

Australian Clean Technology Market-creation Co-Investment Partnership (CIP) - Concept note

Key points

- This concept note presents a high-level Australian Clean Technology Market-creation Co-Investment Partnership (CIP) model for providing financing to scale up supply chain responses in all clean technology markets across all Australian States and Territories and all sectors of the Australian economy.
- Australia's Technology Investment Roadmap sets out over 100 clean technologies in seven sectors that can provide zero emissions solutions and the Australian Government, as the nation's largest early-stage technology investor, is committed to annual Low Emissions Technology Statements to support a partnership with the private sector and the states and territories. All State and Territory governments in Australia have committed to be net zero emissions economies by 2050.
- The CIP represents a model that can be implemented as a partnership model between the Australian Government and state and territory governments, whereby state and territory government program investment, traditionally through the form of grants, can be better coordinated to leverage co-financing investment contributions from the Australian Government and attract private investment. The Australian Government contributions can be provided through existing agencies such as CEFC and ARENA and/or additional funding.
- Investment opportunities would be identified using a multi-sector goal-oriented approach, using 'reverse auction' style competitive rounds to achieve scale that catalyses market supply chains. Sectors and priority investment areas could correspond with those covered in the Australian Government's Technology Investment Roadmap, in addition to an 'enhanced manufacturing' stream to support growth of traditional manufacturing and new industries. Within each sector, funding would be allocated to align with sectoral decarbonisation pathway goals, while also incorporating COVID recovery goals and geographic investment priorities. Proposals would be called for to meet those goals.
- This model would collectively leverage a greater amount of overall private sector capital, delivering bigger economic and employment impacts, lowering economy-wide emissions and leading to greater resilience of the Australian economy.

Introduction

The opportunity to capture investment from fragmented sources yet with shared ambitious goals

The Australian Government is committed to accelerating new and emerging low-emissions technologies and building on areas of comparative advantage in agriculture, industry, mining and energy-intensive exports. The CEFC and ARENA are national institutions with years of experience in investing in technology and leveraging private sector capital. At the same time, States and Territory Governments have their own programs for emissions reductions investment and technology support. And in parallel, all Australian Governments are preparing to invest substantially to support their economies to recover from the COVID-19 pandemic.

While immediate actions taken by Australian governments in the midst of the COVID-19 pandemic will naturally focus on minimising the severity of ongoing short term health and economic shocks, parallel medium to long-term actions can lay the foundation for long term growth and employment. Investments made by Australian governments in the wake of the crisis will shape Australia's economy for decades to come. In building back the economy post-pandemic, Australia is presented with a large opportunity to align its investments with the global trends towards zero emissions technologies. Doing so will result in better economic growth and employment outcomes, especially over the medium and longer term (Hepburn et al., 2020; McKinsey, 2020), while also helping to achieve long-term low-emissions reductions.

All Australian states and territories have made net zero emissions commitments and many of Australia's largest investors, companies and industry bodies are also already committed to achieving net zero emissions by or before 2050. ClimateWorks Australia's recent analysis with CSIRO demonstrates that reaching net zero by 2050 is achievable for Australia (ClimateWorks Australia, 2020), and other research has shown the same globally (Energy Transition Commission, 2018; IEA, 2020; Monteith and Menon, 2020). For some key sectors of the Australian economy, such as buildings and electricity, emerging solutions could decrease the cost, and aid deployment, of already demonstrated and mature solutions to decarbonise these sectors. Decarbonising harder-to-abate sectors such as transport, industry and agriculture, will require additional support for emerging solutions through R&D and investment in commercialisation. For Australia to be on a net zero trajectory (consistent with limiting global temperature rise to well below 2 degrees Celsius), the implementation of these solutions will need to scale up and accelerate. And by doing so, Australia can harness significant competitive advantage in a decarbonising global economy.

