SA CONNECTION POINT DEMAND FORECASTS 2018

29 JUNE 2018

ElectraNet

Copyright and Disclaimer

Copyright in this material is owned by or licensed to ElectraNet. Permission to publish, modify, commercialise or alter this material must be sought directly from ElectraNet.

Reasonable endeavours have been used to ensure that the information contained in this report is accurate at the time of writing. ElectraNet makes no representation or warranty as to the accuracy, reliability, completeness or suitability for purposes of the information contained within this document. ElectraNet and its employees, agents, consultants give no warranty and accept no liability (including liability to any person by reason of negligence or negligent misstatement) for any statements, opinions, information or matter expressed or implied arising out of, contained in, or derived from, or for any omissions from, the information in this document, except in so far as liability under any statute cannot be excluded.

Forecasts, projections and forward-looking statements included in this document are subject to change and amongst other things, reflect information, data, methodologies, legislation, regulatory guidance, assumptions, prevailing market estimates, assessments, standards, and factors current at the time of publication.

Feedback

ElectraNet welcomes customer and stakeholder feedback on this report, 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:

Hugo Klingenberg
Senior Manager Network Development
ElectraNet
PO Box 7096 Hutt Street Post Office Adelaide, South Australia, 5000

Toll Free: 1800 243 853

Contents

Figures

Tables

Glossary of Terms

Term	Description
AEMO	Australian Energy Market Operator
AER	Australian Energy Regulator
DAPR	Distribution Annual Planning Report
DNSP	Distribution Network Service Provider
EFI	Electricity Forecasting Insights
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
NTNDP	National Transmission Network Development Plan
POE	Probability of Exceedance
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

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

Forecasting electricity demand is a critical input in the planning for the delivery of reliable transmission services to our customers.

Due to the long lead times in the delivery of transmission infrastructure, it is necessary to forecast electricity demand and network loading conditions well into the future. For demand driven projects, this is typically 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, however, at a lower rate on average, with rates varying 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 power into the grid rather than consuming[2].

The purpose of this report is to present the transmission connection point forecasts that ElectraNet is using in its 2018 South Australian Transmission Annual Planning Report (TAPR) and to highlight the trend of reducing midday demand.

Appendix A provides additional information on the maximum, average and minimum daily load shapes in 2017 at each transmission connection point along with how the 2017 data would appear in 2022 with the forecast growth in PV[3]. Also included is how the average load varied by season, weekdays and weekend in 2017. This information is intended to inform the consideration and provision of non-network services in future Regulatory Investment Tests for Transmission (RIT-T).[4]

The data in Appendix A is available in spreadsheet format on request.

[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 points that are injecting power.

[3.] PV forecasts are supplied by SA Power Networks

[4.] The economic cost benefit test that is applied in the NEM to considering options for relieving transmission network limitations or constraints.
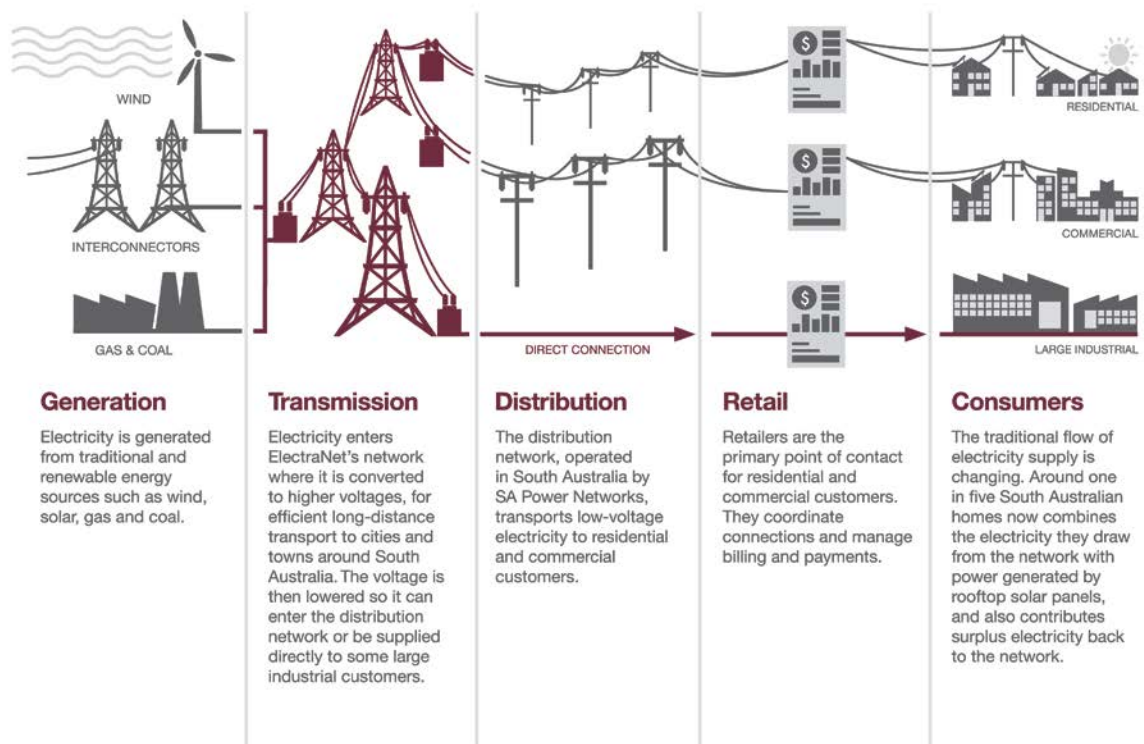
2.   Background

As a specialist in electricity transmission, ElectraNet provides energy and infrastructure solutions across Australia. ElectraNet's 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 91 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

Generation

Electricity is generated from traditional and renewable energy sources such as wind, solar, gas and coal.

Transmission

Electricity enters ElectraNet's network where it is converted to higher voltages, for efficient long-distance transport to cities and towns around South Australia. The voltage is then lowered so it can enter the distribution network or be supplied directly to some large industrial customers.

Distribution

The distribution network, operated in South Australia by SA Power Networks, transports low-voltage electricity to residential and commercial customers.

Retail

Retailers are the primary point of contact for residential and commercial customers. They coordinate connections and manage billing and payments.

Consumers

The traditional flow of electricity supply is changing. Around one in five South Australian homes now combines the electricity they draw from the network with power generated by rooftop solar panels, and also contributes surplus electricity back to the network.

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.

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) 2018 Electricity Forecasting Insights (EFI) forecasts South Australian state-wide 10% probability of exceedance (POE)[5] maximum demand to have a diverse range of potential outcomes.

These outcomes range from grid supplied electricity in South Australia being largely unchanged in 2036 under a "Strong" scenario to close to 600 MW lower than the recorded maximum in South Australia, set in 2009, under a "Weak" scenario. See Figure 4-1 for further details on AEMO's March 2018 EFI forecasts for South Australia.

However, the development of new loads, such as potential new mining loads under higher economic growth scenarios, would see maximum demand supplied by the transmission network increase. This would require 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 receives maximum demand forecasts from SA Power Networks and engages with our direct connect customers to understand future demand for grid supplied services on an annual basis.

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. While the need for additional amendments to the forecasts received from SA Power Networks has been considered, ElectraNet is not proposing to make any amendments for the 2018 TAPR.

SA Power Networks has reconciled its connection point forecasts to the trend of AEMO's 2017 Electricity Forecasting Insights state-wide forecasts, which does not materially differ from that determined by AEMO in the 2018 March update, 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.[6]

This report uses 10% POE forecasts. That is, one year in ten, the annual maximum demand is expected to exceed the forecast[7].

[5.] 10% POE indicates a value that is expected to be exceeded once every ten years, on average.

[6.] SA Power Networks Distribution Annual Planning Report: December 2017

[7.] 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 is using in the 2018 TAPR are presented in Appendix A.

3.2 ElectraNet direct connect customers

Large customer loads that connect directly to the transmission network provide maximum demand forecasts for their respective connection points. ElectraNet has reviewed, but 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 load 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);

- OZ Minerals – Carrapateena (Mount Gunson 132 kV connection point);

- 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 maintain confidentiality, data which may identify ElectraNet's larger customers has not been included in Appendix A.

Table 3-1: Combined direct connect load customer demand forecast (MW)

Year	2017-18	2018-19	2019-20	2020-21	2021-22	2022-23	2023-24	2024-25	2025-26	2026-27
Combined total (MW)	321	376	376	376	376	376	376	376	376	376

3.3 Minimum demand

Appendix A outlines the maximum ten-year demand forecast for each connection point.

Daily load traces of maximum, average and minimum demands for each connection point and at the higher regional level are also included.

The daily minimum demand traces identify that numerous connection points are reaching zero grid demand or are injecting power back into the network at times. Table 3-2 identifies those connection points that recorded negative demand (injection) because of distributed PV systems in 2017.

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

Connection point	ETC Category[8]	2017 Minimum	2017-18 Maximum
Ardrossan West	2	-0.5	10.5
Baroota	1	-0.5	8.2
Kadina East	2	-0.1	24.4
Kanmantoo	1	-0.1	1.6
Stony Point Distribution	1	0.0	0.1

Table 3-3 identifies additional connection points that might see this phenomenon occur by 2021-22 based on current PV forecasts and without further material changes to the minimum demand.

Table 3-3: Additional Connection points that may inject power at time of maximum PV generation within 5 years (2022)

Connection point	ETC Category[9]	2022 Minimum	2022 Maximum
Angas Creek	4	-3.4	16.5
Ardrossan West	2	-3.1	9.4
Baroota	1	-2.3	8.2
Brinkworth	4	-0.7	4.6
Dalrymple	1	-1.6	7.0
Davenport West	4	-1.7	31.2
Dorrien	4	-4.8	80.7
Kadina East	2	-5.1	24.4
Kanmantoo	1	-0.5	1.6
Mannum	4	-1.4	12.2
Mt Barker/Mt Barker South	4	-10.0	84.1
Neuroodla	1	-0.1	0.9
Port Lincoln	3	-0.6	30.9
Snuggery Rural	3	-0.6	13.0
Southern Suburbs	4	-12.3	666.8
Stony Point Distribution	1	0.0	0.1
Templers	4	-2.6	30.0
Waterloo	4	-1.2	8.5
Wudinna	2	-1.6	14.9
Yadnarie	2	-1.1	8.2

---

8. Electricity Transmission Code reliability category

4. AEMO Forecasts

4.1 Electricity Forecasting Insights

AEMO publishes annual state-wide demand forecasts for South Australia. Until 2016, this was published as part of a National Electricity Forecasting Report (NEFR). From 2017, the forecasts have been published as part of AEMO's Electricity Forecasting Insights.

AEMO's latest state-wide forecast for operational[9] demand is shown in Figure 4-1.

Figure 4-1: AEMO's March 2018 SA 10% POE operational demand forecast
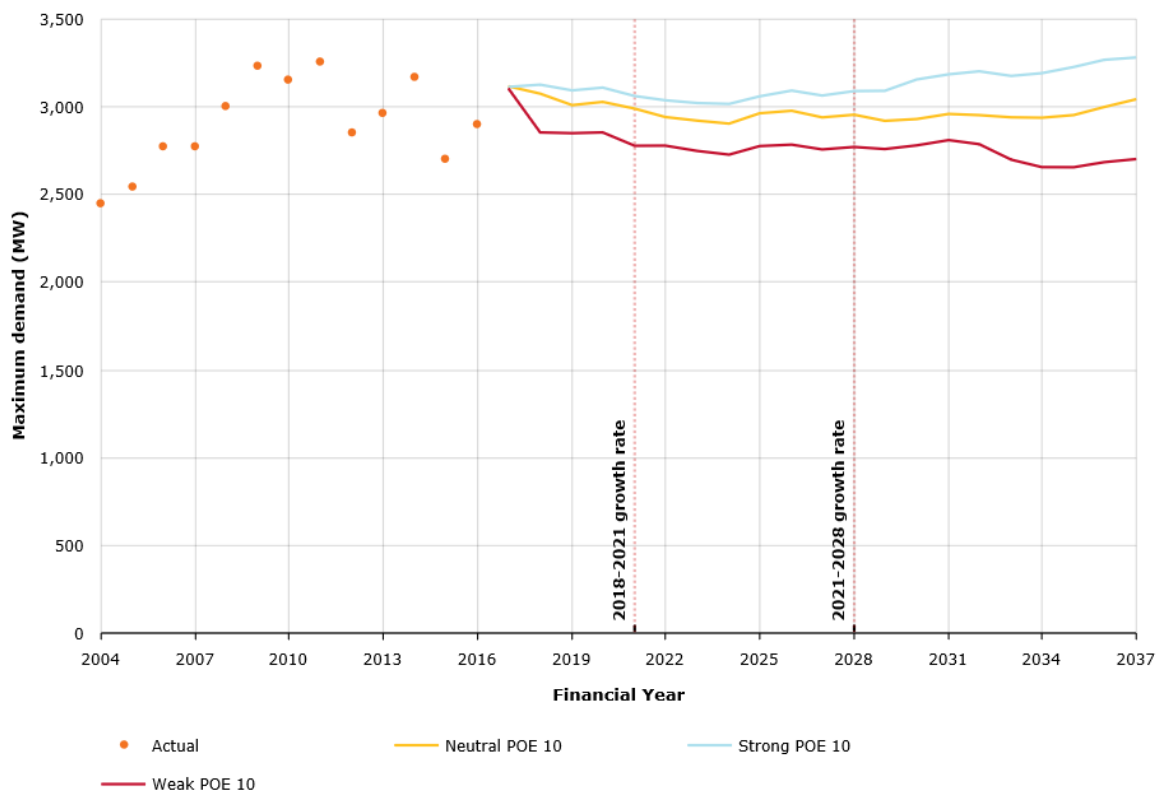
Source: AEMO 2018 Electricity Forecasting Insights – March 2018 Update SA Operational Demand

Due to the 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 in South Australia will fall below zero potentially during the mid-2020s.

This is a direct result of the strong uptake of distributed generation and supporting technologies, which has led to reduced demand drawn from the grid. ElectraNet has

---

9. Operational demand measures demand by grid injection at major supply points and includes losses and auxiliary supplies. This does not include the demand of embedded generators such as distributed PV.

presented minimum demand traces across the network to demonstrate that this is already occurring at localised levels on the network.

Table 4: AEMO 2018 EFI forecasts for the first year negative grid demand may occur by scenario.

Scenario	First year of negative grid demand
Strong	2024-25
Neutral	2025-26
Weak	2025-26

4.2   Connection Point Forecasting

In September 2017, 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[10].

Like the methodology used by SA Power Networks, the AEMO connection point forecasts are reconciled to AEMO's most recent state-wide forecasts. AEMO's connection point forecasts are compared in Appendix A with ElectraNet and SA Power Networks forecasts.

5.   Reconciliation

ElectraNet uses both the AEMO state-wide forecasts and SA Power Networks' connection point forecasts depending on the needs of a planning study.

5.1   Connection point reconciliation

Appendix A compares the ElectraNet/SA Power Networks connection point forecasts with AEMO's connection point forecasts. Any material divergences that could have an influence on emerging network constraints and subsequently on ElectraNet's capital forecasts are identified. The effect of any variances in the demand forecasts are reported in ElectraNet's TAPR.

5.2   State-wide reconciliation

To further ensure consistency of the forecasts used, SA Power reconciles the connection point forecasts with AEMO's state-wide forecast by applying – at the state-wide level – the same growth rates as AEMO in performing its forecast reconciliation process.

---

10.   http://aemo.com.au/Electricity/Planning/Forecasting/AEMO-Transmission-Connection-Point-Forecasting

This page is intentionally blank

![ElectraNet]

South Australian Connection Point Demand Forecasts 2018

Appendices

June 2018

Security Classification: Public
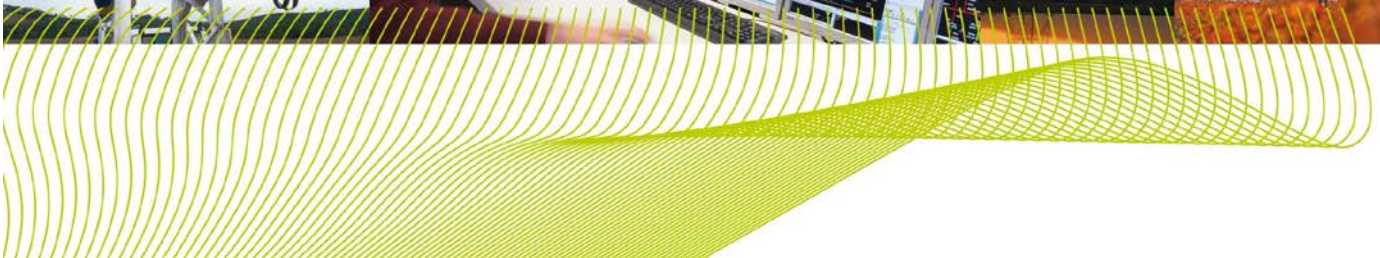
Appendix A Connection Point Forecasts

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. Included are the actuals recorded in summer 2017-18. These should be considered as preliminary.

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 2017-18 summer. Typically, maximum demands 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 potential non-network solution to a network limitation 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 2017-18.

Also provided is the average demand load shape for each connection point based on season, weekdays and weekend.

The forecast effect of continued growth in PV is demonstrated by showing how the additional PV is expected to impact on the 2017 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.

A1   Adelaide Metro

Actual and 10POE forecast
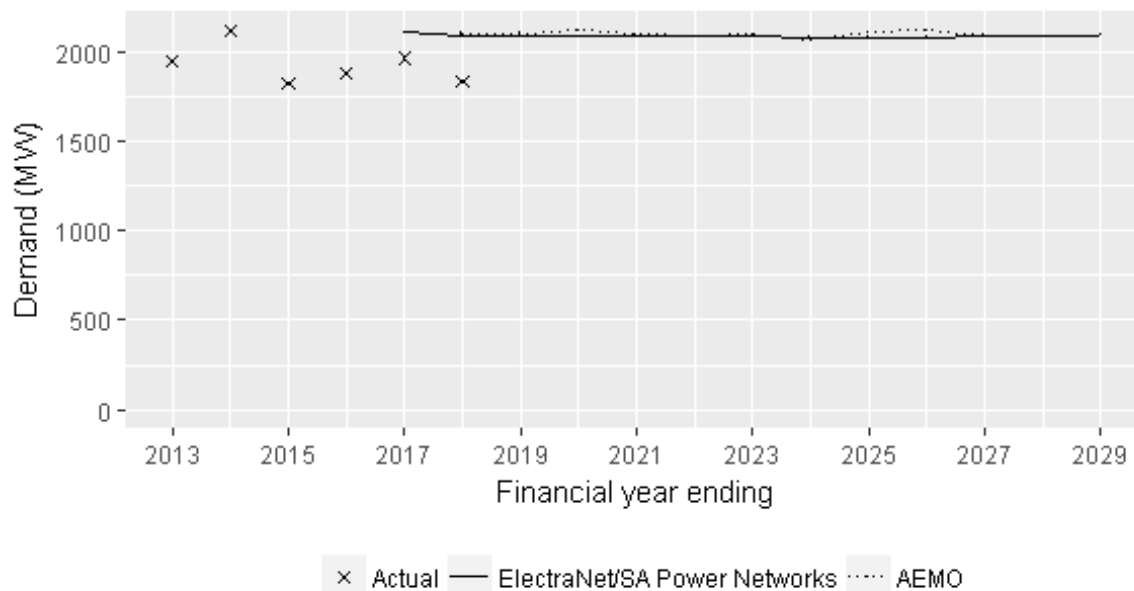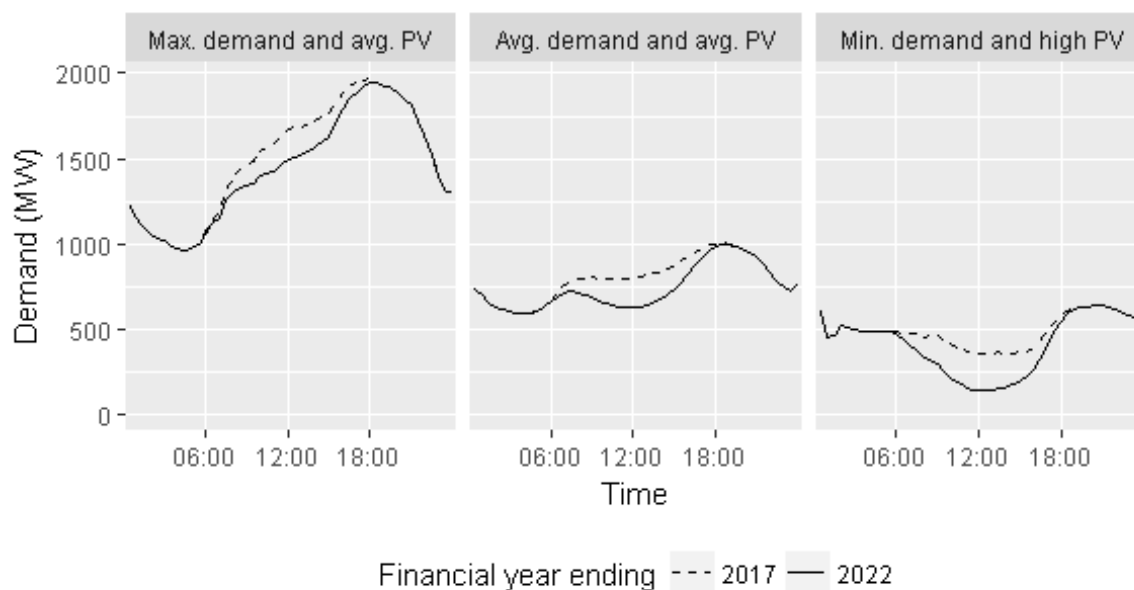
2017 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums.

Financial year	Actual (MW)
2013-14	2115.7
2014-15	1826.9
2015-16	1884.6
2016-17	1964.7
2017-18	1834.7

Financial Year	Forecast - MW
2018-19	1992.2
2019-20	1980.2
2020-21	1968.0
2021-22	1955.9
2022-23	1943.5
2023-24	1931.3
2024-25	1919.3
2025-26	1906.9
2026-27	1910.6
2027-28	1914.0
2028-29	1917.4

A1.1 Eastern Suburbs

Category: 4
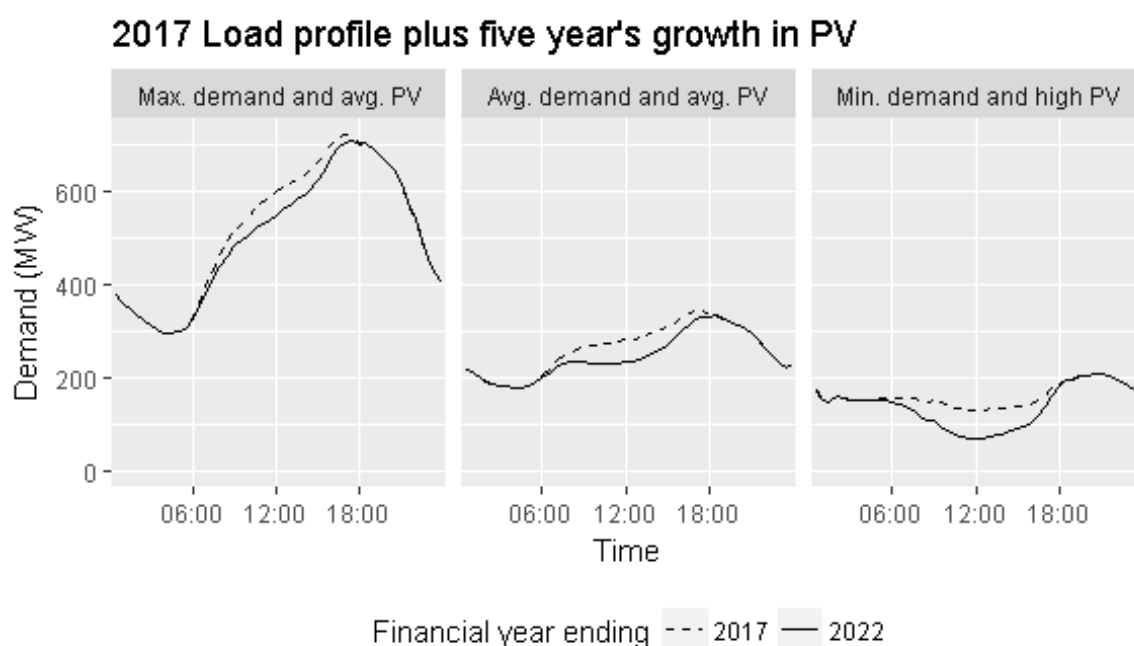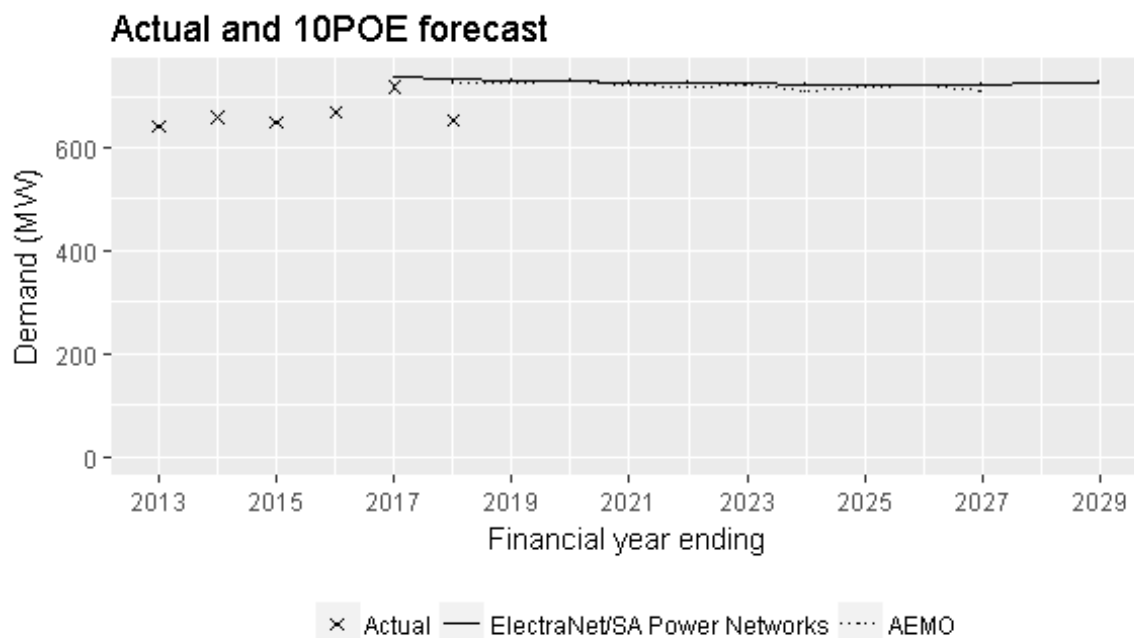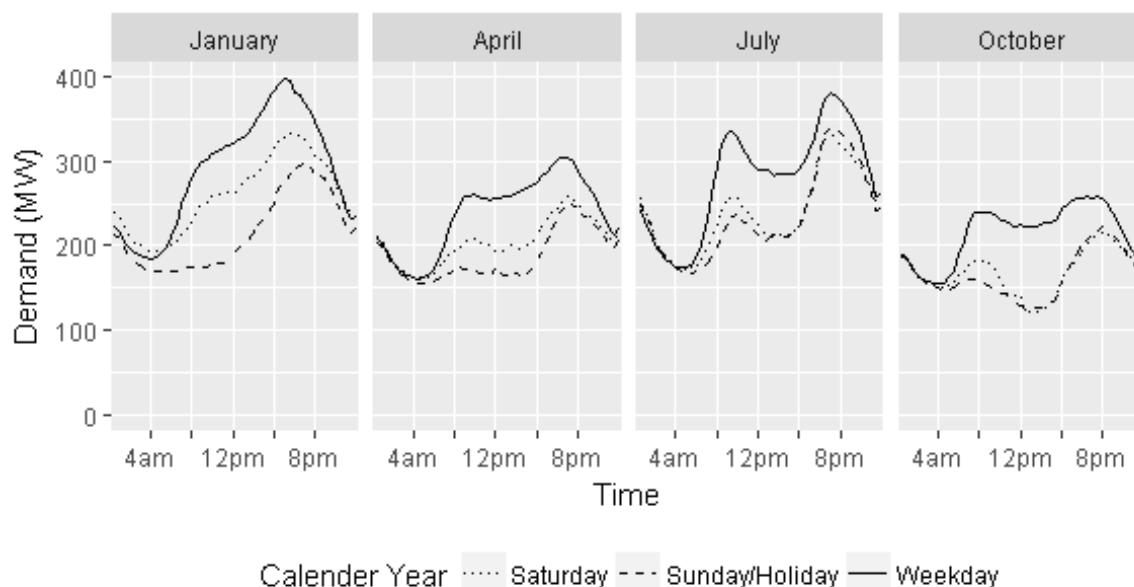
Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
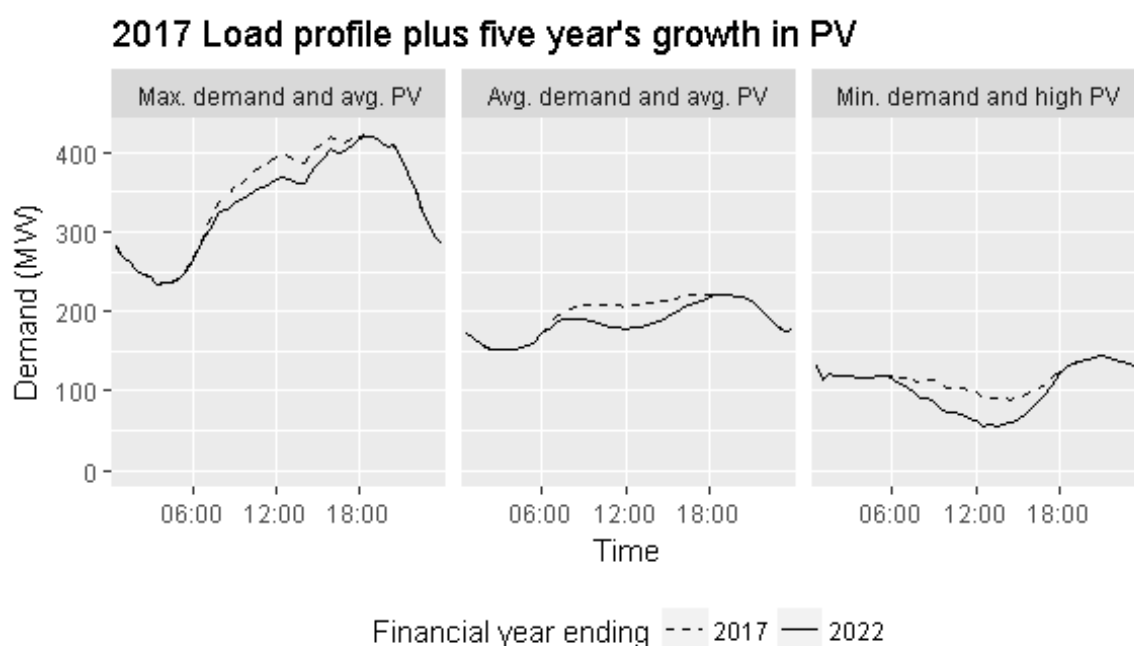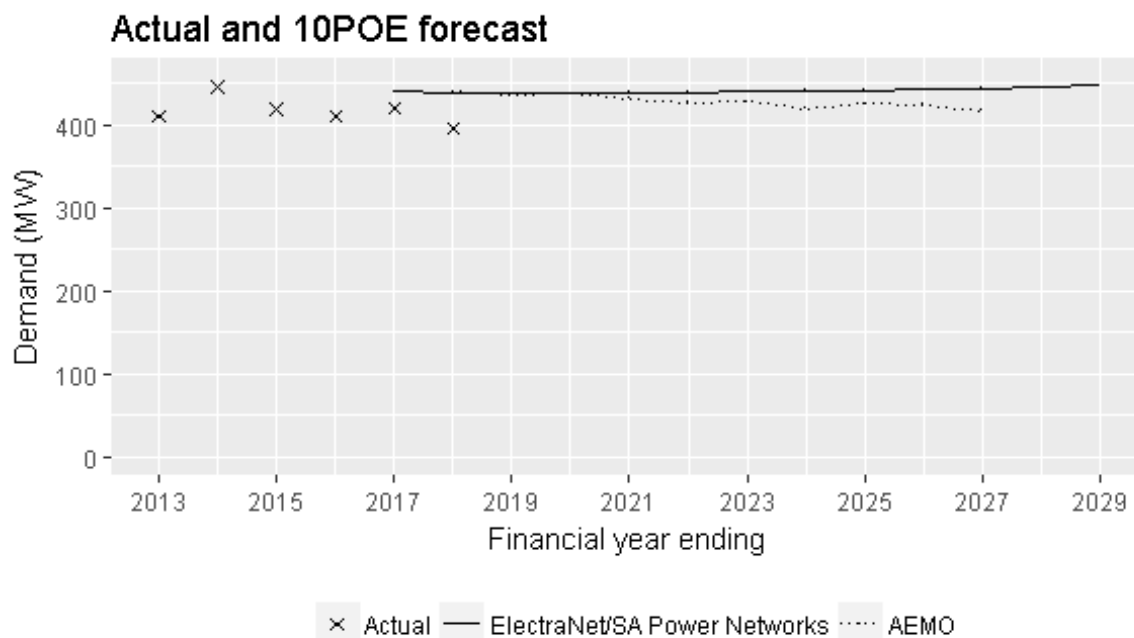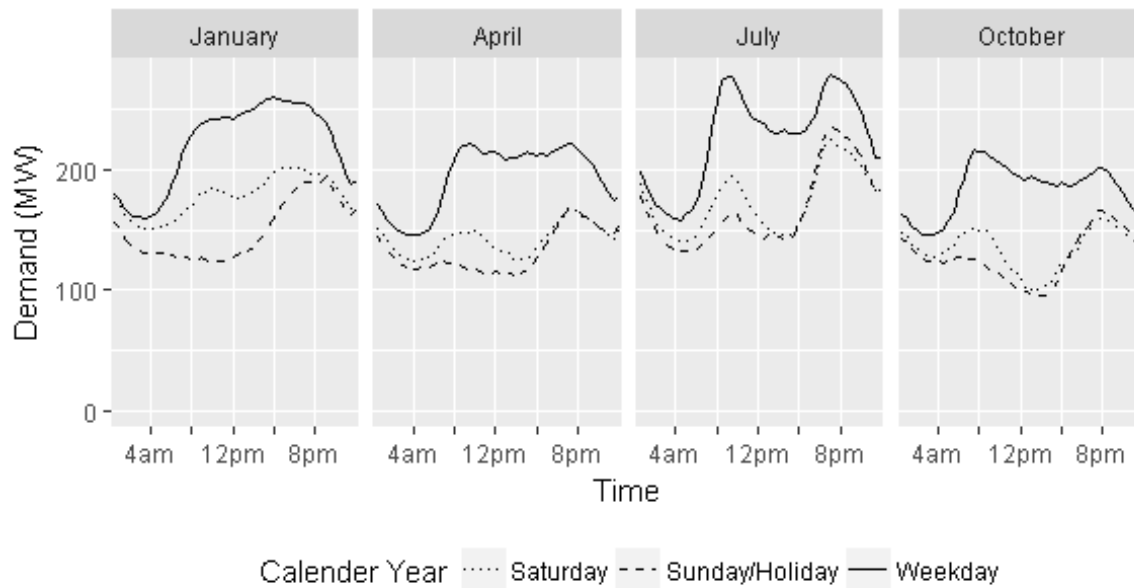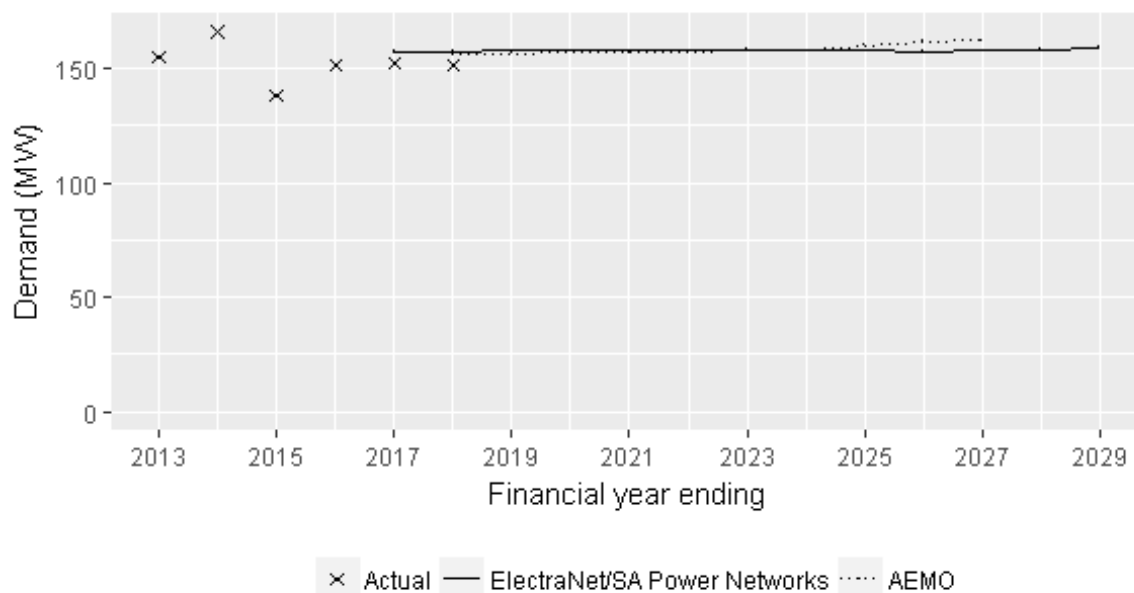
2017 Average load profile by month

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

Financial year	Actual (MW)	
2013-14	658.9	
2014-15	648.8	
2015-16	668.7	
2016-17	718.0	
2017-18	652.3	

Financial Year	Forecast - MW	Forecast - PF
2018-19	730.6	0.99
2019-20	729.1	0.99
2020-21	727.6	0.99
2021-22	726.2	0.99
2022-23	724.7	0.99
2023-24	723.2	0.99
2024-25	721.6	0.99
2025-26	721.3	0.99
2026-27	722.9	0.99
2027-28	724.5	0.99
2028-29	726.0	0.99

