2023-27
POWERLINK QUEENSLAND REVENUE PROPOSAL

Regulatory Information Notice Return – PUBLIC

Maximum Demand Forecasting Methodology

Contents

1.   Purpose

This document sets out our response to the requirements set out in schedule 1, Section 10 of the Regulatory Information Notice issued to Powerlink by the Australian Energy Regulatory under Division 4 of Part 3 of the National Electricity (Queensland) Law (the Reset RIN).

Section 10 of the Reset Regulatory Information Notice (RIN) requires Powerlink to provide a suite of information regarding the methodologies and models used in the preparation of the maximum demand forecasts on which our Revenue Proposal is based. Each of the specific requirements is addressed in the following sections.

2.   Demand Forecasting Methodology

2.1   Response to Section 10.1 of the Reset RIN

Provide and describe the methodology used to prepare the maximum demand forecasts.

Connection point forecasts have been sourced from Energy Queensland (EQ) and from Powerlink's direct-connect customers. These individual connection point forecasts are the basis for the non-coincident maximum demand forecasts set out in Table 5.4.1 of Workbook 1 – Forecast of the Reset RIN.

System coincident maximum demand forecasts have been sourced from Australian Energy Market Operator (AEMO) and are the 2020 Electricity Statement of Opportunities (ESOO) Central Scenario forecast. AEMO's demand forecasting methodology is available from the AEMO website[1].

AEMO's coincident maximum demand forecasts for Queensland includes an overall contribution to maximum demand from Powerlink's direct-connect customers. Individual direct-connect customer connection points proportion of this overall contribution to the forecast coincident maximum demand is based on their historical contributions. The balance is attributable to Energy Queensland and a factor is applied to this EQ demand for each connection points contribution to the demand forecast based on the observed diversity of that connection point demand in relation to coincident maximum demand.

2.2   Response to Section 10.2 of the Reset RIN

(a) *Provide the model(s) Powerlink used to forecast maximum demand*

Powerlink has adopted the AEMO 2020 ESOO Central Scenario forecast. This forecast and related materials are available on the AEMO website at:

https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-and-planning-data/nem-electricity-demand-forecasts

Powerlink does not maintain its own independent demand forecasting models.

(b) *Where Powerlink's approach to weather correction has changed, provide historically consistent weather corrected maximum demand data, per the format in Workbook 1 – Forecast, regulatory templates 3.4, and 5.4 using Powerlink's current approach. If this data is unavailable, explain why.*

Powerlink has not changed the approach to weather correction of connection point demand data from that which is applied in producing the annual Category Analysis (CA) RIN data. For DNSP connection points this information is sourced from Energy Queensland. The maximum demand for Powerlink's direct-connect customers is not materially dependent on weather.

Powerlink no longer maintains its own demand forecasting models and now adopts AEMO's demand forecasts for system total maximum demand, including for weather correction.

---

[1] Electricity Demand Forecasting Methodology Information Paper, Australian Energy Market Operator, August 2020

(c) Provide any supporting information or calculations that illustrate how information extracted from Powerlink's forecasting model(s) reconciles to, and explains any differences from, information provided in Workbook 1 – Forecast, regulatory templates 3.4 and 5.4.

Refer to section 2.1. The data provided for individual connection points in Table 5.4.1 summates to the corresponding system demand in Table 3.4.3 of the Reset RIN.

2.3 Response to Section 10.3 of the Reset RIN

For each of the methodologies provided and described in response to paragraph 10.1, and, where relevant, data requested under paragraph 10.2(b) and 10.2(c), explain or provide (as appropriate):

(a) the models used;

Refer to Section 2.2(a).

(b) a global (or top-down) and spatial (bottom-up) forecasting processes;

Each load connection point to the Powerlink transmission network is reported in Table 5.4.1 and the forecasts in this table summate to provide the system wide forecasts reported in Table 3.4.3.

(c) the inputs and assumptions used in the models (including in relation to economic growth, customer numbers and policy changes and provide any associated models or data relevant to justifying these inputs and assumptions);

The inputs and assumptions for the 2020 ESOO forecast are set out in AEMO's Electricity Demand Forecasting Methodology Information Paper[2].

The key inputs to the Energy Queensland connection point forecast are described in Powerlink's 2020 Transmission Annual Planning Report (TAPR), Appendix A, which is included as Appendix 5.02 of our Revenue Proposal.

(d) the weather correction methodology, how weather data has been used, and how Powerlink's approach to weather correction has changed over time;

Our approach to weather correction is set out in our Category Analysis Regulatory Information Notice, Basis of Preparation 2019/20[3].

