CHAPTER 3

Energy and demand projections

3 Energy and demand projections

Key highlights

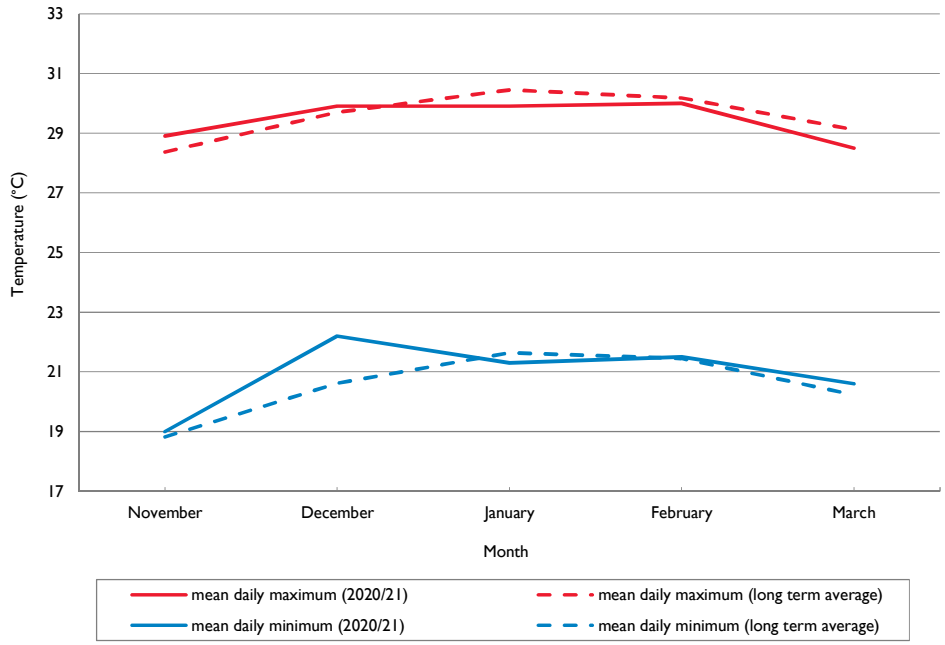
- This chapter describes the historical energy and demand, and provides forecast regional data disaggregated by zone.
- The 2020/21 summer maximum transmission delivered demand of 8,479MW occurred at 6pm on 22 February 2021, was 287MW lower than the maximum delivered demand in 2019/20 and 490MW lower than the record demand set in 2018/19.
- Queensland set a record minimum operational 'as generated' demand of 3,784MW on 3 October 2021 at 11:30am. This coincided with the minimum transmission delivered demand for 2021 of 3,053MW.
- Native plus rooftop photovoltaic (PV) energy increased by approximately 1.4% between 2019/20 and 2020/21.
- Powerlink has adopted the Australian Energy Market Operator's (AEMO) 2021 Electricity Statement of Opportunity (ESOO) forecasts in its planning analysis for the 2021 Transmission Annual Planning Report (TAPR). Powerlink is focussed on working with AEMO to understand the potential future impacts of emerging technologies so transmission network services are developed in ways that are valued by customers.
- Based on AEMO's Steady Progress scenario forecast, Queensland's delivered maximum demand is expected to maintain low growth with an average annual increase of 0.8% per annum over the next 10 years.
- The uptake of rooftop PV and distribution connected solar systems is further reducing delivered demand during the day to the point where this is now lower than night time light load conditions. The rate at which minimum demand declines over the coming years will be closely related to the rate at which rooftop PV systems are installed. Falling minimum demand will result in a variety of impacts on the power system, some of which may necessitate investment on the transmission system.
- Queensland's transmission delivered energy is expected to decline over the next 10 years predominantly due to continued installation of variable renewable energy (VRE) generation embedded within distribution networks and continuing installations of rooftop PV. Based on AEMO's Steady Progress scenario, transmission delivered energy consumption is expected to decline at an average rate of 1.1% per annum over the next 10 years.

3.1 Overview

The 2020/21 summer Queensland maximum delivered demand occurred at 6pm on 22 February 2021, when 8,479MW was delivered from the transmission grid (refer to Figure 3.5 for load measurement definitions). Operational 'as generated' and native demand peaks were recorded at this same time, with operational 'as generated' reaching 9,473MW and native demand reaching 8,929MW. After weather correction, the 2020/21 summer maximum transmission delivered demand was 8,660MW, 3.6% higher than that forecast in the 2020 ESOO Central scenario.

Figure 3.1 shows observed temperatures for Brisbane during summer 2020/21 compared with long-term averages, revealing a slightly cooler summer than average in south east Queensland, with daily maximum temperatures subdued in March.

Figure 3.1 Brisbane temperature ranges over summer 2020/21 (1)



Note:

(1) Long-term average based on years 2000 to 2020/21.

The 2021 Queensland minimum delivered demand occurred at 11:30am on 3 October 2021, when only 3,053MW was delivered from the transmission grid (refer to Figure 3.5 for load measurement definitions). Operational 'as generated' minimum demand was recorded at the same time and set a new record for Queensland of 3,784MW, passing the previous minimum record of 3,839MW set in July 2021. Direct connect loads made up about 60% of the transmission delivered demand with Distribution Network Service Provider (DNSP) customers only making up 40%. Mild weather conditions, during a weekend (Sunday) in combination with strong contribution from rooftop PV were contributors to this minimum demand.

Powerlink has worked with AEMO to derive transmission delivered equivalent demand and energy forecasts based on the forecast operational sent out quantities defined in AEMO's 2021 ESOO. Further information on the development of AEMO's 2021 ESOO is available on AEMO's website[1].

The AEMO 2021 ESOO forecasts provide the top-down, whole of state maximum demand forecast for the Queensland region. These are reconciled with bottom-up forecasts from DNSPs and directly connected customers to create the granular models needed to inform zonal or more localised issues.

The Queensland Government's 50% renewable energy target by 2030 Queensland Renewable Energy Target (QRET) has driven renewable capacity in the form of solar PV and wind farms to connect to the Queensland transmission and distribution networks (refer to Table 8.1 and Table 8.2). Additional uncommitted distribution connected solar and wind farm capacity has been included into the 10-year outlook period from 2026 to model the Queensland Government's target.

At the end of June 2021, Queensland reached 4,074MW of installed rooftop PV capacity[2]. Growth in rooftop PV capacity increased from around 59MW per month in 2019/20 to 65MW per month in 2020/21. An impact of rooftop PV, has been the time shift of the state's maximum demand, which now occurs around 6:00pm. As a result of significant capacity of rooftop PV and small-scale PV non-scheduled generation (PVNSG), maximum demand is unlikely to occur in the day time, it is now expected to occur in the early evening.

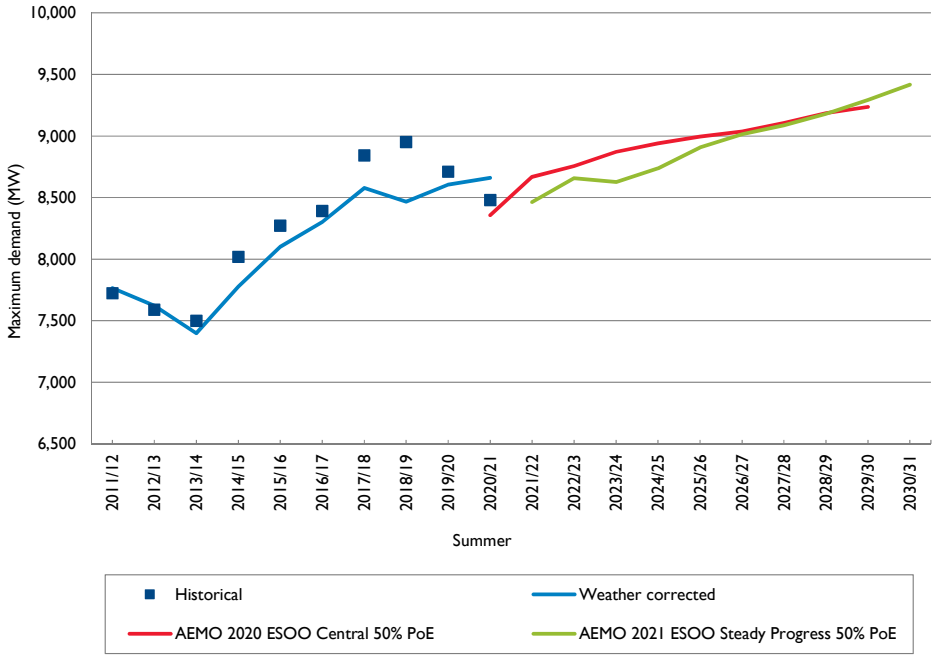
1 AEMO, 2021 Electricity Demand Forecasting Methodology Paper, August 2021.

