WWF

REPORT

2020

Australian renewable export COVID-19 recovery package

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Acknowledgements

WWF-Australia acknowledges the Traditional Custodians of Country throughout Australia and their continuing connection to land, water and culture. We pay our respects to their Elders - past, present and emerging.

Key corporate stakeholders across a range of industries were engaged to ensure the report captured the insights from multiple sectors of the Australia economy. Their input was a critical component of developing this report and provided key insights into the practicality and tangibility of opportunities relating to Australia's economic rebuild following the COVID-19 crisis. We wish to thank those we engaged with for their input.

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WWF is one of the world's largest and most experienced independent conservation organisations, with over five million supporters and a global network active in more than 100 countries.

WWF's mission is to stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature, by conserving the world's biological diversity, ensuring that the use of renewable natural resources is sustainable, and promoting the reduction of pollution and wasteful consumption.

The following pages within are analysis prepared by EY at the request of WWF-Australia to explore the renewable energy opportunities in a COVID-19 recovery package that would put Australia on the pathway to becoming a renewable exporter.

EY
Building a better working world

Foreword

The world is currently facing a once-in-a-lifetime challenge, with COVID-19 causing both social and economic harm across communities, countries, and continents. This pandemic has sown personal tragedies and undone years of gains in employment, and questions are being increasingly asked about what a "new normal" will look like for the global economy. Francesco La Camera, Director General of the International Renewable Energy Agency, has said that COVID-19 has exposed "deep vulnerabilities in the current system."

A successful COVID-19 recovery plan for Australia could well mean a broader economic base, and unlocking genuine, long-term value creation. Specifically, we see the opportunity for Australia to emerge as a renewable export superpower, playing a fundamental role in Australia's recovery and global action to address climate change.

Australia is already a global energy and resources superpower, but in the months and years ahead we will face a choice: return to past priorities or invest in emerging industries that generate jobs and growth. Choosing to prioritise the second path will deliver a range of economic, employment, health, and environmental benefits, which will flow from these new and emerging industries. With support from public and private sector leaders, the Government has an opportunity to support a renewable energy stimulus package to make this a reality and begin rebuilding the economy now.

This report sets out opportunities to grow the Australian economy post COVID-19. Where it makes economic sense, Australia should embrace new technologies, deploy renewables and utilise our domestic strengths to grow export opportunities. This report builds on WWF's ambition of accelerating Australia's transition towards becoming the leading global exporter of renewable energy by 2030 and put us on the pathway to 700% renewables.

1. Executive Summary

Climate change and COVID-19 have much in common: both are planetary-scale challenges that threaten our health and economic prosperity, and both are oblivious to national borders or the size of national economies. But these two challenges also highlight differences in our ability to recognise and respond to the threat within political timeframes: COVID-19 is an acute challenge that is being faced inside one political cycle, whereas the long-term challenges of climate change have to-date lessened the political drive for action.

COVID-19 and Australia

The impacts from COVID-19 are being felt today, and will continue to be felt as our economy, and economies around the world, adapt and return to growth. But this provides a short period to pause and reflect on what our economies should prioritise post COVID-19. As we begin to emerge from our initial economic response, we have the opportunity to plan and build a more resilient future economy. For Australia, this means supporting economic growth, broadening our industrial and resources base, reducing the rate of unemployment and reskilling the nation's workforce. This future presents Australia with a unique opportunity to position itself as a renewable energy superpower.

Along with many other countries, Australia is experiencing a supply shock, aggregate demand shock and a liquidity squeeze in a less robust, fragmented global economy. Closed borders and enforced stringent social distancing have resulted in reductions in GDP and job losses globally, and the four key trends (below) will be important factors in shaping our economic future.

Supply chain disruption

COVID-19 has resulted in significant disruptions to supply chains. With forced government lockdowns, increased hygiene controls and border closures, our globalised world has been crippled, with limited capacity to trade across regions – therefore re-prioritising an onshore supply chain.

Business resilience and agility

Through necessity, COVID-19 has forced businesses to reconsider their strategic priorities and adapt to a new way of working. As business navigates the short-term crisis, there is a concurrent requirement to reshape and reimagine a new business-as-usual environment in a post-crisis world.

Changing consumer behaviour

Consumer spending patterns have distinctly changed in response to the crisis weighted towards essential items and limiting discretional spend. In a post-crisis world, a significant portion of consumers will exhibit behavioural change. Post COVID-19, some global consumers have recently suggested they will be willing to pay a premium for locally made, and more sustainable, good and services. It is anticipated that Australian consumers will follow this trend.

Reduced pollution and GHG emissions

The reduction in economic activity, mainly manufacturing and production, caused by COVID-19 shutdowns has seen a corresponding reduction in pollution with significant improvements in air and water quality forming some of the more conspicuous examples. This has highlighted the resilience of the natural environment, it's well-being value to humans and tangibly shown that it is possible to enact change.

The opportunity to rebuild the Australian economy

A forward-looking stimulus package that aligns with our national climate change greenhouse gas (GHG) emissions goals would deliver long-term economic, employment, and environmental benefits for Australia. Near-term opportunities for continued investment in renewable energy technology and infrastructure, such as solar, batteries, wind, hydrogen and fuel cells, could be the cornerstone of this package, creating and reshaping thousands of jobs in the electricity, transport, manufacturing and industrial sectors, while reducing Australia's domestic emissions and positioning Australia to benefit from low carbon trade opportunities. These solutions could also help to create new jobs and economic opportunities in Aboriginal and Torres Strait Islander (ATSI) communities. Longer-term, emerging low carbon technologies offer further growth and employment opportunities, helping to secure future prosperity for Australia in a globally decarbonised world.

Rebuilding the Australian economy, supported by a forward-looking stimulus package, could unlock new industries alongside growth in existing industries, while creating additional employment opportunities.

Near term

- **Over 100,000 direct jobs could be unlocked** by accelerating Australia's wind and solar project pipeline, fast-tracking new transmission projects to revitalise Australia's congested transmission network and through a combination of modernised manufacturing, battery projects, electrified buses, local solar and hydrogen.[1]
- **Every dollar of stimulus** spent on **clean projects** generates nearly **three times as many jobs per dollar than investment in fossil fuel projects**.[2]

Longer term

- Capturing about **6.5%** of the global steel market through the manufacture of green steel would generate about **$65 billion in annual export revenue** and could **create 25,000 manufacturing jobs** in Queensland and NSW.[3]
- Sun Cable's high voltage direct current (HVDC) cable to Singapore would require **15,000ha of solar PV** arrays and **3,800km of HVDC cable, driving $20 billion in capital expenditure.**[4]
- Using renewable energy, Australia could become a major manufacturer and exporter of hydrogen. Hydrogen (which produces no GHGs when burned) could meet up to **24% of world energy demand** by 2050 with annual hydrogen sales of **$700 billion USD.**[5]
- An additional **60,000 regional employment opportunities** could be created by 2030 if Australia transitions electricity generation (for energy demand) to a 50% renewable energy powered grid, which would be multiplied if electrification and export opportunities were incorporated into this transition.[6] A more rapid transition would generate proportionally more employment to 2030, and beyond.

