Chapter 2:
Energy and demand projections

2 Energy and demand projections

Key highlights

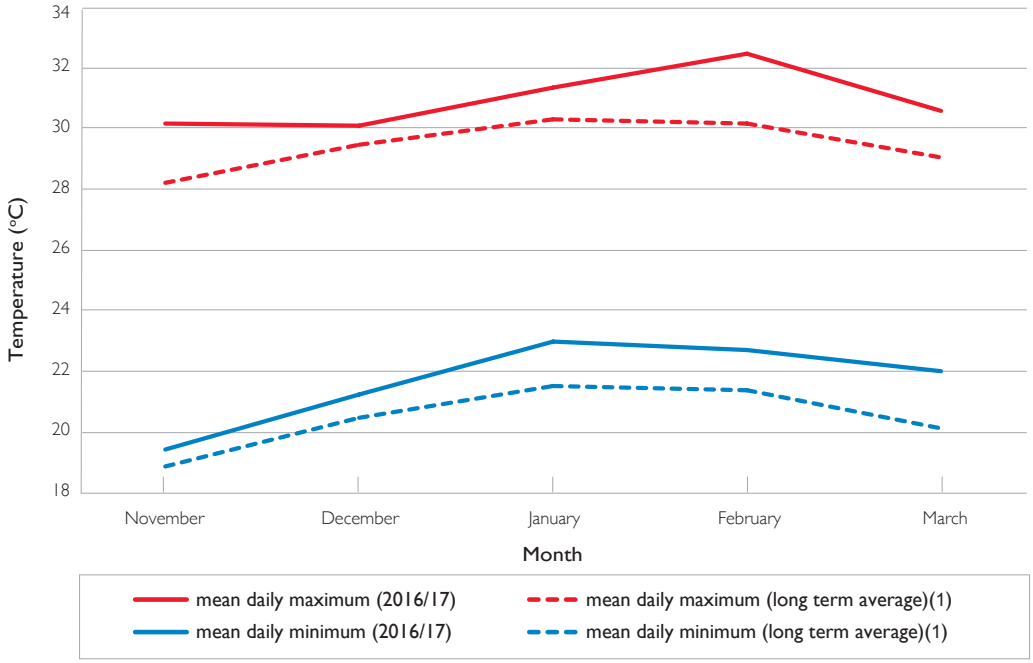
- This chapter describes the historical energy and demand performance of Powerlink's transmission network and provides forecast data separated by zone.
- The 2016/17 summer in Queensland was hot and long lasting with a new maximum delivered demand recorded at 6:00pm on 18 January, when 8,401MW was delivered from the transmission network.
- Scheduled as generated and native demand records were reached at 5:30pm on 12 February. The scheduled as generated reached 9,369MW and the native demand reached 8,756MW.
- 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.
- Based on the medium economic outlook, Queensland's delivered energy consumption and demand is expected to remain relatively flat, with average annual increases of 0.4% and 0.6% 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 a way valued by customers. For example, future developments in battery storage technology coupled with small-scale solar photovoltaic (PV) could see significant changes to future electricity usage patterns. This could reduce the need to develop transmission services to cover short duration peaks.

2.1 Overview

The 2016/17 summer in Queensland was hot and long lasting with two days of particularly high electricity demand on the transmission network on 18 January and 12 February. A new delivered maximum demand was recorded at 6:00pm on 18 January, when 8,401MW was delivered from the transmission network. Scheduled as generated and native demand records were recorded at 5:30pm on 12 February, with scheduled as generated reaching 9,369MW and native demand reaching 8,756MW. The corresponding delivered demand on 12 February was 8,392MW, slightly lower than 18 January record. The scheduled as generated record of 9,369MW exceeded the previous record of 9,097MW recorded in February 2016. After temperature correction, the 2016/17 summer demand exceeded the 2016 Transmission Annual Planning Report (TAPR) forecast by around 2%.

Figure 2.1 shows observed temperatures for Brisbane during summer 2016/17 compared with long-term averages.

Figure 2.1 Brisbane weather over summer 2016/17



Note:

(1) Based on years 2000 to 2017

Energy delivered from the transmission network for 2016/17 is expected to be within 1% of the 2016 TAPR forecast.

The CSG (coal seam gas) industry continues to ramp up with observed demands close to those forecast in the 2016 TAPR. By 2018/19, CSG demand is forecast to exceed 750MW. No new CSG loads have committed to connect to the transmission network since the publication of 2016 TAPR.

During the 2016/17 summer, Queensland had around 1,700MW of installed rooftop PV capacity. This rate of increase has slowed to around 15MW per month. An important impact of the rooftop PV has been to delay the time of state peak, 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 Queensland Government's Solar 150 initiative to support up to 150MW of solar generation in Queensland in collaboration with the Australian Renewable Energy Agency (ARENA) has been a key driver in the number of solar PV farms now committed and under construction in Queensland. The Federal Government's large-scale renewable energy target of 33,000GWh per annum by 2020 is also expected to drive future renewable capacity in the form of solar PV farms seeking to connect to the Queensland transmission and distribution networks over the next two to three years.

Solar PV farms connecting directly to the distribution network will reduce the amount of energy being delivered through the transmission network and accelerate the delay of the state peak from around 5:30pm to an evening peak. No distribution connected solar PV farms were included in the 2016 TAPR. Additional distribution connected solar PV farm capacity has been included further into the 10-year outlook period to align with Australia's obligations under the Paris Agreement on climate change. Further details on interest from potential variable renewable electricity (VRE) proponents is included in Chapter 7.