2 Clean Energy Regulator, Postcode data for small-scale installations – all data, data as at 31/08/2021, September 2021. Whilst RET legislation allows a 12 month creation period for registered persons to create their certificates, updates for the first 9 months of this window are generally not material.

3 Energy and demand projections

Figure 3.2 shows a comparison of AEMO's 2020 ESOO delivered summer maximum demand forecast based on the Central scenario with AEMO's 2021 ESOO based on the Steady Progress scenario, both with 50% Probability of Exceedance (PoE).

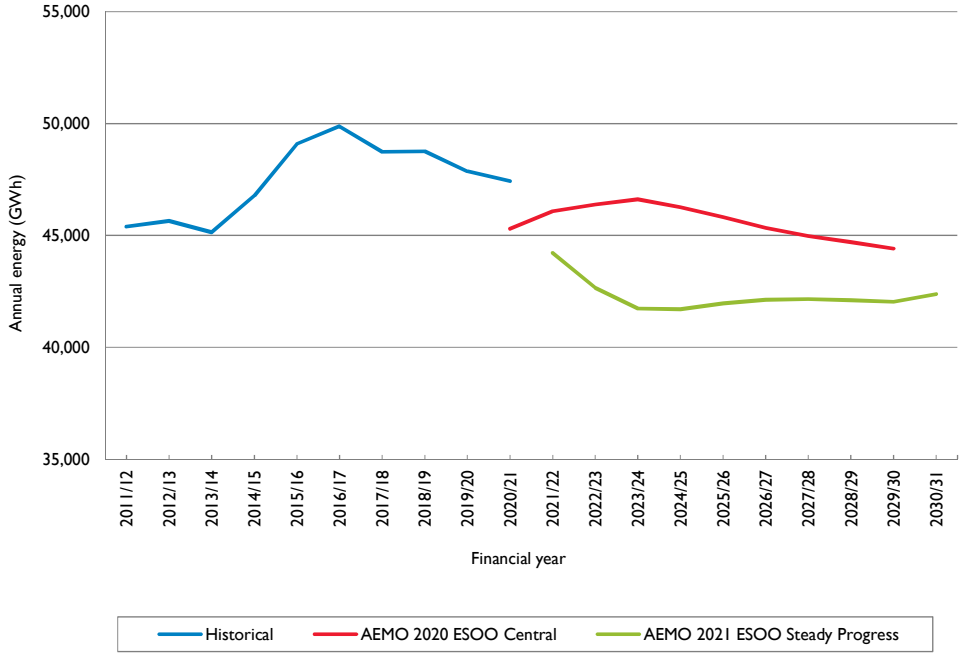
Figure 3.2 Comparison of AEMO's 2020 ESOO Central scenario delivered demand forecast with the 2021 ESOO Steady Progress scenario (1)



Note:
(1) AEMO's 2021 ESOO forecast has been converted from 'operational sent-out' to 'transmission delivered' for the purposes of comparison. Refer to Figure 3.5 for further details.

Figure 3.3 shows a comparison of AEMO's 2020 ESOO delivered energy forecast based on the Central scenario with AEMO's 2021 ESOO based on the Steady Progress scenario. Section 3.4 discusses updates included in AEMO's 2021 ESOO forecasts.

Figure 3.3 Comparison of AEMO's 2020 ESOO Central scenario delivered energy forecast with the 2021 ESOO Steady Progress scenario (1)



Note:

(1) AEMO's 2021 ESOO forecast has been converted from 'operational sent-out' to 'transmission delivered' for the purposes of comparison. Refer to Figure 3.5 for further details.

3.2 Future forecasting challenges

Decentralisation, driven by future developments in battery storage technology coupled with rooftop PV and EVs, could see significant changes to future electricity usage patterns. This could reduce the need to develop transmission services to cover short duration peaks.

However, presently only approximately 20% of final energy consumption in Queensland is from electricity and this electrical energy is predominantly supplied from the interconnected power system. Therefore, the electrification of load historically supplied by the combustion of fossil fuels to various sectors of the economy such as transport, agriculture, mining and manufacturing may require a significant investment in the transmission and distribution networks. The drivers for the electrification of these sectors largely relate to the need to reduce carbon emissions for a variety of reasons (environmental factors, community and corporate expectations or the international treatment of exports with implicit emissions).

The growth in grid-supplied electricity through electrification will, to some extent, be offset by reductions in grid-supplied energy due to decentralisation. However, the geospatial distribution of these two effects are not expected to be uniform. There may be areas where net demand for grid-supplied electricity is likely to significantly increase, and other areas where it is likely to decrease.

Powerlink is committed to understanding the future impacts of emerging technologies and electrification and to work with our customers and AEMO so that these are accounted geospatially within future forecasts. This will allow transmission network services to be developed in ways that are valued by customers.

3 Energy and demand projections

3.3 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 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 Powerlink transmission network.

Powerlink, Energex and Ergon Energy jointly conduct the Queensland Household Energy Survey (QHES) to improve understanding of consumer behaviours and intentions. This survey provides comprehensive insights on consumer intentions on electricity usage.

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 have not been included in AEMO's 2021 ESOO Steady Progress scenario. These developments totalling nearly 1,250MW, are listed in Table 3.1.

Table 3.1 Possible large loads excluded from the Slow Growth, Steady Progress and Hydrogen Superpower scenario forecasts

Zone	Description	Possible load
Ross	Connection to North West Minerals Province (Mt Isa)	Up to 350MW
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

3.4 Demand forecast outlook

The following sections outline the Queensland forecasts for energy, summer maximum demand, winter maximum demand and annual minimum demand. Annual maximum demands continue to be expected in the summer period. Annual minimum demands have generally occurred in winter and more recently in the shoulder periods.

The annual minimum demand has moved from overnight to the day time since 2018 (this is described in Section 3.4.1). The forecast for minimum delivered demand is now closely correlated to rooftop PV installations and embedded variable renewable energy (VRE) generators. Forecasts in this chapter are provided without predicting market outcomes, directions or constraints which may be imposed to ensure system security but impact on the output of these embedded VRE generators.

The 2021 TAPR reports on the Slow Growth, Steady Progress and Hydrogen Superpower scenario forecasts provided by AEMO and aligned to the 2021 ESOO. 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 Slow Growth, Steady Progress and Hydrogen Superpower scenarios are shown in Table 3.2. These growth rates refer to transmission delivered quantities as described in Section 3.4.2. For summer and winter maximum demand, growth rates are based on 50% PoE corrected values for 2020/21 and 2020 respectively.

Table 3.2 Average annual growth rate over next 10 years

	AEMO future scenario growth outlooks		
	Slow Growth	Steady Progress	Hydrogen Superpower
Delivered energy	-3.9%	-1.1%	0.8%
Delivered summer maximum demand (50% PoE)	-0.6%	0.8%	2.2%
Delivered winter maximum demand (50% PoE)	-0.7%	0.7%	2.3%

3.4.1 Changing load profiles

Historically, the daily load profile as delivered by the Powerlink transmission grid has seen daily maximum demand occur in the mid afternoon during the summer seasons, and during evening periods within the cooler winter seasons. Daily minimum demands have typically occurred during the night time (typically 4am or so) when industries and commercial premises are mostly closed and households are sleeping.

However, the installation of small scale rooftop PV systems and distribution connected solar farms is progressively changing the characteristics of daily demand required to be supplied by the Powerlink transmission system. The uptake of rooftop PV systems within Queensland continues to be one of the highest per capita rates in the world, and there are now over 800,000 installed solar PV systems with an aggregate state-wide capacity of more than 4,074MW[3].

