.96
2019-20	88.4	0.96
2020-21	88.8	0.96
2021-22	88.4	0.96
2022-23	88.9	0.96
2023-24	88.5	0.96
2024-25	88.5	0.96

6.5.2   North West Bend

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	25.8	
2013-14	26.9	
2014-15	25.9	
Financial Year	Forecast - MW	Forecast - PF
2015-16	26.9	0.96
2016-17	26.5	0.96
2017-18	26.2	0.96
2018-19	25.9	0.96
2019-20	25.6	0.96
2020-21	25.3	0.96
2021-22	25.1	0.96
2022-23	24.9	0.96
2023-24	24.7	0.96
2024-25	24.6	0.96

6.6   South East

Actual and forecast
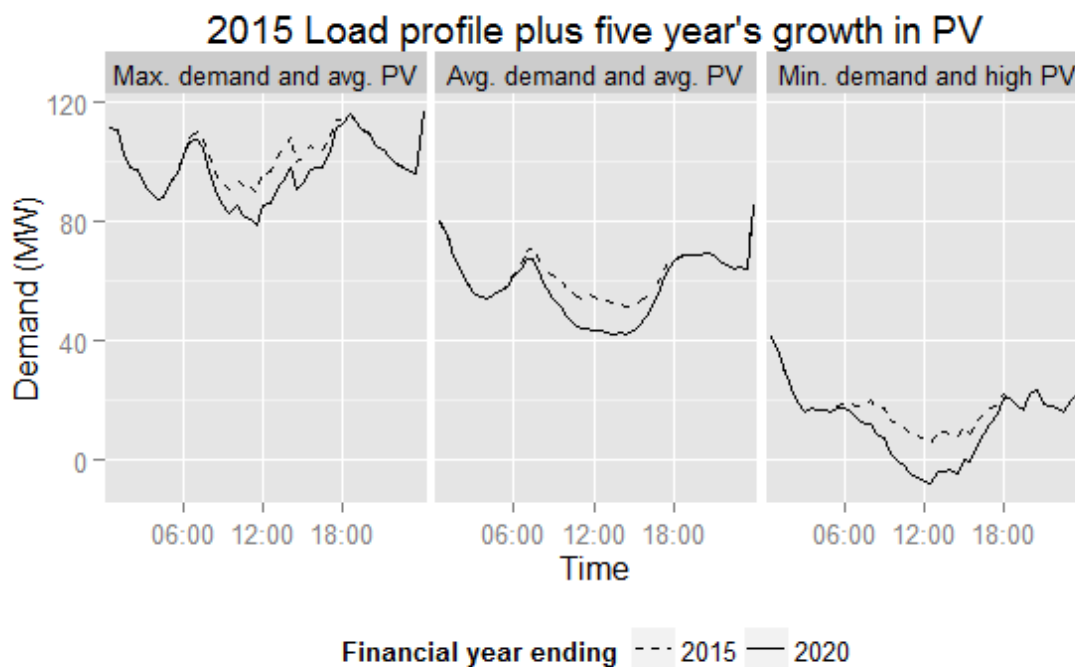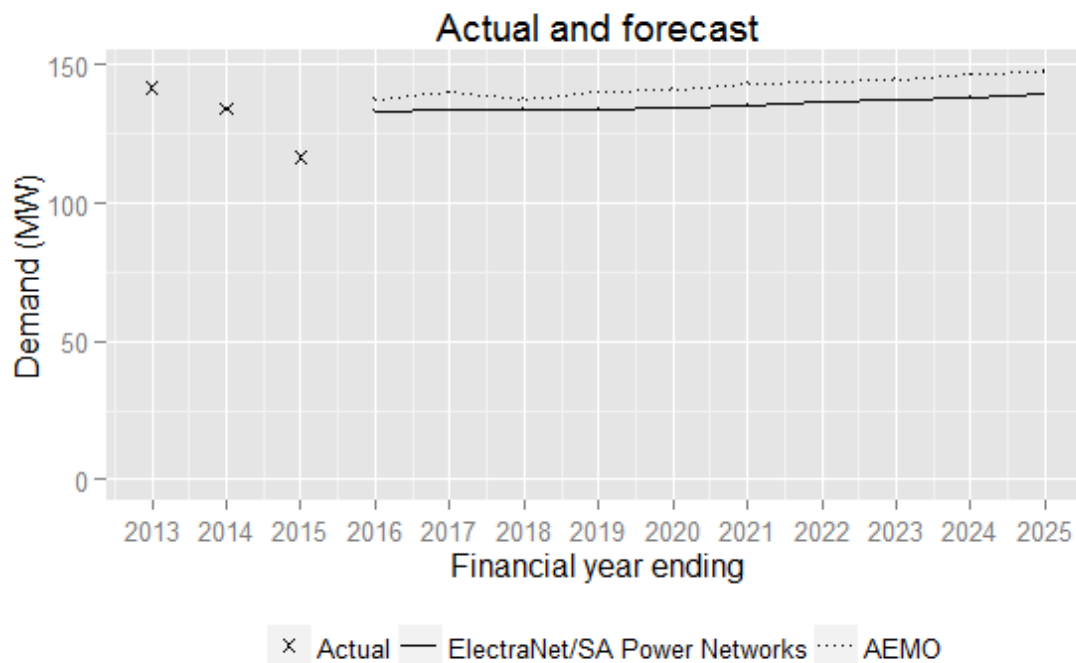

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2012-13	141.5
2013-14	134.1
2014-15	116.6

Financial Year	Forecast - MW
2015-16	133.2
2016-17	133.5
2017-18	133.8
2018-19	134.0
2019-20	134.3
2020-21	135.3
2021-22	136.4
2022-23	137.3
2023-24	138.4
2024-25	139.2