2 Energy and demand projections

The forecasts presented in this TAPR indicate relatively flat growth for energy, summer maximum demand and winter maximum demand in the first half of the 10-year outlook period, with moderate growth in the latter half of the 10-year outlook period. While there has been significant investment in the resources sector, global price signals for resources such as coal and gas are unlikely to result in further developments in the short-term. Independent economic outlook is that Queensland, on the whole, is still experiencing slow economic growth, however this is expected to return to solid growth for the second half of the forecasting period. The lower Australian dollar has improved growth prospects in areas such as tourism and foreign education while sustained low interest rates are providing a boost in the housing industry. Queensland's population growth has slowed following the resources boom and is expected to increase by around 15% to around 5.6 million over the 10-year forecast period.

The consumer response to electricity prices is expected to have a continued dampening effect on electricity usage. Future developments in battery storage technology coupled with rooftop PV could see significant changes to future electricity usage patterns. In particular, developments in battery storage technology have the potential to flatten electricity usage, reducing the need to develop transmission services to cover short duration peaks and put downward pressure on transmission costs.

Powerlink is committed to understanding the future impacts of emerging technologies so that transmission network services are developed in a way most valued by customers. Driven by this commitment, Powerlink has again hosted a forum in April 2017 to share and build on knowledge related to emerging technologies. As a result, several enhancements were made to the forecasting methodology associated with emerging technologies in this TAPR. Details of Powerlink's forecasting methodology can be found in Appendix B.

The delivered demand forecast in the 2017 TAPR shows an increase compared to the 2016 TAPR. The increase from 2020 is largely due to an expectation that electricity prices will remain flat and then fall and that the Queensland state economy will return to solid growth. Figure 2.2 shows a comparison of the delivered summer maximum demand forecast with the 2016 TAPR, based on a 50% probability of exceedance (PoE) and medium economic outlook.

The delivered energy forecast in the 2017 TAPR shows a reduction compared to the 2016 TAPR. The reduction to 2020 is largely due to the forecast of distribution connected solar PV farms and a forecast reduction in energy by a major transmission connected customer. Figure 2.3 shows a comparison of the delivered energy forecast with the 2016 TAPR, based on the medium economic outlook.

Figure 2.2 Comparison of the medium economic outlook demand forecasts

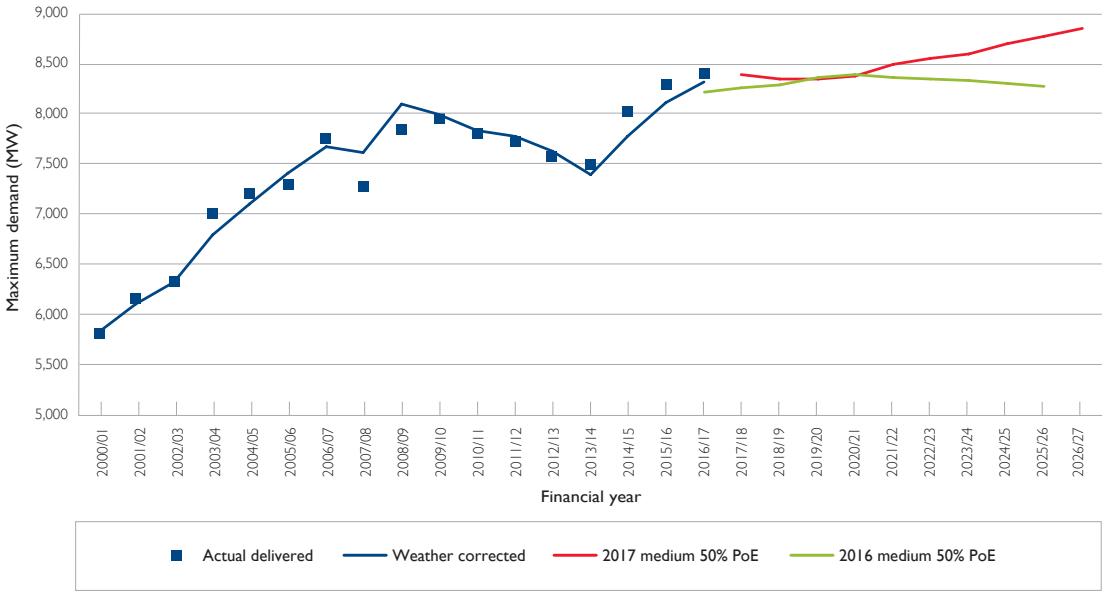
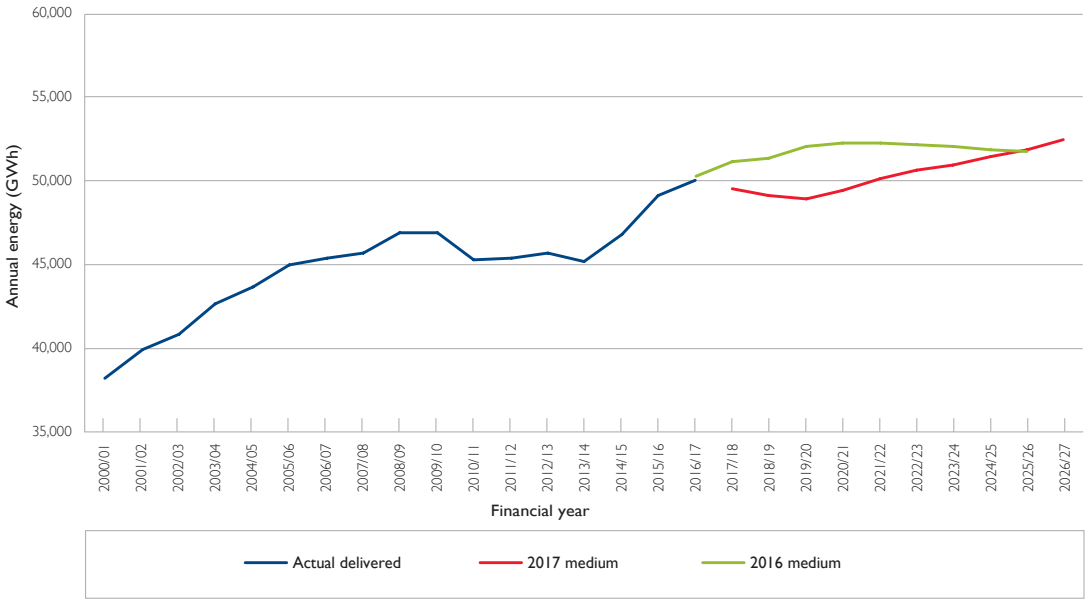


