CHAPTER 2

Energy and demand projections

2 Energy and demand projections

Key highlights

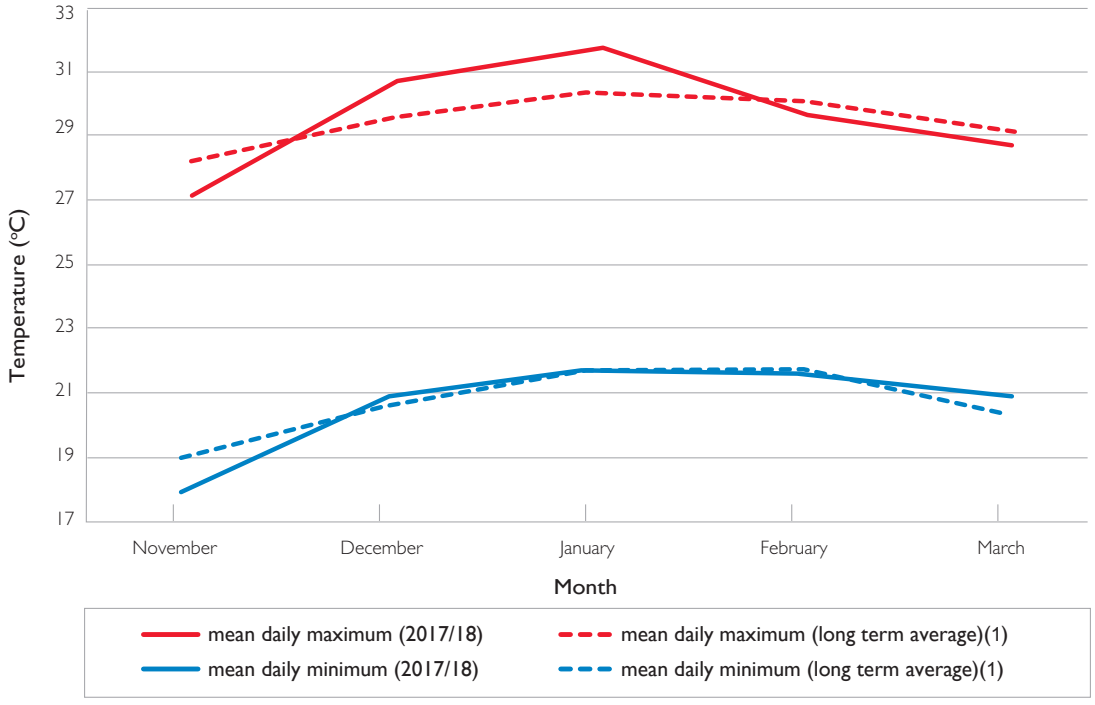
- This chapter describes the historical energy and demand performance of Powerlink's transmission network and provides forecast data separated by zone.
- The 2017/18 summer in Queensland set a new maximum delivered demand record at 5:00pm on 14 February, when 8,842MW was delivered from the transmission network.
- Powerlink develops its energy and demand forecasts using both a top-down econometric model and bottom-up forecasts from the distribution businesses and direct connect customers.
- Queensland's delivered energy consumption is expected to decline over the next 10 years due to the committed and uncommitted solar farms and wind farms connecting to the distribution networks in response to market and policy incentives. Based on the medium economic outlook, delivered energy consumption is expected to decline at an average annual rate of 0.7% per annum over the next 10 years.
- Based on the medium economic outlook, Queensland's delivered maximum demand is expected to maintain low growth, with an average annual increase of 0.4% per annum over the next 10 years.
- Powerlink is focused on understanding the potential future impacts of emerging technologies so transmission network services are developed in ways that are valued by customers.

2.1 Overview

The 2017/18 summer in Queensland set a new record demand at 5:00pm on 14 February, when 8,842MW was delivered from the transmission grid. This corresponded to an operational 'as generated' demand of 9,796MW, passing the previous record of 9,412MW set last summer. After temperature correction, the 2017/18 summer demand exceeded the 2017 Transmission Annual Planning Report (TAPR) forecast by around 3%.

Figure 2.1 shows observed temperatures for Brisbane during summer 2017/18 compared with long-term averages.

Figure 2.1 Brisbane weather over summer 2017/18



Note:

(1) Based on years 2000 to 2018.

Energy delivered from the transmission network for 2017/18 is expected to be within 1% of the 2017 TAPR forecast.

The electrical load for the coal seam gas (CSG) industry has nearly reached its forecast peak with observed demands close to those forecast in the 2017 TAPR. The CSG demand reached 725MW in 2017/18. No new CSG loads have committed to connect to the transmission network since the publication of 2017 TAPR.

The Federal Government's large-scale renewable energy target of 33,000GWh per annum by 2020 has driven renewable capacity in the form of solar photovoltaic (PV) and wind farms to connect to the Queensland transmission and distribution networks over the next two to three years (refer to Table 6.1 and Table 6.2).

The energy forecast includes 654MW of semi-scheduled solar farms and 107MW of semi-scheduled wind farms to connect to the distribution networks. This is 75% of the renewable generation connecting to the distribution networks within Table 6.2. The energy forecast also includes 98MW of non-scheduled solar farms connecting to the distribution networks over the next two years. Solar PV and wind farms connecting directly to the distribution network will reduce the amount of energy being delivered through the transmission network.

Additional uncommitted distribution connected solar farm capacity has been included into the 10-year outlook period from 2023 to model the Queensland government's target of 50% renewable energy by 2030.

Powerlink engaged independent consultants to develop the Queensland retail electricity price projections for the 10-year forecast period of the 2018 TAPR. The price projection forecast includes a significant reduction over the next five years, which is much lower than the price projections assumed within the 2017 TAPR. The reduction in forecast retail price is attributed to the high quantities of renewable generation that have committed over the previous 12 months within Queensland. The additional generation is expected to make the wholesale generation market within Queensland more competitive.

Based on the historical impact of electricity prices on electricity demand, a reduction in electricity prices would result in higher electricity demand. However, the consumer response to falling electricity prices is expected to be weaker on increasing electricity usage than rising electricity prices had on dampening electricity usage. It is expected that electricity consumers will generally maintain their energy efficiency behaviours with falling electricity prices and this has been reflected in the demand and energy forecast. The Queensland Government is supporting continued energy efficiency behaviours by encouraging households to purchase four-star and higher energy efficient appliances through their energy efficient appliance rebate.

During the 2017/18 summer, Queensland reached 2,000MW of installed rooftop PV capacity. Growth in rooftop PV capacity has increased from around 15MW per month in 2016/17 to 25MW per month in 2017/18. However, the forecast of reducing electricity prices will extend the payback period of new rooftop PV and this is expected to decrease the rate of new capacity over the forecasting period. New rooftop PV capacity is forecast to remain at 25MW per month in 2018/19 before reducing and remaining at 15MW per month from 2020/21. An impact of rooftop PV has been the delay of the time of state maximum demand, which now occurs around 5:30pm. As more rooftop PV is installed, future summer maximum demands are likely to occur in the early evening.

The summer maximum demand and winter maximum demand forecasts presented in this TAPR indicate low growth over the 10-year outlook period. Independent economic outlook is that Queensland, on the whole, has been experiencing slow economic growth. However, this is expected to return to solid growth for the forecasting period. The lower Australian dollar has improved growth prospects in areas such as tourism and foreign education while there is moderate growth in the engineering construction industry. Queensland's population growth has slowed following the resources boom and is expected to increase by around 16% to around 5.8 million over the 10-year forecast period.