A1.2   Northern Suburbs

Category: 4
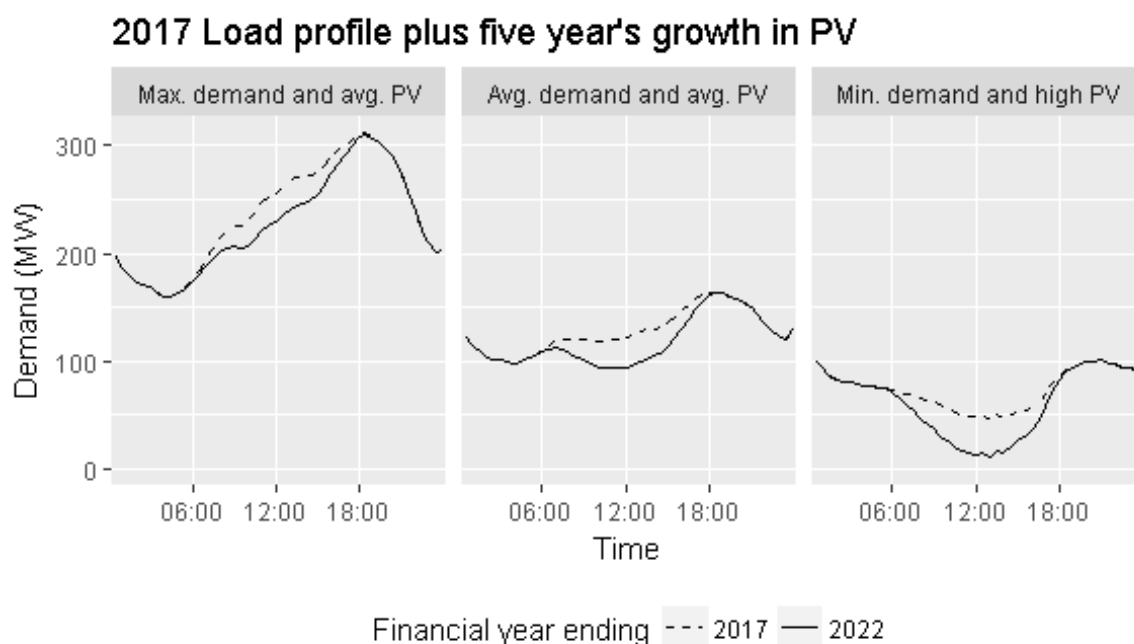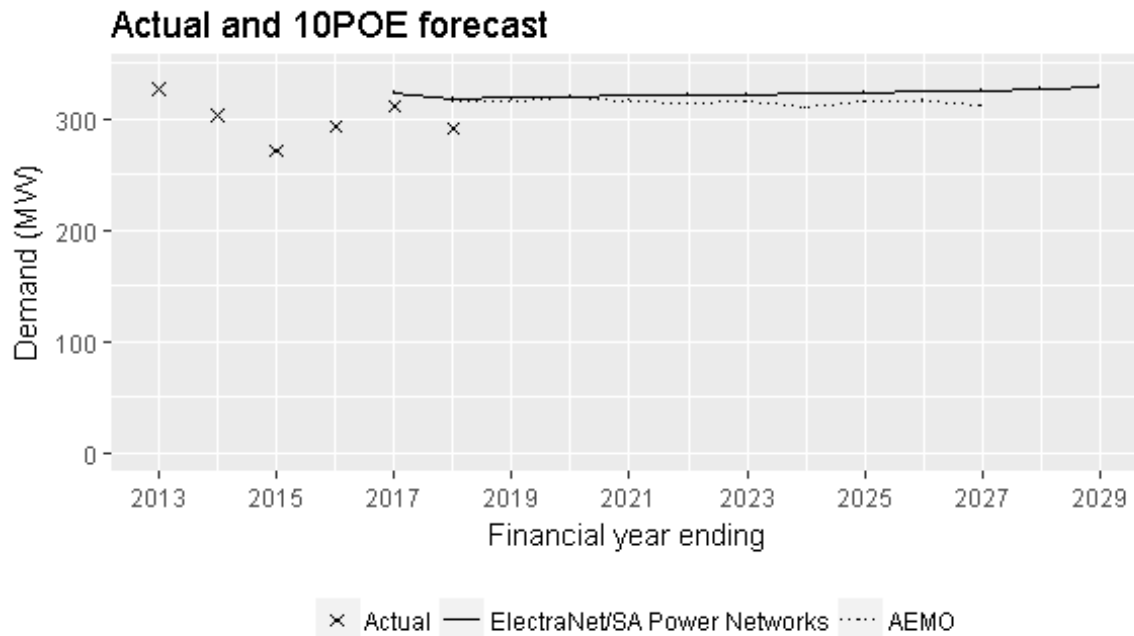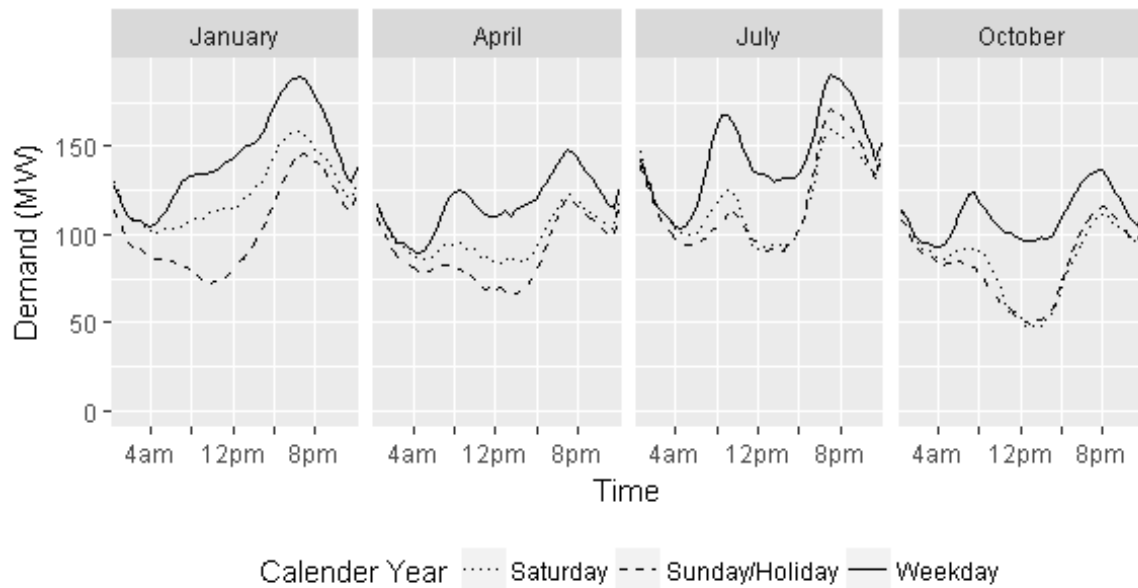
Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month

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

Financial year	Actual (MW)	
2013-14	303.0	
2014-15	271.0	
2015-16	293.8	
2016-17	311.2	
2017-18	291.6	

Financial Year	Forecast - MW	Forecast - PF
2018-19	318.9	0.99
2019-20	319.8	0.99
2020-21	320.6	0.99
2021-22	321.4	0.99
2022-23	322.2	0.99
2023-24	323.0	0.99
2024-25	323.8	0.99
2025-26	324.3	0.99
2026-27	325.7	0.99
2027-28	327.1	0.99
2028-29	328.7	0.99

A1.3   Southern Suburbs

Category: 4
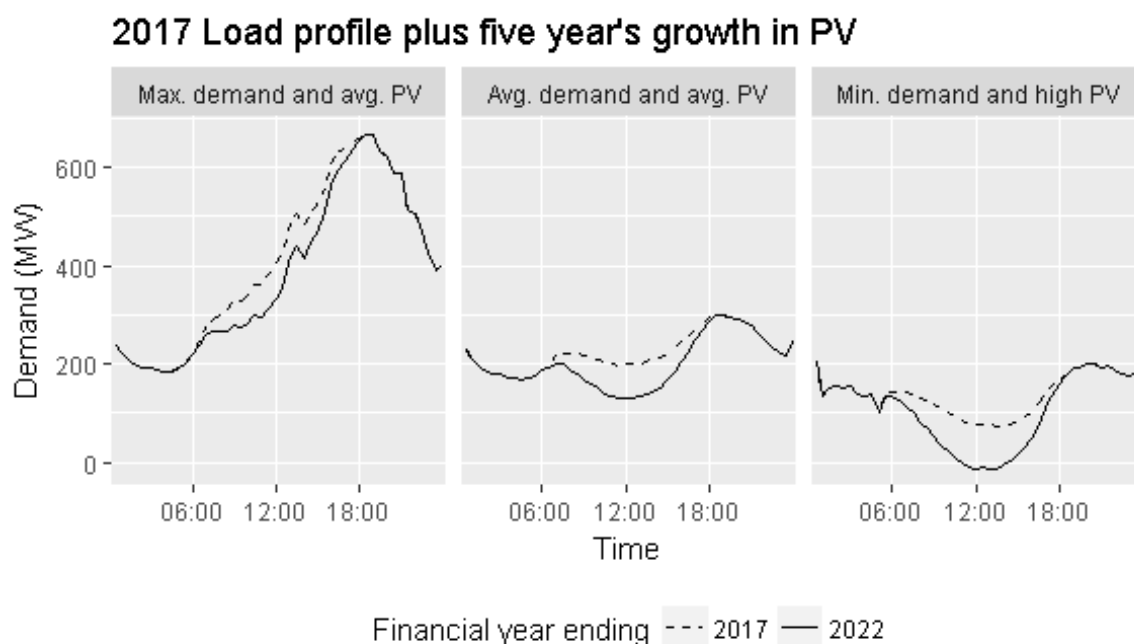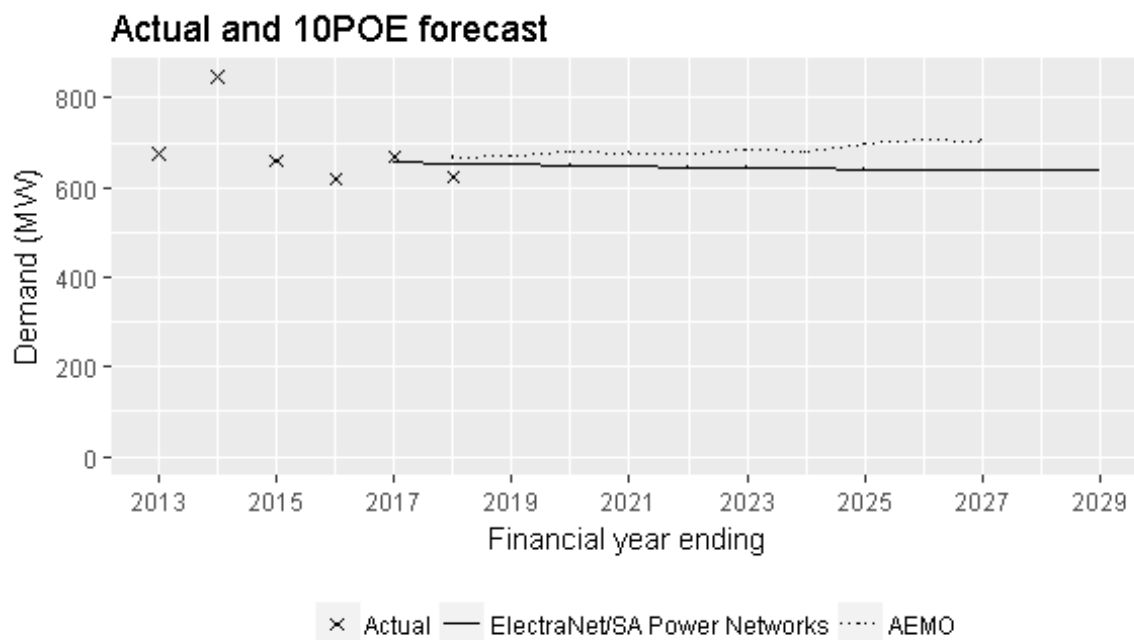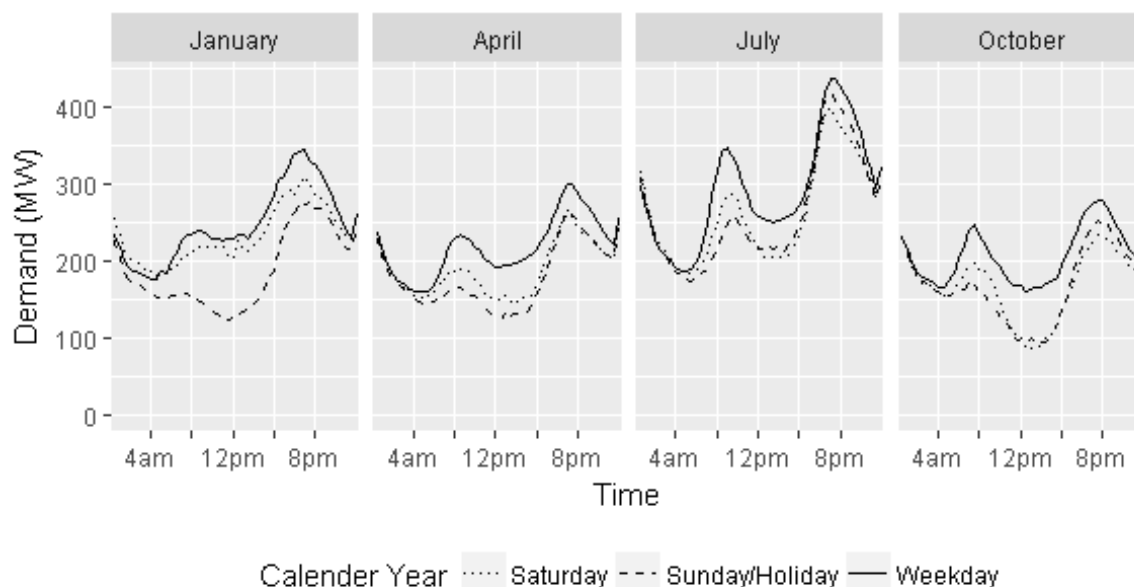
Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
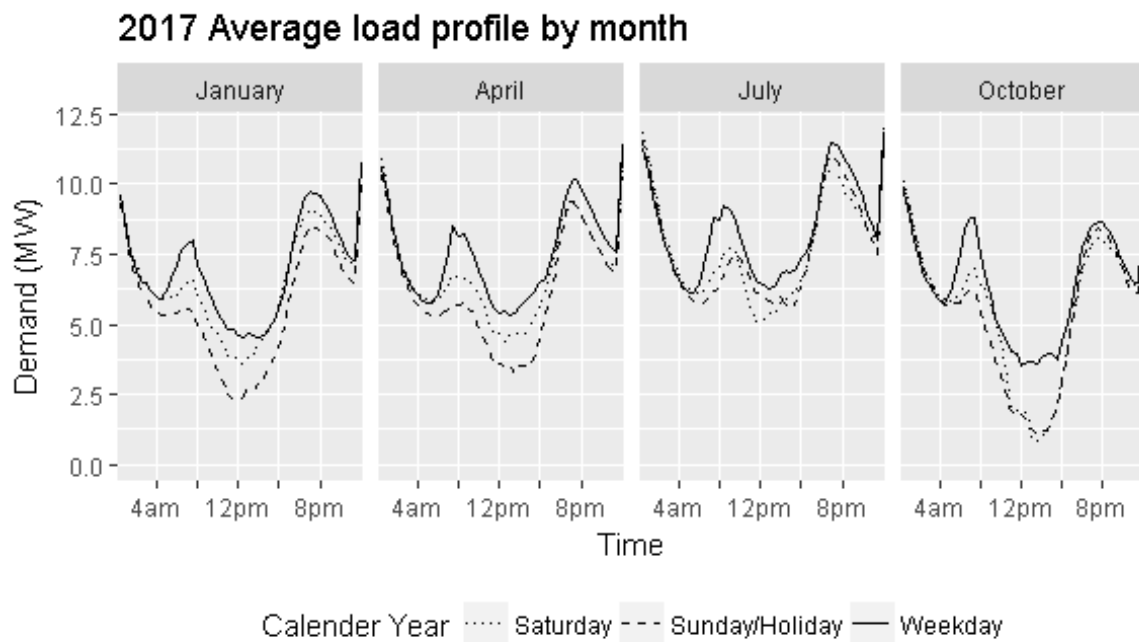
2017 Average load profile by month

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand
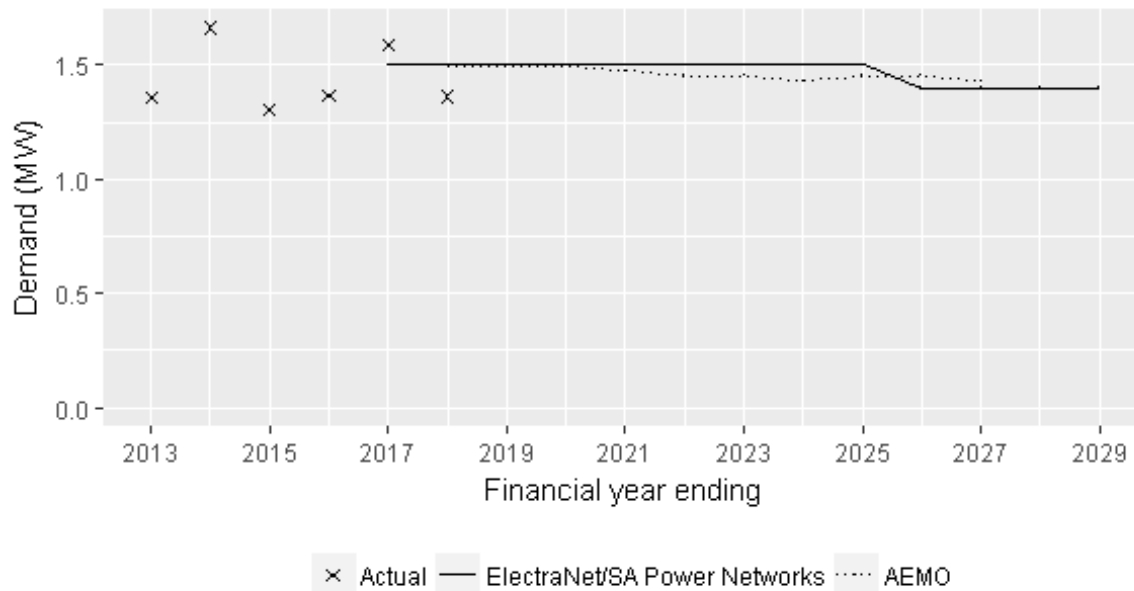
Financial year	Actual (MW)
2013-14	846.9
2014-15	658.7
2015-16	619.1
2016-17	667.8
2017-18	624.8

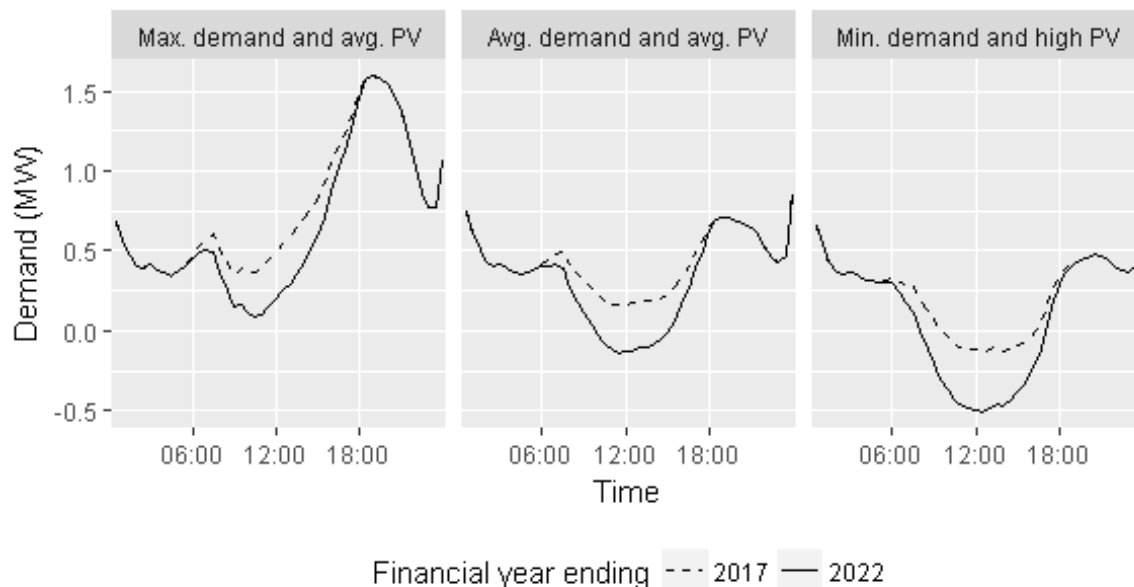| Financial Year	Forecast - MW	Forecast - PF
2018-19	650.5	0.99
2019-20	649.0	0.99
2020-21	647.3	0.99
2021-22	645.6	0.99
2022-23	643.9	0.99
2023-24	642.2	0.99
2024-25	640.5	0.99
2025-26	638.4	0.99
2026-27	638.0	0.99
2027-28	637.6	0.99
2028-29	637.1	0.99

A1.4   Western Suburbs

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month

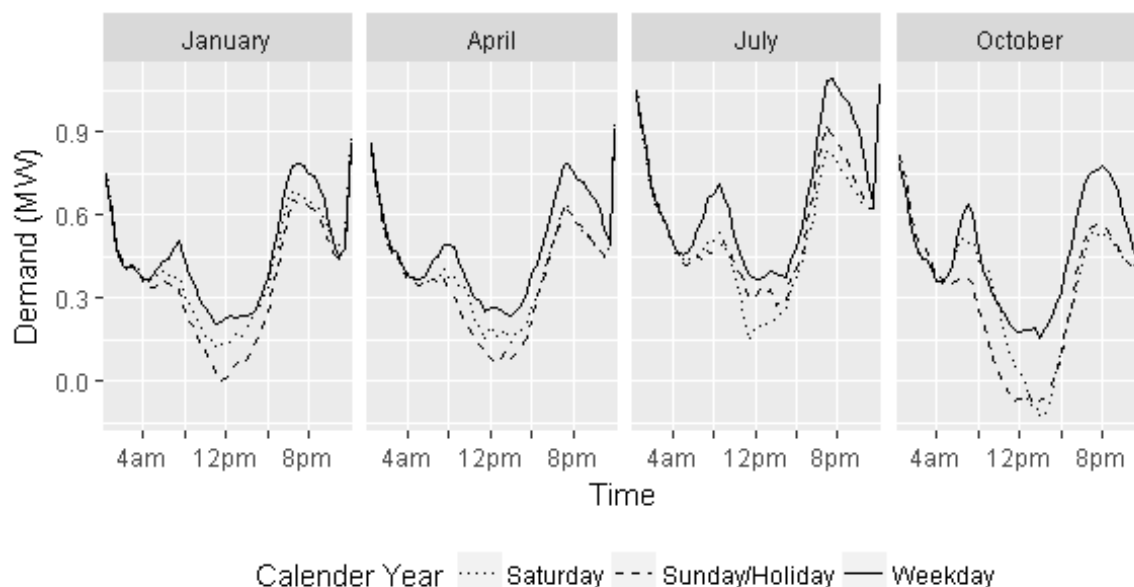Calender Year ······ Saturday - - - Sunday/Holiday —— Weekday

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

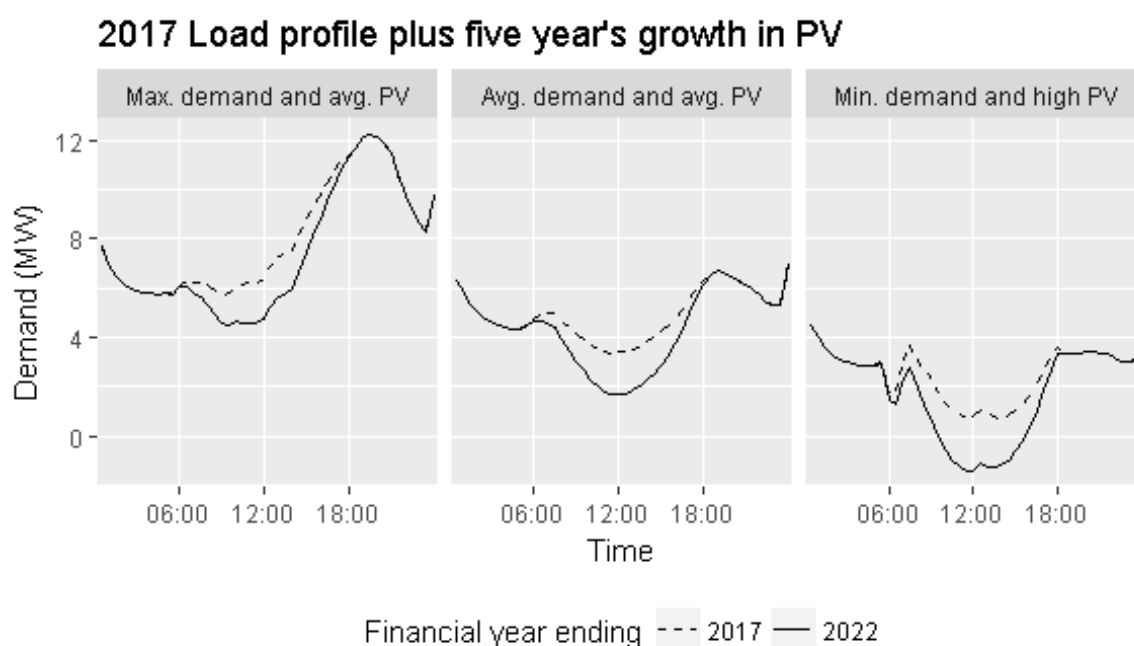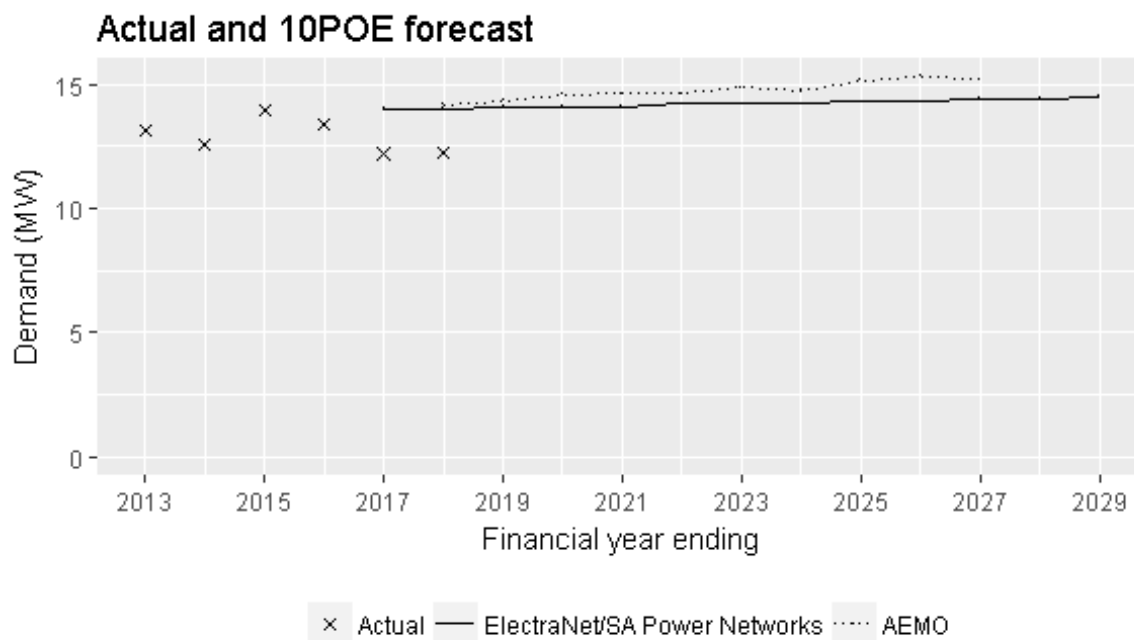| Financial year	Actual (MW)
2013-14	445.8
2014-15	419.1
2015-16	410.3
2016-17	420.8
2017-18	394.9

Financial Year	Forecast - MW	Forecast - PF
2018-19	437.3	1.00
2019-20	437.8	1.00
2020-21	438.6	1.00
2021-22	439.4	1.00
2022-23	440.2	1.00
2023-24	441.0	1.00
2024-25	441.8	1.00
2025-26	442.3	1.00
2026-27	444.0	1.00
2027-28	445.6	1.00
2028-29	447.2	1.00

A2   Eastern Hills

Actual and 10POE forecast
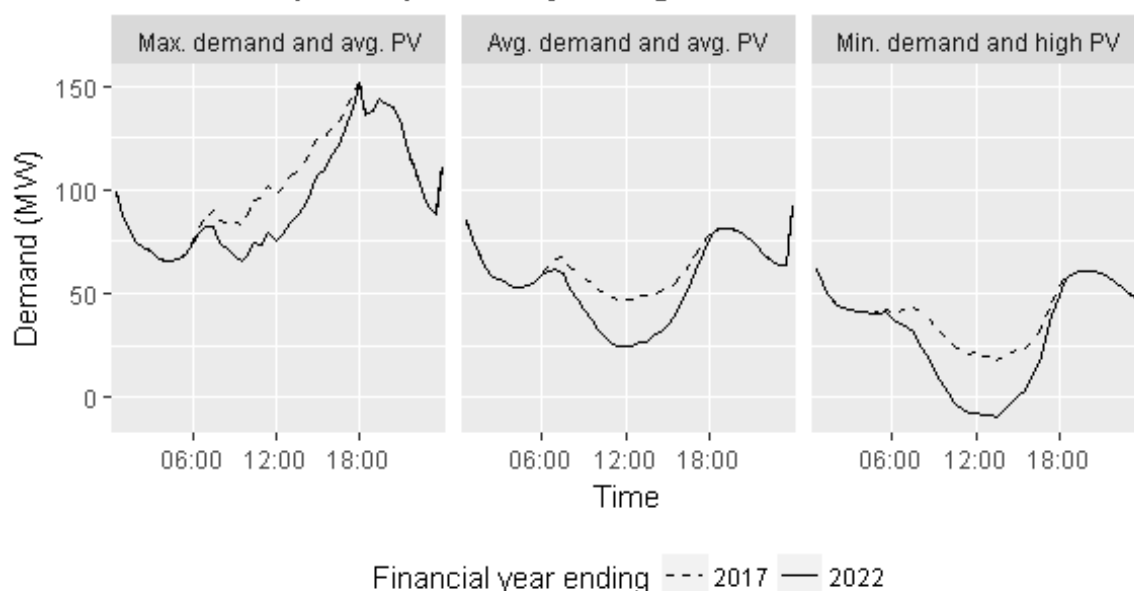
2017 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums.

Financial year	Actual (MW)
2013-14	166.1
2014-15	138.1
2015-16	151.6
2016-17	152.1
2017-18	151.4
Financial Year	Forecast - MW
2018-19	159.0
2019-20	159.3
2020-21	159.5
2021-22	159.9
2022-23	160.3
2023-24	160.6
2024-25	161.0
2025-26	161.5
2026-27	163.1
2027-28	165.0
2028-29	167.0

A2.1   Angas Creek

Category: 4

Actual and 10POE forecast
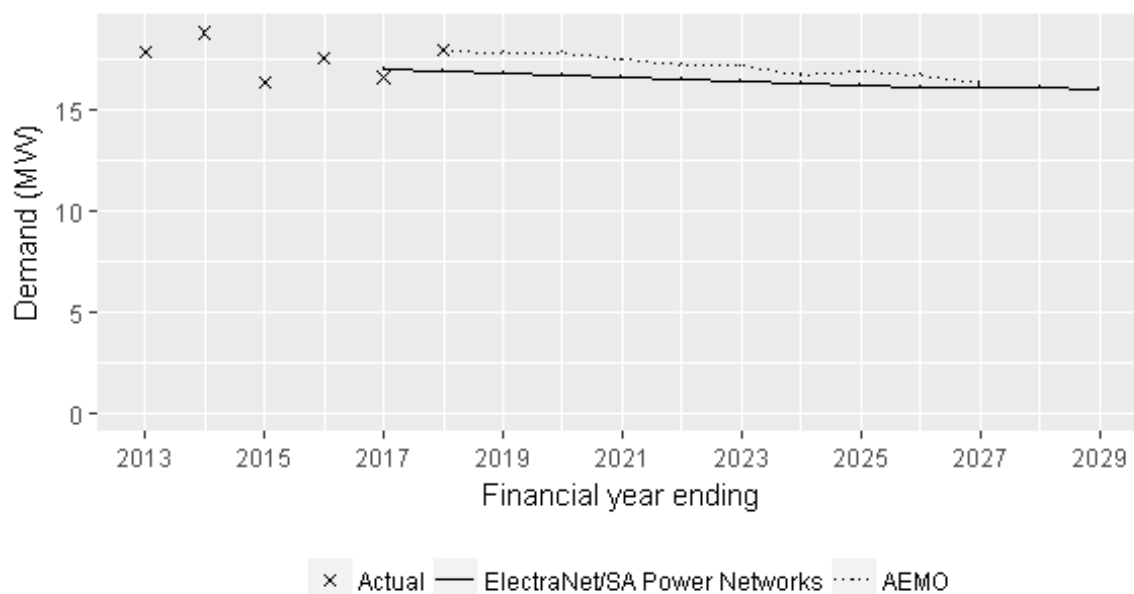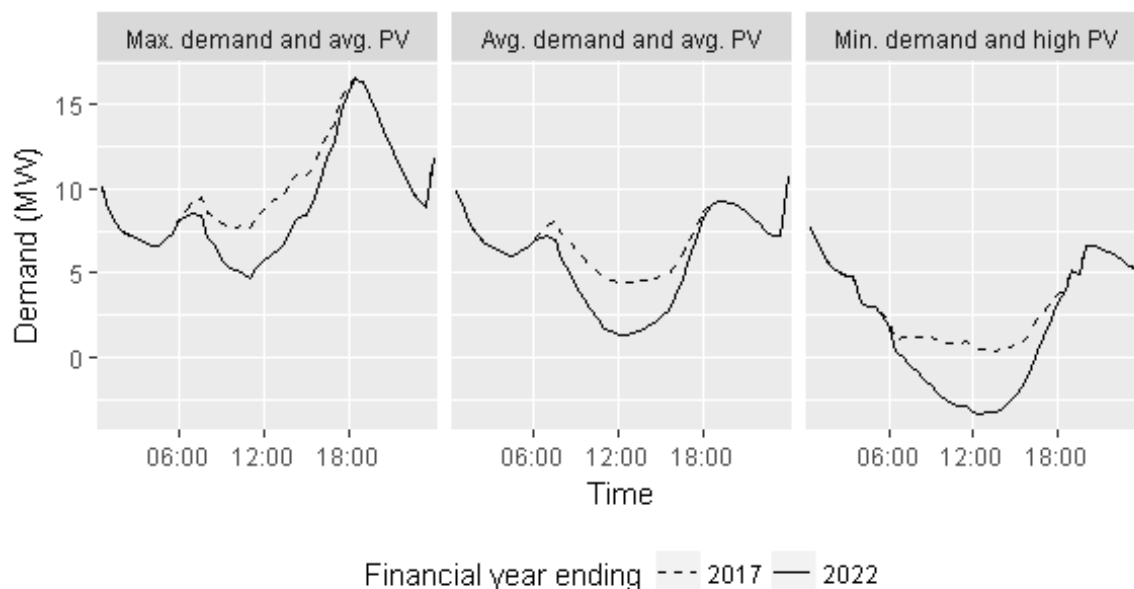
2017 Load profile plus five year's growth in PV
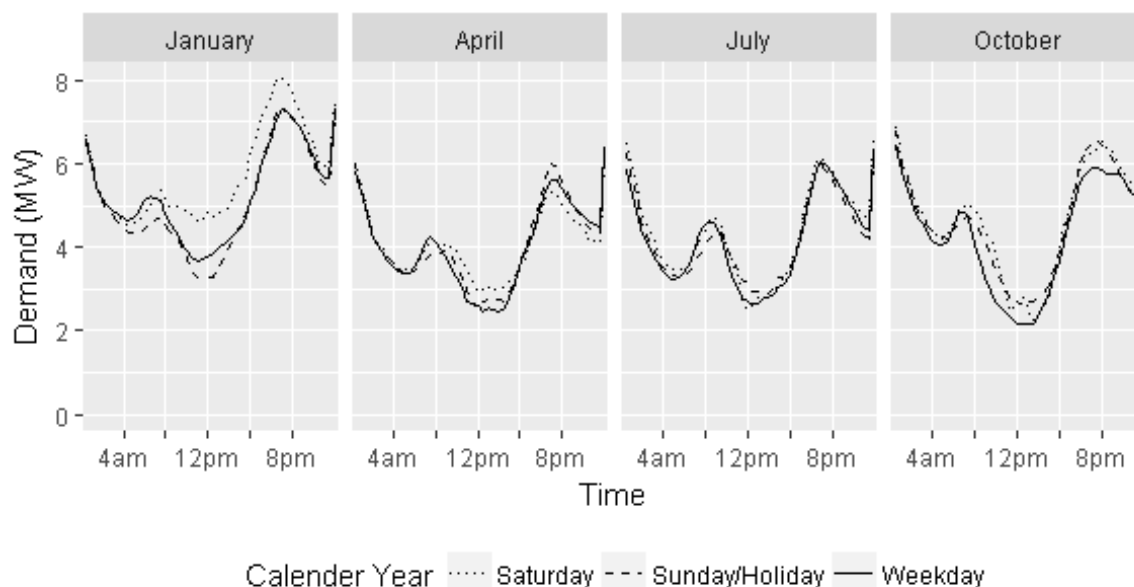
2017 Average load profile by month

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand
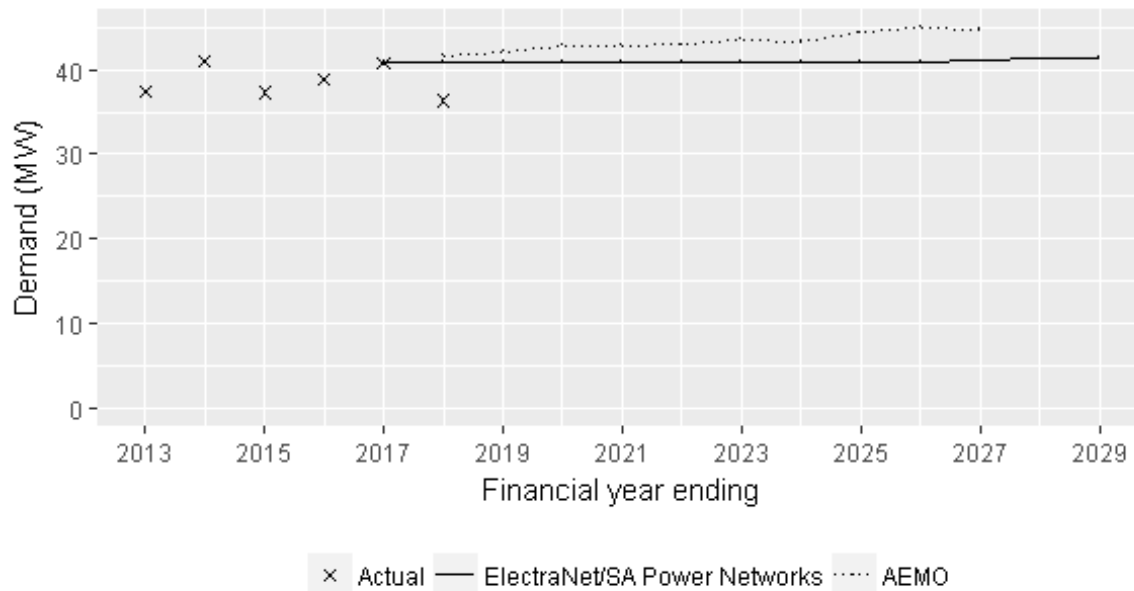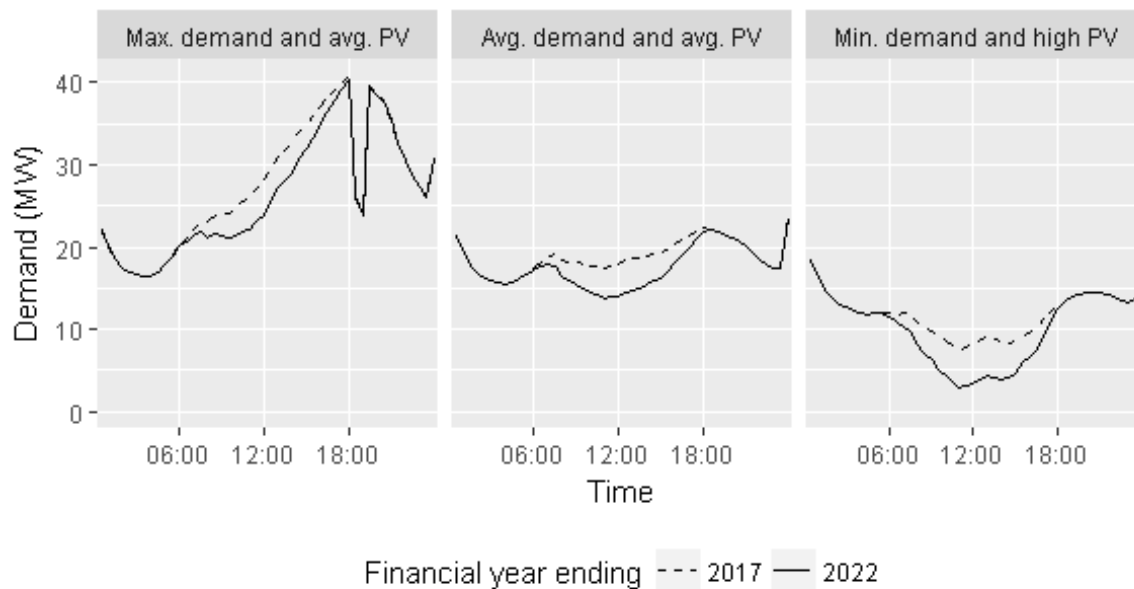
Financial year	Actual (MW)	
2013-14	18.8	
2014-15	16.3	
2015-16	17.5	
2016-17	16.6	
2017-18	17.9	
Financial Year	Forecast - MW	Forecast - PF
2018-19	16.8	0.97
2019-20	16.7	0.97
2020-21	16.6	0.97
2021-22	16.5	0.97
2022-23	16.4	0.97
2023-24	16.3	0.97
2024-25	16.2	0.97
2025-26	16.1	0.97
2026-27	16.1	0.97
2027-28	16.1	0.97
2028-29	16.0	0.97