Figure 2.3 Comparison of the medium economic outlook energy forecasts



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. 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.

2 Energy and demand projections

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. This takes place through ongoing engagement activities and forums such as the Demand and Energy Forecasting Forum and Powerlink Queensland Transmission Network Forum undertaken prior to and shortly after the release of the TAPR.

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 demand and winter 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 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 2016/17.

Table 2.2 Average annual growth rate over next 10 years

	Economic growth outlooks		
	Low	Medium	High
Delivered energy	-0.4%	0.4%	1.4%
Delivered summer maximum demand (50% PoE)	-0.1%	0.6%	1.5%
Delivered winter maximum demand (50% PoE)	0.0%	0.6%	1.5%

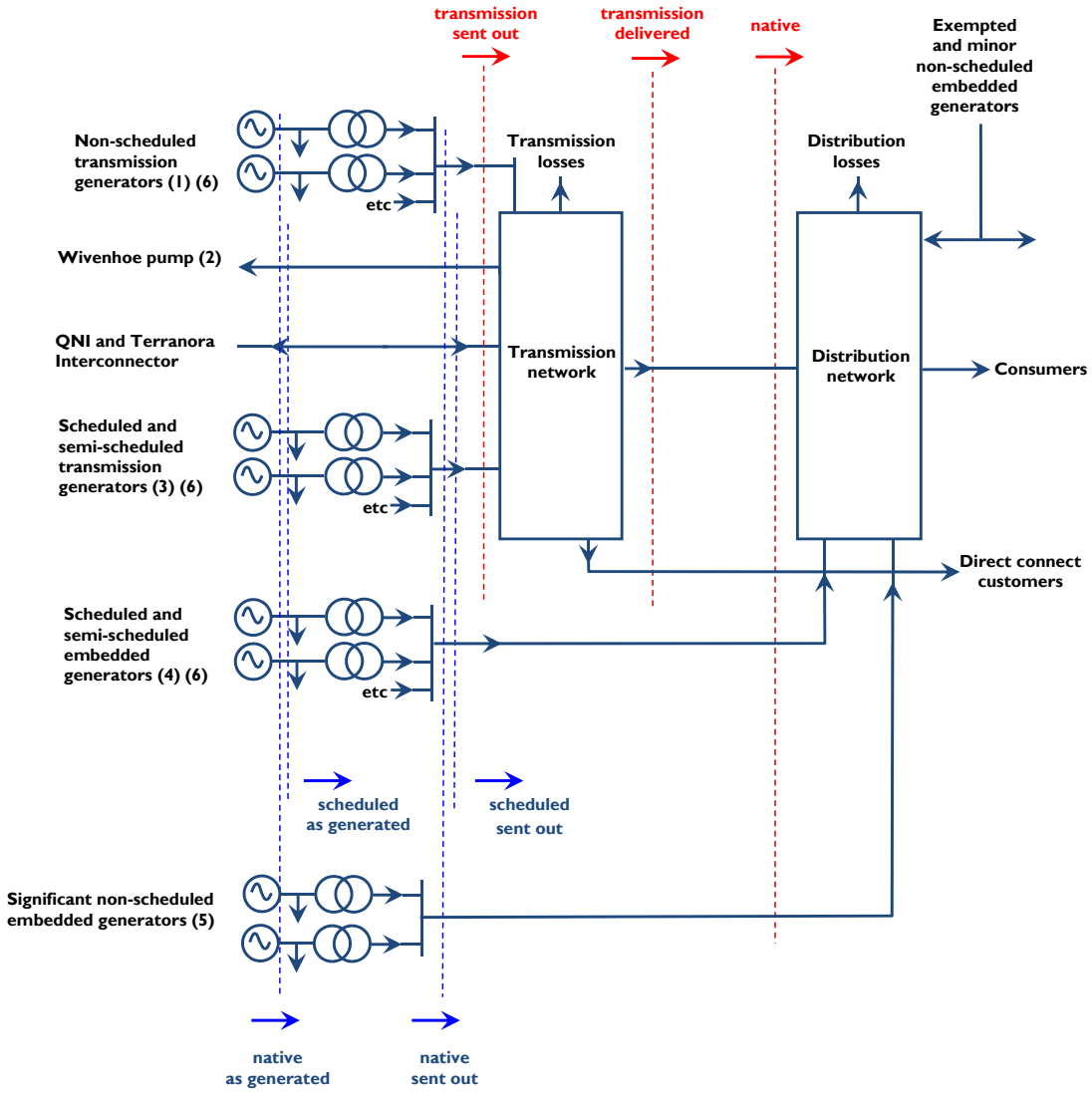
2.3.1 Future management of maximum demand