6.6.1 Blanche

Actual and forecast
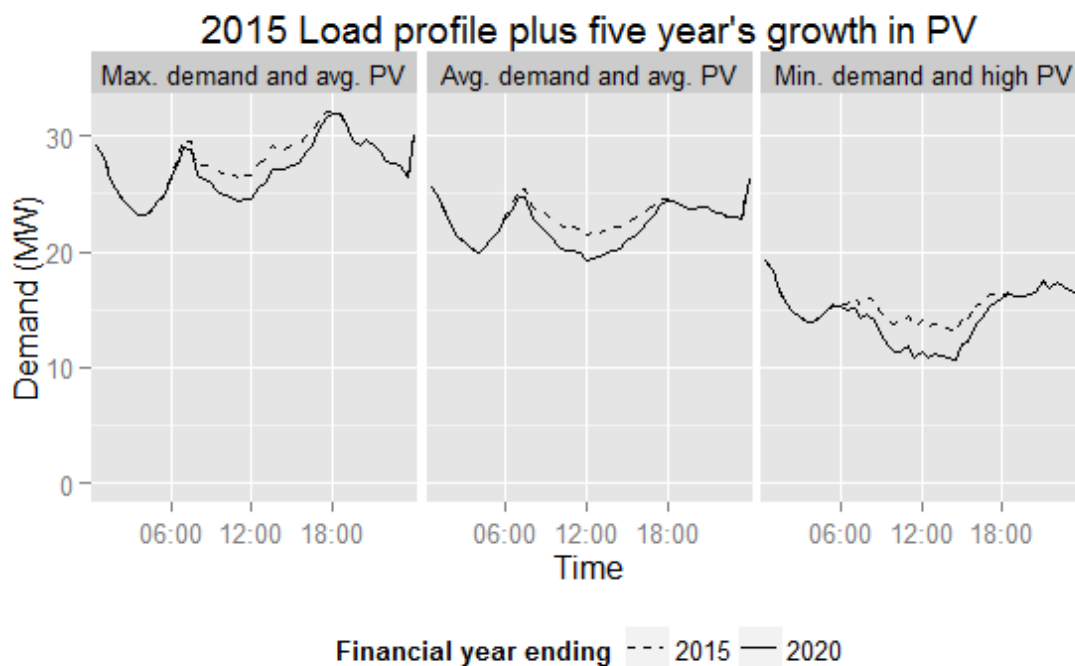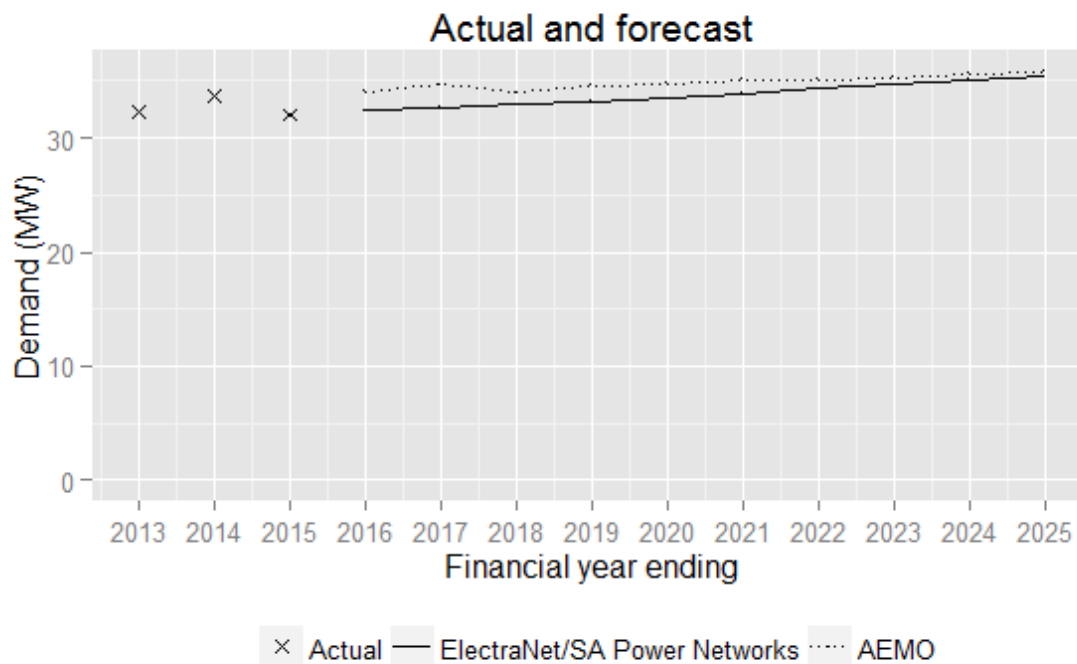

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	32.2	
2013-14	33.7	
2014-15	32.0	
Financial Year	Forecast - MW	Forecast - PF
2015-16	32.4	0.94
2016-17	32.7	0.94
2017-18	32.9	0.94
2018-19	33.2	0.94
2019-20	33.5	0.94
2020-21	33.9	0.94
2021-22	34.3	0.94
2022-23	34.7	0.94
2023-24	35.1	0.94
2024-25	35.4	0.94

6.6.2   Keith

Actual and forecast
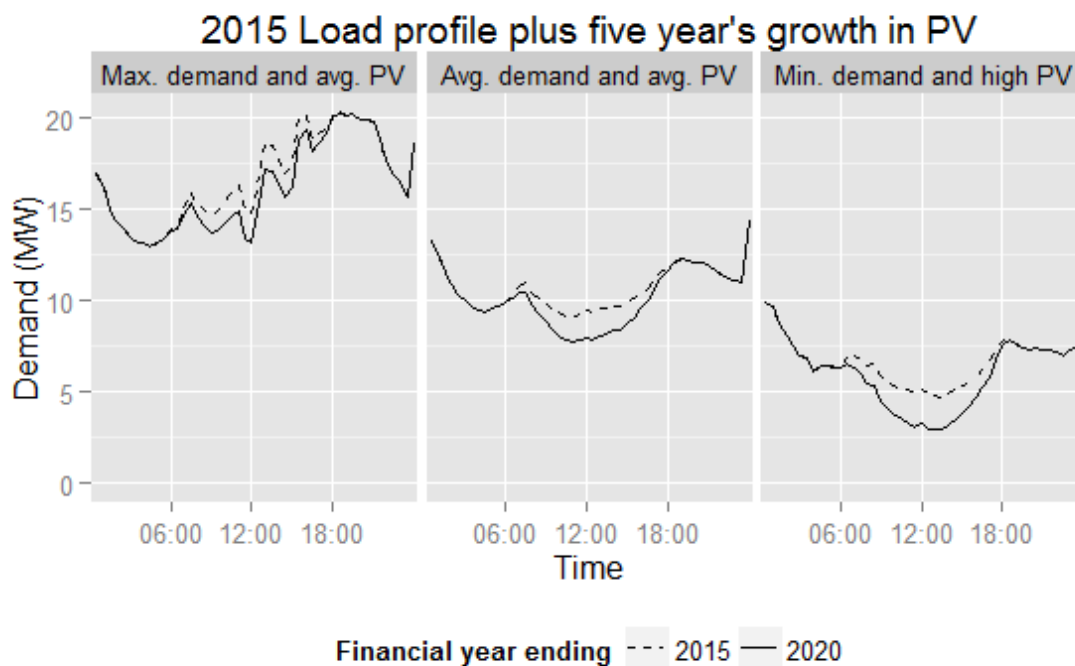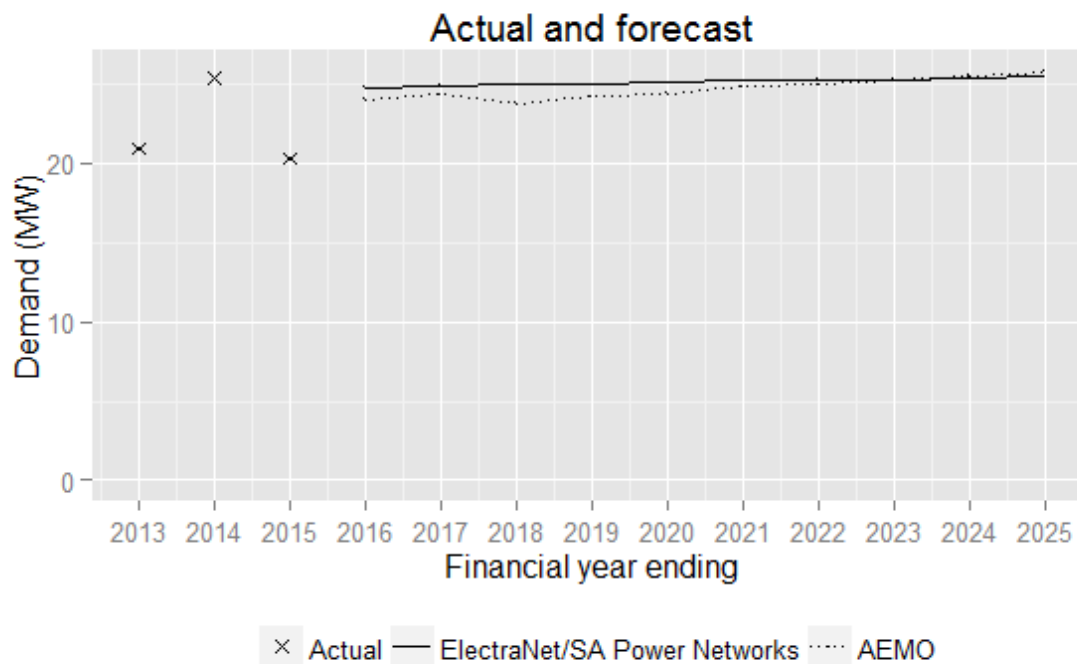

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	20.9	
2013-14	25.4	
2014-15	20.3	
Financial Year	Forecast - MW	Forecast - PF
2015-16	24.8	0.98
2016-17	24.9	0.98
2017-18	25.0	0.98
2018-19	25.0	0.98
2019-20	25.1	0.98
2020-21	25.2	0.98
2021-22	25.3	0.98
2022-23	25.3	0.98
2023-24	25.4	0.98
2024-25	25.5	0.98

