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Department of Climate Change, Energy, the Environment and Water (DCCEEW)

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Climateworks Centre submission on the Hydrogen Headstart Program

Climateworks Centre welcomes the opportunity to respond to the Hydrogen Headstart Program consultation paper. Climateworks specialises in accelerated climate transitions for Australia, Southeast Asia and the Pacific in line with a 1.5 degrees Celsius limit. An independent non-profit organisation, it was co-founded in 2009 by the Myer Foundation and Monash University and works within the Monash Sustainable Development Institute.

The Hydrogen Headstart consultation is taking place in the context of the National Hydrogen Strategy review, which is an opportunity to determine priority use cases and opportunities for new export industries.

Scenario analysis from Climateworks and CSIRO for the Australian Industry Energy Transitions Initiative (Australian Industry ETI) found that hydrogen could be effectively used to reduce emissions in heavy industry (Australian Industry ETI 2023a). Developing Australia's hydrogen markets and capabilities is a major opportunity to achieve Australia's domestic emissions reduction targets, as well as contribute to global decarbonisation through renewable hydrogen exports. This is especially urgent as the window to keep global warming within 1.5 degrees is still open, but narrowing.

The Australian Industry ETI found that low-cost, renewable hydrogen could play an important role in decarbonising Australian industry, both as a fuel and chemical feedstock. Renewable hydrogen will be especially important in instances where electrification is not technically possible or is cost prohibitive. Pairing the production credit and the Guarantee of Origin scheme could provide important verification of emissions reduction.

Hydrogen Headstart can help realise the role of hydrogen in decarbonisation by sending a signal to the market, providing potential investors with the confidence to invest in renewable hydrogen production and supply at the scale needed. It can also support the rapid deployment of the renewable energy and shared infrastructure needed in industrial regions.

During the ten-year period that Hydrogen Headstart funding will be available, renewable hydrogen will be urgently required to decarbonise Australian industry. Modelling for the Australian Industry ETI finds that in the short-term, hydrogen could be used effectively to decarbonise ammonia production, and potentially also mining haulage and alumina calcination. Long-term, steelmaking and freight could require significant volumes of hydrogen. A rapid build-out of renewable energy could enable the creation of new export industries, in which renewable hydrogen plays a key role. Australia could also derive long-term value from electrolysers as a provider of essential system services.

Climateworks recommends that:

- Funding through the Hydrogen Headstart Program should be prioritised (or weighted as part of the selection criteria) for high-emitting and high-economic-output industrial regions.

A key finding of the Australian Industry ETI work was that renewable energy needs to be integrated at scale by sharing of transmission and energy infrastructure in industrial regions. Renewable energy is a key enabler for decarbonisation and critical to the production of renewable hydrogen. Bringing renewable energy into regions sooner will have the effect of transforming the regions where there is likely to be a large future demand for renewable hydrogen and electricity. Weighting merit criteria towards existing industrial regions can support this change by: removing the effect of the cost differential between some of Australia's regions; accelerating the development of Australia's hydrogen industry; helping Australia to connect to new global hydrogen supply chains; and taking advantage of hydrogen's immense jobs and investment potential in our existing regions.

Recommendation:

- Production credits should be in addition to other existing or planned support from government programs and agencies, which would enable projects to proceed rapidly if delivery of Hydrogen Headstart production credits does not commence until 2026.

While production credits are an important step forward, they should be part of an overall suite of policies at both the federal and state and territory levels. This could include ARENA funding, co-investment across levels of government, as well as market mechanisms to support services offered by electrolysers (such as flexibility). Other funding and support could include projects that may begin before 2026. Grants should complement sectoral pathways and plans, supporting capital investment in hydrogen offtakers by ensuring there is an adequate supply to meet demand. These actions will amplify the outcomes of production credits and accelerate the growth of the renewable hydrogen industry.

Recommendation:

- Hydrogen Headstart's investment mandate should be designed to drive economy-wide emissions reductions, carefully balanced against reducing the risk faced by individual facilities.

One of the risks of a production credit applied on a project-by-project basis is that the needs of individual businesses (who are required to act in their own best interest) may detract from the economy-wide goals of the program. This is a careful balancing act. The success of Hydrogen Headstart will rely on the catalysation of projects at a 50MW scale. However, this must be balanced against the need for the funding to provide an economy-wide benefit, in this case, accelerating the development of Australia's hydrogen industry.

Recommendation:

- Hydrogen Headstart funding should be granted with consideration for mandatory reporting provisions recently announced by the International Sustainability Standards Board.

The International Sustainability Standards Board recently established an approach to net zero planning and disclosure of climate targets (*International sustainability standards board* n.d.). With funding disbursement to commence in 2026, consideration should be given to applying this approach to government entities and companies.

Under emerging international best practice, funding entities would require the disclosure of carbon emissions and a transition plan to net zero emissions, which includes a plan to address scope 3 emissions. Requiring and supporting credible transition plans and scope 3 emissions reporting for these projects would both future proof the projects and enable the production credit funding to act as a best practice method for future funding.