[1] 50,000 new direct jobs by accelerating wind and solar projects with development approval (Clean Energy Council, A Clean Recovery, 2020), 8,000 jobs through fast-tracking new transmission projects to revitalize Australia's congested transmission network (Beyond Zero Emissions, The Million Jobs Plan, 2020) and 45,000 jobs through a combination of modernizing manufacturing, battery projects, electrified buses, local solar and hydrogen (WWF, Delivering Economic Stimulus Through Renewables, 2020)

[2] Adapted from Garrett-Peltier 2017, Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model. Economic Modelling, Volume 61.

[3] Grattan Institute, Start with steel: A practical plan to support carbon workers and cut emissions, 2020.

[4] Sun Cable, Renewable Energy for Singapore & Australia, 2020.

[5] Bloomberg New Energy Finance, Hydrogen Economy Outlook, 2020.

[6] Climate Council, Renewable Energy Jobs: Future Growth in Australia, 2016.

Government will need to play a leadership role to ensure that the opportunities and benefits of renewables turn into reality, and building on past successes will be the foundation for achieving a renewables-oriented domestic economy. For example, Australia already has the highest rate of residential rooftop solar penetration in the world, but there is significant room for growth. Continued growth in rooftop solar installations is a platform from which we can expand into new opportunities such as distributed energy solutions, both domestically and for export. Current measures to support opportunities in hydrogen, such as the recently announced Advancing Hydrogen Fund and the expansion of the Clean Energy Finance Corporation (CEFC) to fund hydrogen, move in the right direction, but there are alternative opportunities to develop a broad-based renewables sector.

To unlock these growth opportunities in a world emerging from COVID-19, a renewable stimulus package would support investment and employment for Australia to become a leading renewable energy exporter. Engagement with experts and industry has been synthesised into a set of focus areas for Australia to use renewable energy to support the regrowth of Australia's economy in a post COVID-19 world. The following six focus areas form the foundation of this economic rebuild (Figure 1).

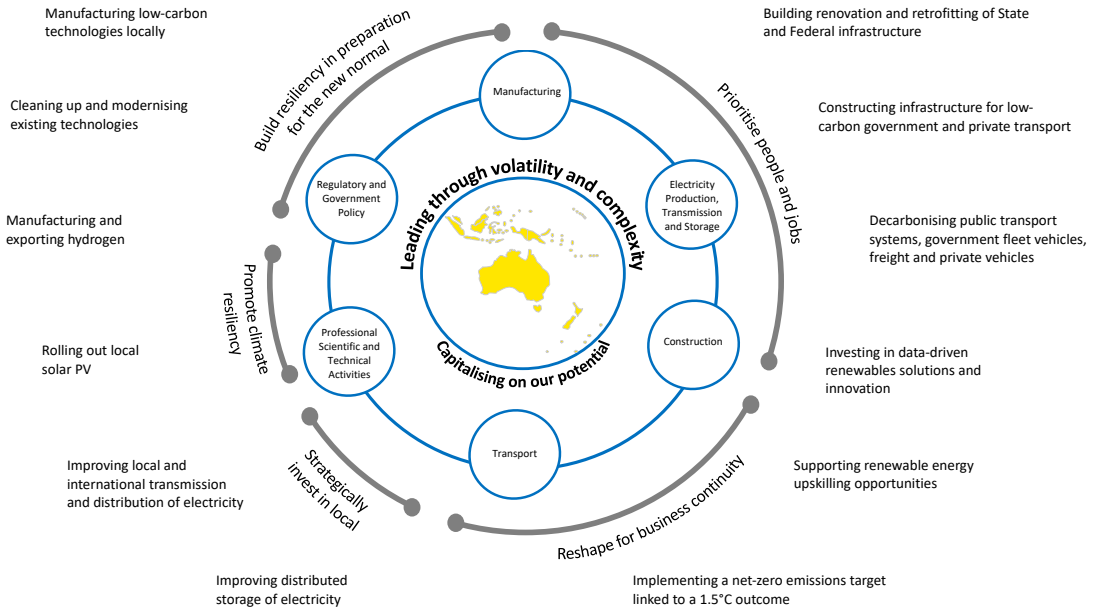


Figure 1: Focus areas matrix indicating the interrelationships of the 12 opportunities (text external to the diagram) with the 6 focus areas (yellow circles), with 5 broader policy trends necessary for the transition (outer-most grey ring)

- **Reimagining our manufacturing and export industries to increase competitiveness,** including manufacturing low-carbon technologies locally, electrifying and reducing GHG emissions from existing manufacturing and manufacturing, using and exporting green hydrogen

- **Incentivising renewable electricity generation, transmission and storage, and energy exports,** including increasing community rooftop solar photovoltaics (PV), improving local and international transmission and distribution of electricity and improving distributed storage of electricity

- **Directing infrastructure investment towards zero carbon activities** including building renovation and retrofitting of State and Federal infrastructure

- **Rethinking and decarbonising transport**, including constructing infrastructure to enable public transport, government fleet vehicles, and private vehicles to run on renewable electricity

- **Investing in Australian research, training, innovation and technology,** including investing in data-driven renewables solutions and innovation and supporting renewable energy upskilling and education opportunities

- **Regulatory and government driven climate action,** including implementing a 2050 net-zero emissions trajectory and target.

2. COVID-19: Impact and response

2.1 Impact

Economically, the COVID-19 crisis has caused a supply shock, aggregate demand shock and liquidity squeeze in a less robust, fragmented global economy with higher levels of debt and lower interest rates than previous Black Swan events.

In many countries, the response has been to require specific industries to close, and to limit the operation of others through physical distancing requirements: this has precipitated job losses and GDP impacts to manage public health. Similarly, the need to limit physical interaction, such as governments prohibiting non-essential travel, has significantly reduced demand, forcing some businesses to close, decreasing the turnover of others and resulting in widespread job losses.

The impacts from COVID-19 are varied between industries, locations, and demographics. Four significant economic trends are resulting from the COVID-19 crisis. These trends transcend industries, and demonstrate the impetus for Australia, and the world, to re-evaluate the current economy, and prioritise an economic rebuild.

