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**Report:** **Response to:**  
**Electricity Demand Forecasting  
Methodology - Consultation Paper**  
**Published 26<sup>th</sup> July 2024**

**Submission Date:** August 23<sup>rd</sup> 2024

**2026 ISP Consumer Panel**

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## Electricity Demand Forecasting Methodology Consultation Paper.

The 2026 ISP Consumer Panel is responding to this Consultation Paper because of its direct relevance to the 2026 ISP process, In particular, the Panel is aware of the significance of a range of forecasts that are central to the 2025 IASR process.

The Panel also recognises that the proposed forecasting methodology has relevance to other AEMO reliability and planning reports such as the MT PASA and the ES00.

AEMO's approach to the Methodology must meet the requirements set out in the relevant AER Guidelines, including the Forecasting Best Practice Guideline (FBPG) and the Reliability Forecast Guideline (RFG). The Panel will further comment on these requirements during subsequent stages of the Methodology review.

### ISP Review

The Energy and Climate Change Ministerial Council (ECMC) released its response to the Review of the Integrated System Plan<sup>1</sup> on 1<sup>st</sup> March 2024. The ECMC' response set out 12 actions for AEMO to address in the 2026 ISP:

- I. Integrating gas into the ISP
- II. Enhancing demand forecasting
- III. Better data on industrial and consumer electrification
- IV. Optimising for the demand side
- V. Coal fired generation shut down scenarios
- VI. Improving locational information
- VII. Enhanced analysis of system security
- VIII. Jurisdictional policy transparency
- IX. Clarifying policy inclusions
- X. Improving the accessibility of the ISP
- XI. Incorporating community sentiment
- XII. Additional planning inputs

The first 4 of these actions are specifically related to the forecasting methodology,. The demand forecasting methodology will need to address these 4 actions. The Panel's opinion is that a number of the other actions from the ECMC are in line with electricity demand forecasting methodology and so don't require changes to the methodology, although they may require enhanced data inputs into the modelling.

The following action, beyond the initial four, may require review and possible change through the forecasting methodology.

- *carrying out additional analysis of future gas demand and gas pricing*
- *developing projections about the future utilisation of gas infrastructure*
- *collating information about dates of expected gas pipeline or GPG closure or conversion, such as from natural gas to hydrogen.*
- *updating medium- and long-term projections of gas generator fuel costs, including hydrogen and biomethane, to reflect expectations about gas market developments*
- *Undertaking targeted stakeholder engagement to enhance assumptions underpinning consumer energy resources (CER) and distributed resources projections*

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<sup>1</sup> [ecmc-response-to-isp-review.pdf \(energy.gov.au\)](https://www.energy.gov.au/ecmc-response-to-isp-review.pdf)

*in the ISP. The assumptions should reflect a comprehensive view of initiatives affecting CER and distributed resources uptake and evaluate the implications for operational demand.*

- *Developing a framework, methodology and guidance material to support DNSPs and jurisdictions to develop projections and undertake analysis in a consistent manner to support the ISP's development.*
- *The System Planning Working Group and AEMO will work with the relevant stakeholders, including DNSPs, to develop a suitable approach to trade off the cost of unlocking increasing tranches of orchestrated CER and distributed resources against other investment options for use in the earliest ISP practicable.*

Considerations of “*medium and long term projections of gas generation fuel costs, including hydrogen and biomethane*” will require changes to the forecasting methodology with specific attention being given to impacts on the contribution of gas to electricity generation and use.

The Panel also anticipates that the actions pertaining to guidance to “*support DNSPs and jurisdictions to develop projections and undertake analysis in a consistent manner to support the ISP's development,*” will require some change to the forecasting methodology at least to the extent of clearly describing AEMO's approach to engagement with DNSP's and the roles of both parties in this new area.