The installation of additional rooftop PV systems and distribution connected solar PV 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 latter half of the 10-year demand forecast shows some growth in the maximum demand (refer to Figure 2.2). If the trend continues, Powerlink will need to consider if the network needs to be augmented to meet these evening peaks at a future point. However, there is an opportunity for new technology and non-network solutions to deliver cost efficiencies and negate the need to build new transmission assets by assisting in the management of evening maximum demand. The successful integration of non-network solutions has the potential to shift and reduce maximum demand back to daylight hours where demand levels are reduced due to embedded solar generation.

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 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 generators and scheduled and semi-scheduled embedded generators refer to Table 5.1

2.3.3 Energy forecast

Historical Queensland energies are 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	Scheduled as generated	Scheduled sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Native	Native plus solar PV
2007/08	51,337	47,660	52,268	48,711	47,177	45,653	47,188	47,188
2008/09	52,591	48,831	53,638	50,008	48,351	46,907	48,563	48,580
2009/10	53,150	49,360	54,419	50,753	48,490	46,925	49,187	49,263
2010/11	51,381	47,804	52,429	48,976	46,866	45,240	47,350	47,531
2011/12	51,147	47,724	52,206	48,920	46,980	45,394	47,334	47,813
2012/13	50,711	47,368	52,045	48,702	47,259	45,651	47,090	48,129
2013/14	49,686	46,575	51,029	47,918	46,560	45,145	46,503	47,894
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	52,546
2016/17 (1)	55,593	51,808	57,213	53,562	51,745	50,190	52,007	53,861

Note:

(1) These projected end of financial year values are based on revenue and statistical metering data until March 2017.

The forecast transmission delivered energy forecasts are presented in Table 2.4 and displayed 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
2017/18	49,161	49,560	50,584
2018/19	48,553	49,171	51,695
2019/20	48,123	48,924	51,958
2020/21	48,210	49,414	52,713
2021/22	48,541	50,144	53,782
2022/23	48,644	50,669	54,558
2023/24	48,530	51,001	55,180
2024/25	48,615	51,520	56,300
2025/26	48,475	51,858	57,044
2026/27	48,076	52,459	57,404

Figure 2.5 Historical and forecast transmission delivered energy

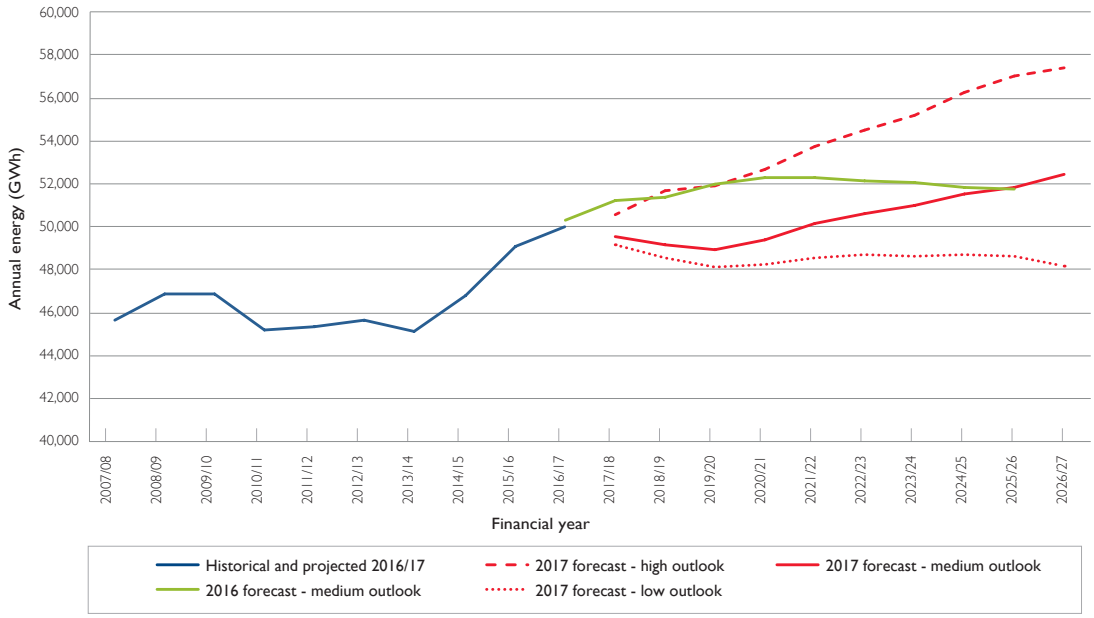


Table 2.5 Forecast annual native energy (GWh)