2 Energy and demand projections

Powerlink is committed to understanding the future impacts of emerging technologies so that transmission network services are developed in ways that are valued by customers. For example, future developments in battery storage technology coupled with small-scale PV could see significant changes to future electricity usage patterns. This could reduce the need to develop transmission services to cover short duration peaks. Details of Powerlink's forecasting methodology can be found in Appendix B.

The delivered maximum demand forecast in the 2018 TAPR shows a slight increase compared to the 2017 TAPR. The increase is due to a higher than expected maximum demand for 2017/18 and to an expectation that electricity prices will fall. Figure 2.2 shows a comparison of the delivered summer maximum demand forecast with the 2017 TAPR, based on a 50% probability of exceedance (PoE) and medium economic outlook.

The delivered energy forecast in the 2018 TAPR shows a reduction compared to the 2017 TAPR. The reduction is largely due to the high quantity of distribution connected solar PV farms that were committed over the last 12 months. Also, additional uncommitted distribution connected solar PV farm capacity has been included to meet a proportion of the Queensland Government's target of 50% renewable energy by 2030. Figure 2.3 shows a comparison of the delivered energy forecast with the 2017 TAPR, based on the medium economic outlook.

Figure 2.2 Comparison of the medium economic outlook demand forecasts

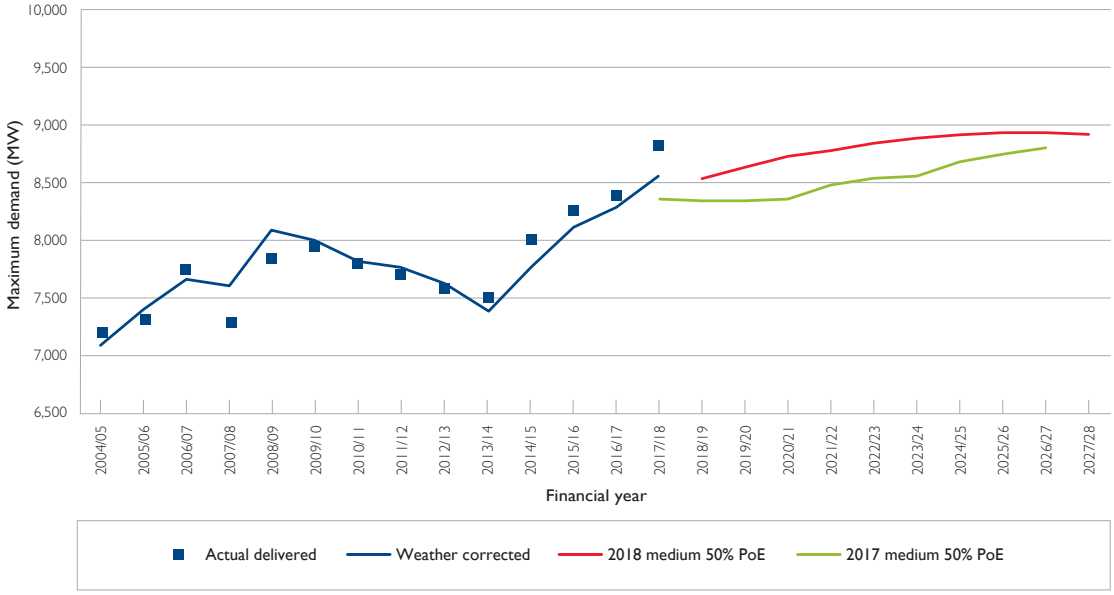
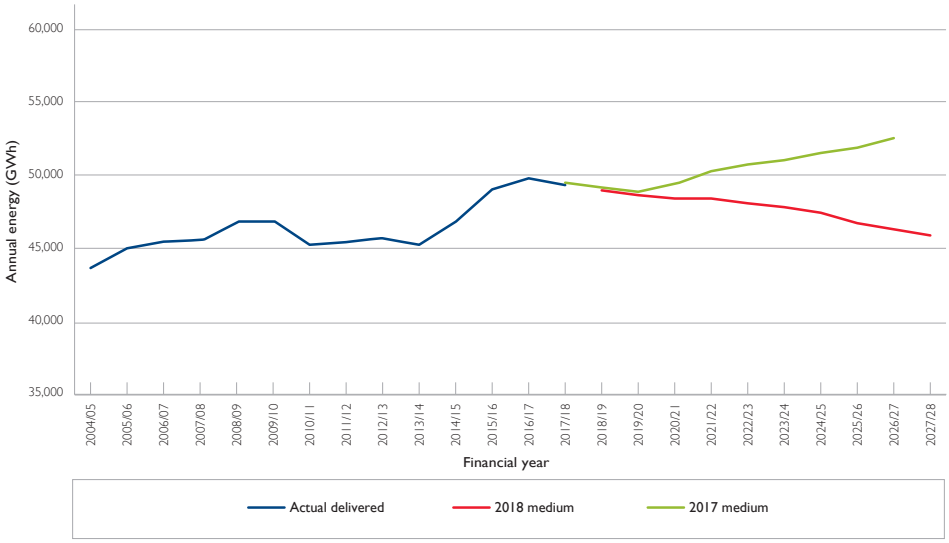


Figure 2.3 Comparison of the medium economic outlook energy forecasts



2.2 Customer consultation

In accordance with the National Electricity Rules (NER), Powerlink has obtained summer and winter maximum demand forecasts over a 10-year outlook period from Queensland's Distribution Network Service Providers (DNSPs), Energex and Ergon Energy (part of the Energy Queensland group). These connection supply point forecasts are presented in Appendix A. Also in accordance with the NER, Powerlink has obtained summer and winter maximum demand forecasts from other customers that connect directly to the transmission network. These forecasts have been aggregated into demand forecasts for the Queensland region and for 11 geographical zones, defined in Table 2.12 in Section 2.4, using diversity factors observed from historical trends.

Energy forecasts for each connection supply point were obtained from Energex, Ergon Energy and other transmission connected customers. These have also been aggregated for the Queensland region and for each of the 11 geographical zones in Queensland.

Powerlink works with Energex, Ergon Energy, Australian Energy Market Operator (AEMO), customer and consumer representatives, and the wider industry to refine its forecasting process and input information.

Powerlink, Energex and Ergon Energy jointly conduct the Queensland Household Energy Survey to improve understanding of consumer behaviours and intentions. This survey provides air conditioning penetration forecasts that feed directly into the demand forecasting process, plus comprehensive insights on consumer intentions on electricity usage.

Powerlink's forecasting methodology is described in Appendix B.

Transmission customer forecasts

New large loads

No new large loads have connected or have committed to connect in the outlook period.

Possible new large loads

There are several proposals under development for large mining, metal processing and other industrial loads. These are not yet at a stage that they can be included (either wholly or in part) in the medium economic forecast. These developments totalling nearly 900MW, are listed in Table 2.1.

Table 2.1 Possible large loads excluded from the medium economic outlook forecast

Zone	Description	Possible load
North	Further port expansion at Abbot Point	Up to 100MW
North	CSG load (Bowen Basin area)	Up to 80MW
North and Central West	New coal mining load (Galilee Basin area)	Up to 400MW
Surat	CSG load and coal mining projects (Surat Basin area)	Up to 300MW

2.3 Demand forecast outlook

The following sections outline the Queensland forecasts for energy, summer maximum demand and winter maximum demand.

