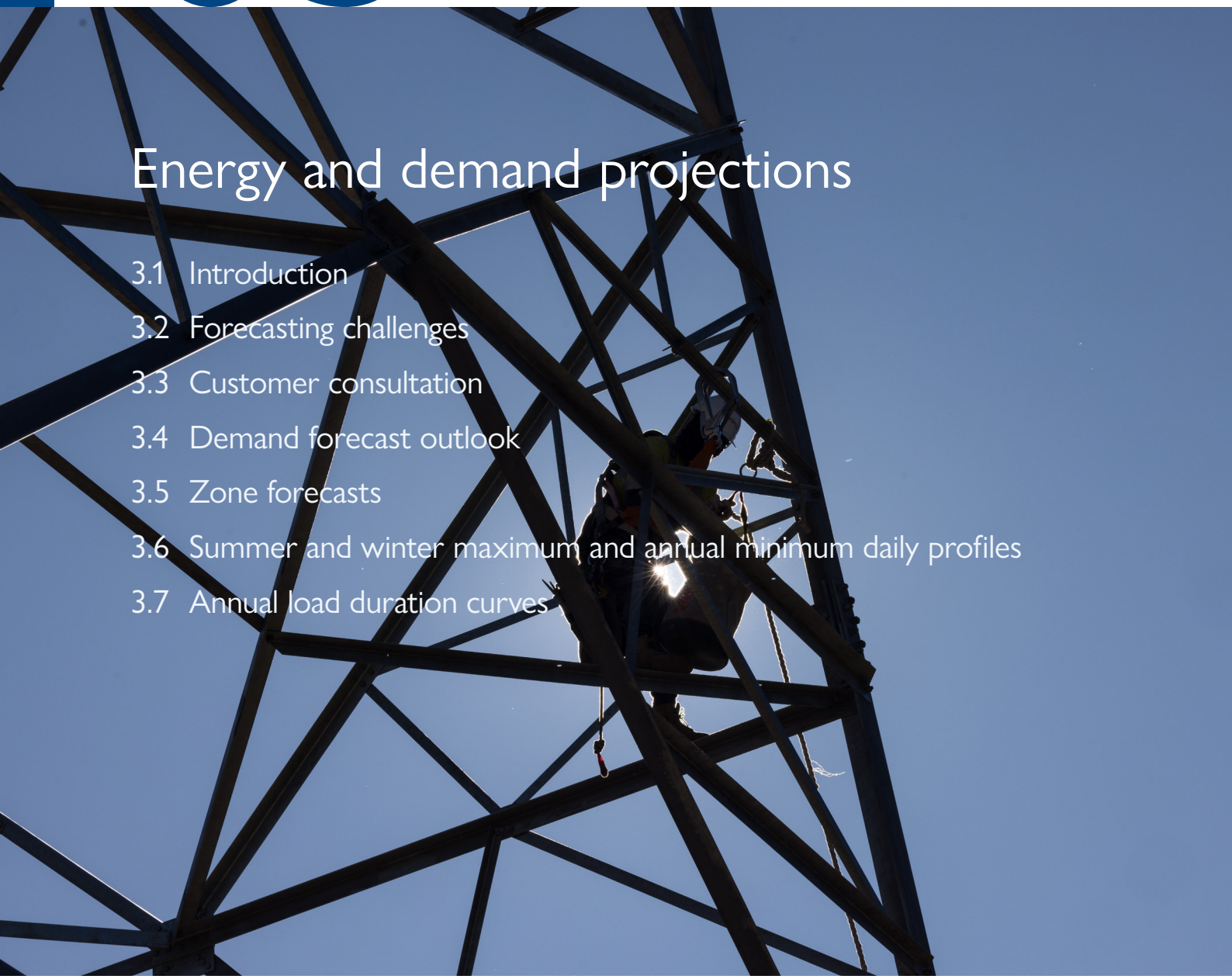
03



Energy and demand projections

This chapter describes the historical energy and demand, and provides forecast regional data disaggregated by zone.

Key highlights

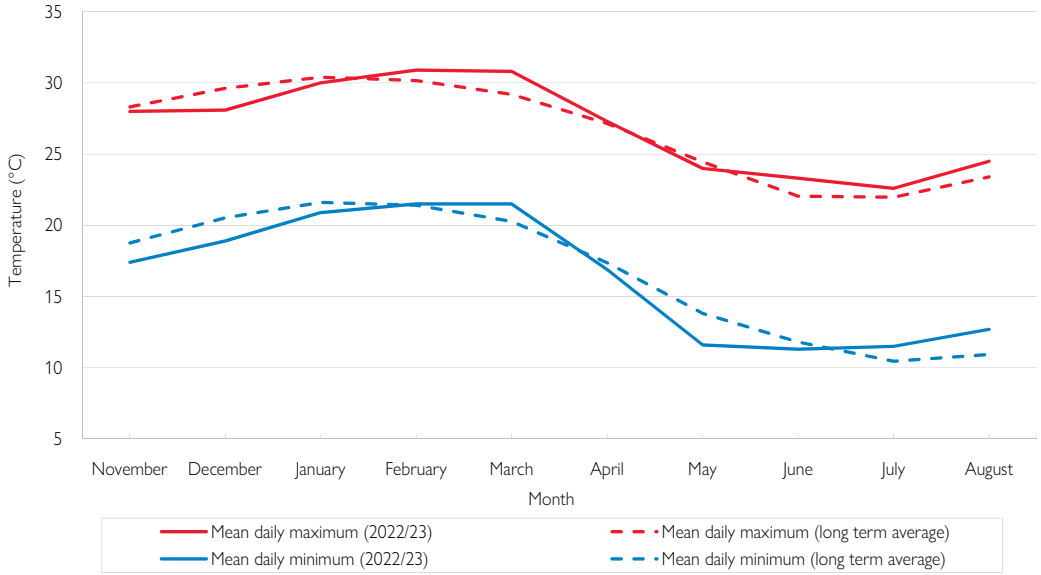
- Queensland's maximum transmission delivered demand for 2022/23 was 8,916MW on 17 March 2023. This maximum demand occurred at 6.00pm and was 116MW lower than the record maximum delivered demand set in 2022.
- Queensland set a new record minimum transmission delivered demand of 2,538MW on 20 August 2023. This minimum demand occurred at 12.30pm and was 59MW lower than the previous record minimum set in September 2022.
- Powerlink has adopted the Australian Energy Market Operator's (AEMO) 2023 Electricity Statement of Opportunity (ESOO) forecasts in its planning analysis for the 2023 Transmission Annual Planning Report (TAPR). Powerlink is focussed on working with AEMO and EQL to understand the potential impacts of emerging technologies (e.g. electric vehicles and electrification of broader industry processes) and new industries to develop transmission network services in ways that are valued by customers.
- Based on AEMO's Step Change scenario forecast, Queensland's transmission delivered maximum demand is expected to have mild growth with an average annual increase of 1.8% per annum over the next 10 years.
- The uptake of rooftop photovoltaic (PV) and distribution connected solar systems is further reducing delivered demand during the day. 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 increase over the next 10 years predominantly due to the electrification of load within a number of Queensland industries. Based on AEMO's Step Change scenario, transmission delivered energy consumption is expected to increase at an average rate of 1.8% per annum over the next 10 years.

3.1 Introduction

The 2022/23 summer Queensland maximum transmission delivered demand occurred at 6.00pm on 17 March 2023, when 8,916MW was delivered from the transmission grid (refer to Figure 3.9 for load measurement definitions). Operational 'as generated' peak was recorded 30 minutes earlier at 5.30pm, reaching 10,070MW. After weather correction, the 2022/23 summer maximum transmission delivered demand was 9,110MW, 0.7% higher than that forecast in the 2022 ESOO Step Change scenario.

Figure 3.1 shows observed mean temperatures for Brisbane during November 2022 to August 2023 compared with long-term averages. The comparison reveals a slightly cooler summer than average in south east Queensland, whilst daily maximum temperatures in March 2023 were slightly higher than the long-term average. Winter temperatures were also slightly warmer than the long-term average.

Figure 3.1 Brisbane temperature ranges over November 2022 to August 2023 (1)



Note:

(1) Long-term average based on years 2000 to 2022/23.

The 2023 Queensland minimum delivered demand occurred at 12.30pm on 20 August 2023, when only 2,538MW was delivered from the transmission grid (refer to Figure 3.9 for load measurement definitions). Operational 'as generated' minimum demand was recorded on 17 September 2023 at 11.00am and set a new record for Queensland of 3,387MW, passing the previous minimum record of 3,469MW set in September 2022.

At the time of minimum delivered demand, directly connected loads made up about 73.5% of the transmission delivered demand with Distribution Network Service Provider (DNSP) customers making up the remainder. 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 2023 ESOO. Further information on the development of AEMO's 2023 ESOO is available on AEMO's website[1].

The AEMO 2023 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.