To achieve the scale and rate of implementation required, market support is needed for technological development, deployment and integration. A well-designed increase in public and private investment can enable activities, through providing investor certainty and reducing barriers to their adoption, that are at the demonstration, commercialisation and deployment stages of innovation and drive down emissions across Australia's supply chains. A considerable amount of private sector capital is available to finance such activities (Australian Sustainable Finance Initiative, 2019). Analysis of patents filed in Australia highlights the opportunity low carbon investment presents. Patents have been filed across all

of the sectors of the economy that require decarbonising (Oxford University, 2020, unpublished). Australia also punches above its weight globally when it comes to green patents filed. This means Australian businesses and the Australian economy are not only ready but can leverage increased low carbon investment to deliver significant economic benefit for the country. The challenge is in covering the breadth of the economy — across all sectors and jurisdictions — in the effort to increase flows of finance for decarbonisation.

How a mission-oriented Australian Clean Technology Market-creation Co-Investment Partnership could help

Support for zero emissions technologies should include both ‘push’ and ‘pull’ support measures. Technology push mechanisms are those that support the upfront investment and development of a technology (e.g. grants for research and pilot demonstrations). Technology ‘pull’ mechanisms are those that create market-scale signals and incentives for supply chain responses based on expectations of widespread deployment potential of the final product (e.g. direct procurement, reverse auctions, policies and targets).

By investing in demonstration, commercialisation and deployment stages of technology innovation, the Clean Energy Finance Corporation (CEFC) uses a ‘push’ mechanism to catalyse private investment in Australia’s clean energy sector. It is effectively meeting this establishment mandate. In 2018–19, more than \$3 in private finance was leveraged for every dollar invested by the CEFC. This was an increase from each CEFC dollar being matched by \$1.80 in private finance in 2017–18 (CEFC, 2019). In the year to 30 June 2020, new CEFC investment commitments of more than \$1 billion, supporting 23 clean energy investments, leveraged \$3.2 billion for a total project value of \$4.2 billion (CEFC, 2020a). State and territory government procurement and grant schemes offer the ‘pull’ that’s needed to complement the CEFC’s investment mandate.

While the CEFC has a broad mandate that covers all decarbonisation sectors, and there are state government processes and programs aimed at decarbonisation, the scale of the decarbonisation required is now larger and not being fully addressed by existing processes. Existing government funding is not deployed across all of the sectors required for states and territories to meet their net zero by 2050 commitments. For example, CEFC and ARENA investment in housing is far more prevalent in NSW and Victoria than in other Australian states and territories. In addition, state and territory governments’ individual programs lack the scale that the CEFC can provide, and require significant finance capabilities to deliver on their net zero commitments. Building on the successful CEFC financing model, there is scope for a large-scale CIP to accelerate strategic investment in the decarbonisation of the Australian economy. This CIP could support the scale of investment needed. There is great potential to unlock increased volumes of private capital if greater public support is made available and coordinated in a goal-oriented way. This paper describes a model that can do this using existing mechanisms that can be scaled up.

Outline of Australian Clean Technology Market-creation Co-Investment Partnership (CIP)

CIP model

The CIP would take the form of an Australian Government partnership with state and territory governments, allowing goal-oriented investing in decarbonisation technologies and market solutions that can also incorporate COVID recovery goals and geographic investment priorities. State and territory government program investment, which has traditionally taken the form of grant funding, can leverage significantly more private sector finance when used in ways that are more tailored to meet commercial and private sector needs. Examples of government investment instruments that can enhance the private sector leverage achieved from public investment by incorporating some risk sharing mechanisms include:

- Contract for Differences, and
- First-Loss Protection Mechanism. 'Any instrument designed to ensure the amount of capital which is exposed first should there be a financial loss on a security, including equity, debt, and derivatives instruments' (Climate Policy Initiative, 2013).

Such investment models would enable more projects that are not quite commercially investable right now to become investable with the support of state/territory governments, CEFC financing and leveraged private investment. A mission-oriented approach would be taken to funding allocation, with a quantum of funding provided for defined goals specific to the decarbonisation sectors, most of which are outlined in the Australian Government's Technology Investment Roadmap. Proposals would be called for to meet those goals.

