DEMAND FORECASTING METHODOLOGY

PAL ATT 2.02 – PUBLIC

2026–31 REGULATORY PROPOSAL

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1. Executive summary

Development of demand and consumption forecasts are a critical part of the ongoing planning of our networks that help us to provide safe, reliable, and affordable supply to our customers into the future.

This document provides an overview of our forecast development methodology, forecast scenarios, input data sources, and the tools and systems used to create our probabilistic demand forecasts.

In developing our forecasts for the 2026–31 regulatory period we have sought to continue our data-driven approach. Our network has almost 100 per cent smart meter coverage and a broad range of other data sets. This data allows us to create 'bottom up', asset specific, time series forecasts for the majority of our network, from our transmission connection points down to the distribution transformers that provide low voltage connections for residential customers.

We have been working with Blunomy since 2017 to leverage the specialist energy transition and data analytics capability of their forecasting tool known as the 'Vision' platform. [1] Through practical learnings and experience, the tool has been iteratively improved across our business since 2018. Vision is a data-driven platform, leveraging large data sets and AI to provide forecasting and planning insights for electricity networks. We currently use the demand forecasting module of the Vision platform to produce our probabilistic forecasts.

As the Vision platform in use today is fundamentally an independently developed product, Blunomy has developed a detailed 'Modelling Guideline' to help inform the AER on the operation for the system and how it processes our input data and defined scenarios to create forecasts. Blunomy's guideline has been provided as a confidential attachment to our regulatory submission.

We currently use a scenario-based approach for forecasting. A scenario-based approach attempts to manage uncertainty presented by the energy transition. While we use the Vision platform to undertake analysis to develop our forecast, we have optionality over the input data and scenarios used.

We have used scenarios from the AEMO Electricity Statement of Opportunities (ESOO) Inputs, Assumptions and Scenarios Report published in August 2024 to underpin our forecast for the 2026–31 regulatory proposal. This is the most up to date set of AEMO scenarios and inputs and we have integrated them into our planning processes. We use the 'Step Change' scenario as the basis for our forecasts given its continued industry standing as the most likely and credible scenario for future consumer energy usage.

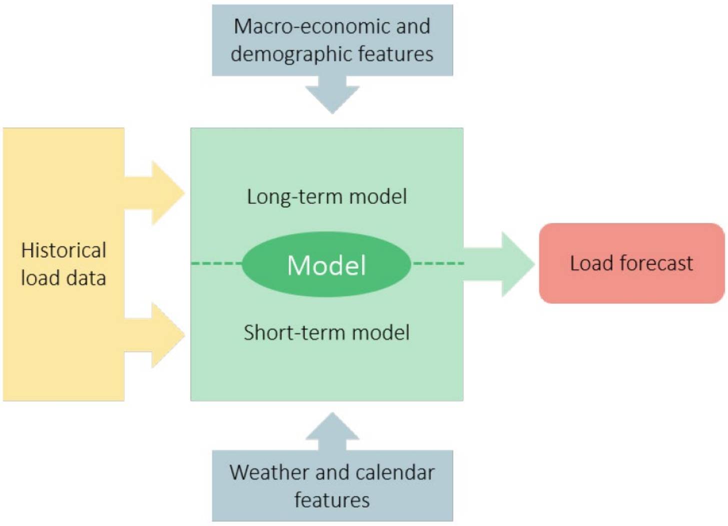
[1] Blunomy, *Vision platform.* Further information available here: https://vision-grid.com

2. Forecasting model outline

The demand forecasting model within the Vision platform forecasts customer maximum demand, minimum demand and energy consumption across the network at all levels from the distribution side of terminal stations all the way down to the distribution substation level.

Forecast modelling is undertaken for each scenario through a two-part short term and long term modelling combination. The short-term model, with a 30-minute temporal resolution, considers factors such as weather, seasonality and calendar impacts such as day of week and public holidays across the forecast period. The long-term model considers macro-economic and demographic impacts that drive year on year trending of peak demand and energy consumption. Both short-term and long-term modelling outputs are combined to create the final forecast and a high level diagrammatic view of this approach is shown in figure 1.

FIGURE 1 HIGH LEVEL MODEL STRUCTURE



Further information can be found in Blunomy's confidential modelling guideline.[2]

[2] PAL ATT 2.03 – Blunomy – Detailed demand forecasting methodology – Jan2025 – Confidential

3. AEMO forecasting model scenarios

We use scenarios to forecast across our network to manage inherent uncertainty through the energy transition.

