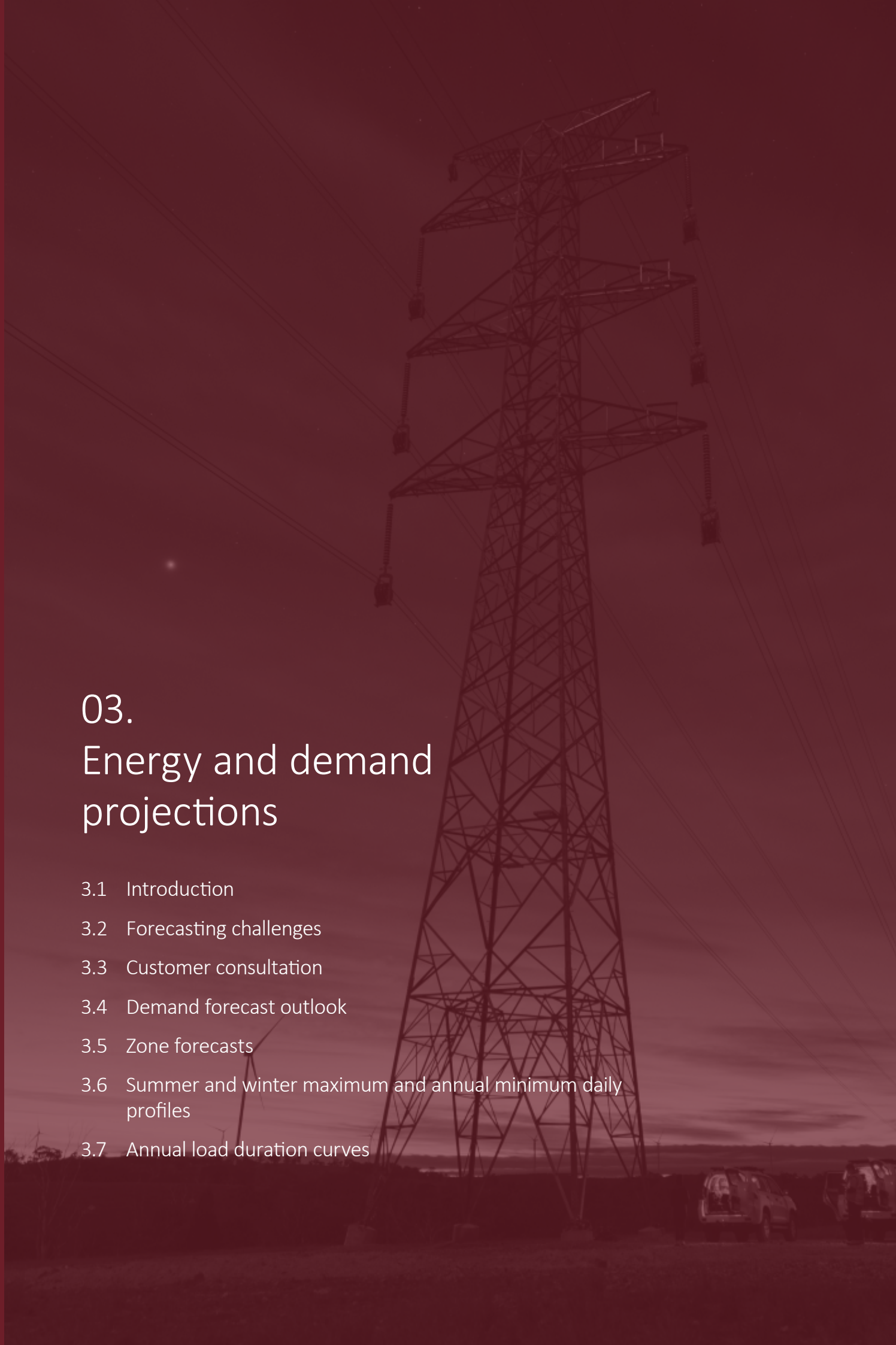


03. Energy and demand projections

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

Key highlights

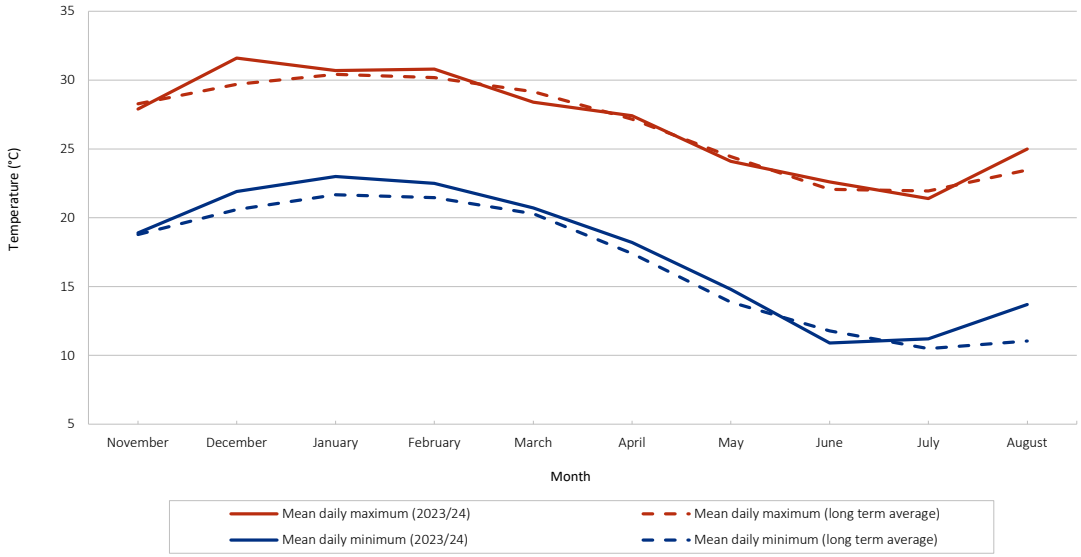
- Queensland's maximum transmission delivered demand for 2023/24 was 9,429MW on 22 January 2024. This maximum demand occurred at 5.00pm and was 513MW greater than the record maximum delivered demand set in 2023.
- Queensland set a new record minimum transmission delivered demand of 2,389MW on 5 October 2024. This minimum demand occurred at 10.00am and was 149MW lower than the previous record minimum set in August 2023.
- Powerlink has produced the load forecast for the 2024 Transmission Annual Planning Report (TAPR) instead of adopting Australian Energy Market Operator's (AEMO's) forecast published in their 2024 Energy Statement of Opportunity (ESOO). This decision was driven by a need to have more granular forecasts at the sub-regional level and the ability to better focus on Queensland consumer behaviour and potential market development in the forecast input assumptions.
- Based on Powerlink's Central scenario forecast, Queensland's transmission delivered maximum demand is expected to have steady growth with an average annual increase of 3.1% 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 Powerlink's Central scenario forecast, transmission delivered energy consumption is expected to increase at an average rate of 2.5% per annum over the next 10 years.

3.1 Introduction

The 2023/24 summer Queensland maximum transmission delivered demand occurred at 5.00pm on 22 January 2024, when 9,429MW was delivered from the transmission grid (refer to Figure 3.9 for load measurement definitions). Operational 'as generated' peak demand was recorded at the same time, reaching 11,005MW. After weather correction, the 2023/24 summer maximum transmission delivered demand was 9,795MW, 4.0% higher than forecast in the 2023 ESOO Step Change scenario forecast.

Figure 3.1 shows observed mean temperatures for Brisbane during November 2023 to August 2024 compared with long-term averages. The comparison reveals a hotter summer than average in south east Queensland and the winter temperatures in July and August were also warmer than the long-term average. The high summer temperatures were also accompanied by extreme relative humidity, especially in January, which was the primary cause of the record maximum demand that month.

Figure 3.1 Brisbane temperature ranges over November 2023 to August 2024 (1)



Note:

(1) Long-term average based on years 2000 to 2023/24.

The 2024 Queensland minimum transmission delivered demand occurred at 10.00am on 5 October 2024, when only 2,389MW was delivered from the transmission grid (refer to Figure 3.9 for load measurement definitions). Operational 'as generated' minimum demand was recorded at the same time and set a new record for Queensland of 3,091MW, passing the previous minimum record of 3,387MW set in September 2023.

