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Re: Draft 2023 Inputs, Assumptions and Scenarios Report

Dear Andrew

The Energy Efficiency Council (EEC) thanks the Australian Energy Market Operator (AEMO) for the opportunity to comment on the *Draft 2023 Inputs, Assumptions and Scenarios Report*. The EEC is the peak non-government organisation for managing how energy is used, including energy efficiency, load shaping and demand response. For simplicity, these are collectively referred to as 'energy management' in this submission.

This submission makes five points:

- Energy management can reduce greenhouse gas emissions and reduce the time and cost of developing a reliable renewable electricity system;
- Energy management and electrification are inter-related;
- The level of improvement in energy management in the period 2023 to 2050 will be strongly impacted by both government policy and energy market reforms;
- The EEC recommends that AEMO undertake bottom-up analysis to determine the potential for energy management improvement in the period 2023-2050; and
- The EEC recommends that AEMO should use 'energy management' as a sensitivity analysis on all scenarios.

Energy management can deliver a renewable grid faster and more affordably

Reducing demand at key times, such as reducing the amount of energy required for residential heating in winter, can dramatically lower the investment needed in generation, storage and networks. An energy system dominated by variable renewables will inevitably necessitate excess generation for much of the year. However, the level of required investment in the electricity system is determined by demand during key points of the year, when supply is at risk of being lower than demand. Minimising demand during these periods will result in a demand profile that is better matched to generation output, resulting in better utilisation of generation and lower costs.

Commented [LM1]: Original formulation could be read as conservation.

Given that changes in energy management will have a profound impact on electricity demand, electricity market forecasts need to include transparent assumptions about these changes. The EEC applauds AEMO for the substantial effort that it has undertaken to include changes in energy management in its forecasting, and we look forward to ongoing engagement with AEMO as it finalises its inputs, assumptions and scenarios.

Energy management and electrification are inter-related

The key technologies involved in electrifying buildings and transport will generally deliver substantial increases in energy efficiency. For example, heat pump water heaters are typically at least three times as energy efficient as their gas-fired equivalents.

However, the efficiency and electricity demand associated with electrification can vary dramatically. For example, if an existing home with gas heating is retrofitted with efficient

heat pumps, draught-proofing and ceiling insulation, the home's annual electricity consumption and peak demand would be significantly lower than if it is electrified with just an inefficient electric heating system. The EEC requests that AEMO consider the close relationship between electrification and energy management in how it both undertakes and frames its forecasting.

Policy and markets strongly impact energy management

It is not clear from the published documents how CSIRO and ClimateWorks Centre calculated the amounts of energy efficiency improvement that occur in the four scenarios. While energy management is influenced by energy prices, it is also strongly influenced by other barriers, and policies that governments introduce to address those barriers. For example, the introduction of the Commercial Building Disclosure (CBD) program in 2010 resulted in the energy use of offices that are part of this program falling by over 50 per cent per square meter in the period 2011 to 2022. The impact of the CBD program also highlights that policies can rapidly change the rate of improvement in energy management, and the risks of extrapolating trends in energy management forward without regard for policy changes.

Bottom-up analysis of energy management potential

The EEC recommends that AEMO develop bottom-up projections for 'ambitious-but-achievable' and 'low' improvements in energy management in the period 2023 to 2050. We recommend that the 'ambitious' projection is developed based on the technical potential for energy efficiency improvement, moderated with realistic assessments of the economic, social and political factors that could unlock or prevent this potential from being realised.

For example, given governments' work on the *Addendum to the Trajectory for Low Energy Buildings*, an 'ambitious but achievable' level of improvement for the energy efficiency of homes could mean:

- All new homes are built to a Nationwide Home Energy Rating System (NatHERS) of 7 stars;
- When existing homes are electrified, efficient appliances are installed and basic upgrades are undertaken to ceiling insulation and draught-proofing; and
- When existing homes undergo major renovations, they are upgraded to a respectable level of energy efficiency.

To develop the 'low projection' for energy management, AEMO could assume that a smaller proportion of the improvements in the 'ambitious but achievable' projection are achieved.

Estimating the potential for improvement in energy management in Australia would benefit from analysis of international practice. Organisations like the International Energy Agency (IEA) and American Council for an Energy Efficient Economy (ACEEE) have identified that Australia is behind its international competitors in both energy efficiency policy and practice. As a result, if Australia simply adopted overseas policies and practices its level of energy efficiency would increase significantly, and going beyond overseas practice would see even deeper rates of efficiency improvement.

The EEC notes that different forms of energy management don't just affect annual electricity consumption, but also when electricity is used. For example, improved residential thermal efficiency will particularly reduce demand during peak demand periods. We strongly recommend that AEMO consider the impact of energy management on annual load shapes.

Sensitivity analysis

The EEC strongly supports AEMO's approach of using diverse scenarios for its forecasting. The last twenty years have shown that planning an electricity system around a single 'most likely' central scenario risks optimising the electricity system for a future that does not eventuate. Using diverse scenarios can help policy makers and the energy sector understand the impact of various factors on the reliability, affordability and sustainability of the electricity system, and make policies and investments that invest to minimise costs and risks across a range of potential outcomes. Accordingly, the EEC recommends that AEMO test scenarios where governments plan for faster decarbonisation.

To properly determine the impacts of energy management on the energy system, the EEC also recommends that AEMO use energy management for sensitivity testing on the scenarios. As noted above, energy management improvements in the period 2023-2050 could vary significantly depending on whether key policies are introduced, such as the introduction of mandatory disclosure of energy efficiency ratings for homes when they are sold. Understanding the impact of varying levels of energy management on the electricity system would help energy market bodies and governments make decisions on how much improvement in energy management they should target.

Currently, AEMO's forecasting test the impact of energy management by changing the level of energy management between the four main scenarios. However, there are multiple significant changes between the four scenarios (e.g. the level of hydrogen production), which makes it much harder to clearly identify the impacts of energy management on the energy system. This limits the ability of policy makers to use AEMO's forecasting to inform policy making and investment around energy management.

Therefore, the EEC recommends that AEMO undertake sensitivity analysis on all four scenarios comparing the impact of 'ambitious energy management' and 'low energy management'. Sensitivity analysis on low and ambitious energy management scenarios would help inform both policy makers and industry, especially if AEMO identified energy management opportunities in its Electricity Statement of Opportunities and Gas Statement of Opportunities.

Summary

The EEC believes that understanding the potential impact of energy management on the electricity system will be critical to both planning the electricity system and inform governments about the policies that they should contemplate to improve energy management. The EEC looks forward to engaging deeply with AEMO as it continues its work on its forecasting. I can be contacted on 0414 065 556 or via rob.murray-leach@eec.org.au.

Yours sincerely



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