If particular interest to the Panel is the forecasting methodology revisions to the approach to undertake “*targeted stakeholder engagement to enhance assumptions underpinning consumer energy resources (CER) and distributed resources projections in the ISP,*” and also to the approaches to *trade off the cost of unlocking increasing tranches of orchestrated CER and distributed resources against other investment options.*”

The orchestration of CER was a theme that was actively pursued by the 2024 Panel and achieving effective orchestration of CER continues to be of high interest for the 2026 Panel. We think that the methodology will need to include best estimates of the impact of orchestration on future supply forecasts as well as demand forecasts. We recognise that some of the variability in, and uncertainty of modelling orchestration, will likely also be part of the ISP methodology review with ‘sensitivities’ expected to play a larger part of methodology considerations. We think that the 2026 ISP modelling is likely to benefit from testing the sensitivity of the ISP outputs (i.e the CDPs and the ODP) to different levels of orchestration, and to do this prior to the publication of the Draft ISP.

The following comments provide brief responses to most of the questions posed in the Demand Forecasting Methodology Consultation Paper and shown in *italics*. The numbers used are the same used in the consultation paper.

#### Customer segments within AEMO's forecasting methodology

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

The Panel broadly agrees with AEMO's position in the Consultation Paper. We consider that the component based forecasting approach remains generally ‘fit for purpose’. In addition, we note the importance of giving some consideration to any interactions between the drivers, e.g., the link between economic growth and the forecasts of the number of EV's, and industrial demand.

The forecasting principle, “*demand drivers, uncertainty and risks*”. will require a greater focus on a detailed update of the risks and uncertainty that customers are or are likely to experience with the

transition to low carbon electricity supply underway and gathering momentum. The Panel believes that a realistic narrative about the most likely trajectories of prices over the near to medium future needs to be told. This includes recognising that customers are likely to continue to pay more from year to year for their energy needs, including for electricity. The Panel opines that net energy costs are likely to fall in the long term, it is unrealistic to suggest falling real electricity prices in the near future, as unpopular as this narrative will be with some stakeholders, including policy makers.

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?*

The Panel does not consider that a single segment of “residential consumers” for forecasting remains reasonable. A significant number of residential customers are able to invest in CER while many are unable to, mainly for cost reasons or living in rental homes/apartments. Also, some lower income mortgagees are cash strapped. Some residential properties are also unsuitable for PV, the main CER asset. The very different demand profiles for households with CER compared to those without CER access means that, we believe, there should be two household customer segments: Households with CER and households without CER.

AEMO might also want to consider two additional segments, being mid- to large-scale batteries and data centres. We discuss the latter segment in response to Q 7. With respect to mid-large scale ‘market scheduled’ batteries, we expect their number to increase particularly if this type of batteries become an increasingly utilised part of the distribution network and therefore to the new requirements of the ISP review report. At this point in time, however, we do not appear to have a methodology for specifically identifying the demand and supply characteristics of this particular sector.

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?*

The Panel supports forecasting with more granular special forecasts, compared with using NEM regions. We note that AEMO already produces some sub-regional forecasts.

The Panel agrees that the energy transition will not occur uniformly within NEM regions, including that Renewable Energy Zones will all be different in structure, network connections and local energy supply impact to each other, Consequently our opinion is that more granular spatial forecasts will provide greater accuracy for modelling and will enhance the ability to understand the pro-s and cons of various ISP candidate development paths (CDP's).

We suggest that some further investigation may be useful when considering this issue of regional forecasts. For example, Victoria is currently one NEM region. Arguably, it should be two, i.e., (i) Metropolitan Melbourne, and (ii) Regional Victoria - Metropolitan Melbourne is highly urbanised. In contrast, Regional Victoria is influenced by agricultural production and processing and therefore may have a very different demand profile and growth potential than the Metropolitan Melbourne region. It would be useful for AEMO to further consider this matter as part of its review.