6.6.3 Kincraig

Actual and forecast
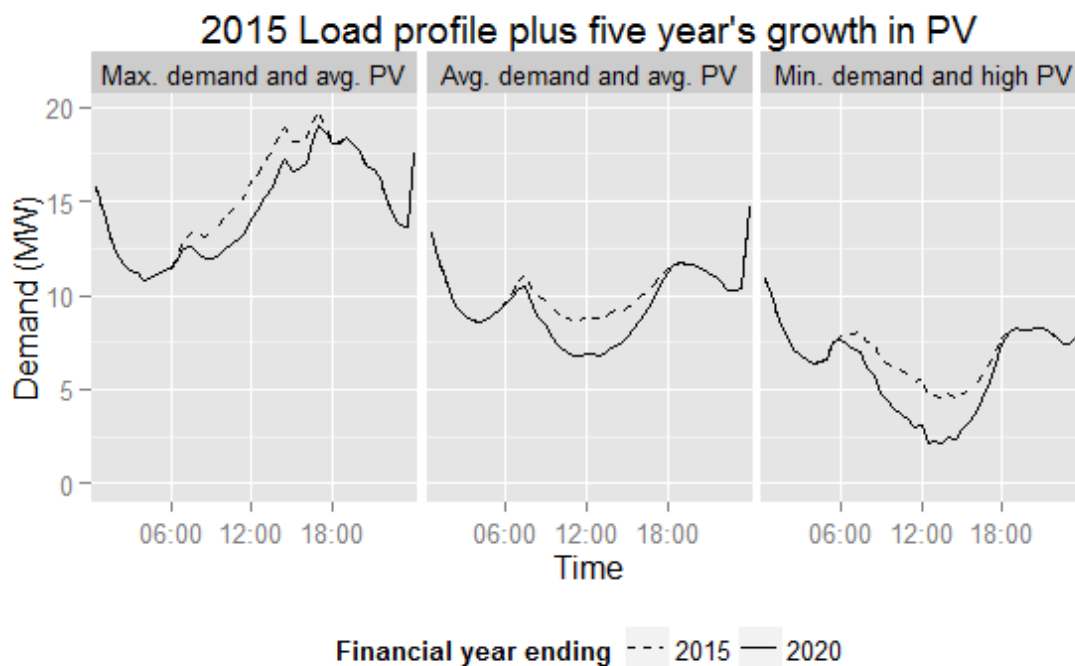

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	26.1	
2013-14	21.8	
2014-15	19.7	
Financial Year	Forecast - MW	Forecast - PF
2015-16	22.3	0.93
2016-17	22.4	0.93
2017-18	22.5	0.93
2018-19	22.6	0.93
2019-20	22.7	0.93
2020-21	22.9	0.93
2021-22	23.2	0.93
2022-23	23.4	0.93
2023-24	23.6	0.93
2024-25	23.8	0.93

6.6.4 Mt Gambier

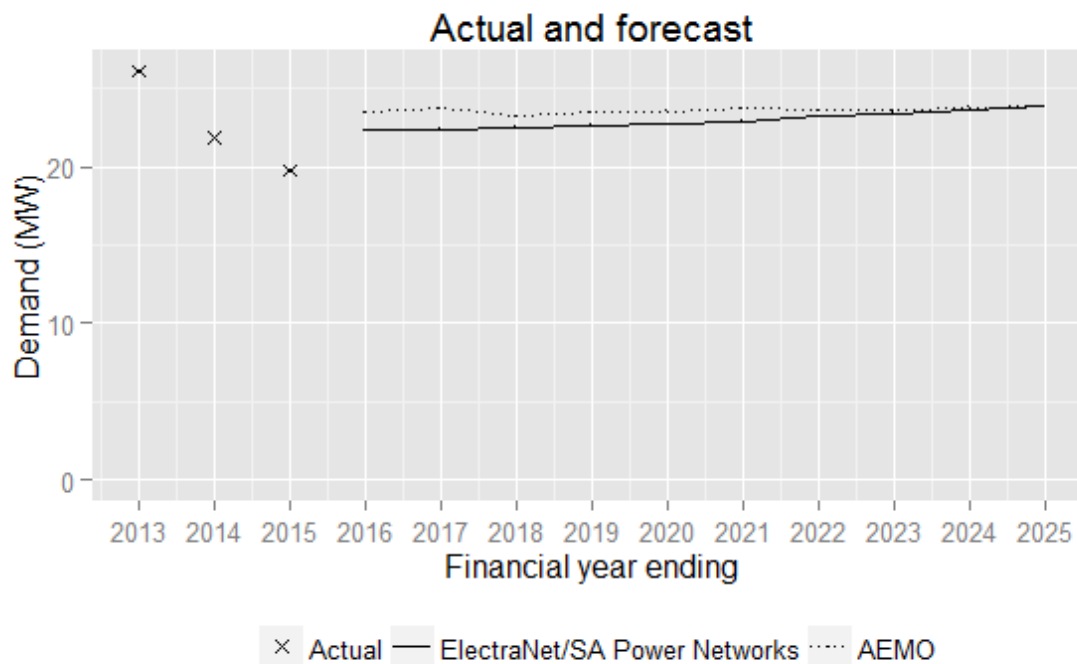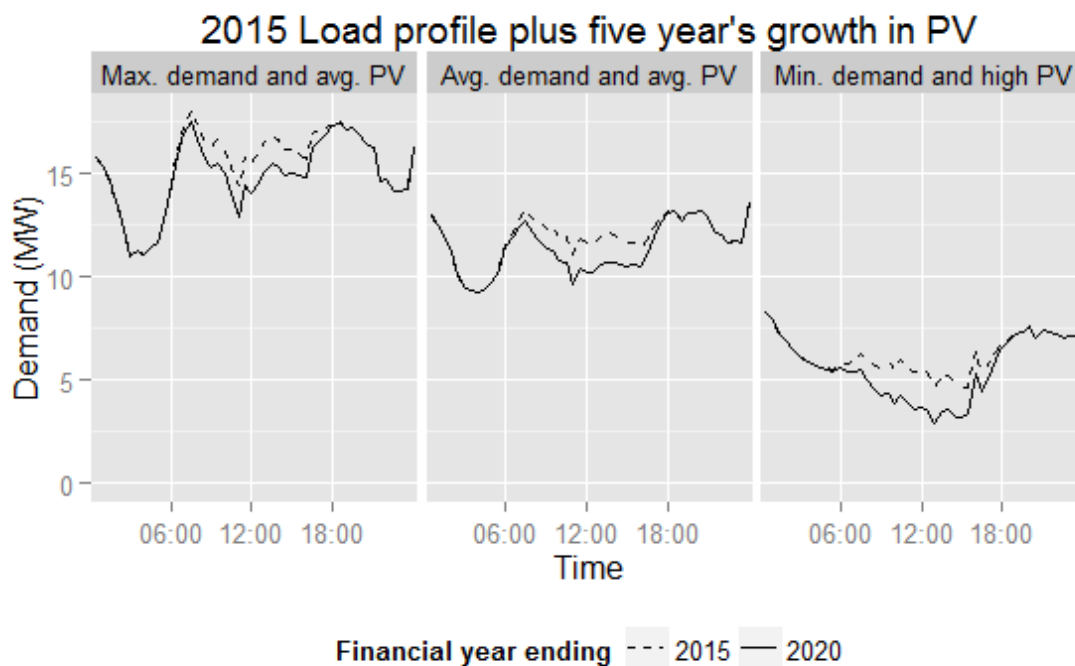Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	25.9	
2013-14	22.4	
2014-15	18.0	
Financial Year	Forecast - MW	Forecast - PF
2015-16	21.6	0.96
2016-17	21.5	0.96
2017-18	21.5	0.96
2018-19	21.5	0.96
2019-20	21.5	0.96
2020-21	21.9	0.96
2021-22	22.2	0.96
2022-23	22.6	0.96
2023-24	22.9	0.96
2024-25	23.2	0.96