At the time of minimum transmission delivered demand, directly connected loads made up about 83.6% 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 developed a transmission delivered demand and energy forecast tool working closely with AEMO and EQL. The decision to move away from adopting AEMO's ESOO forecast was driven by the need for sub regional forecasts. Powerlink is also better placed to forecast future load (new and/or as a result of decarbonisation) in the High, Central and Low scenario forecasts. Powerlink's forecast also includes sub-regional areas, otherwise known as TAPR zones (refer to Appendix F) and delivers the added benefit of forecasts at all levels of the transmission network in the state. The Powerlink forecasting tool uses inputs from a variety of sources listed in Appendix C.

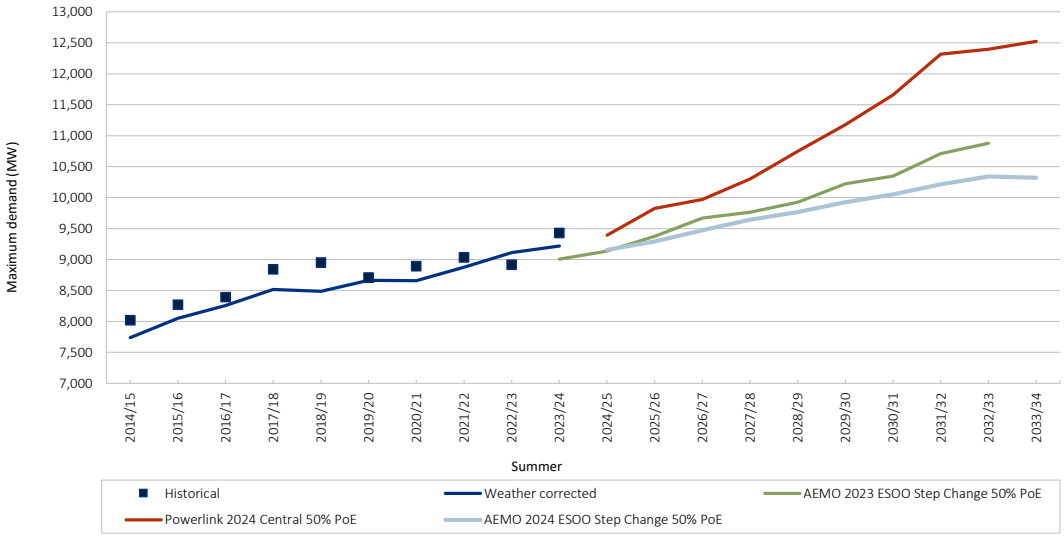
The Queensland Government's 50% renewable energy target by 2030 (QRET) and net zero by 2050 has driven renewable capacity in the form of solar PV and wind farms to connect to the Queensland transmission and distribution networks (refer to tables 7.1 and 7.2). Additional uncommitted distribution connected solar and wind farm capacity has been included into the 10-year outlook period from 2025 to model the Queensland Government's targets.

At the end of June 2024, Queensland reached 6,464MW of installed rooftop PV capacity[1]. Growth in rooftop PV capacity remains strong at around 68MW per month in 2023/24. 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 5.00pm 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.

[1] Clean Energy Regulator, Postcode data for small-scale installations – all data, data as at 31/06/2024, August 2024. 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 3.2 shows a comparison of AEMO's 2023 and 2024 ESOO delivered summer maximum demand forecasts based on the Step Change scenario with Powerlink's 2024 Central scenario, both with 50% Probability of Exceedance (PoE). The increase in the forecast maximum demand is due to an increase in the pace of electrification, new and anticipated block loads in several zones. The Powerlink forecast also considered the connection of Mt Isa on the completion of the Copper String 2032 project from Winter 2031.

Figure 3.2 Comparison of AEMO's 2023 ESOO Step Change scenario delivered demand forecast with the 2024 Powerlink Central scenario (1)

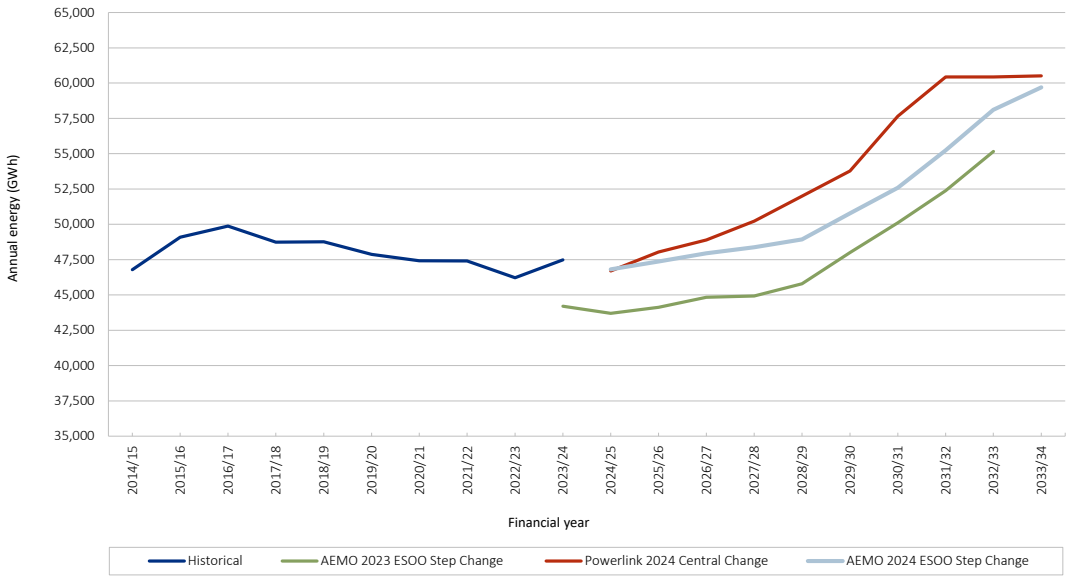


Note:

(1) AEMO's 2023 and 2024 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 3.3 shows a comparison of AEMO's 2023 ESOO delivered energy forecasts based on the Step Change scenario with Powerlink's 2024 Central scenario. Section 3.4 discusses updates included in Powerlink's 2024 forecasts. The steady increase in delivered energy is due to new anticipated loads and electrification of existing loads.

Figure 3.3 Comparison of AEMO's 2023 ESOO Step Change scenario delivered energy forecast with the 2024 Powerlink Central scenario (1)

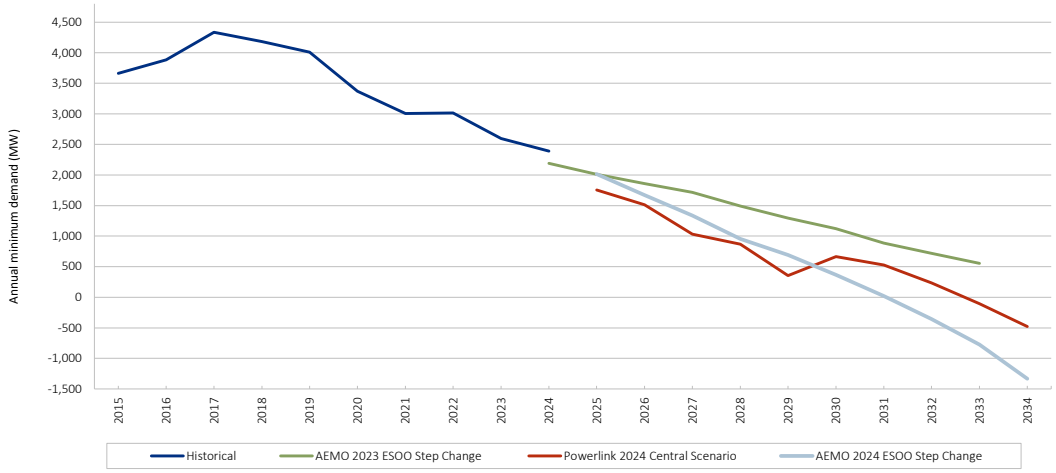


Note:

(1) AEMO's 2023 and 2024 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 2023 ESOO annual delivered minimum demand forecast based on the Step Change scenario with Powerlink's Central scenario. The drop in minimum demand is due to increases in embedded generation and continued growth in rooftop PV. The increase in 2030/31 is due to new and anticipated ~750MW of block loads coming online and offsetting the PV installation, from 2031/32 the PV generation increases beyond the scale of the block load. The minimum demand forecast does not factor in any market intervention to prevent the grid from becoming unstable under the minimum system load conditions. Market interventions could include directing on grid-scale Battery Energy Storage System (BESS) and PHES systems to increase demand.