The Panel does, however, recognise AEMO's point that the more regions there are, the greater the complexity of the ISP modelling process, i.e., there is a trade-off between more accurate forecasts

and more complex modelling, the latter also potentially making the interpretation of the modelling outputs more difficult. Consideration therefore needs to be given to the extent to which sub-regional forecasts will assist in the overall accuracy and usability of the ISP/ESOO/MT PASA reports, given this additional complexity.

#### 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 Panel agrees that, in principle the LIL demand forecast should have a similar level of certainty (or uncertainty) around the criteria for accepting proposed LIL developments that has recently been applied to the anticipated generation development. However, there is a history of industry surveys of LIL customers over or understating their business expansion plans.

We suggest therefore that there should be a level of transparency about how uncertain some plans (and forecasts) are, and the potential to disaggregate the forecasts according to firstly the existing criteria, and secondly, any new criteria – at least until the level of accuracy of forecasts that apply more lenient criteria is better understood.

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

Industrial sectors change over time as innovation occurs and new products and services emerge while others decline. The capacity of AEMO to adjust forecasting in line with high probability changes between the shorter and longer term is sensible.

We should expect short term forecasts to be more accurate and it is important that they are when/if they are used for reliability planning decisions (RERT etc). In the longer term there should be scope to use broader criteria but there should also be transparency about the process, the different levels of accuracy and the ability to disaggregate, consistent with our comments in response to question 4.

#### Hydrogen Sector Consumption forecasts.

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?*

The 2024 ISP illustrated the significant impact on transmission planning and investment that the hydrogen forecast can have on the proposed CDPs and the ODP. For example, significantly more transmission was required in the NEM post 2030 under the 'Green Energy Export' scenario in the 2024 ISP.

Depending on the quality and reliability of the data available to AEMO, the Panel supports AEMO's proposal to include green commodities including steel, iron, ammonia, and aluminium as part of the hydrogen forecast. These will form part of the longer-term forecasts and will include a higher level of uncertainty especially given the realistic costs of such processes is still unclear. In this case, as the potential for the forecast of hydrogen demand to range from small (limited and/or late uptake) to

very large is significant, AEMO should provide forecasts for a range of demand scenarios for domestic green commodity manufacturing.

AEMO will also need to explain how the forecast modelling will distinguish between genuine green (i.e, renewable based) and semi- or non-green hydrogen production in the medium to long term forecasts.

AEMO also needs to distinguish between its forecasts of those developments impacting on the 'public'/open access transmission/distribution systems, and those developments impacting only on private transmission/distribution networks (e.g., green hydrogen where the manufacturing plant and the associated infrastructure supporting the delivery of renewable energy to the manufacturing site is privately owned and is clearly distinct from the general network).

The Panel notes and supports AEMO's comment that the ISP methodology will further review the assumptions on hydrogen storage. We are concerned, however, that AEMO does not appear to distinguish in the Consultation Paper between the hydrogen export market and the hydrogen domestic market. In our view this is an important distinction that should be considered in the revised methodology.

It is appropriate that AEMO monitor developments in the use of hydrogen for future electricity demand forecasting, however currently we regard hydrogen impacts on electricity demand to be likely to be modest, with most plans for proposed hydrogen electrolyser developments in 'hydrogen hubs<sup>2</sup>,' including associated new renewable generation capacity, so are not likely to be adding significant additional load to the NEM/SWIS networks.

#### LNG consumption forecasting

AEMO indicates it is satisfied with its current forecasting approach to forecasting consumption (p 11) . While we have not considered the details of this approach, we do highlight the need to consider the changing profile of both supply and demand for LNG over time, e.g., the availability of coal-seam gas in Queensland through to 2040 and beyond.

#### Business mass market (BMM) 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?*

Data Centre Magazine<sup>3</sup> reports (February 2024) that Australia ranks no 7 in terms of global listing of data centre numbers, with 306 data centres, close to France (314) and Canada (335). The magazine reports:

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<sup>2</sup> The Panel understands that hydrogen focused projects that have been announced by State Governments are: Pilbara and Kwinana in WA, Hunter in NSW, Bell Bay in Tasmania, Gladstone in Queensland and Upper Spencer Gulf in SA.