Year	Low growth outlook	Medium growth outlook	High growth outlook
2017/18	50,997	51,395	52,419
2018/19	50,745	51,363	53,887
2019/20	50,641	51,442	54,476
2020/21	50,890	52,095	55,394
2021/22	51,221	52,823	56,462
2022/23	51,323	53,347	57,237
2023/24	51,262	53,734	57,913
2024/25	51,511	54,416	59,196
2025/26	51,644	55,026	60,213
2026/27	51,573	55,956	60,901

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	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
2007/08	8,082	7,603	8,178	7,713	7,425	7,281	7,569	7,569	7,893
2008/09	8,677	8,135	8,767	8,239	8,017	7,849	8,070	8,078	8,318
2009/10	8,891	8,427	9,053	8,603	8,292	7,951	8,321	8,355	8,364
2010/11	8,836	8,299	8,895	8,374	8,020	7,797	8,152	8,282	8,187
2011/12	8,707	8,236	8,769	8,319	7,983	7,723	8,059	8,367	8,101
2012/13	8,453	8,008	8,691	8,245	7,920	7,588	7,913	8,410	7,952
2013/14	8,365	7,947	8,531	8,114	7,780	7,498	7,831	8,378	7,731
2014/15	8,809	8,398	9,000	8,589	8,311	8,019	8,326	8,512	8,084
2015/16	9,094	8,668	9,272	8,848	8,580	8,271	8,539	8,783	8,369
2016/17	9,369	8,886	9,541	9,062	8,698	8,392	8,756	8,899	8,666

The transmission delivered summer maximum demand forecasts are presented in Table 2.7 and displayed 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
2017/18	7,877	8,317	8,881	7,931	8,372	8,938	8,113	8,558	9,127
2018/19	7,806	8,244	8,805	7,898	8,339	8,905	8,163	8,612	9,188
2019/20	7,758	8,199	8,763	7,887	8,332	8,902	8,240	8,698	9,284
2020/21	7,747	8,194	8,768	7,914	8,368	8,949	8,356	8,827	9,430
2021/22	7,781	8,236	8,820	8,015	8,479	9,075	8,505	8,989	9,610
2022/23	7,772	8,232	8,822	8,070	8,542	9,148	8,600	9,095	9,729
2023/24	7,736	8,201	8,796	8,095	8,575	9,191	8,686	9,192	9,840
2024/25	7,767	8,239	8,844	8,190	8,682	9,312	8,867	9,387	10,053
2025/26	7,763	8,243	8,857	8,249	8,752	9,396	9,001	9,535	10,219
2026/27	7,744	8,230	8,852	8,300	8,813	9,471	9,103	9,650	10,351

Figure 2.6 Historical and forecast transmission delivered summer demand

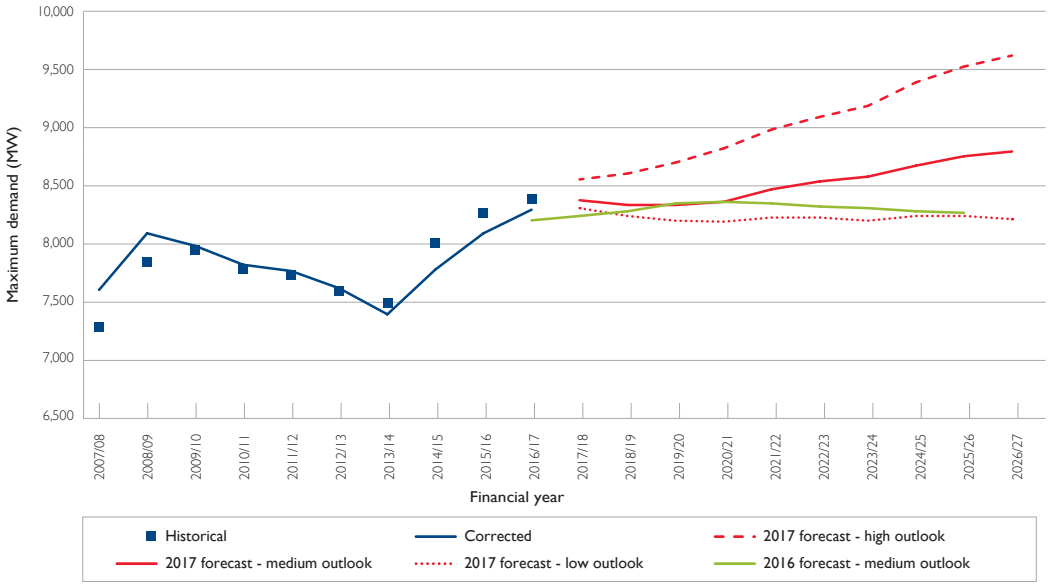


Table 2.8 Forecast summer native demand (MW)

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
2017/18	8,203	8,643	9,207	8,256	8,698	9,263	8,439	8,883	9,452
2018/19	8,131	8,570	9,131	8,224	8,665	9,230	8,488	8,938	9,513
2019/20	8,084	8,524	9,089	8,213	8,658	9,227	8,566	9,024	9,610
2020/21	8,072	8,520	9,094	8,239	8,693	9,275	8,681	9,152	9,756
2021/22	8,107	8,562	9,145	8,340	8,805	9,400	8,830	9,315	9,935
2022/23	8,098	8,558	9,147	8,396	8,868	9,473	8,925	9,421	10,055
2023/24	8,062	8,527	9,122	8,420	8,901	9,516	9,012	9,518	10,166
2024/25	8,092	8,565	9,170	8,516	9,008	9,638	9,192	9,712	10,379
2025/26	8,089	8,569	9,183	8,575	9,077	9,722	9,327	9,861	10,545
2026/27	8,070	8,556	9,178	8,626	9,139	9,797	9,429	9,976	10,677