A2.2   Kanmantoo

Category: 1

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
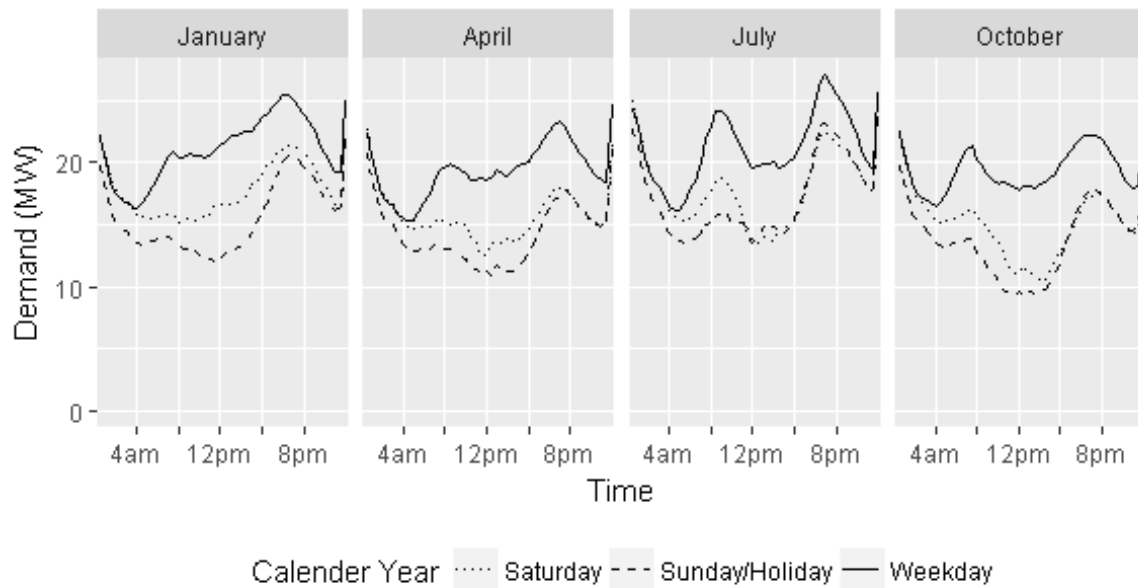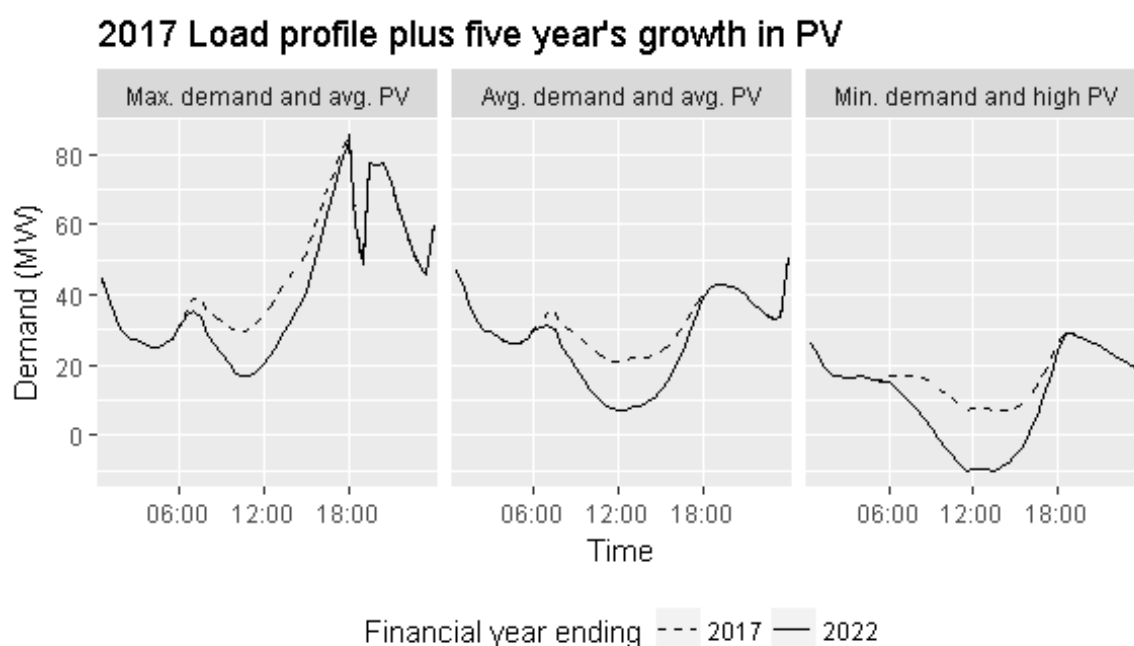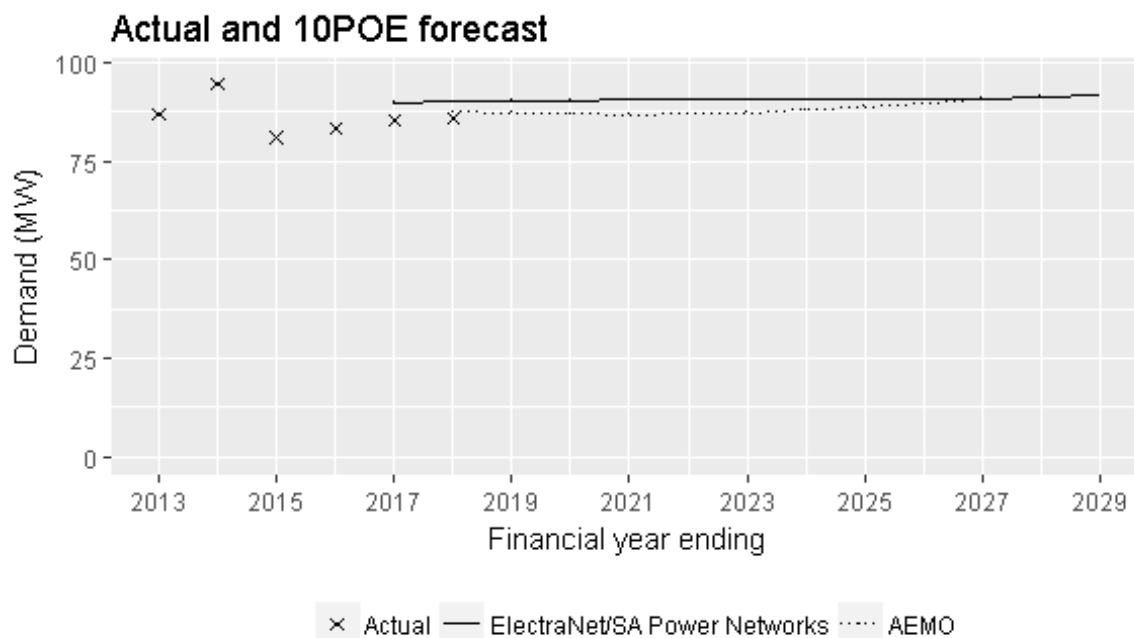
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	1.7
2014-15	1.3
2015-16	1.4
2016-17	1.6
2017-18	1.4

Financial Year	Forecast - MW	Forecast - PF
2018-19	1.5	0.97
2019-20	1.5	0.97
2020-21	1.5	0.97
2021-22	1.5	0.97
2022-23	1.5	0.97
2023-24	1.5	0.97
2024-25	1.5	0.97
2025-26	1.4	0.97
2026-27	1.4	0.97
2027-28	1.4	0.97
2028-29	1.4	0.97

ElectraNet

A2.3 Mannum
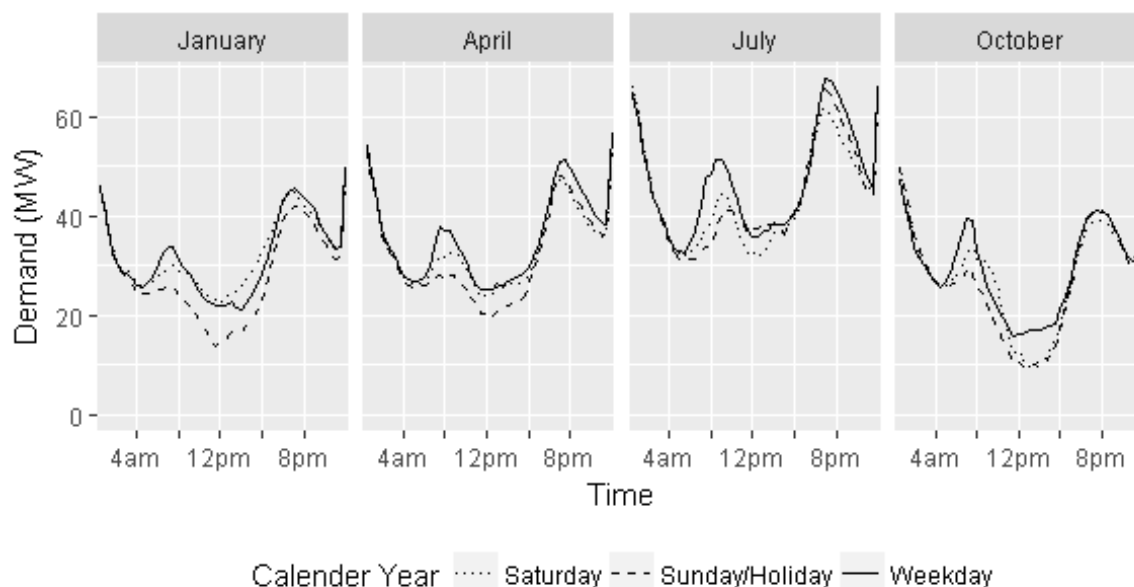
Category: 4

2017 Average load profile by month

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand
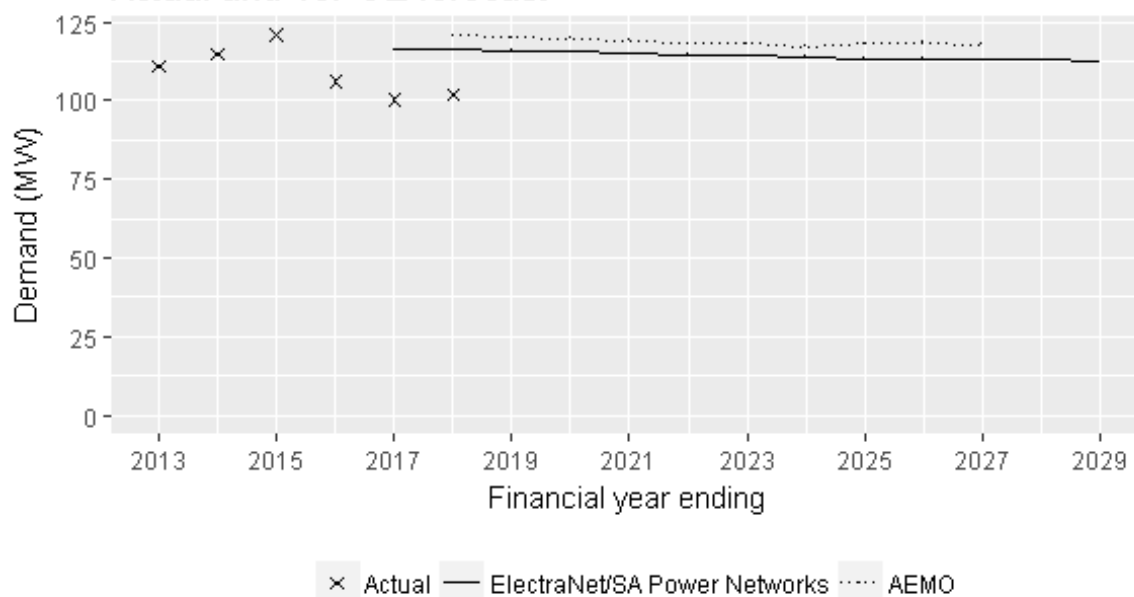
Financial year	Actual (MW)
2013-14	12.6
2014-15	13.9
2015-16	13.4
2016-17	12.2
2017-18	12.3

Financial Year	Forecast - MW	Forecast - PF
2018-19	14.1	0.97
2019-20	14.1	0.97
2020-21	14.1	0.97
2021-22	14.2	0.97
2022-23	14.2	0.97
2023-24	14.2	0.97
2024-25	14.3	0.97
2025-26	14.3	0.97
2026-27	14.4	0.97
2027-28	14.4	0.97
2028-29	14.5	0.97

A2.4   Mobilong

Category: 4

Actual and 10POE forecast

× Actual — ElectraNet/SA Power Networks ⋯⋯ AEMO

2017 Load profile plus five year's growth in PV

Financial year ending - - - 2017 — 2022

2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	41.0
2014-15	37.3
2015-16	38.9
2016-17	40.7
2017-18	36.3

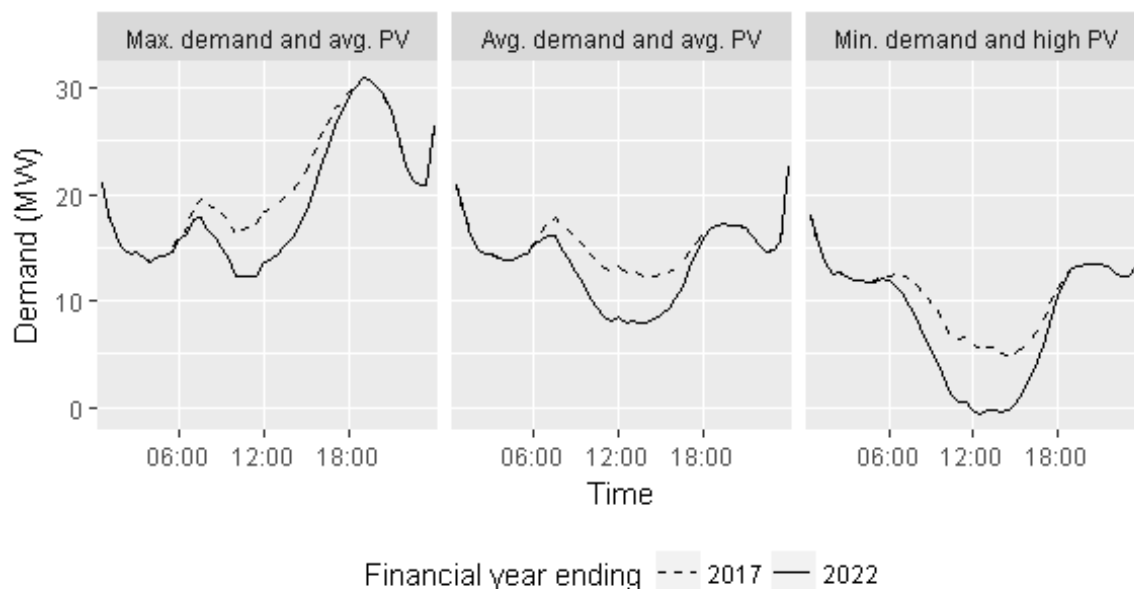| Financial Year	Forecast - MW	Forecast - PF
2018-19	41.0	0.94
2019-20	41.0	0.94
2020-21	41.0	0.94
2021-22	41.0	0.94
2022-23	41.0	0.94
2023-24	41.0	0.94
2024-25	41.0	0.94
2025-26	41.0	0.94
2026-27	41.1	0.94
2027-28	41.3	0.94
2028-29	41.5	0.94

A2.5   Mt Barker/Mt Barker South

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month
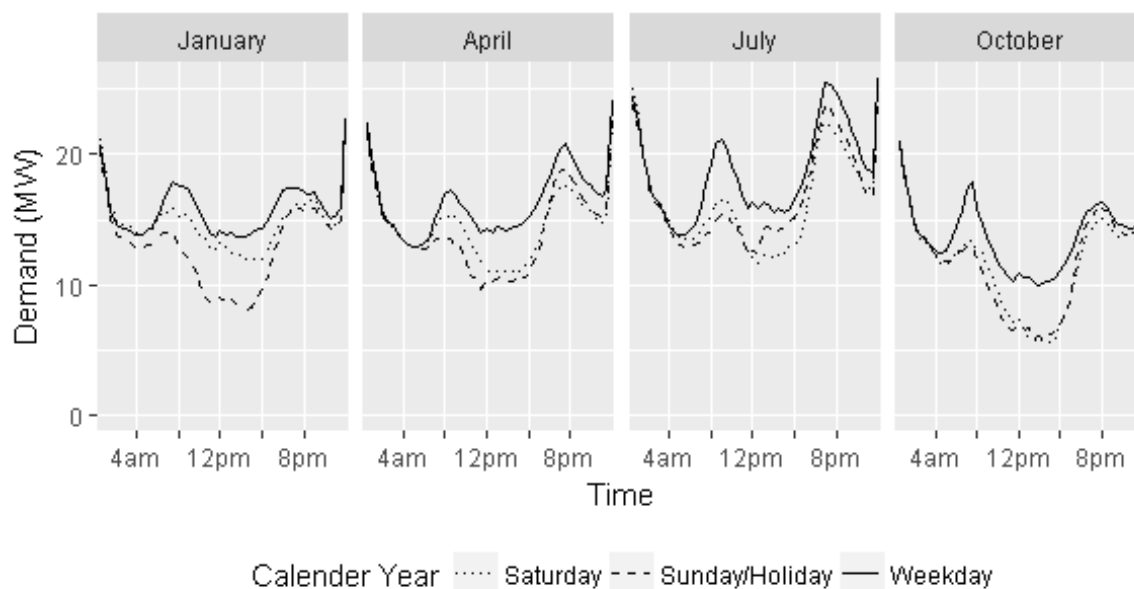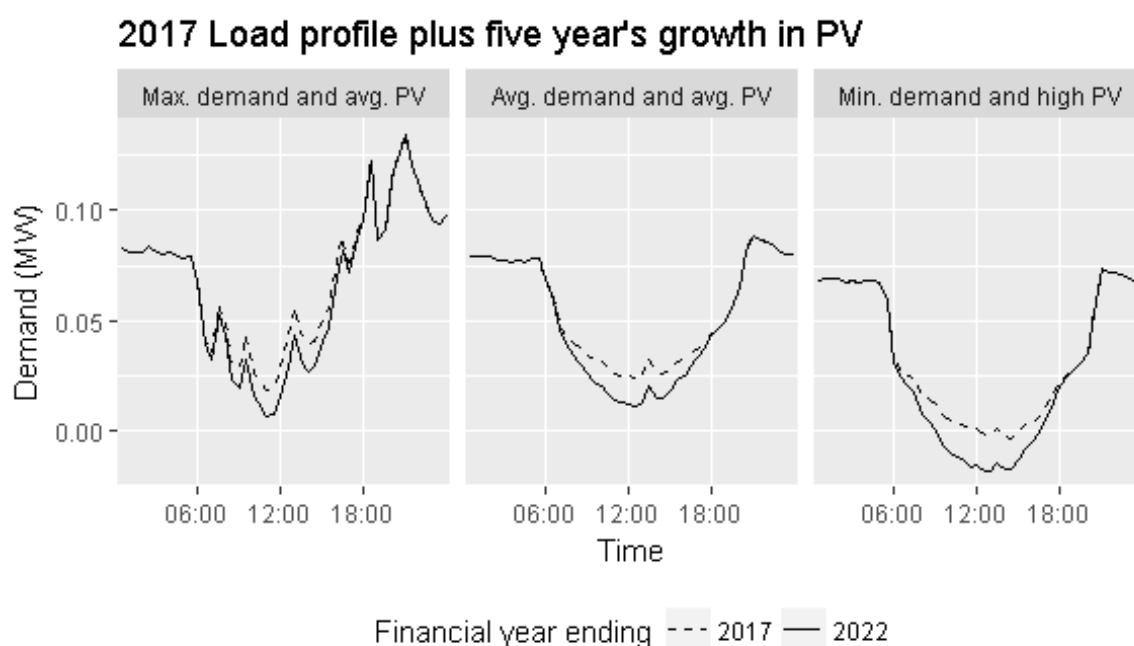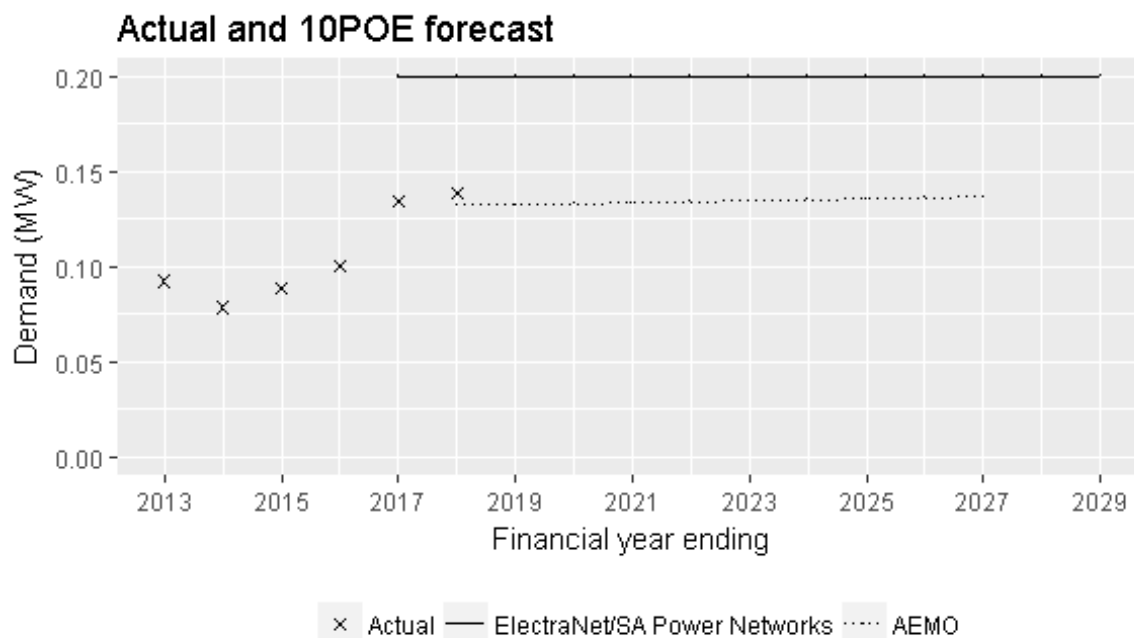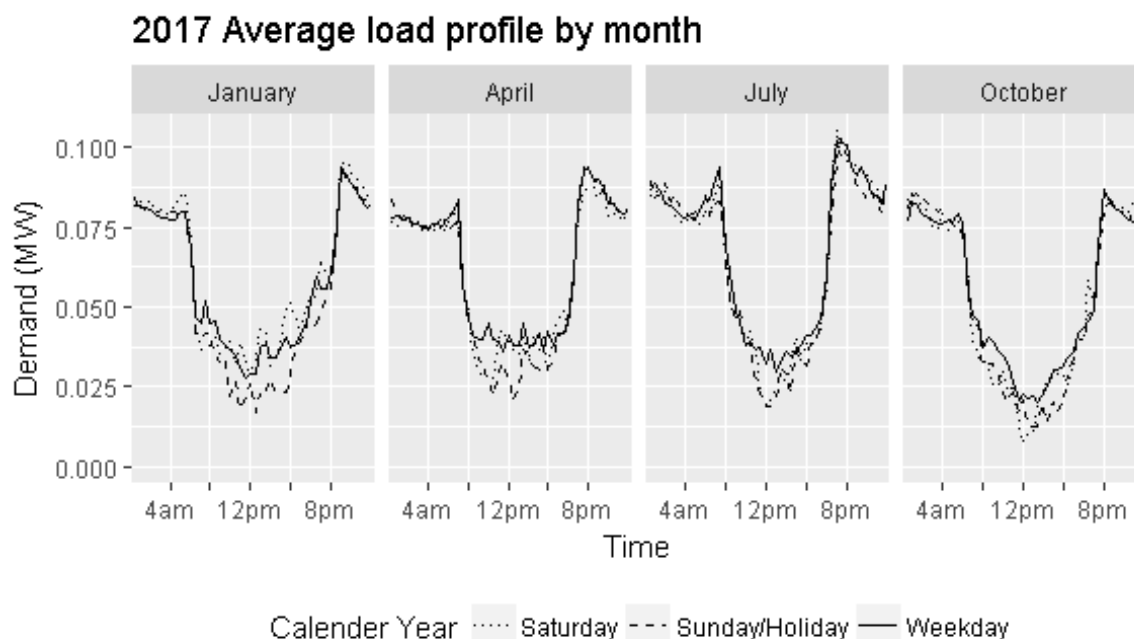

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2013-14	94.8
2014-15	81.0
2015-16	83.2
2016-17	85.3
2017-18	86.0

Financial Year	Forecast - MW	Forecast - PF
2018-19	90.4	0.96
2019-20	90.5	0.96
2020-21	90.6	0.96
2021-22	90.6	0.96
2022-23	90.7	0.96
2023-24	90.8	0.96
2024-25	90.8	0.96
2025-26	90.8	0.96
2026-27	91.0	0.96
2027-28	91.4	0.96
2028-29	91.8	0.96

A3 Eyre Peninsula

Actual and 10POE forecast
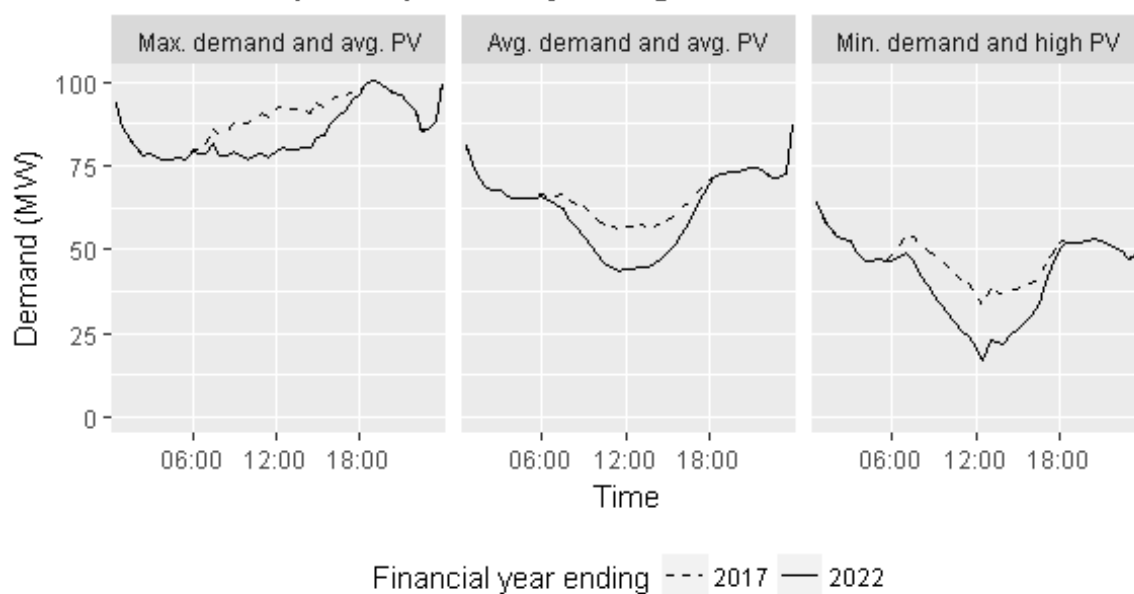
2017 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums.

Financial year	Actual (MW)
2013-14	114.6
2014-15	120.9
2015-16	106.1
2016-17	100.2
2017-18	101.9
Financial Year	Forecast - MW
2018-19	116.6
2019-20	116.1
2020-21	115.6
2021-22	115.1
2022-23	114.8
2023-24	114.2
2024-25	113.8
2025-26	113.7
2026-27	113.6
2027-28	113.5
2028-29	113.5

A3.1 Port Lincoln

Category: 3

Actual and 10POE forecast
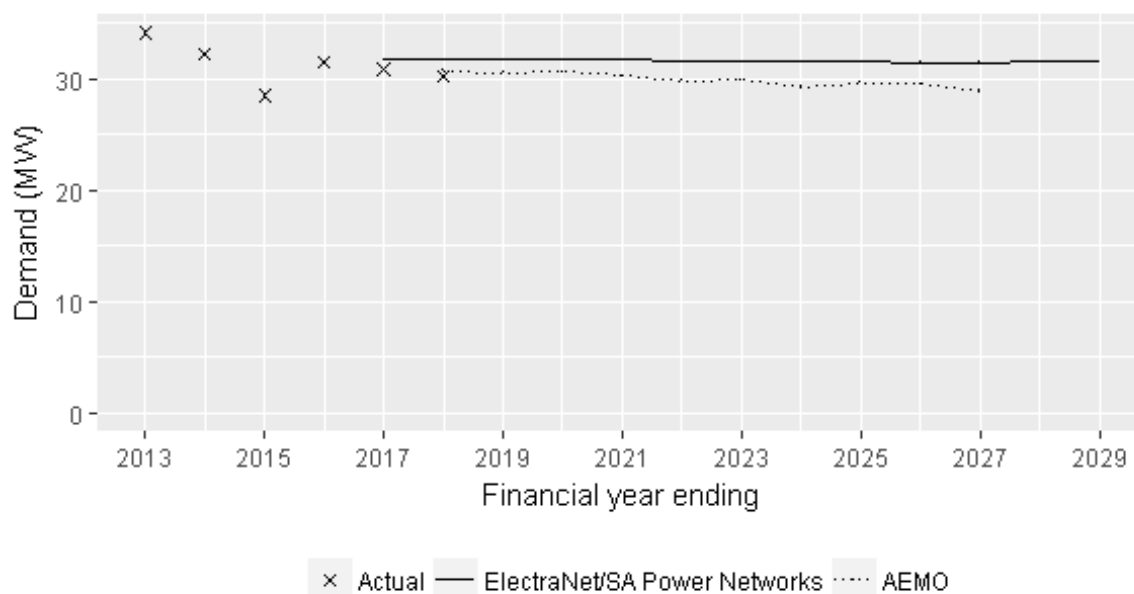
2017 Load profile plus five year's growth in PV

2017 Average load profile by month

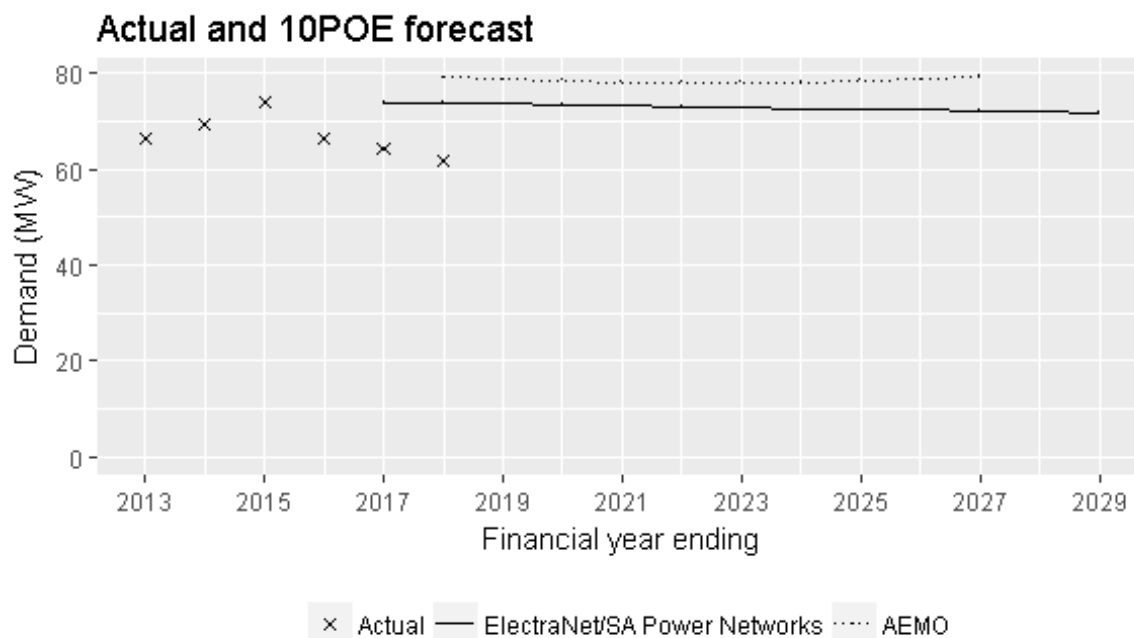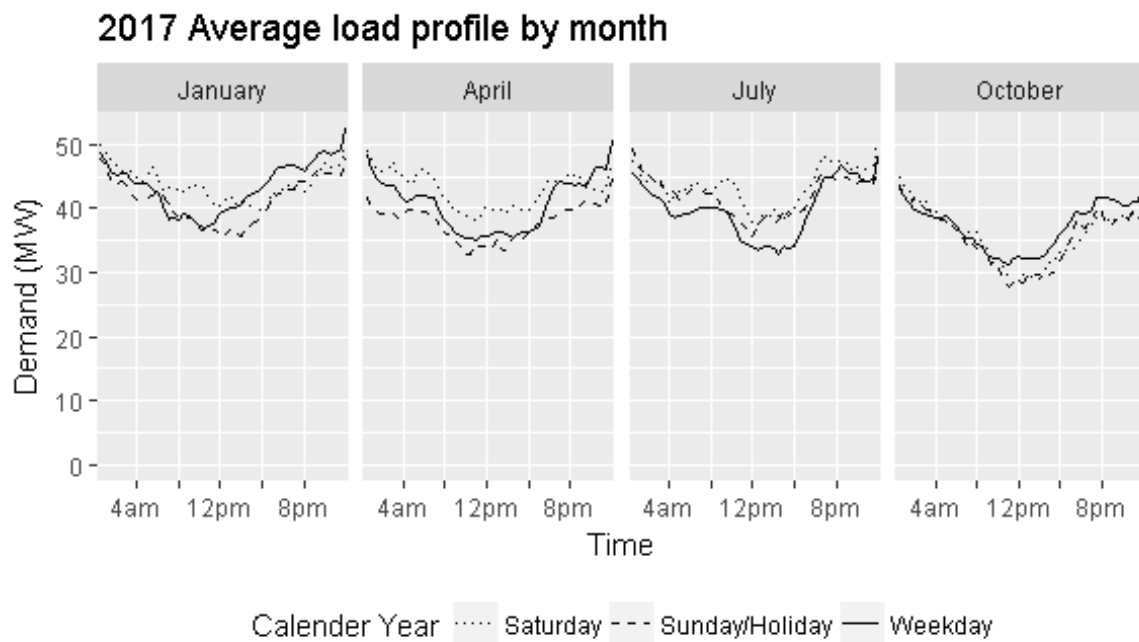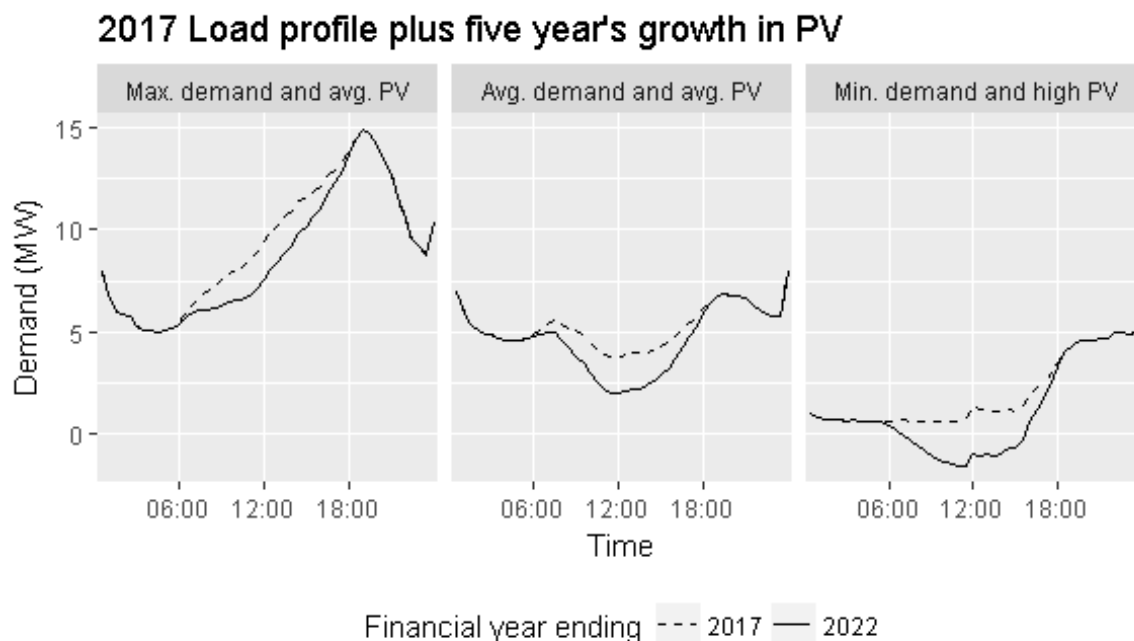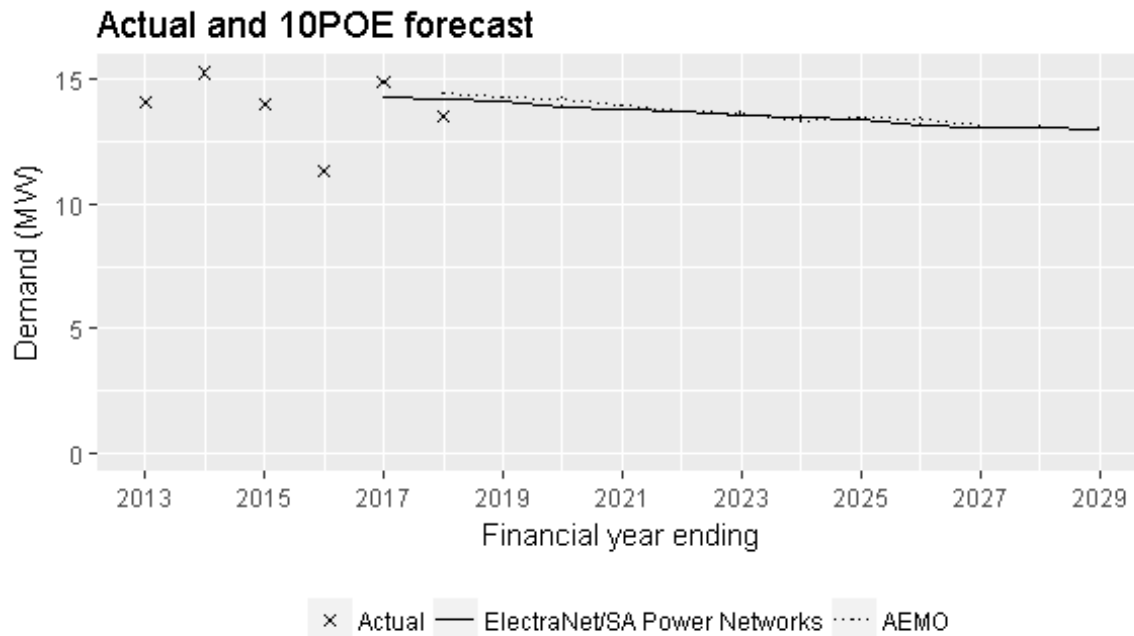Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2013-14	32.3
2014-15	28.5
2015-16	31.5
2016-17	30.9
2017-18	30.3

Financial Year	Forecast - MW	Forecast - PF
2018-19	31.7	0.91
2019-20	31.7	0.91
2020-21	31.7	0.91
2021-22	31.6	0.91
2022-23	31.6	0.91
2023-24	31.6	0.91
2024-25	31.6	0.91
2025-26	31.5	0.91
2026-27	31.5	0.91
2027-28	31.6	0.91
2028-29	31.6	0.91