6.6.5 Penola West

Actual and forecast
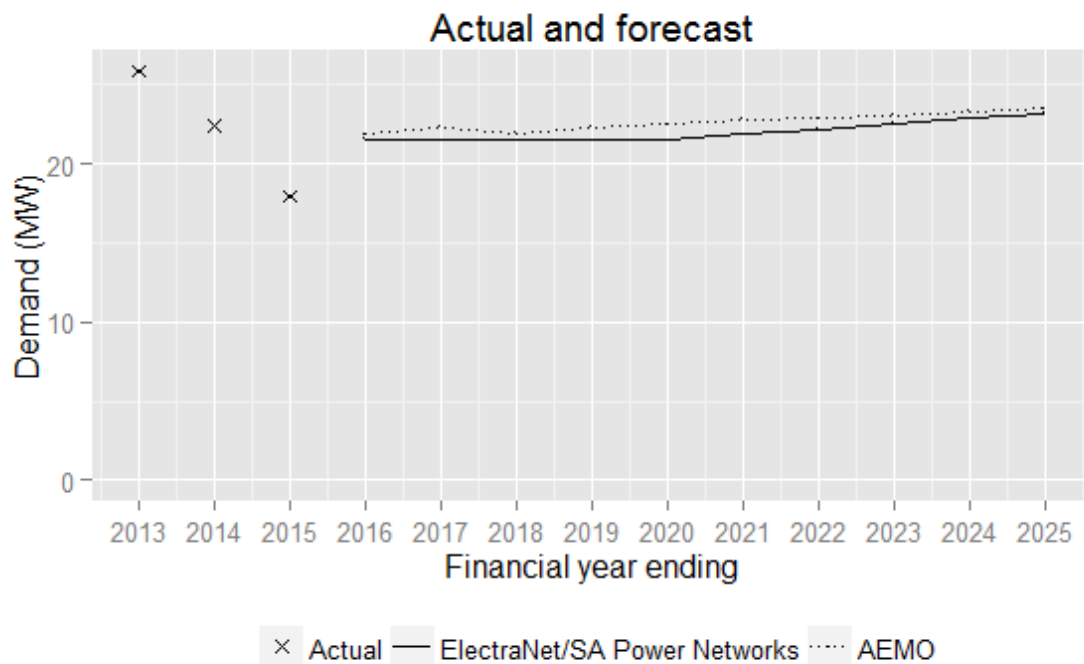

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	9.8	
2013-14	6.2	
2014-15	5.5	
Financial Year	Forecast - MW	Forecast - PF
2015-16	8.9	0.95
2016-17	8.8	0.95
2017-18	8.7	0.95
2018-19	8.6	0.95
2019-20	8.5	0.95
2020-21	8.4	0.95
2021-22	8.3	0.95
2022-23	8.2	0.95
2023-24	8.2	0.95
2024-25	8.1	0.95

6.6.6   Snuggery Rural

Actual and forecast
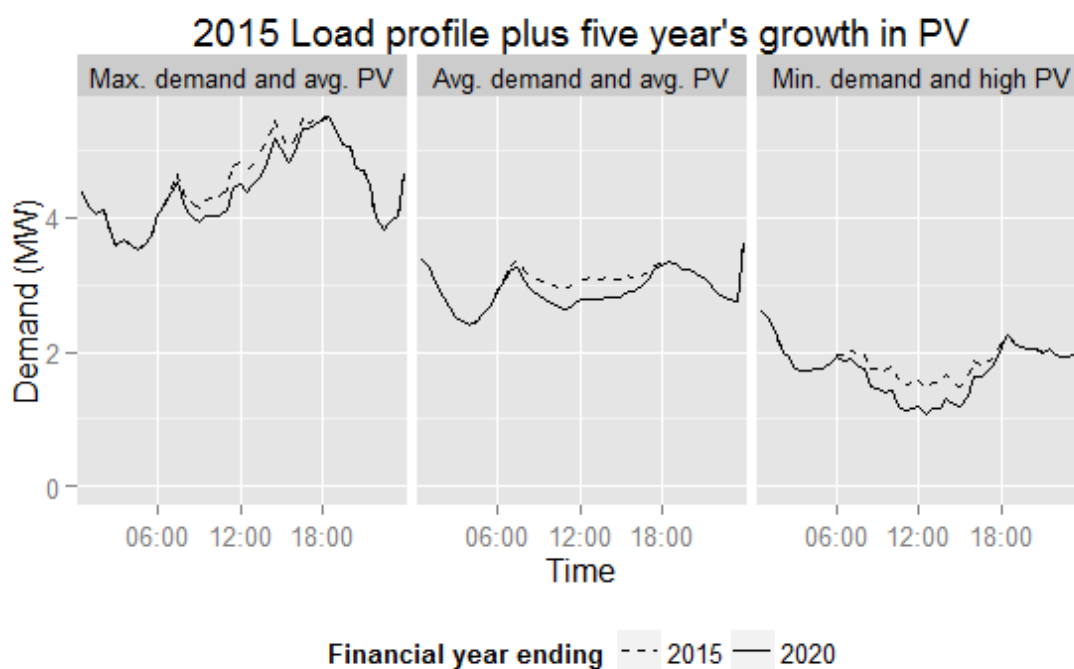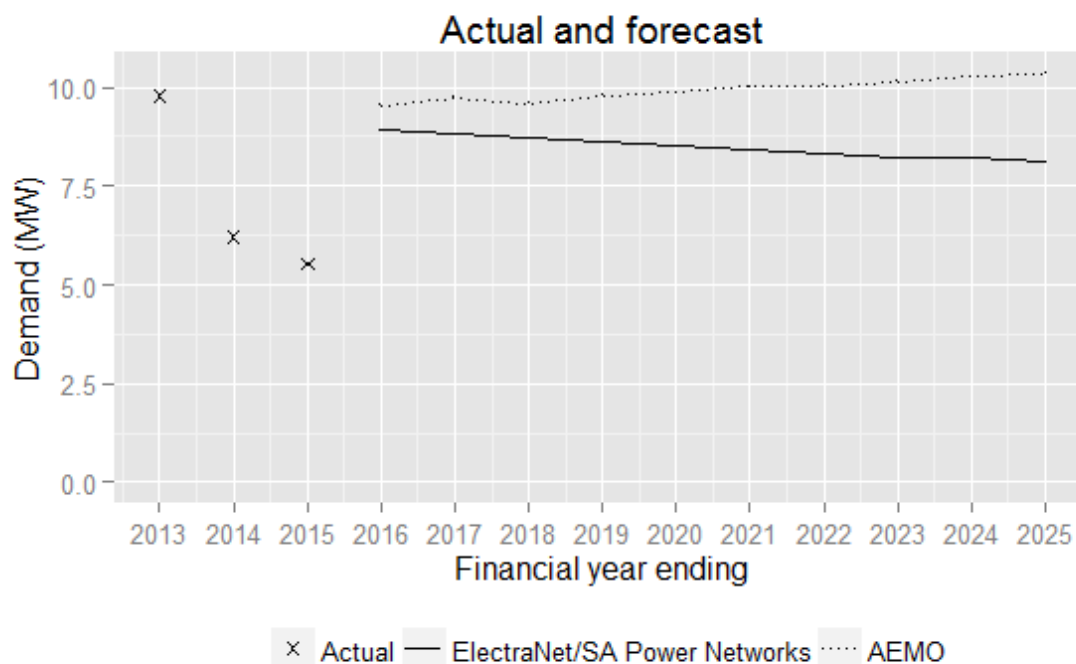

2015 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	14.1	
2013-14	15.7	
2014-15	13.5	
Financial Year	Forecast - MW	Forecast - PF
2015-16	15.9	0.92
2016-17	16.0	0.92
2017-18	16.2	0.92
2018-19	16.3	0.92
2019-20	16.4	0.92
2020-21	16.6	0.92
2021-22	16.8	0.92
2022-23	17.1	0.92
2023-24	17.3	0.92
2024-25	17.5	0.92