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
2007	7,837	7,416	7,893	7,481	7,298	7,166	7,350	7,350	7,026
2008	8,197	7,758	8,283	7,858	7,612	7,420	7,665	7,665	7,237
2009	7,655	7,158	7,756	7,275	7,032	6,961	7,205	7,205	7,295
2010	7,313	6,885	7,608	7,194	6,795	6,534	6,933	6,933	6,942
2011	7,640	7,207	7,816	7,400	7,093	6,878	7,185	7,185	6,998
2012	7,490	7,081	7,520	7,128	6,955	6,761	6,934	6,934	6,908
2013	7,150	6,753	7,345	6,947	6,699	6,521	6,769	6,769	6,983
2014	7,288	6,895	7,470	7,077	6,854	6,647	6,881	6,881	6,999
2015	7,816	7,369	8,027	7,620	7,334	7,126	7,411	7,412	7,301
2016	8,020	7,513	8,191	7,686	7,439	7,207	7,454	7,454	7,480

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
2017	7,077	7,263	7,534	7,118	7,304	7,575	7,176	7,363	7,635
2018	7,048	7,232	7,500	7,117	7,302	7,571	7,373	7,561	7,834
2019	7,039	7,224	7,493	7,131	7,317	7,587	7,452	7,642	7,920
2020	7,043	7,231	7,505	7,159	7,348	7,624	7,557	7,753	8,037
2021	7,072	7,263	7,541	7,241	7,434	7,716	7,664	7,864	8,156
2022	7,083	7,276	7,558	7,303	7,500	7,786	7,746	7,951	8,248
2023	7,060	7,256	7,540	7,327	7,527	7,817	7,812	8,020	8,324
2024	7,079	7,278	7,567	7,395	7,600	7,898	7,940	8,155	8,466
2025	7,095	7,297	7,592	7,461	7,670	7,975	8,070	8,290	8,610
2026	7,058	7,263	7,562	7,480	7,694	8,005	8,130	8,354	8,682

Figure 2.7 Historical and forecast winter transmission delivered demand

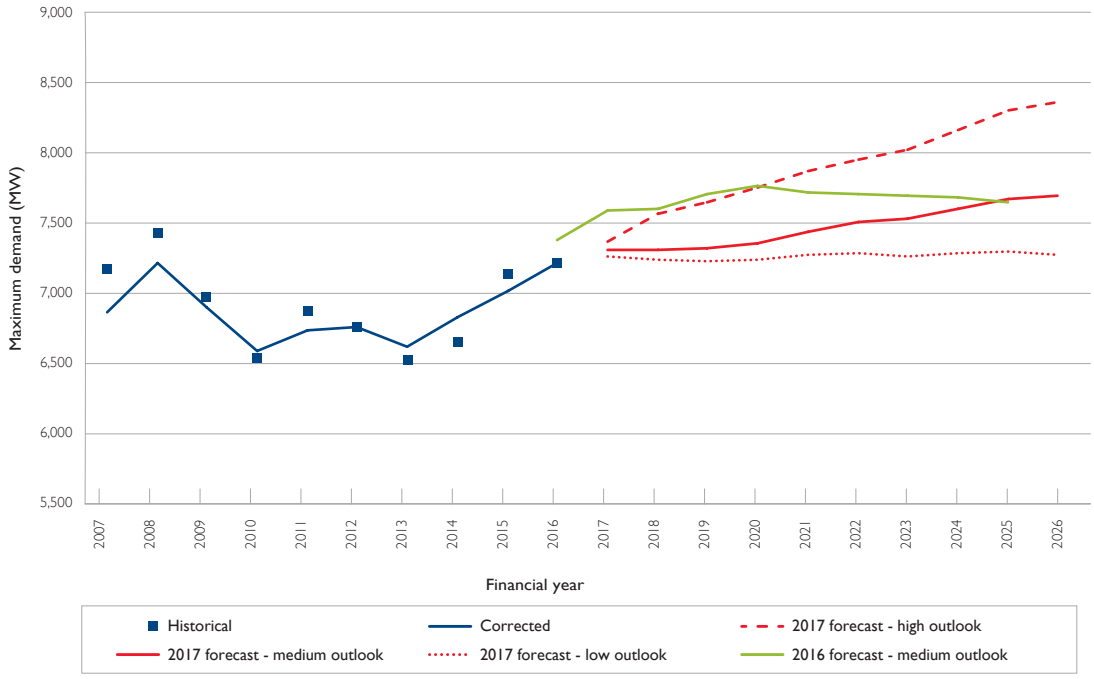


Table 2.11 Forecast winter native demand (MW)