We use AEMO's 'Inputs Assumptions and Scenarios Report' (IASR) as the basis for our forecasts as we consider it to be the most credible combination of inputs and assumptions available. The inherent assumptions that AEMO publishes, including uptake rates, usage profiles and macroeconomic factors are used to underpin our forecasts for the 2026–31 regulatory proposal.

Given the timing of our regulatory submission we have used the AEMO Electricity Statement of Opportunities (ESOO) IASR, published in August 2024, as the basis for our forecast scenarios. This is the most up to date set of AEMO scenarios and inputs that we are able to integrate into our planning processes to meet a January 2025 submission to the AER.

Our process has created forecasts using AEMO's Progressive Change, Step Change and Green Energy Exports scenarios, as defined in August 2024, for the purposes of assessment and sensitivity analysis.

The 'Step Change' scenario has continued to be identified by AEMO and industry as the most likely and credible option for future consumer energy use. As a result, we have adopted the Step Change scenario for our network planning assessments and expenditure forecasts.

4. Forecasting model inputs

As noted in section 3, we have aligned with AEMO's ESOO IASR from 2024 and have used AEMOs input data and our own network and metering data across our forecasting process. A description of the data we have used to underpin our forecasts is shown in table 1 below.

TABLE 1 FORECAST INPUT VARIABLES AND MAIN DATA SOURCES

INPUT VARIABLE	DATA SOURCE
Historical Energy Use	Internal – Wholesale Meter data, network SCADA data, power quality monitoring data, customer smart meter data
Network Topology	Internal – Current network topology and planned changes
Weather & Irradiance	ECMWF[3] – ERA5 Hourly Temperature dataset ECMWF – ERA5 irradiance dataset
Rooftop Solar Uptake	Internal – Existing connections & capacity AEMO – August 2024 IASR forecast uptakes
Storage Uptake	
Electric Vehicles	Victoria's Department of Transport – Historical vehicle registration snapshots AEMO – August 2024 IASR forecast uptakes
Electrification / Gas Transition	Victorian Gas Distribution Networks (AGN, MGN, AusNet) – Gas consumption Department of Energy, Environment and Climate Action, National Pollutant Inventory emissions AEMO – August 2024 IASR forecasts
Energy Efficiency	AEMO – August 2024 IASR efficiency forecast
Economic Growth	AEMO – August 2024 IASR Victorian GSP forecast
Population Growth	AEMO – August 2024 IASR Victorian population forecast Victoria in Future 2023 population projection
Energy Consumption	Department of Climate Change, Energy, the Environment and Water – 2023 Australian Energy Update

[3] European Centre for Medium-Range Weather Forecasts (ECMWF) https://www.ecmwf.int

5. Forecasting model outputs

The model generates a forecast demand scenario as a 30-minute timeseries over a forecast horizon of 25 years. The forecast is modelled across a representative set of weather conditions and integrates the impact of Customer Energy Resources (solar PV, batteries, EVs), expected policy impacts and behavioural change towards broader electrification trends.

Forecasting the complete demand timeseries provides a comprehensive forecast dataset that can be used in other models and processes across the business such as our LV power flow modelling tool, Energy Workbench.

Demand forecasting outputs include maximum and minimum demand for each asset across our network for the forecast horizon with three probability of exceedance (POE) bands. These probability of exceedance bands create forecasts based on the likelihood of weather events that significantly drive demand. Forecasts for a one in 10-year weather year (POE10), a one in 2-year weather year (POE 50), and a 9 in 10-year weather year (POE90).

The foundation for forecast demand outputs is the existing demand of our customers within our network.

5.1 Adding future change drivers

Six main forecast factors are then added to our forecasts as explicit future 'building blocks' with their own forecast data series over the forecast period. This is because their effects are not captured in the existing demand data of our customers.

These forecasts cover:

- rooftop solar installed capacity and export
- electric vehicle numbers and expected energy use
- installed storage capacity and contribution to import / export
- electrification of gas and other fuels
- export from existing or committed large renewable generators
- committed and planned network changes: Changes to our networks in the form of planned upgrades, transfers between assets, or new contracted customer connections.

Forecast outputs are reviewed by our engineers prior to being released for use across the business.

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