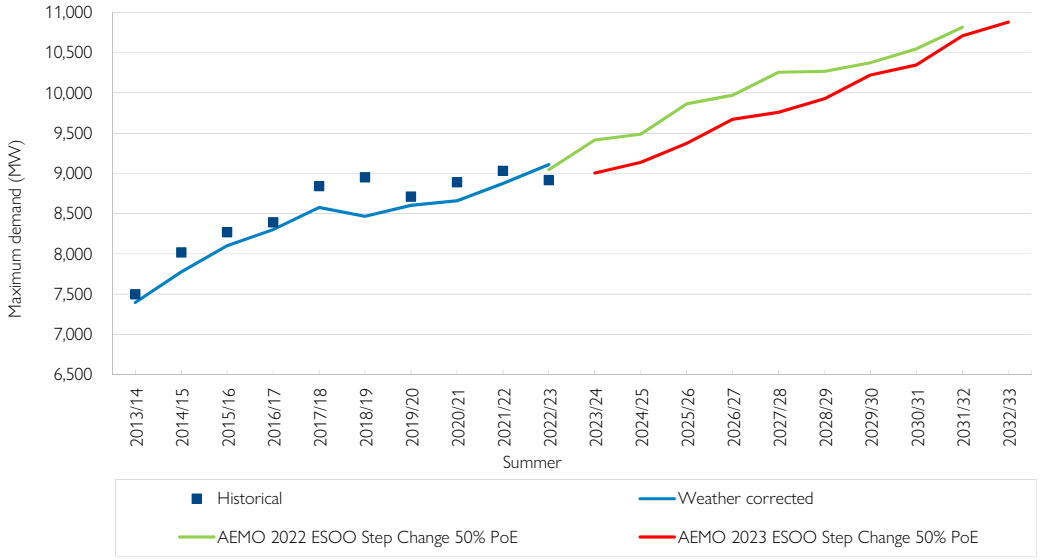
The Queensland Government's 50% renewable energy target by 2030 (QRET) and net zero by 2050 has driven renewable capacity in the form of solar PV and wind farms to connect to the Queensland transmission and distribution networks (refer to tables 7.1 and 7.2). Additional uncommitted distribution connected solar and wind farm capacity has been included into the 10-year outlook period from 2026 to model the Queensland Government's targets.

[1] AEMO, Forecasting Approach - Electricity Demand Forecasting Methodology, September 2021.

At the end of June 2023, Queensland reached 5,614MW of installed rooftop PV capacity[2]. Growth in rooftop PV capacity remains strong at around 65MW per month in 2022/23. An impact of rooftop PV has been to time shift both the state's minimum and maximum demands. The minimum demand now occurs during the day rather than night time. The maximum demand now occurs between 5.30pm and 7.00pm. As a result of significant capacity increases in rooftop PV and PV non-scheduled generation (PVNSG), maximum demand is unlikely to reoccur in the day time.

Figure 3.2 shows a comparison of AEMO's 2022 ESOO delivered summer maximum demand forecast based on the Step Change scenario with AEMO's 2023 ESOO based on the Step Change scenario, both with 50% Probability of Exceedance (PoE). The decrease in the forecast maximum demand is due to an increase in the forecast of embedded generators within EQL network combined with a slight reduction in the pace of electrification.

Figure 3.2 Comparison of AEMO's 2022 ESOO Step Change scenario delivered demand forecast with the 2023 ESOO Step Change scenario (1) (2)



Notes:

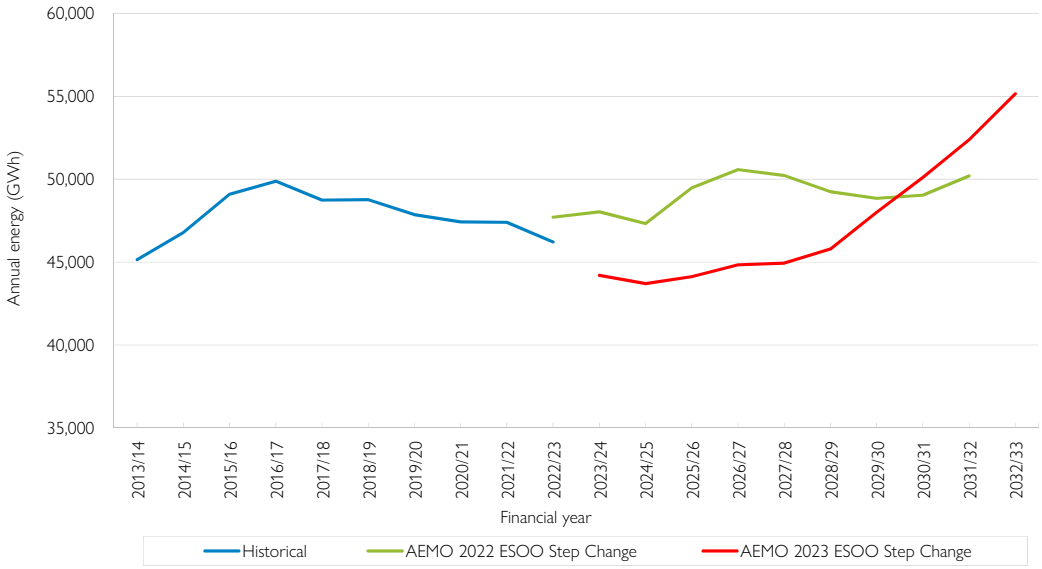
(1) AEMO's 2023 ESOO forecast has been converted from 'operational sent-out' to 'transmission delivered' for the purposes of comparison. Refer to Figure 3.9 for further details.

(2) AEMO's 2023 ESOO forecast has been adjusted for future uncommitted distribution connected renewables by Powerlink to incorporate the Queensland Government's renewable energy targets.

Figure 3.3 shows a comparison of AEMO's 2022 ESOO delivered energy forecast based on the Step Change scenario with AEMO's 2023 ESOO Step Change scenario. Section 3.4 discusses updates included in AEMO's 2023 ESOO forecasts. The slight drop and then uplift in delivered energy in AEMO's 2023 Step Change scenario is due to slower electrification of load and increasing embedded generation until 2024/25. From 2024/25 the increase is a combination of expected electric vehicle uptake and industries beginning to electrify their operations to meet their emission reduction targets.

[2] Clean Energy Regulator, Postcode data for small-scale installations – all data, data as at 31/07/2023, August 2023. Whilst RET legislation allows a 12 month creation period for registered persons to create their certificates, updates for the first nine months of this window are generally not material.

Figure 3.3 Comparison of AEMO's 2022 ESOO Step Change scenario delivered energy forecast with the 2023 ESOO Step Change scenario (1)

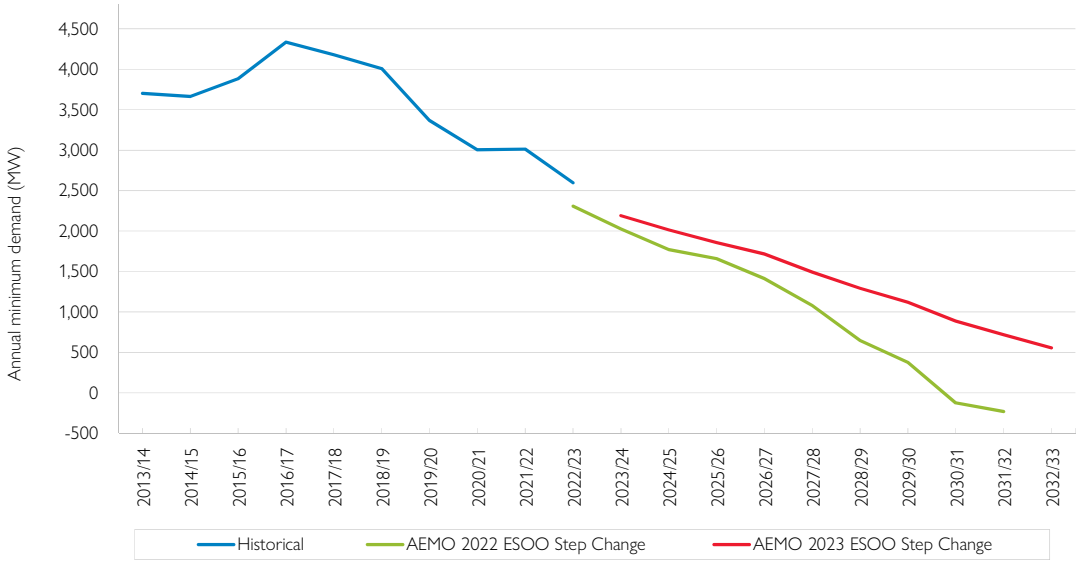


Note:

(1) AEMO's 2023 ESOO forecast has been converted from 'operational sent-out' to 'transmission delivered' for the purposes of comparison. Refer to Figure 3.9 for further details.

Figure 3.4 shows a comparison of AEMO's 2022 ESOO annual delivered minimum demand forecast based on the Step Change scenario with AEMO's 2023 ESOO Step Change scenario. The rate of decline in the annual minimum demand has slowed from the previous year. This is due to the increase in electrification in the later years of the forecast.

Figure 3.4 Comparison of AEMO's 2022 ESOO Step Change scenario minimum delivered demand forecast with the 2023 ESOO Step Change scenario (1)



Note:

(1) AEMO's 2023 ESOO forecast has been converted from 'operational sent-out' to 'transmission delivered' for the purposes of comparison. Refer to Figure 3.9 for further details.