- **Supply chain disruption:** COVID-19 has resulted in significant disruptions to global and domestic supply chains. With forced government lockdowns, increased hygiene control and border closures. Our globalised world has been crippled, with limited capacity to trade across regions, therefore re-prioritising an onshore supply chain.
- **Business resilience and agility:** Through necessity, COVID-19 has forced businesses to reconsider their strategic priorities and adapt to a new way of working. As businesses navigate the short-term crisis, there is a concurrent requirement to reshape and reimagine a new business-as-usual environment in a post-crisis world.
- **Changing consumer behaviour:** Consumer spending patterns have changed in response to the crisis, weighted towards essential items and decreased discretional spending. In a post-crisis world, a significant portion of consumers will exhibit behavioural change, which will be guided by income levels and demographics.
- **Reduced pollution and GHG emissions:** The reduction in economic activity, mainly manufacturing and transport (including aviation, road and sea transport), caused by COVID-19 shutdowns has seen a corresponding reduction in pollution, highlighting the resilience of the natural world.

2.1.1 Supply chain disruption

Production shutdowns, national border closures and increased hygiene controls due to COVID-19 have significantly disrupted global and domestic supply chains. A halt in manufacturing due to forced government lockdowns abroad, firstly and particularly in China, has translated to an unavailability of many inputs to Australian businesses and final consumer goods. Additionally, border closures and increased health compliance across the logistics chain have slowed the overall speed of the supply chain. In the first quarter of the 2020 calendar year, imports decreased 3% in January and 14% in February, with further reductions expected throughout 2020 (Figure 2).

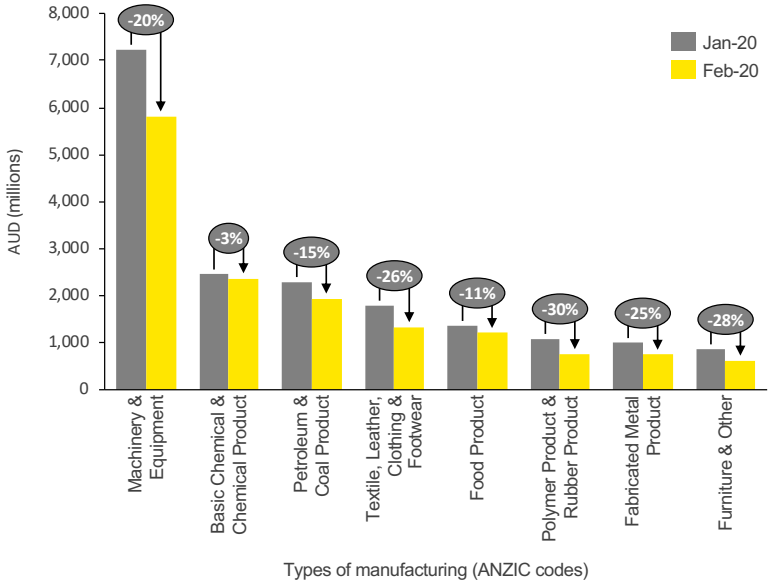


Figure 2: Australian imports in January and February 2020 for key sectors (EY analysis, ABS data)

Manufactured goods have seen some of the largest drops in absolute and percentage terms from January to February (Figure 2), likely the result of supply chain disruption alongside reduced local demand. A consequence of this supply chain interruption has been an enhanced focus on local manufacturing security with the potential for the expansion of Australian manufacturing in strategic areas where we possess a competitive advantage. Specific manufacturing examples and trends resulting from this crisis include:

- Re-building manufacturing capabilities onshore to secure supply chains and reduce reliance on international producers and suppliers.
- Domestic demand responses, such as Tindo Solar – Australia's only solar panel manufacturer – experiencing record sales since the start of March.
- Food security and supply availability concerns have driven the consideration of transforming Australia from a net importer of chemical and fertiliser manufacturing, to a net exporter. Additionally, this will contribute to strengthen the historically strong Australian agriculture sector.

2.1.2 Business resilience and agility

As sections of the Australian economy have gone into hibernation, COVID-19 has tested business resilience and agility through greater workforce flexibility, realignment of strategic priorities, development of IT and communications infrastructure and the cultural shift towards new ways of working.

- **Workforce flexibility**: Businesses have seen increased remote working, changed hours and adaption to new physical distancing and public health measures. Many businesses have observed the possibilities and productivity of remote work, which will likely increase after COVID-19. However, the need for physical social interaction and the inability of the majority of labour-intensive (manual) jobs to be undertaken remotely suggests this trend is likely to have less of an aggregate impact throughout the entire economy than many "work futurists" are hypothesising.

- **Realignment of strategic priorities**: The sudden shock of the COVID-19 crisis has forced businesses to re-evaluate their business models and cashflow in the short-term, and realign their strategic priorities and plans for the longer-term. Particular trends include a focus on increased supply chain security, sustainable growth and crisis planning and management.

- **Development of IT and communications infrastructure**: A rapid digitisation and upscaling of IT infrastructure and communications systems and protocols has occurred due to the physical distancing requirements imposed during COVID-19. While some of this may be scaled back after the immediate crisis, much of the infrastructure and acquired knowledge will remain, resulting in enhanced productivity.

- **Cultural shift towards a new way of working**: Arguably the most significant medium to long-term change for the private sector will be a more creative, empathetic and dynamic approach to working and communicating. This provides an opportunity for enhanced diversity and inclusion, including for parents of young children, geographically remote individuals and those with physical disabilities, lifting output and well-being overall.

These trends constitute large elements of the current state of flux in business which make this moment in time the right time for strong decisive leadership in policy and stimulus.

2.1.3 Changing consumer behaviour

COVID-19 has resulted in large job losses, significant health and well-being concerns and reduced consumer confidence which has seen distinct changes in consumer spending patterns. Consumer confidence has fallen by over 30% in the past five months according to the ANZ-Roy Morgan consumer confidence index, with other consumer confidence indexes such as the Westpac-Melbourne Institute index displaying similar trends. This decline in consumer confidence is a result of the inherent uncertainty of the COVID-19 crisis and job losses with real world implications for spending behaviours. Recent data from the big four banks has evidenced this trend, particularly relating to an increase in spending on essential goods, decrease in discretionary spending, and higher expenditure on physical goods relative to services, and lower expenditure on services overall.

