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

Climateworks Centre submission on the expanded Capacity Investment Scheme

Climateworks Centre (Climateworks) welcomes the opportunity to respond to the Department of Climate Change, Energy, the Environment and Water's (DCCEEW's) consultation on the expanded Capacity Investment Scheme (CIS).

Climateworks bridges the gap between research and climate action, operating as an independent not-for-profit within Monash University. Climateworks develops specialist knowledge to accelerate emissions reduction, in line with the global 1.5°C temperature goal, across Australia, Southeast Asia and the Pacific.

Electricity generation is Australia's largest source of greenhouse gas emissions. Increased investment in variable renewable and clean dispatchable capacity¹ is essential if Australia is to meet its obligations under the Paris Agreement. Climateworks recognises the value of accelerating the deployment of firmed renewable energy through underwriting contracts with project operators and Renewable Energy Transformation Agreements with state and territory governments. In this submission, Climateworks recommends changes to enhance and refine the CIS.

Submission Summary

Climateworks recommends the CIS:

- Bases its deployment of variable renewable and clean dispatchable capacity on the least-cost pathway for limiting global warming to 1.5°C.
- Deliver a mix of energy projects that increase dispatchable renewable energy generation and storage and reduce the frequency of market intervals experiencing zero or negative wholesale spot prices.

¹ Climateworks supports the CIS using section 17 of the Renewable Energy (Electricity) Act 2000 (Australian Government, 2000) that excludes coal and gas generation in its definition of clean renewable energy.

- Prioritises the expansion of its rules to allow VPP projects and other mechanisms for energy demand management to receive support under the CIS from the outset.
- Prioritises merit based criteria that increase the probability of projects being located in Renewable Energy Zones and able to serve industrial precincts.

Context

Climateworks' scenario analysis shows that Australia can still achieve trajectories compatible with the Paris climate goals. The least-cost trajectories from this work deliver very strong emissions reductions this decade:

- about 75 per cent reduction below 2005 levels by 2030 for the 1.5°C scenario; and
- about 50 per cent reduction below 2005 levels by 2030 for the 2°C scenario.

The rapid decarbonisation of Australia's electricity grid is integral to both scenarios. A renewables based energy system will eliminate close to a third of Australia's total emissions and lead to reduced emissions for downstream sectors of the economy. Furthermore, it can unlock economic and international emissions reduction opportunities through green energy exports. A 1.5°C-aligned least-cost pathway for Australia can be achieved with renewable energy, backed up by storage, accounting for 85-90 per cent of electricity generation by 2030 and nearing 100 per cent by 2034 (Li et al. 2023).

Scenario Analysis

Recommendation 1: Base the deployment of variable renewable and clean dispatchable capacity on the least-cost pathway for limiting global warming to 1.5°C.

We understand, based on a reference made in the CIS Stage 1 Public Consultation Paper, that the CIS expansion objective of 32 GW is based on modelling from AEMO's 2022 ISP *Step Change Scenario* (AEMO 2022). Climateworks analysis indicates neither the 2022 or Draft 2024 ISP *Step Change Scenarios* are consistent with the least-cost pathway for limiting global warming to 1.5°C.

There is currently around 55 GW of renewable capacity in the electricity system (Li et al 2023). There are 12 GW of projects under construction or with financial commitments underway across the NEM (Clean Energy Council 2024). The CIS is expected to deliver a further 32 GW of capacity through 2030. That would create a total of around 99 GW of generation and storage capacity on track for the NEM by 2030. This would be 17 GW less than required under the Climateworks 1.5C scenario.

Climateworks recommends aligning the renewable capacity and clean dispatchable capacity objectives of the CIS with the Australian Energy Market Operator's (AEMO) Draft 2024 Integrated System Plan (ISP) *Green Energy Exports* scenario (AEMO 2024).

Under the National Energy Objective, the Australian Government has responsibility for the strategic direction of energy markets and setting greenhouse gas emission reduction targets. AEMO is required to consider how it can promote investment in and enhance the operational efficiency of the National Energy Market (NEM) in a way that is consistent with those targets (Government of South Australia, 1996).