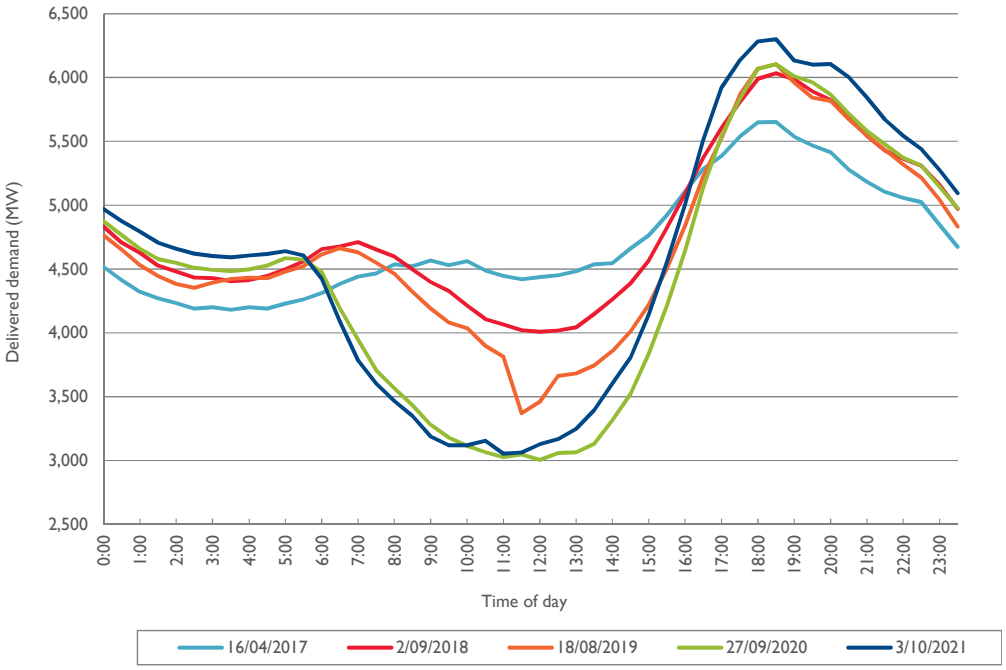
While the cumulative effect of small-scale renewable energy has reduced maximum demand and energy consumption, power produced by embedded solar installations has the effect of 'hollowing' the daily demand profile during the day time period. This contribution ceases during the evening when the sun sets. This effect is more likely to be prominent within Queensland during the lower day time demand winter and spring seasons. The term 'duck curve' was first coined by the Californian Independent System Operator to describe the effects of embedded solar power generation on the shape of the daily load profile, and is a characteristic experienced by transmission networks globally where there has been a significant level of embedded, highly correlated PV renewable energy systems.

Figure 3.4 depicts the change in daily load profile of the transmission delivered minimum demand daily profile. The duck curve can be seen to emerge creating a new annual minimum demand in the middle of the day from 2018.

[3] Clean Energy Regulator, Postcode data for small-scale installations – all data, data as at 31/08/2021, September 2021.

3 Energy and demand projections

Figure 3.4 Transmission delivered annual minimum demand for the Queensland region (1)(2)



Notes:

(1) Minimum demand can be caused by abnormal conditions, as depicted in the 2019 trace when lowest demand coincided with a large industrial load being out of service.

(2) 3 October 2021 trace based on preliminary metering data.

Minimum demand during the day has continued to decrease with the progressive installation of rooftop PV systems. However, maximum daily demand has continued to increase in line with underlying load growth since the contribution of rooftop PV tapers off towards the evening. This has resulted in an increasing divergence between minimum and maximum demand which needs to be met and managed by generation and the transmission network.

This change in load profile has also meant that day time minimum demand is now lower than night time for a significant portion of the year. This has meant that reactive power devices historically installed to manage night time minimum demand may no longer be sufficient to manage voltages during day time periods.

The uptake of rooftop PV systems is expected to continue within residential and commercial premises. Should this trend progress in the absence of energy storage devices (such as household battery systems) or significant levels of demand time of day shifting, minimum demand is expected to further decrease with continued widening between maximum and minimum demand. The installation of additional reactive devices and/or non-network solutions are likely to be required to manage voltages during minimum demand conditions (refer to sections 11.1 and 6.7.10).

Continuation of this trend is likely to present further challenges to the energy system. Generating stations will be required to ramp up and down in response to daily demand variations more frequently. Decreasing minimum demand may lower the amount of synchronous generation that is able to be on-line and this could further impact on voltage control, system strength, inertia and the ability for available generators to meet evening peak demand. However, there may be opportunities for new technologies and non-network solutions to assist with managing the daily peaks and troughs. Demand shifting and storage solutions have the potential to smooth the daily load profile. These type of services could offer a number of benefits to the electricity system including reducing the need for additional transmission investment.

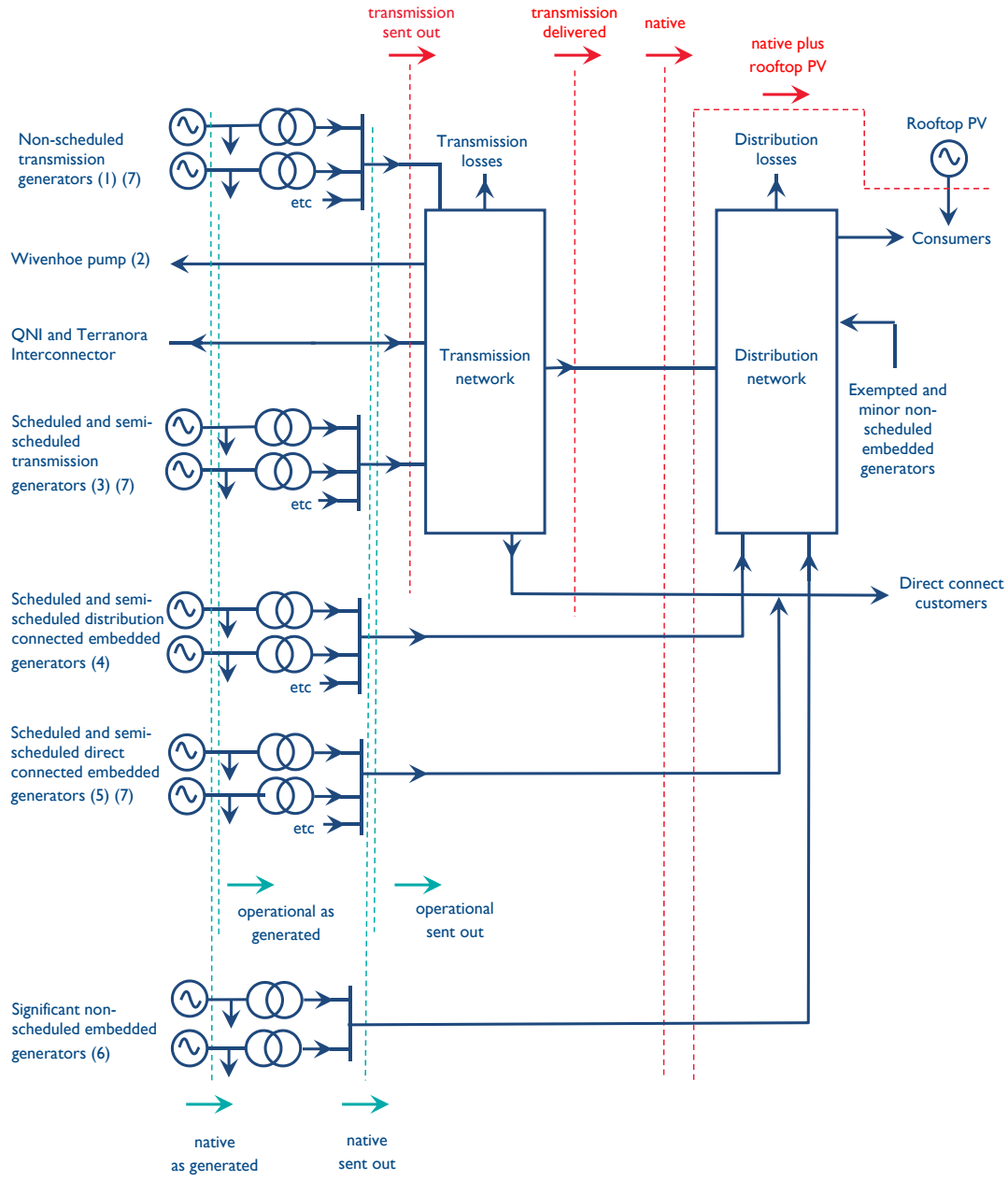
Powerlink is continuing to monitor and assess the impacts of changing load profiles on the transmission network, and is taking an integrated planning approach to address emerging issues and challenges with the transforming energy system.

3.4.2 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 3.5 shows the common ways demand and energy measurements are defined, with this terminology used consistently throughout the TAPR.

3 Energy and demand projections

Figure 3.5 Load measurement definitions



Notes:

(1) Includes Invicta and Koombooloomba.

(2) Depends on Wivenhoe generation.

(3) Includes Yarwun which is non-scheduled.

(4) For a full list of scheduled and semi-scheduled distribution connected generators refer to Table 8.2.

(5) Sun Metals Solar Farm and Condamine.