All forecasts are prepared for three economic outlooks, high, medium and low. Demand forecasts are also prepared to account for seasonal variation. These seasonal variations are referred to as 10% PoE, 50% PoE and 90% PoE forecasts. They represent conditions that would expect to be exceeded once in 10 years, five times in 10 years and nine times in 10 years respectively.

The 'as generated' and 'sent out' maximum demands within the summer and winter maximum demand tables 2.6 and 2.9, have been changed from scheduled to operational within the 2018 TAPR. Scheduled demands are a short-term forecast used for the dispatch of scheduled and semi-scheduled generators, whereas operational demand is the actual demand that occurred. There is minimal difference between scheduled and operational demands. The change will bring the 2018 TAPR into alignment with other market participants that are using operational demand.

The forecast average annual growth rates for the Queensland region over the next 10 years under low, medium and high economic growth outlooks are shown in Table 2.2. These growth rates refer to transmission delivered quantities as described in Section 2.3.2. For summer and winter maximum demand, growth rates are based on 50% PoE corrected values for 2017/18.

Table 2.2 Average annual growth rate over next 10 years

	Economic growth outlooks		
	Low	Medium	High
Delivered energy	-1.4%	-0.7%	0.3%
Delivered summer peak demand (50% PoE)	-0.1%	0.4%	1.2%
Delivered winter peak demand (50% PoE)	0.2%	0.7%	1.3%

2.3.1 Future management of maximum demand

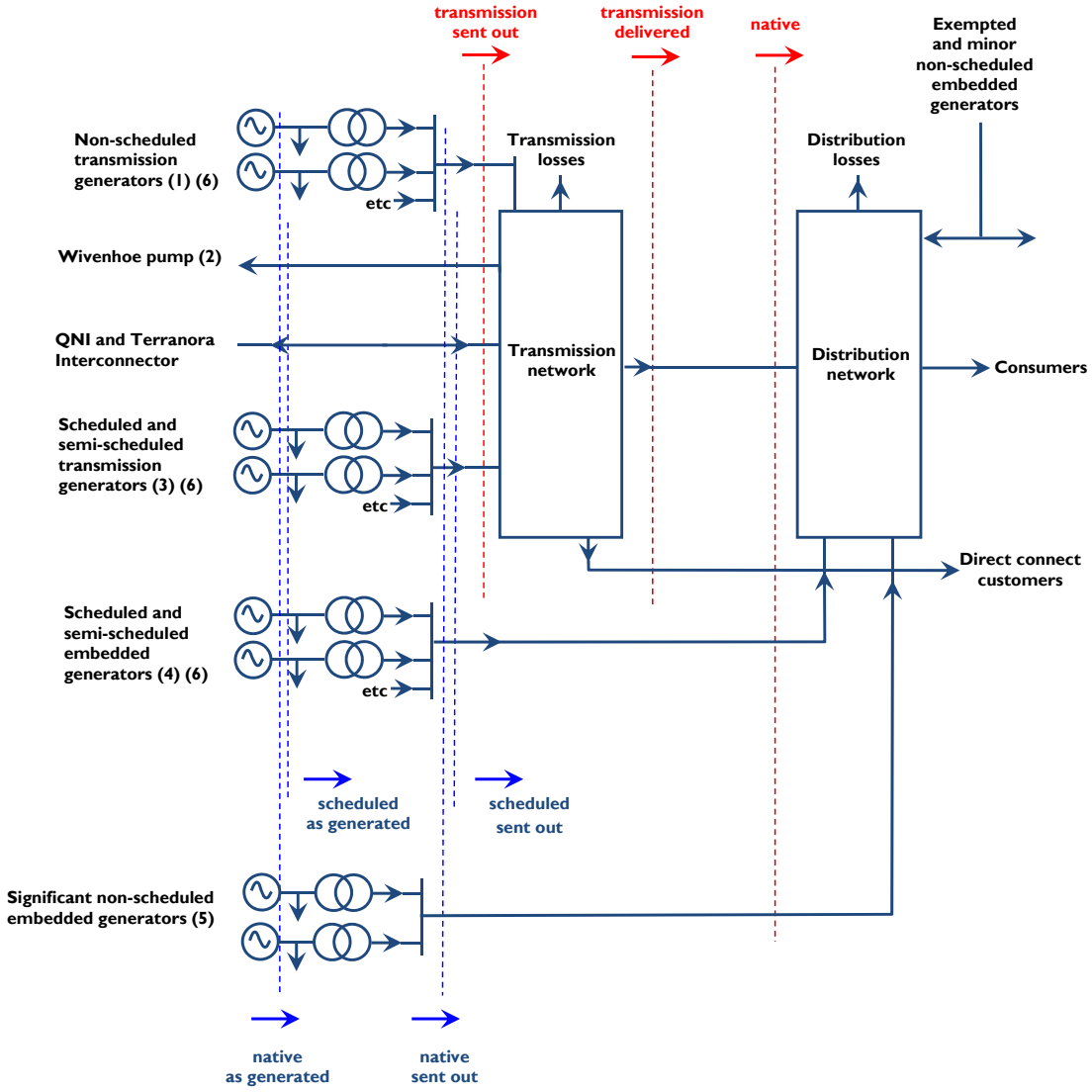
The installation of additional rooftop PV systems and distribution connected solar farms is expected to delay the current time of the maximum demand from around 5:30pm to an evening peak and reduce the delivered demand and energy during daylight hours. The 10-year demand forecast shows low growth in the maximum demand (refer to Figure 2.2). If the trend continues, Powerlink will need to consider the approach to meet these evening peaks. However, there is an opportunity for new technology and non-network solutions to assist in managing evening demand, which could deliver cost efficiencies and negate the need to build new transmission assets. The successful integration of non-network solutions has the potential to shift and reduce maximum demand back into the period where demand levels are reduced due to embedded solar generation. This can also have the benefit of impacting the scope of Powerlink's reinvestment decisions when assets approach end of technical service life.

Powerlink seeks input on new technology and non-network solutions through ongoing engagement activities such as the annual Transmission Network Forum, Powerlink's Customer Panel, Future Transmission Network webinars (refer to Section 1.9.1) and Non-network Engagement Stakeholder Register (NESR) (refer to Section 1.9.2). Early advice on the potential for non-network solutions is provided each year in the TAPR (refer to Chapter 5 and Appendix F) and submissions for non-network solutions are invited as part of the TAPR process. Powerlink will also continue to request non-network solutions from market participants for individual asset reinvestments as part of the Regulatory Investment Test for Transmission (RIT-T) process defined in the NER.

2.3.2 Demand and energy terminology

The reported demand and energy on the network depends on where it is being measured. Individual stakeholders have reasons to measure demand and energy at different points. Figure 2.4 shows the common ways to measure demand and energy, with this terminology used consistently throughout the TAPR.

Figure 2.4 Load forecast definitions



Notes:

(1) Includes Invicta and Koombooloomba.

(2) Depends on Wivenhoe generation.

(3) Includes Yarwun which is non-scheduled.

(4) Barcaldine, Roma, Mackay, Kidston Solar Farm and Townsville Power Station 66kV component.

(5) Pioneer Mill, Racecourse Mill, Moranbah North, Moranbah, Barcaldine Solar Farm, German Creek, Oaky Creek, Isis Central Sugar Mill, Daandine, Bromelton and Rocky Point.

(6) For a full list of transmission network connected generators and scheduled and semi-scheduled embedded generators refer to Table 6.1 and Table 6.2.

2.3.3 Energy forecast

Historical Queensland energy is presented in Table 2.3. They are recorded at various levels in the network as defined in Figure 2.4.