A3.2   Stony Point Distribution

Category: 1

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
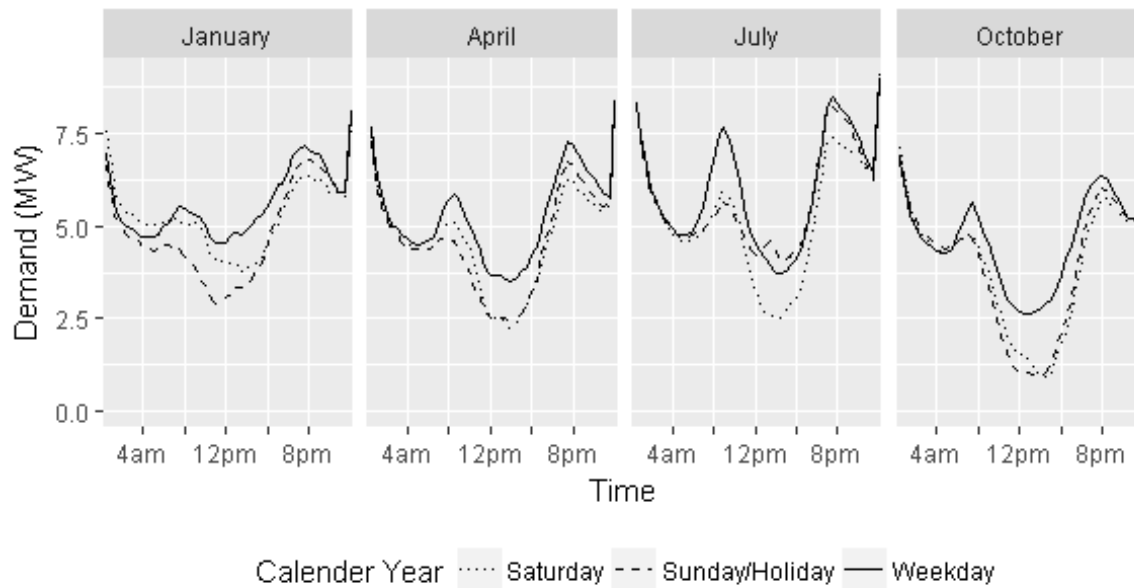
2017 Average load profile by month

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand
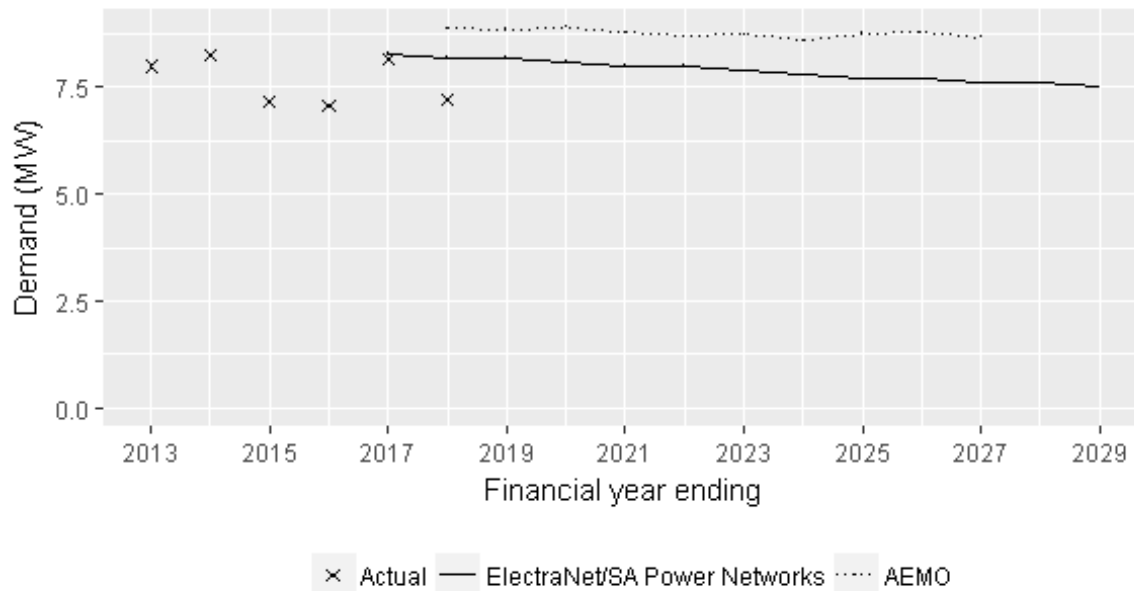
Financial year	Actual (MW)
2013-14	0.1
2014-15	0.1
2015-16	0.1
2016-17	0.1
2017-18	0.1

Financial Year	Forecast - MW	Forecast - PF
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
2025-26	0.2	0.90
2026-27	0.2	0.90
2027-28	0.2	0.90
2028-29	0.2	0.90

ElectraNet

A3.3 Whyalla Central

Category: 4
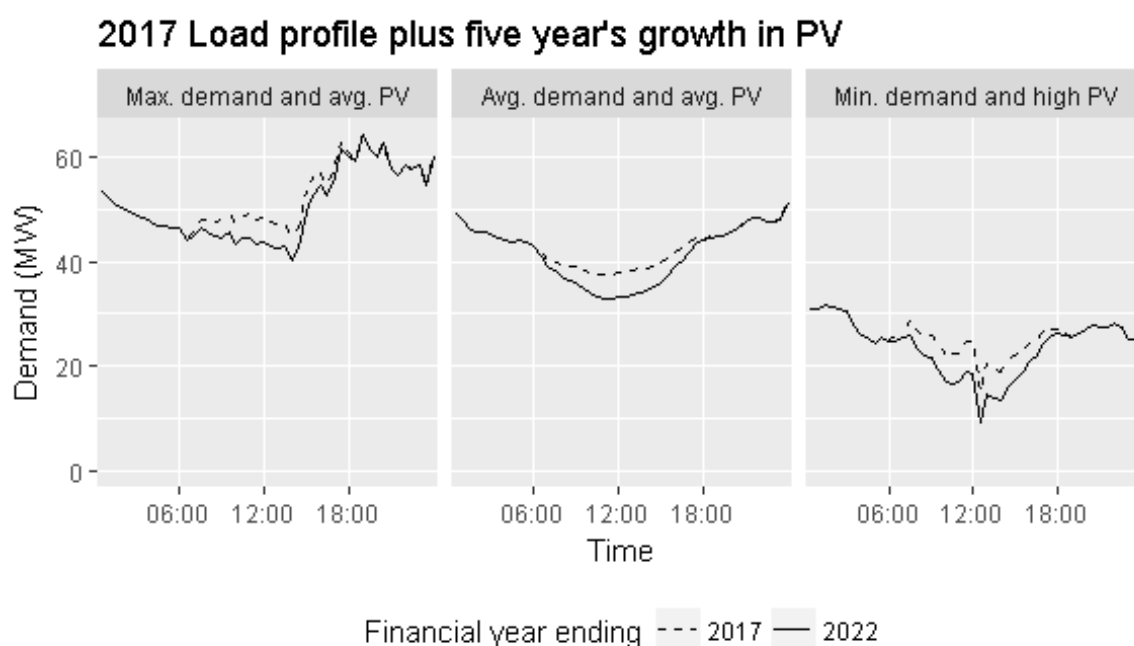
Actual and 10POE forecast

× Actual ── ElectraNet/SA Power Networks ····· AEMO

2017 Load profile plus five year's growth in PV

Financial year ending --- 2017 ── 2022

2017 Average load profile by month

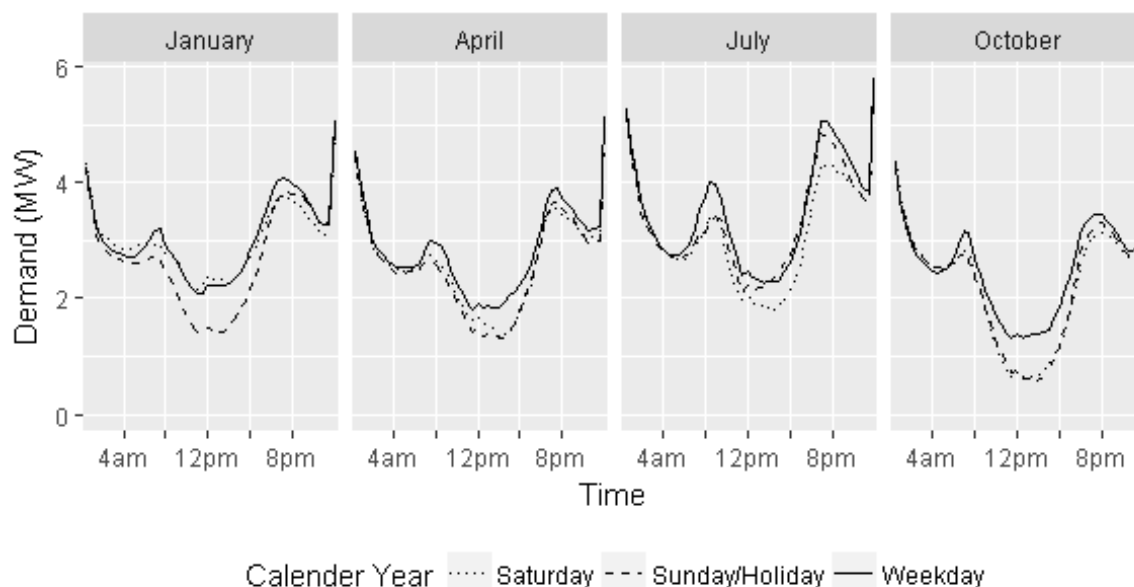
Calender Year ····· Saturday --- Sunday/Holiday —— Weekday

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

Financial year	Actual (MW)
2013-14	69.4
2014-15	74.1
2015-16	66.3
2016-17	64.1
2017-18	61.7

Financial Year	Forecast - MW	Forecast - PF
2018-19	73.7	0.95
2019-20	73.5	0.95
2020-21	73.2	0.95
2021-22	73.0	0.95
2022-23	72.8	0.95
2023-24	72.5	0.95
2024-25	72.3	0.95
2025-26	72.4	0.95
2026-27	72.2	0.95
2027-28	72.0	0.95
2028-29	71.8	0.95

A3.4   Wudinna

Category: 2

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	15.3
2014-15	14.0
2015-16	11.3
2016-17	14.9
2017-18	13.5

Financial Year	Forecast - MW	Forecast - PF
2018-19	14.1	1.00
2019-20	13.9	1.00
2020-21	13.8	1.00
2021-22	13.7	1.00
2022-23	13.6	1.00
2023-24	13.5	1.00
2024-25	13.4	1.00
2025-26	13.2	1.00
2026-27	13.1	1.00
2027-28	13.1	1.00
2028-29	13.0	1.00

A3.5   Yadnarie

Category: 2

Actual and 10POE forecast
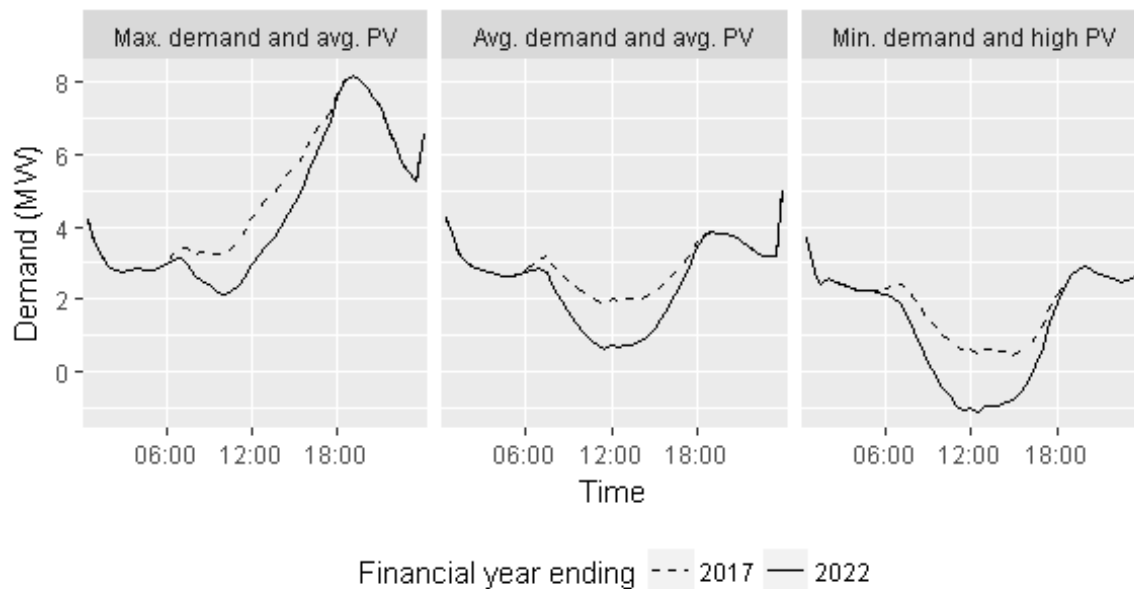
2017 Load profile plus five year's growth in PV
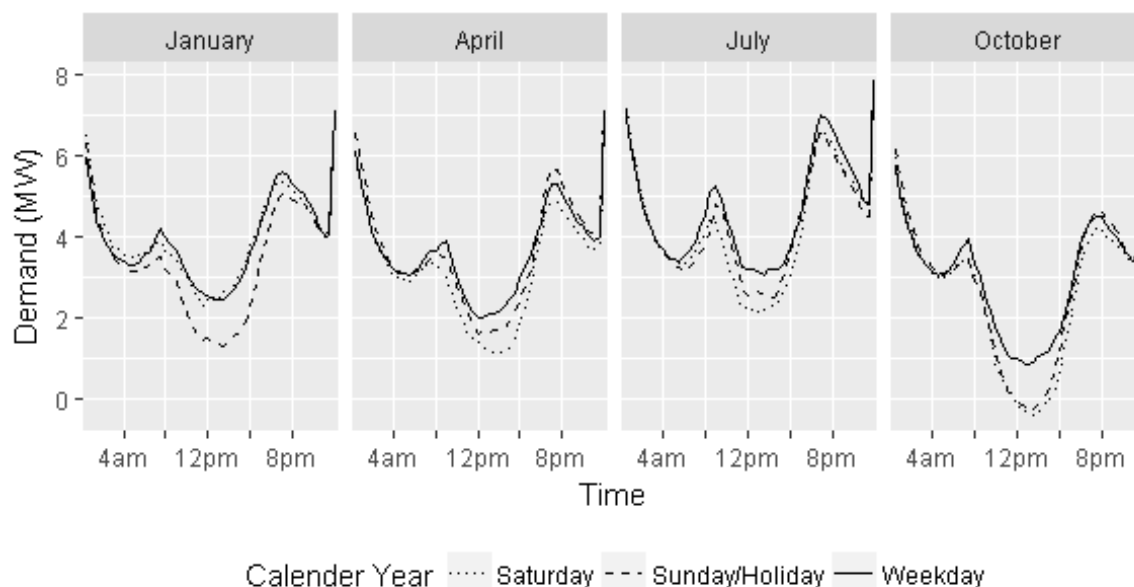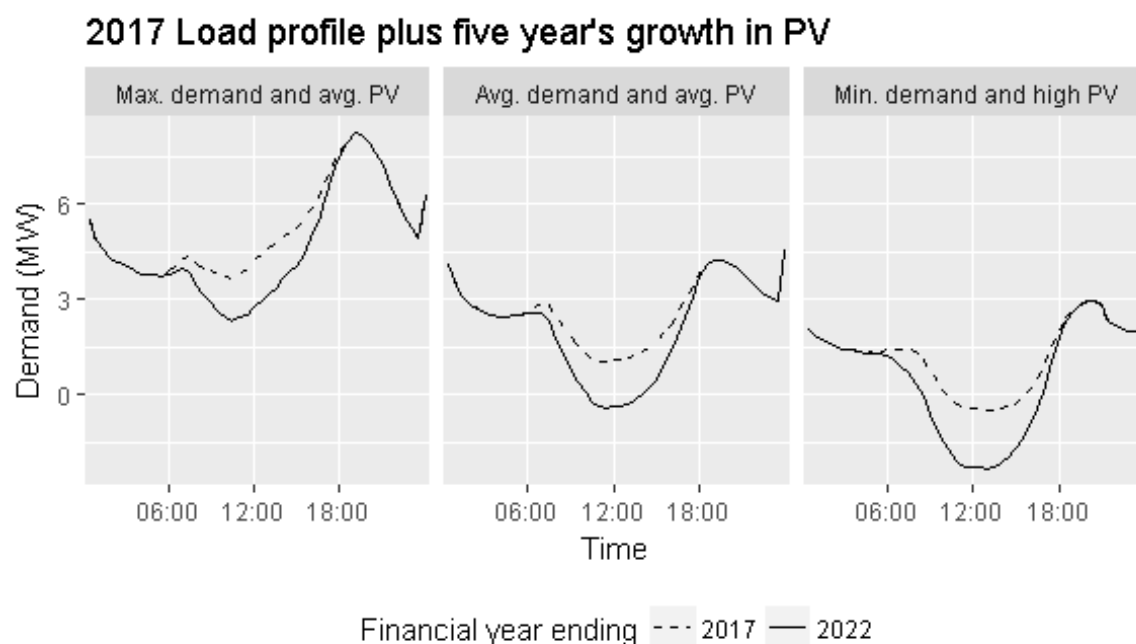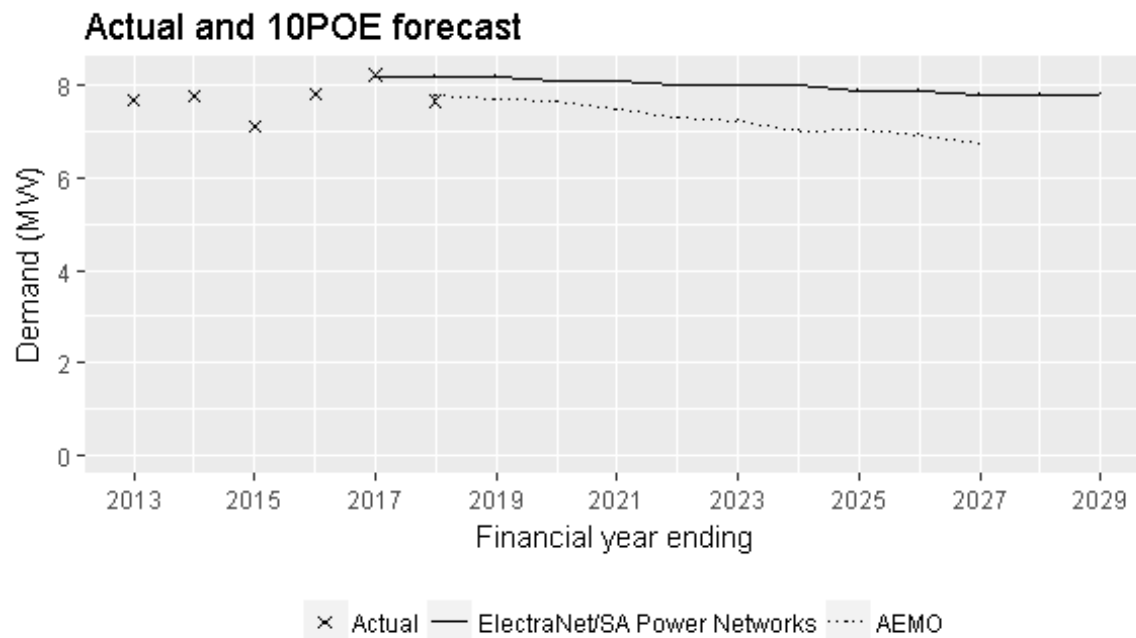
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	8.2
2014-15	7.2
2015-16	7.1
2016-17	8.2
2017-18	7.2

Financial Year	Forecast - MW	Forecast - PF
2018-19	8.2	0.98
2019-20	8.1	0.98
2020-21	8.0	0.98
2021-22	8.0	0.98
2022-23	7.9	0.98
2023-24	7.8	0.98
2024-25	7.7	0.98
2025-26	7.7	0.98
2026-27	7.6	0.98
2027-28	7.6	0.98
2028-29	7.5	0.98

A5   Mid North

Actual and 10POE forecast
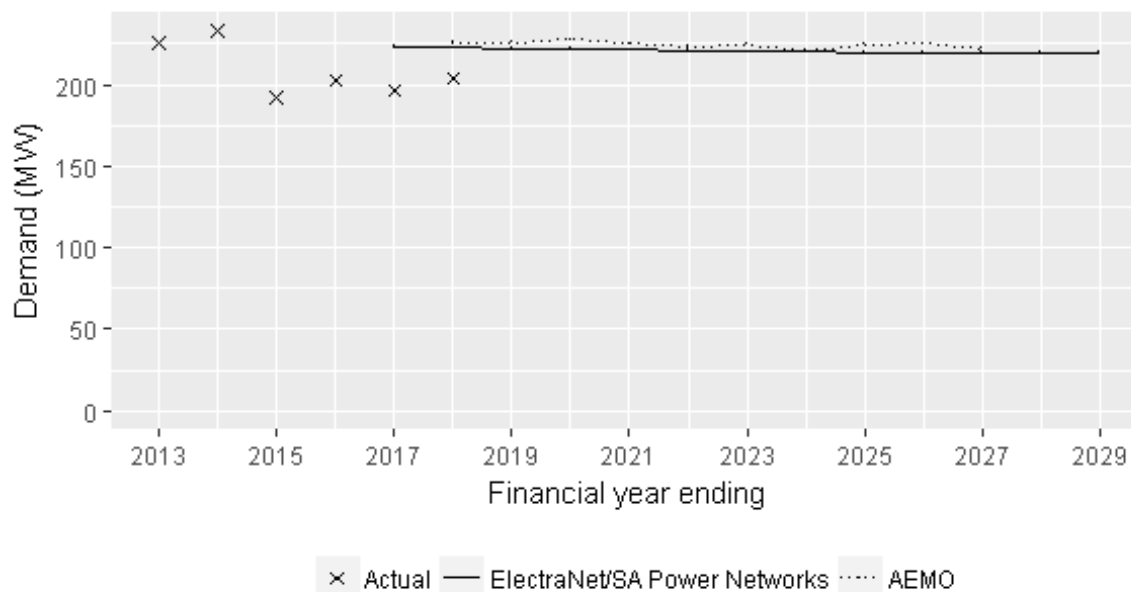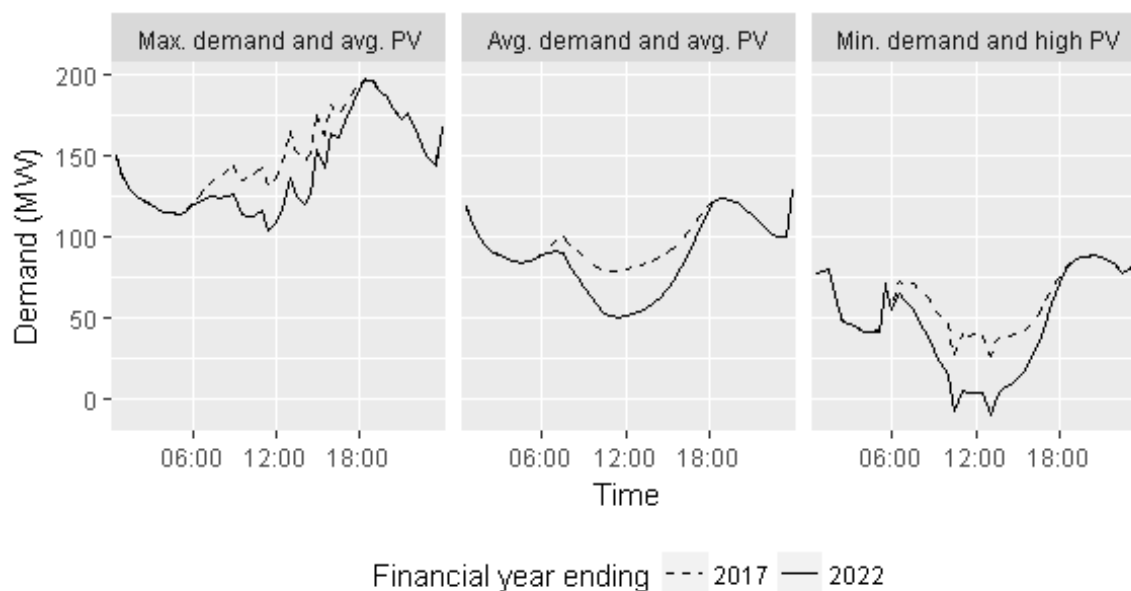
2017 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums.

Financial year	Actual (MW)
2013-14	233.0
2014-15	192.0
2015-16	202.5
2016-17	196.7
2017-18	203.8

Financial Year	Forecast - MW
2018-19	220.4
2019-20	219.6
2020-21	218.8
2021-22	218.3
2022-23	217.4
2023-24	216.8
2024-25	216.1
2025-26	215.3
2026-27	216.1
2027-28	216.7
2028-29	217.5

A5.1   Ardrossan West

Category: 2
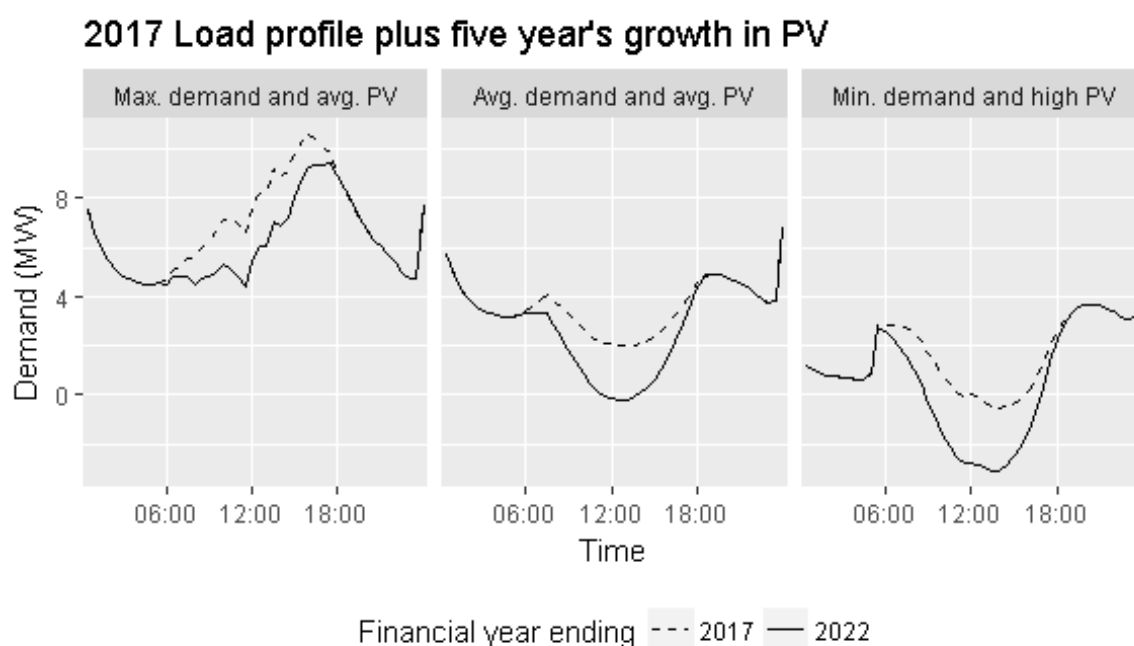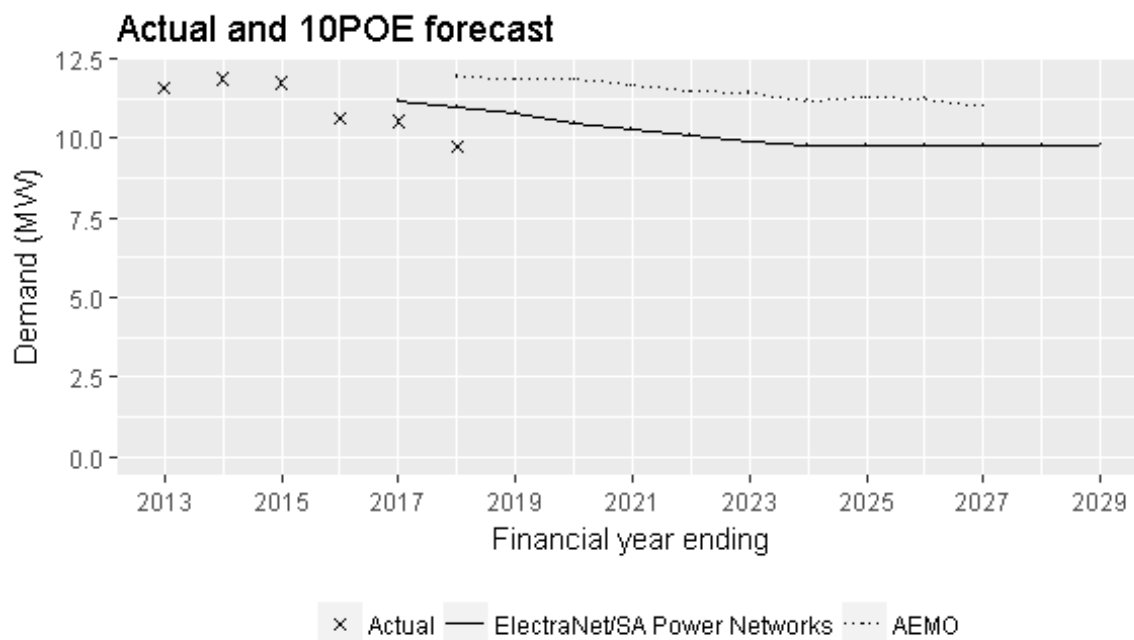
Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
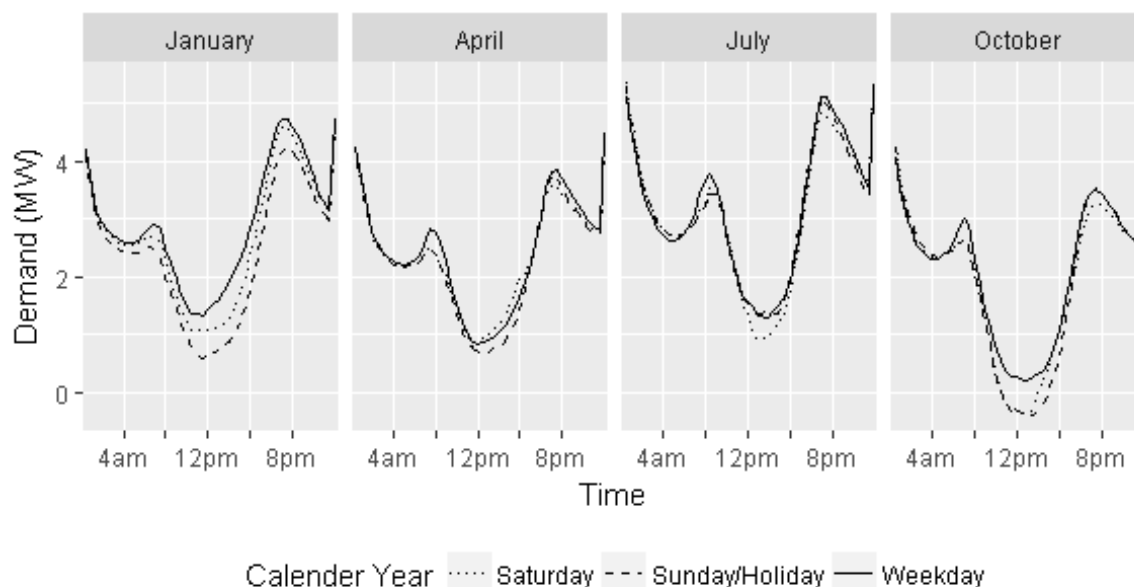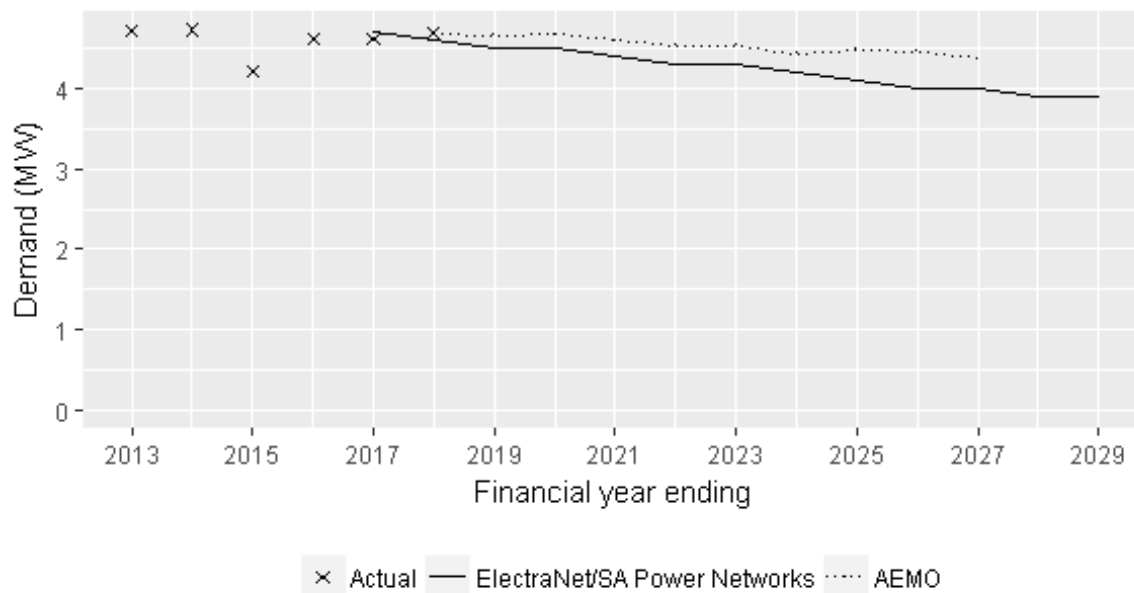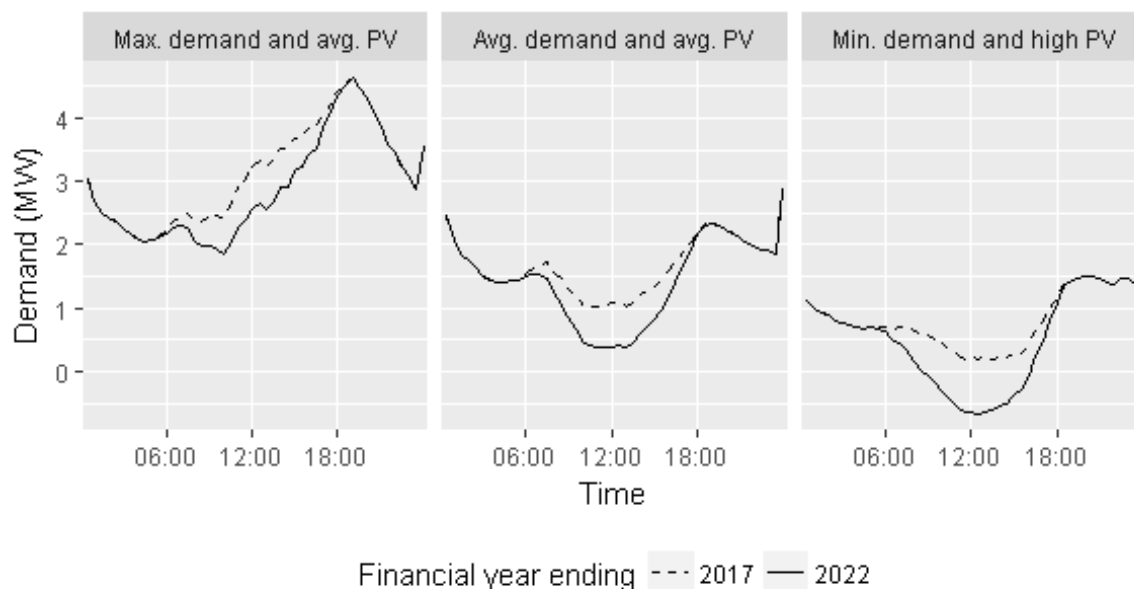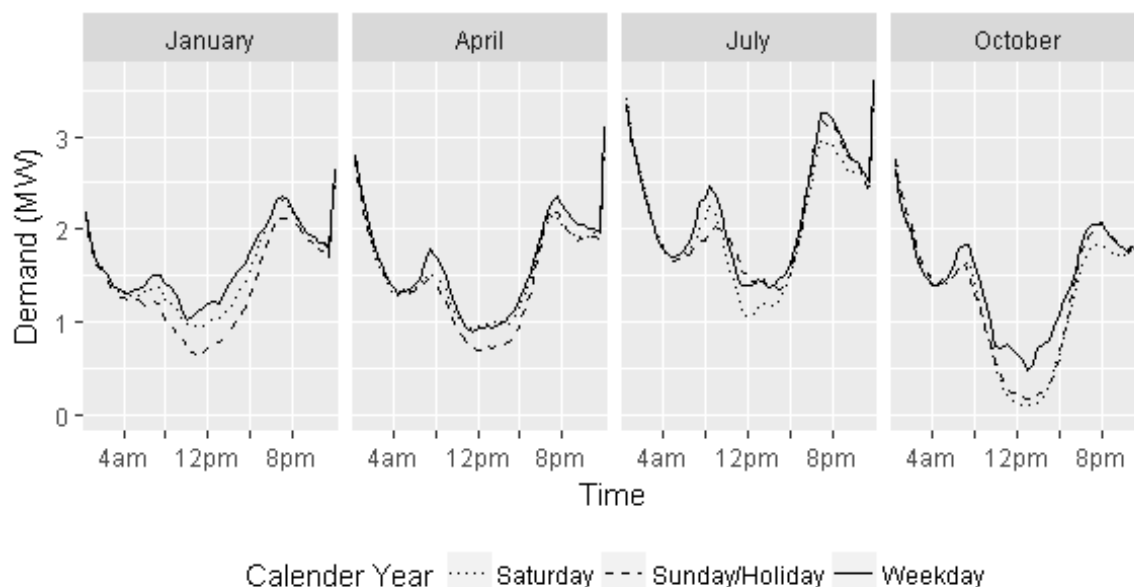
2017 Average load profile by month

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

Financial year	Actual (MW)	
2013-14	11.9	
2014-15	11.7	
2015-16	10.6	
2016-17	10.5	
2017-18	9.8	
Financial Year	Forecast - MW	Forecast - PF
2018-19	10.8	0.98
2019-20	10.5	0.98
2020-21	10.3	0.98
2021-22	10.1	0.98
2022-23	9.9	0.98
2023-24	9.8	0.98
2024-25	9.8	0.98
2025-26	9.8	0.98
2026-27	9.8	0.98
2027-28	9.8	0.98
2028-29	9.8	0.98