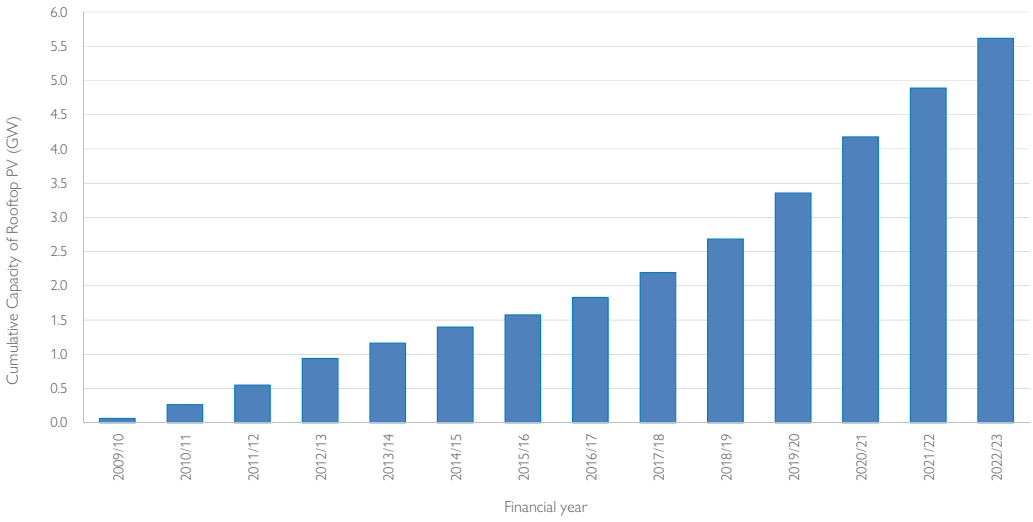
3.2 Forecasting challenges

3.2.1 Rooftop photovoltaic and Distributed Energy Sources

Residential and commercial loads are generally located within built up urban and township areas, with continued uptake of rooftop PV systems and distributed energy sources having the greatest impact to demand and energy patterns in these areas.

Queensland has the highest adoption rate of rooftop PV systems in the world on a per capita basis. The current installation rate has increased slightly over the last two years and is approximately 782MW per annum with the average installation size within residential households increasing over time (refer Figure 3.5). The uptake of rooftop PV systems is expected to continue with the most recent 2023 Queensland Household Energy Survey (QHES) indicating that 26% of respondents intend to purchase new or upgrade rooftop PV systems in the next three years (refer Figure 3.6). 76% of solar owners indicated a high overall importance of maximising consumption of electricity at the time when their solar system is generating. Renting (46%), followed by unaffordability (17%) are the top reasons for not having solar. Of the reasons for intending to upgrade or replace their solar PV, 52% indicated they want a larger system to reduce their electricity bill, 29% that they've purchased or are looking to purchase a household battery, and 14% have purchased or are looking to purchase an EV. Of those yet to do so, 16% of respondents intend to purchase battery storage within the next 3 years, 45% an EV and 39% have high interest in community batteries.

Figure 3.5 Cumulative capacity of Queensland rooftop PV (1) (2)

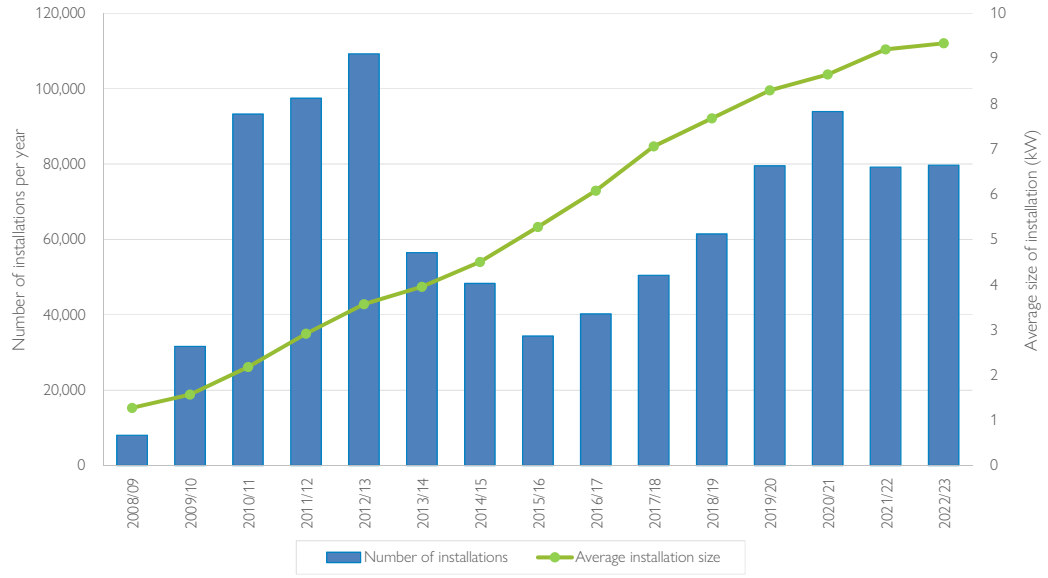


Notes:

(1) Source: Clean Energy Regulator.

(2) Registrations generally lag installations and hence data for FY2023 may be slightly understated.

Figure 3.6 Annual installation rates and average sizes for Queensland rooftop PV (1) (2)



Notes:

(1) Source: Clean Energy Regulator.

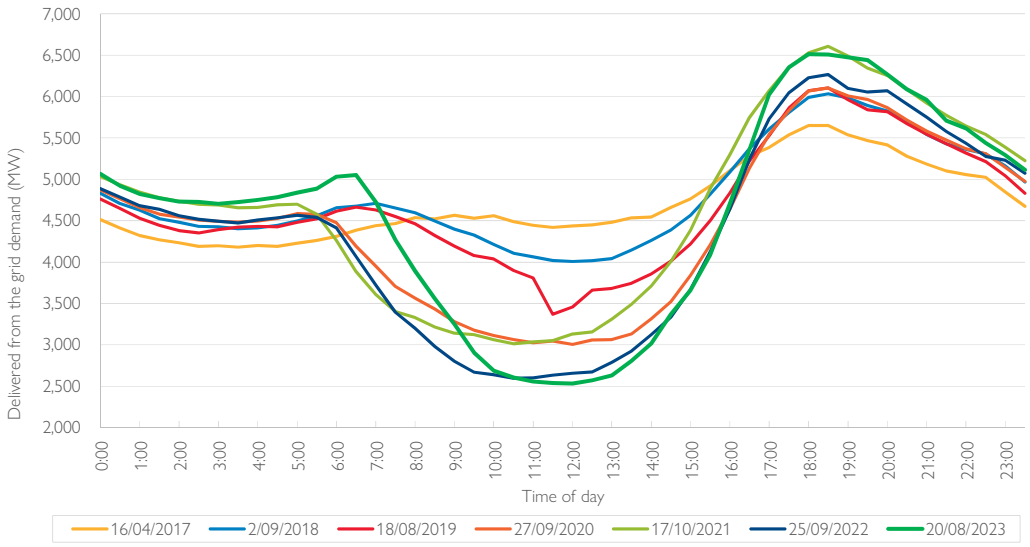
(2) Registrations generally lag installations and hence data for FY2023 may be slightly understated.

The installation of rooftop PV systems and distribution connected solar farms has progressively changed the characteristics of daily demand required to be supplied by Powerlink's transmission network. Historically the delivered load profile has generally seen daily peaks occur during the mid afternoon or evening periods. However, the cumulative impact of embedded solar renewable energy results in a hollowing of the daytime daily demand profile, which diminishes as the sun sets in the evening.

This effect is more likely to be prominent within Queensland during the lower day time demand in the winter and spring seasons. The term 'duck curve' was first coined by the Californian Independent System Operator to describe the effects of utility scale solar power generation on the shape of the daily net 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 3.7 depicts the change in daily load profile of the transmission delivered profile within Queensland.

Minimum demand during the day has continued to decrease with the progressive installation of rooftop PV and distribution network solar system connections. 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 large-scale generation and the transmission network. With the expected continued uptake of residential and commercial rooftop PV installations, and in the absence of significant levels of demand shifting or distributed energy storage, minimum demand levels are expected to further decrease with a continued widening between maximum and minimum demand.

Figure 3.7 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) 2023 trace based on preliminary metering data up to 13 September 2023.