Transmission losses are the difference between transmission sent out and transmission delivered energy. Scheduled power station auxiliaries are the difference between scheduled as generated and scheduled sent out energy.

Table 2.3 Historical energy (GWh)

Year	Operational as generated	Operational sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Native	Native plus solar PV
2008/09	52,591	48,831	53,638	50,008	48,351	46,907	48,563	48,563
2009/10	53,150	49,360	54,419	50,753	48,490	46,925	49,187	49,187
2010/11	51,381	47,804	52,429	48,976	46,866	45,240	47,350	47,350
2011/12	51,147	47,724	52,206	48,920	46,980	45,394	47,334	47,334
2012/13	50,711	47,368	52,045	48,702	47,259	45,651	47,090	47,090
2013/14	49,686	46,575	51,029	47,918	46,560	45,145	46,503	46,503
2014/15	51,855	48,402	53,349	50,047	48,332	46,780	48,495	49,952
2015/16	54,238	50,599	55,752	52,223	50,573	49,094	50,744	52,509
2016/17	55,101	51,323	56,674	53,017	51,262	49,880	51,635	53,506
2017/18 (1)	54,619	50,8867	56,228	52,6156	50,8723	49,374	51,117	53,663

Note:

(1) These projected end of financial year values are based on revenue metering and statistical data up until April 2018.

The forecast transmission delivered energy forecasts are presented in Table 2.4 and in Figure 2.5. Forecast native energy forecasts are presented in Table 2.5.

Table 2.4 Forecast annual transmission delivered energy (GWh)

Year	Low growth outlook	Medium growth outlook	High growth outlook
2018/19	48,765	49,061	49,664
2019/20	48,179	48,736	49,771
2020/21	47,542	48,494	49,718
2021/22	47,018	48,331	49,896
2022/23	46,504	48,126	50,036
2023/24	45,924	47,862	50,196
2024/25	45,137	47,356	50,417
2025/26	44,314	46,792	50,375
2026/27	43,675	46,410	50,612
2027/28	42,962	45,913	50,720

2 Energy and demand projections

Figure 2.5 Historical and forecast transmission delivered energy

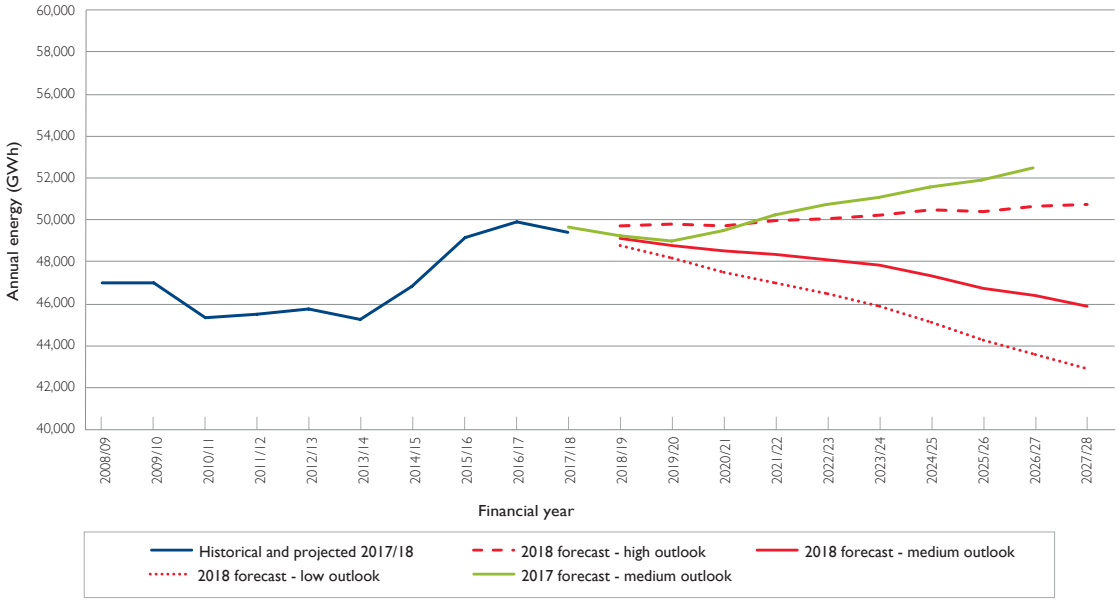


Table 2.5 Forecast annual native energy (GWh)

Year	Low growth outlook	Medium growth outlook	High growth outlook
2018/19	50,788	51,084	51,686
2019/20	50,774	51,331	52,366
2020/21	51,082	52,034	53,258
2021/22	51,066	52,379	53,945
2022/23	50,893	52,516	54,425
2023/24	50,651	52,589	54,924
2024/25	50,192	52,410	55,472
2025/26	49,684	52,163	55,746
2026/27	49,361	52,096	56,298
2027/28	48,949	51,899	56,707

2.3.4 Summer maximum demand forecast

Historical Queensland summer maximum demands at time of native peak are presented in Table 2.6.

Table 2.6 Historical summer maximum demand (MW)

Summer	Operational as generated	Operational sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Native	Native plus solar PV	Native corrected to 50% PoE
2008/09	8,707	8,135	8,767	8,239	8,017	7,849	8,070	8,070	8,318
2009/10	8,897	8,427	9,053	8,603	8,292	7,951	8,321	8,321	8,364
2010/11	8,826	8,299	8,895	8,374	8,020	7,797	8,152	8,152	8,187
2011/12	8,714	8,236	8,769	8,319	7,983	7,723	8,059	8,059	8,101
2012/13	8,479	8,008	8,691	8,245	7,920	7,588	7,913	7,913	7,952
2013/14	8,374	7,947	8,531	8,114	7,780	7,498	7,831	7,831	7,731
2014/15	8,831	8,398	9,000	8,589	8,311	8,019	8,326	8,512	8,084
2015/16	9,154	8,668	9,272	8,848	8,580	8,271	8,539	8,783	8,369
2016/17	9,412	8,886	9,541	9,062	8,698	8,392	8,756	8,899	8,666
2017/18	9,796	9,262	10,054	9,480	9,133	8,842	9,189	9,594	8,924

The transmission delivered summer maximum demand forecasts are presented in Table 2.7 and in Figure 2.6. Forecast summer native demand is presented in Table 2.8.

Table 2.7 Forecast summer transmission delivered demand (MW)

Summer	Low growth outlook			Medium growth outlook			High growth outlook		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2018/19	8,015	8,491	9,080	8,059	8,538	9,130	8,144	8,626	9,221
2019/20	8,065	8,551	9,152	8,151	8,642	9,248	8,271	8,768	9,382
2020/21	8,093	8,588	9,198	8,235	8,737	9,356	8,406	8,917	9,548
2021/22	8,092	8,594	9,214	8,285	8,797	9,430	8,501	9,025	9,672
2022/23	8,092	8,600	9,228	8,330	8,852	9,496	8,604	9,141	9,804
2023/24	8,088	8,601	9,234	8,373	8,902	9,555	8,717	9,264	9,940
2024/25	8,059	8,575	9,211	8,387	8,921	9,581	8,833	9,390	10,077
2025/26	8,037	8,556	9,196	8,407	8,947	9,614	8,923	9,489	10,188
2026/27	7,991	8,512	9,155	8,401	8,945	9,618	9,010	9,584	10,294
2027/28	7,930	8,453	9,099	8,376	8,925	9,603	9,075	9,659	10,379