(6) Lakeland Solar and Storage, Hughenden Solar Farm, Pioneer Mill, Moranbah North, Moranbah, Racecourse Mill, Barcaldine Solar Farm, Longreach Solar Farm, German Creek, Oaky Creek, Isis Central Sugar Mill, Baking Board Solar Farm, Daandine, Sunshine Coast Solar Farm, Bromelton and Rocky Point.

(7) For a full list of transmission network connected generators and scheduled and semi-scheduled direct connected embedded generators refer to Table 8.1.

3.4.3 Energy forecast

Historical Queensland energy measurements are presented in Table 3.3. They are recorded at various levels in the network as defined in Figure 3.5.

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

Table 3.3 Historical energy (GWh)

Financial Year	Operational as generated	Operational sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Native	Native plus rooftop PV
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	54,538	50,198	56,139	51,918	50,172	48,739	50,925	53,406
2018/19	54,861	50,473	56,381	52,118	50,163	48,764	51,240	54,529
2019/20	54,179	50,039	55,776	51,740	49,248	47,860	50,804	54,449
2020/21	53,415	49,727	54,710	51,140	48,608	47,421	50,107	55,232

The transmission delivered energy forecasts are presented in Table 3.4.

Table 3.4 Forecast annual transmission delivered energy (GWh)

Financial Year	Slow Growth	Steady Progress	Hydrogen Superpower
2021/22	41,554	44,221	49,163
2022/23	39,818	42,665	48,377
2023/24	38,672	41,726	48,437
2024/25	38,639	41,704	48,121
2025/26	38,669	41,960	47,948
2026/27	38,673	42,120	50,798
2027/28	38,684	42,159	50,940
2028/29	38,769	42,105	50,833
2029/30	31,760 (1)	42,035	50,910
2030/31	31,882	42,377	51,326

Note:

(1) AEMO assumes the shutdown of a large industrial load in the Slow Growth scenario in the latter half of winter 2029.

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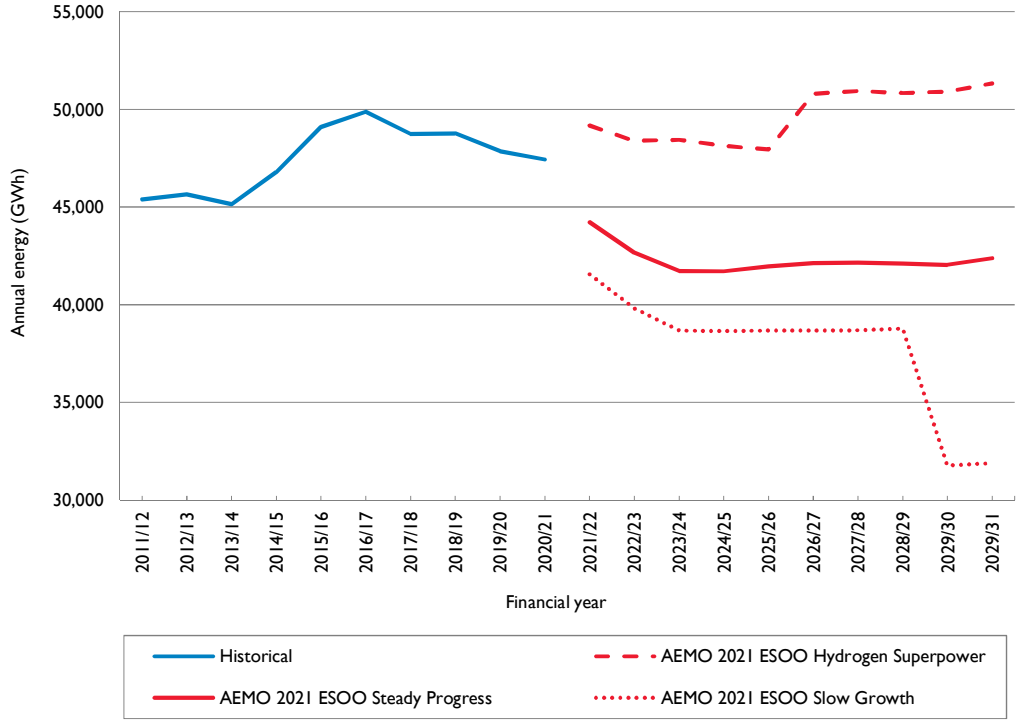
The historical annual transmission delivered energy from Table 3.3 and the forecast transmission delivered energy for the Slow Growth, Steady Progress and Hydrogen Superpower scenarios from Table 3.4 are shown in Figure 3.6.

Figure 3.6 Historical and forecast transmission delivered energy



The native energy forecasts are presented in Table 3.5.

Table 3.5 Forecast annual native energy (GWh)

Financial Year	Slow Growth	Steady Progress	Hydrogen Superpower
2021/22	45,281	47,949	52,890
2022/23	44,209	47,056	52,769
2023/24	43,438	46,492	53,203
2024/25	43,400	46,465	52,882
2025/26	43,319	46,609	53,298
2026/27	43,325	46,954	57,019
2027/28	43,341	47,362	56,997
2028/29	43,421	47,745	57,103
2029/30	36,411 (1)	48,120	57,384
2030/31	36,534	48,461	58,398

Note:

(1) AEMO assumes the shutdown of a large industrial load in the Slow Growth scenario in the latter half of winter 2029.

3.4.4 Summer maximum demand forecast

Historical Queensland summer maximum demand measurements at time of transmission delivered peak are presented in Table 3.6.

Table 3.6 Historical summer maximum demand at time of transmission delivered peak (MW)

Summer	Operational as generated	Operational sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Transmission delivered corrected to 50% PoE	Native	Native plus solar PV
2011/12	8,707	8,143	8,790	8,226	7,890	7,722	7,765	8,058	8,058
2012/13	8,278	8,208	8,448	8,427	8,113	7,597	7,638	7,911	7,911
2013/14	8,445	7,596	8,587	7,749	7,514	7,559	7,436	7,794	8,086
2014/15	8,809	8,360	9,024	8,623	8,276	7,983	7,737	8,330	8,524
2015/16	9,154	8,620	9,332	8,850	8,532	8,222	8,050	8,541	9,021
2016/17	9,412	8,856	9,572	9,078	8,694	8,347	8,257	8,731	8,817
2017/18	9,798	9,211	10,015	9,489	9,080	8,789	8,515	9,198	9,602
2018/19	10,010	9,433	10,173	9,666	9,248	8,969	8,488	9,387	9,523
2019/20	9,836	9,283	10,052	9,544	9,056	8,766	8,662	9,255	9,453
2020/21	9,473	8,954	9,627	9,161	8,711	8,479	8,660	8,929	9,256

The summer transmission delivered maximum demand forecasts are presented in Table 3.7.

Table 3.7 Forecast summer transmission delivered maximum demand (MW)

Summer	Slow Growth			Steady Progress			Hydrogen Superpower		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2021/22	8,050	8,389	8,843	8,138	8,463	8,912	8,774	9,127	9,554
2022/23	8,225	8,579	9,031	8,310	8,658	9,088	8,775	9,137	9,507
2023/24	7,981	8,291	8,793	8,316	8,626	9,120	8,852	9,191	9,633
2024/25	8,283	8,625	9,093	8,400	8,737	9,199	9,065	9,398	9,861
2025/26	8,257	8,608	9,070	8,601	8,906	9,389	9,133	9,470	9,875
2026/27	8,427	8,771	9,252	8,703	9,013	9,513	9,645	9,957	10,360
2027/28	8,517	8,873	9,356	8,760	9,086	9,569	9,853	10,166	10,576
2028/29	8,601	8,957	9,411	8,856	9,180	9,685	9,993	10,310	10,701
2029/30 (1)	7,857	8,199	8,678	8,999	9,293	9,804	10,156	10,440	10,840
2030/21	7,799	8,145	8,610	9,118	9,417	9,895	10,462	10,752	11,137