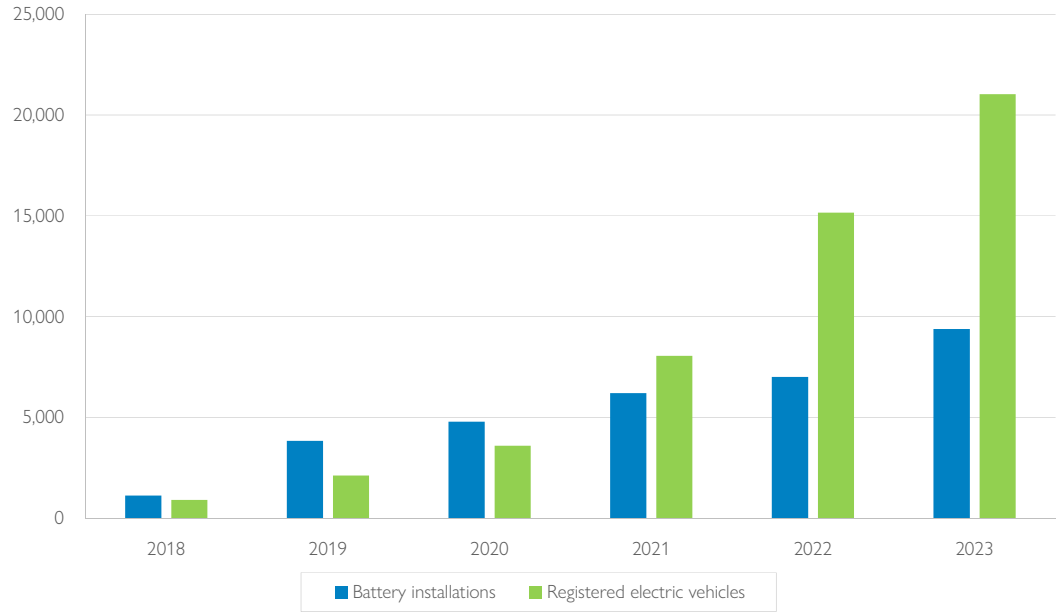
Continuation of this trend is likely to present challenges to the power system. Generators are increasingly required to ramp up and down in response to daily demand variations more steeply. Decreasing minimum demand will lead a lower number of units of synchronous generation that are able to be online and this could further impact on voltage control, stability, system strength, inertia and the ability for available generators to meet evening peak demand. During very low load periods, semi-scheduled generation will reduce output (spilling the available resource) to ensure sufficient demand is available to preserve the minimum levels of synchronous generation required to maintain system security. In extreme cases, AEMO will follow its minimum system load market notification framework and operating protocol[3].

There may be opportunities for new technologies and non-network solutions to assist with these power system security challenges, and these type of services could offer a number of benefits to the power system including reducing the need for additional transmission network investment.

Residential household batteries and EVs have the potential to help smooth daily demand profiles and improve the utilisation of the network where appropriate incentives are in place. Without such incentives, batteries may be fully charged in the early morning, exposing the same minimum demand through the middle and latter part of the day. The small-scale battery segment is continuing to build steadily in Queensland with almost 9,000 battery installations currently reported within residential households and over 20,000 registered electric vehicles (refer Figure 3.8).

[3] Department of Energy and Public Works, Emergency backstop mechanism, 6 February 2023.

Figure 3.8 Queensland residential battery uptake (1) and number of registered electric vehicles (2)



Notes:
(1) Source: Clean Energy Regulator.
(2) Source: Queensland Government – Electric vehicle snapshot.

3.2.2 Electrification of load and decarbonisation

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 in 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 electrification of these sectors largely relate to the need to reduce carbon emissions for a variety of reasons including environmental, 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 significantly increases, and other areas where it may decrease.

Powerlink is committed to developing an understanding of 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.

3.3 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 D. 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.

Powerlink is proactively engaging with customers to understand their decarbonisation plans. To enable efficient planning of the network, early customer consultation is required to allow transmission network services to be developed in ways that are valued by customers.

3.3.1 Transmission customer forecasts

New large loads

One large load was committed in the past 12 months. A new manufacturing plant in the Gladstone area.

Possible new large loads

There are several proposals under development for large mining, metal processing, other industrial loads and the electrification of existing loads. These proposed new large loads total approximately 5,612MW with a high scenario of up to 12,632MW. The likely distribution of these loads are defined in Table 3.1. The majority of proposed loads have not been included in AEMO's 2023 ESOO Step Change scenario forecast. However, AEMO's Step Change scenario forecast did allow for approximately 250MW of new electrification load in the Gladstone zone (refer to sections 6.10.2 and 8.2.3). The proposed load in the Gladstone zone in Table 3.1 is inclusive of this 250MW.

Table 3.1 Possible large loads excluded from the Progressive Change, Step Change and Hydrogen Export scenario forecasts

Zone	Description	Possible load
South Queensland	Hydrogen facility	945MW
	Data centre	
Gladstone	Electrification of existing metal processing and industrial loads	3,543MW to 10,562MW (1)
	Hydrogen facilities	
Northern	Electrification of existing mining load	1,124MW
	New industrial	
	New mining	

Note

(1) This represents a base and high scenario.

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 shoulder periods.

The annual minimum demand has moved from overnight to the day time since 2018 (as described in Section 3.2.1). 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 2023 TAPR reports on the Progressive Change, Step Change and Hydrogen Export scenario forecasts provided by AEMO and aligned to its 2023 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 load 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 Progressive Change, Step Change and Hydrogen Export scenarios are shown in Table 3.2. These growth rates refer to transmission delivered quantities as described in Section 3.4.1. For summer and winter maximum demand, growth rates are based on 50% PoE corrected values for 2022/23 and 2022 respectively.

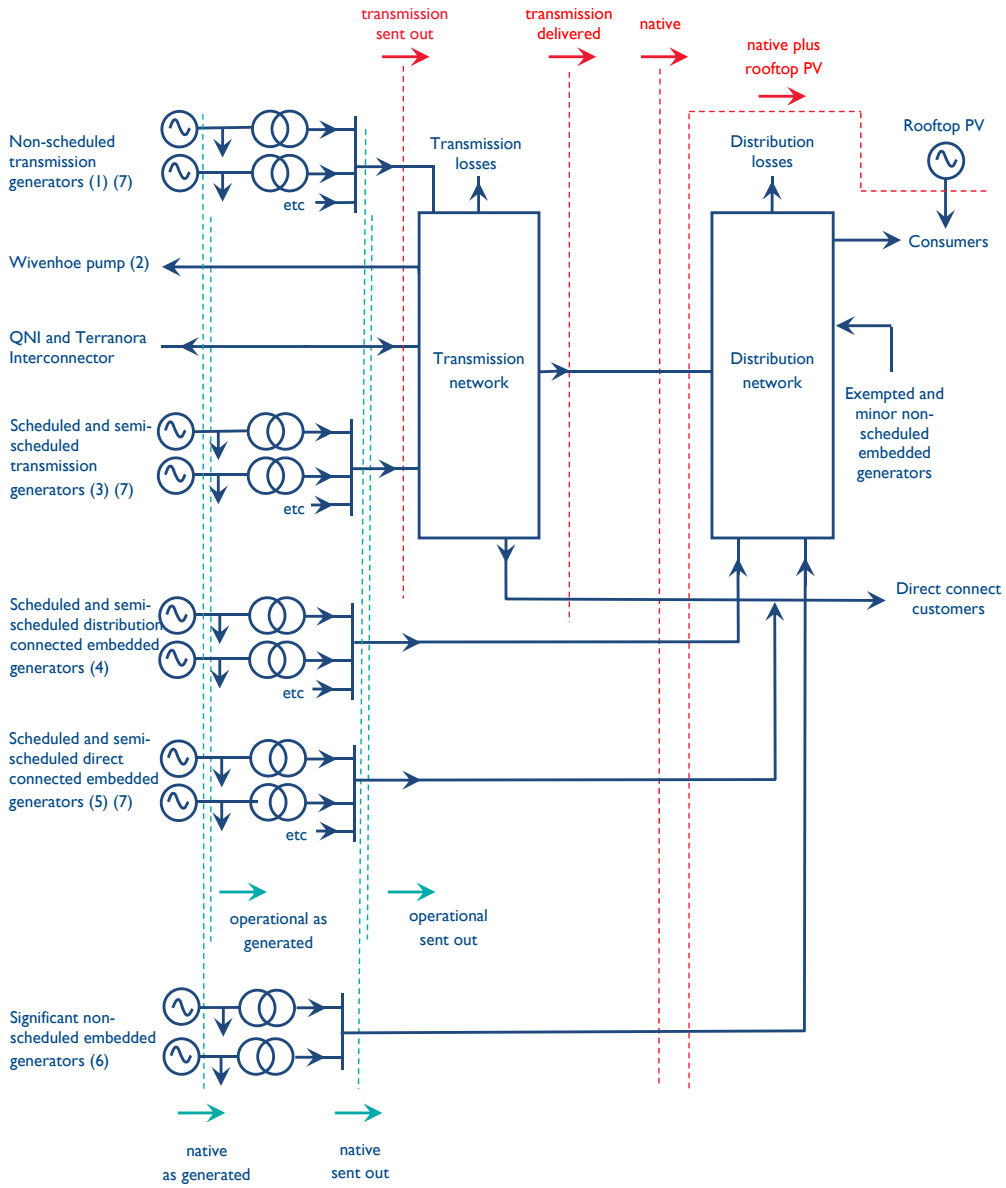
Table 3.2 Average annual growth rate over next 10 years

	AEMO future scenario outlooks		
	Progressive Change	Step Change	Hydrogen Export
Delivered energy	-0.6%	1.8%	5.3%
Delivered summer maximum demand (50% PoE)	0.2%	1.8%	2.4%
Delivered winter maximum demand (50% PoE)	0.2%	1.7%	2.4%

3.4.1 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 3.9 shows the common ways demand and energy measurements are defined, with this terminology used consistently throughout the TAPR.

Figure 3.9 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 7.2.

(5) Sun Metals Solar Farm and Condamine.