Looking forward, EY's FutureConsumer.Now research suggests a significant percentage of consumers will exhibit behavioural change and increased spending in certain areas in the COVID-19 recovery phase and beyond. Post COVID-19, some global consumers have recently suggested they will be willing to pay a premium for certain products and services (Figure 3): onshore manufacturing of products and more sustainable of products and services were the second and third most compelling justifications for consumers paying a premium. It is anticipated that Australian consumers will follow this global trend and be willing to pay a premium for more sustainable options, representing an opportunity in the form of local and sustainable manufacturing.

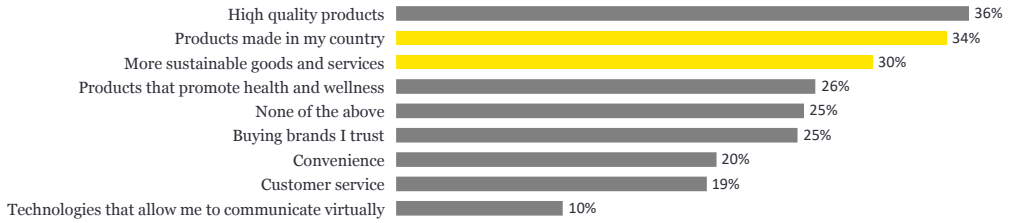


Figure 3: Reasons for consumers to pay a premium for products and services post COVID-19 (EY FutureConsumer.Now, April 2020)

2.1.4 Reduced pollution and GHG emissions

The sudden reduction in production stemming from COVID-19 has seen a corresponding reduction in pollution, with air and water pollution being more obvious examples. Similarly, GHG emissions are likely to show reductions from business as usual.

Air pollution is one of the world's leading risk factors for death, with the Global Burden of Disease study estimating that it contributes to over 3.4 million premature deaths.[7] Further, 91% of the world's population lives in places where air quality exceeds the World Health Organisation's (WHO's) guideline limits.[8] There is a growing body of evidence that suggests long-term exposure to air pollution can impact other aspects of health and wellbeing, including early childhood cognitive function. Acute events such as the recent 2019/20 Australian bushfire season brought poor air quality to much of Australia's population: the carbon dioxide (CO_2), carbon monoxide (CO), sulfur dioxide (SO_2) and nitrogen dioxide (NO_2) found in bushfire smoke can be toxic to the environment and human health.

COVID-19 and the Australian bushfires have had major economic and environmental consequences. COVID-19 represents the most challenging hurdle for Australia's economy since World War II. For bushfire-affected areas experiencing already depressed economic activity the COVID19 economic impacts have been severe..

Past recessions have shown that quick recoveries – quick being within three years – are possible, but their speed and coverage is uncertain. For example, after the Great Depression, WWII and the Spanish Flu, the Australian economy had an average of 8% growth in the three years following each recession.[9] Australia's rebound will depend in part on strategic investment across all regions, especially those local government areas affected by the bushfires and reduced tourism.

But while the acute impacts of COVID-19 have drawn an almost immediate policy response, addressing the longer term chronic impacts of climate change similarly requires economic and industrial innovation. Longer term, air pollution and GHG emissions will be strongly influenced by the approach to economic recovery and stimulus priorities following the COVID-19 crisis

2.2 Response: stimulus opportunities

2.2.1 Stimulus options

The Australian Government has implemented large fiscal stimulus packages while the RBA has utilised many of its monetary policy levers in an attempt to lessen the impacts of COVID-19. The already fragile Australian economy appears to be most heavily impacted by reduced local demand. COVID-19 will continue to transform global economies, with Australia not immune to its impacts. However, in part due to the early measures Australia took to limit the spread, Australia is now in a stronger position to many of our country peers in addressing the challenges of COVID-19.

But while other challenges facing Australia and the world have been pushed from the front pages, they have not gone away. Climate change remains a pressing global challenge – the world is already on

[7] GBD 2017 Risk Factor Collaborators – "Global, regional, and national comparative risk assessment of 84 behavioral, environmental and occupational, and metabolic risks or clusters of risks for 195 countries and territories, 1990-2017: a systematic analysis for the Global Burden of Disease Study 2017.

[8] World Health Organisation, Ambient air pollution: A global assessment of exposure and burden of disease 2016.

[9] COVID-19 and summer bushfires: The economic impact on your suburb and pathways to recovery, SGS Economics and Planning, 2020.

track to record its hottest year ever[10] – while lethargic growth amongst many OECD countries and increasing inequality in our societies, already presents long-term structural challenges.

The acute economic effects of COVID-19 need to be managed (Figure 4): wage support and tax incentives can meet those short-term needs[11]. But long-term growth is best served by approaches which position the Australian economy for inevitable future changes, rather than uncritically following historic patterns. This includes prioritising green construction projects such as clean energy infrastructure (e.g. renewable energy assets, and new energy storage opportunities such as hydrogen and grid mobilisation) where they demonstrate a high economic impact.

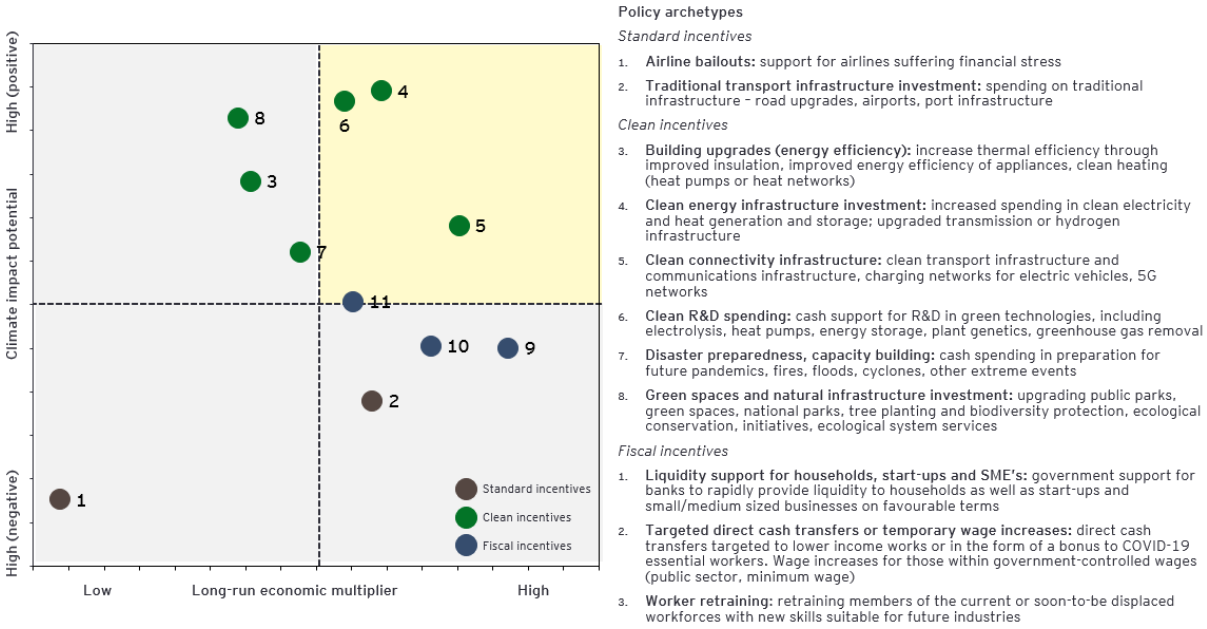


Figure 4: COVID-19 policy archetypes mapped to climate impact potential and long-run economic multiplier [12]