Some examples of government programs that illustrate this goal-oriented and co-investment financing approach are included in Figure 1. States and Territories can adapt to target investment potential in all sectors in their economy to meet their jurisdictions net zero emissions goals.

Figure 1. Examples of government goal-oriented and co-financed programs

Large Scale Solar Program

Through a competitive grant funding round aimed at driving down the cost of delivering large-scale solar projects in Australia, close to \$90 million of ARENA grant funding, combined with over \$370 million of CEFC finance, unlocked almost \$1 billion of private investment in the 12 funded projects, and saw costs of technology and delivery halved during the 18 months allocation period for the program (CEFC, 2020b).

NSW Government Empowering Homes Program

Launched in February 2020, the NSW Government Empowering Homes Program provides Hunter residents access to interest-free loans for home energy storage batteries. The CEFC has committed \$7 million in debt finance.

Advancing Hydrogen Fund

Through its Advancing Hydrogen Fund, the CEFC will make available up to \$300 million in debt and/or equity to support the growth of a clean, innovative, safe and competitive Australian hydrogen industry. In the first instance, the CEFC will seek to invest in projects included in ARENA's \$70 million Renewable Hydrogen Deployment Funding Round. The CEFC's debt will also focus on projects that align with the Australian Government's

National Hydrogen Strategy, including projects which have State or Territory Government financial support (CEFC, 2020c).

NSW Government Emerging Energy Program

This initiative provides grant funding to assist with the development of innovative, large-scale electricity and storage projects in NSW. By reducing barriers to invest in emerging technologies, it supports affordable, reliable and clean energy across the State. The NSW Government is working with ARENA to fund additional projects (NSW Government, 2020).

South Australian (SA) Government Grid Scale Storage Fund

In 2018, the SA Government launched the Grid Scale Storage Fund which contributes state government funding toward energy storage infrastructure capable of addressing intermittency in the South Australian electricity system. ARENA signed a Memorandum of Understanding with the SA Government with a view to coordinating the assessment of projects that may be eligible for joint funding (ARENA, 2018).

The Australian Government, in partnership with state and territory governments would jointly staff a program implementation team with a remit to coordinate the CIP's operations. Each joint-team would draw on expertise from the CEFC, ARENA (where ARENA funding was involved), state/territory government departments responsible for emissions reduction, and treasury department commercial divisions containing skills in leveraging private sector investment. Joint-teams would co-design the program calls for proposals defining the goals in each sector and in each state/territory. The call for proposals could be implemented using a reverse-auction approach, in which the state or territory government with the CEFC invites bids to meet the program goal. Programs would be designed at sufficient scale to support multiple successful bidders each round, to ensure a supply-chain scale response and competition between multiple consortia. Project proponents would then place bids for the minimum funding they need to deploy the clean technologies, with the project proponents with the best value for money (including scores on any other criteria required at bid time) securing contracts to perform the work in exchange for the funding. There would be no need for transfer of allocated state or territory government budget to the CEFC. The program teams would jointly assess the bidders to progress to a preliminary shortlist. State and territory governments would approve grants aligned to a specific program goal, for example, the development of green hydrogen hubs. Once the grants have been approved, the CEFC would then be well-positioned to negotiate an amount to debt to further support the program goal. A strength of building off the CEFC is that it has the staff with capability and capacity to support this approach. Support for this model could be provided by ensuring staff resourcing for the CEFC, ARENA and state and territory governments to resource these joint program teams.

Type and size of investment opportunities

The CIP would facilitate large scale asset and infrastructure investments across all sectors of the Australian economy, to reach the level of decarbonisation needed for Australia to align with the Paris Agreement. Key opportunity areas would include key technologies identified via the Australian Government's Technology Investment Roadmap Discussion Paper (Australian Government, 2020) which are largely aligned with those in ClimateWorks

Australia's Decarbonisation Futures report (ClimateWorks Australia, 2020). Examples include green hydrogen (including production and use, transport and green certification), batteries (including lithium and other raw material components), transmission infrastructure, and farm and buildings enhancements that reduce emissions (see **Appendix A** for illustrative examples). The CIP would offer a menu of investment areas that governments may address through forthcoming Commonwealth-State Deals and any budget expenditure aimed at supporting clean technologies.