Figure 3.4 Comparison of AEMO's 2023 ESOO Step Change scenario minimum delivered demand forecast with the Powerlink 2024 Central scenario (1)



Note:

(1) AEMO's 2023 and 2034 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.

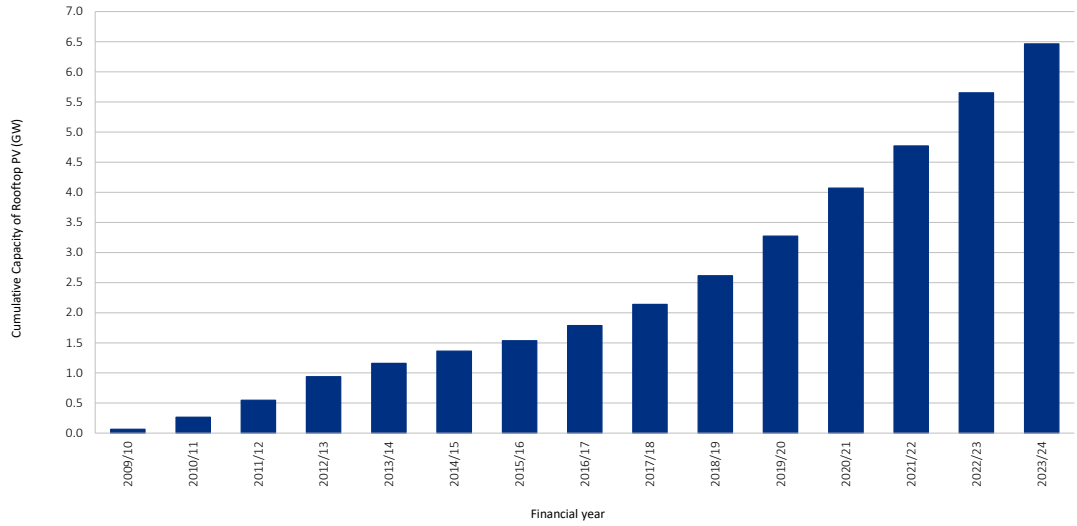
3.2 Forecasting challenges

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 810MW 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 2024 Queensland Household Energy Survey (QHES) indicating that 27% of respondents intend to purchase new or upgrade rooftop PV systems in the next three years (refer Figure 3.6). Of the reasons for having or intending to purchase a battery in the next three years, 47% indicated it is to store excess solar energy and use it later during peak times to reduce electricity use from the grid. 38% of respondents have high interest in community batteries. Of those yet to do so, 59% would consider purchasing an electric vehicle or plug-in hybrid in the next 3 years. Of the households with Electric Vehicle (EV) ownership 64% are open to the concept of their EV charging being managed by a third party. It is also expected that there will also be an increase in PV installations in 2027/28 when customers stop receiving the 44-cent feed in tariff and upgrade their systems.

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

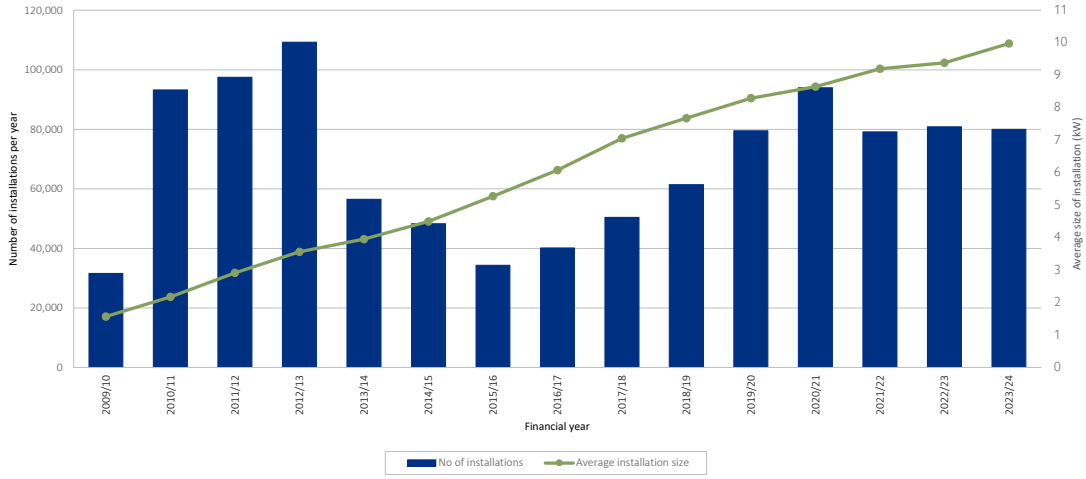


Notes:

(1) Source: Clean Energy Regulator.

(2) Registrations generally lag installations and hence data for FY2024 may be slightly understated.

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



Notes:

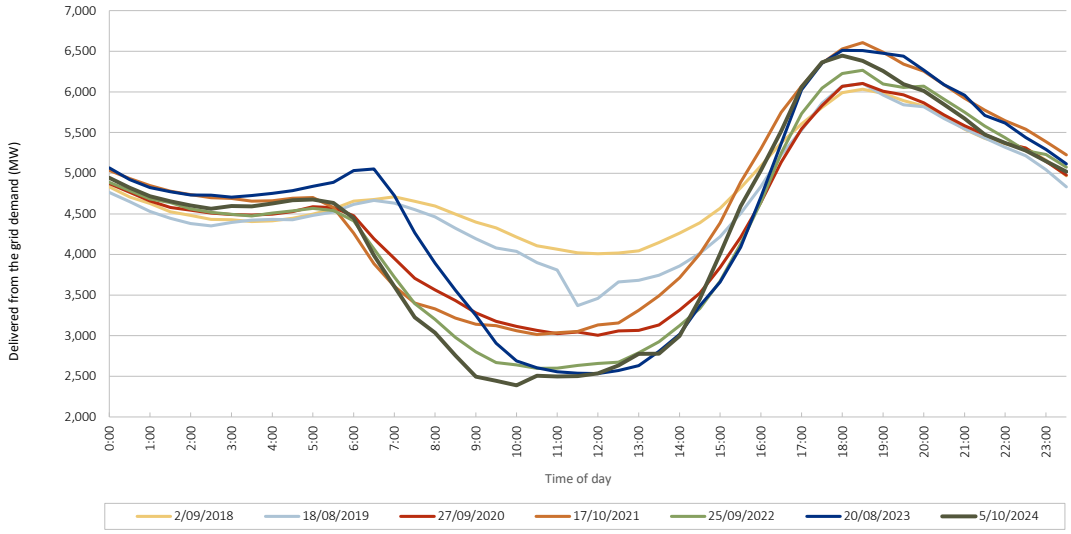
(1) Source: Clean Energy Regulator.

(2) Registrations generally lag installations and hence data for FY2024 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.

Figure 3.7 Transmission delivered annual minimum demand for the Queensland region (1) (2)



Note:

(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.

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.

3.2.2 Minimum demand

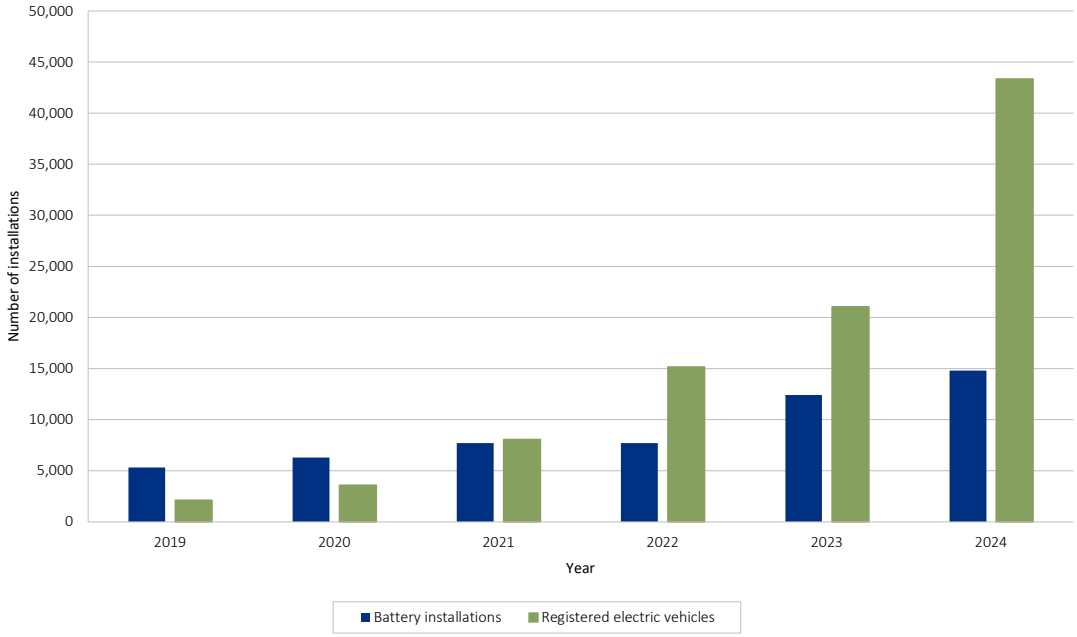
Continuation of the minimum demand trend is likely to present challenges to the power system. Generators are increasingly required to ramp up and down in response to daily demand variations more steeply. Decreasing minimum demand will lead a lower number of units of synchronous generation that are able 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[2].