COVID-19 is a global disaster that will take time to address: its short-term impacts have been severe, with every indication that the future may look very different to the past. However, there will be a future recovery, and we have a window of opportunity to achieve long-term benefits (economic and climate). Communities need employment, the country needs growth, and our challenge is to ensure that policy and economic stimulus decisions taken now meet both immediate needs, and also create the foundation for long-term sustainable growth. Focus areas in renewable energy use domestically and for exports would align with our climate goals, deliver jobs and growth, and position us as a new world superpower for a growing energy market.

[10] National Centers for Environmental Information. Global Climate Report. March 2020.
[11] Adapted from Hepburn et al 2020, *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change*? Oxford Review of Economic Policy 36(S1): forthcoming.
[12] Adapted from Hepburn et al 2020, *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change*? Oxford Review of Economic Policy 36(S1): forthcoming.

3. A renewable exports stimulus plan

A stimulus package focused on decarbonising the economy post COVID-19 would open up major economic, social and environmental opportunities for Australia. Continued investment in energy efficiency, electrification and renewable energy such as solar, batteries, wind, hydrogen and fuel cells are important to create and reshape thousands of jobs in the electricity, transport, manufacturing and industrial sectors while reducing Australia's emissions.

But an economic rebuild will not occur without collaboration. Government (federal and state), private sector, non-profit organisations and communities are all necessary contributors. Government policy, coherent regulatory frameworks, and private investment are fundamental for Australia to develop innovative, low-carbon technologies and economic activities.

With the support from public and private sector leaders, if executed consistently and coherently, the opportunities identified in this report for economic stimulus could rebuild the Australian economy and provide extensive employment opportunities, while simultaneously positioning Australia as a new order energy superpower. An objective within Australia's economic rebuild is to accelerate transition towards becoming the leading global exporter of renewable energy by 2030 and put Australia on the pathway to 700% renewables. Transition, in this context, refers to the macroeconomic, macrosocial and macro-environmental change from the status quo to the target condition – cementing Australia's position as the leading exporter by 2030.

The following criteria were used as the guiding principles to ensure that the focus areas and opportunities included in this report are economically impactful, politically engaging and align to an innovation agenda.

- **Prioritise people and jobs:** Stimulate job creation and redeployment across existing and new industries
- **Reshape for business continuity:** Be cost effective, politically feasible and manage the impacts of this health crisis in the short-term
- **Strategically invest in local:** Promote capital investment and commercialisation of onshore supply chains and technology
- **Promote climate resiliency:** Prioritise climate adaptation and mitigation and align opportunities to achieving Australia's Paris Agreement target
- **Build resilience in preparation for the new normal:** Develop a local knowledge economy and focus on rebuilding in a post COVID-19 world where economic priorities have strategically shifted

3.1 Stimulus focus areas

Within the six focus areas, 12 detailed opportunities which support Australia to realise its economic, jobs and renewable energy potential in a post COVID-19 world were identified. These strategic opportunities are outlined in Table 1 below with a more detailed analysis provided in Annexure 1.

	Focus Area	Opportunity	
	**Restarting our manufacturing industries**	**Manufacturing low-carbon technologies locally**	*Support the Australian manufacturing industry to build components for clean energy projects and energy efficient equipment for buildings locally while increasing export subsidies*
		Cleaning up and modernising existing manufacturing	*Support the Australian manufacturing industry to improve the energy and emissions efficiency of their plant, equipment and operations, which will in turn increase their competitiveness domestically and internationally*
		Manufacturing, using and exporting renewable hydrogen	*Commercialise production, develop infrastructure, build capabilities, drive demand and promote green steel and ammonia industries with an end-goal of exporting embodied renewable energy in the form of high-value products*
	**Incentivising electricity generation, transmission and storage, and energy exports**	**Rolling out community solar PV**	*Install rooftop solar PV on all public housing, low-income rental housing, community organisations, and all state infrastructure (where feasible), and expand financing options*
		Improving local and international transmission and distribution of electricity	*Create high quality, integrated transmission networks domestically and internationally, accelerate the development of Renewable Energy Zones, and develop regional and remote microgrids*
		Improving distributed storage of electricity	*Increase distributed energy storage in communities and homes, and increase coordination of and demand for distributed energy resources*
	**Directing infrastructure investment towards zero carbon activities**	**Building renovation and retrofitting of state and federal infrastructure**	*Strategically invest in government building renovations and retrofits, while maintaining the historical significance of such buildings*
	**Rethinking and decarbonising transport**	**Constructing infrastructure for low-carbon government and private transport**	*Incentivise the uptake of private vehicle owners purchasing electric vehicles, whilst simultaneously supporting current electric vehicle owners through increased charging infrastructure*
		Decarbonising public transport services, government fleet vehicles, freight and private vehicles	*Accelerate the electrification of all public transport, and develop and construct electric public transport infrastructure which will in turn have supply- and demand-side benefits*
	**Investing in Australian research, training, innovation and technology**	**Investing in data-driven renewables solutions and innovation**	*Increase funding for renewable energy innovation hubs, incentivise data collaboration, and create a streamlined system to support R&D tax incentives*
		Supporting renewable energy upskilling opportunities	*Future-proof Australia's professional, scientific and technical knowledge-base, and provide increased subsidies for renewable energy education and training opportunities*
	**Regulatory and government driven climate action**	**Implementing a net-zero emissions target linked to a 1.5°C outcome**	*Establish an economy-wide net-zero emissions target by 2050*

Table 1: Outlining the detailed opportunities for economic stimulus in Australia's economic rebuild through six key focus areas

3.2 A comprehensive and strategic approach

The focus areas identified in this report are focused on gently nudging the economic order towards clean, financially viable solutions. The focus areas are supported by a comprehensive and coordinated renewable energy and sustainable finance approach to drive economic growth, employment, export capabilities and financial sector investment (Table 2). The focus areas outline Australia's blueprint for renewable energy success, support growth across value chains and deliver long-term economic and employment value, even during turbulent times, with volatile markets and growing unemployment.