The size of program investment opportunities can vary depending on the need, the jurisdiction and the sector. Using a matrix model, the CIP will help make visible to investors the current and future opportunities in all states and territories and across each sector. Sectors could correspond with those covered in the Australian Government's Technology Investment Roadmap, in addition to an 'enhanced manufacturing' stream to support growth of traditional manufacturing and new industries.

This multi-sector goal-oriented approach will allow state and territory governments to coordinate their current financial contributions with national funding agencies such as the CEFC and other federal funding programs and leverage co-financing contributions from both the Australian government and private sector. This would result in collectively leveraging a greater amount of overall private sector capital, delivering bigger economic and employment impacts, lowering economy-wide emissions and leading to greater resilience of the Australian economy. It would also provide the required capability by building on existing frameworks and financial mechanisms.

The CEFC currently has a \$10bn allocation as a revolving fund (meaning when it is repaid it can re-invest the same capital). The experience of the CEFC shows that private sector investment can be leveraged at substantial scale for targeted clean technology outcomes. For example, in 2018-19 the CEFC achieved leverage on average around three times as much private investment as public investment, while the Clean Energy Innovation Fund within the CEFC has leveraged eight dollars of private investment for each dollar of CEFC investment (CEFC, 2019). This can be achieved for more sector coverage and geographical coverage with additional coordinated State government contributions in all sectors and further ARENA capacity.

To illustrate indicative CIP investment figures, the **Appendix B** shows the CEFC's existing \$10bn allocation applied with equal distribution of investment across all sectors and shared equally across states and territories based on share of population as at 31 Dec 2019. It is assumed the total investment amount would be shared between the CEFC (70 per cent), ARENA (20 per cent) and states/territories (10 per cent). This breakdown roughly emulates the CEFC-ARENA large scale solar funding allocation (CEFC, 2017). Indicative investment figures are at **Appendix B** with private sector leverage at the CEFC-average of 2.3 times.

Illustrative goal-oriented program areas

Decarbonisation opportunities are ample in each sector of the Australian economy. **Appendix A** presents illustrative goal-oriented programs for each sector and technology

type, which form a 'menu' from which the Australian Government and state and territory governments could collectively draw to catalyse market-scale supply chain responses to accelerate decarbonisation technologies and improve Australia's competitive advantage.