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 15,000 battery installations currently reported within residential households and over 40,000 registered electric vehicles (refer to Figure 3.8). Appendix C lists the forecast assumptions for electric vehicle uptake over the forecast period.

[2] 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.

3.2.3 Electrification of load and decentralisation

Decentralisation, driven by future developments in battery storage technology coupled with rooftop PV and EVs, could see significant changes to future electricity usage patterns. With appropriate consumer behaviour reinforced by tariff reforms, this could reduce the need to develop transmission services to cover short duration peaks.

In 2021 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. It is uncertain whether new hydrogen load will be flexible; the forecast assumes it is inflexible due to this uncertainty. However, new electrification loads that have indicated a portion of load to be flexible (non-firm) it is assumed that this will not contribute to peak demand in the forecast.

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). Powerlink has produced transmission connection supply point forecasts that incorporate Energex and Ergon's inputs. These connection supply point forecasts are presented in Appendix C. 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 has connected in the past 12 months, the Fitzroy mine in the Northern Bowen Basin.

Possible new large loads

There are several proposals under development for new large mining, metal processing, other industrial loads and for the electrification of existing loads. These proposed large loads total approximately 5,215MW with a high scenario of up to 9,637MW. The likely distribution of these loads is defined in Table 3.1. The majority of proposed loads have been included in Powerlink's High scenario forecast only. However, Powerlink's Central scenario forecast does allow for approximately 1,800MW of anticipated electrification and hydrogen load in the Gladstone zone (refer to sections 6.10.2 and 8.2.5). This anticipated load ramps up to the 1,800MW over the forecast period beginning from 2026/27. The loads in the Gladstone zone in Table 3.1 exclude this 1,800MW.

Table 3.1 Possible large loads excluded from the Low and Central scenario forecasts

Zone	Description	Possible load
North Queensland	Electrification	1,609MW
	Manufacturing	
Central Queensland	Hydrogen production and liquefaction	3,330MW to 7,7752MW (1)
	Electrification	
Southern Queensland	Data Centre and Industrial	276MW

Note:

(1) This represents a 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 previously occurred in winter and have now shifted to the shoulder seasons.

The forecast for minimum delivered demand is 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 2024 TAPR reports on the Low, Central and High scenario forecasts produced by Powerlink. 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 Low, Central and High scenarios are shown in Table 3.2. These growth rates refer to transmission delivered quantities as described in Section 3.4.1. The summer and winter maximum demand growth rates are based on 50% PoE corrected values for 2023/24 and 2024 respectively.

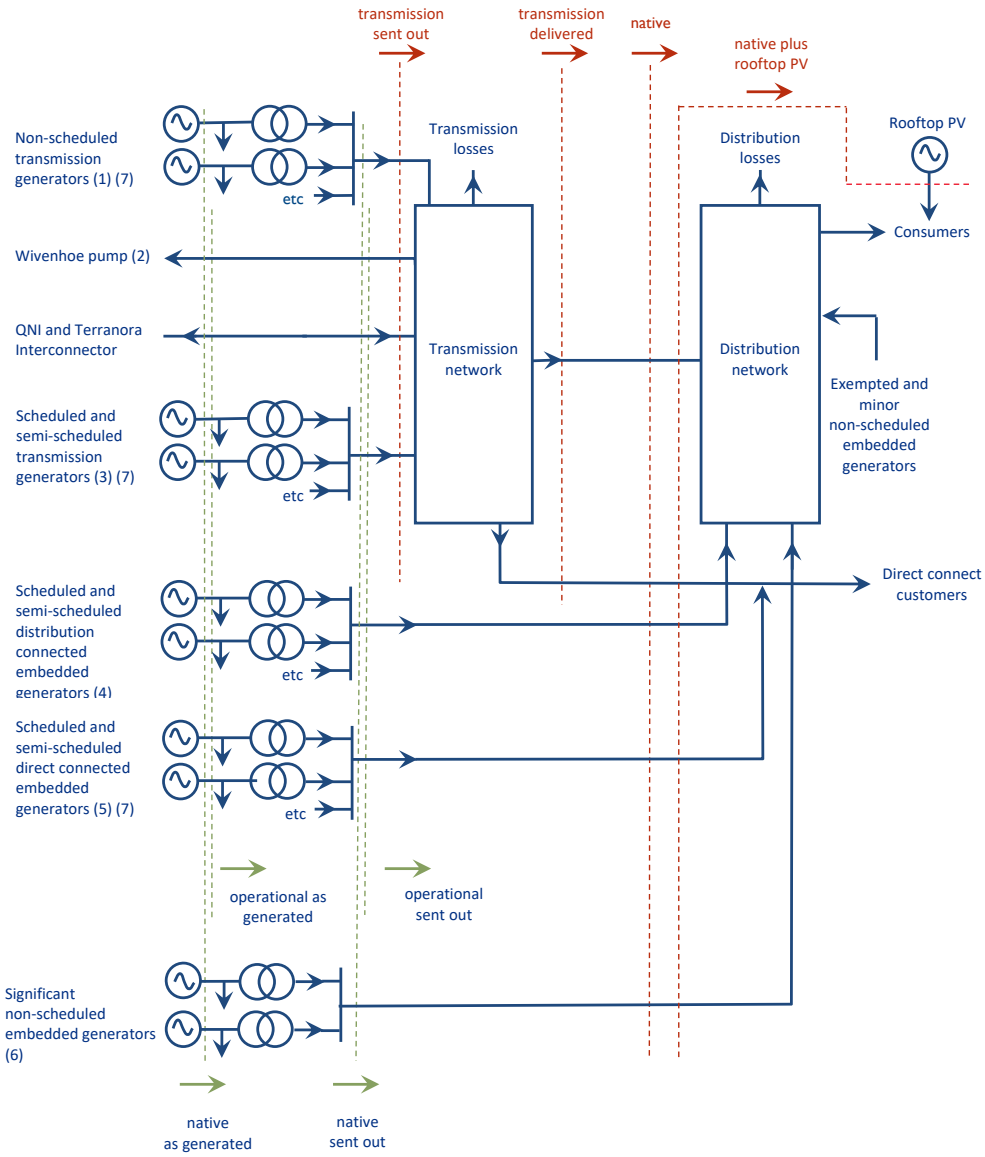
Table 3.2 Average annual growth rate over next 10 years

	Powerlink future scenario outlooks		
	High	Central	Low
Delivered energy	6.0%	2.5%	0.4%
Delivered summer maximum demand (50% PoE)	5.5%	3.1%	1.5%
Delivered winter maximum demand (50% PoE)	5.5%	3.0%	2.0%

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 3.10.

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
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
2023/24	54,827	50,154	55,858	51,272	48,753	47,477	50,251	58,010

The transmission delivered energy forecasts are presented in Table 3.4.