A5.2   Baroota

Category: 1

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month

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

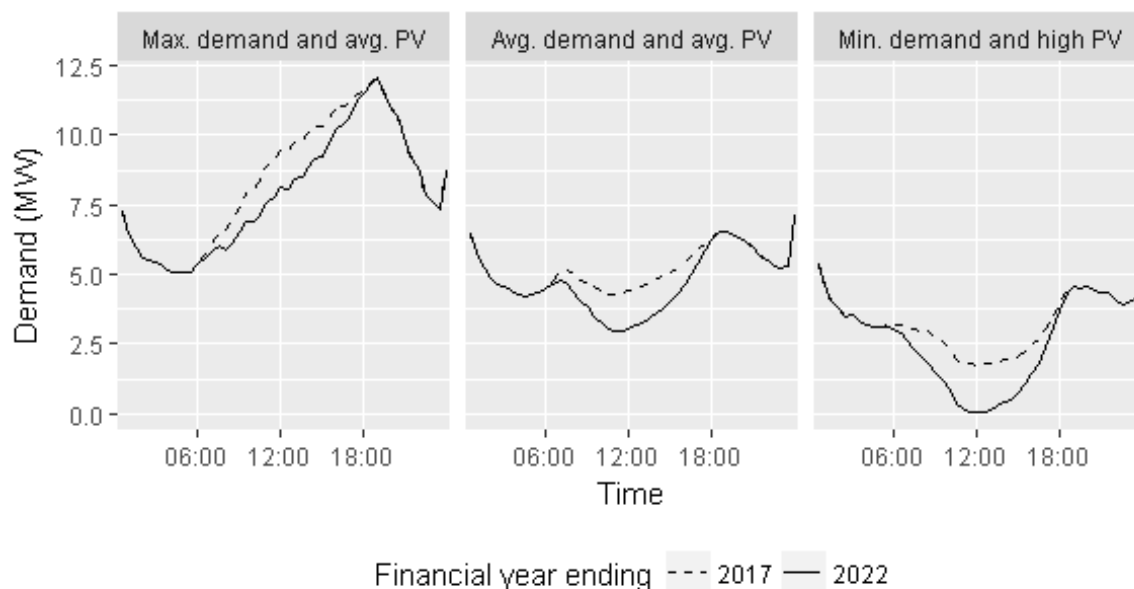| Financial year	Actual (MW)	
2013-14	7.8	
2014-15	7.1	
2015-16	7.8	
2016-17	8.2	
2017-18	7.7	
Financial Year	Forecast - MW	Forecast - PF
2018-19	8.2	1.00
2019-20	8.1	1.00
2020-21	8.1	1.00
2021-22	8.0	1.00
2022-23	8.0	1.00
2023-24	8.0	1.00
2024-25	7.9	1.00
2025-26	7.9	1.00
2026-27	7.8	1.00
2027-28	7.8	1.00
2028-29	7.8	1.00

A5.3   Brinkworth

Category: 4

2017 Average load profile by month
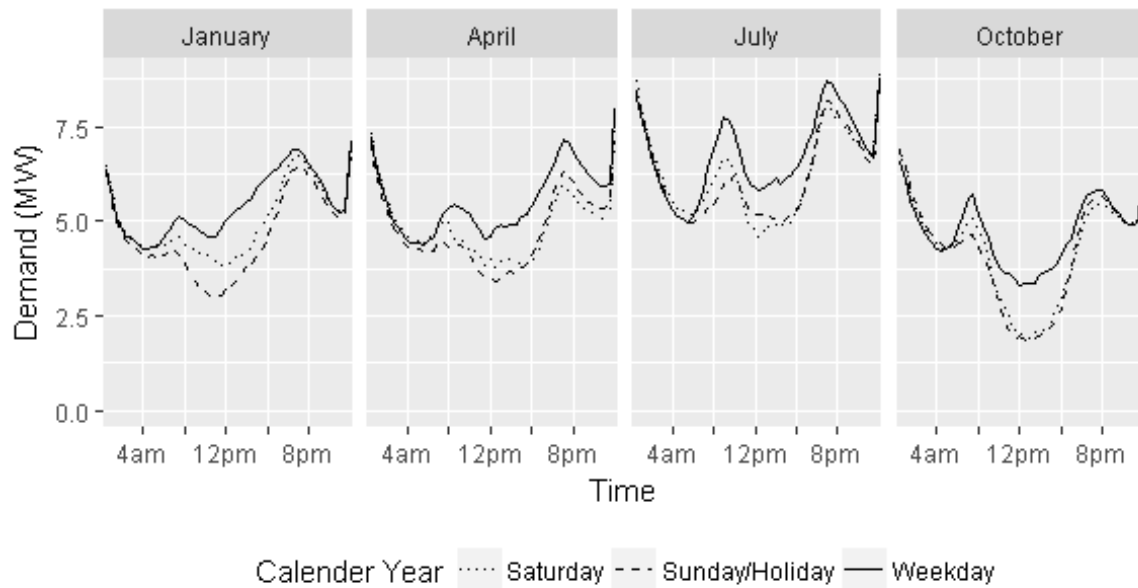

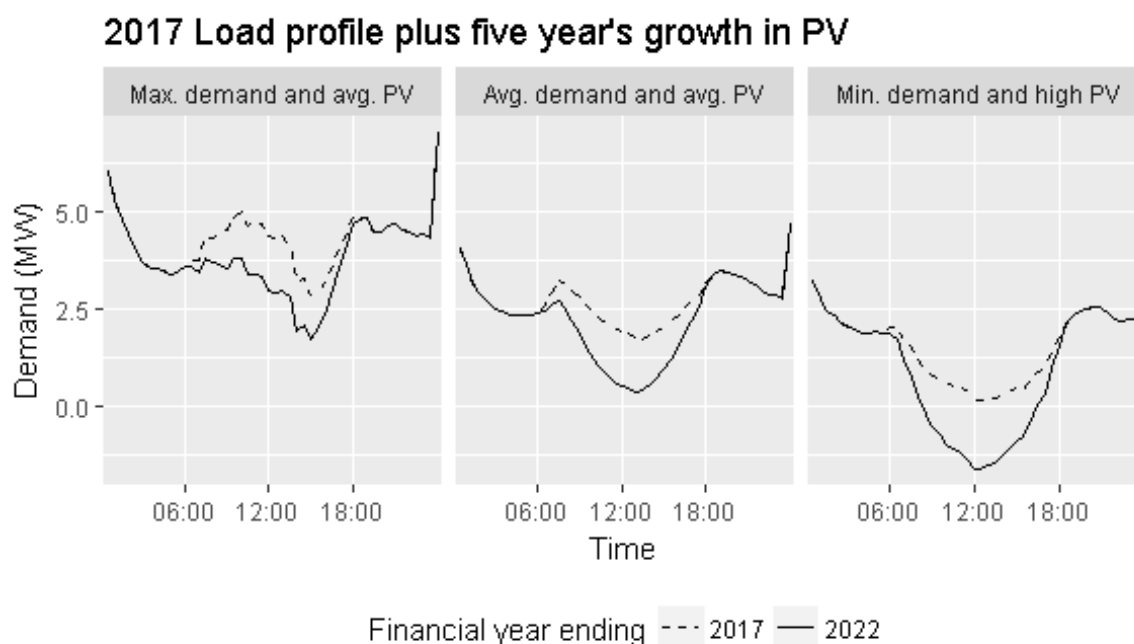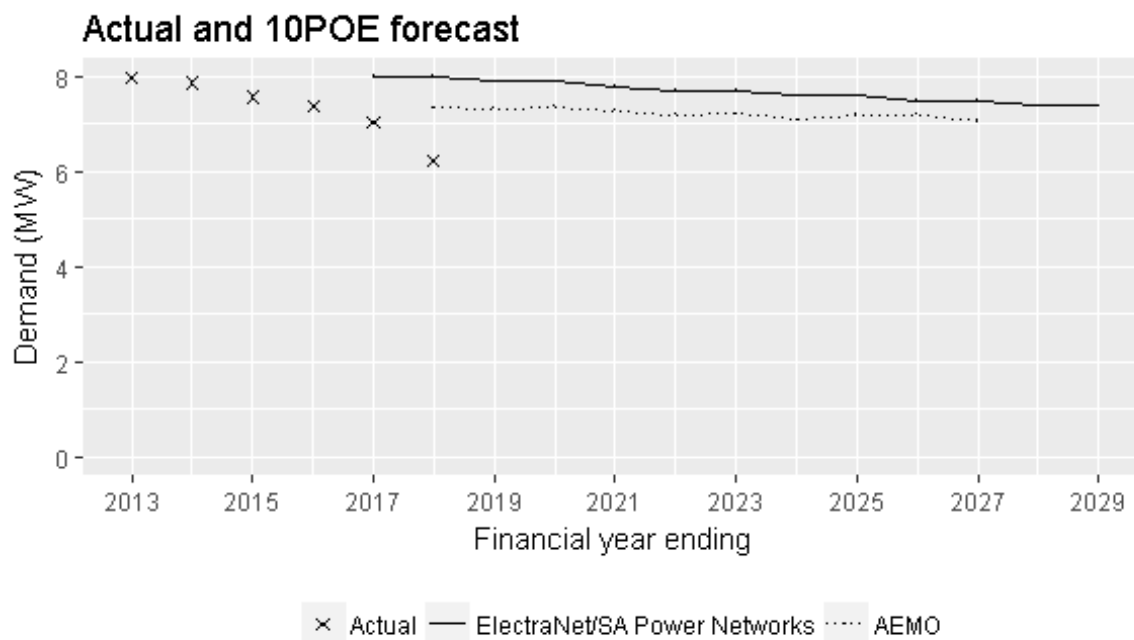Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2013-14	4.7
2014-15	4.2
2015-16	4.6
2016-17	4.6
2017-18	4.7

Financial Year	Forecast - MW	Forecast - PF
2018-19	4.5	1.00
2019-20	4.5	1.00
2020-21	4.4	1.00
2021-22	4.3	1.00
2022-23	4.3	1.00
2023-24	4.2	1.00
2024-25	4.1	1.00
2025-26	4.0	1.00
2026-27	4.0	1.00
2027-28	3.9	1.00
2028-29	3.9	1.00

A5.4 Clare North

Category: 4

Actual and 10POE forecast
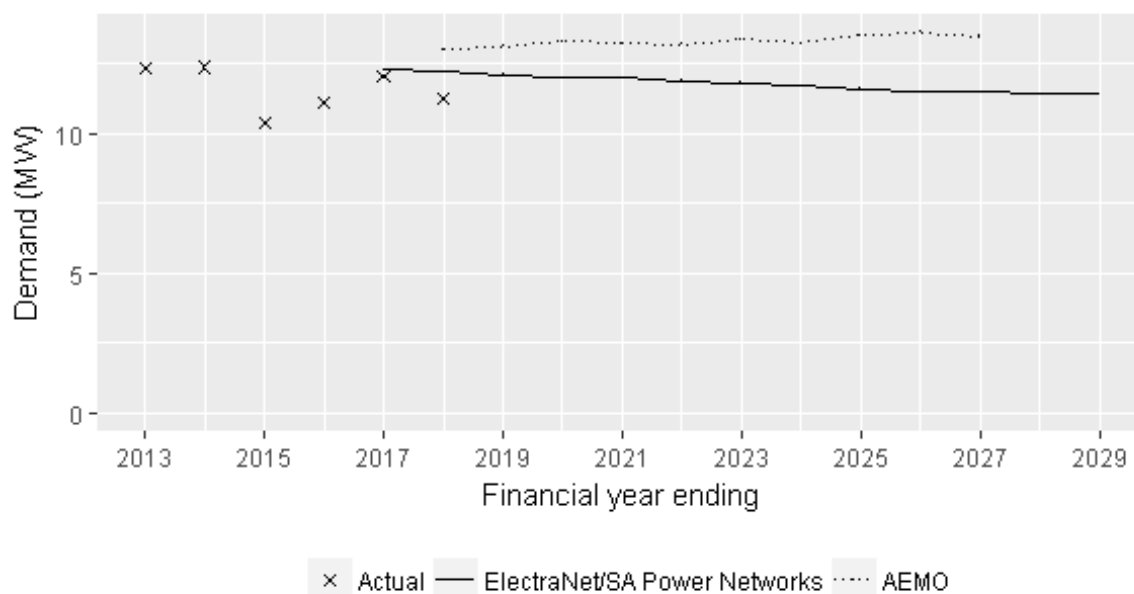
2017 Load profile plus five year's growth in PV
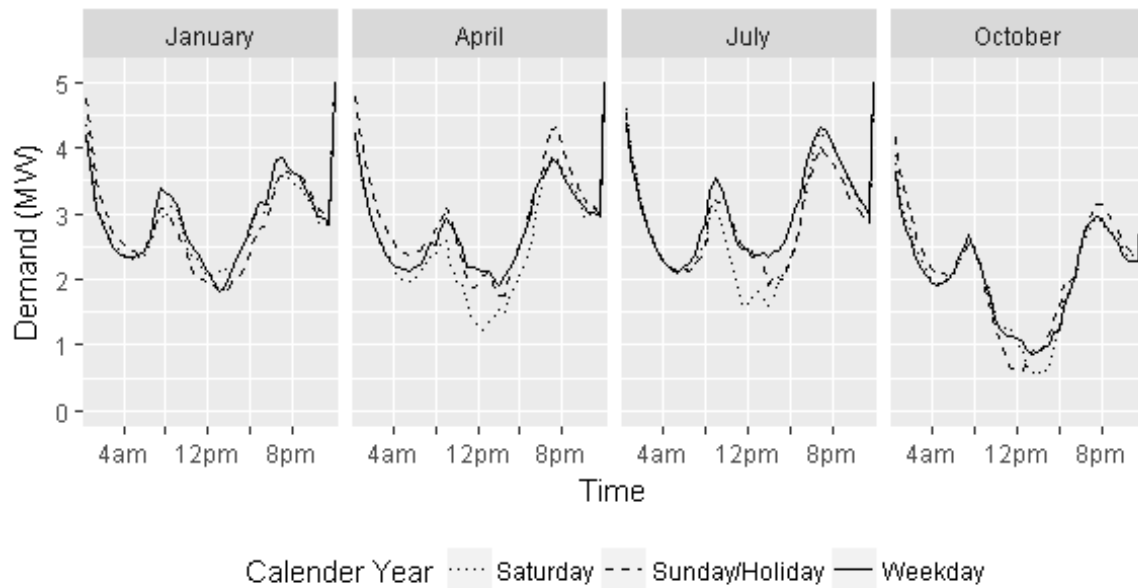
2017 Average load profile by month

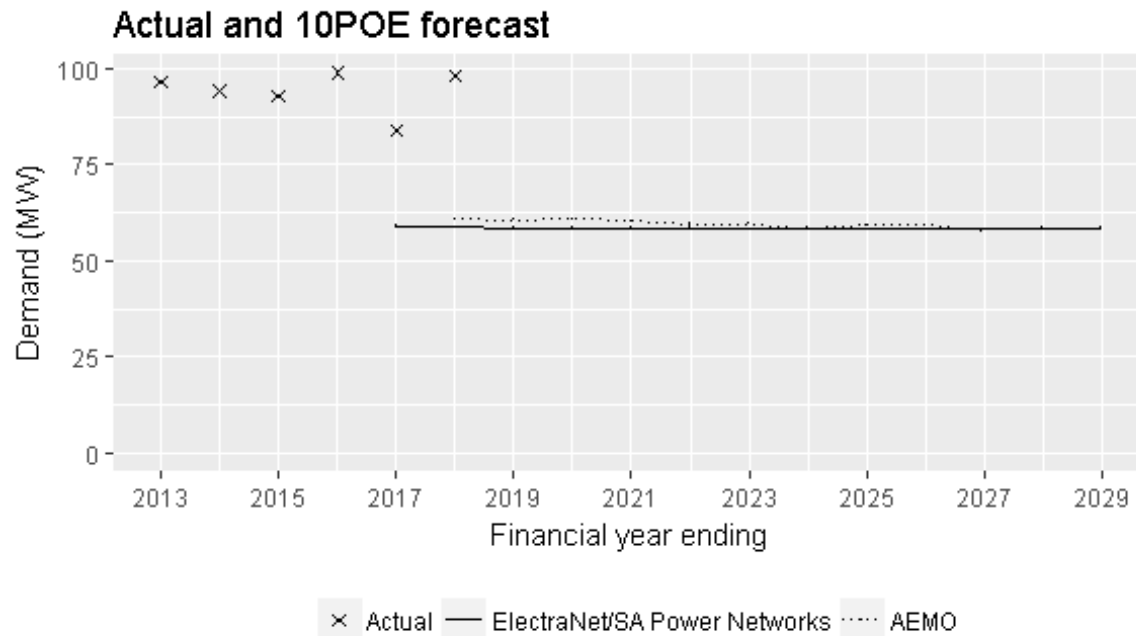Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2013-14	12.4
2014-15	10.4
2015-16	11.1
2016-17	12.0
2017-18	11.3

Financial Year	Forecast - MW	Forecast - PF
2018-19	12.1	0.94
2019-20	12.0	0.94
2020-21	12.0	0.94
2021-22	11.9	0.94
2022-23	11.8	0.94
2023-24	11.7	0.94
2024-25	11.6	0.94
2025-26	11.5	0.94
2026-27	11.5	0.94
2027-28	11.4	0.94
2028-29	11.4	0.94

A5.5   Dalrymple
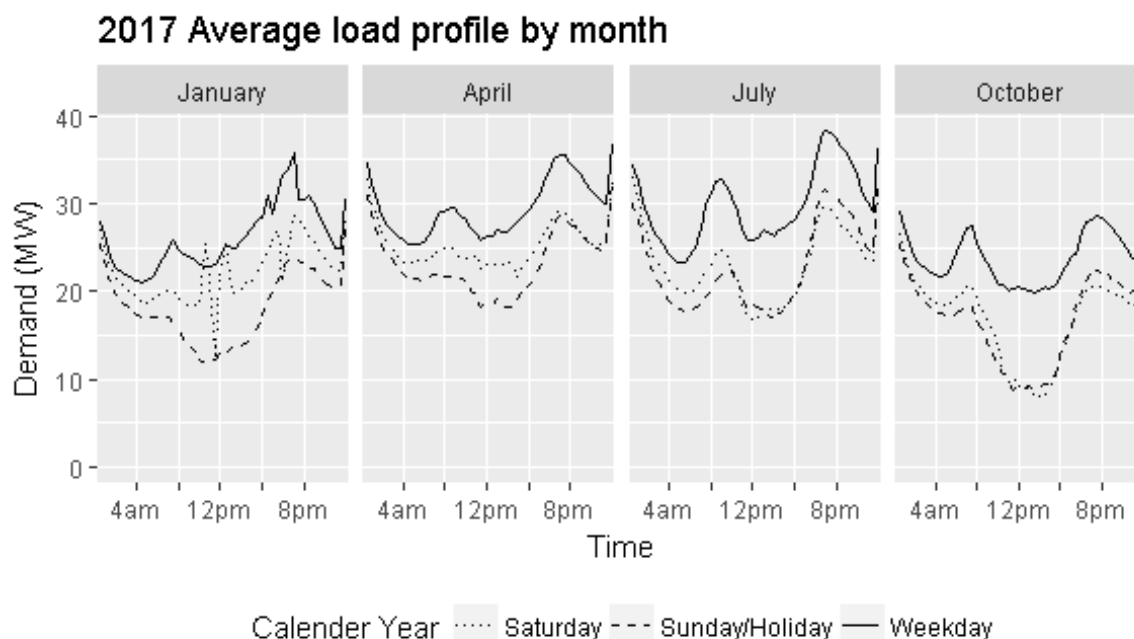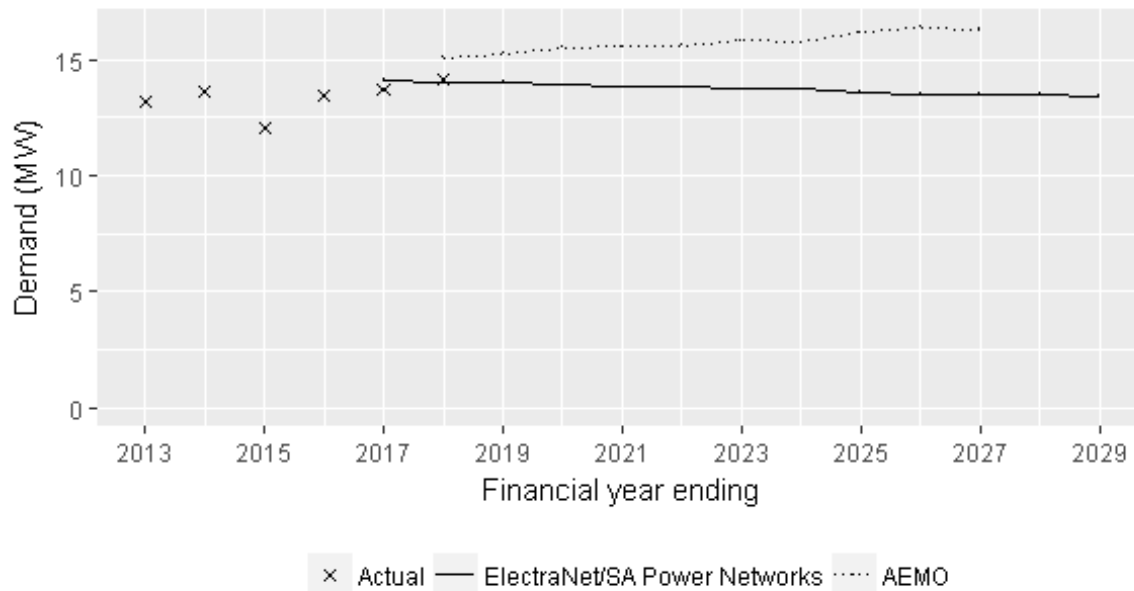
Category: 1

2017 Average load profile by month

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

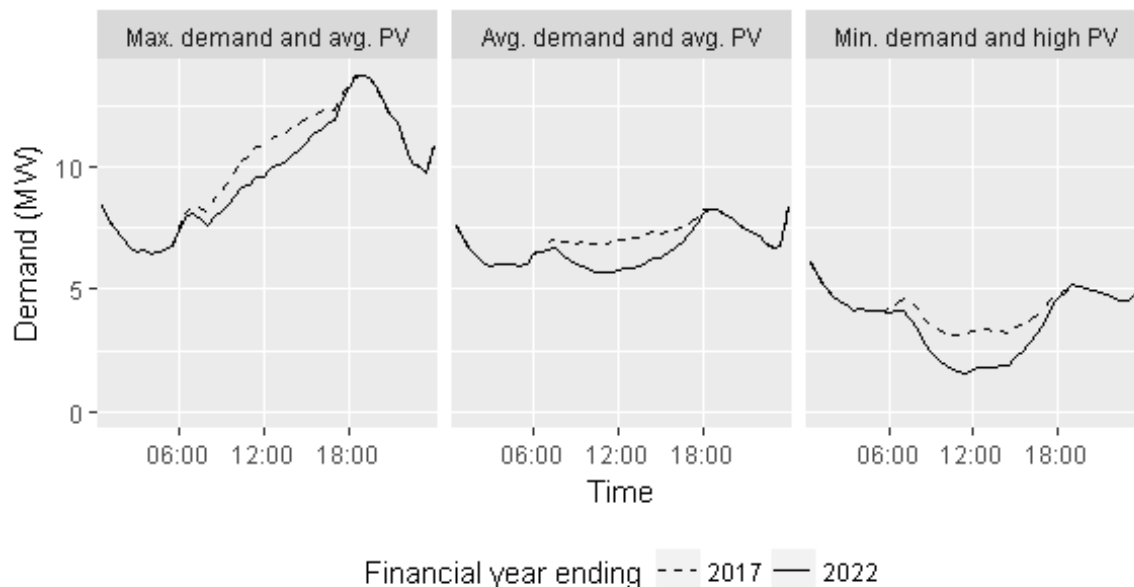| Financial year	Actual (MW)	
2013-14	7.9	
2014-15	7.6	
2015-16	7.4	
2016-17	7.0	
2017-18	6.2	
Financial Year	Forecast - MW	Forecast - PF
2018-19	7.9	1.00
2019-20	7.9	1.00
2020-21	7.8	1.00
2021-22	7.7	1.00
2022-23	7.7	1.00
2023-24	7.6	1.00
2024-25	7.6	1.00
2025-26	7.5	1.00
2026-27	7.5	1.00
2027-28	7.4	1.00
2028-29	7.4	1.00

A5.6   Dorrien

Category: 4
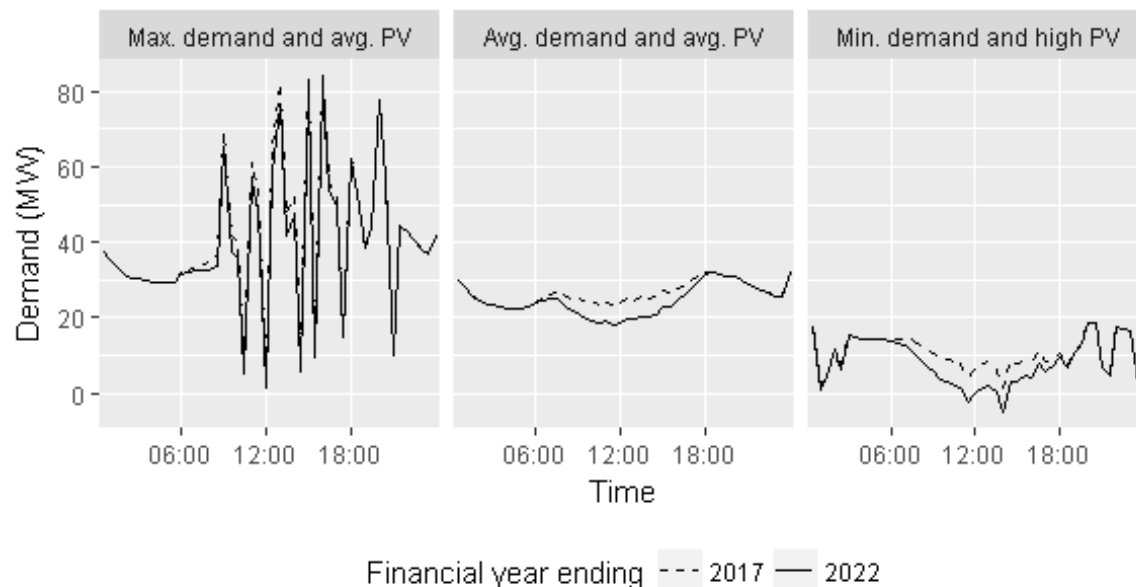
Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
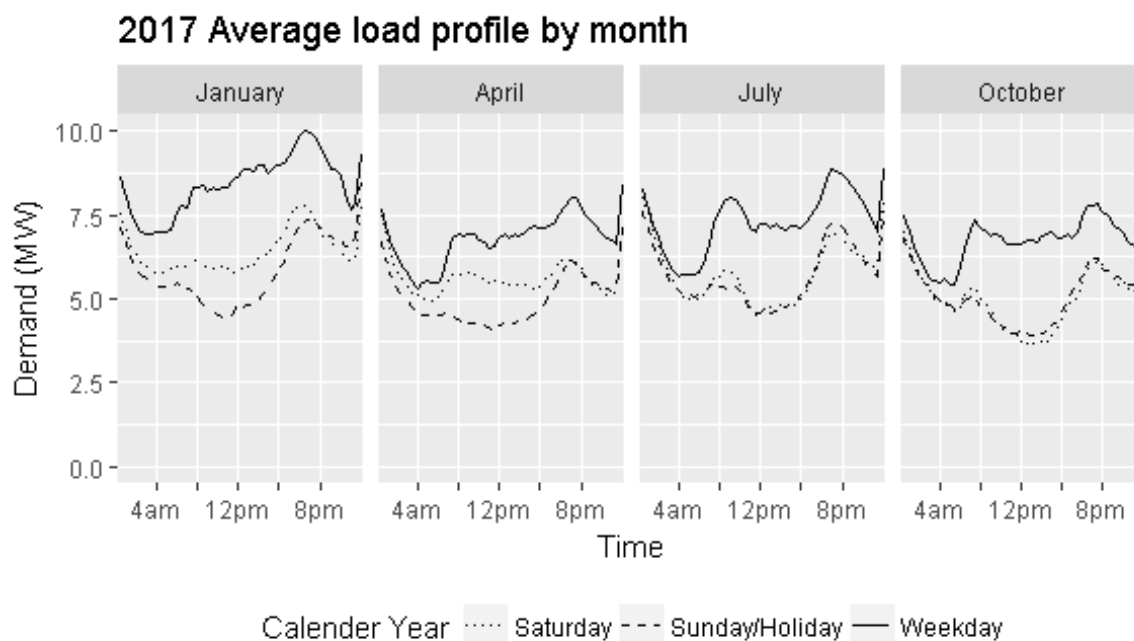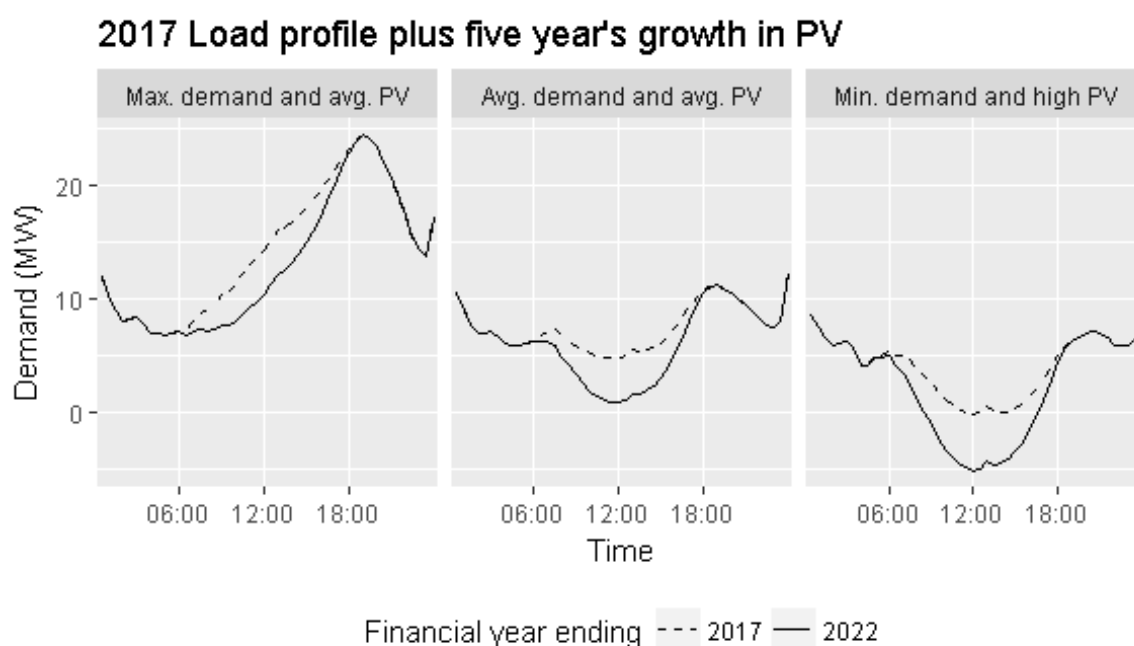
2017 Average load profile by month

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

Financial year	Actual (MW)	
2013-14	94.2	
2014-15	93.0	
2015-16	99.0	
2016-17	83.9	
2017-18	98.3	

Financial Year	Forecast - MW	Forecast - PF
2018-19	58.6	0.97
2019-20	58.6	0.97
2020-21	58.5	0.97
2021-22	58.4	0.97
2022-23	58.3	0.97
2023-24	58.3	0.97
2024-25	58.2	0.97
2025-26	58.2	0.97
2026-27	58.3	0.97
2027-28	58.4	0.97
2028-29	58.5	0.97

A5.7   Hummocks

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
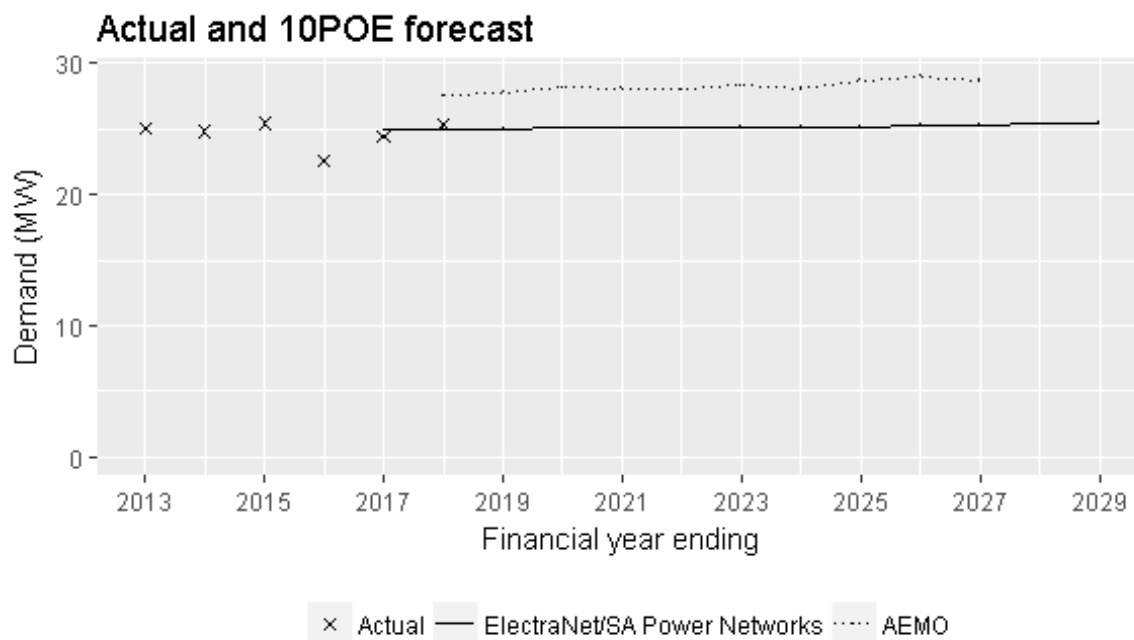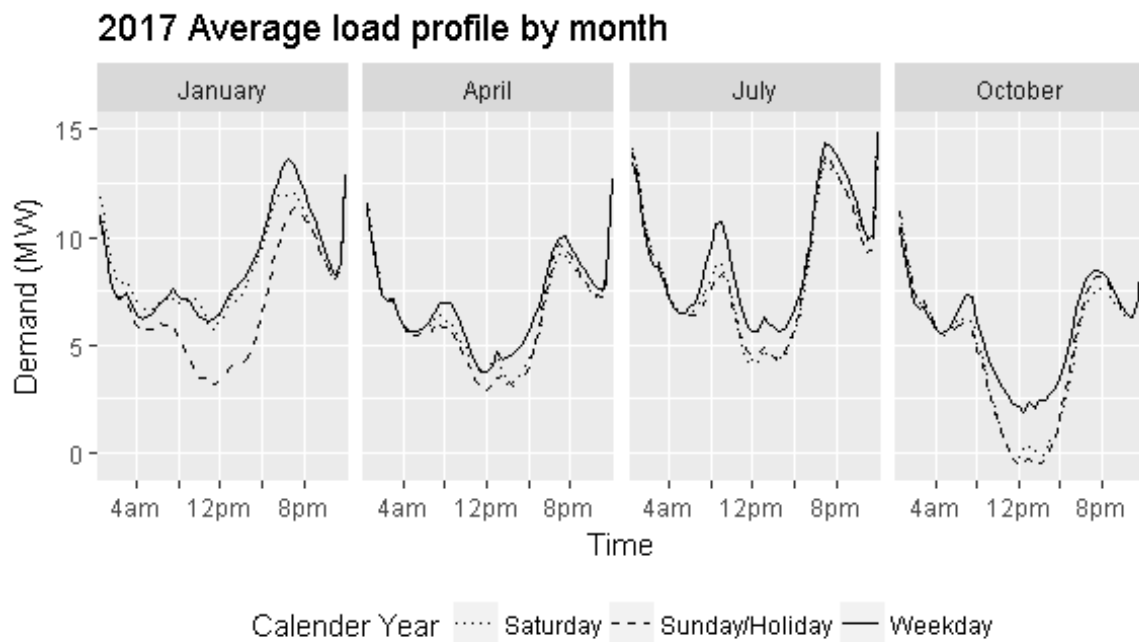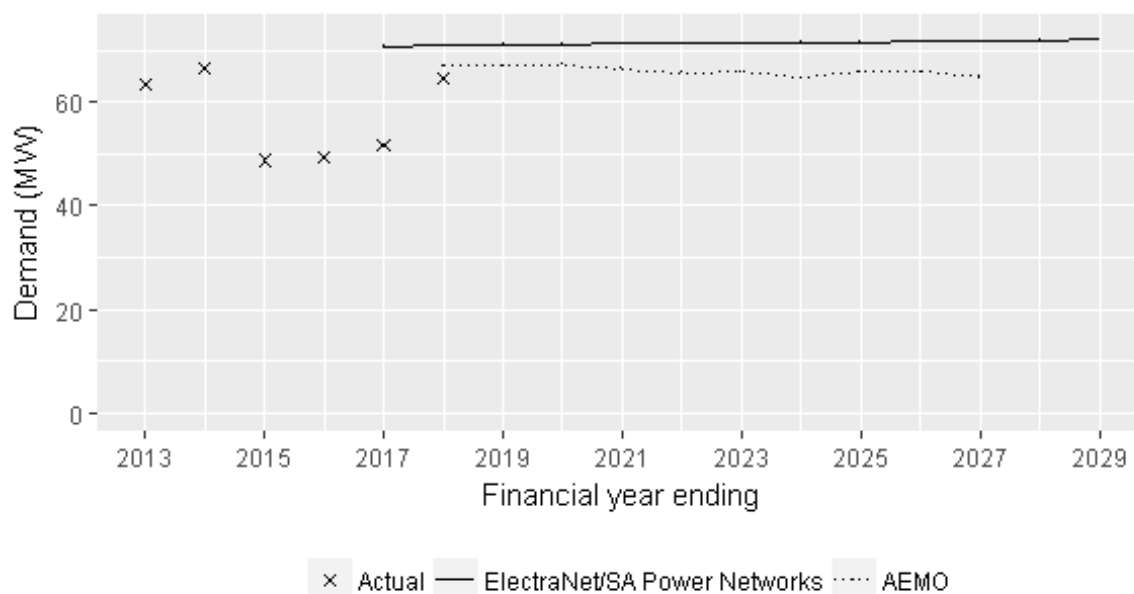
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	13.6
2014-15	12.0
2015-16	13.4
2016-17	13.7
2017-18	14.1

Financial Year	Forecast - MW	Forecast - PF
2018-19	14.0	0.97
2019-20	13.9	0.97
2020-21	13.8	0.97
2021-22	13.8	0.97
2022-23	13.7	0.97
2023-24	13.7	0.97
2024-25	13.6	0.97
2025-26	13.5	0.97
2026-27	13.5	0.97
2027-28	13.5	0.97
2028-29	13.4	0.97