Climateworks fully supports the provision of the $2 million of funding for First Nations communities to engage with hydrogen project development in addition to the Hydrogen Headstart funding. This engagement is critical to the self-determination of First Nations people. It will also help unlock projects in a timely manner by prioritising sharing the benefits of transformative projects with the local community. This sets the stage for success and helps to avoid social licence issues.

We have included a table with responses to specific questions from the consultation paper. These are presented in Table 1 below.

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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Table 1: Response to consultation paper questions

Question	Response
Question 2.1: Are there any other eligibility requirements the Program should consider?	Technology selection is important and should be considered as part of broader federal and state energy planning. It is expected that some electrolysers will have greater capacity to ramp hydrogen production up and down, reducing the proportion of electricity storage required to support low-cost variable renewable electricity. If electrolysers are grid-connected, consideration should be given to whether the grid firming service will have a value in future energy markets as a benefit. If federal or state governments introduce a market mechanism to support load balancing, more flexible electrolysers could benefit financially. This would represent a windfall and residual funding could be recycled into the fund to kickstart new projects.
Question 2.7: How should the Program consider projects with proposed export offtake and the extent to which this offtake may support the development of an Australian hydrogen industry or other additional benefits to Australia?	Hydrogen production may support lower electricity prices for producers if deployed at scale for domestic decarbonisation. But at larger scales, hydrogen producers may experience diseconomies of scale with the higher volumes required for new export industries. It is essential for Australia to have a strategy for hydrogen exports, hydrogen derivatives, and other green products that require hydrogen, in order to determine the appropriate scale of Australia's renewable energy exports and what the trade-offs might be.
Question 4.3: How should the Program treat additional Commonwealth or State Government funding or other support for the same project?	Other support from government programs and agencies should be provided so projects can proceed rapidly, ensuring progress isn't delayed by Hydrogen Headstart funding beginning in 2026. This could include debt funding mechanisms, co-investment between federal and state governments, and payments for engineering, procurement and construction. Allowing the aggregation of funding for different parts of the projects will send a strong signal to the private sector, kick-starting large-scale deployment and bringing down capex unit cost. There is a similar need to support offtakers of renewable hydrogen to invest in new technologies that facilitate the production of hydrogen derivatives. Hydrogen Headstart funding is a step in the right direction. It should be paired with government policies to incentivise projects that reduce emissions using renewable hydrogen-using plants, such as retrofitting of calciners for alumina refining and direct reduction furnaces for ironmaking.
Question 5.2: Additional feedback on the proposal for recipients to repay Government support in the event the sales price increases materially during the 10 year period.	Any funding from windfall gain repayments could be repurposed to enable additional future rounds of funding. Future rounds of funding for new projects could be weighted towards incrementally larger electrolyser projects to incrementally catalyse investment for projects with larger capacity, encouraging greater volumes.
Question 9.1:	We welcome that the proposed merit criteria place importance on community consultation as part of project development. Projects should consult with and involve First Nations communities, following

Please provide any feedback on the proposed merit criteria.	best practice. This helps to improve the social licence of projects and promote self-determination of First Nations people (Climateworks Centre 2023). Similarly to ARENA's investment plan, merit criteria favouring knowledge sharing and the unlocking of future investment are valuable.
Question 9.2: How should merit criteria be structured or weighted to ensure the success of delivery of hydrogen from projects?	Co-location of hydrogen supply and demand can benefit both producers and offtakers, and projects located near offtakers could avoid some logistical challenges and commercial risks. Many potential early offtakers are located in regional areas. In addition to supporting the development of renewable hydrogen at scale, weighting merit criteria toward regional areas could benefit communities with carbon-intensive industries that are likely to decline in a low carbon global economy.
Question 9.4: What additional outcomes should be incorporated into the formal merit criteria for the Program in order to deliver broader benefits?	There is an urgent need to develop a skilled workforce in the hydrogen supply chain. Accenture analysis for the Australian Industry ETI found that 63,100 workers could be required in hydrogen by 2050 (including temporary construction jobs) (Australian Industry ETI 2023b). The hydrogen industry has a higher requirement for highly skilled workers than some other energy industries. Targeted training opportunities are needed, and industry should be supported to teach current workers new technical skills. Hydrogen Headstart is an opportunity to encourage this by weighting in favour of projects that require highly skilled workers and apprenticeships.
Question 9.6: How should emissions abatement calculations consider the different end uses of hydrogen and greenfield vs brownfield facilities?	Because of the long life of plant of some industrial facilities, some offtakers may see longer-term abatement value from early deployment of hydrogen plant. Replacing high-emitting plant reaching the end of its lifetime with processes that use renewable hydrogen could have the greatest long-term cumulative effect on Australia's emissions and reduce the risk of stranded assets for offtakers.The Program should consider the long-term opportunity cost of emissions from offtakers in addition to tCO_2e per tonne of product calculations.

References

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Climateworks Centre (2023) *Brief for policy-makers: Renewable energy industrial precincts*, Climateworks Centre, https://www.climateworkscentre.org/resource/brief-for-policy-makers-renewable-energy-industrial-precincts/, accessed 27 June 2023.

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