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
2017	7,322	7,508	7,778	7,363	7,549	7,820	7,420	7,607	7,880
2018	7,292	7,477	7,745	7,361	7,546	7,816	7,617	7,805	8,079
2019	7,284	7,468	7,737	7,376	7,562	7,832	7,696	7,887	8,164
2020	7,288	7,476	7,749	7,404	7,593	7,868	7,802	7,997	8,282
2021	7,317	7,508	7,786	7,486	7,679	7,960	7,908	8,109	8,401
2022	7,328	7,521	7,802	7,548	7,744	8,030	7,991	8,195	8,493
2023	7,305	7,500	7,785	7,572	7,771	8,062	8,056	8,265	8,568
2024	7,323	7,522	7,812	7,640	7,844	8,142	8,185	8,399	8,711
2025	7,339	7,542	7,836	7,705	7,915	8,220	8,315	8,534	8,854
2026	7,304	7,509	7,808	7,726	7,940	8,251	8,375	8,600	8,927

2.4 Zone forecasts

The 11 geographical zones referred to 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 TAPR 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 North, 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 and Surat zones
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	1.19
Ross	1.50	1.60
North	1.15	1.18
Central West	1.10	1.18
Gladstone	1.03	1.05
Wide Bay	1.03	1.13
Surat	1.13	1.14
Bulli	1.15	1.30
South West	1.04	1.19
Moreton	1.01	1.01
Gold Coast	1.02	1.01

2 Energy and demand projections

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	Glad-stone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2007/08	1,818	2,719	2,728	3,165	10,058	1,399		87	1,712	18,684	3,283	45,653
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	1,738	2,715	2,677	3,130	10,219	1,326	4,049	1,521	1,312	18,315	3,188	50,190
Forecasts												
2017/18	1,683	2,818	2,908	3,352	9,489	1,278	4,267	1,518	1,178	17,715	3,354	49,560
2018/19	1,647	2,736	2,850	3,217	9,490	1,209	4,428	1,566	1,132	17,562	3,334	49,171
2019/20	1,631	2,720	2,871	3,054	9,499	1,057	4,515	1,596	1,117	17,529	3,335	48,924
2020/21	1,655	2,766	2,915	3,045	9,528	1,001	4,542	1,608	1,130	17,831	3,393	49,414
2021/22	1,678	2,814	2,968	3,103	9,549	1,034	4,662	1,598	1,144	18,142	3,452	50,144
2022/23	1,695	2,854	3,064	3,147	9,567	1,061	4,681	1,569	1,152	18,382	3,497	50,669
2023/24	1,707	2,889	3,152	3,156	9,584	1,085	4,680	1,497	1,129	18,587	3,535	51,001
2024/25	1,741	2,951	3,172	3,207	9,610	1,127	4,624	1,413	1,061	19,000	3,614	51,520
2025/26	1,777	3,017	3,068	3,289	9,639	1,122	4,463	1,326	1,022	19,438	3,697	51,858
2026/27	1,782	3,061	2,993	3,420	9,679	1,138	4,303	1,077	1,060	20,120	3,826	52,459

Table 2.15 Annual native energy (GWh) by zone

Year	Far North	Ross	North	Central West	Glad-stone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2007/08	1,818	3,371	2,771	3,528	10,058	1,413		87	2,039	18,819	3,283	47,188
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	1,738	3,066	3,364	3,569	10,219	1,354	4,096	1,521	1,551	18,341	3,188	52,007
Forecasts												
2017/18	1,697	3,135	3,574	3,731	9,489	1,298	4,352	1,518	1,457	17,789	3,355	51,395
2018/19	1,675	3,127	3,562	3,702	9,491	1,295	4,513	1,566	1,438	17,659	3,335	51,363
2019/20	1,660	3,127	3,583	3,685	9,499	1,297	4,612	1,596	1,424	17,624	3,335	51,442
2020/21	1,683	3,174	3,627	3,742	9,528	1,328	4,651	1,608	1,437	17,924	3,393	52,095
2021/22	1,707	3,222	3,680	3,800	9,549	1,361	4,771	1,598	1,450	18,234	3,451	52,823
2022/23	1,723	3,262	3,776	3,843	9,567	1,388	4,790	1,569	1,458	18,474	3,497	53,347
2023/24	1,736	3,297	3,864	3,880	9,584	1,412	4,789	1,497	1,463	18,677	3,535	53,734
2024/25	1,769	3,359	3,933	3,958	9,610	1,454	4,733	1,413	1,483	19,090	3,614	54,416
2025/26	1,805	3,425	3,993	4,041	9,638	1,498	4,573	1,326	1,504	19,526	3,697	55,026
2026/27	1,865	3,524	4,087	4,171	9,679	1,564	4,413	1,077	1,542	20,208	3,826	55,956

2 Energy and demand projections

Tables 2.16 and 2.17 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 2.16 State winter maximum transmission delivered demand (MW) by zone

Winter	Far North	Ross	North	Central West	Glad-stone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2007	219	309	286	442	1,165	297			410	3,451	587	7,166
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
Forecasts												
2017	202	283	388	388	1,062	208	476	195	252	3,274	576	7,304
2018	203	278	398	380	1,064	204	504	202	246	3,251	572	7,302
2019	203	278	401	380	1,063	203	511	205	247	3,258	568	7,317
2020	206	278	406	387	1,064	202	509	195	247	3,283	571	7,348
2021	212	280	414	393	1,065	203	521	198	249	3,324	575	7,434
2022	211	278	444	402	1,066	201	531	198	246	3,346	577	7,500
2023	212	266	462	404	1,066	201	527	196	247	3,366	580	7,527
2024	216	270	468	410	1,068	204	517	188	251	3,418	590	7,600
2025	219	274	474	416	1,070	206	516	180	254	3,464	597	7,670
2026	221	276	477	422	1,071	208	496	169	256	3,497	601	7,694