A5.8   Kadina East

Category: 2

Actual and 10POE forecast

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

2017 Load profile plus five year's growth in PV

Financial year ending - - - 2017 ── 2022
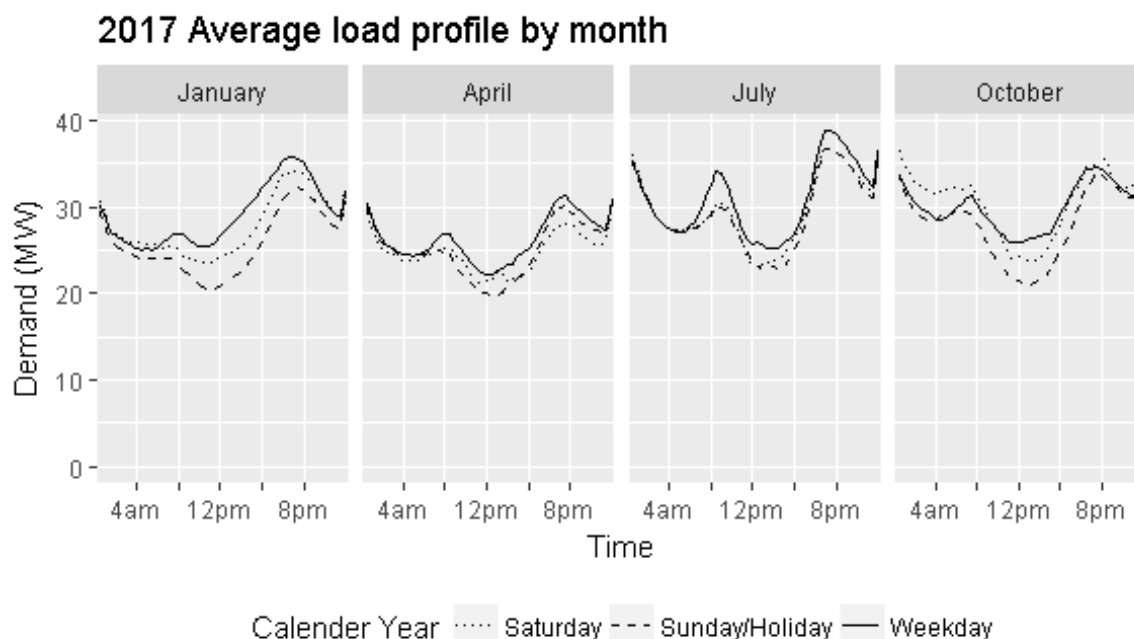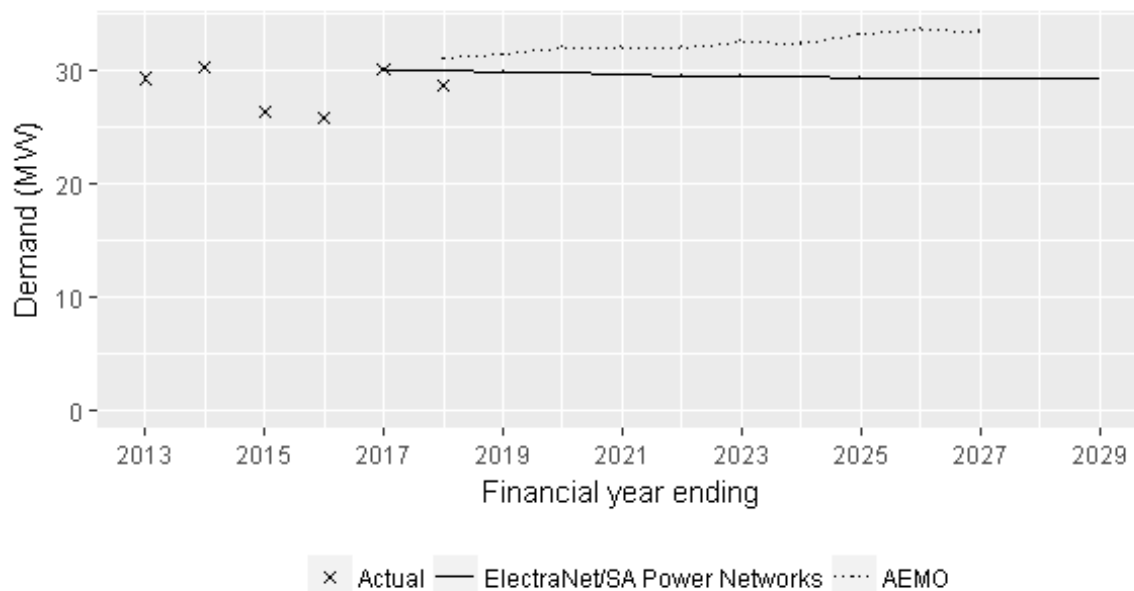
2017 Average load profile by month

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

Financial year	Actual (MW)	
2013-14	24.8	
2014-15	25.4	
2015-16	22.6	
2016-17	24.4	
2017-18	25.4	

Financial Year	Forecast - MW	Forecast - PF
2018-19	25.0	0.95
2019-20	25.1	0.95
2020-21	25.1	0.95
2021-22	25.1	0.95
2022-23	25.2	0.95
2023-24	25.2	0.95
2024-25	25.2	0.95
2025-26	25.3	0.95
2026-27	25.3	0.95
2027-28	25.4	0.95
2028-29	25.5	0.95

A5.9   Port Pirie/Bungama
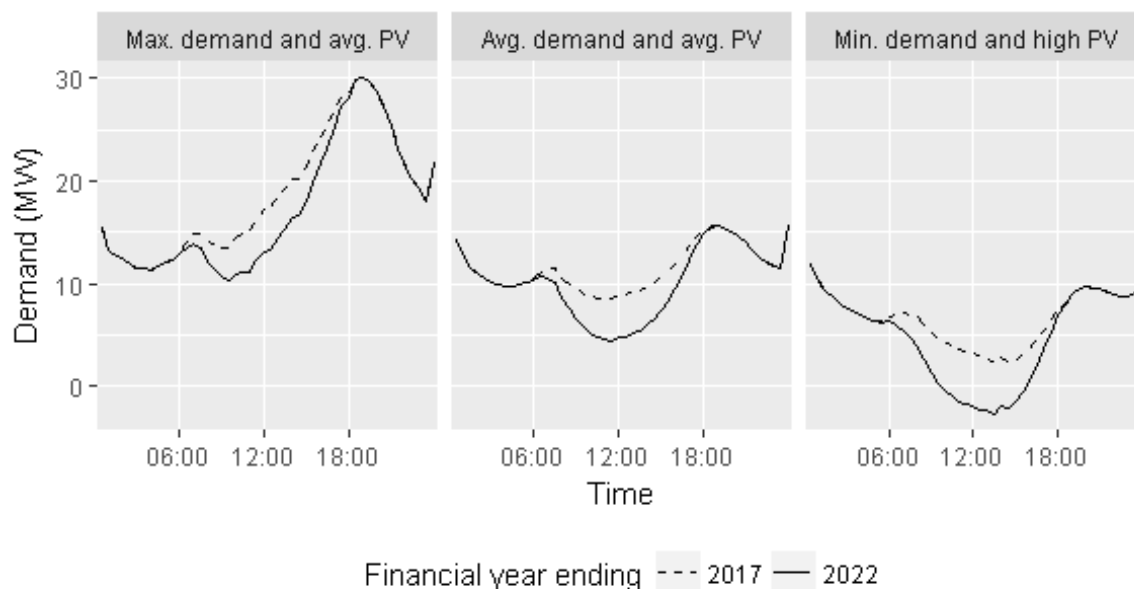
Category: 4

Actual and 10POE forecast
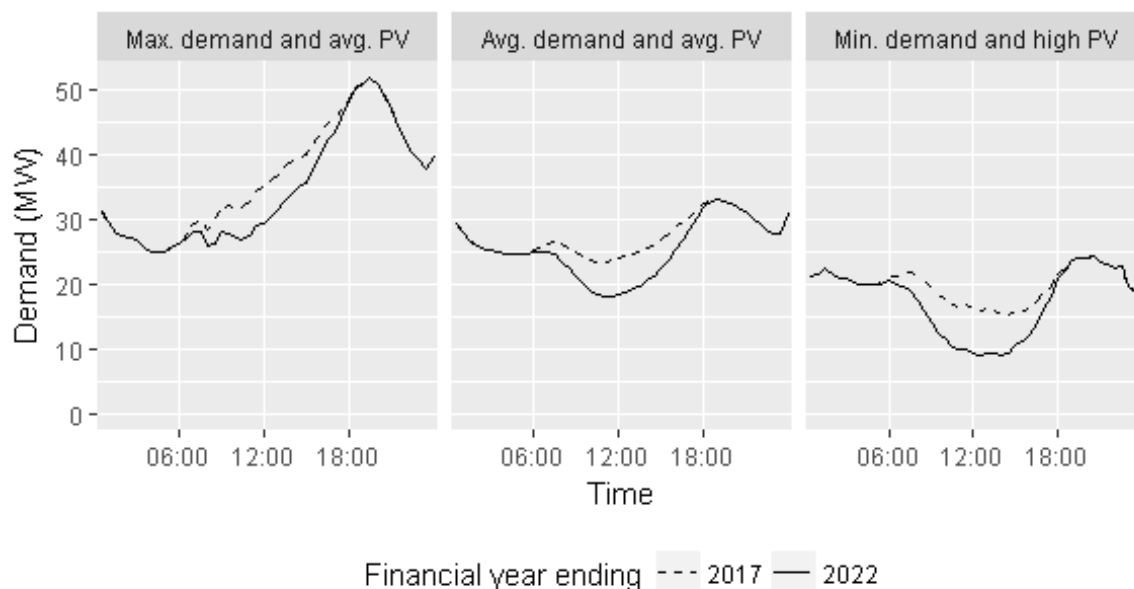
2017 Load profile plus five year's growth in PV
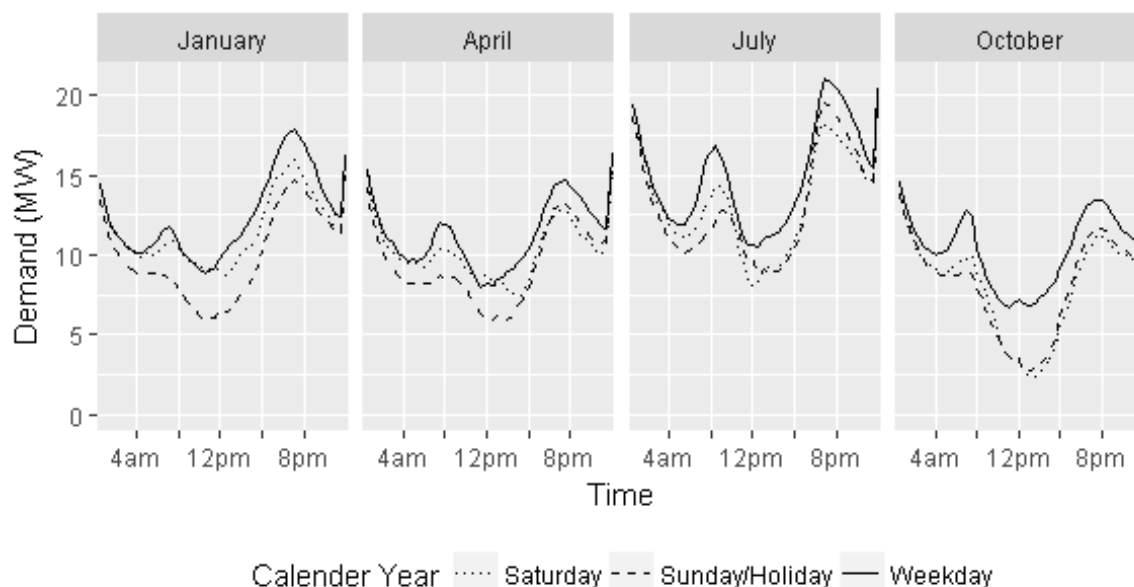
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	66.6
2014-15	48.8
2015-16	49.4
2016-17	51.6
2017-18	64.5

Financial Year	Forecast - MW	Forecast - PF
2018-19	71.1	0.93
2019-20	71.2	0.93
2020-21	71.3	0.93
2021-22	71.4	0.93
2022-23	71.4	0.93
2023-24	71.5	0.93
2024-25	71.6	0.93
2025-26	71.7	0.93
2026-27	71.8	0.93
2027-28	71.9	0.93
2028-29	72.1	0.93

A5.10 Templers

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
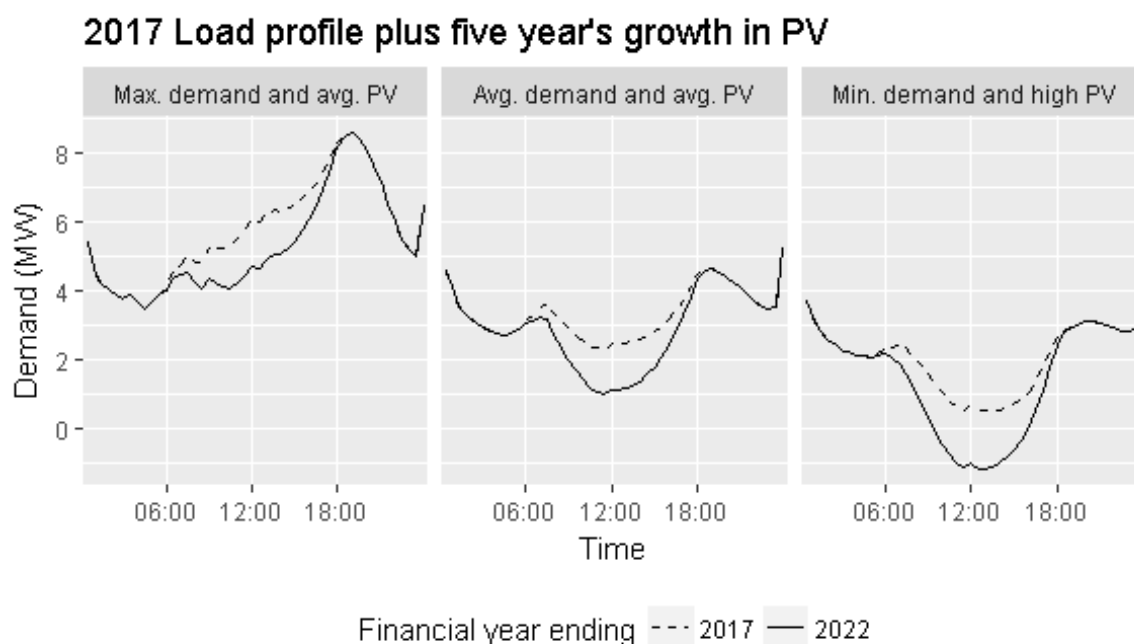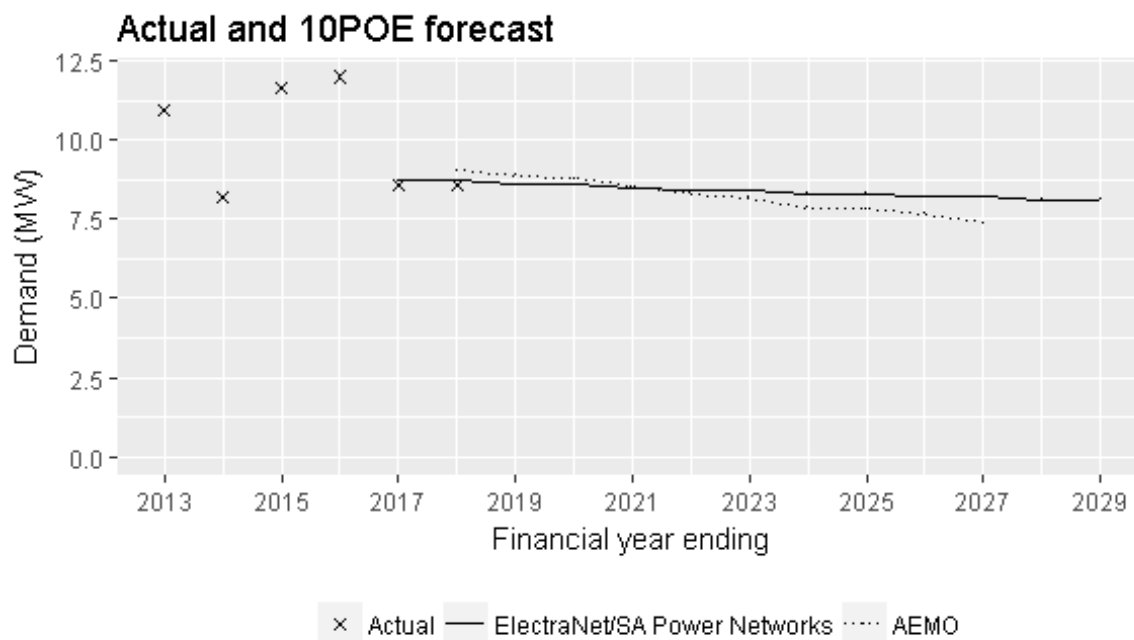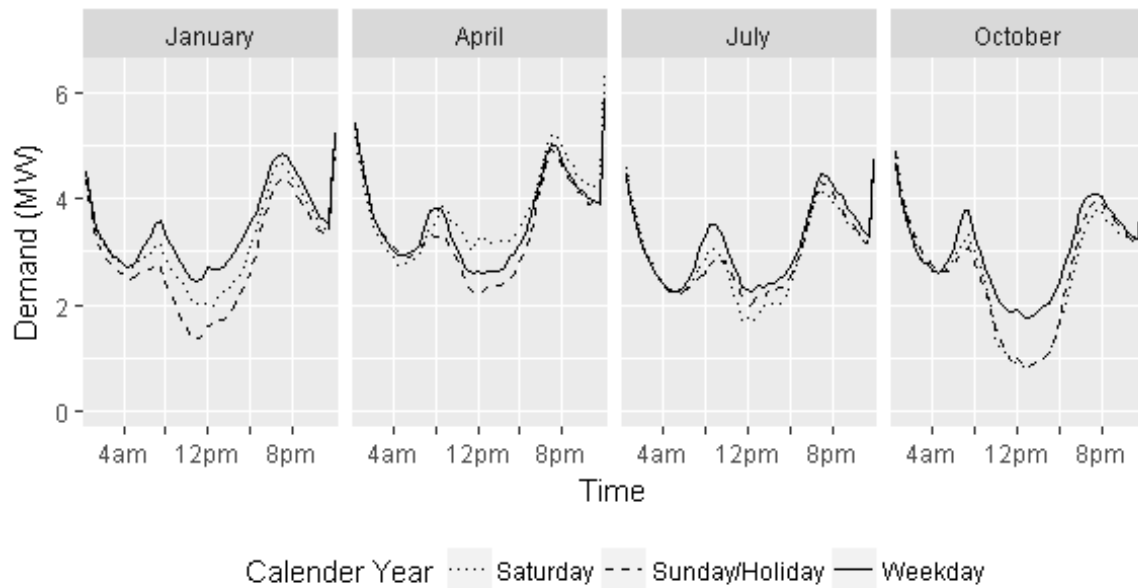
2017 Average load profile by month

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

Financial year	Actual (MW)	
2013-14	30.2	
2014-15	26.3	
2015-16	25.7	
2016-17	30.0	
2017-18	28.6	
Financial Year	Forecast - MW	Forecast - PF
2018-19	29.8	0.96
2019-20	29.7	0.96
2020-21	29.6	0.96
2021-22	29.5	0.96
2022-23	29.5	0.96
2023-24	29.4	0.96
2024-25	29.3	0.96
2025-26	29.2	0.96
2026-27	29.2	0.96
2027-28	29.2	0.96
2028-29	29.2	0.96

A5.11 Waterloo

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	8.2
2014-15	11.6
2015-16	12.0
2016-17	8.5
2017-18	8.6

Financial Year	Forecast - MW	Forecast - PF
2018-19	8.6	0.98
2019-20	8.6	0.98
2020-21	8.5	0.98
2021-22	8.4	0.98
2022-23	8.4	0.98
2023-24	8.3	0.98
2024-25	8.3	0.98
2025-26	8.2	0.98
2026-27	8.2	0.98
2027-28	8.1	0.98
2028-29	8.1	0.98

A6   Riverland

Actual and 10POE forecast
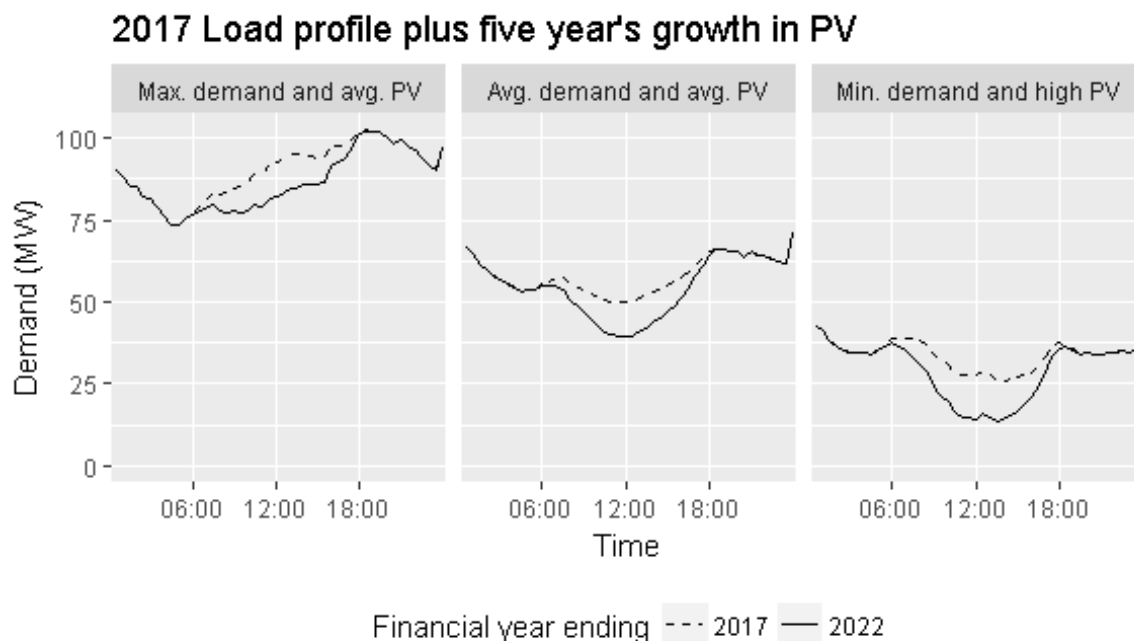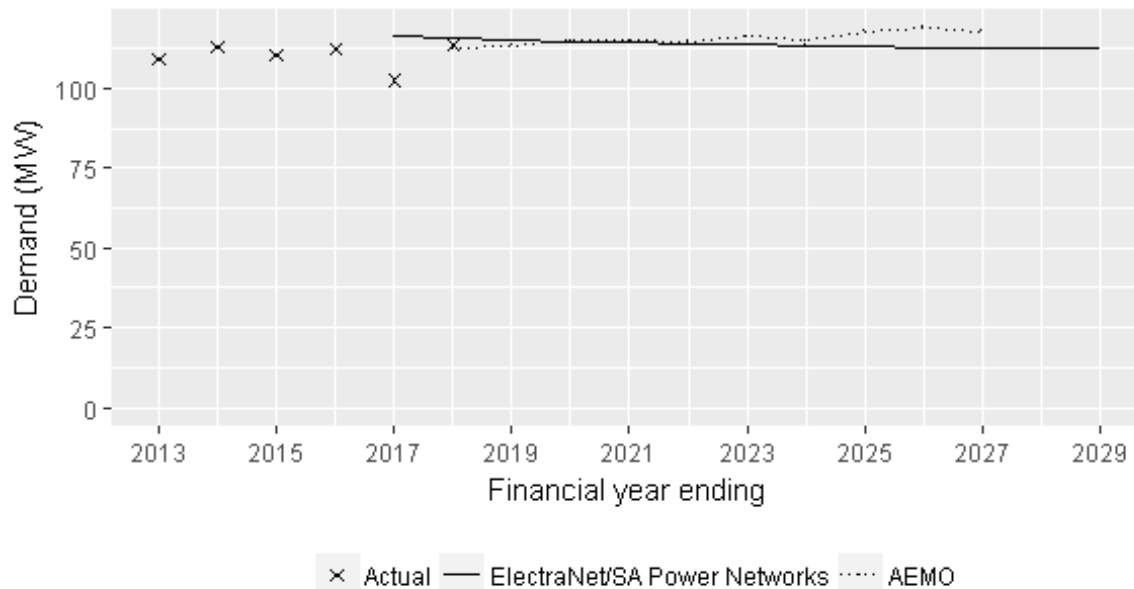
2017 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums.

Financial year	Actual (MW)
2013-14	113.1
2014-15	110.5
2015-16	112.1
2016-17	102.4
2017-18	113.5

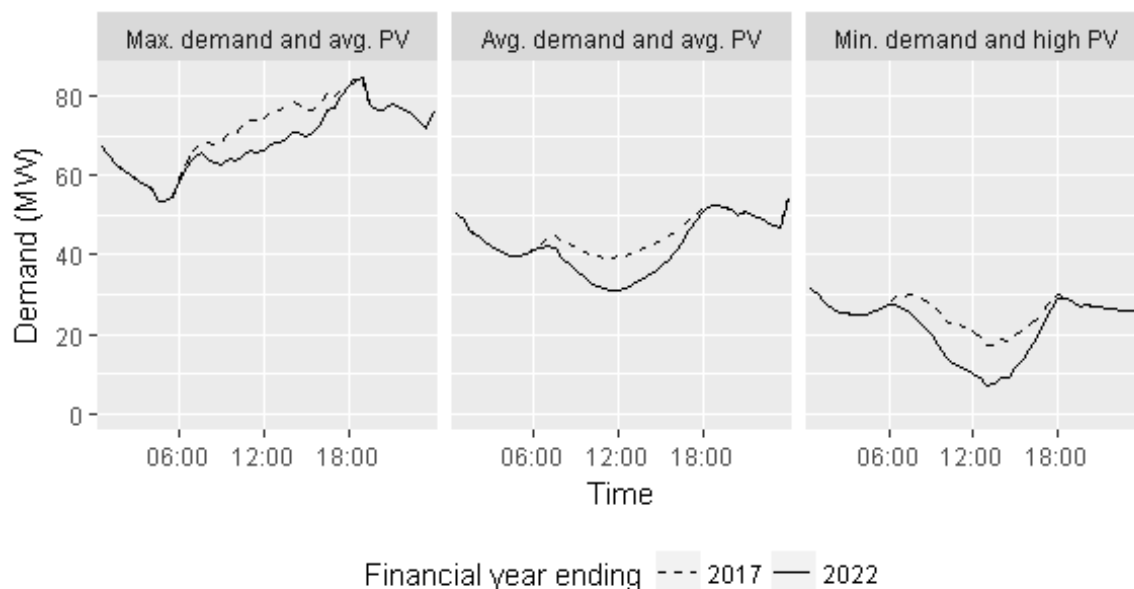| Financial Year	Forecast - MW
2018-19	114.5
2019-20	113.4
2020-21	112.4
2021-22	111.2
2022-23	110.2
2023-24	109.1
2024-25	108.2
2025-26	107.0
2026-27	106.9
2027-28	106.7
2028-29	106.4

A6.1　Berri

Category: 4

Actual and 10POE forecast
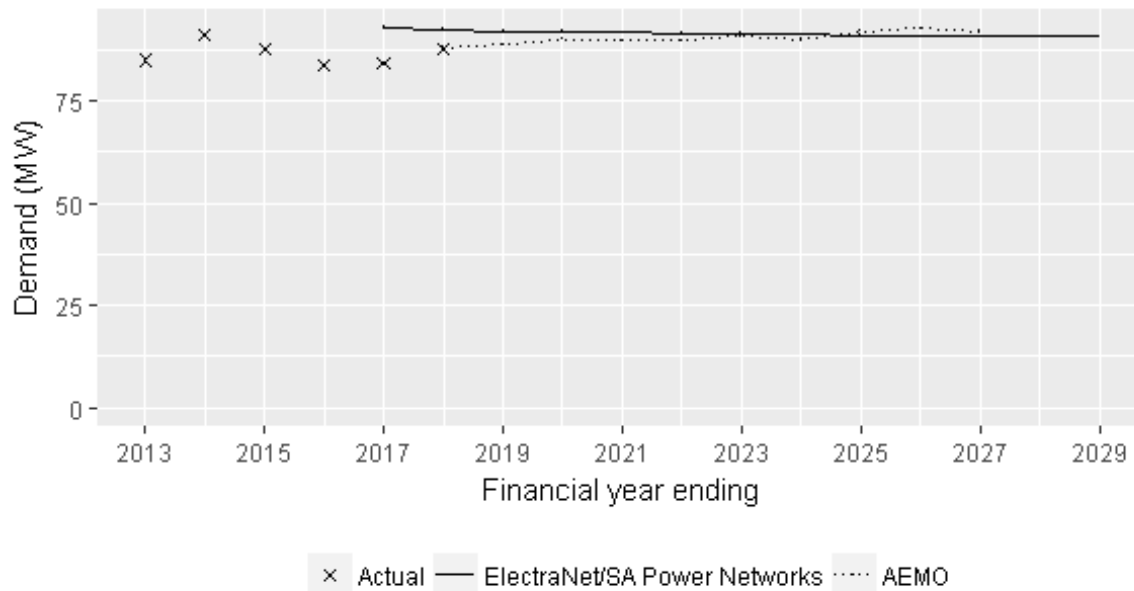
2017 Load profile plus five year's growth in PV
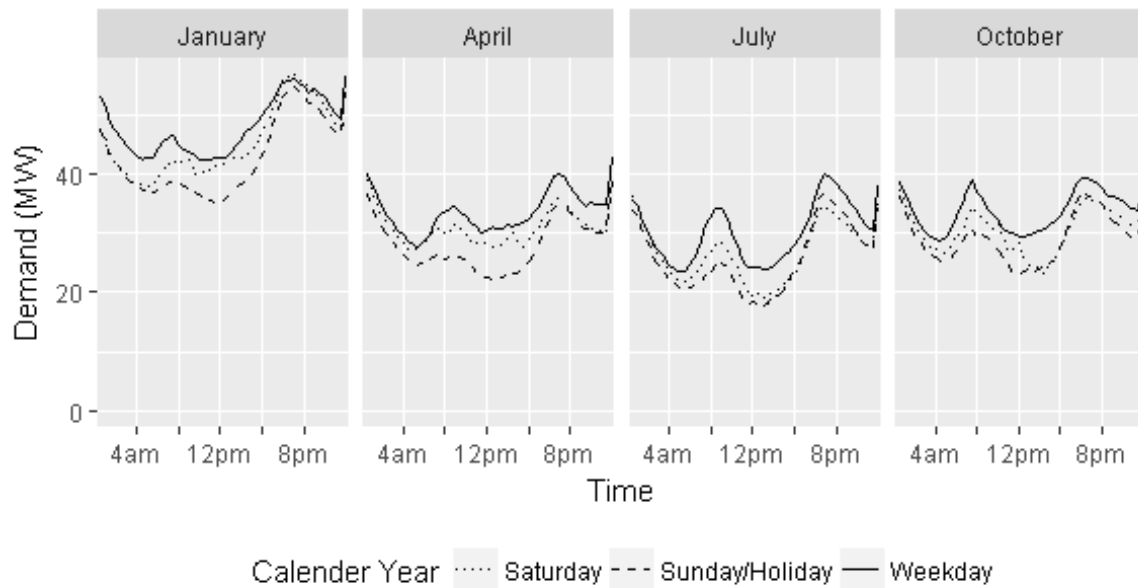
2017 Average load profile by month

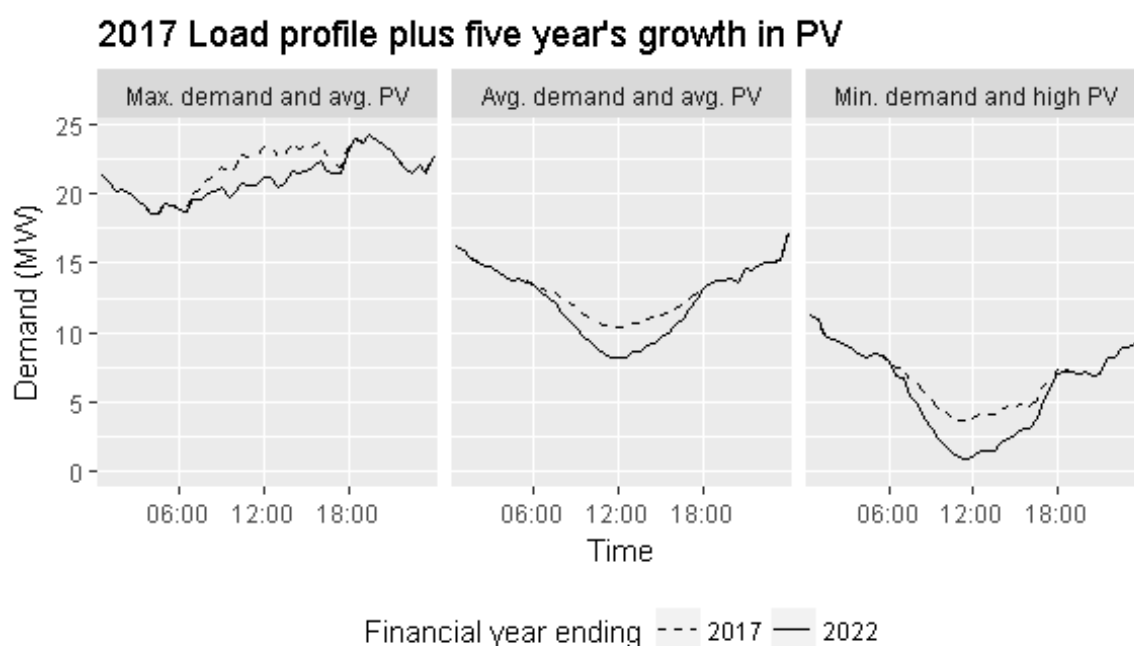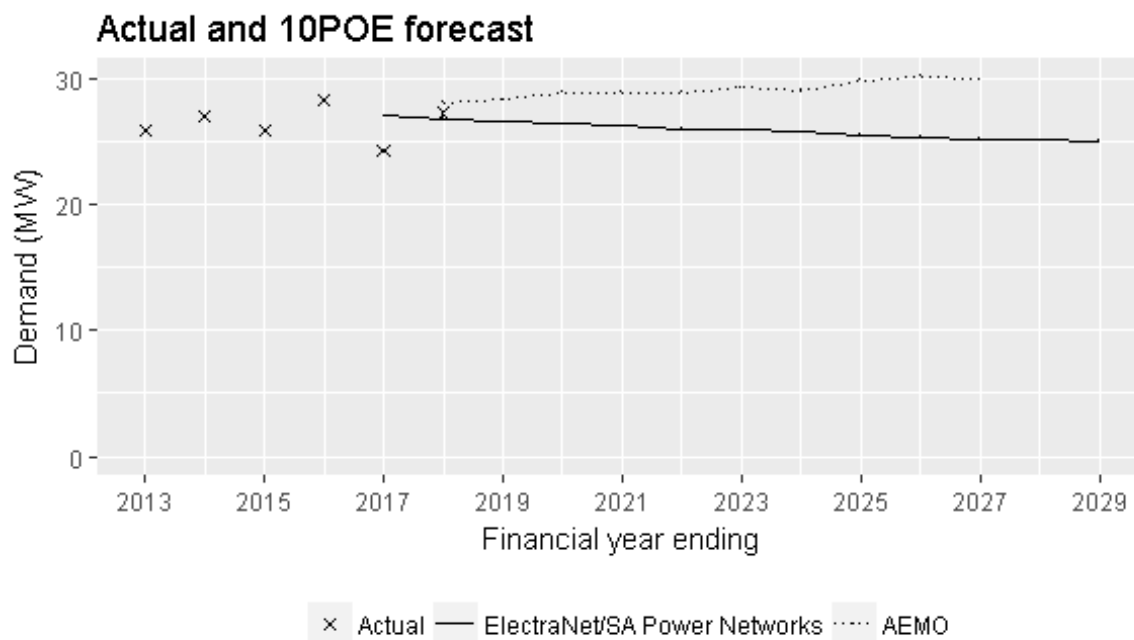Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2013-14	91.0
2014-15	87.6
2015-16	83.9
2016-17	84.4
2017-18	87.6

Financial Year	Forecast - MW	Forecast - PF
2018-19	92.1	0.97
2019-20	91.9	0.97
2020-21	91.7	0.97
2021-22	91.6	0.97
2022-23	91.4	0.97
2023-24	91.2	0.97
2024-25	91.0	0.97
2025-26	90.8	0.97
2026-27	90.8	0.97
2027-28	90.8	0.97
2028-29	90.8	0.97

A6.2   North West Bend

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month

Calender Year ······ Saturday - - - Sunday/Holiday —— Weekday
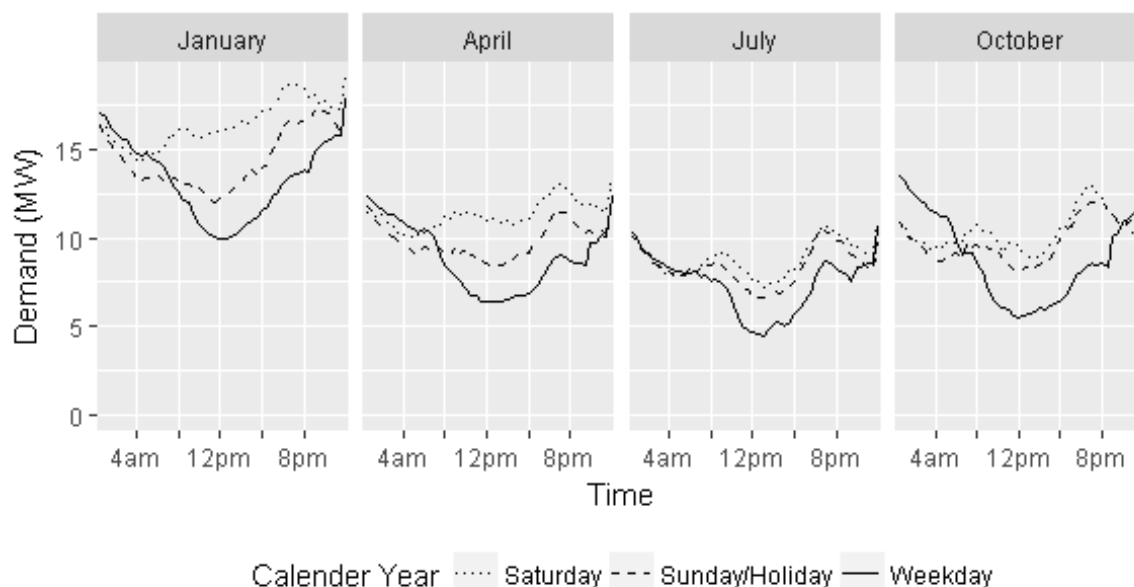
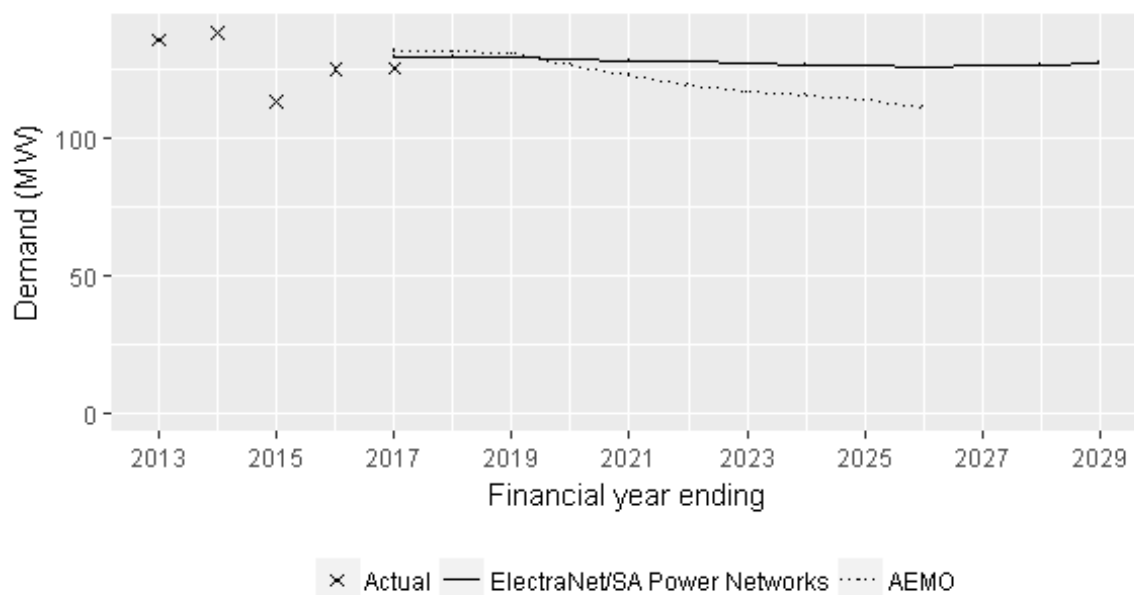Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2013-14	26.9
2014-15	25.9
2015-16	28.3
2016-17	24.2
2017-18	27.2

Financial Year	Forecast - MW	Forecast - PF
2018-19	26.5	0.95
2019-20	26.4	0.95
2020-21	26.2	0.95
2021-22	26.0	0.95
2022-23	25.9	0.95
2023-24	25.7	0.95
2024-25	25.5	0.95
2025-26	25.3	0.95
2026-27	25.2	0.95
2027-28	25.1	0.95
2028-29	25.0	0.95

A7 South East

Actual and 10POE forecast
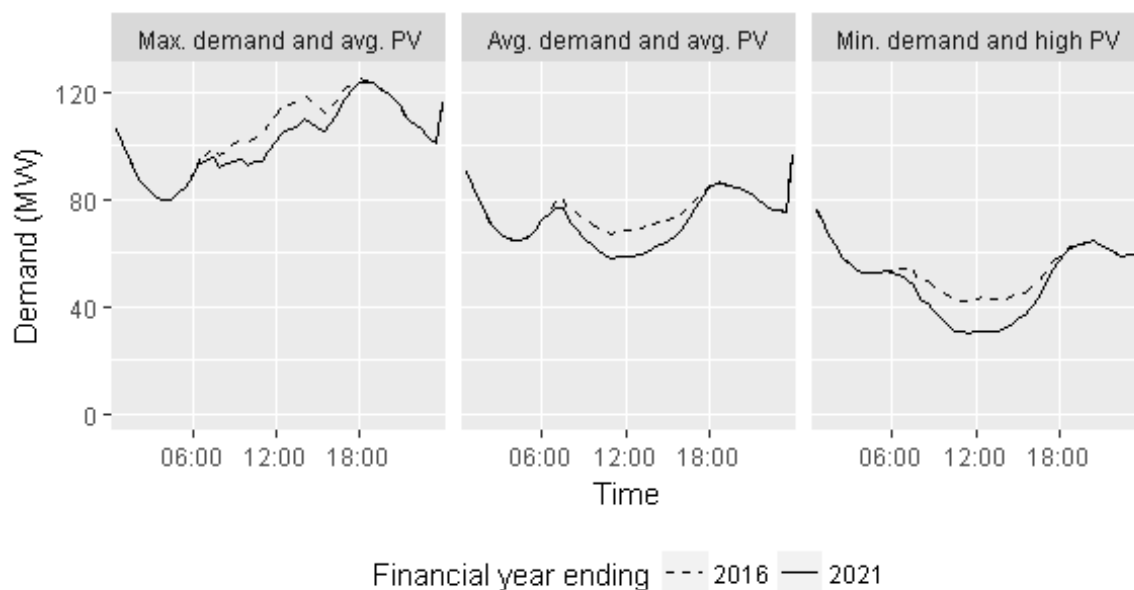

2017 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums.