Focus Area	Horizon	Type of Measure				Financial Mechanism	Gravity
		Govt. spending	Tax	Subsidy	Regulatory Reform		
Restarting our manufacturing industries	Medium	√		√	√	► State and Federal Government Loan Guarantee ► Tax subsidies for process electrification ► Export subsidy ► Export Development Grant	
Incentivising electricity production, transmission and storage, and energy exports	Medium	√		√	√	► Government funded interest-free loan ► Subsidy ► Export subsidy ► Peer-to-peer energy trading	
Directing infrastructure investment towards zero carbon activities	Medium	√		√	√	► Co-investment ► State and Federal Government Loan Guarantee	
Rethinking and decarbonising transport	Medium	√	√	√	√	► Federal Government Loan Guarantee ► Tax offset/exemption	
Investing in Australian research, training, innovation and technology	Short	√	√	√	√	► Tax offset ► Delegated Government Organisation Funding ► Education subsidy	
Regulatory and government driven climate action	Long	√	√		√	► Net-zero GHG emissions 2050 target ► Offsets market	

Table 2: Focus Areas Matrix – assessing each Focus Area's time horizon, type of measure, financial mechanism required, gravity and risk

3.3 The employment and investment case for stimulus

3.3.1 Immediate employment impacts of COVID-19

As a direct result of the acute COVID-19 crisis, unemployment and underemployment within Australia has risen and is expected to continue to do so despite the Federal Government wage subsidy programme. These trends are economy wide with all industries being disrupted to some degree. This is demonstrated by the change in employment across sectors (Figure 5), with wages also appearing to fall. The education and training sector was the only exception: however, this increase in employment is not expected to continue due to employment reductions in tertiary education resulting from decreased international students and online learning.

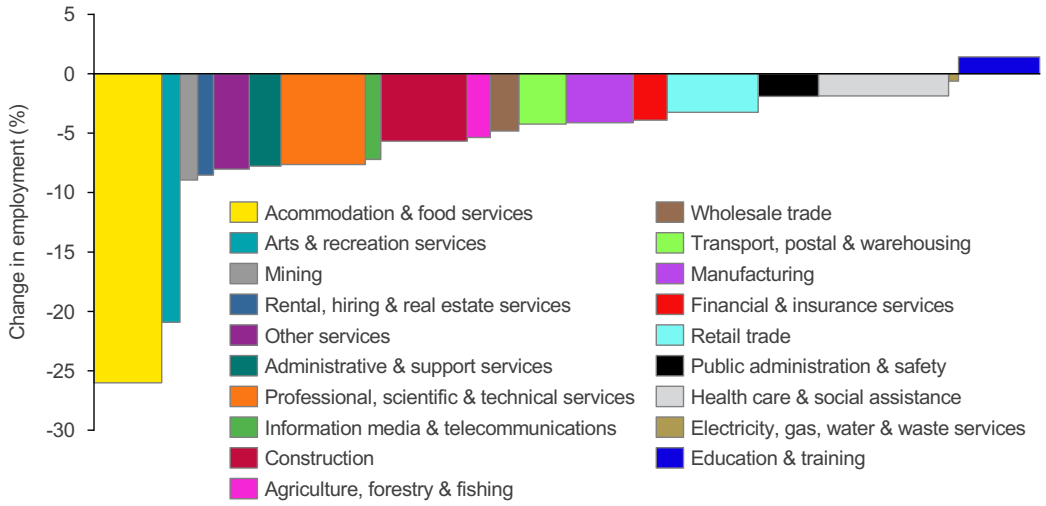


Figure 5: Changes in employment across Australia's sectors from March to April 2020, weighted by total employment

3.3.2 Future investment, future jobs

An Australian renewable stimulus could support the Australian economy, in particular employment for the workforce which has been impacted by the COVID-19 crisis. The impact of a renewable stimulus would be to both drive new employment growth and provide greater diversity within the broader economy. There is an option to transition employment through fiscal stimulus, and through strategic redeployment and reskilling, to accelerate and diversify employment gains.

And there is good reason to invest for growth in the renewables and renewable export sector: every $1 million of spending generates 4.8 full-time jobs in renewable infrastructure and 4.95 full-time jobs in energy efficiency[13]. Given these employment effects, a modest expansion of Australia's current COVID-19 economic stimulus package ($153.6 billion from the Commonwealth, $11.8 billion from the states and $105 billion in Reserve Bank of Australia lending[14]), would see significant employment growth across all sectors, including those impacted by COVID-19.

For example, were 10% of total stimulus directed towards clean projects, 160,000 additional employment opportunities would be unlocked, an employment return on investment around three times

[13] Adapted from Hepburn et al 2020, *Will COVID-19 fiscal recovery packages accelerate or retard progress on climate change*? Oxford Review of Economic Policy 36(S1): forthcoming.
[14] Australian Government, EY Analysis.

greater than would be generated by similar spending in fossil fuel sectors. By comparison, every AUD$1 million of spending generates 1.7 FTE in fossil fuel industries.[15]

From an export perspective, 16,000 jobs and over $10 billion in export revenue are expected from production of hydrogen for export by 2040 under a high hydrogen demand scenario (global demand of 80 million tonnes)[16] with broader employment benefits such as up to 25,000 additional manufacturing jobs by capturing 6.5% of the global steel market. [17]

To place the costs of this green stimulus package in context, it represents a fraction of the immediate government stimulus package while generating significant job numbers and reorienting the economy towards a more strategic, low-carbon trajectory.

3.3.3 Skills and re-skilling

Inherent in this job creation is the need to consider the skills of those made unemployed and the skills required for these new jobs in low carbon projects.

EY has identified key skills which we believe will be central to rebuilding the Australian economy, post COVID-19. Coupled with this skills analysis, we have utilised the ABS's estimated job losses from March-April 2020 and analysed the key industries which have been, and are likely to continue to be, impacted by the COVID-19 crisis.

Economy wide, there are opportunities for upskilling and redeployment of employees impacted by the COVID-19 crisis to support an economic rebuild. The sectorial job losses capability matrix below (Table 3) indicates the skills vital in a renewable energy transition, and maps these skills to each sector, to demonstrate the wide-ranging opportunities for upskilling and redeployment. The severity of job loss is represented horizontally across sectors via a colour scale, while key skills for a renewable energy economic rebuild are represented vertically. Approximate estimates for absolute job losses are displayed for each sector on the far right for additional perspective to the percentage changes already presented.