Figure 2.6 Historical and forecast transmission delivered summer demand

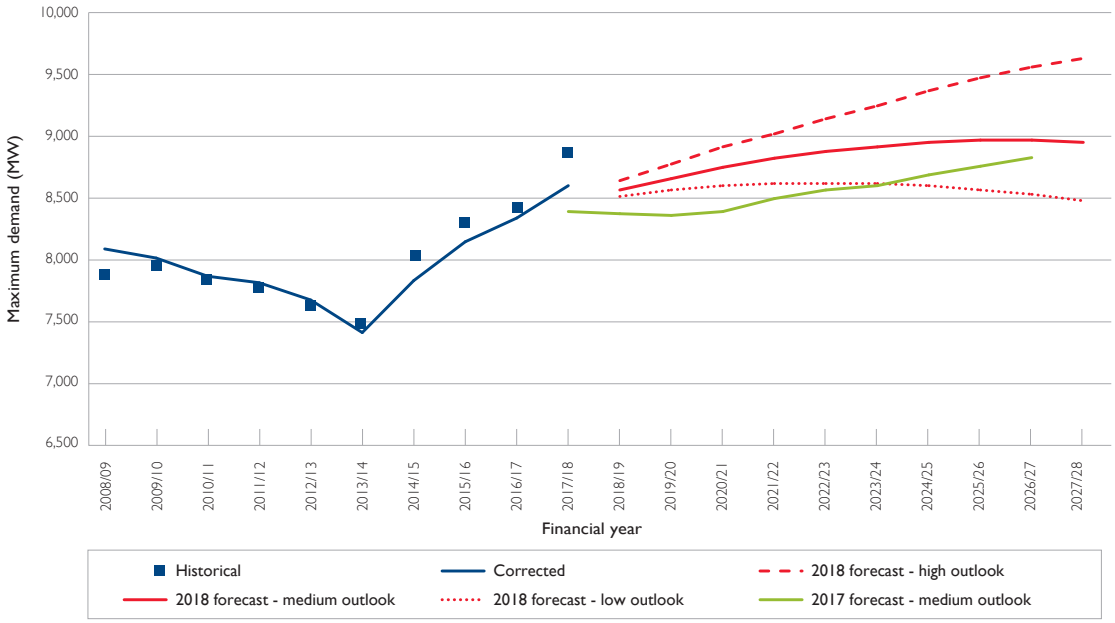


Table 2.8 Forecast summer native demand (MW)

Summer	Low growth outlook			Medium growth outlook			High growth outlook		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2018/19	8,348	8,825	9,413	8,392	8,872	9,464	8,477	8,959	9,554
2019/20	8,399	8,885	9,485	8,485	8,976	9,582	8,605	9,102	9,715
2020/21	8,426	8,921	9,531	8,568	9,070	9,690	8,739	9,250	9,881
2021/22	8,426	8,927	9,547	8,619	9,131	9,763	8,834	9,358	10,006
2022/23	8,425	8,933	9,561	8,664	9,185	9,829	8,937	9,474	10,137
2023/24	8,422	8,934	9,568	8,707	9,236	9,889	9,050	9,598	10,274
2024/25	8,392	8,908	9,545	8,721	9,255	9,915	9,167	9,723	10,410
2025/26	8,371	8,889	9,530	8,740	9,280	9,947	9,256	9,822	10,521
2026/27	8,324	8,845	9,489	8,734	9,279	9,951	9,343	9,918	10,628
2027/28	8,263	8,786	9,432	8,709	9,258	9,936	9,409	9,992	10,713

2.3.5 Winter maximum demand forecast

Historical Queensland winter maximum demands at time of native peak are presented in Table 2.9. As winter demand normally peaks after sunset, solar PV has no impact on winter maximum demand.

Table 2.9 Historical winter maximum demand (MW)

Winter	Scheduled as generated	Scheduled sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Native	Native plus solar PV	Native corrected to 50% PoE
2008	8,212	7,758	8,283	7,858	7612	7,420	7,665	7,665	7,237
2009	7,694	7,158	7,756	7,275	7032	6,961	7,205	7,205	7,295
2010	7,335	6,885	7,608	7,194	6795	6,534	6,933	6,933	6,942
2011	7,632	7,207	7,816	7,400	7093	6,878	7,185	7,185	6,998
2012	7,469	7,081	7,520	7,128	6955	6,761	6,934	6,934	6,908
2013	7,173	6,753	7,345	6,947	6699	6,521	6,769	6,769	6,983
2014	7,307	6,895	7,470	7,077	6854	6,647	6,881	6,881	6,999
2015	7,822	7,369	8,027	7,620	7,334	7,126	7,411	7,412	7,301
2016	8,017	7,513	8,191	7,686	7,439	7,207	7,454	7,454	7,479
2017	7,723	7,221	7,879	7,374	7,111	6,894	7,157	7,157	7,433

The transmission delivered winter maximum demand forecasts are presented in Table 2.10 and displayed in Figure 2.7. Forecast winter native demand is presented in Table 2.11.

Table 2.10 Forecast winter transmission delivered demand (MW)

Winter	Low growth outlook			Medium growth outlook			High growth outlook		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2018	7,239	7,427	7,710	7,272	7,461	7,745	7,339	7,529	7,815
2019	7,315	7,507	7,795	7,379	7,572	7,863	7,466	7,661	7,955
2020	7,332	7,527	7,820	7,440	7,637	7,933	7,559	7,758	8,059
2021	7,362	7,560	7,857	7,512	7,712	8,014	7,680	7,885	8,192
2022	7,360	7,560	7,861	7,544	7,748	8,055	7,746	7,954	8,268
2023	7,333	7,534	7,836	7,551	7,757	8,067	7,804	8,016	8,334
2024	7,288	7,489	7,792	7,538	7,745	8,057	7,858	8,072	8,394
2025	7,236	7,438	7,742	7,515	7,724	8,037	7,907	8,123	8,449
2026	7,170	7,372	7,678	7,477	7,687	8,003	7,938	8,157	8,487
2027	7,110	7,313	7,619	7,442	7,653	7,970	7,970	8,192	8,525

Figure 2.7 Historical and forecast winter transmission delivered demand

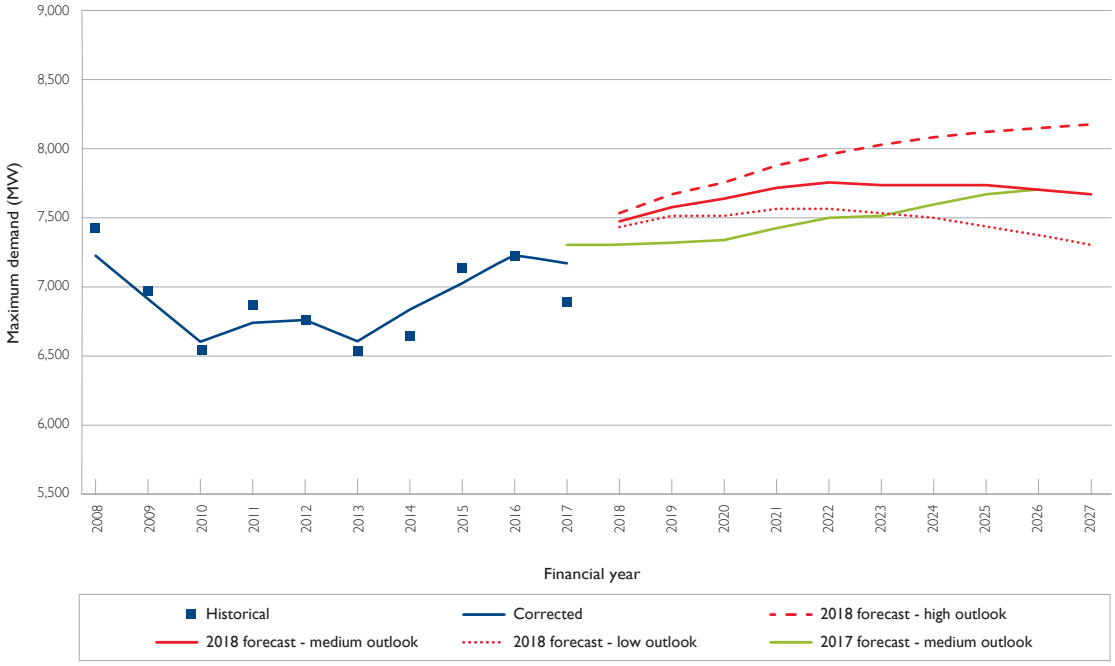


Table 2.11 Forecast winter native demand (MW)