Financial year	Actual (MW)
2013-14	138.3
2014-15	113.1
2015-16	124.9
2016-17	125.5
2017-18	130.6

Financial Year	Forecast - MW
2018-19	129.2
2019-20	128.6
2020-21	128.1
2021-22	127.8
2022-23	127.0
2023-24	126.5
2024-25	126.2
2025-26	125.6
2026-27	126.1
2027-28	126.7
2028-29	127.5

A7.1   Blanche

Category: 4

Actual and 10POE forecast
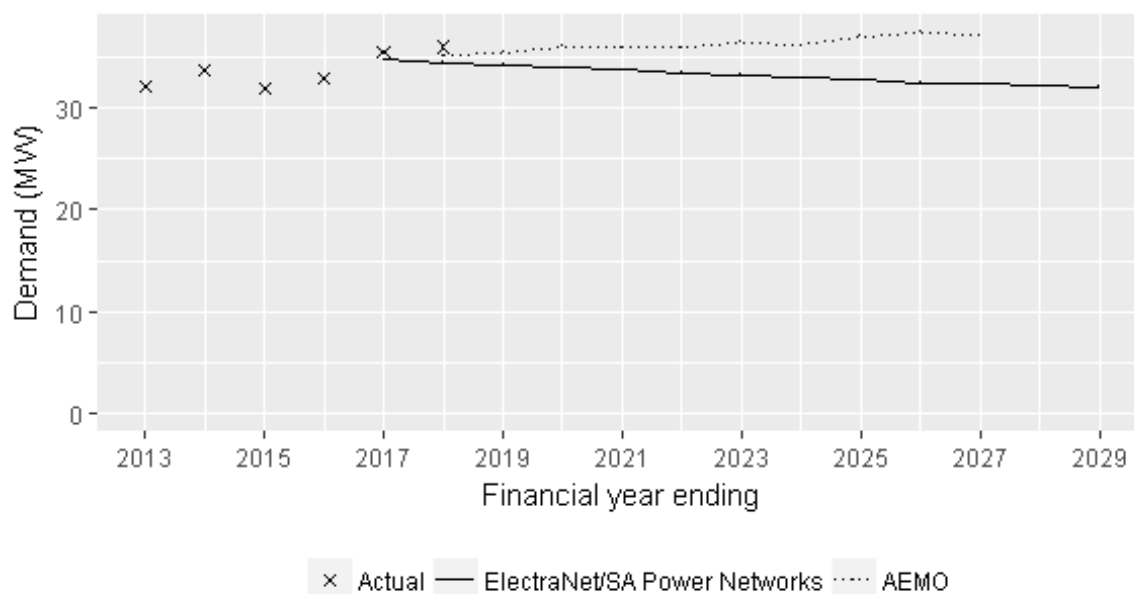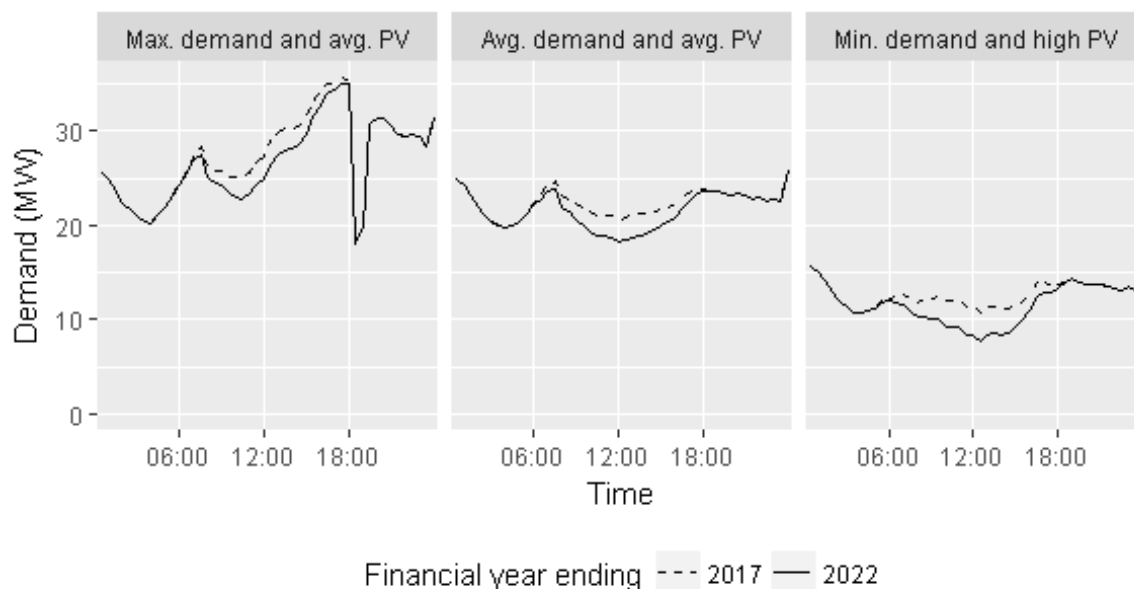
2017 Load profile plus five year's growth in PV
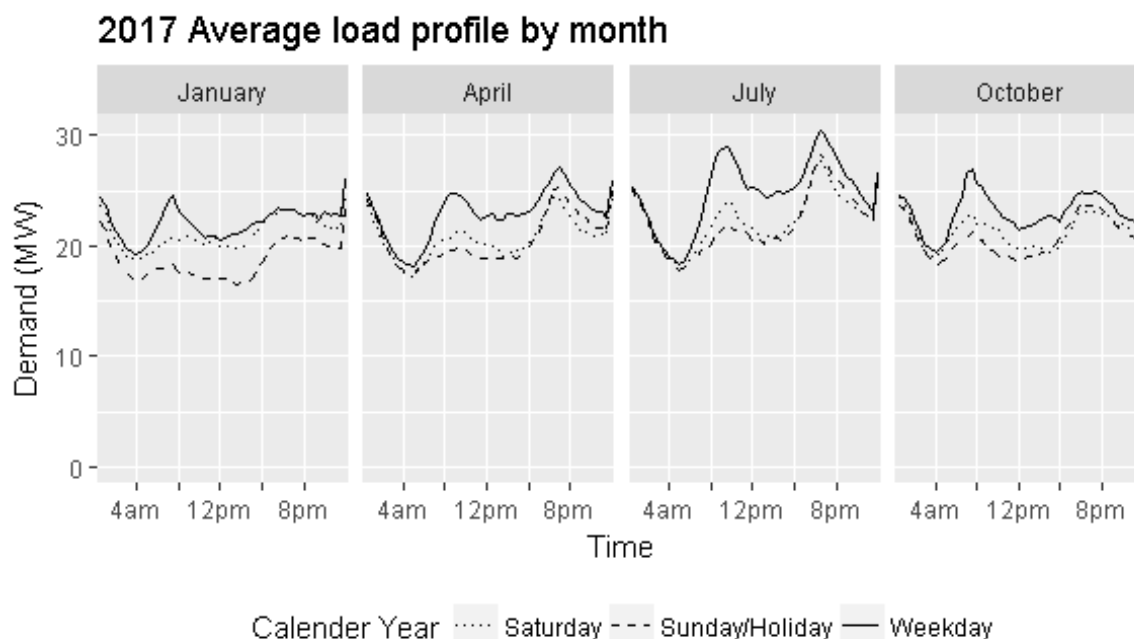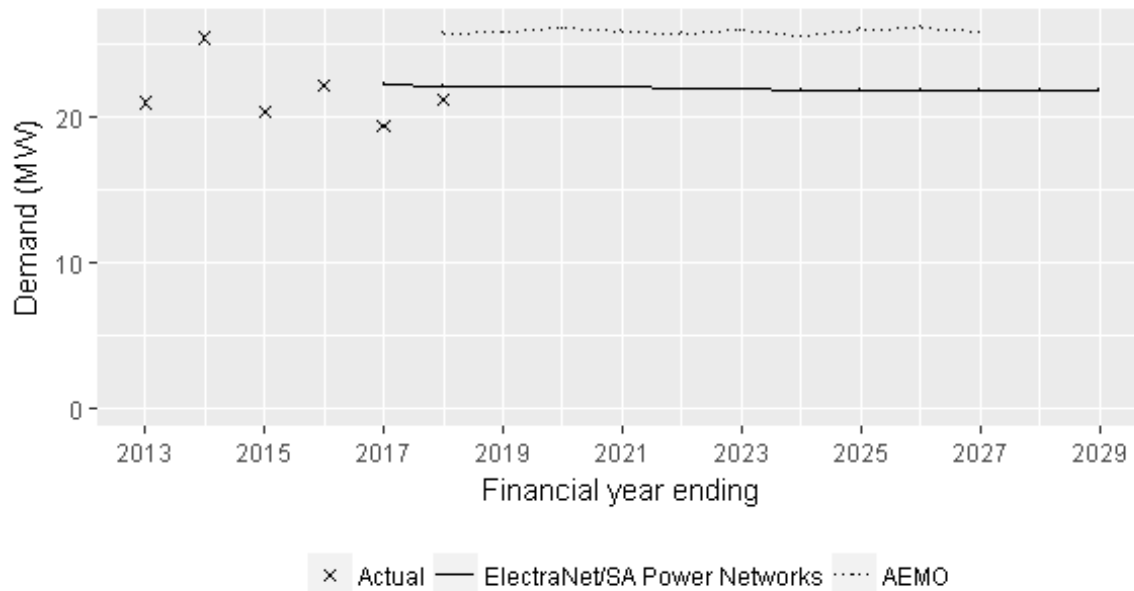
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	33.7
2014-15	32.0
2015-16	33.0
2016-17	35.6
2017-18	36.1

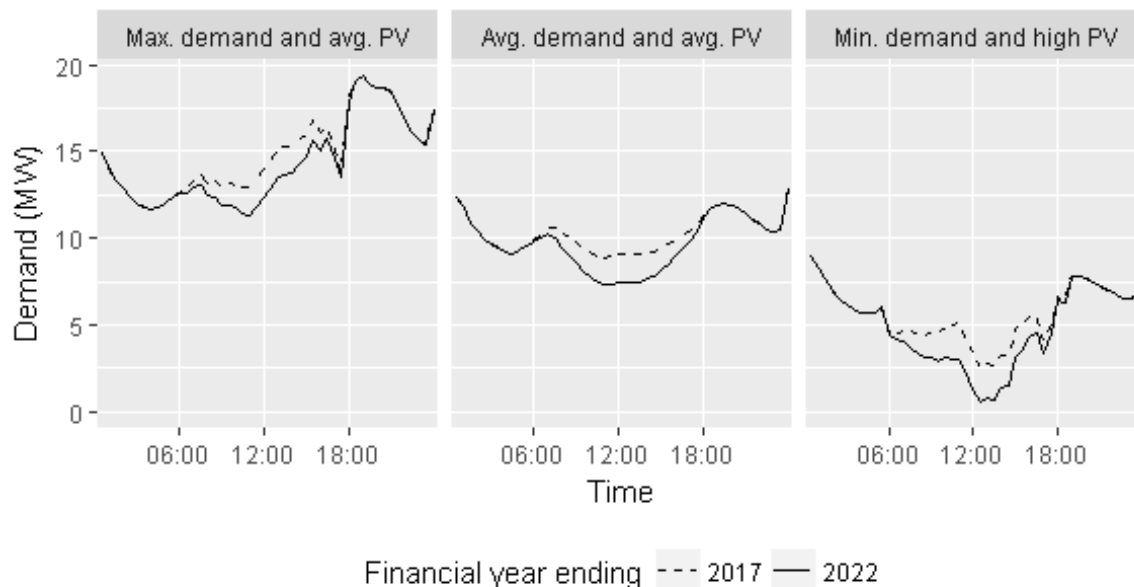| Financial Year	Forecast - MW	Forecast - PF
2018-19	34.3	0.94
2019-20	34.0	0.94
2020-21	33.8	0.94
2021-22	33.5	0.94
2022-23	33.3	0.94
2023-24	33.0	0.94
2024-25	32.8	0.94
2025-26	32.5	0.94
2026-27	32.4	0.94
2027-28	32.2	0.94
2028-29	32.1	0.94

A7.2   Keith

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
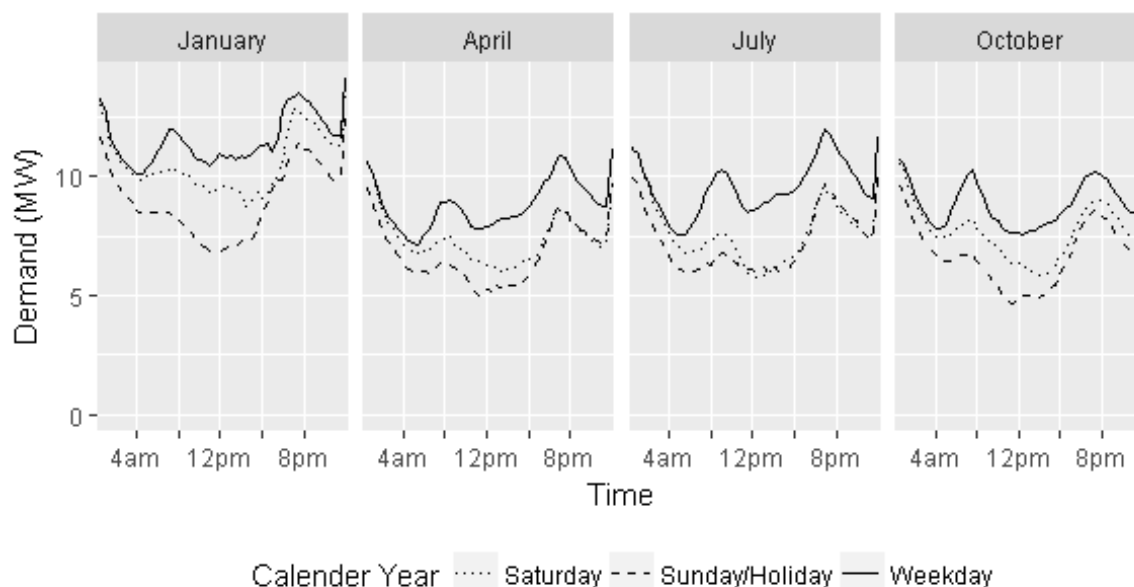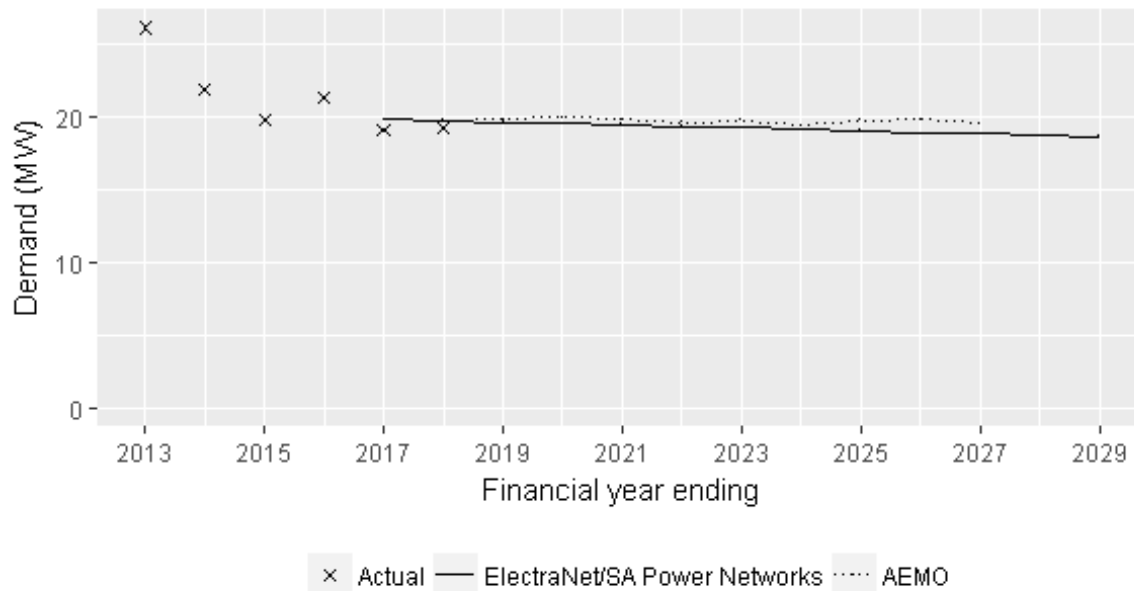
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	25.4
2014-15	20.3
2015-16	22.1
2016-17	19.3
2017-18	21.2

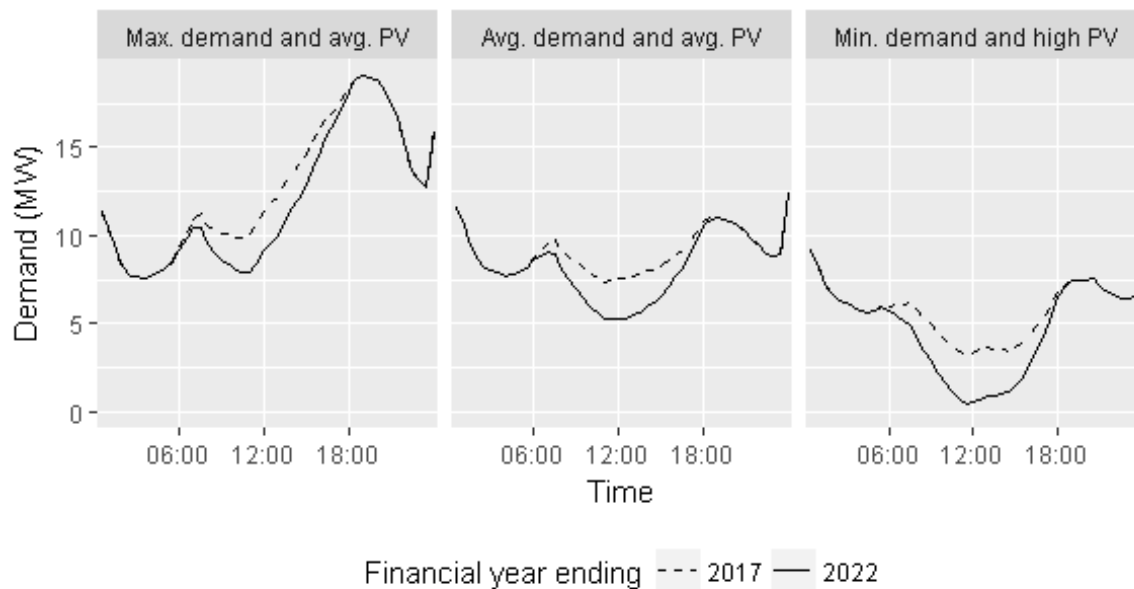| Financial Year	Forecast - MW	Forecast - PF
2018-19	22.0	1.00
2019-20	22.0	1.00
2020-21	22.0	1.00
2021-22	21.9	1.00
2022-23	21.9	1.00
2023-24	21.8	1.00
2024-25	21.8	1.00
2025-26	21.8	1.00
2026-27	21.8	1.00
2027-28	21.8	1.00
2028-29	21.8	1.00

A7.3   Kincraig

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
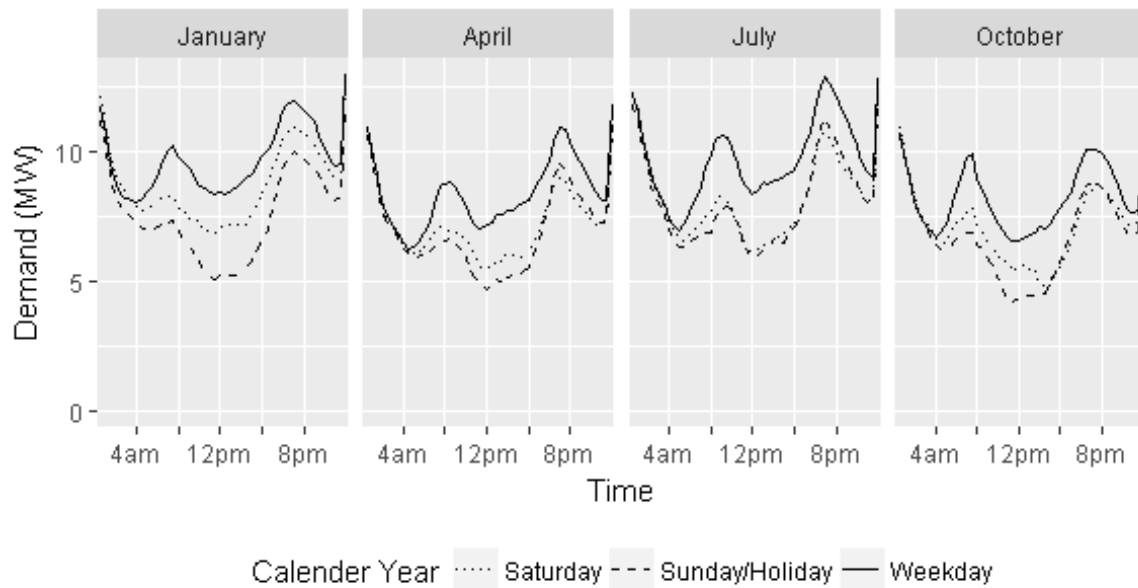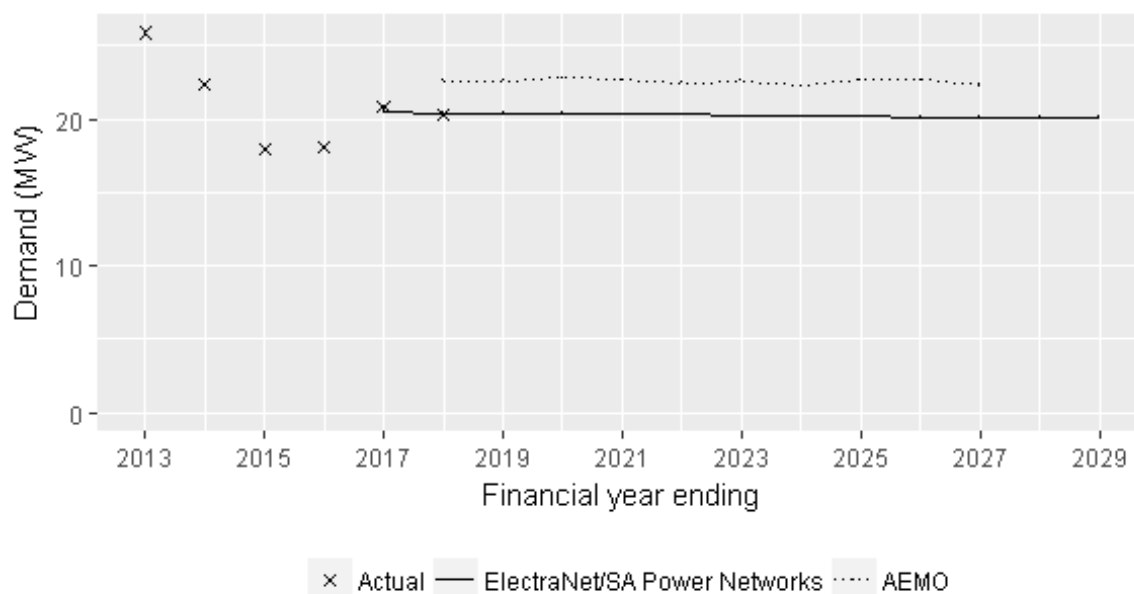
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	21.8
2014-15	19.7
2015-16	21.2
2016-17	19.0
2017-18	19.2

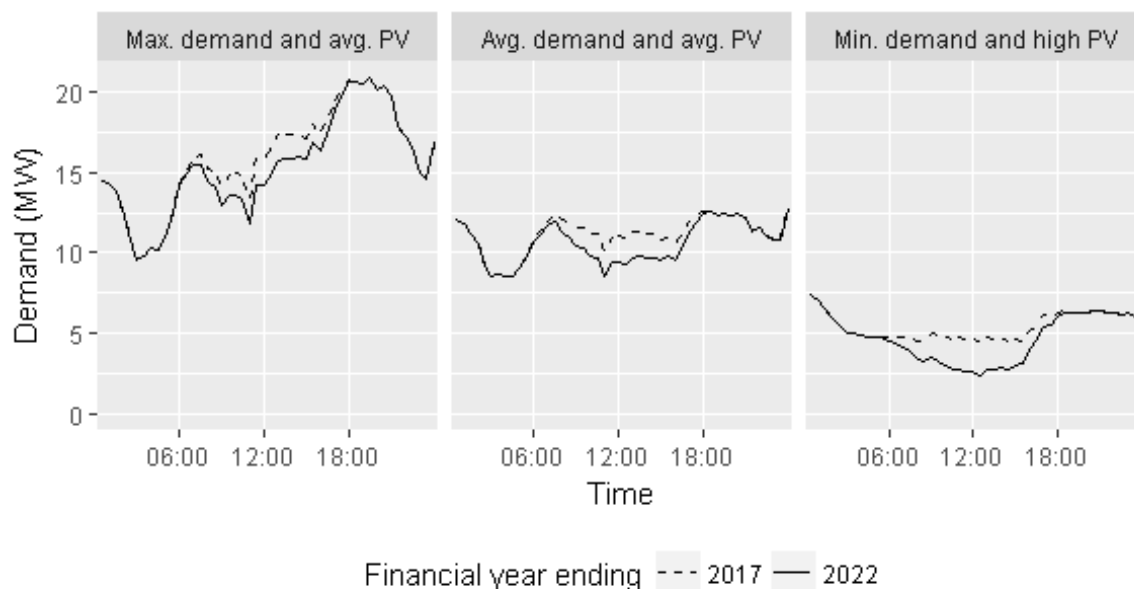| Financial Year	Forecast - MW	Forecast - PF
2018-19	19.6	0.96
2019-20	19.5	0.96
2020-21	19.4	0.96
2021-22	19.3	0.96
2022-23	19.2	0.96
2023-24	19.1	0.96
2024-25	19.0	0.96
2025-26	18.8	0.96
2026-27	18.8	0.96
2027-28	18.7	0.96
2028-29	18.6	0.96

A7.4   Mt Gambier

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
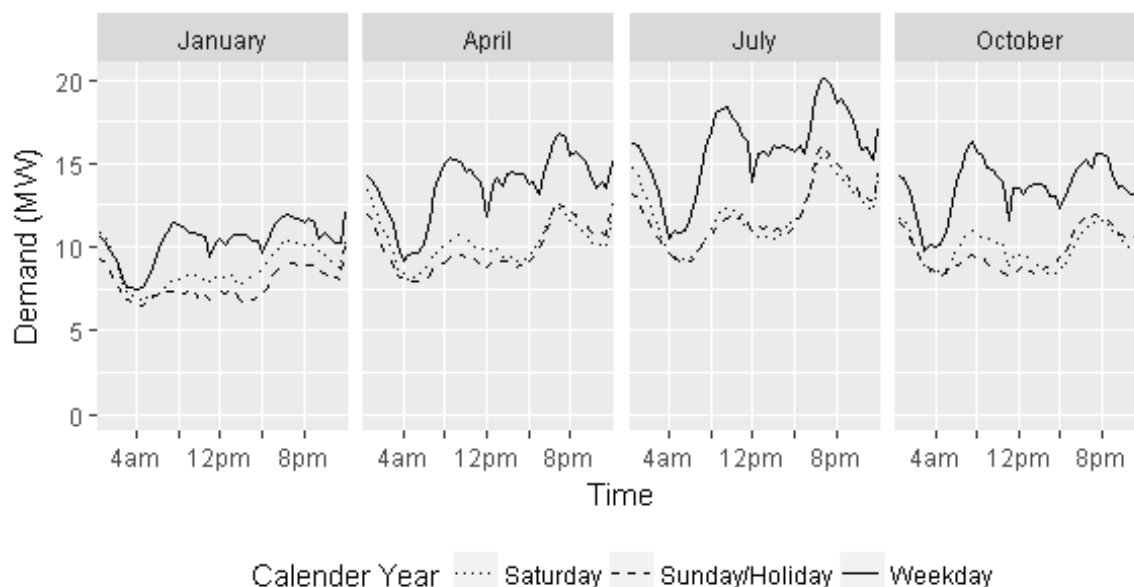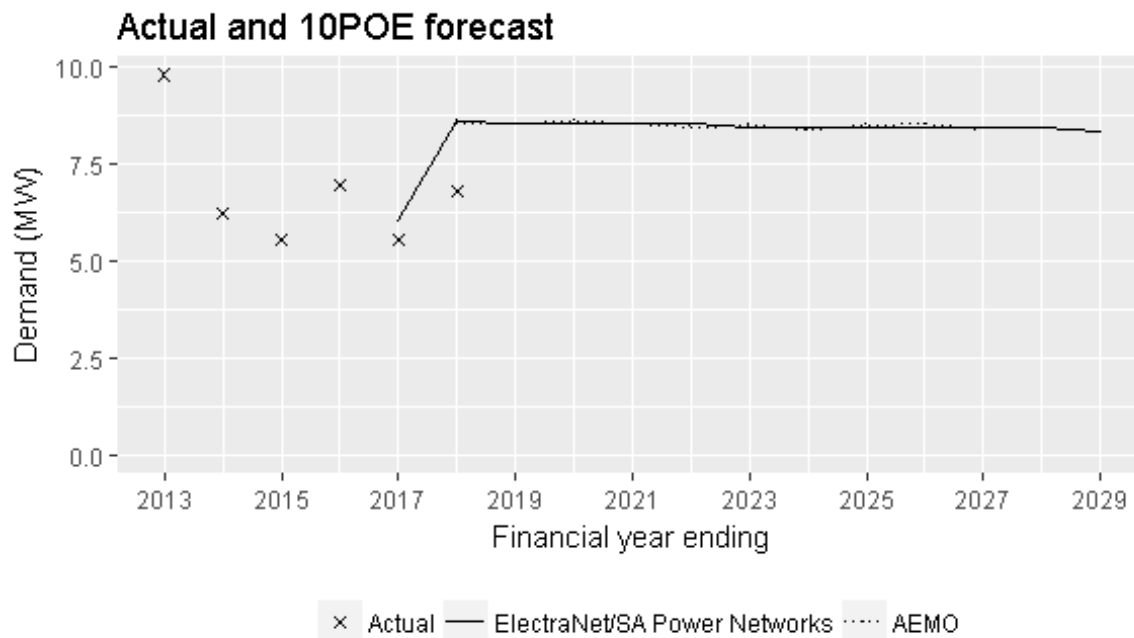
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	22.4
2014-15	18.0
2015-16	18.1
2016-17	20.9
2017-18	20.2

Financial Year	Forecast - MW	Forecast - PF
2018-19	20.4	0.98
2019-20	20.4	0.98
2020-21	20.3	0.98
2021-22	20.3	0.98
2022-23	20.2	0.98
2023-24	20.2	0.98
2024-25	20.2	0.98
2025-26	20.1	0.98
2026-27	20.1	0.98
2027-28	20.1	0.98
2028-29	20.1	0.98

A7.5   Penola West

Category: 4

Actual and 10POE forecast

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

2017 Load profile plus five year's growth in PV

Financial year ending --- 2017 —— 2022

2017 Average load profile by month

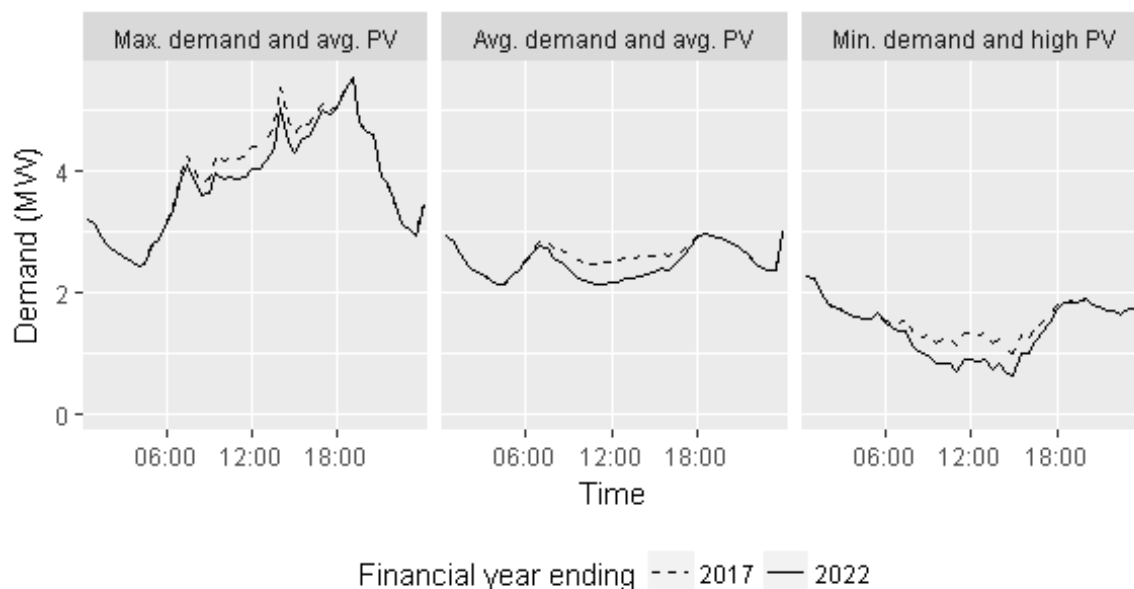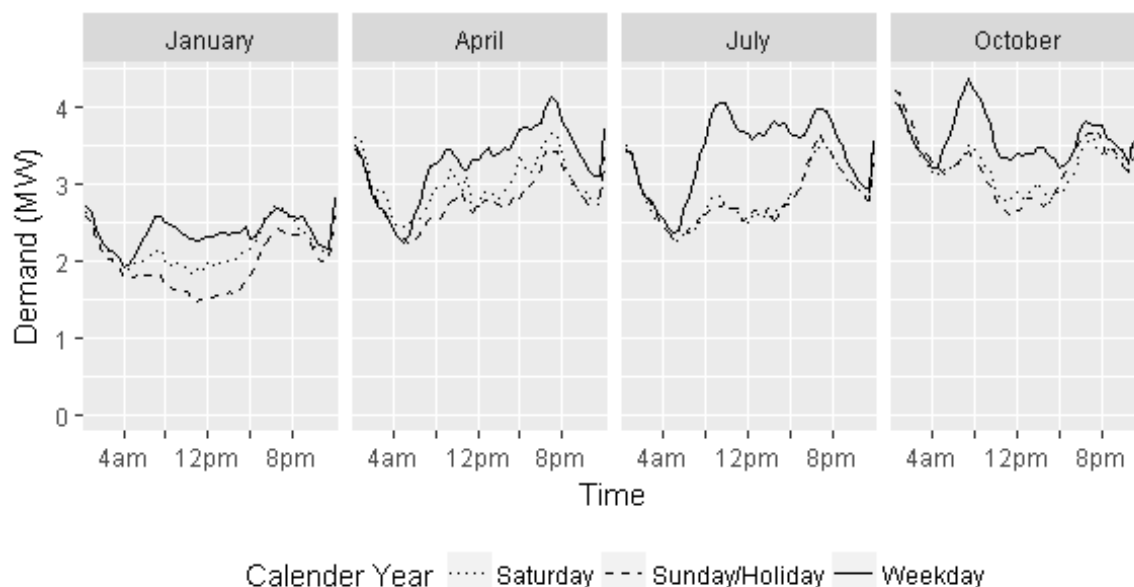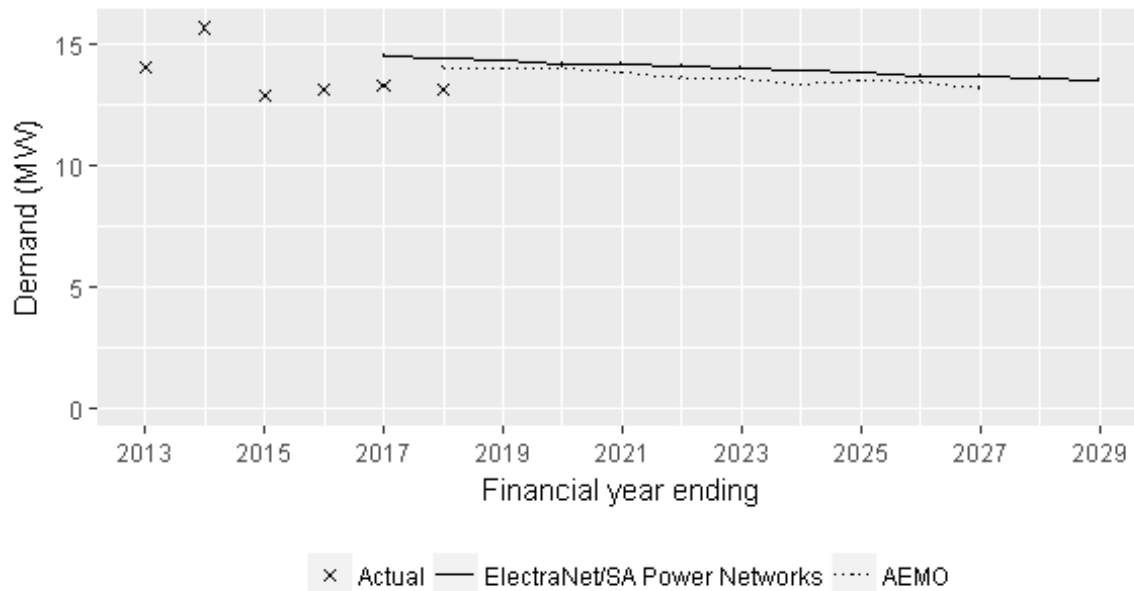Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)
2013-14	6.2
2014-15	5.5
2015-16	6.9
2016-17	5.5
2017-18	6.8

Financial Year	Forecast - MW	Forecast - PF
2018-19	8.5	0.95
2019-20	8.5	0.95
2020-21	8.5	0.95
2021-22	8.5	0.95
2022-23	8.4	0.95
2023-24	8.4	0.95
2024-25	8.4	0.95
2025-26	8.4	0.95
2026-27	8.4	0.95
2027-28	8.4	0.95
2028-29	8.3	0.95

A7.6   Snuggery Rural

Category: 3

Actual and 10POE forecast

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

2017 Load profile plus five year's growth in PV

Financial year ending --- 2017 — 2022

2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	15.7
2014-15	12.9
2015-16	13.1
2016-17	13.3
2017-18	13.1