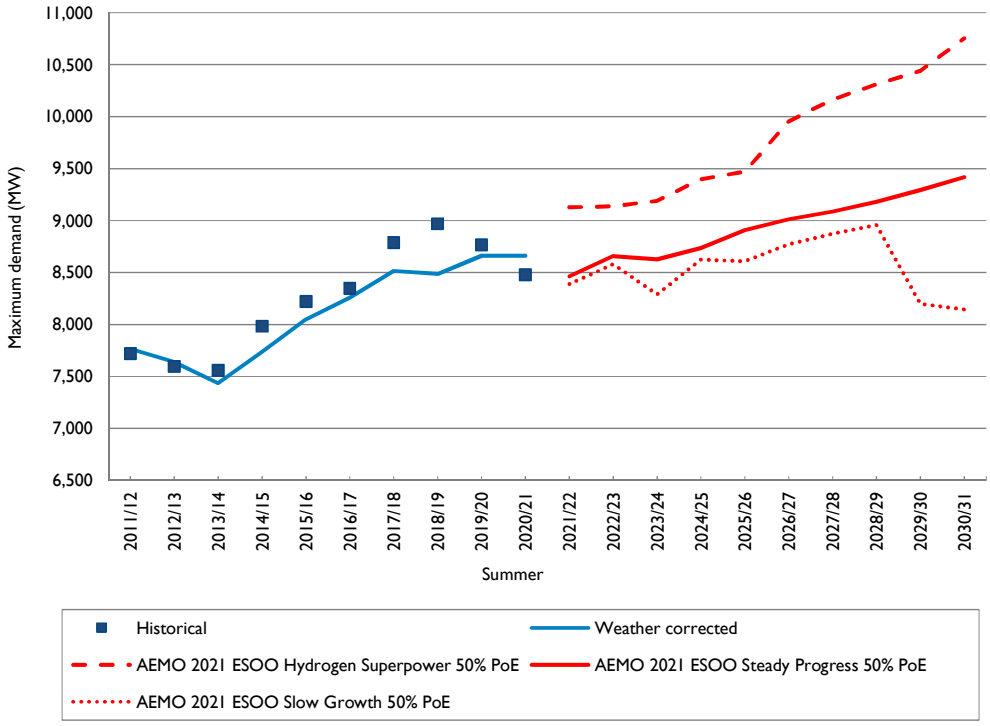
Note:

(1) Shutdown of a large industrial load is assumed in the Slow Growth scenario in the latter half of winter 2029.

3 Energy and demand projections

The summer historical transmission delivered maximum demands from Table 3.6 and the forecast 50% PoE summer transmission delivered maximum demands for the Slow Growth, Steady Progress, and Hydrogen Superpower scenarios from Table 3.7 are shown in Figure 3.7.

Figure 3.7 Historical and forecast transmission delivered summer maximum demand



Historical Queensland summer maximum demand measurements at time of native peak are presented in Table 3.8.

Table 3.8 Historical summer maximum demand at time of native peak (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
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	9,584	9,062	8,698	8,392	8,756	8,899	8,666
2017/18	9,796	9,262	10,010	9,480	9,133	8,842	9,189	9,594	8,924
2018/19	10,044	9,450	10,216	9,626	9,240	8,951	9,415	9,685	8,930
2019/20	9,853	9,294	10,074	9,515	9,011	8,710	9,268	9,652	9,163
2020/21	9,473	8,954	9,627	9,161	8,711	8,479	8,929	9,254	9,110

The summer native maximum demand forecasts are presented in Table 3.9.

Table 3.9 Forecast summer native maximum demand (MW)

Summer	Slow Growth			Steady Progress			Hydrogen Superpower		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2021/22	8,643	8,983	9,436	8,790	9,116	9,564	9,192	9,545	9,972
2022/23	8,640	8,994	9,446	8,809	9,157	9,587	9,301	9,662	10,032
2023/24	8,651	8,961	9,463	8,838	9,148	9,642	9,450	9,789	10,231
2024/25	8,706	9,047	9,515	8,916	9,253	9,714	9,546	9,879	10,342
2025/26	8,779	9,130	9,591	9,027	9,333	9,815	9,718	10,055	10,460
2026/27	8,847	9,191	9,672	9,129	9,439	9,939	10,313	10,624	11,027
2027/28	8,940	9,295	9,778	9,269	9,596	10,078	10,462	10,775	11,185
2028/29	9,016	9,372	9,826	9,381	9,705	10,209	10,619	10,936	11,327
2029/30 (1)	8,274	8,617	9,095	9,533	9,827	10,338	10,841	11,125	11,525
2030/31	8,352	8,697	9,163	9,659	9,957	10,435	11,127	11,418	11,803

Note:

(1) Shutdown of a large industrial load is assumed in the Slow Growth scenario in the latter half of winter 2029.

3.4.5 Winter maximum demand forecast

Historical Queensland winter maximum demand measurements at time of transmission delivered peak are presented in Table 3.10. As winter demand normally peaks after sunset, solar PV has no impact on winter maximum demand.

Table 3.10 Historical winter maximum demand at time of transmission delivered peak (MW)

Winter	Operational as generated	Operational sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Transmission delivered corrected to 50% PoE	Native	Native plus rooftop PV
2012	7,244	7,466	7,356	7,576	7,337	6,525	6,502	6,764	6,764
2013	7,131	6,488	7,273	6,649	6,507	6,551	6,753	6,693	6,693
2014	7,288	6,895	7,448	7,091	6,853	6,642	6,761	6,879	6,879
2015	7,816	7,334	8,027	7,624	7,299	7,090	6,976	7,415	7,415
2016	8,017	7,469	8,176	7,678	7,398	7,176	7,198	7,456	7,456
2017	7,595	7,063	7,756	7,282	7,067	6,870	7,138	7,085	7,085
2018	8,172	7,623	8,295	7,803	7,554	7,331	7,654	7,580	7,580
2019	7,898	7,446	8,096	7,735	7,486	7,296	7,289	7,544	7,544
2020	8,143	7,671	8,320	7,941	7,673	7,483	7,276	7,751	7,751
2021	8,143	7,677	8,279	7,901	7,659	7,472	(1)	7,714	7,725

Note:

(1) The winter 2021 weather corrected demand was not available at time of publication.

3 Energy and demand projections

The winter transmission delivered maximum demand forecasts are presented in Table 3.11.

Table 3.11 Forecast winter transmission delivered maximum demand (MW)

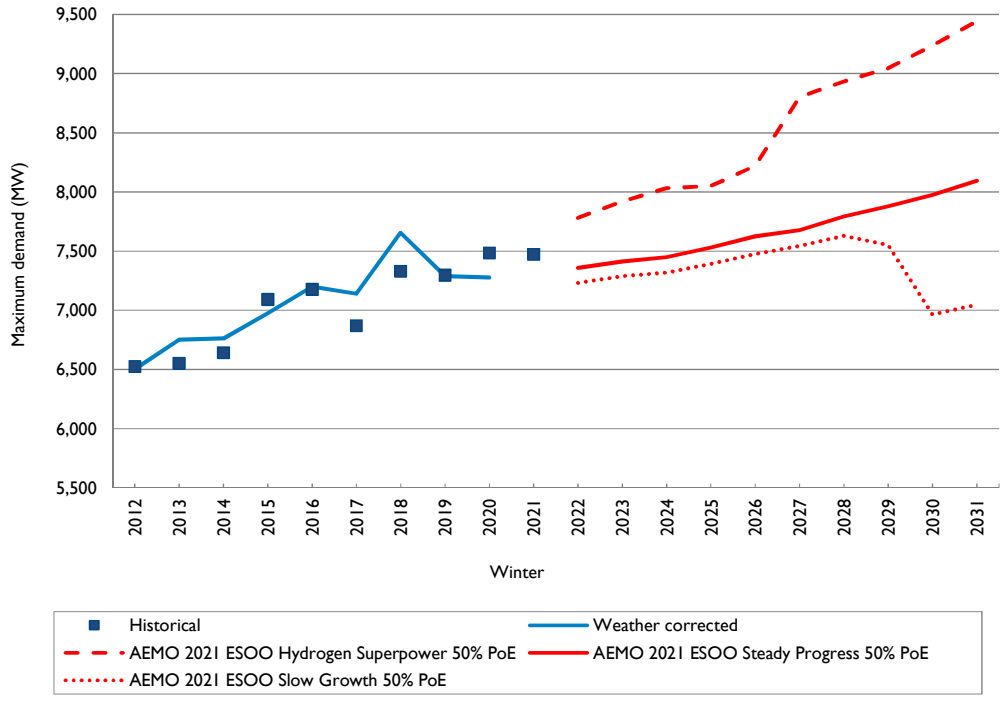
Winter	Slow Growth			Steady Progress			Hydrogen Superpower		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2022	6,974	7,231	7,526	7,101	7,359	7,661	7,546	7,782	8,102
2023	7,023	7,287	7,593	7,166	7,412	7,717	7,678	7,921	8,239
2024	7,058	7,318	7,638	7,202	7,449	7,757	7,785	8,032	8,345
2025	7,140	7,392	7,707	7,274	7,530	7,838	7,811	8,050	8,359
2026	7,216	7,475	7,794	7,375	7,625	7,936	7,982	8,220	8,527
2027	7,283	7,545	7,853	7,420	7,678	7,992	8,566	8,804	9,107
2028	7,370	7,629	7,937	7,532	7,792	8,109	8,699	8,934	9,250
2029	7,251	7,550	7,883	7,624	7,877	8,185	8,796	9,044	9,353
2030 (1)	6,708	6,964	7,283	7,732	7,975	8,283	8,996	9,238	9,548
2031	6,784	7,048	7,366	7,844	8,094	8,396	9,197	9,443	9,765

Note:

(1) Shutdown of a large industrial load is assumed in the Slow Growth scenario in the latter half of winter 2029.

