Australian Government
Department of Climate Change, Energy, the Environment and Water

Electricity Demand Forecasting Methodology consultation submission

The Department of Climate Change, Energy, the Environment and Water (DCCEEW) appreciates the opportunity to input on the first stage of the Electricity Demand Forecasting Methodology review, and considers the methodology generally remains fit-for-purpose.

AEMO's component-based forecasting approach

1. Does a component-based forecasting approach continue to provide a fit-for-purpose method that reflects best practice for electricity demand forecasting?

DCCEEW supports AEMO's component-based approach to forecasting.

2. Are the customer segments appropriate aggregations of electricity consumers, and do they provide sufficient capability to apply aggregate methodologies for each in order to forecast each cohort's future electricity consumption?

DCCEEW supports efforts to provide greater visibility of customer segments that are likely to have significant energy demand implications in a decarbonising economy. This could be particularly useful for segments with loads that may vary significantly between scenarios or have materially different levels of demand flexibility.

Some disaggregation, where appropriate, could help to refine electrification forecasts and identify potential for energy efficiency and demand flexibility, for example. Specifically, DCCEEW supports separating data centres from the large industrial load (LIL) and Business Mass Market (BMM) segments to better prepare for their growth across the National Electricity Market (NEM).

3. Do you have any comments on the benefits of AEMO developing specific sub-regional consumption and demand forecasts? Are there specific inputs and assumptions that are more likely to be important to understand on a spatial level more granular than the NEM region, or would a simpler allocation approach of the regional forecasts provide sufficient insight to inform sub-regional forecasting?

DCCEEW supports further development of sub-regional consumption and demand forecasts. Governments, industry and network service providers are increasingly calling for more granular information on likely future energy demand, including to assist the development of place-based policy and programs.

DCCEEW considers that a bottom-up approach to forecasting load from priority individual sub-regions would likely yield more accurate, useful results than distributing regional forecasts between the sub-regions. Specific inputs could include potential electrification of industrial facilities, for example, building on AEMO's current data gathering activities (e.g. the LIL survey and Standing Information Requests).

DCCEEW also notes recent work to develop sectoral energy consumption datasets and recommends this be used to support improvements within the BMM regarding spatial/sectoral energy consumption and reflected in publications, where appropriate. DCCEEW would also like AEMO to publish its allocation of demand to sub-regions for each customer segment.

Business annual consumption

4. Do you have any views on whether the existing commitment criteria for LIL inclusion in the single scenario forecast should be expanded to include a similar level of certainty as the 'anticipated' generator developments?

The existing commitment criteria for LIL inclusion are useful for some purposes, such as in modelling the baseline scenario (current policies and implemented measures) for Australia's annual electricity emissions projections. DCCEEW supports retaining, at a minimum, visibility (e.g. through a separate series) of LILs that are considered committed. However, DCCEEW also supports expanding the criteria, potentially through the scenario and associated assumption selection process, to include a similar level of certainty as 'anticipated' generator developments.

Such expansion could facilitate understanding of intentions to electrify, particularly demand further out in the forecast horizon, noting that LIL electrification is a key lever for decarbonisation and could result in material changes in demand. Greater visibility of 'anticipated' demand, including identification of loads that are likely to ramp up over several years, would provide policy makers with invaluable insights to better understand the pace, scale and location of electrification and associated infrastructure requirements. An expansion to the criteria for LIL inclusion would also reduce the risk of underestimating future LIL demand from potential new green industries.

Close consultation with network service providers will be crucial in designing an expanded approach.

5. Do you have any comments on if the forecasting approach should apply criteria differently across the short and long term?

DCCEEW considers different criteria may be appropriate to reflect the varying levels of commitment and certainty across short- and long-term timeframes. Long-term forecasting would certainly benefit, in DCCEEW's view, from an expansion of the commitment criteria to accommodate more nuance around loads with lower commitment levels, while stricter criteria may be appropriate for short-term forecasting to provide certainty to stakeholders on likely material changes.

DCCEEW is aware of stakeholder support (including from some network service providers) for such a change of approach to long-term forecasting. This is based on concerns that current models may fail to accurately quantify future load growth, risking delays to relevant network augmentation/ investment and regulatory processes.

However, DCCEEW also supports consistency between the primary short and long-term demand forecasts (e.g. ESOO Central and the associated ISP 'most-likely' scenario) to ensure a unified approach to demand across the short and long-term. Changes in criteria that create divergence between these forecasts could be best explored through alternative scenarios or sensitivities.