Table 3.4 Forecast annual transmission delivered energy (GWh)

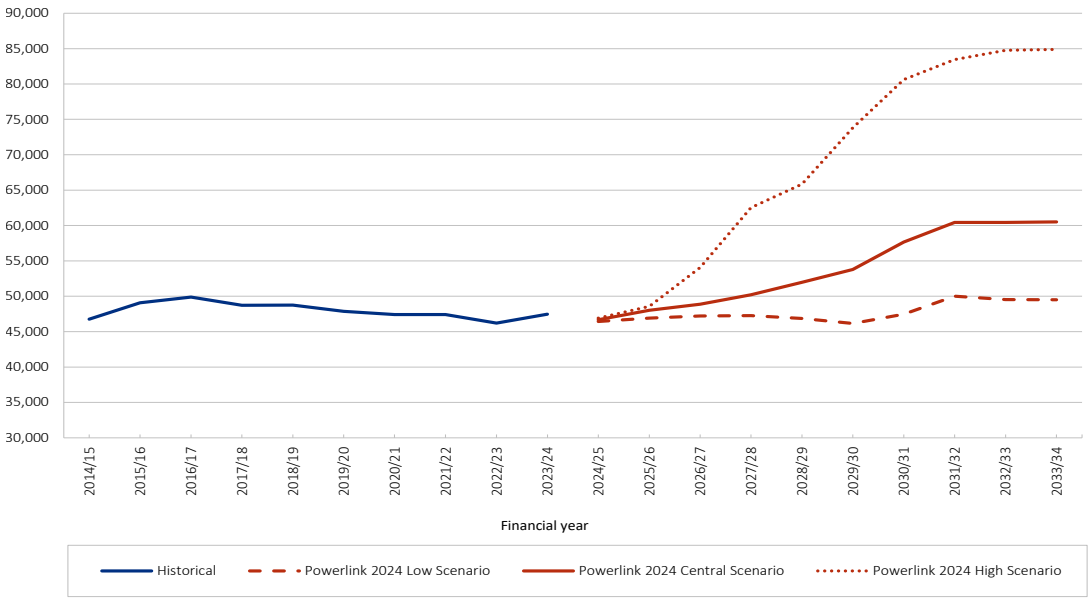
Financial year	High	Central	Low
2024/25	46,923	46,697	46,435
2025/26	48,569	48,032	46,931
2026/27	54,071	48,883	47,240
2027/28	62,554	50,217	47,267
2028/29	65,852	52,000	46,871
2029/30	73,836	53,785	46,176
2030/31	80,632 (1)	57,650 (1)	47,468
2031/32	83,468	60,434	50,017
2032/33	84,780	60,437	49,544
2033/34	84,880	60,516	49,527

Note:

(1) Large industrial block load connected in 2030/31

The historical annual transmission delivered energy from Table 3.3 and the forecast transmission delivered energy for the High, Central and Low scenarios from Table 3.4 are shown plotted in Figure 3.11.

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	High	Central	Low
2024/25	51,208	50,987	50,725
2025/26	53,169	52,517	51,518
2026/27	58,674	53,368	51,834
2027/28	67,160	54,702	51,858
2028/29	70,460	56,491	51,464
2029/30	78,445	58,280	50,775
2030/31	85,241	62,146	52,069
2031/32	88,089	64,939	54,628
2032/33	89,391	64,933	54,143
2033/34	89,480	65,002	54,118

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
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	9,110	9,413	9,395
2023/24	11,005	10,359	11,136	10,587	9,807	9,429	9,218	11,149	9,998

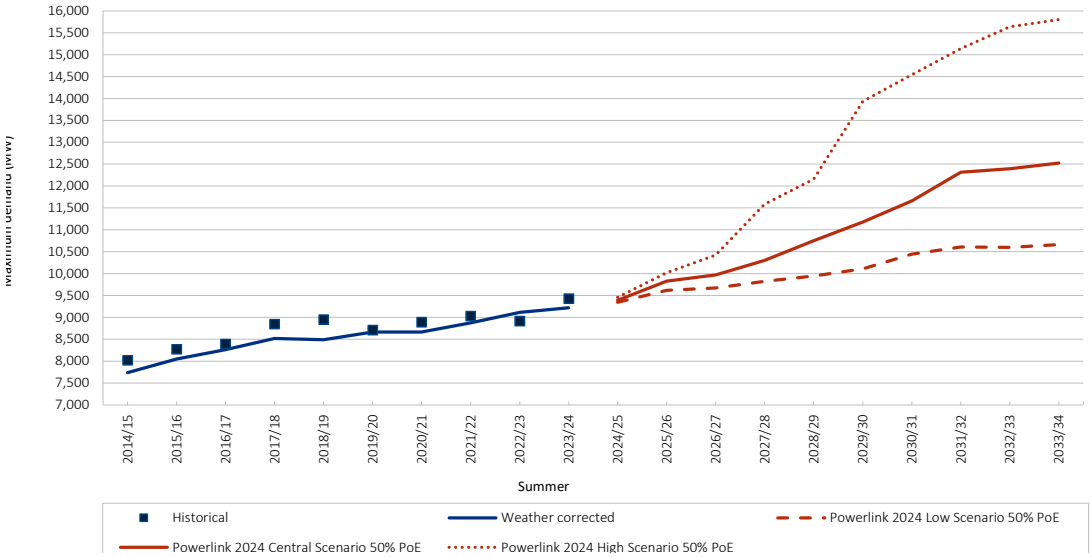
The summer transmission delivered maximum demand forecasts are presented in Table 3.7.

Table 3.7 Forecast summer transmission delivered maximum demand (MW)

Summer	High			Central			Low		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2024/25	8,948	9,459	10,092	8,914	9,392	10,015	8,887	9,342	9,990
2025/26	9,509	10,021	10,621	9,345	9,828	10,422	9,148	9,617	10,216
2026/27	9,902	10,419	11,055	9,489	9,969	10,548	9,201	9,670	10,220
2027/28	11,054	11,585	12,181	9,812	10,301	10,864	9,351	9,823	10,353
2028/29	11,618	12,153	12,724	10,241	10,749	11,312	9,460	9,941	10,457
2029/30	13,369	13,934	14,509	10,667	11,179	11,726	9,615	10,111	10,605
2030/31	13,978	14,544	15,134	11,166	11,660	12,214	9,978	10,441	10,986
2031/32	14,579	15,138	15,736	11,771	12,317	12,890	10,123	10,609	11,089
2032/33	15,059	15,634	16,259	11,840	12,398	12,961	10,112	10,598	11,063
2033/34	15,211	15,799	16,421	11,955	12,524	13,076	10,183	10,661	11,123

The summer historical transmission delivered maximum demands from Table 3.11 and the forecast 50% PoE summer transmission delivered maximum demands for the High, Central and Low scenarios from Table 3.7 are shown in Figure 3.11. The large-scale anticipated new load from electrification and hydrogen is assumed to be inflexible.

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
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
2023/24	11,005	10,359	11,136	10,587	9,807	9,429	10,209	11,149	9,998

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

Table 3.9 Forecast summer native maximum demand (MW)

Summer	High			Central			Low		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2024/25	9,445	9,936	10,504	9,388	9,883	10,458	9,349	9,825	10,404
2025/26	9,991	10,503	11,047	9,812	10,328	10,890	9,617	10,095	10,637
2026/27	10,380	10,890	11,486	9,948	10,471	11,015	9,661	10,141	10,655
2027/28	11,521	12,045	12,599	10,257	10,797	11,342	9,816	10,287	10,783
2028/29	12,062	12,610	13,175	10,680	11,242	11,797	9,920	10,412	10,901
2029/30	13,802	14,385	14,960	11,109	11,663	12,208	10,071	10,575	11,052
2030/31	14,410	14,988	15,564	11,608	12,135	12,703	10,426	10,916	11,413
2031/32	15,022	15,583	16,169	12,218	12,792	13,383	10,582	11,077	11,539
2032/33	15,493	16,085	16,684	12,295	12,869	13,458	10,583	11,069	11,534
2033/34	15,649	16,262	16,856	12,416	12,988	13,585	10,654	11,131	11,601

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
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	7,556	7,553	7,553
2024	8,728	8,190	8,728	8,152	8,196	7,970		7,927	7,513

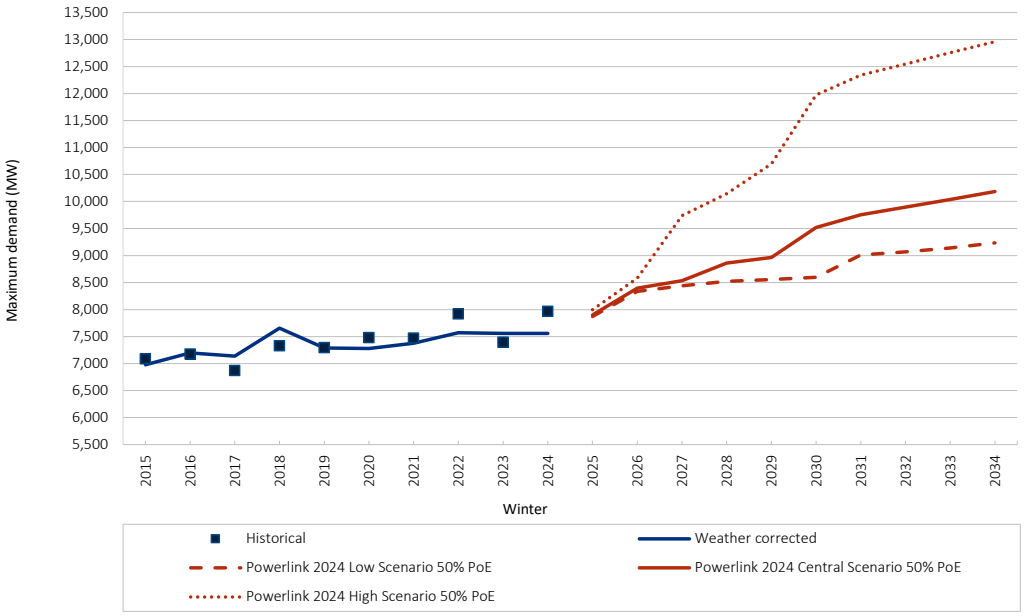
The winter transmission delivered maximum demand forecasts are presented in Table 3.11.