Calibrating the firmed renewable energy target of the CIS with the 1.5°C aligned Draft 2024 ISP *Green Energy Exports* scenario will ensure the program is consistent with the Paris

Agreement and Australia's stated intention to become a renewables superpower. It will also signal to AEMO that greater weighting should be given to 'emissions reduction potential' in its determination of the ISP optimal development path.

Energy Mix

Recommendation: Deliver a mix of energy projects that increase dispatchable renewable energy generation and storage and reduce the frequency of market intervals experiencing zero or negative wholesale spot prices.

Climateworks recommends CIS tenders be assessed on the mix of variable renewable technologies in each state and territory and their impact on wholesale market spot prices. The CIS should support projects that meet the projected clean energy availability and demand patterns of different locations. The weighting of CIS merit criteria that influence project location should be increased to ensure investment is consistent with spatial aspects of the energy market and system requirements.

The frequency of market intervals experiencing negative or zero wholesale spot prices across the NEM is currently increasing (AEMO 2023). This is due to the higher output and timing of variable renewable energy and lower operational demand. It is most common during the middle of the day in Victoria and South Australia as a result of the substantial supply of solar generation in those states. At a time when new investment in renewable energy projects is required, the market is sending adverse signals about their financial viability.

The CIS should factor in the comparatively low cost of utility-scale solar projects, the timeline for coal phase-out and the clean energy capacity of different states and territories. The consideration of these aspects in program design could reduce the regularity of negative or zero wholesale spot prices, improve the financial viability of renewable capacity projects for investors, and reduce the risk of excessive investment from the Australian Government.

Energy Demand Management

Recommendation: Expand rules to allow VPP projects and other mechanisms for energy demand management to receive support under the CIS from the outset.

Climateworks supports the intention to incorporate VPPs in future CIS tenders. We recommend their inclusion be prioritised along with other mechanisms for energy demand management. The widespread deployment of load shifting solutions can minimise peak demand if incentivised correctly. Lower peaks can reduce investment needed in system infrastructure, and costs for energy users.

Climateworks acknowledges that demand-side markets, technologies and infrastructure (such as VPPs) are currently underdeveloped in Australia. The impacts of different levels of decentralised energy and demand management on transmission requirements and grid stability require further research. Developing a greater understanding of the factors inhibiting consumer participation in VPPs is also at an early stage.

However, further analysis of the impacts of VPPs and other demand management mechanisms can take place in conjunction with their deployment. Research on how these technologies influence energy systems and markets has advanced to the point where we

know they will support grid stability. Further analysis of demand evolution and scenario planning, such as that undertaken through the National Energy Transformation Partnership, will benefit from the feedback and data generated through active demand management projects. Climateworks supports the expeditious inclusion of VPPs and other mechanisms for energy demand management in the CIS as technical, regulatory and market standards are concurrently advanced.

Proximity to Industrial Precincts

Recommendation: Prioritise merit based criteria that increase the probability of projects being located in Renewable Energy Zones and able to serve industrial precincts.

Climateworks welcomes the CIS's inclusion of merit based criteria that enhance the probability of projects being located within Renewable Energy Zones and able to serve industrial precincts. In particular, we support criteria on the project's approach to system benefits, technical and commercial viability and engagement with communities and supply chains. Climateworks encourages further measures, such as increased weighting for those criteria or explicit eligibility criteria, that will increase the likelihood of CIS projects being located near heavy industry.

The Australian Industry Energy Transitions Initiative shows emissions from industry can be reduced by 92 per cent by 2050, consistent with the least cost pathway for limiting global warming to 1.5°C, with effective and coordinated action from government, industry and communities (Hornngren et al. 2023). Schemes such as the CIS are ideally placed to be part of this coordinated action. Locating clean variable renewable and dispatchable capacity infrastructure within Renewable Energy Zones and close to industrial precincts would reduce transmission investment and accelerate access to firmed affordable clean energy. Regional businesses and CIS projects will each benefit from access to shared infrastructure and the creation of clean energy jobs.

Furthermore, locating clean energy capacity where it can best serve industrial precincts will have advantageous long-term outcomes for the Australian economy which will capitalise on increased competitiveness in international markets by exporting green commodities. The Australian Industry Energy Transitions Initiative showed investment in industry abatement and transitioning the electricity system could generate \$236 billion annually (Hornngren et al. 2023). Government investment in clean energy capacity in industrial regions should be prioritised.

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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