(6) Lakeland Solar and Storage, Hughenden Solar Farm, Pioneer Mill, Moranbah North, Racecourse Mill, Barcaldine Solar Farm, Longreach Solar Farm, German Creek, Oaky Creek, Baking Board Solar Farm, Sunshine Coast Solar Farm 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 7.1.

3.4.2 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 3.9.

Transmission losses are the difference between transmission sent out and transmission delivered energy. Scheduled Power Station (PS) 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
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
2021/22	53,737	49,940	54,744	51,052	48,625	47,405	50,081	56,162
2022/23	52,692	48,906	53,690	49,998	47,422	46,214	49,047	55,714

The transmission delivered energy forecasts are presented in Table 3.4.

Table 3.4 Forecast annual transmission delivered energy (GWh)

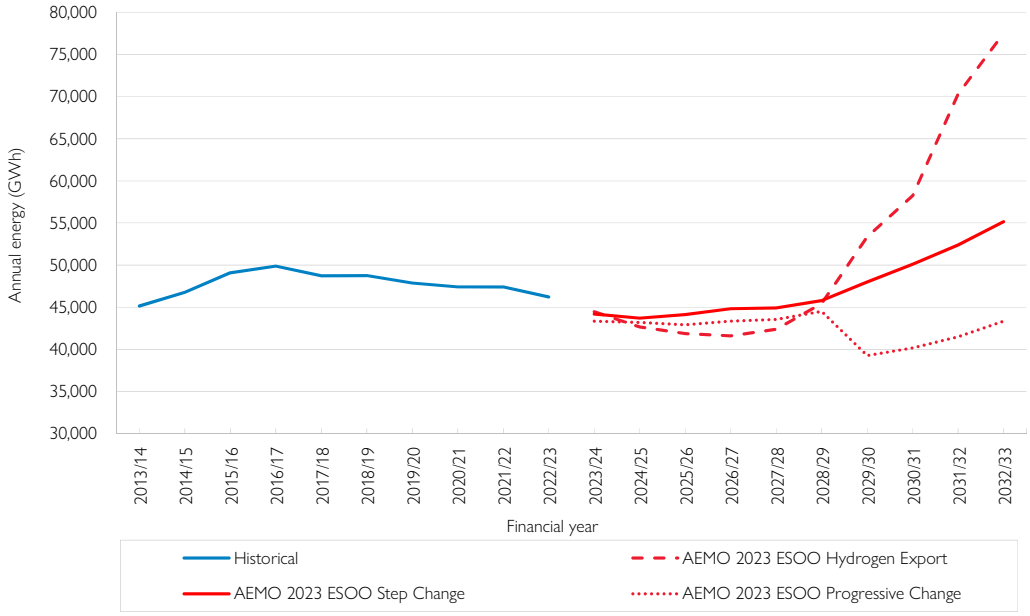
Financial year	Progressive Change	Step Change	Hydrogen Export
2023/24	43,350	44,197	44,475
2024/25	43,183	43,702	42,650
2025/26	42,905	44,123	41,863
2026/27	43,334	44,829	41,599
2027/28	43,540	44,931	42,371
2028/29	44,506	45,792	45,422
2029/30	39,260 (1)	48,008	53,352
2030/31	40,169	50,105	58,274
2031/32	41,484	52,385	70,310
2032/33	43,358	55,157	77,521

Note:

(1) AEMO assumes the shutdown of a large industrial load in the Progressive Change scenario in summer 2029/30.

The historical annual transmission delivered energy from Table 3.3 and the forecast transmission delivered energy for the Progressive Change, Step Change and Hydrogen Export scenarios from Table 3.4 are shown in Figure 3.10.

Figure 3.10 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	Progressive Change	Step Change	Hydrogen Export
2023/24	47,788	48,188	48,913
2024/25	48,557	49,573	50,162
2025/26	48,403	50,280	51,083
2026/27	49,057	51,276	51,599
2027/28	49,509	51,825	53,476
2028/29	50,699	53,314	57,175
2029/30	45,683 (1)	56,115	66,569
2030/31	46,726	58,562	73,451
2031/32	48,202	61,108	86,890
2032/33	50,052	64,275	95,395

Note:

(1) AEMO assumes the shutdown of a large industrial load in the Progressive Change scenario in summer 2029/30.

3.4.3 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
2013/14	8,445	7,892	8,587	8,045	7,810	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
2021/22	10,058	9,503	10,126	9,624	9,332	9,031	8,876	9,323	9,323
2022/23	9,873	9,363	9,985	9,487	9,202	8,916	9,201	9,413	9,395

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

Table 3.7 Forecast summer transmission delivered maximum demand (MW) (1)

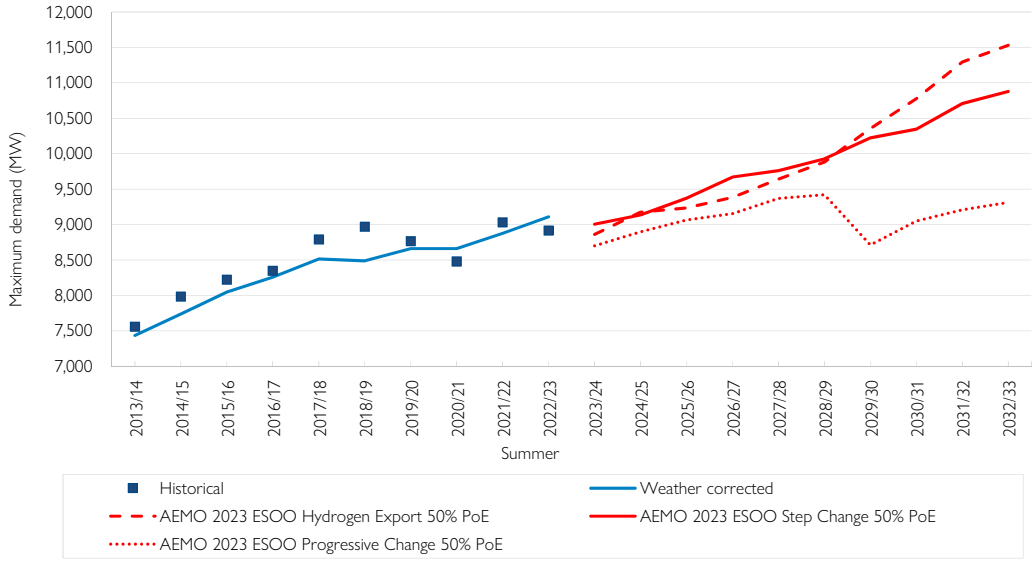
Summer	Progressive Change			Step Change			Hydrogen Export		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2023/24	8,245	8,700	9,136	8,536	9,005	9,435	8,388	8,862	9,295
2024/25	8,443	8,897	9,344	8,664	9,137	9,574	8,691	9,176	9,615
2025/26	8,602	9,064	9,518	8,883	9,374	9,812	8,724	9,235	9,675
2026/27	8,675	9,155	9,625	9,156	9,672	10,125	8,850	9,385	9,849
2027/28	8,883	9,370	9,851	9,238	9,761	10,219	9,102	9,643	10,113
2028/29	8,950	9,421	9,912	9,437	9,928	10,410	9,365	9,884	10,375
2029/30 (1)	8,224	8,711	9,229	9,711	10,223	10,719	9,823	10,356	10,868
2030/31	8,553	9,050	9,568	9,811	10,348	10,841	10,208	10,778	11,293
2031/32	8,688	9,208	9,720	10,149	10,709	11,194	10,695	11,293	11,803
2032/33	8,808	9,314	9,806	10,331	10,879	11,353	10,936	11,531	12,030

Notes:

(1) Shutdown of a large industrial load is assumed in the Progressive Change scenario in summer 2029/30.

The summer historical transmission delivered maximum demands from Table 3.11 and the forecast 50% PoE summer transmission delivered maximum demands for the Progressive Change, Step Change, and Hydrogen Export scenarios from Table 3.7 are shown in Figure 3.11.

Figure 3.11 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 rooftop PV	Native corrected to 50% PoE
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
2021/22	10,013	9,475	10,089	9,615	9,196	8,907	9,326	9,468	9,295
2022/23	10,070	9,537	10,196	9,689	9,224	8,909	9,374	9,940	9,575

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

Table 3.9 Forecast summer native maximum demand (MW)

Summer	Progressive Change			Step Change			Hydrogen Export		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2023/24	9,097	9,556	9,988	9,200	9,673	10,099	9,240	9,718	10,147
2024/25	9,203	9,660	10,103	9,440	9,918	10,350	9,463	9,951	10,386
2025/26	9,253	9,719	10,169	9,633	10,127	10,561	9,714	10,229	10,665
2026/27	9,401	9,886	10,351	9,849	10,368	10,818	9,911	10,449	10,910
2027/28	9,513	10,004	10,481	10,027	10,554	11,008	10,163	10,707	11,174
2028/29	9,691	10,166	10,653	10,304	10,799	11,277	10,555	11,078	11,566
2029/30 (1)	9,041	9,532	10,047	10,568	11,084	11,576	11,012	11,548	12,057
2030/31	9,235	9,735	10,249	10,826	11,366	11,856	11,469	12,043	12,554
2031/32	9,369	9,893	10,402	11,045	11,608	12,090	12,035	12,637	13,144
2033/34	9,554	10,063	10,552	11,352	11,903	12,373	12,437	13,035	13,530

Note:

(1) Shutdown of a large industrial load is assumed in the Progressive Change scenario in summer 2029/30.