With the exception of Arts and Recreation Services, there is a significant overlap in the skills between highly impacted sectors and the new economy employment needs. As discussed further below, job losses in Construction, Manufacturing and Professional, Scientific and Technical Services have potential to be redeployed in a renewable energy transition with adequate supporting policy and stimulus.

[15] Adapted from Garrett-Peltier 2017, Green versus brown: Comparing the employment impacts of energy efficiency, renewable energy, and fossil fuels using an input-output model. Economic Modelling, Volume 61.

[16] ARENA, Opportunities for Australia from Hydrogen Exports, 2018.

[17] Grattan Institute, Start with steel: A practical plan to support carbon workers and cut emissions, 2020.

Sectorial job losses capability matrix		Vital skills									Job losses from the start of March to April[18]
		Legal	*Financial*	*Business*	*Engineering*	*Project Management*	*Skilled Manual Labour*	*Unskilled Manual Labour*	*Logistics*	*Technology*	
ANZIC sectors	*Agriculture, Forestry and Fishing*			√		√	√	√	√	√	17,000
	Mining			√		√	√	√	√		21,000
	Manufacturing		√	√		√	√	√	√	√	**38,000**
	Electricity, Gas, Water and Waste Services					√	√	√		√	1,000
	Construction			√		√	√	√	√		**68,000**
	Wholesale Trade		√	√		√	√	√	√		19,000
	Retail Trade		√	√			√	√	√		41,000
	Accommodation and Food Services			√			√	√			**243,000**
	Transport, Postal and Warehousing					√	√	√	√		28,000
	Information Media and Telecommunications	√		√		√				√	15,000
	Financial and Insurance Services	√	√	√		√				√	18,000
	Rental, Hiring and Real Estate Services	√	√			√					19,000
	Professional, Scientific and Technical Services	√	√	√		√	√			√	**90,000**
	Administrative and Support Services					√	√	√			34,000
	Public Administration and Safety	√	√	√		√					16,000
	Education and Training					√	√				(16,000)[19]
	Health Care and Social Assistance					√	√				33,000
	Arts and Recreation Services						√				52,000
	Other Services							√			40,000

Table 3: Job loss capability matrix for all sectors against the key skills needed in a renewable transition

[18] EY analysis of ABS data from the start of March to the start of April.

[19] Denotes estimated employment gains from the start of March to the start of April.

The three industries we have identified with the potential to support the rebuild of the Australian economy are as follows:

- **Construction:** The third largest employer in the Australian economy also experienced the third largest job losses from March to April and possesses the expertise and appetite to develop much of the physical infrastructure for Australia to become a renewable energy economy. An additional 58,000 construction jobs could be unlocked through the fast tracking of new renewable projects,[20] accounting for nearly all construction jobs lost to date due to COVID-19.

- **Professional, Scientific and Technical Services:** Australia's fourth largest employing sector suffered the second largest job losses from March to April and possesses the relevant business acumen and project delivery experience to power much of the planning, operation and management required in Australia becoming a major renewable energy exporter.

- **Manufacturing:** The seventh largest employer in the economy experienced the seventh largest number of jobs lost from March to April and possesses skills essential to Australia becoming a large manufacturer of renewable hydrogen and renewable energy embodied exports. Skills and expertise within the manufacturing industry could also support Australia develop the onshore security of supply chains.

These three sectors are predominantly comprised of employment in state capitals, although the Construction and Manufacturing sectors both employ approximately 40% of their workforces in non-capital cities (Figure 6). This implies scope for rural, regional and metropolitan redeployment where job losses have occurred, with less disruption to the livelihoods of these workers.

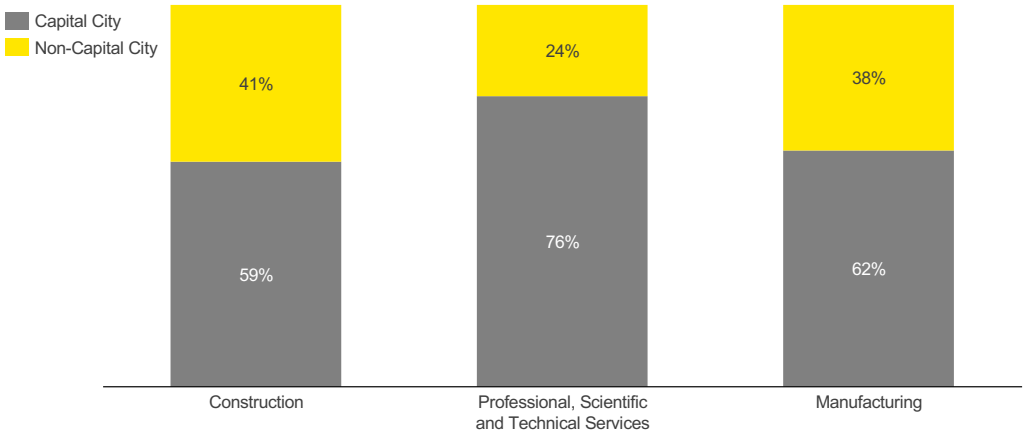


Figure 6: Employment split between capital and non-capital cities for the construction, professional, scientific and technical services and manufacturing sectors (EY analysis, ABS data)

Additionally, the Accommodation and Food Services sector, whilst not having the same skills alignment in the longer-term, has the opportunity to bounce back into employment through untraditional forms. An energy focused example includes undertaking a large-scale energy efficiency retrofit program targeted at the hospitality sector, providing short-term employment of lost jobs before transitioning back to previous forms of employment while simultaneously improving the profitability and sustainability of the hospitality sector in the longer-term.

[20] Clean Energy Council, 2020 and Beyond Zero Emissions, 2020.

3.3.4 Closing the Gap

Since 2008, there has been a conscientious effort by Australian governments to deliver better health, education and employment outcomes for Aboriginal and Torres Strait Islander (ATSI) people, to eliminate the gap between Indigenous and non-Indigenous Australians.[21] After a decade of efforts, the ATSI employment rate was 49% compared to 75% for non-Indigenous Australians in 2018.[22] Further, it was identified that the ATSI employment rate varied by remoteness, with major cities having the highest ATSI employment rate of 59% compared to 35% in very remote areas. There is a growing impetus on state and federal governments to create opportunities for ATSI involvement and employment.[23]

A post COVID-19 stimulus package, focused on widespread development and the use of Australia's vast land and resources for renewable development, could help close the gap. Large scale stimulus could benefit ATSI organisations and communities by sharing the ownership and benefit of the outcomes of renewable energy projects. To date, ATSI participation has not been a major consideration for most renewable development. However, a stimulus package could change this by directly supporting renewables for ATSI communities and encouraging renewable developers to work alongside traditional owners and providing ATSI communities access to additional resources and support to participate in the development of renewable projects.