Hydrogen sector consumption forecasting

6. Are there any other changes that AEMO should consider to the methodology for developing hydrogen forecasts, beyond expanding its use into other green commodities?

AEMO may wish to consider changes to the way in which it quantifies electricity demand due to hydrogen production. Demand for hydrogen production is currently divided between electrolysers that are flexible as to location and those which are bound to a particular location. While the former is considered a dispatchable source, capable of providing future demand flexibility opportunities, the

current forecasting approach does not specify the quantity of demand that can be utilised. DCCEEW recommends that AEMO publish forecasts that quantify demand flexibility from this source.

DCCEEW also recommends that future forecasting provide:

- more explicit detail of changes in the share of on/off grid production
- the degree to which production is expected to be flexible, and what it will be used for (export/domestic industry) over time under different scenarios
- separate forecasts for hydrogen and green commodities.

Business mass market consumption forecasting

7. Should AEMO create a separate customer segmentation for data centres, removing them from the LIL and BMM segments? Would the preferred approach apply a survey-driven forecast, observations from international trends, or another technique?

DCCEEW would support a trial to investigate the separation of data centres under the Business header, alongside LILs, hydrogen, LNG, business EVs and BMM. DCCEEW recognises that there is significant stakeholder interest in, and varied commentary on, the scale and expected growth of this demand segment. These loads have distinctive demand characteristics, including relatively flat demand and demand that is potentially higher in summer given cooling requirements, often with backup generation onsite.

It would help to better understand data centre demand, separate from demand relevant to electrification trends and the impacts of the proposed 2025 National Construction Code on new building energy consumption, for example. It would also help for data and analysis around a future data centre segment to quantify any potential demand flexibility, high/low temperature day demand profiles, and the proportion of facilities likely to connect to the distribution and transmission networks.

8. Are there other sectors which should have their own category within the BMM model?

DCCEEW has not identified additional sectors that require their own category. However, AEMO may wish to consider providing more detail in its publications to explain how the BMM model separates/aggregates sectors. AEMO could draw on the sectoral energy consumption work undertaken for DCCEEW to better reflect differences in the way particular sectors are experiencing the energy transition.

Residential annual consumption

10. Should AEMO's approach to the solar rebound effect take into account differences in the impacts on base load, cooling load and heating load? What data sources exist that may help to estimate these impacts?

DCCEEW would support AEMO taking such an approach to the solar rebound effect, as there is now some robust evidence showing that this can have a material impact on household energy demand (for example, C4Net's work on solar homes for the Victorian Government).

Half-hourly demand traces

12. Do you have any comments on AEMO's potential improvements to developing demand traces?

DCCEEW would support the differentiation of large industrial loads from other components. It is also currently unclear if energy performance improvements (e.g. energy efficiency and demand flexibility) are factored into the demand traces. There may be potential to address this through the inclusion of relevant cross-references to other AEMO publications (such as the IASR).

Demand flexibility, including both load shapes and price responsiveness, is likely to play an increasingly important role in helping to balance the grid as coal generation is replaced with intermittent renewable generation. As a result, loads may become increasingly shaped for certain segments, particularly if new electrification investments build in the ability to flex and market structures evolve to incentivise flexibility. However, DCCEEW understands that under the current methodology, future business electrification loads are assumed to mirror current loads and remain flat across the day throughout the forecast horizon.

Given the range of possible outcomes for the shape of future loads, and the potentially significant impact on the generation, transmission and network infrastructure required to be built, DCCEEW would support a greater focus on daily demand traces, including sensitivity analysis within the ISP.

DCCEEW would also support the consideration of a range of weather years, including consideration of how weather patterns might change in the future.

Rooftop PV and energy storage

16. Do stakeholders consider that the current collection of methodologies, published by AEMO and/or its consultants, provide sufficient transparency on its approach to forecasting PV, battery and VPP uptake and operation?

DCCEEW suggests the EDFM should include expectations for the annual replacement rate of rooftop PV, noting that this information was included in earlier consultation reports (e.g. CSIRO's 2022 'Small-scale solar PV and battery projections' and Green Energy Market's 2021 and 2022 'Projections for distributed energy resources').

Other feedback

In the updated methodology, it may be beneficial for AEMO to explain if/how the following factors have been considered in developing the demand forecasts (including by way of cross-references to other AEMO publications):

- energy system constraints (e.g. grid capacity)
- planning/approval considerations (e.g. data centres with material behind-the-meter generation)
- international dynamics (e.g. carbon tariffs).