Table 3.11 Forecast winter transmission delivered maximum demand (MW)

Winter	High			Central			Low		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2025	7,621	7,996	8,542	7,536	7,900	8,474	7,490	7,871	8,424
2026	8,194	8,581	9,136	8,023	8,396	8,973	7,948	8,336	8,895
2027	9,305	9,741	10,228	8,152	8,532	9,112	8,052	8,443	9,014
2028	9,707	10,144	10,626	8,481	8,860	9,431	8,131	8,520	9,091
2029	10,274	10,694	11,194	8,579	8,962	9,517	8,165	8,556	9,122
2030	11,528	11,974	12,501	9,242	9,520	10,172	8,208	8,594	9,153
2031	11,899	12,342	12,848	9,356	9,755	10,272	8,626	9,011	9,560
2032	12,097	12,542	13,010	9,498	9,894	10,397	8,677	9,068	9,603
2033	12,303	12,753	13,207	9,645	10,037	10,514	8,750	9,142	9,650
2034	12,506	12,959	13,403	9,806	10,814	10,640	8,831	9,233	9,709

The winter historical transmission delivered maximum demands from Table 3.10 and the forecast 50% PoE summer transmission delivered maximum demands for the High, Central and Low 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
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	7,758	7,754	7,830
2022	8,625	8,216	8,701	8,347	8,141	7,921	8,125	8,127	7,571
2023	8,137	7,601	8,223	7,738	7,585	7,399	7,552	7,553	7,556
2024	8,728	8,190	8,728	8,152	8,196	7,970	7,928	7,927	(1)

Note:

(1) The winter 2024 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	High			Central			Low		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2025	8,131	8,499	9,120	8,034	8,404	9,002	7,994	8,351	8,980
2026	8,707	9,082	9,711	8,518	8,899	9,501	8,458	8,815	9,451
2027	9,805	10,193	10,807	8,652	9,031	9,640	8,560	8,926	9,570
2028	10,202	10,600	11,201	8,970	9,360	9,958	8,638	9,001	9,647
2029	10,779	11,163	11,767	9,063	9,457	10,041	8,673	9,039	9,677
2030	12,011	12,406	12,988	9,729	10,005	10,694	8,708	9,074	9,711
2031	12,399	12,795	13,353	9,847	10,238	10,784	9,119	9,493	10,121
2032	12,606	13,000	13,543	9,995	10,373	10,899	9,169	9,548	10,168
2033	12,815	13,213	13,721	10,142	10,516	11,019	9,252	9,617	10,222
2034	13,019	13,419	13,925	10,289	10,663	11,143	9,330	9,698	10,277

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
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	3,490	2,973	3,655	3,277	2,634	2,538	3,181	6,232
2024	3,091	2,647	3,655	2,650	6,650	2,389	2,430	6,741

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

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

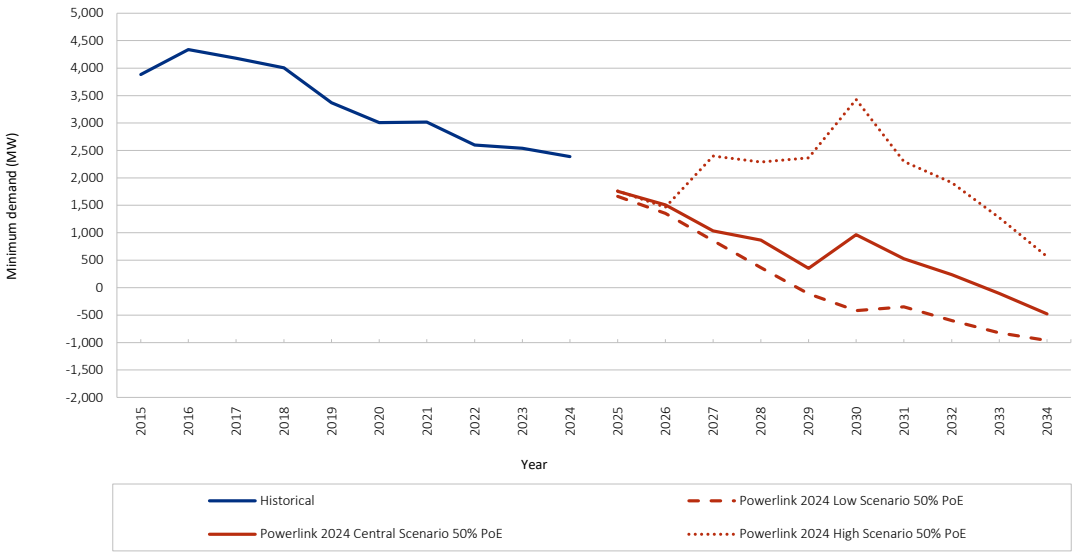
Annual	High			Central			Low		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2024/25	1,279	1,761	2,414	1,300	1,756	2,404	1,222	1,663	2,306
2025/26	981	1,465	2,171	1,038	1,510	2,204	916	1,354	2,035
2026/27	1,892	2,398	3,117	545	1,034	1,734	409	854	1,538
2027/28	1,769	2,290	3,035	362	868	1,584	-82	365	1,058
2028/29	1,822	2,366	3,145	-160	353	1,076	-559	-112	580
2029/30	2,869	3,430	4,244	439	967	1,684	-875	-419	268
2030/31	1,663	2,297	2,864	-14	527	1,263	-825	-349	325
2031/32	1,349	1,915	2,371	-340	235	993	-1,083	-600	64
2032/33	766	1,277	1,764	-699	-105	661	-1,308	-821	-153
2033/34	41	567	1,063	-1,066	-478	303	-1,447	-960	-292

Note:

(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.

The annual historical transmission delivered minimum demands from Table 3.14 and the forecast 50% PoE annual transmission delivered minimum demands for the High, Central and Low scenarios from Table 3.15 are shown in Figure 3.13. The minimum demand forecast does not factor in any market intervention to prevent the grid from becoming unstable under the minimum system load conditions. Market interventions could include directing on grid-scale BESS and Pumped Hydro Energy Storage (PHES) systems to increase demand.

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	High			Central			Low		
	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE	90% PoE	50% PoE	10% PoE
2024/25	2,176	2,491	3,007	2,277	2,582	3,088	2,281	2,588	3,092
2025/26	1,941	2,274	2,785	2,067	2,410	2,931	2,052	2,422	2,920
2026/27	1,644	2,123	2,816	1,571	1,892	2,402	1,642	1,962	2,444
2027/28	2,464	2,891	3,439	1,226	1,622	2,120	1,114	1,436	1,905
2028/29	2,204	2,654	3,306	749	1,099	1,584	639	955	1,415
2029/30	2,302	2,876	3,536	603	1,091	1,827	202	543	985
2030/31	2,790	3,305	3,903	787	1,273	1,744	-262	284	967
2031/32	2,480	2,907	3,410	412	930	1,406	19	546	1,082
2032/33	1,880	2,266	2,789	40	596	1,105	-189	339	889
2033/34	1,152	1,546	2,091	-305	271	763	-406	130	757

Note:

(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.