The winter historical transmission delivered maximum demands from Table 3.10 and the forecast 50% PoE summer transmission delivered maximum demands for the Slow Growth, Steady Progress, and Hydrogen Superpower scenarios from Table 3.11 are shown in Figure 3.8.

Figure 3.8 Historical and forecast winter transmission delivered maximum demand



Historical Queensland winter maximum demand measurements at time of native peak are presented in Table 3.12. As winter demand normally peaks after sunset, solar PV has no impact on winter maximum demand.

Table 3.12 Historical winter maximum demand at time of native peak (MW)

Winter	Operational as generated	Operational sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Native	Native plus rooftop PV	Native corrected to 50 % PoE
2012	7,469	7,081	7,520	7,128	6,955	6,761	6,934	6,934	6,908
2013	7,173	6,753	7,345	6,947	6,699	6,521	6,769	6,769	6,983
2014	7,307	6,895	7,470	7,077	6,854	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	8,188	7,686	7,439	7,207	7,454	7,454	7,479
2017	7,723	7,221	7,874	7,374	7,111	6,894	7,157	7,157	7,433
2018	8,172	7,623	8,295	7,750	7,554	7,383	7,633	7,633	7,904
2019	8,073	7,559	8,286	7,778	7,416	7,208	7,624	7,624	7,617
2020	8,143	7,671	8,320	7,885	7,673	7,441	7,708	7,708	7,544
2021	8,162	8,065	8,328	8,319	8,029	7,468	7,758	7,758	(1)

Note:
(1) The winter 2021 weather corrected demand was not available at time of publication.

The winter native maximum demand forecasts are presented in Table 3.13.

Table 3.13 Forecast winter native maximum demand (MW)

Winter	Slow Growth			Steady Progress			Hydrogen Superpower		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2022	7,386	7,644	7,939	7,515	7,773	8,075	7,955	8,191	8,511
2023	7,429	7,693	7,999	7,571	7,818	8,123	8,084	8,327	8,644
2024	7,464	7,723	8,043	7,607	7,855	8,163	8,248	8,495	8,808
2025	7,541	7,793	8,109	7,680	7,936	8,244	8,328	8,567	8,876
2026	7,622	7,881	8,200	7,791	8,041	8,352	8,531	8,769	9,076
2027	7,697	7,959	8,267	7,909	8,167	8,481	9,136	9,374	9,676
2028	7,780	8,040	8,347	8,025	8,285	8,602	9,291	9,527	9,842
2029	7,672	7,971	8,304	8,139	8,392	8,700	9,458	9,706	10,015
2030 (1)	7,122	7,378	7,697	8,251	8,494	8,802	9,688	9,930	10,240
2031	7,194	7,458	7,777	8,381	8,632	8,933	9,966	10,212	10,535

Note:
(1) Shutdown of a large industrial load is assumed in the Slow Growth scenario in the latter half of winter 2029.

3.4.6 Annual minimum demand forecast

Historical Queensland annual minimum demand measurements at time of transmission delivered minimum are presented in Table 3.14.

Table 3.14 Historical annual minimum demand (MW)

Annual	Operational as generated	Operational sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Native	Native plus rooftop PV
2012	4,095	4,075	4,220	4,188	4,064	3,610	3,734	3,734
2013	4,176	4,097	4,305	4,237	4,108	3,702	3,831	3,831
2014	4,073	3,780	4,274	4,027	3,768	3,664	3,923	3,923
2015	4,281	3,946	4,476	4,178	3,983	3,884	4,079	4,079
2016	4,944	4,470	5,101	4,686	4,471	4,336	4,552	4,552
2017	4,791	4,313	4,942	4,526	4,318	4,181	4,389	4,389
2018	4,647	4,165	4,868	4,501	4,143	4,008	4,366	5,572
2019	4,211	3,712	4,441	4,112	3,528	3,370	3,953	5,323
2020	3,897	3,493	4,094	3,767	3,097	3,006	3,675	5,882
2021 (1)	3,784	3,386	3,895	3,565	3,120	3,053	3,498	6,490

Note:

(1) 2021 minimum based on prelimary data up to 3 October 2021.

Annual transmission delivered minimum demand forecasts are presented in Table 3.15.

Table 3.15 Forecast annual transmission delivered minimum demand (MW) (1)

Annual	Slow Growth			Steady Progress			Hydrogen Superpower		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2022	1,355	1,573	1,774	1,547	1,788	1,974	1,953	2,175	2,371
2023	925	1,164	1,372	1,185	1,427	1,616	1,589	1,823	2,018
2024	666	909	1,124	872	1,132	1,344	1,252	1,511	1,745
2025	467	718	957	653	911	1,134	748	1,035	1,287
2026	296	553	798	366	638	877	438	707	972
2027	84	368	619	141	434	680	484	790	1,085
2028	-56	204	451	1	268	502	101	385	679
2029	-979	-698	-422	-128	166	439	-329	5	323
2030 (2)	-1,108	-832	-573	-280	31	291	-672	-314	21
2031	-1,206	-916	-644	-374	-58	205	-1,185	-826	-474

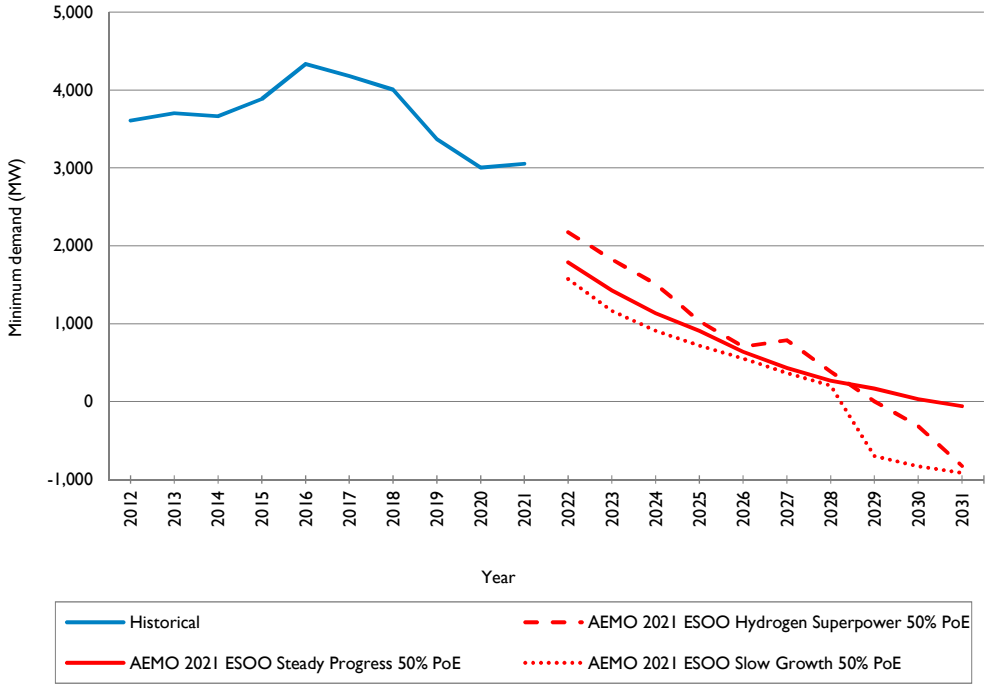
Notes:

(1) Forecasts provided without predicting market outcomes, directions or constraints which may be imposed to ensure system security but will impact output of embedded VRE generators and, as a consequence, transmission delivered demand.

(2) Shutdown of a large industrial load is assumed in the Slow Growth scenario in the latter half of winter 2029.

The annual historical transmission delivered minimum demands from Table 3.14 and the forecast 50% PoE summer transmission delivered minimum demands for the Slow Growth, Steady Progress, and Hydrogen Superpower scenarios from Table 3.15 are shown in Figure 3.9.

Figure 3.9 Historical and forecast transmission delivered annual minimum demand



Annual native minimum demand forecasts are presented in Table 3.16.