6.6.7   Tailem Bend

Actual and forecast

2015 Load profile plus five year's growth in PV
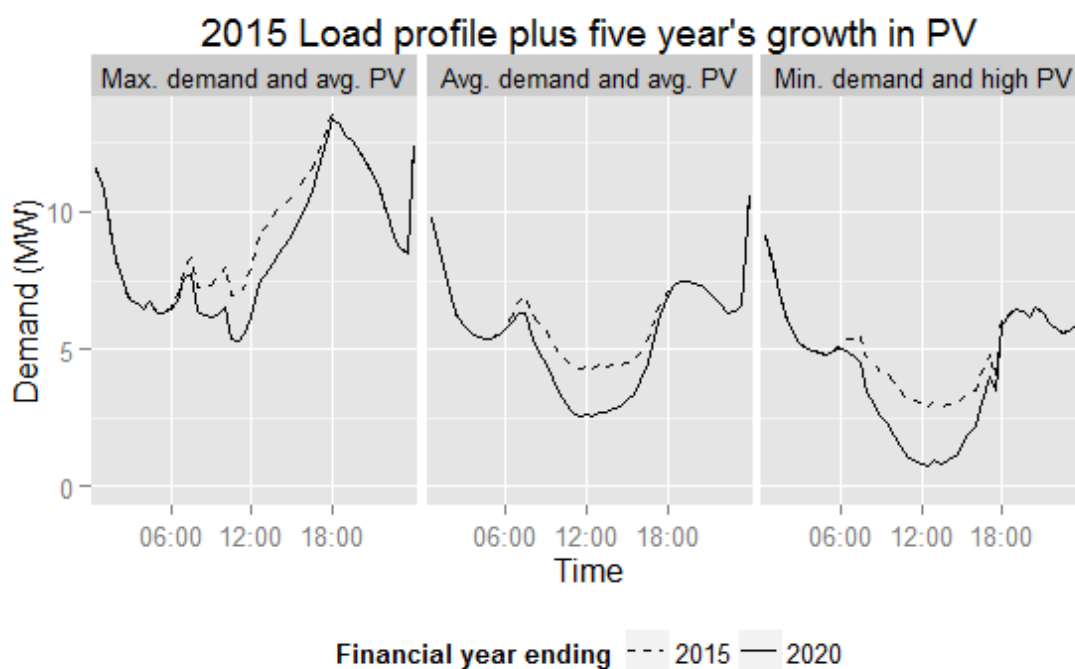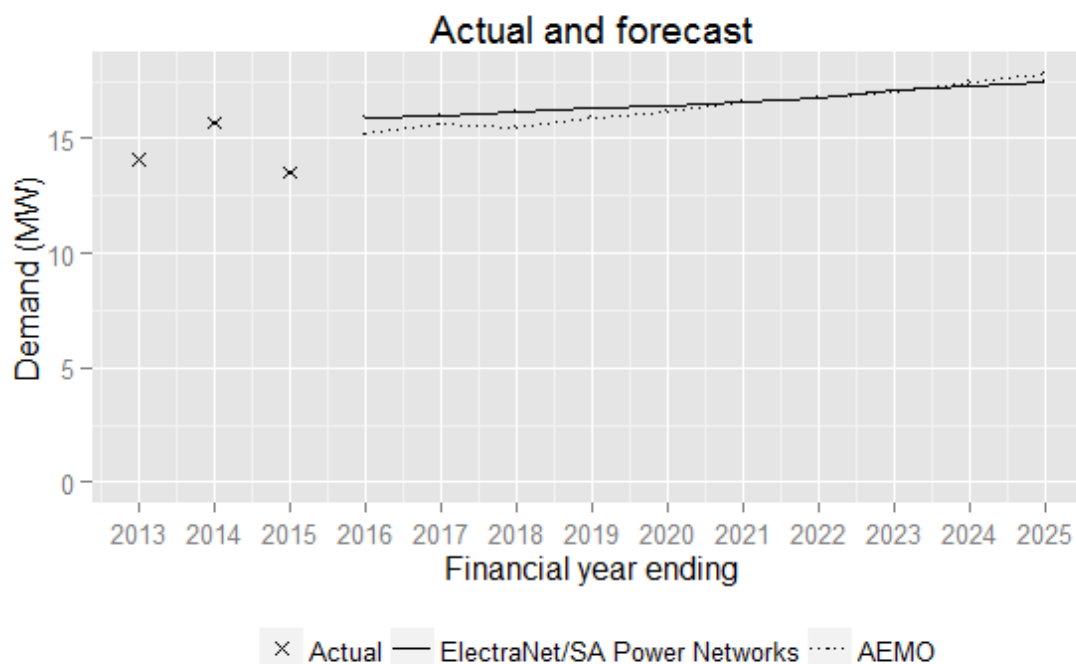
Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	21.3	
2013-14	21.8	
2014-15	20.8	
Financial Year	Forecast - MW	Forecast - PF
2015-16	21.1	0.96
2016-17	20.9	0.96
2017-18	20.7	0.96
2018-19	20.4	0.96
2019-20	20.2	0.96
2020-21	20.0	0.96
2021-22	19.9	0.96
2022-23	19.7	0.96
2023-24	19.6	0.96
2024-25	19.4	0.96

6.7   Upper North

Actual and forecast

2015 Load profile plus five year's growth in PV
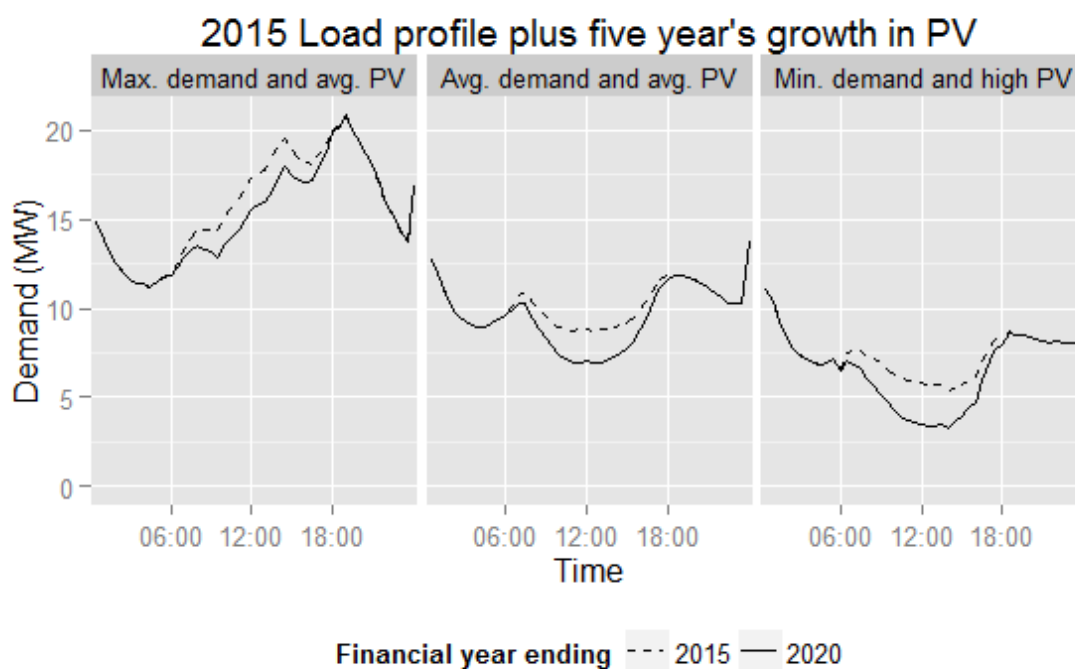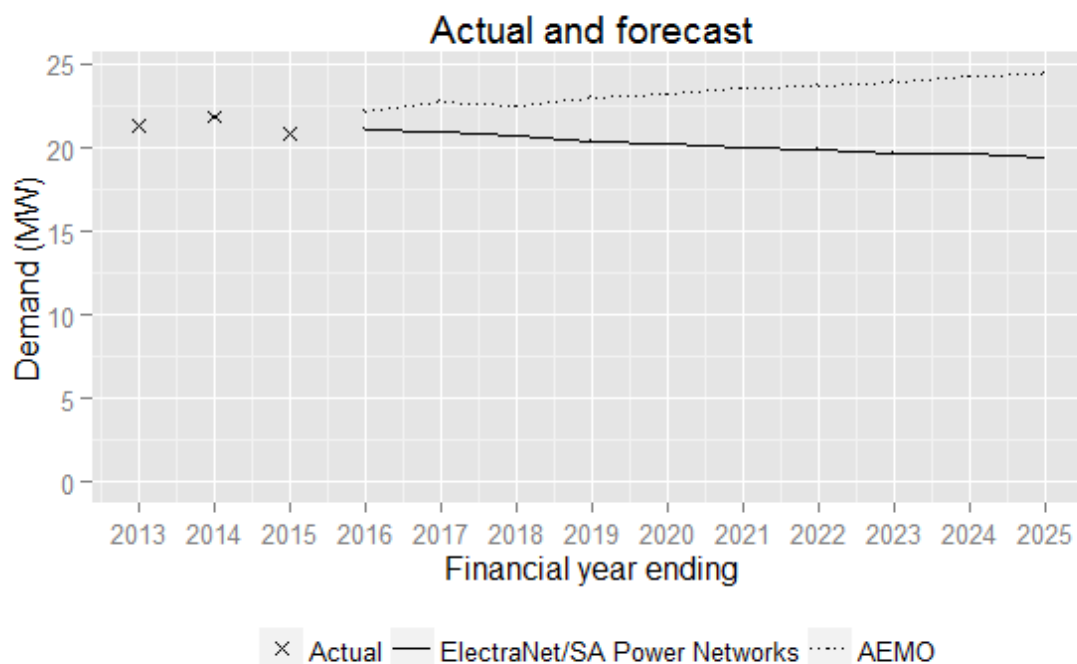
Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2012-13	29.6
2013-14	31.0
2014-15	27.3
Financial Year	Forecast - MW
2015-16	33.6
2016-17	36.1
2017-18	35.6
2018-19	35.1
2019-20	34.4
2020-21	34.5
2021-22	34.5
2022-23	34.5
2023-24	34.6
2024-25	34.7