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

Winter	Far North	Ross	North	Central West	Glad-stone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2007	219	309	292	520	1,165	297			485	3,476	587	7,350
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
Forecasts												
2017	202	336	450	449	1,063	210	511	195	281	3,276	576	7,549
2018	203	332	460	440	1,063	206	539	202	275	3,254	572	7,546
2019	203	332	462	441	1,064	205	547	205	275	3,260	568	7,562
2020	206	332	467	447	1,064	205	544	195	276	3,286	571	7,593
2021	212	333	475	454	1,066	206	557	198	277	3,326	575	7,679
2022	211	331	505	463	1,066	203	566	198	275	3,349	577	7,744
2023	212	319	524	465	1,066	204	562	196	275	3,368	580	7,771
2024	216	323	530	471	1,068	206	552	188	280	3,420	590	7,844
2025	219	327	535	477	1,070	209	551	181	283	3,466	597	7,915
2026	221	329	539	483	1,071	210	531	170	285	3,500	601	7,940

2 Energy and demand projections

Tables 2.18 and 2.19 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 2.18 State summer maximum transmission delivered demand (MW) by zone

Summer	Far North	Ross	North	Central West	Glad-stone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2007/08	292	296	386	476	1,193	243		15	314	3,466	600	7,281
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
Forecasts												
2017/18	323	374	411	463	1,038	208	471	179	255	3,971	679	8,372
2018/19	322	371	407	458	1,041	205	486	181	253	3,947	668	8,339
2019/20	322	368	407	463	1,040	204	489	178	252	3,944	665	8,332
2020/21	327	368	417	463	1,040	203	488	174	252	3,968	668	8,368
2021/22	331	371	422	479	1,043	204	504	174	253	4,022	676	8,479
2022/23	333	358	453	486	1,045	204	507	173	254	4,049	680	8,542
2023/24	335	358	467	485	1,045	204	503	171	253	4,070	684	8,575
2024/25	341	365	474	493	1,047	207	503	163	258	4,137	694	8,682
2025/26	347	371	479	499	1,049	209	489	155	261	4,192	701	8,752
2026/27	353	376	482	504	1,053	211	474	150	263	4,237	710	8,813

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

Summer	Far North	Ross	North	Central West	Glad-stone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2007/08	292	404	390	533	1,193	243		15	387	3,512	600	7,569
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
Forecasts												
2017/18	324	449	490	524	1,038	210	532	179	281	3,992	679	8,698
2018/19	322	446	486	519	1,040	208	547	181	279	3,969	668	8,665
2019/20	322	443	486	524	1,040	206	550	179	278	3,965	665	8,658
2020/21	327	443	497	524	1,040	205	548	174	278	3,989	668	8,693
2021/22	331	447	501	541	1,043	206	564	174	279	4,044	675	8,805
2022/23	333	433	532	547	1,045	207	568	173	280	4,070	680	8,868
2023/24	335	434	546	546	1,045	206	563	171	279	4,091	685	8,901
2024/25	341	441	553	554	1,047	209	564	163	284	4,158	694	9,008
2025/26	347	446	558	560	1,049	211	550	155	287	4,213	701	9,077
2026/27	353	452	561	566	1,052	213	534	149	290	4,259	710	9,139

2.5 Daily and annual load profiles

The daily load profiles (transmission delivered) for the Queensland region on the days of 2016 winter and 2016/17 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 2016 and summer 2016/17 maximum native demand days

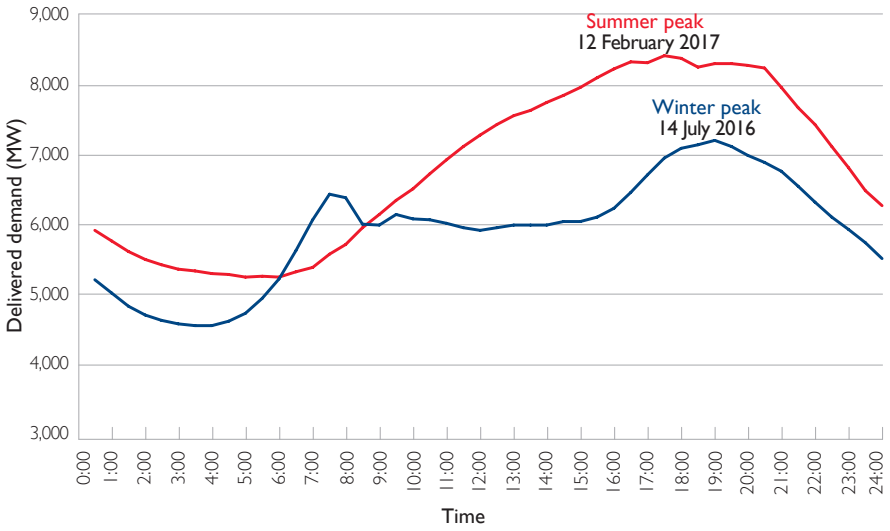


Figure 2.9 Normalised cumulative transmission delivered load duration from 1 April 2016 to 31 March 2017