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APPENDIX A

For Illustration Only

<p>Clean Technology Market-creation Co-Investment Partnership: illustrative investment program design examples¹, covering all sectors and States/Territories <i>State-Federal Co-Investment programs supporting multiple projects to stimulate supply-chain scale and competition, through 'reverse auction' style programs leveraging private funding by inviting bidders to craft the most efficient, minimum level of funding needed via combining some grant funds with CEFC-style financing and/or contracts for difference or other risk-sharing terms.</i></p>						
Green hydrogen	Buildings	Manufacturing	Transport	Industry	Electricity	Agriculture and land
<p>Local renewable hydrogen hubs: matching supply with demand - for local consortia who combine a minimum scale of hydrogen demand and a renewable hydrogen production source that can supply the demand.</p> <p>Hydrogen Haulage - Clean Trucking program for renewable hydrogen powered mining truck and on-road truck demonstration projects over two years.</p> <p>Renewable Hydrogen Export readiness program - to secure the support for ~ three +300MW scale green hydrogen/ Ammonia facilities around Australia.</p>	<p>Renovation Refresh - supporting new business models for delivery of up to 600,000 residential energy efficiency upgrades per year for three years</p> <p>Low bill low carbon homes - development of XX new energy efficient social housing dwellings per year for three years, including minimum content for low emissions cement and other building materials.</p> <p>Precinct Power Providers - development of XX integrated energy systems with demand response (including microgrids for precincts).</p>	<p>Battery processing and manufacturing program - support at least one new lithium battery refinery and two new large-scale lithium battery plants, and new battery recycling infrastructure that recycles 5,000 tonnes (25% of annual battery waste) within 5 years.</p> <p>Modernising critical manufacturing program - support manufacturers to purchase energy modernisation equipment, for example, energy productivity measures, electrical heating technologies like industrial heat pumps, solar panels and battery storage.</p> <p>Technology grants - to support commercialised research and development activities in technologies related to sustainable manufacturing.</p> <p>Local manufacturing of EV components or assembly of vehicles</p>	<p>Clean Bus Program - to support public transport authorities to support the uptake of up to 500 electric buses. Funding can be used to support bus procurement, depot upgrades and charging equipment.</p> <p>Development of integrated zero-emissions transport systems (infrastructure+technology) for XX regional towns or suburban hubs</p> <p>Freight Fleet Futures program - seek the level and type of support required to establish a clean fleet solution for five long-haul vehicles or more. This support could be in the form of a loan/ grant or residual price guarantee for the vehicles and refuelling infrastructure at the end of the contract term. Providers would source vehicle supply and clean fuel supply, the compressions and refuelling systems in addition to scaling up maintenance and engineering support.</p> <p>Electric vehicle program - to support uptake via infrastructure readiness or vehicle fleets (after further consultation with industry)</p>	<p>Low-carbon supply chain procurement - support XX buyers to embed low-carbon materials and products in procurement supply chains larger than \$XX million</p> <p>Biofuel production support (TBC explore options to support local usage for energy security or export potential for commercial opportunity)</p> <p><i>Feedstocks/industrial processes</i></p> <ul style="list-style-type: none"> - Materials designed for circularity - Materials collection, sorting and recycling technologies - Biomaterials for construction - Shift to green ammonia in production of fertilisers and explosives <p><i>Process heating</i></p> <ul style="list-style-type: none"> - Heat pumps and other electric technologies - Bioenergy - Renewable heat from concentrated solar thermal to replace gas use in alumina <p><i>Other</i></p> <p>Development of new catalysts for abatement of nitrous oxide emissions from nitric acid production</p>	<p>Transmission - funding/underwriting for 3-5 new transmission connections</p> <p>Storage: Home and small business battery program - fund 100,000 small battery installations for households and small businesses (under \$1 million turnover) over three years (through low-interest CEFC loans and state/territory battery subsidies)</p> <p>Pumped hydro - reverse auction for the lowest availability charge for pumped storage projects across Australia</p>	<p>Farm Carbon Enhancement - supporting farmers to build and maintain carbon stocks in soils, biodiversity outcomes and farm forestry.</p> <p>Urban sustainability greening program - to support XX local governments to upgrade urban landscapes to promote resilience to heatwaves; support urban agriculture and water-sensitive urban design.</p>

¹ Can be tailored to suit the size of the market in each jurisdiction and technology

APPENDIX B

For Illustration Only

Clean Technology Market-creation Co-Investment Partnership: illustrative investment contributions based on a \$10bn allocation to the CEFC shared equally across 7 sectors, matched by 20% ARENA and 10% State grants

		Sectors						
		Green hydrogen (\$m)	Buildings (\$m)	Manufacturing (\$m)	Transport (\$m)	Industry (\$m)	Electricity (\$m)	Agriculture and land (\$m)
Jurisdiction (illustrative pro-rata allocation based on population size)	NSW	65	65	65	65	65	65	65
	Vic	53	53	53	53	53	53	53
	QLD	41	41	41	41	41	41	41
	WA	21	21	21	21	21	21	21
	SA	14	14	14	14	14	14	14
	Tas	4	4	4	4	4	4	4
	ACT	3	3	3	3	3	3	3
	NT	2	2	2	2	2	2	2
	10%	204	204	204	204	204	204	204
	20% (ARENA)	409	409	409	409	409	409	409
	70% (CEFC)	1430	1430	1430	1430	1430	1430	1430
(at CEFC's average private leverage ratio)	Private capital unlocked	4700	4700	4700	4700	4700	4700	4700