6.7.1   Davenport West

Actual and forecast
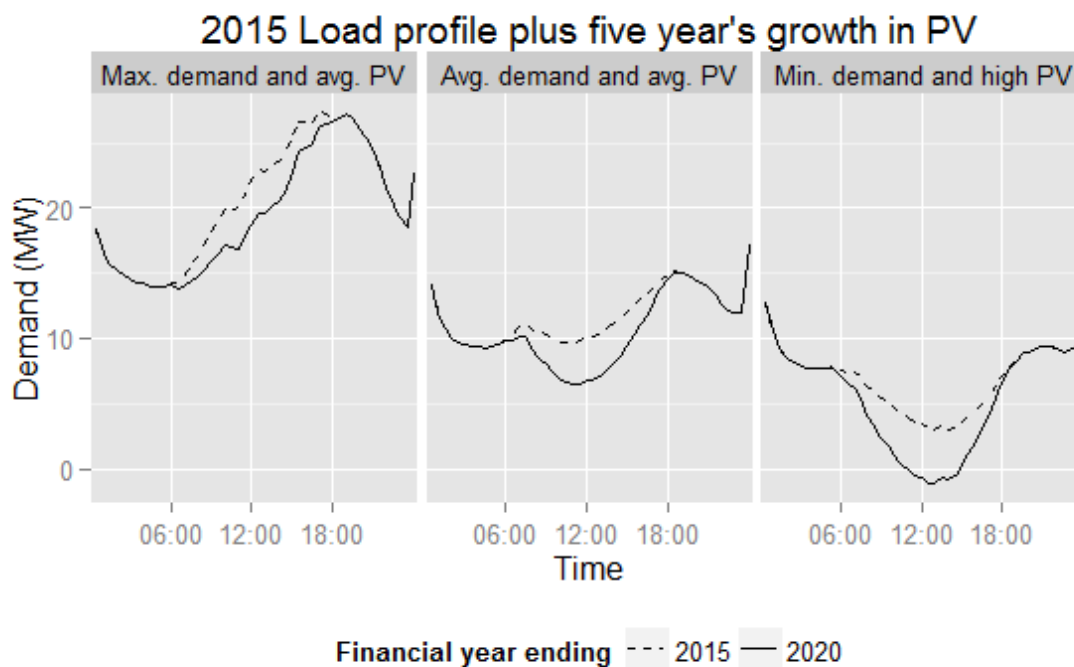

2015 Load profile plus five year's growth in PV
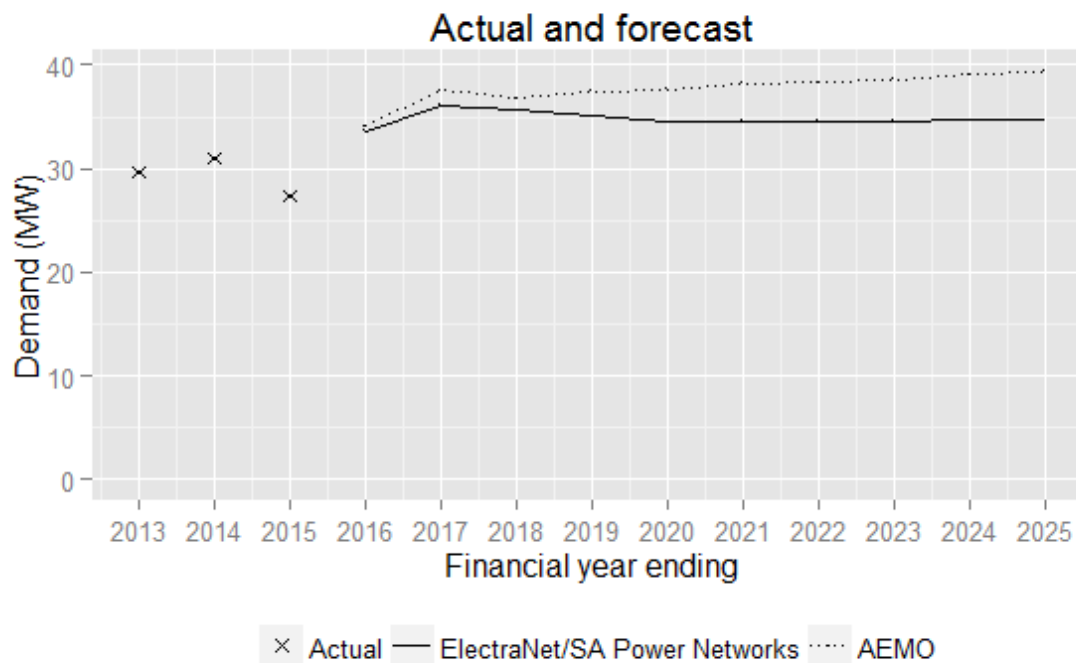
Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	27.4	
2013-14	28.6	
2014-15	25.4	
Financial Year	Forecast - MW	Forecast - PF
2015-16	31.7	0.99
2016-17	34.2	0.99
2017-18	33.7	0.99
2018-19	33.2	0.99
2019-20	32.6	0.99
2020-21	32.7	0.99
2021-22	32.8	0.99
2022-23	32.8	0.99
2023-24	32.9	0.99
2024-25	33.0	0.99