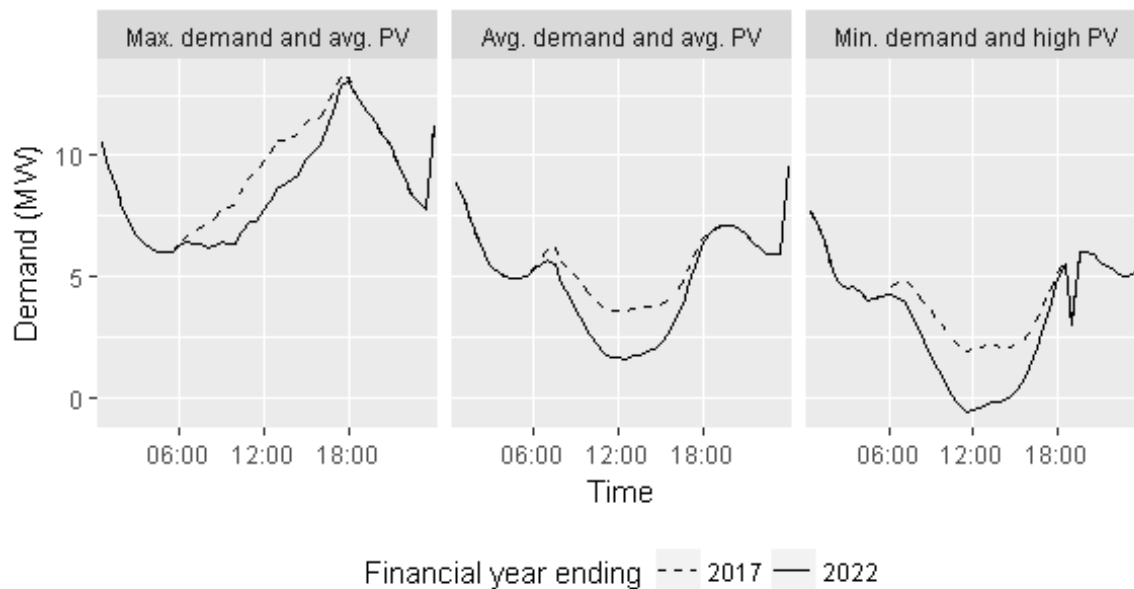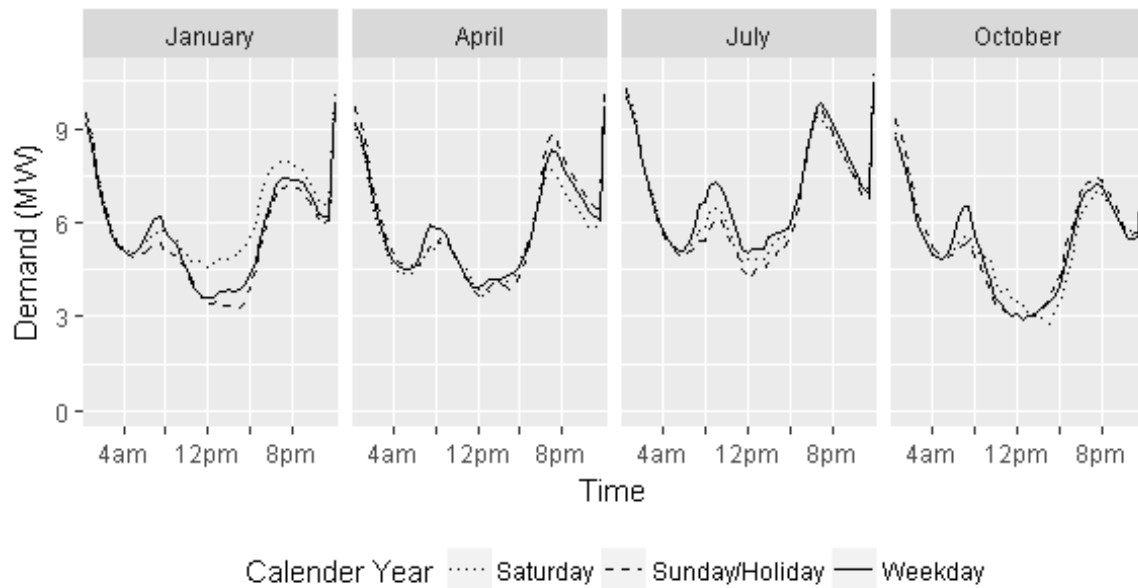| Financial Year	Forecast - MW	Forecast - PF
2018-19	14.3	0.96
2019-20	14.2	0.96
2020-21	14.2	0.96
2021-22	14.1	0.96
2022-23	14.0	0.96
2023-24	13.9	0.96
2024-25	13.8	0.96
2025-26	13.7	0.96
2026-27	13.7	0.96
2027-28	13.6	0.96
2028-29	13.5	0.96

A7.7   Tailem Bend

Category: 4

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month

Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand
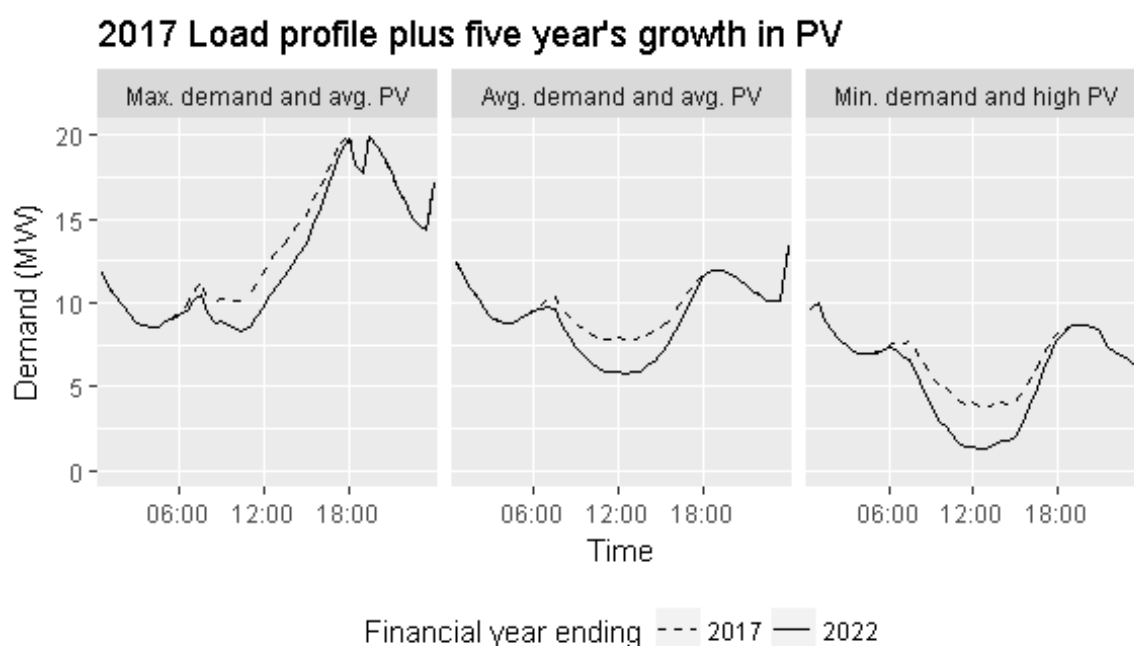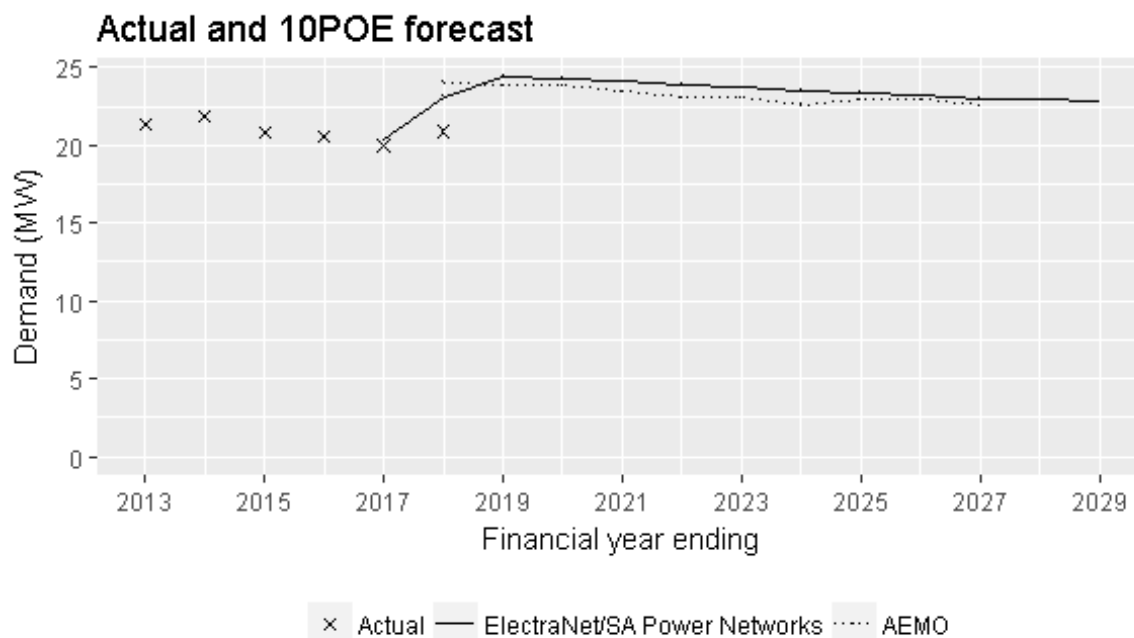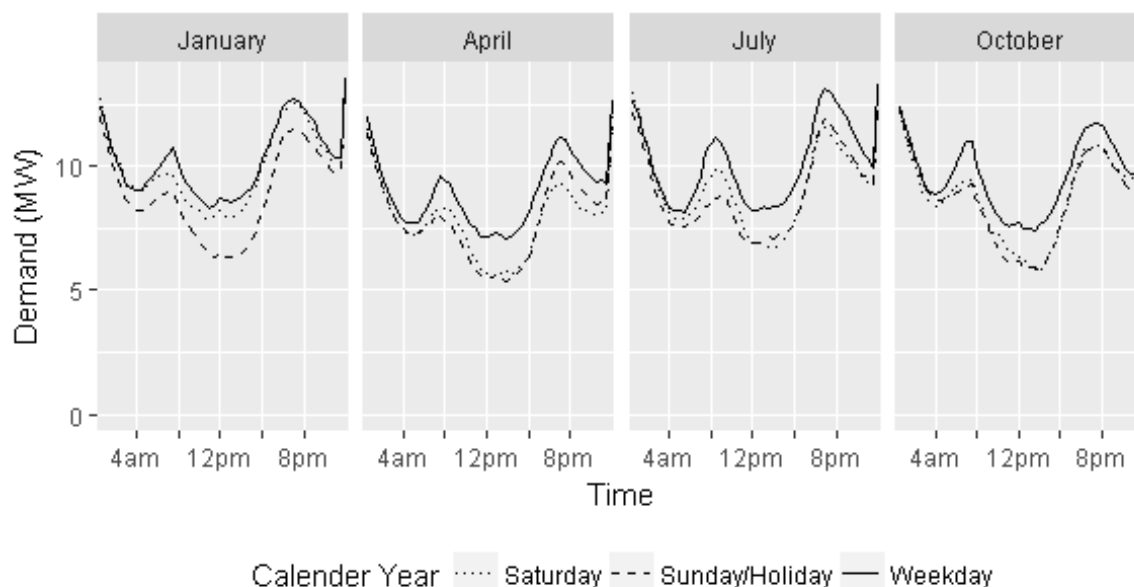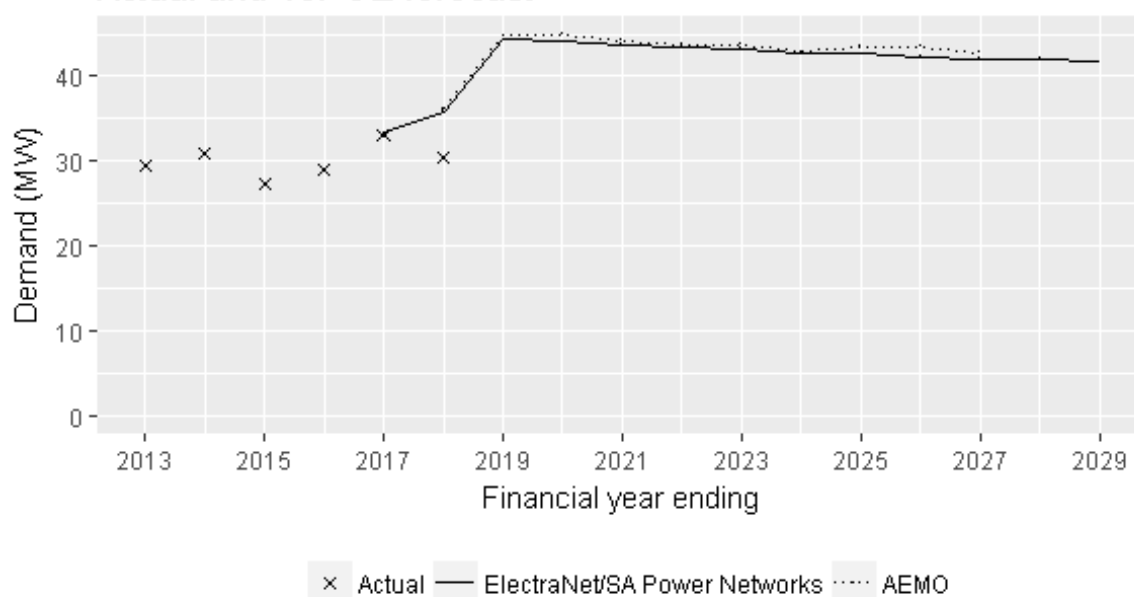
Financial year	Actual (MW)
2013-14	21.8
2014-15	20.8
2015-16	20.6
2016-17	20.0
2017-18	20.9

Financial Year	Forecast - MW	Forecast - PF
2018-19	24.4	0.92
2019-20	24.3	0.92
2020-21	24.1	0.92
2021-22	23.9	0.92
2022-23	23.7	0.92
2023-24	23.5	0.92
2024-25	23.4	0.92
2025-26	23.2	0.92
2026-27	23.0	0.92
2027-28	22.9	0.92
2028-29	22.8	0.92

A8   Upper North

Actual and 10POE forecast
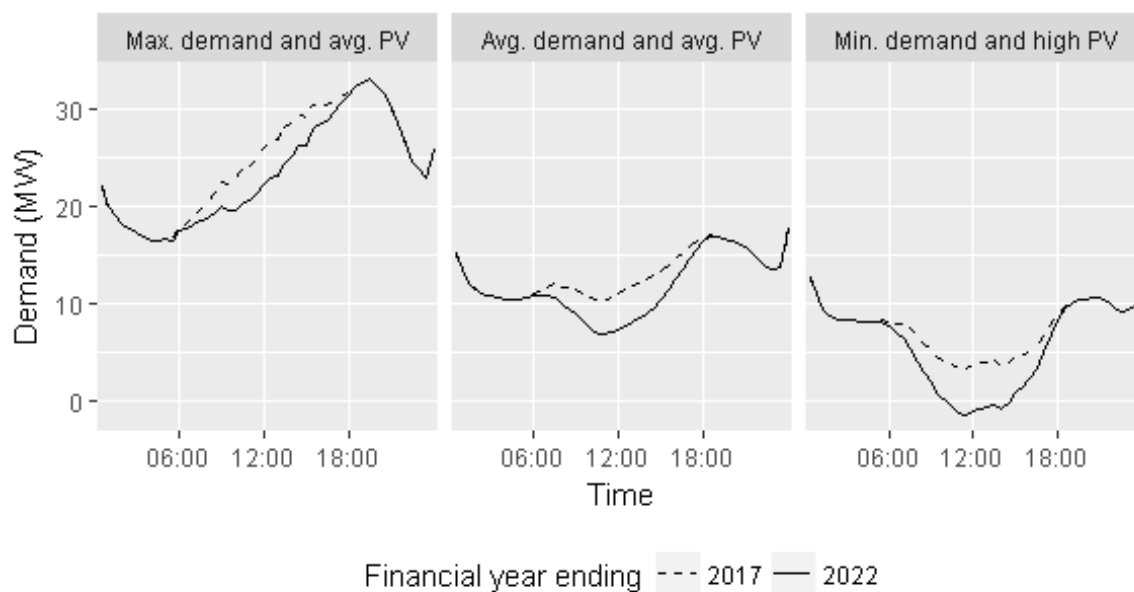
2017 Load profile plus five year's growth in PV

Table of actual and forecast annual active power maximums.

Financial year	Actual (MW)
2013-14	30.8
2014-15	27.3
2015-16	29.1
2016-17	33.1
2017-18	30.4

Financial Year	Forecast - MW
2018-19	35.3
2019-20	34.7
2020-21	34.4
2021-22	34.1
2022-23	33.8
2023-24	33.4
2024-25	33.1
2025-26	32.7
2026-27	32.7
2027-28	32.7
2028-29	32.7

A8.1 Davenport West

Category: 4
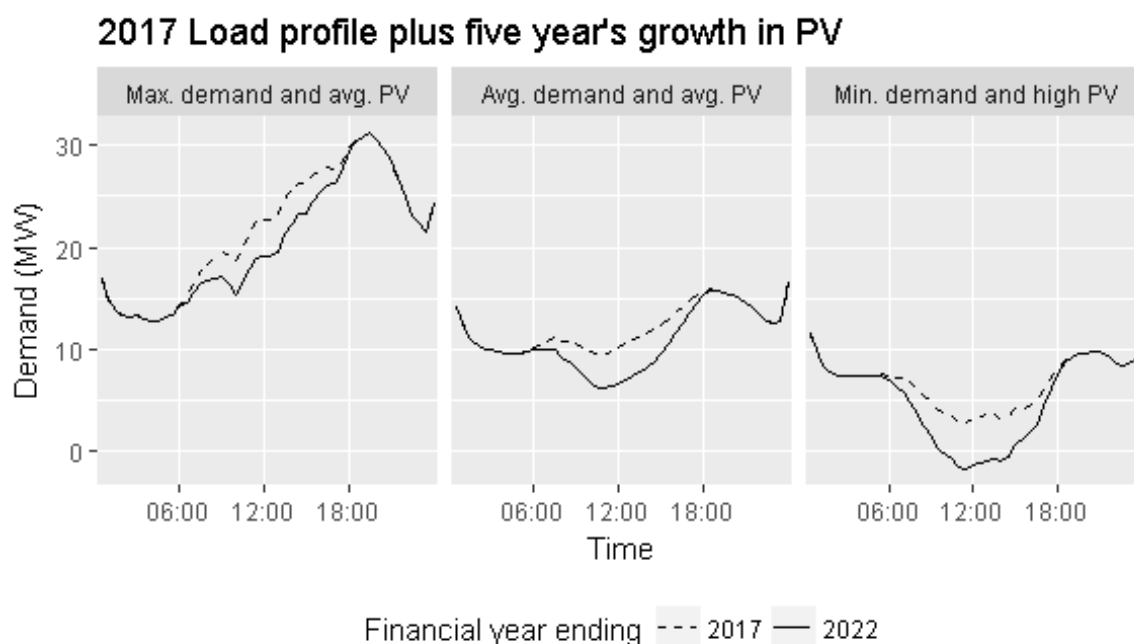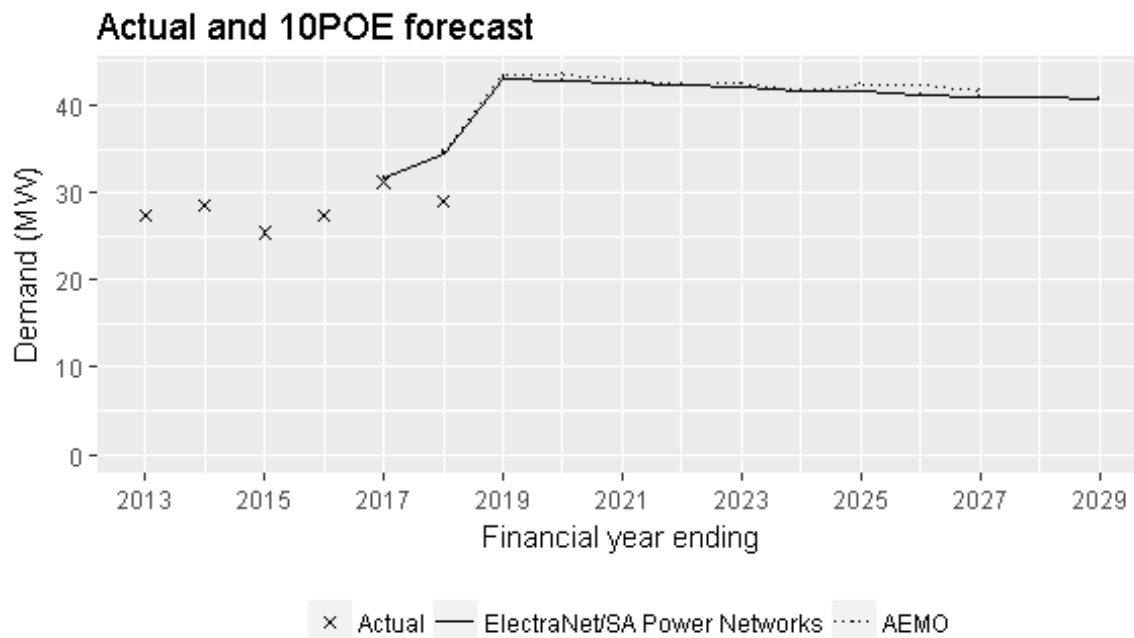
Actual and 10POE forecast

2017 Load profile plus five year's growth in PV

2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	28.6
2014-15	25.4
2015-16	27.3
2016-17	31.2
2017-18	28.9

Financial Year	Forecast - MW	Forecast - PF
2018-19	43.1	0.99
2019-20	42.8	0.99
2020-21	42.5	0.99
2021-22	42.3	0.99
2022-23	42.0	0.99
2023-24	41.7	0.99
2024-25	41.5	0.99
2025-26	41.2	0.99
2026-27	41.0	0.99
2027-28	40.9	0.99
2028-29	40.7	0.99

A8.2   Leigh Creek South

Category: 1

Actual and 10POE forecast

2017 Load profile plus five year's growth in PV
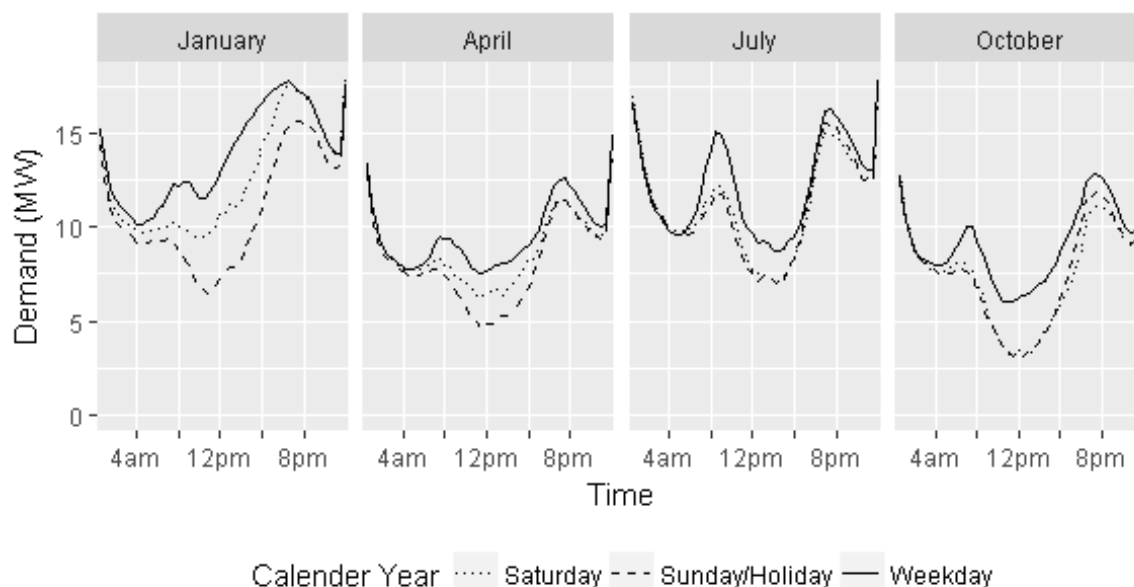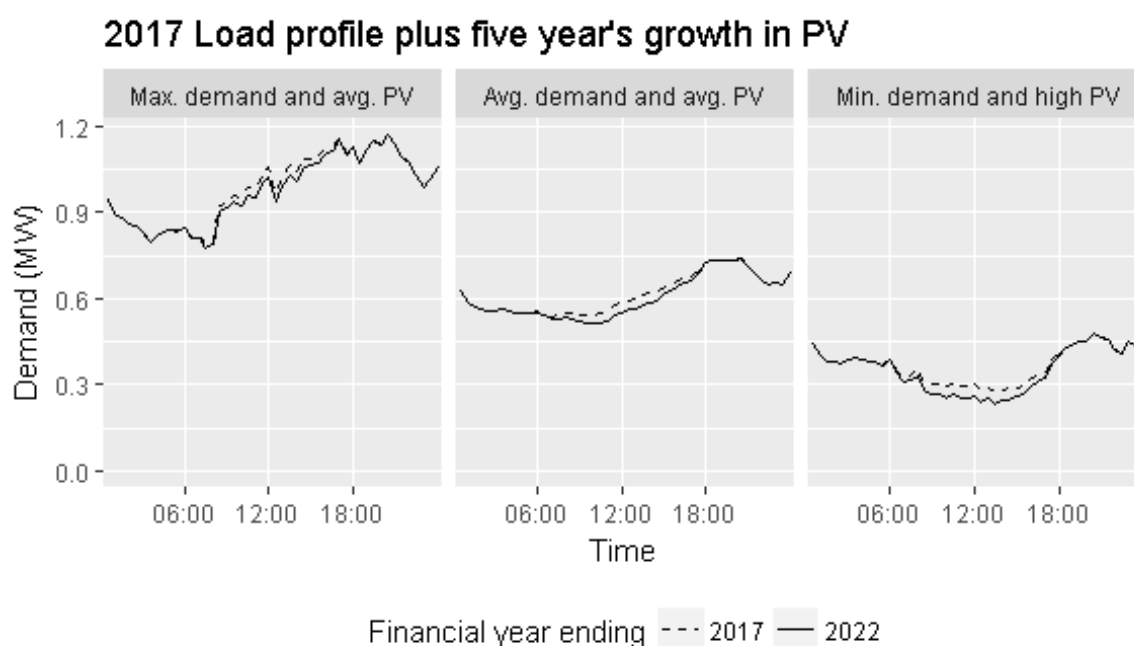
2017 Average load profile by month

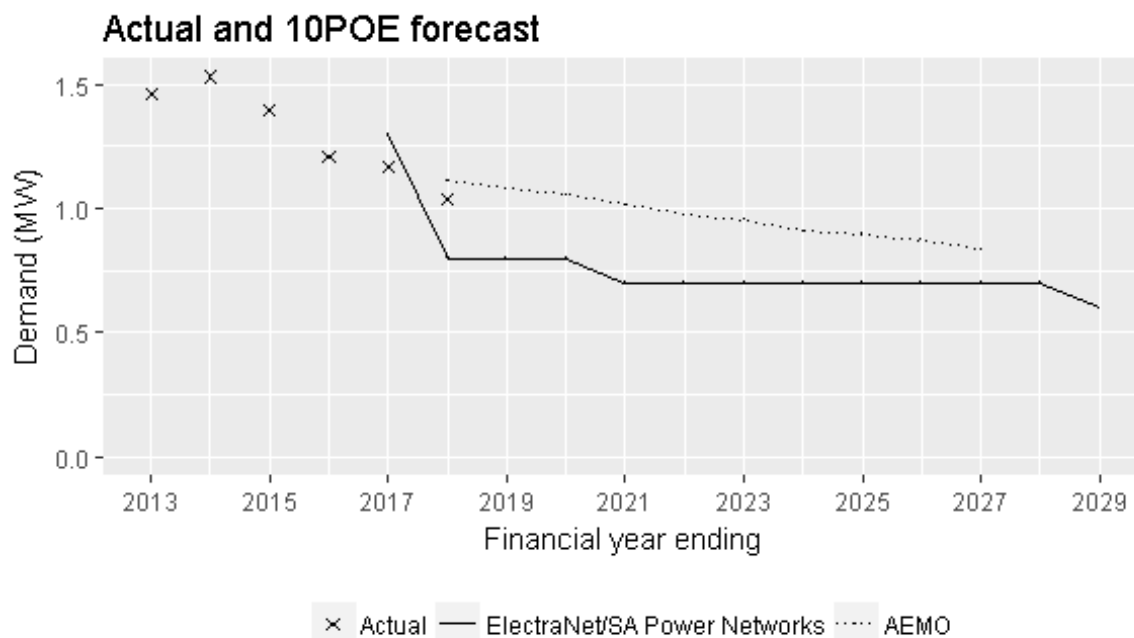Table of actual and forecast annual active power maximums and forecast annual power factor at time of max demand

Financial year	Actual (MW)	
2013-14	1.5	
2014-15	1.4	
2015-16	1.2	
2016-17	1.2	
2017-18	1.0	

Financial Year	Forecast - MW	Forecast - PF
2018-19	0.8	0.98
2019-20	0.8	0.98
2020-21	0.7	0.98
2021-22	0.7	0.98
2022-23	0.7	0.98
2023-24	0.7	0.98
2024-25	0.7	0.98
2025-26	0.7	0.98
2026-27	0.7	0.98
2027-28	0.7	0.98
2028-29	0.6	0.98

A8.3   Neuroodla

Category: 1

Actual and 10POE forecast
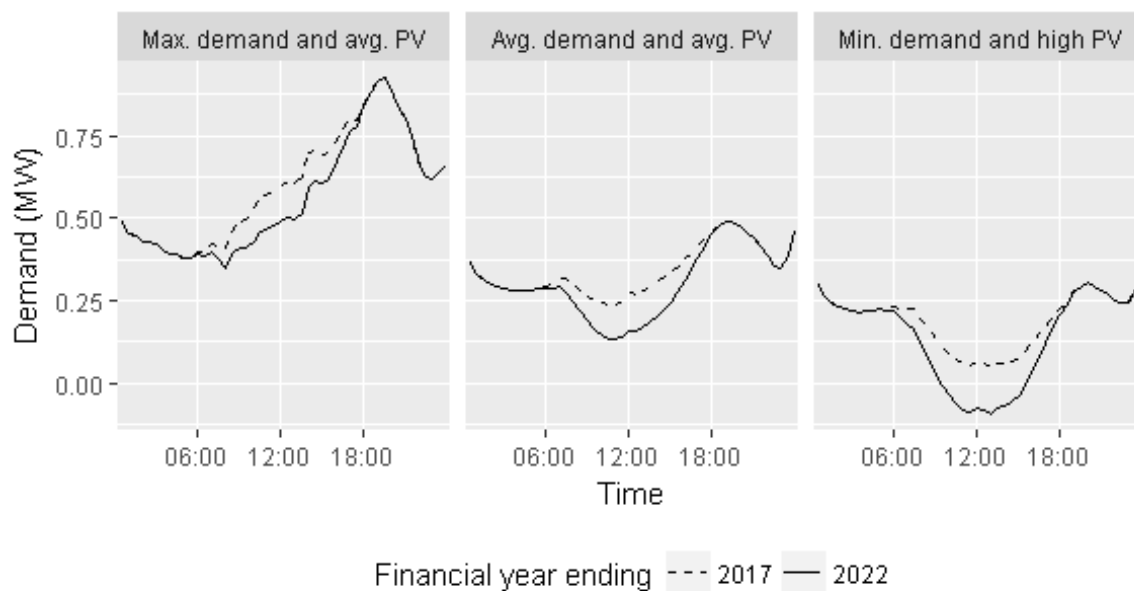
× Actual — ElectraNet/SA Power Networks ····· AEMO

2017 Load profile plus five year's growth in PV

Financial year ending --- 2017 — 2022
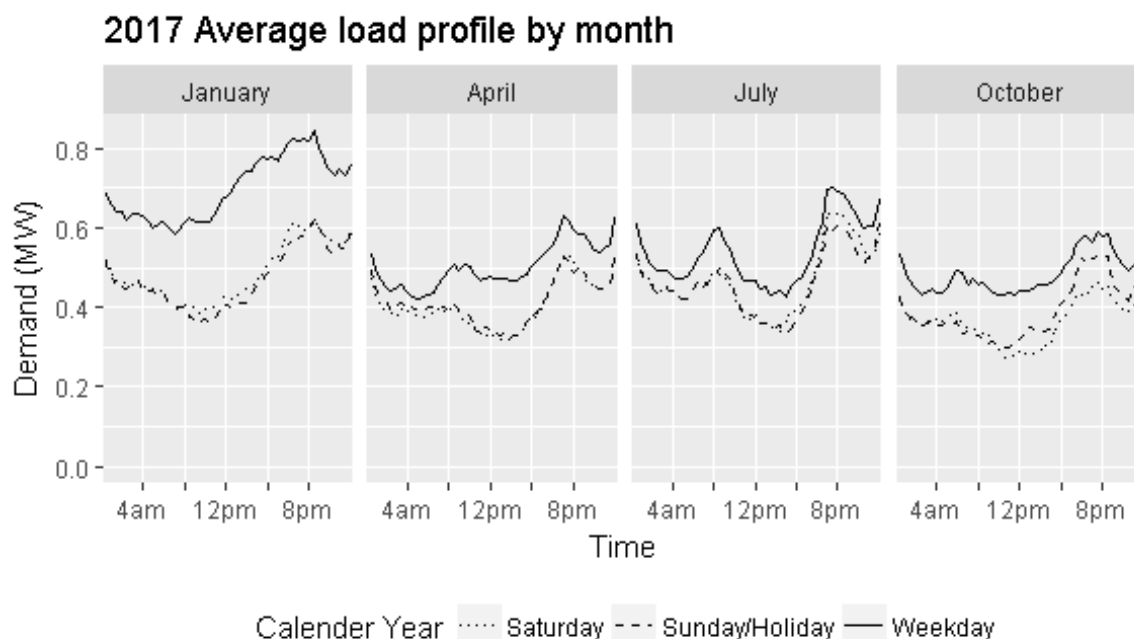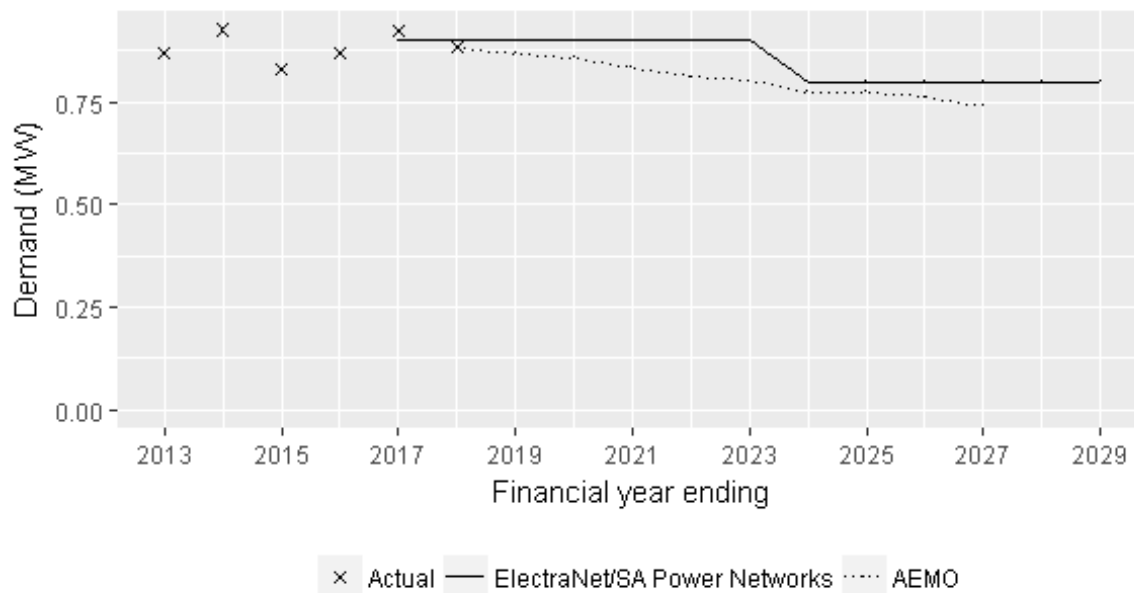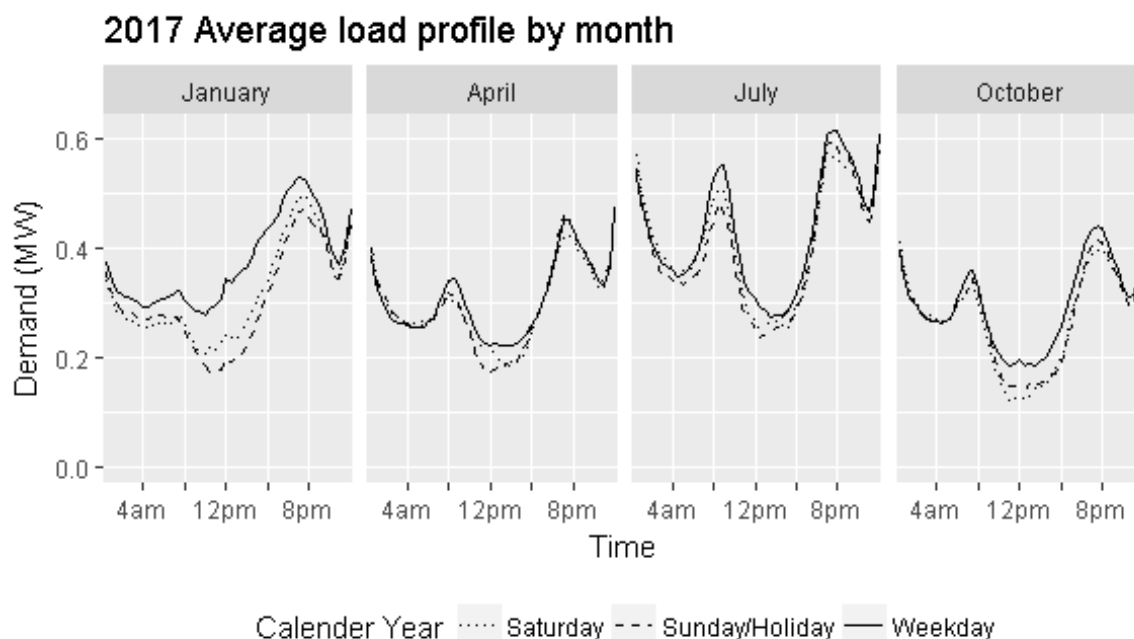
2017 Average load profile by month

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

Financial year	Actual (MW)
2013-14	0.9
2014-15	0.8
2015-16	0.9
2016-17	0.9
2017-18	0.9

Financial Year	Forecast - MW	Forecast - PF
2018-19	0.9	1.00
2019-20	0.9	1.00
2020-21	0.9	1.00
2021-22	0.9	1.00
2022-23	0.9	1.00
2023-24	0.8	1.00
2024-25	0.8	1.00
2025-26	0.8	1.00
2026-27	0.8	1.00
2027-28	0.8	1.00
2028-29	0.8	1.00

Appendix B Connection point coincidence factors

The following tables present the connection point co-incidence factors based on average diversity at each location based on the last six summers.

Connection Point	Coincidence
Eastern Suburbs	0.93
Northern Suburbs	0.97
Southern Suburbs	0.98
Western Suburbs	0.95
Angas Creek	0.87
Kanmantoo	0.83
Mannum	0.84
Mobilong	0.92
Mt Barker	0.93
Port Lincoln	0.92
Stony Point Distribution	0.51
Whyalla Central	0.73
Wudinna	0.87
Yadnarie	0.92
Ardrossan West	0.89
Baroota	0.89
Brinkworth	0.91
Clare North	0.94

Connection Point	Coincidence
Dorrien	0.62
Dalrymple	0.87
Hummocks	0.95
Kadina East	0.94
Port Pirie/Bungama	0.95
Templers	0.93
Waterloo	0.78
Berri	0.94
North West Bend	0.73
Blanche	0.91
Keith	0.85
Kincraig	0.92
Mt Gambier	0.92
Penola West	0.84
Snuggery Rural	0.90
Tailem Bend	0.96
Davenport West	0.95
Leigh Creek South	0.86