Winter	Low growth outlook			Medium growth outlook			High growth outlook		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2018	7,498	7,686	7,969	7,531	7,720	8,004	7,598	7,788	8,074
2019	7,574	7,765	8,054	7,638	7,831	8,122	7,725	7,920	8,214
2020	7,591	7,786	8,079	7,699	7,896	8,192	7,817	8,017	8,318
2021	7,621	7,819	8,116	7,771	7,971	8,273	7,939	8,144	8,451
2022	7,619	7,819	8,120	7,803	8,007	8,313	8,005	8,213	8,527
2023	7,592	7,793	8,095	7,810	8,016	8,326	8,063	8,274	8,593
2024	7,547	7,748	8,051	7,797	8,004	8,316	8,117	8,331	8,653
2025	7,495	7,697	8,001	7,774	7,982	8,296	8,166	8,382	8,708
2026	7,429	7,631	7,937	7,736	7,946	8,262	8,197	8,416	8,746
2027	7,369	7,572	7,878	7,700	7,912	8,229	8,229	8,451	8,784

2.4 Zone forecasts

The 11 geographical zones referenced throughout this TAPR are defined in Table 2.12 and are shown in the diagrams in Appendix C. In the 2008 Annual Planning Report (APR) Powerlink split the South West zone into Bulli and South West zones, and in the 2014 APR Powerlink split the South West zone into Surat and South West zones.

Table 2.12 Zone definitions

Zone	Area covered
Far North	North of Tully, including Chalumbin
Ross	North of Proserpine and Collinsville, excluding the Far North zone
North	North of Broadsound and Dysart, excluding the Far North and Ross zones
Central West	South of Nebo, Peak Downs and Mt McLaren, and north of Gin Gin, but excluding the Gladstone zone
Gladstone	South of Raglan, north of Gin Gin and east of Calvale
Wide Bay	Gin Gin, Teebar Creek and Woolooga 275kV substation loads, excluding Gympie
Surat	West of Western Downs and south of Moura, excluding the Bulli zone
Bulli	Goondiwindi (Waggamba) load and the 275/330kV network south of Kogan Creek and west of Millmerran
South West	Tarong and Middle Ridge load areas west of Postmans Ridge, excluding the Bulli zone
Moreton	South of Woolooga and east of Middle Ridge, but excluding the Gold Coast zone
Gold Coast	East of Greenbank, south of Coomera to the Queensland/New South Wales border

Each zone normally experiences its own maximum demand, which is usually greater than that shown in tables 2.16 to 2.19.

Table 2.13 shows the average ratios of forecast zone maximum transmission delivered demand to zone transmission delivered demand at the time of forecast Queensland region maximum demand. These values can be used to multiply demands in tables 2.16 and 2.18 to estimate each zone's individual maximum transmission delivered demand, the time of which is not necessarily coincident with the time of Queensland region maximum transmission delivered demand. The ratios are based on historical trends.

Table 2.13 Average ratios of zone maximum delivered demand to zone delivered demand at time of Queensland region maximum demand

Zone	Winter	Summer
Far North	1.19	1.16
Ross	1.38	1.55
North	1.13	1.15
Central West	1.12	1.21
Gladstone	1.03	1.05
Wide Bay	1.04	1.11
Surat	1.07	1.14
Bulli	1.14	1.22
South West	1.05	1.13
Moreton	1.02	1.01
Gold Coast	1.03	1.01

Tables 2.14 and 2.15 show the forecast of transmission delivered energy and native energy for the medium economic outlook for each of the 11 zones in the Queensland region.

Table 2.14 Annual transmission delivered energy (GWh) by zone

Year	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2008/09	1,851	2,772	2,779	3,191	10,076	1,430		94	1,774	19,532	3,408	46,907
2009/10	1,836	2,849	2,719	3,300	10,173	1,427		84	1,442	19,619	3,476	46,925
2010/11	1,810	2,791	2,590	3,152	10,118	1,308		95	1,082	18,886	3,408	45,240
2011/12	1,792	2,723	2,611	3,463	10,286	1,323		105	1,196	18,629	3,266	45,394
2012/13	1,722	2,693	2,732	3,414	10,507	1,267		103	1,746	18,232	3,235	45,651
2013/14	1,658	2,826	2,828	3,564	10,293	1,321	338	146	1,304	17,782	3,085	45,145
2014/15	1,697	2,977	2,884	3,414	10,660	1,266	821	647	1,224	18,049	3,141	46,780
2015/16	1,724	2,944	2,876	3,327	10,721	1,272	2,633	1,290	1,224	17,944	3,139	49,094
2016/17	1,704	2,682	2,661	3,098	10,196	1,305	4,154	1,524	1,308	18,103	3,145	49,880
2017/18 (1)	1,689	2,676	2,662	3,043	9,374	1,245	4,805	1,484	1,259	18,013	3,124	49,374
Forecasts												
2018/19	1,683	2,276	2,795	3,154	9,471	1,312	4,628	1,436	1,252	17,699	3,355	49,061
2019/20	1,693	2,188	2,710	3,084	9,476	1,204	4,609	1,490	1,087	17,816	3,384	48,736
2020/21	1,616	2,216	2,733	2,770	9,456	864	4,892	1,594	944	17,994	3,417	48,494
2021/22	1,349	2,243	2,753	2,572	9,493	875	4,903	1,570	955	18,168	3,450	48,331
2022/23	1,363	2,268	2,744	2,528	9,523	834	4,721	1,482	914	18,270	3,479	48,126
2023/24	1,371	2,287	2,727	2,474	9,529	788	4,562	1,448	868	18,312	3,497	47,862
2024/25	1,372	2,300	2,705	2,413	9,532	740	4,307	1,354	820	18,308	3,505	47,356
2025/26	1,375	2,313	2,685	2,356	9,535	694	4,024	1,208	774	18,313	3,515	46,792
2026/27	1,379	2,328	2,667	2,300	9,540	649	3,895	1,070	729	18,327	3,526	46,410
2027/28	1,381	2,341	2,647	2,245	9,543	605	3,696	904	686	18,330	3,535	45,913

Note:

(1) These projected end of financial year values are based on revenue metering and statistical data up until April 2018.