Table 3.16 Forecast annual native minimum demand (MW) (1)

Annual	Slow Growth (2)			Steady Progress			Hydrogen Superpower		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2022	2,538	2,756	2,957	2,730	2,971	3,156	3,125	3,347	3,543
2023	2,105	2,343	2,551	2,368	2,610	2,799	2,773	3,008	3,202
2024	1,850	2,094	2,308	2,057	2,317	2,529	2,472	2,731	2,965
2025	1,654	1,906	2,145	1,839	2,097	2,320	2,011	2,298	2,550
2026	1,480	1,737	1,982	1,666	1,938	2,177	1,718	1,987	2,253
2027	1,270	1,553	1,805	1,493	1,785	2,032	1,776	2,082	2,377
2028	1,127	1,386	1,634	1,387	1,655	1,889	1,447	1,731	2,025
2029	205	486	762	1,252	1,546	1,819	1,092	1,426	1,744
2030	77	353	611	1,107	1,417	1,678	753	1,111	1,446
2031	-18	272	544	1,017	1,333	1,597	590	948	1,300

Notes:

(1) Forecasts provided without predicting market outcomes, directions or constraints which may be imposed to ensure system security but impact on the output of these embedded VRE generators.

(2) Shutdown of a large industrial load is assumed in the Slow Growth scenario in the latter half of winter 2029.

3 Energy and demand projections

3.5 Zone forecasts

AEMO's 2021 ESOO provides forecasts for Queensland as a single region. Forecasts from DNSPs and directly connected customers at each transmission connection supply point have been used to apportion the demand and energy forecasts into the 11 zones referenced throughout this TAPR. The 11 geographical zones are defined in Table C.1 and illustrated in Figure C.1 in Appendix C. Each zone normally experiences its own maximum demand, which is usually greater than that shown in tables 3.20 to 3.23.

Table 3.17 shows the average ratios of zone maximum transmission delivered demand to zone transmission delivered demand at the time of Queensland region maximum delivered demand. These values can be used to multiply demands in tables 3.20 and 3.22 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 3.17 Average ratios of zone maximum delivered demand to zone delivered demand at time of Queensland region maximum delivered demand

Zone	Winter	Summer
Far North	1.09	1.23
Ross	1.25	1.67
North	1.11	1.14
Central West	1.13	1.23
Gladstone	1.03	1.04
Wide Bay	1.03	1.08
Surat	1.14	1.16
Bulli	1.03	1.08
South West	1.04	1.10
Moreton	1.03	1.01
Gold Coast	1.03	1.03

Tables 3.18 and 3.19 show the historical and forecast of transmission delivered energy and native energy for the Steady Progress scenario for each of the 11 zones in the Queensland region.

Table 3.18 Annual transmission delivered energy by zone (GWh)

Financial Year	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
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	1,657	2,645	2,650	3,027	9,362	1,238	4,383	1,497	1,315	17,873	3,092	48,739
2018/19	1,648	2,338	2,621	2,996	9,349	1,198	4,805	1,519	1,376	17,849	3,065	48,764
2019/20	1,594	2,466	2,495	2,859	9,303	1,031	5,025	1,580	1,141	17,395	2,971	47,860
2020/21	1,519	2,569	2,413	2,813	9,383	970	5,241	1,491	993	16,807	3,222	47,421
Forecasts												
2021/22	1,380	2,317	2,371	2,298	9,279	862	5,103	1,671	652	15,665	2,623	44,221
2022/23	1,330	2,300	2,297	2,209	9,262	566	4,617	1,662	726	15,141	2,555	42,665
2023/24	1,309	2,271	2,269	2,182	9,256	405	4,401	1,661	673	14,814	2,485	41,726
2024/25	1,295	2,254	2,258	2,165	9,258	385	4,434	1,673	650	14,840	2,492	41,704
2025/26	1,299	2,257	2,265	2,282	9,259	381	4,434	1,673	651	14,945	2,514	41,960
2026/27	1,296	2,246	2,259	2,283	9,265	382	4,382	1,654	654	15,145	2,554	42,120
2027/28	1,277	2,206	2,221	2,252	9,270	378	4,278	1,614	644	15,412	2,607	42,159
2028/29	1,246	2,150	2,173	2,217	9,274	364	4,151	1,567	628	15,673	2,662	42,105
2029/30	1,218	2,095	2,126	2,182	9,279	351	4,021	1,519	613	15,918	2,713	42,035
2030/31	1,231	2,108	2,147	2,208	9,283	347	4,022	1,520	617	16,135	2,759	42,377

3 Energy and demand projections

Table 3.19 Annual native energy by zone (GWh)

Financial Year	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
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	1,667	2,935	3,296	3,493	9,362	1,259	4,853	1,497	1,527	17,944	3,092	50,925
2018/19	1,670	2,894	3,211	3,608	9,349	1,266	5,163	1,519	1,550	17,945	3,065	51,240
2019/20	1,614	2,899	3,159	3,656	9,303	1,282	5,395	1,580	1,479	17,466	2,971	50,804
2020/21	1,539	2,904	2,982	3,552	9,383	1,234	5,451	1,491	1,476	17,152	2,943	50,107
Forecasts												
2021/22	1,409	3,057	2,981	3,206	9,279	1,161	5,368	1,671	1,466	15,729	2,622	47,949
2022/23	1,358	3,097	2,907	3,116	9,262	1,113	5,374	1,662	1,412	15,202	2,553	47,056
2023/24	1,337	3,070	2,879	3,091	9,255	1,090	5,368	1,661	1,385	14,873	2,483	46,492
2024/25	1,323	3,051	2,868	3,073	9,257	1,068	5,399	1,673	1,362	14,901	2,490	46,465
2025/26	1,327	3,054	2,875	3,080	9,259	1,063	5,399	1,673	1,362	15,005	2,512	46,609
2026/27	1,340	3,072	2,897	3,108	9,264	1,068	5,400	1,674	1,372	15,207	2,552	46,954
2027/28	1,354	3,086	2,916	3,130	9,269	1,074	5,402	1,674	1,381	15,472	2,604	47,362
2028/29	1,363	3,096	2,938	3,159	9,273	1,067	5,402	1,675	1,382	15,732	2,658	47,745
2029/30	1,376	3,107	2,960	3,188	9,278	1,063	5,402	1,676	1,386	15,975	2,709	48,120
2030/31	1,388	3,121	2,981	3,215	9,282	1,059	5,403	1,676	1,389	16,192	2,755	48,461

Tables 3.20 and 3.21 show the historical and 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 Steady Progress scenario and average (50% PoE) summer weather.

Table 3.20 State summer maximum transmission delivered demand by zone (MW)

Summer	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
2011/12	296	376	404	525	1,191	249		18	217	3,788	658	7,722
2012/13	278	297	373	546	1,219	233		14	231	3,766	627	7,597
2013/14	296	401	427	504	1,152	248	13	17	267	3,597	637	7,559
2014/15	278	381	399	466	1,254	263	96	81	227	3,846	692	7,983
2015/16	308	392	411	443	1,189	214	265	155	231	3,953	661	8,222
2016/17	258	222	378	429	1,193	270	421	178	286	3,993	719	8,347
2017/18	304	376	413	463	1,102	278	504	183	301	4,147	718	8,789
2018/19	342	339	400	484	1,096	285	526	191	312	4,270	724	8,969
2019/20	286	325	391	368	1,080	263	610	191	267	4,276	709	8,766
2020/21	254	405	431	471	1,111	298	588	165	248	3,894	614	8,479
Forecasts												
2021/22	265	329	413	403	1,091	233	557	191	234	4,093	654	8,463
2022/23	268	344	425	439	1,091	266	555	189	280	4,143	658	8,658
2023/24	268	340	425	438	1,091	268	535	185	284	4,140	652	8,626
2024/25	268	347	432	447	1,092	273	551	184	290	4,194	659	8,737
2025/26	275	359	439	486	1,094	283	537	181	312	4,270	670	8,906
2026/27	280	364	444	498	1,095	288	537	181	317	4,331	678	9,013
2027/28	283	366	445	506	1,095	289	531	180	319	4,386	686	9,086
2028/29	286	364	447	512	1,096	291	550	180	320	4,439	695	9,180
2029/30	292	375	454	524	1,098	298	536	180	327	4,504	705	9,293
2030/31	299	381	461	532	1,099	304	538	180	335	4,572	716	9,417

3 Energy and demand projections

Table 3.21 State summer maximum native demand by zone (MW)

Summer	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
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
2018/19	338	456	432	562	1,104	293	630	191	340	4,338	731	9,415
2019/20	287	451	441	530	1,084	277	660	191	305	4,322	720	9,268
2020/21	256	508	483	596	1,111	314	681	165	307	3,894	614	8,929
Forecasts												
2021/22	267	527	459	520	1,089	263	729	190	326	4,093	653	9,116
2022/23	269	492	469	524	1,089	271	728	189	330	4,140	656	9,157
2023/24	269	498	469	529	1,088	272	720	185	329	4,139	650	9,148
2024/25	269	504	476	537	1,090	277	731	183	334	4,194	658	9,253
2025/26	275	473	482	550	1,091	282	724	181	340	4,267	668	9,333
2026/27	280	478	488	561	1,092	287	724	181	345	4,327	676	9,439
2027/28	284	484	492	574	1,102	291	727	181	349	4,421	691	9,596
2028/29	288	489	496	586	1,105	294	729	182	352	4,483	701	9,705
2029/30	295	494	503	594	1,107	300	731	182	359	4,550	712	9,827
2030/31	302	501	510	603	1,110	307	733	182	367	4,619	723	9,957

Tables 3.22 and 3.23 show the historical and 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 Steady Progress scenario and average (50% PoE) winter weather.

