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Department of Climate Change, Energy, the Environment and Water
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To whom it may concern,

Climateworks Centre submission AEMO Draft 2024 ISP Addendum Consultation

Climateworks Centre (Climateworks) welcomes the opportunity to respond to the AEMO Draft 2024 ISP Addendum Consultation. Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. We are climate transition specialists, developing specialist knowledge to accelerate emissions reduction in line with the global 1.5°C temperature goal across Australia, Southeast Asia and the Pacific.

Rapid decarbonisation of the electricity and energy system is essential for Australia to meet its obligations under the Paris Agreement. Electricity generation is the nation's largest contributor to global climate change. The adoption of renewables will reduce emissions by around a third and have powerful positive flow-on effects for other sectors of the economy.

Climateworks has already worked with CSIRO to develop the first stage of ISP modelling. It appears that the AER areas of concern are beyond the scope of our work on the ISP, however, we have undertaken research on each of the first four AER points on the Addendum, which are shown below.

1. Scenarios for sensitivity analysis and presentation of results

Last year Climateworks published [Decarbonisation Scenarios 2023](#), which explores what alignment with the Paris Agreement means for the decarbonisation of Australia's economy. In the 1.5°C scenario, where emissions are reduced in line with the target of limiting temperature rise to 1.5 degrees Celsius, emissions reduce by 68 per cent below 2005 levels by 2030 and reach net zero before 2040. This represents much faster reductions than aimed for in Australia's current emissions targets.

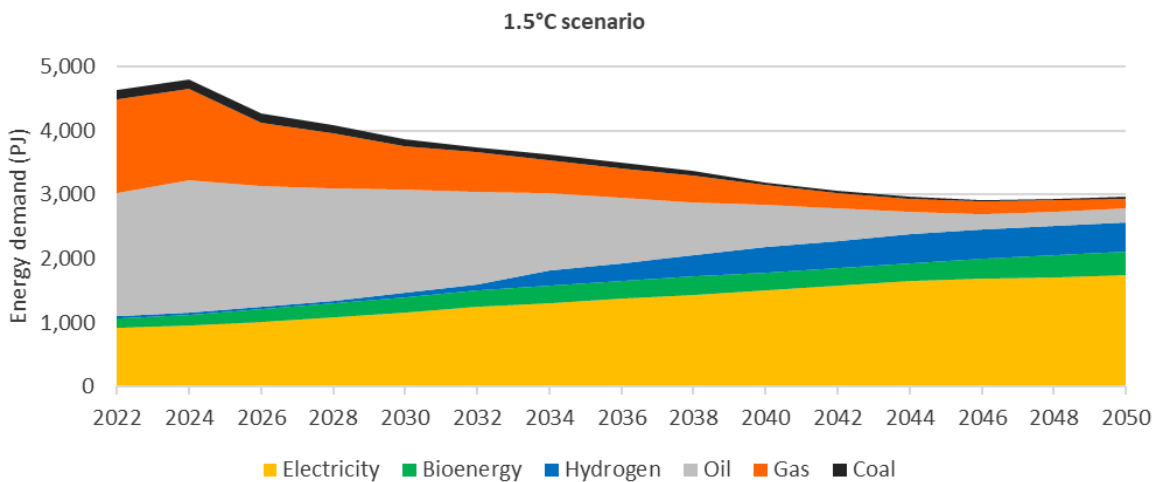
In our 1.5°C scenario, renewables comprise 83 per cent of total electricity generation by 2030 and close to 100 per cent by 2050. To achieve this, clean electricity generation capacity expands from 55 GW today to around 151 GW by 2030 and 398 GW by 2050. All coal-fired power generation will cease by 2035, and gas-powered generation will reduce by 69 per cent by 2030 and 96 per cent by 2050.

The Intergovernmental Panel on Climate Change (IPCC) has outlined the catastrophic impacts of failing to limit global warming to 1.5°C above pre-industrial temperatures. To avoid those consequences, Australia must prioritise the rapid decarbonisation of the electricity and energy sector. Fortunately, the rapid, orderly and cohesive delivery of a clean electricity and energy system, as outlined in our 1.5°C scenario, will benefit the environment as well as the Australian economy and our communities. We suggest that the Addendum:

- Aligns actions with the Paris Agreement target of limiting global warming to 1.5°C.