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Table 2.15 Annual native energy (GWh) by zone

Year	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2008/09	1,851	3,336	2,950	3,481	10,076	1,437		94	2,265	19,665	3,408	48,563
2009/10	1,836	3,507	3,070	3,635	10,173	1,447		84	2,193	19,766	3,476	49,187
2010/11	1,810	3,220	2,879	3,500	10,118	1,328		95	2,013	18,979	3,408	47,350
2011/12	1,792	3,217	2,901	3,710	10,286	1,348		105	2,014	18,695	3,266	47,334
2012/13	1,722	3,080	3,064	3,767	10,507	1,292		103	1,988	18,332	3,235	47,090
2013/14	1,658	3,067	3,154	3,944	10,293	1,339	402	146	1,536	17,879	3,085	46,503
2014/15	1,697	3,163	3,434	3,841	10,660	1,285	1,022	647	1,468	18,137	3,141	48,495
2015/16	1,724	3,141	3,444	3,767	10,721	1,293	2,739	1,290	1,475	18,011	3,139	50,744
2016/17	1,704	2,999	3,320	3,541	10,196	1,329	4,194	1,524	1,549	18,134	3,145	51,635
2017/18 (1)	1,697	2,954	3,310	3,504	9,374	1,264	4,838	1,484	1,499	18,070	3,124	51,117
Forecasts												
2018/19	1,719	2,676	3,464	3,620	9,472	1,332	4,723	1,436	1,532	17,756	3,355	51,084
2019/20	1,730	2,698	3,440	3,639	9,474	1,339	4,726	1,490	1,540	17,873	3,384	51,331
2020/21	1,746	2,726	3,464	3,669	9,457	1,352	5,008	1,594	1,552	18,050	3,417	52,034
2021/22	1,762	2,754	3,483	3,697	9,493	1,363	5,020	1,570	1,563	18,224	3,450	52,379
2022/23	1,776	2,779	3,508	3,722	9,523	1,373	4,923	1,482	1,573	18,378	3,479	52,516
2023/24	1,783	2,797	3,525	3,735	9,529	1,378	4,848	1,448	1,578	18,471	3,497	52,589
2024/25	1,785	2,810	3,536	3,740	9,532	1,379	4,675	1,354	1,579	18,516	3,505	52,410
2025/26	1,788	2,824	3,547	3,745	9,536	1,381	4,471	1,208	1,581	18,568	3,514	52,163
2026/27	1,792	2,838	3,560	3,753	9,540	1,383	4,421	1,070	1,583	18,630	3,526	52,096
2027/28	1,794	2,852	3,571	3,758	9,543	1,384	4,297	904	1,585	18,677	3,535	51,899

Note:

(1) These projected end of financial year values are based on revenue metering and statistical data up until April 2018.

Tables 2.16 and 2.17 show the forecast of transmission delivered summer maximum demand and native summer maximum demand for each of the 11 zones in the Queensland region. It is based on the medium economic outlook and average summer weather.

Table 2.16 State summer maximum transmission delivered demand (MW) by zone

Year	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2008/09	280	350	317	459	1,178	278		19	367	3,934	667	7,849
2009/10	317	394	415	505	1,176	268		11	211	3,919	735	7,951
2010/11	306	339	371	469	1,172	274		18	175	3,990	683	7,797
2011/12	296	376	405	525	1,191	249		18	217	3,788	658	7,723
2012/13	277	303	384	536	1,213	232		14	241	3,754	634	7,588
2013/14	271	318	353	493	1,147	260	30	21	291	3,711	603	7,498
2014/15	278	381	399	466	1,254	263	130	81	227	3,848	692	8,019
2015/16	308	392	412	443	1,189	214	313	155	231	3,953	661	8,271
2016/17	269	291	392	476	1,088	276	447	175	309	3,957	712	8,392
2017/18	304	376	414	464	1,102	278	557	183	301	4,145	718	8,842
Forecasts												
2018/19	327	396	412	468	1,062	212	522	164	273	3,973	729	8,538
2019/20	329	399	410	475	1,063	214	535	181	277	4,023	736	8,642
2020/21	337	408	409	481	1,062	213	566	184	276	4,062	739	8,737
2021/22	340	413	414	484	1,063	214	570	183	278	4,098	740	8,797
2022/23	347	411	415	501	1,066	214	556	171	279	4,144	748	8,852
2023/24	344	406	432	509	1,068	215	545	166	281	4,186	750	8,902
2024/25	347	409	446	507	1,069	214	522	157	280	4,218	752	8,921
2025/26	353	416	447	509	1,070	215	503	151	280	4,250	753	8,947
2026/27	357	421	453	509	1,070	214	495	125	280	4,268	753	8,945
2027/28	360	424	452	509	1,071	214	481	103	280	4,279	752	8,925

Table 2.17 State summer maximum native demand (MW) by zone

Year	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2008/09	280	423	331	510	1,178	278		19	421	3,963	667	8,070
2009/10	317	500	453	539	1,176	268		11	361	3,961	735	8,321
2010/11	306	412	408	551	1,172	274		18	337	3,991	683	8,152
2011/12	296	449	434	598	1,191	249		18	378	3,788	658	8,059
2012/13	277	417	422	568	1,213	241		14	328	3,799	634	7,913
2013/14	271	423	386	561	1,147	260	88	21	316	3,755	603	7,831
2014/15	278	399	479	548	1,254	263	189	81	254	3,889	692	8,326
2015/16	308	423	491	519	1,189	214	370	155	257	3,952	661	8,539
2016/17	269	364	512	559	1,088	276	498	175	329	3,974	712	8,756
2017/18	310	480	486	508	1,102	278	617	183	328	4,179	718	9,189
Forecasts												
2018/19	327	465	496	538	1,062	212	582	164	299	3,998	729	8,872
2019/20	329	468	494	545	1,063	215	595	181	303	4,047	736	8,976
2020/21	337	477	493	552	1,062	213	626	184	302	4,085	739	9,070
2021/22	340	482	497	555	1,063	214	629	183	305	4,122	741	9,131
2022/23	347	480	499	571	1,066	214	616	171	305	4,168	748	9,185
2023/24	344	475	516	579	1,069	215	605	166	307	4,210	750	9,236
2024/25	347	478	530	578	1,069	214	582	157	306	4,242	752	9,255
2025/26	353	486	531	578	1,069	215	563	151	307	4,274	753	9,280
2026/27	357	490	537	579	1,070	214	555	125	307	4,292	753	9,279
2027/28	360	494	536	579	1,070	214	541	103	306	4,303	752	9,258

Tables 2.18 and 2.19 show the forecast of transmission delivered winter maximum demand and native winter maximum demand for each of the 11 zones in the Queensland region. It is based on the medium economic outlook and average winter weather.