<sup>3</sup> [Top 10: Countries with the Most Data Centres | Data Centre Magazine](#)

*“Australia is working to enhance its data centre developments, with Statista projecting that the data centre market will reach US\$5.01bn in revenue in 2024. It is also expected that Australian data centres will reach 2.67 thousand MW in 2024, growing at a CAGR of 3.60% to reach 3.18 thousand MW by 2029.”*

The Panel is satisfied that substantial new load from data centres is likely, including in the next 2-5 years. Obtaining best estimates of (moderately) likely load is important for system planning, including the ISP. The Panel agrees that it is sensible to separate out forecasts for data centres from the LIL and BMM (business mass market) sector forecasts.

There is an opportunity to work closely with data centre proponents, known and potential, to seek best possible estimates of load and location of that load. Again, AEMO’s proposed survey methodology for forecasting this sector will need to address the reliability of such surveys – who should be surveyed, and how do we address the questions around overseas control of these centres – does this affect the reliability of the forecasts?

The Panel also asks if there are other checks that can be introduced? For example, test survey proposals against criteria such as the strength of the existing and necessary fibre connections in the area and the presence and density of relevant high data using customer in the proposed location(s) (such as business/research parks).

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

The Panel posits that food processing may warrant their own category in the BMM. Recognising our limited experience on this topic we are not aware of other potential sectors.

Residential Annual Consumption

*9. Do you think AEMO should be considering any other external drivers of energy consumption when developing its residential consumption forecasts?*

The “process flow” diagram, figure 2 from the Consultation Paper, for residential consumption forecasts included the major drivers likely to increase residential demand, including electric vehicles (EVs) which are most likely to have the most significant impact. Transition from gas is also covered in heating load forecasts, as this is the main application of gas that will be electrified, assuming that water heating is included in heating load.

Other external drivers of residential consumption may include changes to demography and building types, for example, every major city is looking to increase density in areas close to transport hubs and/or city centres. This (currently) limits opportunity for growth in PVs/EVs and CER coordination. On the other hand, the average size of separate dwellings appears to be increasing significantly, even though housing block sizes are becoming smaller, requiring more heating and cooling despite advances in energy efficiency opportunities.

An aspect of residential consumption that is less evident in the current approach is measures that can reduce residential consumption, including energy efficiency and impact on the roll out of smart meters.

In releasing the smart meter rule change<sup>4</sup> on 4<sup>th</sup> April this year, AEMC Chair, Anna Collyer said:

*“A number of Australians are already using smart meters to cut power bills, from those who have resources such as rooftop solar, to customers without solar who may be using smart meters to access cheaper tariffs,”*

We understand that the potential for smart meters to be a tool to help households reduce energy bills by reducing electricity use was a key factor in mandating a roll out of smart meters for all residential customers by 2030, maybe smart meter roll out impacts, direct and indirect, is worth considering in the residential consumption model?

Panel members hope that energy efficiency measures, particularly for housing, will also help residential customers to reduce electricity demand. However, we see little real appetite from governments or property developers to seriously improve housing energy efficiency in the way that appliance energy efficiency has improved over the last couple of decades.

Perhaps there is value in also considering the impacts of embedded networks and apartment living, on average household load?

*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?*

‘Solar rebound’ represents a large assumed load increase tied to the installation of solar PV, however, the Panel observes that the evidence base for solar rebound is limited and, to the best of our knowledge, has not been reviewed recently, which is of concern given the impact on forecasts.

We opine that insufficient regard seems to have been given to how much new PV capacity is replacing or augmenting existing PV systems (which presumably would not result in new solar rebound load increases, or at least as much SR load increase).

There appears to be a risk of double counting other load increases with SR, especially for electrification of gas and transport.