6.7.2 Leigh Creek South

Actual and forecast

× Actual — ElectraNet/SA Power Networks ⋯ AEMO

2015 Load profile plus five year's growth in PV

Financial year ending - - - 2015 — 2020
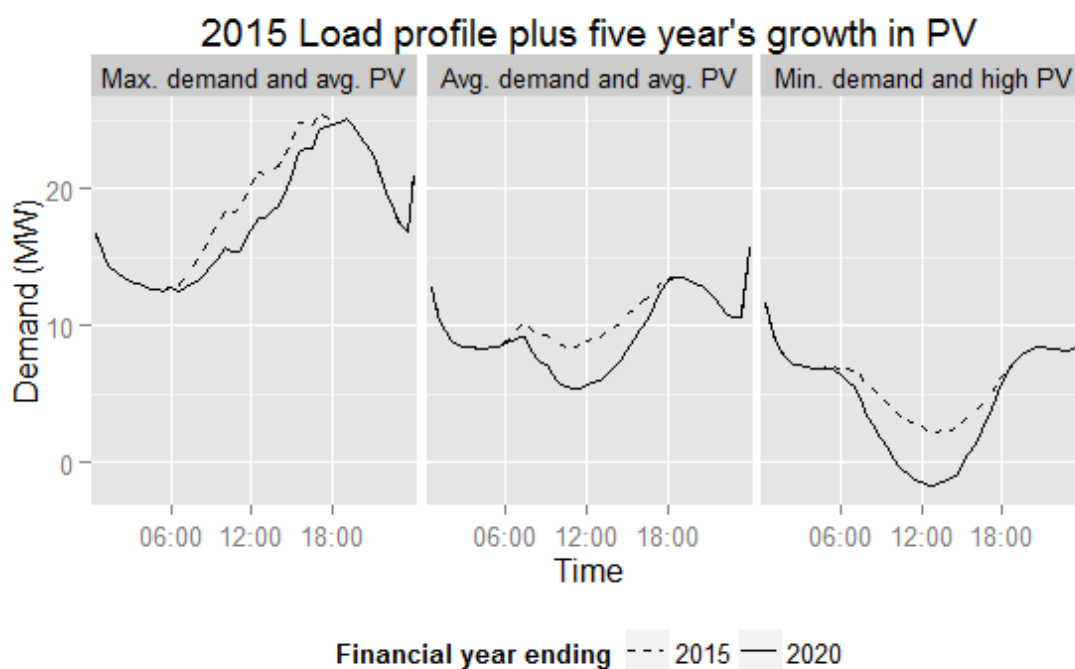
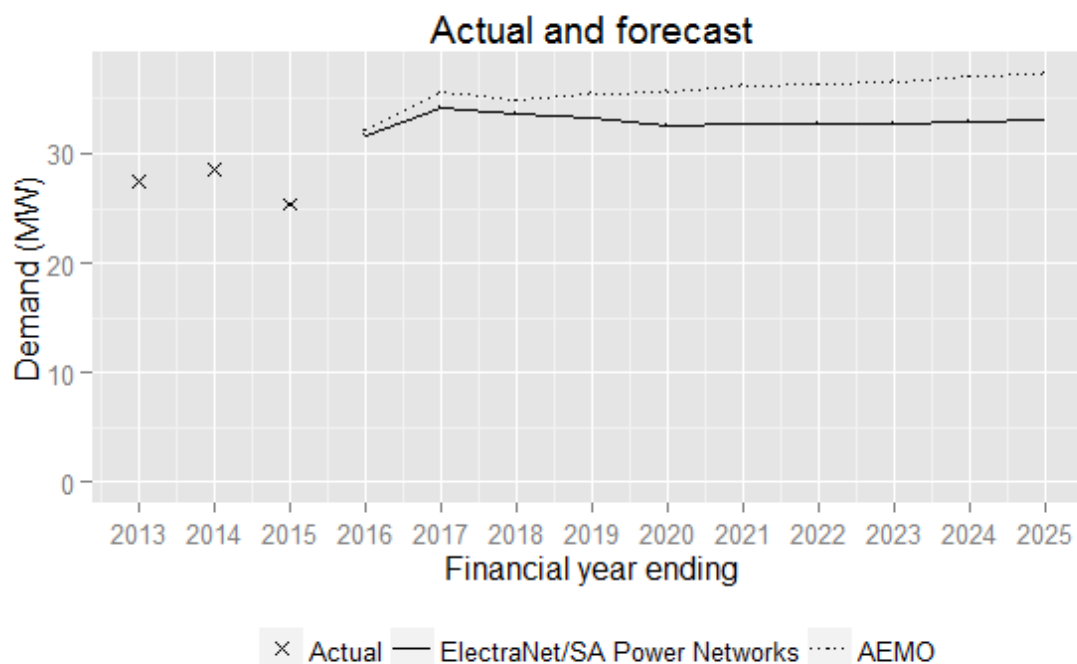Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	1.5	
2013-14	1.5	
2014-15	1.4	
Financial Year	Forecast - MW	Forecast - PF
2015-16	1.5	0.94
2016-17	1.5	0.94
2017-18	1.5	0.94
2018-19	1.5	0.94
2019-20	1.4	0.94
2020-21	1.4	0.94
2021-22	1.4	0.94
2022-23	1.4	0.94
2023-24	1.4	0.94
2024-25	1.3	0.94