Table 2.18 State winter maximum transmission delivered demand (MW) by zone

Year	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2008	216	285	361	432	1,161	253		17	374	3,655	666	7,420
2009	210	342	328	416	1,125	218		19	341	3,361	601	6,961
2010	227	192	325	393	1,174	179		18	269	3,173	584	6,534
2011	230	216	317	432	1,155	222		22	376	3,303	605	6,878
2012	214	212	326	426	1,201	215		20	346	3,207	594	6,761
2013	195	249	348	418	1,200	190	23	17	263	3,039	579	6,521
2014	226	346	359	463	1,200	204	16	51	257	2,974	551	6,647
2015	192	289	332	429	1,249	203	172	137	258	3,268	597	7,126
2016	216	278	341	451	1,229	193	467	193	280	3,009	550	7,207
2017	218	290	343	366	1,070	220	520	182	247	2,912	526	6,894
Forecasts												
2018	208	295	368	412	1,075	206	559	185	274	3,296	583	7,461
2019	210	299	367	416	1,075	209	580	202	281	3,345	588	7,572
2020	212	303	371	418	1,072	210	583	208	286	3,380	594	7,637
2021	214	305	372	426	1,073	211	600	209	290	3,417	595	7,712
2022	215	307	375	433	1,074	213	601	194	292	3,445	599	7,748
2023	217	297	380	437	1,075	215	585	192	296	3,464	599	7,757
2024	218	297	380	438	1,076	215	571	183	297	3,474	596	7,745
2025	218	298	381	438	1,076	216	549	172	298	3,482	596	7,724
2026	218	298	387	438	1,076	216	529	148	298	3,485	594	7,687
2027	218	298	387	438	1,075	216	519	131	298	3,482	591	7,653

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Table 2.19 State winter maximum native demand (MW) by zone

Year	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2008	216	362	365	470	1,161	253		17	479	3,676	666	7,665
2009	210	425	372	466	1,125	218		19	407	3,362	601	7,205
2010	227	319	363	484	1,174	186		18	380	3,198	584	6,933
2011	230	339	360	520	1,155	222		22	428	3,304	605	7,185
2012	214	289	360	460	1,201	215		20	375	3,206	594	6,934
2013	195	291	374	499	1,200	195	89	17	290	3,040	579	6,769
2014	226	369	420	509	1,200	204	90	51	286	2,975	551	6,881
2015	192	334	404	518	1,249	203	208	137	288	3,281	597	7,411
2016	216	358	419	504	1,229	200	467	193	310	3,008	550	7,454
2017	218	367	416	415	1,070	220	554	182	276	2,913	526	7,157
Forecasts												
2018	208	348	434	476	1,075	209	601	185	302	3,299	583	7,720
2019	210	353	432	479	1,076	211	623	202	309	3,348	588	7,831
2020	212	356	437	482	1,072	213	625	208	314	3,383	594	7,896
2021	214	359	438	490	1,073	214	642	209	318	3,419	595	7,971
2022	215	360	441	497	1,075	215	643	194	320	3,448	599	8,007
2023	217	350	446	501	1,075	217	627	192	325	3,467	599	8,016
2024	218	351	446	501	1,076	218	613	183	326	3,476	596	8,004
2025	218	351	447	502	1,076	218	591	172	326	3,485	596	7,982
2026	218	352	453	502	1,076	218	572	148	327	3,487	593	7,946
2027	218	351	453	501	1,076	218	561	131	327	3,484	592	7,912

2.5 Daily and annual load profiles

The daily load profiles (transmission delivered) for the Queensland region on the days of 2017 winter and 2017/18 summer maximum native demands are shown in Figure 2.8.

The annual cumulative load duration characteristic for the Queensland region transmission delivered demand is shown in Figure 2.9.

Figure 2.8 Daily load profile of winter 2017 and summer 2017/18 maximum native demand days

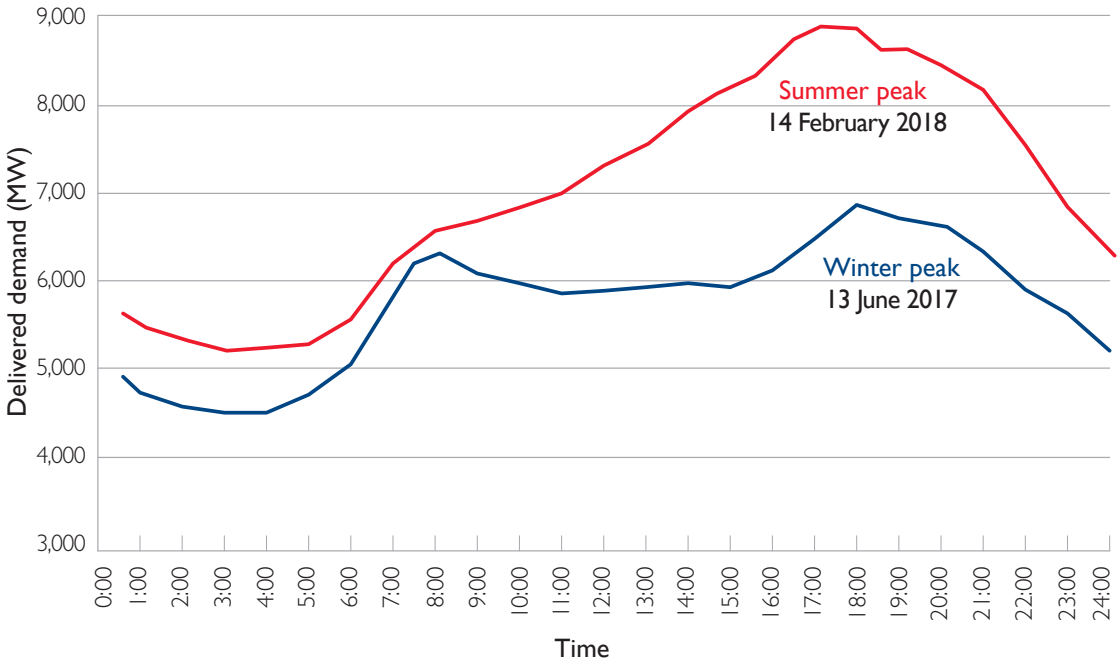
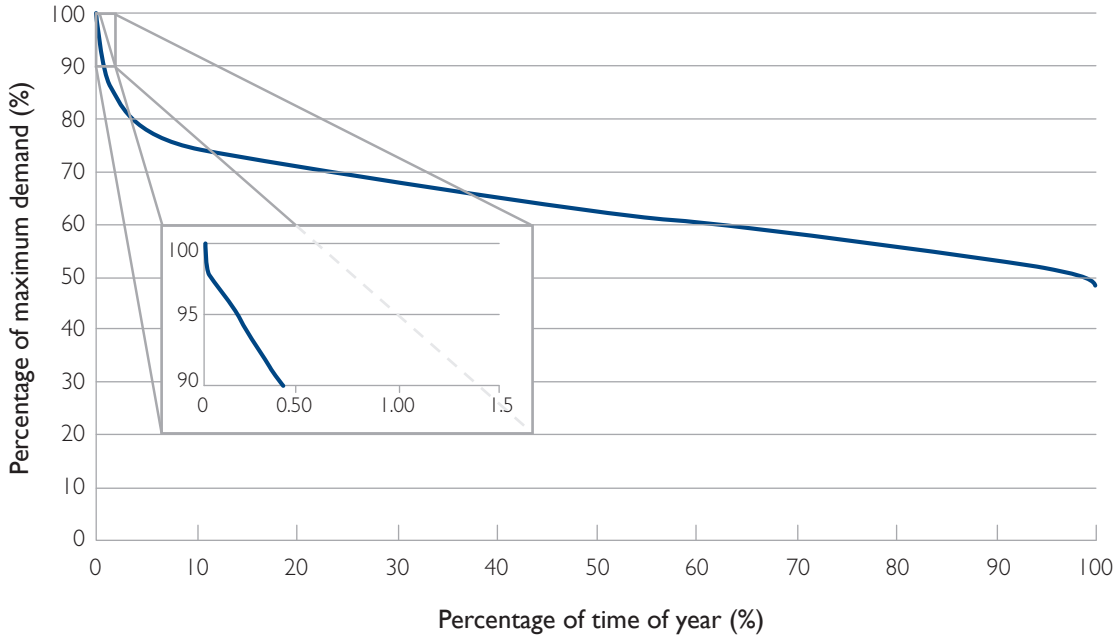


Figure 2.9 Normalised cumulative transmission delivered load duration from 1 April 2017 to 31 March 2018



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