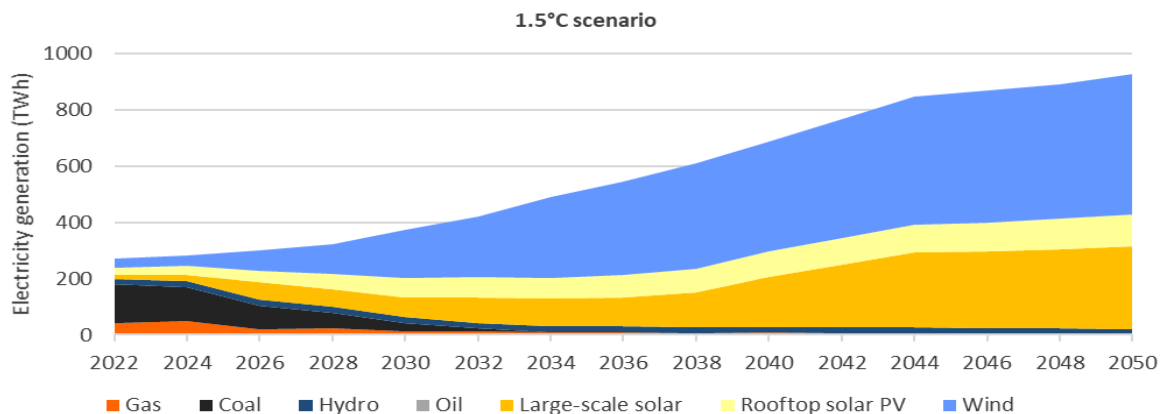
- Prioritises implementation of the ISP due to the potential for rapid emissions reduction and the sector's flow-on effects to the rest of the economy.
- Plans for the rapid and orderly phase-out of fossil gas in the electricity and energy sector. To achieve net zero, deploying renewables, electrification, and energy efficiency measures will displace fossil gas across the whole of the economy. In Climateworks' 1.5°C scenario shown in Figure 1, fossil gas use falls by 54 per cent by 2030 and 90 per cent by 2050, relative to 2022 levels. In 2050, gas-fired power stations provide less than 1 per cent of total electricity generation. Gas use by industry falls by 46 per cent by 2030 and 86 per cent by 2050. It plays no future role in buildings, dropping by 53 per cent by 2030 and near zero use by 2045. It continues to play a small role in the agriculture and transport sectors.

Figure 1. End-use energy demand in Climateworks' 1.5°C scenario.



- By 2050, our modelling shows gas-fired power plants are only used to firm the grid on occasions where demand exceeds supply from renewables and demand-side management. Renewable energy and new and existing storage technologies largely displace gas and provide grid flexibility. The small amount of gas required shown in Figure 2, may mean it is completely replaceable by alternatives such as biomethane. This small amount of gas could generate electricity and support a small part of industry.

Figure 2. Australia's electricity generation (TWh), by fuel, in Climateworks' 1.5°C scenario.



2. Consumer energy resources (CER)

Climateworks encourages AEMO to prioritise the widespread deployment of demand management mechanisms to reduce energy costs for consumers, enhance grid stability, reduce investment needed in utility-scale infrastructure and accelerate emissions reduction. For example, AEMO can support improved governance of the clean energy transformation to increase transparency, coordination and efficacy. This should prioritise demand-side for firming. Doing so will require accelerating the uptake of residential batteries, heat pump water heaters, zero-emissions vehicles and other consumer energy resources. Technologies, including independently orchestrated virtual power plant (VPP) networks and vehicle-to-grid demand response services, may also play roles.

3. Jurisdictional policies for renewable energy zones (REZs)

and

4. Firming and storage in REZs

Climateworks encourages precinct-scale spatial planning to support the integration of industrial, export, freight/transport, and urban electrification clusters. Climateworks considers key elements for successful REZs are:

- Alignment of government and private sector funding and investment, including developing a coherent sustainable finance system architecture in line with international best practices. Aligning finance, planning, and investment is crucial. The [IMF and the World Bank](#) recently highlighted the challenges of establishing a global, aligned, interoperable, sustainable finance system architecture. Australia can demonstrate global leadership by implementing a Sustainable Finance Strategy that aligns with international best practices and addresses those challenges.
- Precinct-scale spatial planning to support integrated industrial, export, freight/transport and urban electrification clusters. REZs should prioritise precinct-scale spatial planning to inform the deployment of clean energy resources and enable cohesion across sectors. Net-zero industrial, export, freight/transport and urban centres will benefit from an integrated approach and access to clean electricity and energy. Localised planning that provides comprehensive detail on the unique electricity and energy transition requirements of different regions and sectors is necessary to both direct investment and resources and engender social licence. Precinct scale planning for industrial regions will provide long-term guidance and assurance to communities undertaking transitions to net-zero emissions. It will enable the integration and sharing of resources, workforces and clean energy alternatives. Policymakers can leverage each region's comparative advantages and establish Australia as a 'renewable energy superpower'.
- With effective and coordinated action from government, industry and communities, [emissions from industry can be reduced by 65 per cent by 2030 and 92 per cent by 2050](#), relative to the 2020 level. Some industrial processes are difficult to abate, but existing and emerging technologies will allow for the decarbonisation of most industrial sectors.

Thank you for taking the time to consider our submission. We would welcome an opportunity to brief your team if you would like to explore our responses in further detail.

Yours sincerely,

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