(e) An outline of the treatment of block loads, transfers and switching within the forecasting process;

An outline of the treatment of these matters by both Energex and Ergon energy is provided in our 2020 TAPR, Appendix A, which is included as Appendix 5.02 of our Revenue Proposal.

(f) any appliance models, where used, or assumptions relating to average customer energy usage (by customer type);

The AEMO 2020 ESOO forecast includes specific consideration of appliance models and impacts on energy efficiency, as described in the Electricity Demand Forecasting Methodology Information Paper (August 2020).

---

[2] Forecasting Dend planning methodologies and guidelines, AEMO, https://www.aemo.com.au/energy-systems/electricity/national-electricity-market-nem/nem-forecasting-and-planning/forecasting-approach/forecasting-and-planning-guidelines.

[3] Powerlink network information – RIN responses, AER, https://www.aer.gov.au/networks-pipelines/performance-reporting/powerlink-network-information-rin-responses.

(g) *how the forecasting methodology used is consistent with, and takes into account, historical observations (where appropriate), including any calibration processes undertaken within the model (specifically whether the load forecast is matched against actual historical load on the system and substations);*

Refer to AEMO's Electricity Demand Forecasting Methodology Information Paper (August 2020) and Powerlink's 2020 TAPR, Appendix A.

(h) *how the resulting forecast data is consistent across forecasts provided for each connection point identified in Workbook 1 – Forecast, regulatory template 5.4 and system wide forecasts;*

Each maximum demand type for each connection point in Table 5.4.1 is summated to arrive at the corresponding system wide maximum demand in Table 3.4.3.

(i) *how the forecasts resulting from these methods and assumptions have been used in determining the following:*

    a. *capex forecasts; and*

    b. *operating and maintenance expenditure forecasts;*

The forecasts that result from these methods and assumptions have been used as the basis for the Planning Statements and Planning Reports that are included in the Project Packs submitted as supporting information for our capital expenditure forecasts with our Revenue Proposal.

The forecasts that result from these methods and assumptions have been used as input to calculating the rate of growth component of our operating expenditure forecast consistent with the Australian Energy Regulator's (AER) base-step-trend methodology[4].

(j) *whether Powerlink used the forecasting model(s) it used in the joint planning process for the purposes of its revenue proposal;*

The Energex and Ergon Energy forecasting models are generally used for joint planning. Also refer to Powerlink's Joint Planning Framework which is provided as supporting information to our Revenue Proposal.

(k) *whether Powerlink forecasts both coincident and non-coincident maximum demand at the connection point, or other nominated network elements, and how these forecasts reconcile with the system level forecasts (including how various assumptions that are allowed for at the system level relate to the network level forecasts);*

Refer to Section 2.1 as well as Appendix A in Powerlink's 2020 TAPR.

(l) *whether Powerlink records historic maximum demand in MW, MVA or both;*

Powerlink records historic maximum demand for both MW and MVAr and then calculates MVA.

(m) *the probability of exceedance that Powerlink uses in network planning;*

Refer to Powerlink's Asset Planning Criteria Framework provided as supporting information to our Revenue Proposal.

(n) *the contingency planning process, in particular the process used to assess high system demand;*

Refer to Powerlink's Asset Planning Criteria Framework provided as supporting information to our Revenue Proposal.

---

[4] Expenditure Forecasting Assessment Guideline for Electricity Transmission, Australian Energy Regulator, November 2013.

(o) how risk is managed across the network, particularly in relation to non-network solutions to peak demand events;

Refer to Powerlink's Asset Planning Criteria Framework provided as supporting information to our Revenue Proposal.

(p) whether and how the maximum demand forecasts underlying the revenue proposal reconcile with any demand information or related planning statements published by AEMO, as well as forecasts produced by any distribution network service providers connected to Powerlink's network;

Refer to Section 2.1.

(q) how the normal and emergency ratings are used in determining capacity for individual transmission connection points.

Refer to our Category Analysis Regulatory Information Notice, Basis of Preparation 2019/20.

2.4   Response to Section 10.4 of the Reset RIN

Provide:

(a) evidence that any independent verifier engaged by Powerlink has examined the reasonableness of the method, processes and assumptions in determining the forecasts and has sufficiently capable expertise in undertaking a verification of forecasts; and

(b) all documentation, analysis and models evidencing the results of the independent verification.

We have not engaged an independent verifier as we adopted AEMO's 2020 ESOO Central Scenario forecasts.