3.5 Zone forecasts

Powerlink's 2024 TAPR zone forecast are coincident with the state peak. This year's TAPR includes a new geographical zone called North West. The North West zone represents the connection of North West Minerals Province (NWMP), with includes Mt Isa, to the National Electricity Market (NEM). The North West loads are included in the forecast from 2029 following the completion of the Copper String 2032 project. The now 12 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	1.15	1.22
Ross	1.48	1.50
North	1.17	1.13
North West	1.32	1.12
Central West	1.02	1.03
Gladstone	1.03	1.02
Wide Bay	1.01	1.20
Surat	1.20	1.21
Bulli	1.07	1.14
South West	1.04	1.21
Moreton	1.00	1.03
Gold Coast	1.04	1.12

Tables 3.18 and 3.19 show the historical and forecast of transmission delivered energy and native energy for the Central scenario for each of the 12 zones in the Queensland region.

Table 3.18 Annual transmission delivered energy by zone (GWh)

Financial Year	Far North	Ross	North West	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals													
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
2023/24	1,566	2,286	-	2,548	2,866	9,368	951	5,376	1,481	991	17,093	2,948	47,474
Forecasts													
2024/25	1,583	2,531	-	2,036	2,969	9,345	1,720	4,721	1,377	1,349	15,897	3,170	46,697
2025/26	1,546	2,565	-	2,050	3,047	9,751	1,500	4,400	1,363	1,332	17,342	3,136	48,032
2026/27	1,495	2,702	-	2,132	3,209	9,914	1,429	4,254	1,352	1,367	17,952	3,078	48,883
2027/28	1,435	2,663	-	2,442	3,519	10,954	1,345	4,535	1,333	1,343	17,653	2,995	50,217
2028/29	1,389	2,608	-	2,489	3,529	13,267	1,275	4,640	1,320	1,304	17,251	2,927	52,000
2029/30	1,358	2,580	-	2,467	3,509	15,579	1,222	4,562	1,298	1,279	17,049	2,883	53,785
2030/31	1,344	2,565	-	2,457	3,496	19,752	1,193	4,422	1,282	1,266	17,000	2,873	57,650
2031/32	1,337	2,565	901	2,507	3,499	21,703	1,171	4,266	1,266	1,265	17,079	2,876	60,434
2032/33	1,336	2,558	901	2,505	3,483	21,978	1,158	4,045	1,257	1,253	17,077	2,887	60,437
2033/34	1,339	2,561	900	2,508	3,486	21,981	1,152	4,005	1,256	1,253	17,170	2,904	60,516

Table 3.19 Annual native energy by zone (GWh)

Financial Year	Far North	Ross	North West	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals													
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
2023/24	1,584	2,855	-	3,156	3,453	9,368	1,182	5,594	1,481	1,473	17,156	2,948	50,251
Forecasts													
2024/25	1,599	4,097	-	2,292	3,561	9,345	1,911	5,657	1,377	1,901	16,077	3,170	50,987
2025/26	1,562	4,127	-	2,306	3,639	9,751	1,860	5,339	1,363	1,913	17,522	3,136	52,517
2026/27	1,511	4,267	-	2,388	3,801	9,914	1,791	5,186	1,352	1,948	18,133	3,078	53,368
2027/28	1,451	4,233	-	2,698	4,112	10,954	1,708	5,461	1,333	1,924	17,833	2,995	54,702
2028/29	1,405	4,179	-	2,745	4,122	13,267	1,639	5,569	1,320	1,886	17,433	2,927	56,491
2029/30	1,374	4,149	-	2,722	4,101	15,579	1,588	5,493	1,298	1,862	17,232	2,883	58,280
2030/31	1,360	4,133	-	2,713	4,088	19,752	1,558	5,353	1,282	1,849	17,184	2,873	62,146
2031/32	1,353	4,136	901	2,765	4,092	21,702	1,537	5,200	1,266	1,849	17,264	2,876	64,939
2032/33	1,352	4,123	901	2,761	4,075	21,978	1,524	4,978	1,257	1,837	17,260	2,887	64,933
2033/34	1,355	4,125	900	2,764	4,076	21,981	1,518	4,934	1,256	1,836	17,353	2,904	65,002

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 12 zones in the Queensland region. It is based on the Central scenario and average (50% PoE) summer weather.

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

Summer	Far North	Ross	North West	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals													
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
2023/24	294	321	-	423	372	1,098	214	608	177	270	4,907	742	9,429
Forecasts													
2024/25	328	466	-	430	501	1,135	442	535	169	311	4,188	886	9,392
2025/26	338	547	-	436	528	1,141	462	351	167	359	4,509	990	9,828
2026/27	337	589	-	474	552	1,180	460	370	162	367	4,506	971	9,969
2027/28	341	561	-	482	482	1,442	485	412	165	413	4,572	946	10,301
2028/29	360	634	-	504	556	1,578	472	432	160	492	4,622	939	10,749
2029/30	340	674	-	487	566	2,006	427	520	159	337	4,641	1,021	11,179
2030/31	351	691	-	495	608	2,297	430	535	151	348	4,697	1,056	11,660
2031/32	353	592	260	575	631	2,614	473	398	156	360	4,811	1,094	12,317
2032/33	370	838	260	516	631	2,356	508	356	160	410	4,881	1,113	12,398
2033/34	365	754	260	501	605	2,476	504	300	153	412	5,074	1,145	12,524

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

Summer	Far North	Ross	North West	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals													
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
2023/24	298	497	-	505	563	1,098	302	732	177	382	4,912	742	10,209
Forecasts													
2024/25	334	677	-	430	564	1,135	454	685	169	359	4,190	886	9,883
2025/26	338	674	-	436	571	1,141	463	644	167	360	4,544	990	10,328
2026/27	338	698	-	474	594	1,180	461	660	162	369	4,564	971	10,471
2027/28	349	712	-	482	616	1,442	454	666	165	366	4,600	946	10,797
2028/29	366	777	-	504	620	1,578	473	696	160	339	4,789	939	11,242
2029/30	346	852	-	487	629	2,006	474	654	159	385	4,650	1,021	11,663
2030/31	357	838	-	495	634	2,297	477	646	151	395	4,789	1,056	12,135
2031/32	361	905	260	475	665	2,414	501	629	156	417	4,915	1,094	12,792
2032/33	370	889	260	516	675	2,356	510	623	160	412	4,984	1,113	12,869
2033/34	366	881	260	501	649	2,376	506	621	153	414	5,116	1,145	12,988

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 12 zones in the Queensland region. It is based on the Central scenario and average (50% PoE) winter weather.

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

Winter	Far North	Ross	North West	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals													
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
2024	221	187	-	367	441	1,071	270	473	193	396	3,728	624	7,970
Forecasts													
2025	269	381	-	352	409	928	362	438	138	255	3,525	844	7,900
2026	280	454	-	362	438	1,047	383	321	139	348	3,742	882	8,396
2027	279	488	-	393	457	1,077	381	347	134	354	3,733	889	8,532
2028	288	473	-	407	456	1,216	409	347	139	348	3,855	922	8,860
2029	298	524	-	417	460	1,304	390	357	132	406	3,820	854	8,962
2030	294	583	-	421	489	1,585	369	450	137	292	4,015	883	9,520
2031	294	578	220	414	509	1,701	360	448	126	291	3,930	884	9,755
2032	296	446	220	433	519	1,942	387	334	131	302	3,987	898	9,894
2033	310	464	220	434	530	1,979	397	299	134	314	4,021	935	10,037
2034	308	485	220	422	509	2,001	424	253	129	347	4,122	964	10,184

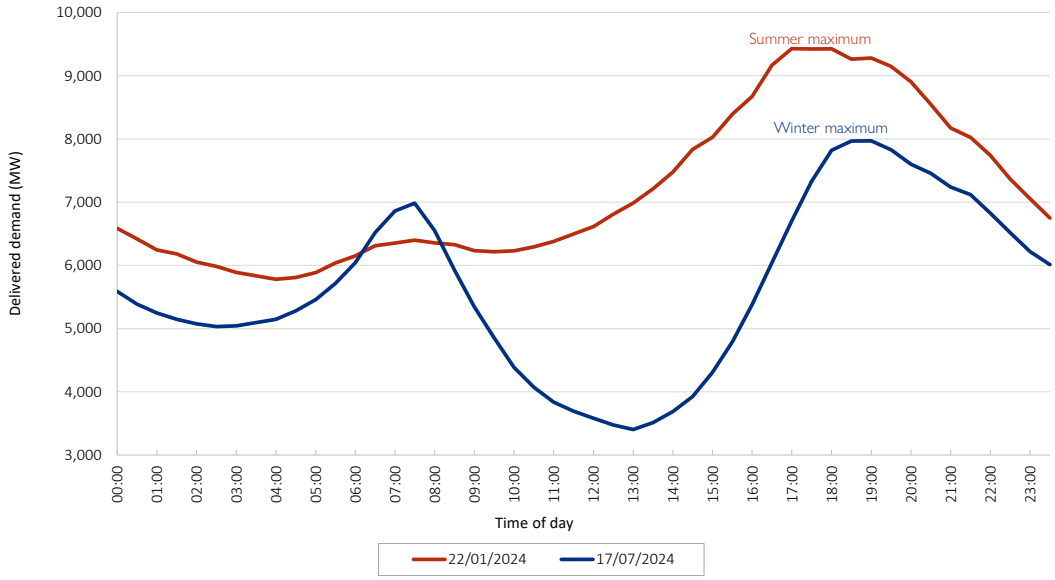
Table 3.23 State winter maximum native demand by zone (MW)