The Panel would expect the interaction between household batteries and solar rebound to be complicated and increasingly pertinent. We also understand that some people go the other way” - installing solar leads to them making efficiency investments and behaviour changes rather than increasing consumption. There is a question as to how this is taken into account?

There is also a question about the extent to which the same solar rebound assumptions can be used for apartments/strata and businesses?

The Panel proposes that AEMO prioritises further research to address these matters and provide more contemporaneous, evidence-based and appropriately nuanced values for solar rebound.

#### Small non-scheduled generation, losses and auxiliary loads

*11. What data sources can stakeholders recommend that provide additional visibility or insights on non-scheduled generators?*

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<sup>4</sup> [AEMC moves to accelerate smart meter rollout for Australians | AEMC](#)



With reference to AEMO's comments on transmission losses (p 15), AEMO correctly identifies that changes to sources of generation will lead to changes in flow paths including impacting on the volume of energy transmitted through existing transmission flow paths. This is a change that is likely to affect transmission losses across the system.

#### Maximum and minimum demand

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

The Panel supports all three of AEMO's suggested improvements, namely:

- Develop synthetic weather traces
- Proposal to scale LIL and non-LIL separately
- Improve trace scaling algorithm to maintain actual weather occurring the reference year – and that this may include a synthetic year. We also agree with AEMO re scaling across the whole year, not just min and max

#### Weather and Climate

*13. Should AEMO continue to use weather data back to the year 2000 when determining the median weather standard? If not, what time period do you consider appropriate?*

The Panel supports further analysis of the weather data. There is some evidence that the pace of change on the impacts of climate change on weather (temperature, wind, rain intensity, water temperature etc) has accelerated over the last two decades and adopting a median of weather data for the last two decades may not be appropriate for forecasting future demand.

This is a testable hypothesis, by estimating the median of different segments of the data, e.g., at the simplest level, compare the median of 2000-2010, 2005-2015, 2010-2020, 2015 – 2025, with the median of the whole 25-year period (we note this same type of analysis could be conducted in more detail if appropriate).

We would also support whatever advice that the Bureau of Meteorology gives in response to this question.

*14. Are the weather variables (average 30-minute temperature compared to critical temperatures) used in AEMO's weather standards still appropriate?*

*15. Are the adjustments for the impact of climate change on consumption and demand appropriate? If not, how might they be improved?*

Our response to question 13 above also applies to question 15. At this stage we have no comment on question 14 but are interested in any further analysis of this.

#### 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?*

The Panel has expressed concerns with the current CER forecasts, most particularly, with the forecast of both the level and the rate of uptake of coordinated CER. This concern also applies to the forecasts of VPP developments and DM for large customers. We are aware that DQ is leading an extensive program of research and policy development on CER and CER coordination, as are a number of other organisations.

We would expect AEMO to build on the current research and policy developments, and if any gaps are identified, to progress investigation of those rather than initiate a whole new assessment.

### Electric Vehicles

*17. Do you support AEMO's proposal to remove specific references to the types of charging behaviours adopted in its EV forecast methodology and instead include these in the IASR?*

As AEMO suggests, the EV market is evolving in terms of policy support, technology developments, distribution and type of charging facilities, and who and how consumers use EVs. We note the current growth in hybrids versus full EVs and request AEMO to include these developments in its forecasting methodology.

Given the forecasting methodology is only revised every 4 years, it is appropriate for AEMO to remove specific references in the Methodology report. As the IASR is updated every 2 years, we agree this is the appropriate place to capture the more detailed and specific aspects of this complex market.

EV charging behaviour will be important in its impact on load factor and the panel is comfortable with this topic being considered in the draft (and final) IASR

### Connections and update of electric appliances

*18. Can you suggest data sources that would assist AEMO's investigation of the impact of embedded networks on consumption forecasts*

At this stage, the Panel has no response to this specific question, although we assume that the AER maintains a data base of approvals for embedded network proposals.

However, we recognise that embedded networks are a growing segment of both the business and residential markets and we support further investigation of this.