6.7.3   Neuroodla

Actual and forecast

× Actual ⎯ ElectraNet/SA Power Networks ⋯ AEMO

2015 Load profile plus five year's growth in PV
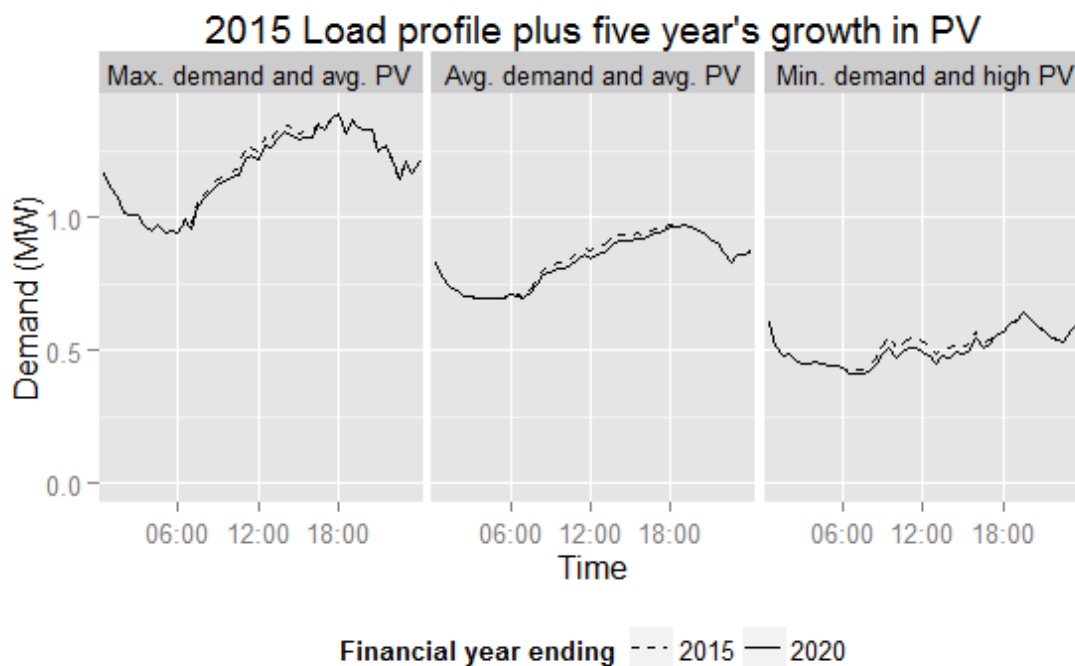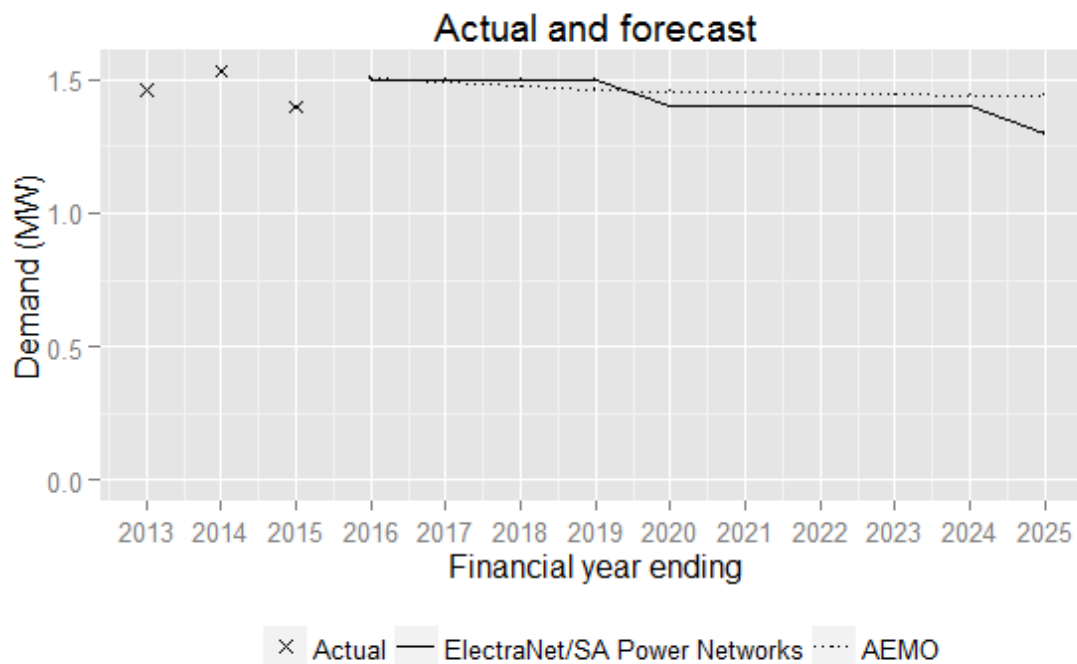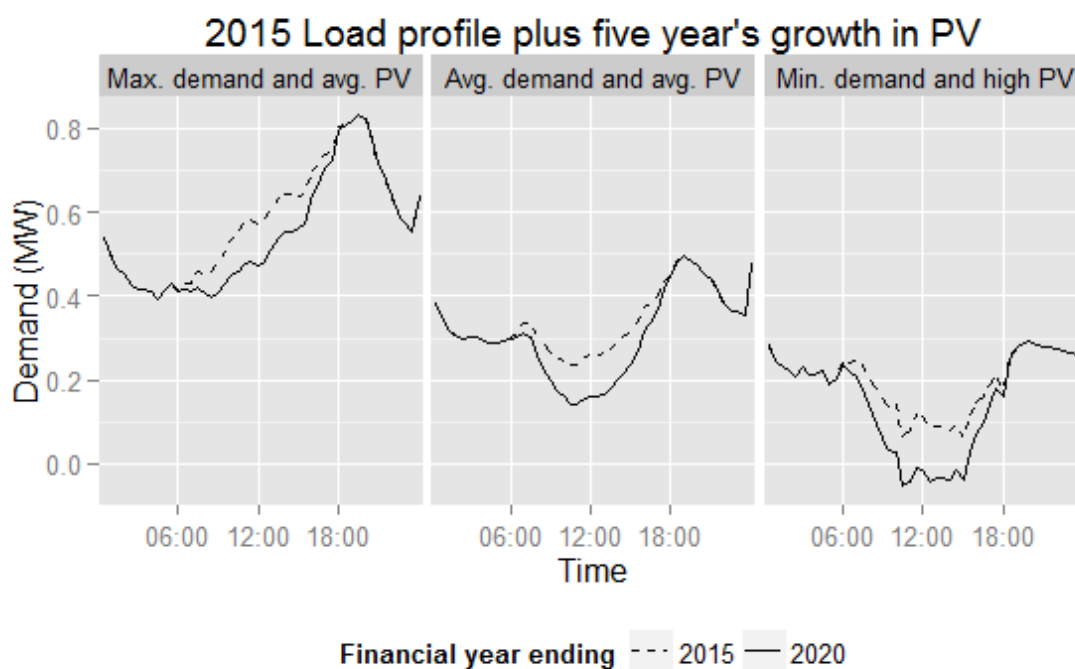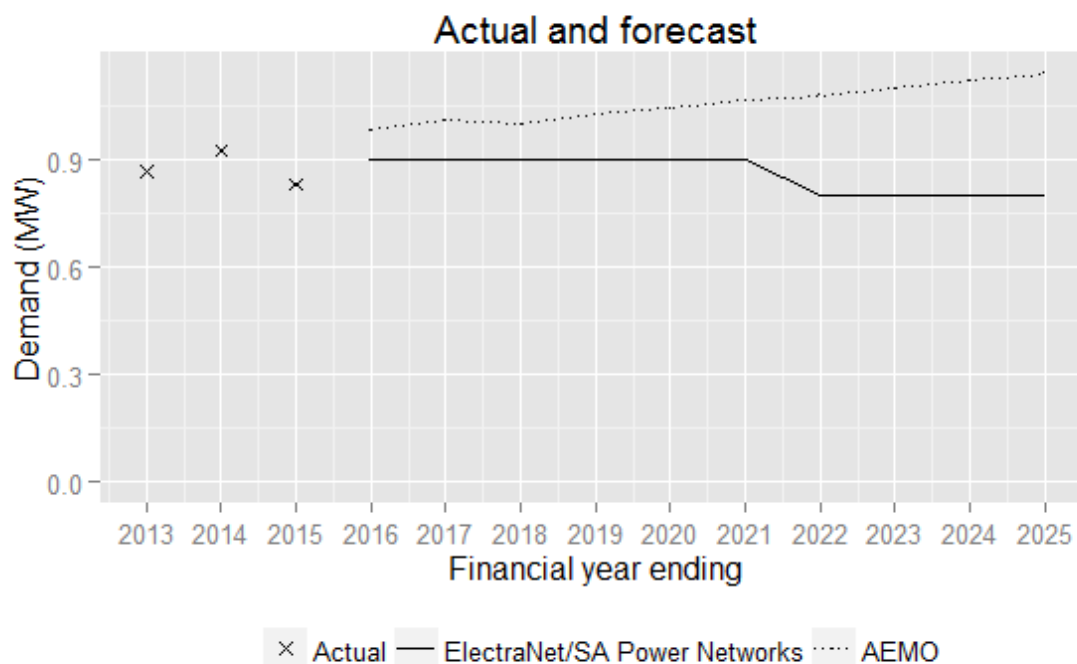
Financial year ending - - - 2015 ⎯ 2020

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2012-13	0.9	
2013-14	0.9	
2014-15	0.8	
Financial Year	Forecast - MW	Forecast - PF
2015-16	0.9	0.89
2016-17	0.9	0.89
2017-18	0.9	0.89
2018-19	0.9	0.89
2019-20	0.9	0.89
2020-21	0.9	0.89
2021-22	0.8	0.88
2022-23	0.8	0.88
2023-24	0.8	0.88
2024-25	0.8	0.88

Appendix B Connection point coincidence factors

The following tables present the connection point co-incidence factors ElectraNet assumes in planning state-wide maximum demand:

Connection Point	Regional Coincidence
Eastern Suburbs	0.98
Northern Suburbs	0.99
Southern Suburbs	0.97
Western Suburbs	0.98
Angas Creek	0.97
Kanmantoo	0.94
Mannum	0.88
Mobilong	0.92
Mt Barker	0.99
Port Lincoln	0.94
Stony Point Distribution	0.70
Whyalla Central	0.89
Wudinna	0.90
Yadnarie	0.96
Ardrossan West	0.86
Baroota	0.91
Brinkworth	0.75
Clare North	0.39

Connection Point	Regional Coincidence
Dorrien	0.93
Dalrymple	0.78
Hummocks	0.82
Kadina East	0.89
Port Pirie/Bungama	0.96
Templers	0.92
Waterloo	0.88
Berri	0.99
North West Bend	0.90
Blanche	0.93
Keith	0.92
Kincraig	0.96
Mt Gambier	0.90
Penola West	0.23
Snuggery Industrial	0.38
Snuggery Rural	0.91
Tailem Bend	0.96
Davenport West	1.00
Leigh Creek South	0.68