Winter	Far North	Ross	North West	North	Central West	Gladstone	Wide Bay	Surat	Bulli	South West	Moreton	Gold Coast	Total
Actuals													
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
2024	221	187	-	367	441	1,071	270	430	193	396	3,728	624	7,928
Forecasts													
2025	276	560	-	356	466	938	376	567	140	297	3,565	865	8,404
2026	283	565	-	365	478	956	388	540	140	302	3,950	930	8,899
2027	282	584	-	396	497	987	386	552	136	308	3,991	912	9,031
2028	297	605	-	410	524	1,227	386	566	141	311	3,958	935	9,360
2029	306	649	-	421	517	1,318	395	581	134	283	3,999	853	9,457
2030	302	643	-	424	548	1,687	413	570	138	335	4,053	890	10,005
2031	302	678	220	419	536	1,729	403	547	128	334	4,050	893	10,238
2032	306	667	220	403	534	1,946	410	517	132	344	4,017	877	10,373
2033	314	655	220	419	543	1,953	413	530	136	350	4,085	898	10,516
2034	311	649	220	426	552	2,010	420	528	130	352	4,110	953	10,663

3.6 Summer and winter maximum and annual minimum daily profiles

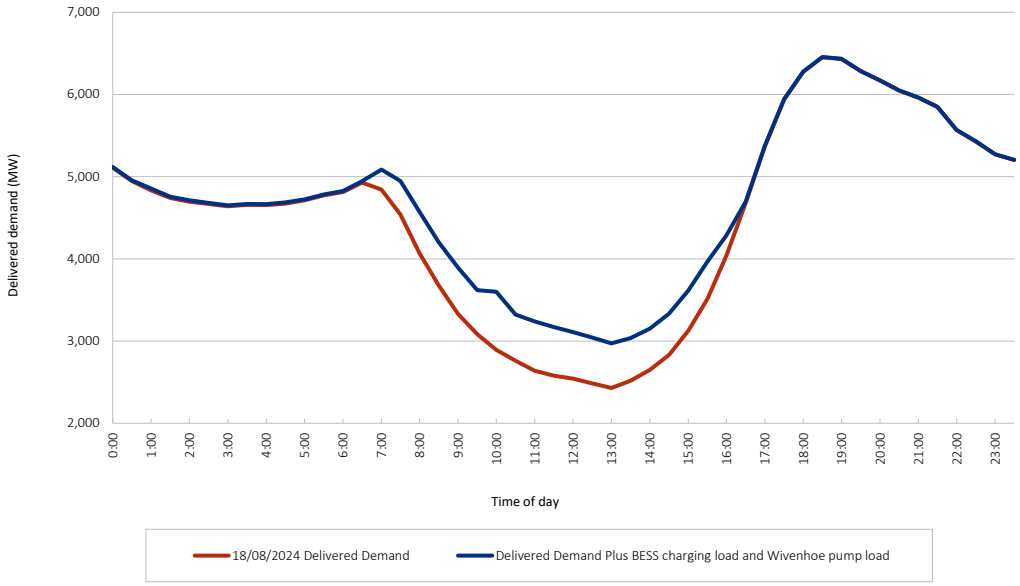
The daily load profiles (transmission delivered) for the Queensland region on the days of summer 2023/24 and winter 2024 maximum demands are shown in Figure 3.14.

Figure 3.14 Daily load profile of summer 2023/24 and winter 2024 maximum transmission delivered demand days



The 2024 annual minimum (transmission delivered) daily load profile for the Queensland region delivered demand plus BESS charging load and Wivenhoe pump load is shown in Figure 3.15.

Figure 3.15 Daily load profile of 2024 minimum transmission delivered day and minimum delivered demand plus BESS charging load and Wivenhoe pump load (1)



Note:

(1) Based on preliminary meter data up to 20 October 2024.

3.7 Annual load duration curves

The annual historical load duration curves for the Queensland region transmission delivered demand since 2019/20 is shown in Figure 3.16.

Figure 3.16 Historical transmission delivered load duration curve

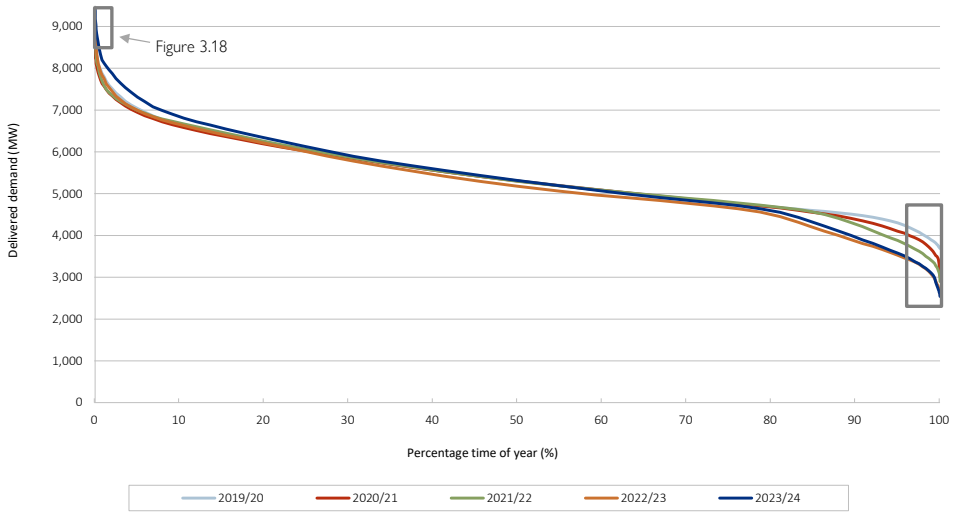


Figure 3.17 Historical transmission delivered load duration curves (95-100%)

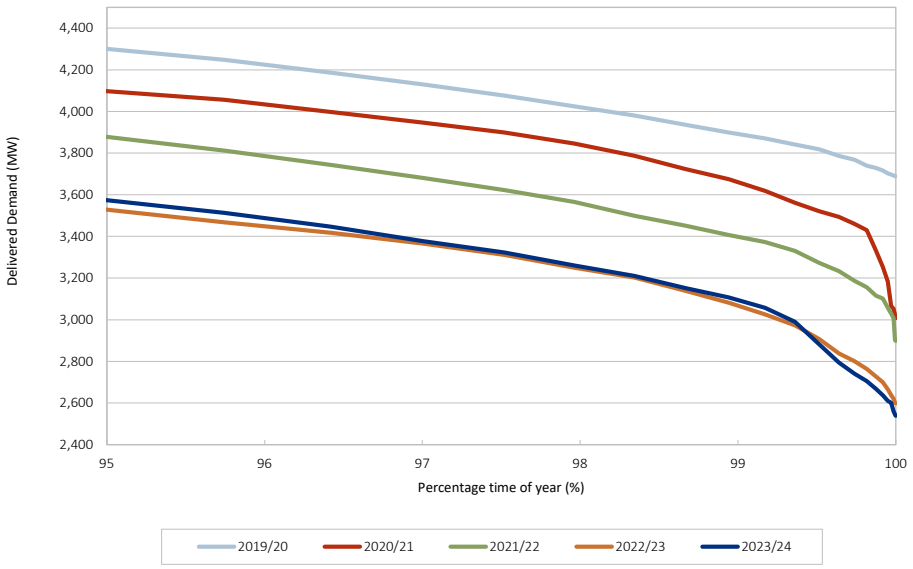


Figure 3.18 Historical transmission delivered load duration curves (0-0.5%)