Table 3.22 State winter maximum transmission delivered demand by zone (MW)

Winter	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
2012	212	175	276	474	1,187	207		21	259	3,065	567	6,525
2013	209	300	344	433	1,195	192	75	21	262	2,964	556	6,551
2014	226	344	355	463	1,200	204	16	51	257	2,975	551	6,642
2015	192	289	332	429	1,249	203	137	137	258	3,267	597	7,090
2016	226	249	370	417	1,242	206	390	181	279	3,079	537	7,176
2017	241	368	366	377	1,074	216	513	187	248	2,797	483	6,870
2018	242	366	335	439	1,091	235	475	186	336	3,086	540	7,331
2019	234	284	362	419	1,037	239	615	195	293	3,078	540	7,296
2020	227	306	327	449	1,104	246	531	191	313	3,274	515	7,483
2021	204	296	334	383	1,075	250	592	179	339	3,275	545	7,472
Forecasts												
2022	209	241	343	422	1,098	227	504	191	310	3,275	539	7,359
2023	209	243	359	423	1,098	232	509	190	311	3,306	532	7,412
2024	209	242	365	426	1,098	235	501	186	309	3,343	535	7,449
2025	213	247	371	433	1,099	239	511	184	314	3,382	537	7,530
2026	212	251	377	445	1,101	243	497	182	318	3,452	547	7,625
2027	215	240	381	455	1,102	247	497	181	322	3,487	551	7,678
2028	217	245	382	465	1,103	248	497	181	324	3,567	563	7,792
2029	220	246	384	476	1,104	252	496	181	328	3,617	573	7,877
2030	224	250	388	480	1,105	255	492	181	331	3,686	583	7,975
2031	234	259	403	498	945	266	504	185	346	3,845	609	8,094

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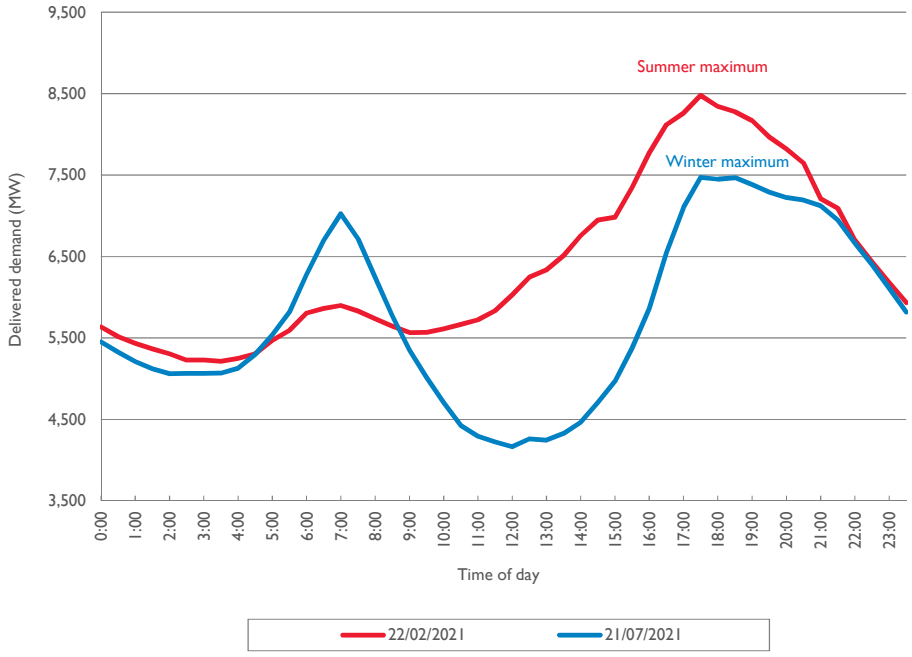
Table 3.23 State winter maximum native demand by zone (MW)

Winter	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
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
2018	242	360	410	494	1,091	235	654	186	336	3,085	540	7,633
2019	230	307	408	483	1,066	241	628	207	346	3,176	532	7,624
2020	227	329	406	492	1,104	247	624	191	342	3,231	515	7,708
2021	206	255	366	459	1,079	232	691	181	357	3,373	559	7,758
Forecasts												
2022	207	327	418	473	1,089	226	723	189	336	3,250	535	7,773
2023	208	328	433	473	1,089	230	721	188	337	3,283	528	7,818
2024	207	328	439	477	1,088	233	713	184	335	3,320	531	7,855
2025	211	333	446	484	1,090	237	723	182	340	3,357	533	7,936
2026	210	337	451	496	1,092	241	716	180	344	3,431	543	8,041
2027	215	331	460	510	1,103	247	722	181	352	3,494	552	8,167
2028	217	334	461	521	1,105	249	720	181	354	3,579	564	8,285
2029	221	338	464	533	1,108	253	722	181	358	3,639	575	8,392
2030	225	342	468	537	1,109	256	723	181	362	3,705	586	8,494
2031	235	356	485	557	949	268	741	186	377	3,866	612	8,632

3.6 Summer and winter maximum and annual minimum daily profiles

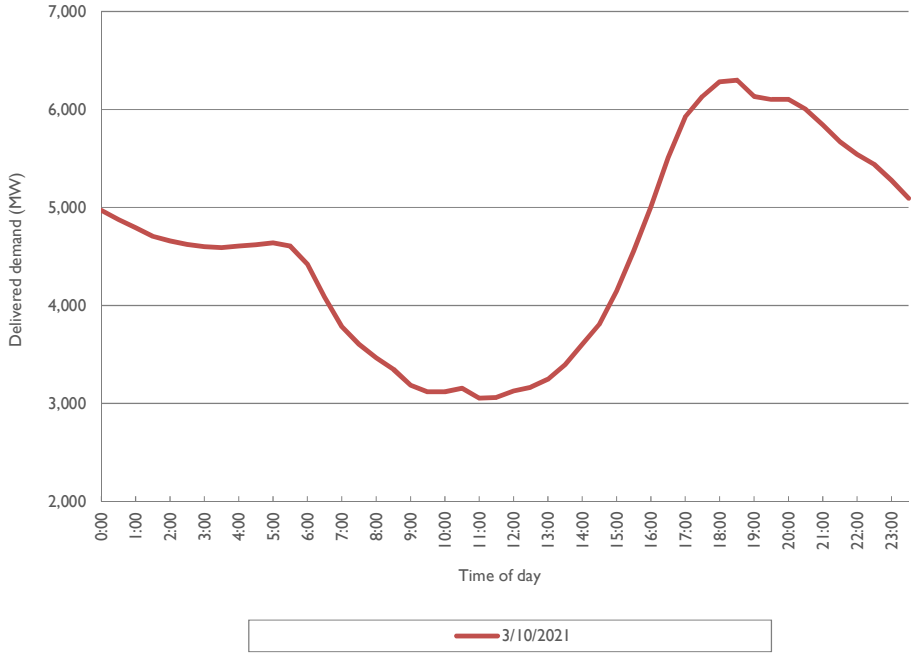
The daily load profiles (transmission delivered) for the Queensland region on the days of summer 2020/21 and winter 2021 maximum demands are shown in Figure 3.10.

Figure 3.10 Daily load profile of summer 2020/21 and winter 2021 maximum transmission delivered demand days



The 2021 annual minimum (transmission delivered) daily load profile for the Queensland region is shown in Figure 3.11.

Figure 3.11 Daily load profile of 2021 minimum transmission delivered day (1)



Note:
(1) Based on preliminary meter data up to 3 October 2021.

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3.7 Annual load duration curves

The annual historical load duration curves for the Queensland region transmission delivered demand since 2016/17 is shown in Figure 3.12.

Figure 3.12 Historical transmission delivered load duration curves