3.4.4 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
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	7,376	7,714	7,725
2022	8,625	8,216	8,701	8,347	8,141	7,921	7,571	8,127	8,127
2023	8,137	7,601	8,223	7,738	7,585	7,399	(1)	7,553	7,553

Note:

(1) The winter 2023 weather corrected demand was not available at time of publication.

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

Table 3.11 Forecast winter transmission delivered maximum demand (MW) (1)

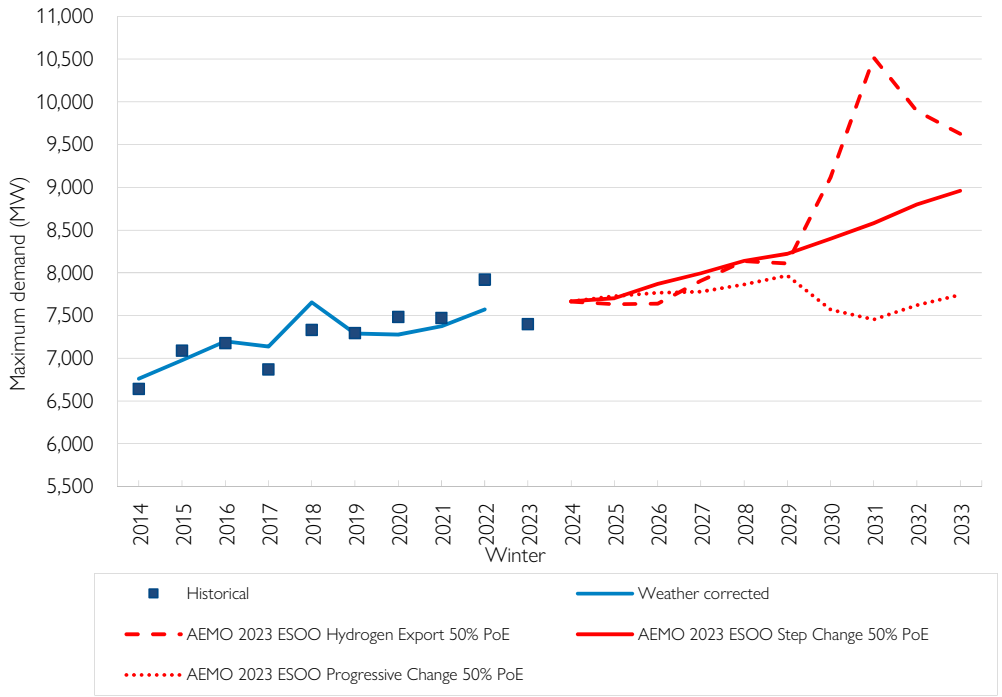
Winter	Progressive Change			Step Change			Hydrogen Export		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2024	7,440	7,667	7,865	7,440	7,666	7,864	7,437	7,663	7,861
2025	7,496	7,727	7,927	7,471	7,703	7,903	7,833	7,632	7,833
2026	7,540	7,767	7,982	7,640	7,869	8,086	7,857	7,640	7,857
2027	7,549	7,777	7,995	7,762	7,995	8,215	8,129	7,905	8,129
2028	7,632	7,862	8,084	7,899	8,139	8,367	8,372	8,137	8,372
2029	7,733	7,967	8,191	7,981	8,223	8,454	8,347	8,108	8,347
2030 (1)	7,328	7,569	7,802	8,162	8,397	8,632	9,363	9,118	9,363
2031	7,207	7,453	7,690	8,341	8,580	8,820	10,769	10,517	10,769
2032	7,344	7,619	7,862	8,537	8,798	9,049	10,162	9,893	10,162
2033	7,470	7,741	7,994	8,688	8,960	9,223	9,907	9,625	9,907

Notes:

(1) Shutdown of a large industrial load is assumed in the Progressive Change scenario in summer 2029/30.

The winter historical transmission delivered maximum demands from Table 3.10 and the forecast 50% PoE summer transmission delivered maximum demands for the Progressive Change, Step Change, and Hydrogen Export scenarios from Table 3.11 are shown in Figure 3.12.

Figure 3.12 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
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	7,699	8,324	7,948	7,663	7,468	7,754	7,754	7,830
2022	8,625	8,216	8,701	8,347	8,141	7,921	8,127	8,127	7,571
2023	8,137	7,601	8,223	7,738	7,585	7,399	7,553	7,553	(1)

Note:

(1) The winter 2023 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	Progressive Change			Step Change			Hydrogen Export		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2024	7,782	8,005	8,207	7,782	8,004	8,206	7,779	8,001	8,203
2025	7,855	8,081	8,286	7,957	8,184	8,389	7,995	8,222	8,426
2026	7,902	8,125	8,344	8,154	8,379	8,600	8,206	8,435	8,657
2027	7,948	8,173	8,394	8,333	8,561	8,786	8,565	8,798	9,026
2028	8,052	8,279	8,505	8,526	8,761	8,994	8,852	9,091	9,331
2029	8,173	8,403	8,631	8,704	8,941	9,177	8,833	9,077	9,320
2030 (1)	7,784	8,021	8,258	8,939	9,169	9,409	9,925	10,160	10,409
2031	7,706	7,948	8,189	9,207	9,442	9,686	11,477	11,722	11,978
2032	7,847	8,118	8,365	9,410	9,667	9,922	10,918	11,191	11,464
2033	7,965	8,232	8,489	9,598	9,866	10,133	10,745	11,032	11,318

Note:

(1) Shutdown of a large industrial load is assumed in the Progressive Change scenario in summer 2029/30.

3.4.5 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)

Summer	Operational as generated	Operational sent out	Native as generated	Native sent out	Transmission sent out	Transmission delivered	Native	Native plus rooftop PV
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	3,869	3,480	3,958	3,701	3,043	3,014	3,671	6,804
2022	3,504	3,065	3,617	3,283	2,707	2,597	3,173	6,457
2023 (1)	3,490	2,973	3,655	3,277	2,634	2,538	3,181	6,232

Note:

(1) 2023 minimum based on preliminary data up to 13 September 2023.

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

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

Annual	Progressive Change			Step Change			Hydrogen Export		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2023/24	2,083	2,238	2,414	2,026	2,191	2,378	2,036	2,202	2,398
2024/25	2,364	2,188	2,364	2,200	2,013	2,200	2,061	1,866	2,061
2025/26	2,260	2,081	2,260	2,056	1,859	2,056	1,904	1,699	1,904
2026/27	2,232	2,046	2,232	1,923	1,715	1,923	2,010	1,754	2,010
2027/28	2,142	1,946	2,142	1,706	1,493	1,706	1,908	1,666	1,908
2028/29	2,080	1,879	2,080	1,517	1,292	1,517	1,805	1,540	1,805
2029/30 (1)	1,280	1,068	1,280	1,362	1,121	1,362	2,346	2,064	2,346
2030/31	1,247	1,024	1,247	1,143	889	1,143	1,952	1,658	1,952
2031/32	1,193	968	1,193	970	719	970	2,631	2,334	2,631
2032/33	1,184	963	1,184	817	556	817	3,011	2,720	3,011

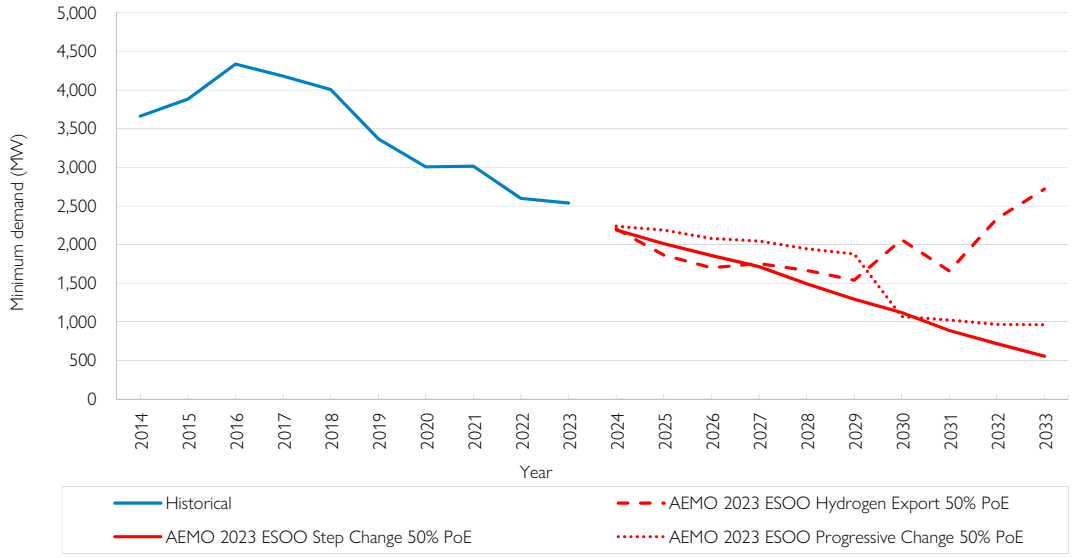
Notes:

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

(2) Shutdown of a large industrial load is assumed in the Progressive Change scenario in summer 2029/30.

The annual historical transmission delivered minimum demands from Table 3.14 and the forecast 50% PoE annual transmission delivered minimum demands for the Progressive Change, Step Change, and Hydrogen Export scenarios from Table 3.15 are shown in Figure 3.13.

Figure 3.13 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	Progressive Change			Step Change			Hydrogen Export		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2023/24	2,663	2,812	2,994	2,623	2,783	2,976	2,584	2,745	2,946
2024/25	2,610	2,764	2,946	2,503	2,668	2,860	2,401	2,570	2,770
2025/26	2,508	2,667	2,850	2,355	2,525	2,727	2,297	2,473	2,682
2026/27	2,484	2,642	2,834	2,228	2,407	2,620	2,437	2,670	2,931
2027/28	2,411	2,579	2,780	2,028	2,216	2,433	2,499	2,703	2,951
2028/29	2,346	2,518	2,724	1,852	2,055	2,285	2,386	2,649	2,919
2029/30 (2)	1,533	1,715	1,931	1,684	1,904	2,150	3,059	3,292	3,580
2030/31	1,496	1,688	1,916	1,545	1,785	2,045	2,801	3,062	3,362
2031/32	1,439	1,634	1,865	1,357	1,615	1,871	3,555	3,837	4,139
2032/33	1,440	1,643	1,870	1,298	1,561	1,826	4,161	4,459	4,756

Notes:

(1) Forecasts 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.

(2) Shutdown of a large industrial load is assumed in the Progressive Change scenario in summer 2029/30.

3.5 Zone forecasts

AEMO's 2023 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 F.1 and illustrated in Figure F.1 in Appendix F. 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 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	1.12	1.17
Ross	1.41	1.47
North	1.15	1.13
Central West	1.11	1.22
Gladstone	1.03	1.02
Wide Bay	1.02	1.08
Surat	1.17	1.20
Bulli	1.06	1.14
South West	1.05	1.13
Moreton	1.01	1.03
Gold Coast	1.03	1.10

Tables 3.18 and 3.19 show the historical and forecast of transmission delivered energy and native energy for the Step Change 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												
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
2021/22	1,598	2,418	2,755	2,776	9,124	904	5,420	1,395	990	17,101	2,924	47,405
2022/23	1,602	2,074	2,668	2,783	8,898	898	5,279	1,334	971	16,829	2,878	46,214
Forecasts												
2023/24	1,415	2,331	2,545	2,238	9,264	614	5,348	1,309	1,015	15,475	2,645	44,197
2024/25	1,366	2,259	2,586	2,260	9,314	219	4,420	1,084	1,020	16,356	2,818	43,702
2025/26	1,305	2,227	2,630	2,468	9,731	43	4,446	1,079	1,021	16,341	2,832	44,123
2026/27	1,289	2,252	2,731	2,560	10,067	59	4,346	1,047	1,065	16,545	2,869	44,829
2027/28	1,281	2,259	2,750	2,621	10,171	75	4,174	991	1,099	16,627	2,883	44,931
2028/29	1,288	2,280	2,815	2,713	10,184	117	3,990	922	1,167	17,303	3,011	45,792
2029/30	1,342	2,360	2,947	2,881	10,970	188	3,839	863	1,274	18,168	3,175	48,008
2030/31	1,411	2,466	3,087	3,056	11,472	263	3,700	817	1,385	19,093	3,353	50,105
2031/32	1,523	2,629	3,298	3,272	11,531	366	3,623	788	1,531	20,247	3,575	52,385
2032/33	1,641	2,799	3,512	3,519	11,599	482	3,547	751	1,692	21,747	3,866	55,157

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												
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
2021/22	1,618	2,900	3,212	3,515	9,124	1,164	5,626	1,395	1,454	17,149	2,924	50,081
2022/23	1,621	2,714	3,230	3,415	8,898	1,148	5,446	1,334	1,490	16,872	2,878	49,047
Forecasts												
2023/24	1,447	3,017	3,078	3,082	9,264	1,188	5,988	1,309	1,639	15,532	2,645	48,188
2024/25	1,501	3,130	3,303	3,285	9,310	1,246	5,609	1,228	1,739	16,405	2,816	49,573
2025/26	1,465	3,143	3,393	3,351	9,726	1,238	5,733	1,258	1,750	16,390	2,831	50,280
2026/27	1,472	3,210	3,535	3,484	10,062	1,262	5,723	1,259	1,805	16,597	2,868	51,276
2027/28	1,500	3,283	3,618	3,608	10,167	1,294	5,684	1,252	1,861	16,677	2,882	51,825
2028/29	1,559	3,395	3,775	3,789	10,179	1,350	5,693	1,254	1,953	17,355	3,010	53,314
2029/30	1,659	3,560	3,991	4,041	10,966	1,438	5,722	1,261	2,084	18,220	3,174	56,115
2030/31	1,757	3,718	4,182	4,265	11,468	1,523	5,691	1,254	2,208	19,146	3,351	58,562
2031/32	1,890	3,919	4,430	4,517	11,526	1,634	5,697	1,254	2,366	20,299	3,574	61,108
2032/33	2,040	4,146	4,702	4,820	11,595	1,761	5,741	1,262	2,545	21,799	3,865	64,275

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 Step Change 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												
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
2021/22	363	441	473	518	1,103	269	594	174	253	4,146	697	9,031
2022/23	305	365	414	418	1,091	283	547	132	276	4,359	725	8,916
Forecasts												
2023/24	302	220	479	369	1,168	191	523	182	236	4,512	760	9,005
2024/25	296	225	474	353	1,143	194	524	176	232	4,499	749	9,137
2025/26	299	239	490	388	1,217	224	528	178	257	4,668	767	9,374
2026/27	304	255	496	418	1,251	270	523	176	288	4,736	763	9,672
2027/28	311	256	503	423	1,264	261	521	176	287	4,804	768	9,761
2028/29	312	267	503	429	1,248	267	515	174	288	4,826	771	9,928
2029/30	330	278	528	463	1,379	308	530	179	318	5,048	806	10,223
2030/31	337	286	533	457	1,442	288	533	179	310	5,125	818	10,348
2031/32	356	303	558	503	1,470	356	541	183	356	5,372	858	10,709
2032/33	365	304	567	502	1,460	338	540	181	350	5,454	870	10,879

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												
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
2021/22	363	516	504	591	1,103	269	708	174	254	4,143	697	9,326
2022/23	307	400	489	512	1,091	286	609	132	290	4,359	725	9,374
Forecasts												
2023/24	311	337	544	521	1,197	323	708	187	328	4,625	779	9,673
2024/25	312	346	550	523	1,197	329	717	185	331	4,711	785	9,918
2025/26	312	352	560	541	1,263	340	718	185	337	4,846	796	10,127
2026/27	314	352	562	547	1,291	342	709	182	343	4,887	787	10,368
2027/28	321	358	570	562	1,304	352	707	181	353	4,958	792	10,554
2028/29	329	375	580	578	1,314	362	713	183	360	5,079	811	10,799
2029/30	346	382	605	603	1,447	379	732	188	377	5,299	846	11,084
2030/31	359	402	620	618	1,534	391	744	190	389	5,450	870	11,366
2031/32	374	405	637	636	1,544	404	750	192	403	5,642	901	11,608
2032/33	387	415	654	653	1,549	416	753	192	415	5,783	923	11,903

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 Step Change 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
Actuals												
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
2022	230	246	322	431	991	280	508	162	360	3,780	611	7,921
2023	217	237	352	418	1,069	252	606	167	321	3,225	537	7,399
Forecasts												
2024	203	228	375	478	1,088	227	457	191	306	3,350	549	7,666
2025	197	226	365	461	1,069	220	445	183	298	3,350	539	7,703
2026	196	229	371	477	1,078	227	461	184	304	3,479	558	7,869
2027	190	227	359	470	1,089	223	431	175	296	3,408	539	7,995
2028	193	228	363	481	1,136	227	434	175	302	3,496	546	8,139
2029	194	231	363	488	1,139	231	428	174	302	3,517	548	8,223
2030	203	242	375	505	1,157	240	436	176	314	3,661	571	8,397
2031	209	249	384	516	1,268	246	441	179	323	3,777	590	8,580
2032	216	255	390	525	1,331	252	442	180	330	3,888	607	8,798
2033	221	259	394	529	1,326	255	445	179	335	3,975	616	8,960

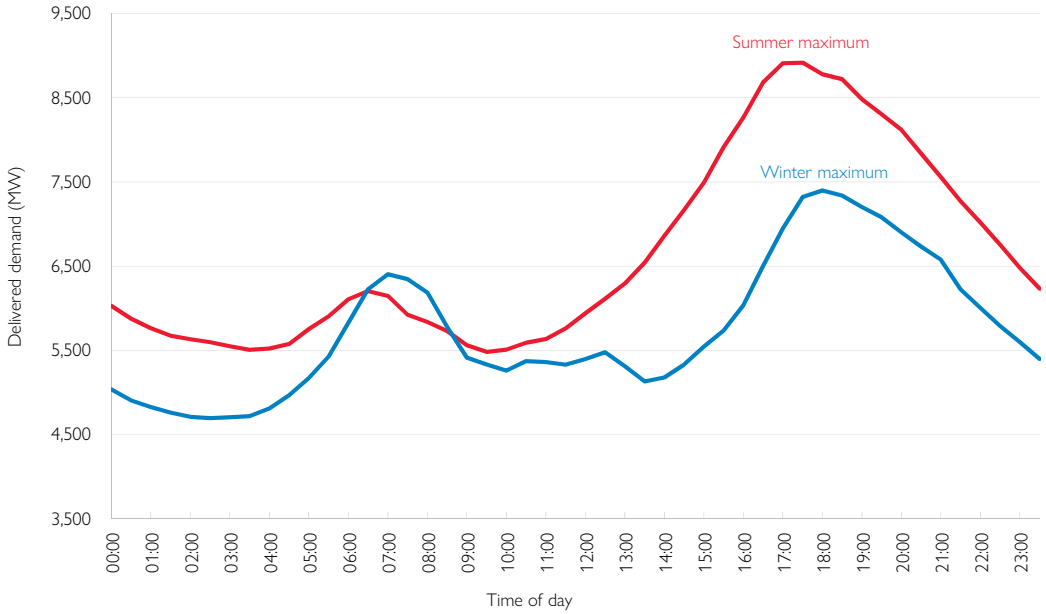
Table 3.23 State winter maximum native demand by zone (MW)

Winter	Far North	Ross	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals												
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
2022	230	248	375	458	991	280	634	162	357	3,779	611	8,125
2023	217	223	408	441	1,069	251	697	167	318	3,224	537	7,552
Forecasts												
2024	226	369	420	509	1,200	204	90	51	286	2,975	551	6,881
2025	192	334	404	518	1,249	203	208	137	288	3,281	597	7,411
2026	216	358	419	504	1,229	200	467	193	310	3,008	550	7,454
2027	218	367	416	415	1,070	220	554	182	276	2,913	526	7,157
2028	242	360	410	494	1,091	235	654	186	336	3,085	540	7,633
2029	230	307	408	483	1,066	241	628	207	346	3,176	532	7,624
2030	227	329	406	492	1,104	247	624	191	342	3,231	515	7,708
2031	206	255	366	459	1,079	232	691	181	357	3,373	559	7,758
2032	230	248	375	458	991	280	634	162	357	3,779	611	8,125
2033	217	223	408	441	1,069	251	697	167	318	3,224	537	7,552

3.6 Summer and winter maximum and annual minimum daily profiles

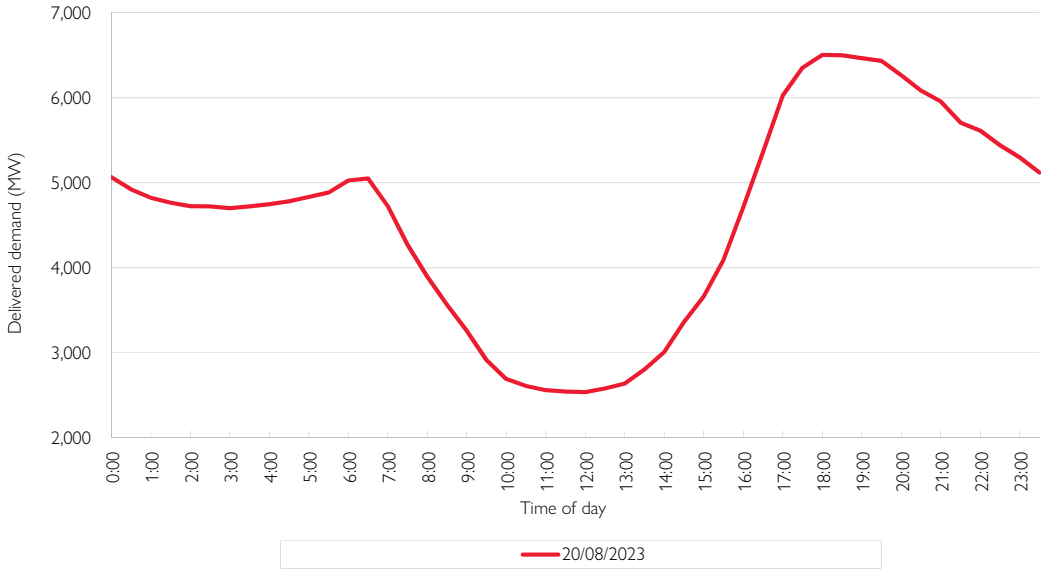
The daily load profiles (transmission delivered) for the Queensland region on the days of summer 2022/23 and winter 2023 maximum demands are shown in Figure 3.14.

Figure 3.14 Daily load profile of summer 2022/23 and winter 2023 maximum transmission delivered demand days



The 2023 annual minimum (transmission delivered) daily load profile for the Queensland region is shown in Figure 3.15.

Figure 3.15 Daily load profile of 2023 minimum transmission delivered day (1)



Note:

(1) Based on preliminary meter data up to 13 September 2023.

3.7 Annual load duration curves

The annual historical load duration curves for the Queensland region transmission delivered demand since 2018/19 is shown in Figure 3.16.

Figure 3.16 Historical transmission delivered load duration curve

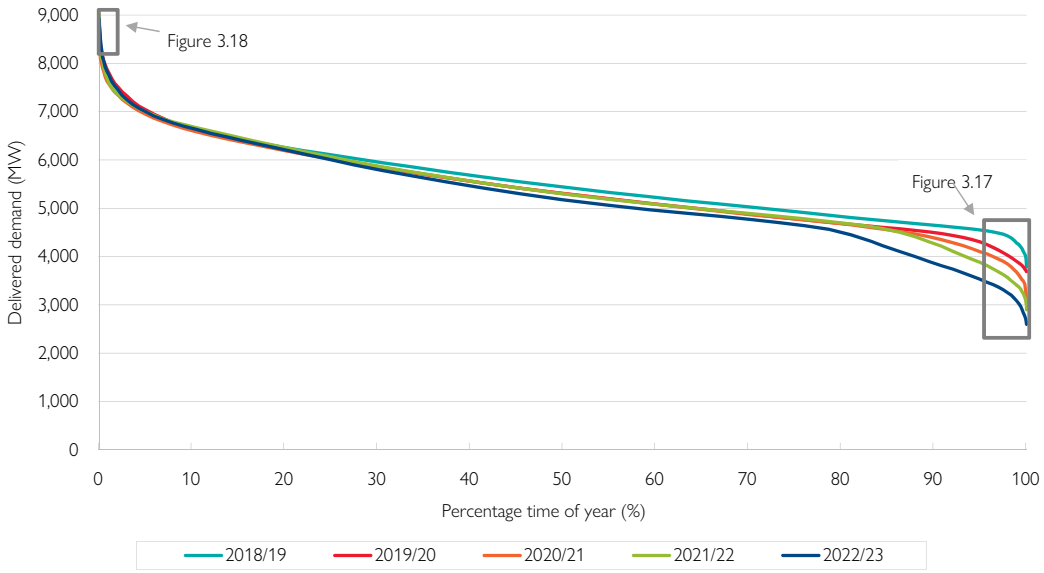


Figure 3.17 Historical transmission delivered load duration curves (95-100%)

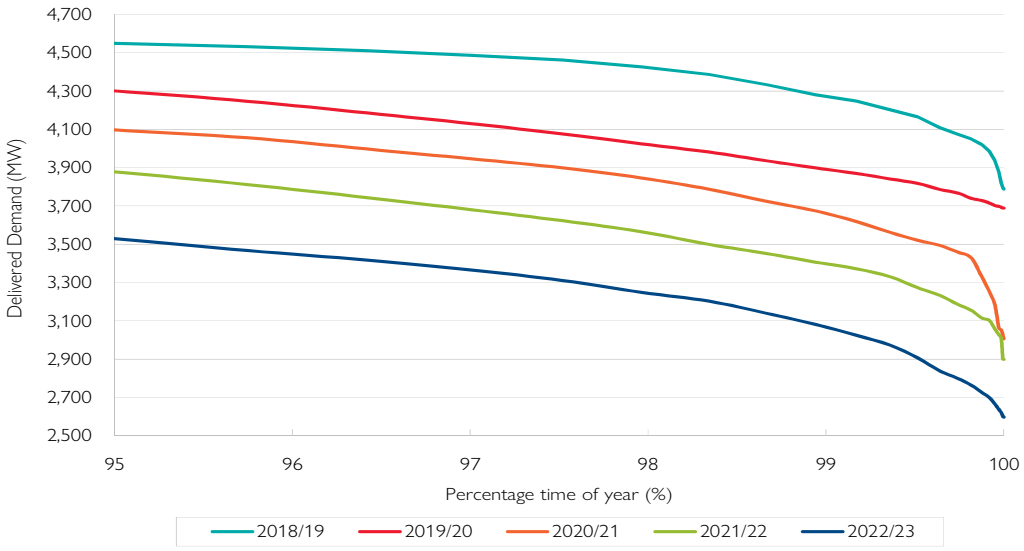


Figure 3.18 Historical transmission delivered load duration curves (0-0.5%)