All governments and private entities involved in cementing Australia's place as a renewable energy export superpower should work with ATSI organisations and communities. This creates the opportunity to drive Australia's renewable energy progress for current and future generations, through direct collaboration with ATSI organisations and communities, bringing traditional and technical knowledge to the forefront.

[21] Closing the Gap, Closing the Gap Report 2020.
[22] Closing the Gap, Closing the Gap Report 2020.
[23] Closing the Gap, Closing the Gap Report 2020.

4. Next steps

There is the opportunity to support economic growth, and the employment that will accompany it, as our economy emerges from COVID-19. But the choices we make about where investments occur in the economy, and the shape of broader economic stimulus measures, will impact the success of this recovery.

Australia *will* rebuild its economy, but it can also choose to incentivise those sectors that maximise employment growth, diversify the economy, and open up new export markets as the world transitions to a lower carbon future. Success would position Australia as a renewable energy export superpower and deliver Australia a competitive advantage on the global stage as nations around the World look to renewable energy options.

This report has set out the opportunity, but this opportunity won't be realised without action. Key to successfully building on our existing renewable energy industries, and building new renewable energy export industries, includes:

- Government successfully leveraging private sector capital and buy-in
- Government and the private sector acknowledging and championing the economic and employment value of an expanded renewable energy sector to Australia, and
- A supportive policy framework, at both Federal and State level, that signals to investors, employers and employees the long-term direction of renewable-energy related growth in Australia.

To be a renewable export superpower, support Indigenous communities and protect Indigenous lands, while creating an economic future compatible with our national and global climate goals, will require strong commitment in the form of government spending, tax, subsidies and regulatory reform. Realising this vision also requires the collaboration of State and Federal government, private actors, non-profit organisations, and communities.

An economic rebuild is possible, but it requires strong commitment and engagement from all. Government-based economic stimulus will in part shape this new normal, this means we have a choice: rebuild the past or invest and position our economies and societies for the future.

ANNEXURE 1:

The opportunities in detail

5. The opportunities in detail

Each of the 12 opportunities have been identified and analysed to ensure maximum impact across the economy, and there are tangible strategies which can be implemented to achieve the objectives and outcomes. The opportunities have been curated based on desktop research and analysis, as well as through engagement with business leaders, to understand their position in relation to the value of each opportunity. The opportunities sit under the six focus areas introduced in the Executive Summary.

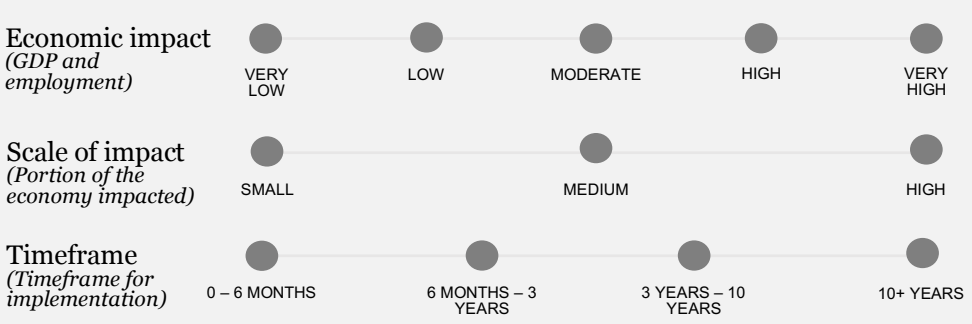
Objectives

- Strategic objective/s of each opportunity to support the overall vision and purpose of the stimulus package split into immediate and long-term objectives

Outcomes

- Outcome/s resulting from implementing the measures associated with each of the opportunities

Gravity



Measures

- Measures to be supported and implemented by state and federal governments to achieve objectives and outcomes split into immediate and long-term measures

5.1 Restarting our manufacturing industries

Opportunity 1: Manufacturing low-carbon technologies locally

Supporting the Australian manufacturing industry to build components for clean energy projects and energy efficient equipment for buildings locally while increasing export subsidies.

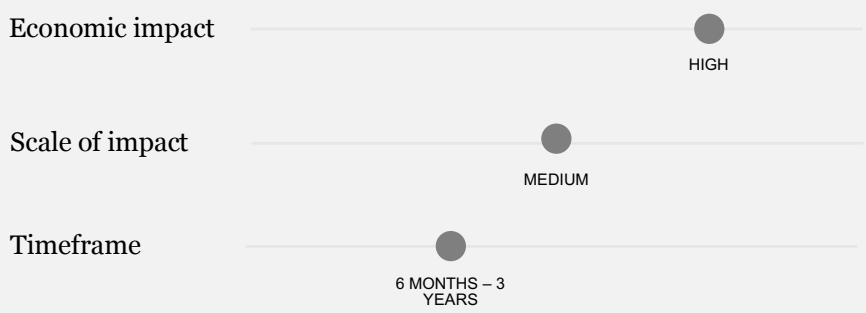
Objectives

- Redeploy displaced manufacturing workers to build energy efficient products and equipment
- Promote the local manufacturing of energy efficient equipment for buildings and their key components, including the manufacturing of high efficiency windows, high efficiency doors, insulation products, hot water fittings, efficient household appliances, high efficiency lighting, and high efficiency heating/cooling and ventilation systems
- Promote the local manufacturing of products, key components and machinery that are essential for renewable energy technologies such as solar, wind, hydro wave, and battery storage
- Promote the local manufacturing of the components for low-carbon transport vehicles (land, rail, air and water).

Outcomes

- Increased short to long-term re-deployment and re-employment of a portion of the Australian workforce impacted by COVID-19
- Increased sales of local clean energy technologies to domestic and international buyers, improving Australian manufacturers' profitability and global exposure
- Reduced emissions within the Australian and global economy as individuals and businesses begin purchasing Australian-produced/supported clean energy technologies
- Fostering financial sector willingness to invest in viable renewable energy projects and technologies (via the CEFC)

Gravity



The development of clean energy technologies in Australia will likely have two main impacts:

- It will re-employ semi-skilled workers who were displaced due to COVID-19 as identified in the employment analysis in Section 3.3 above
- The export subsidies allow medium to large businesses to increase their sales potential. This may also provide these businesses the opportunity to scan overseas markets for franchising or even production opportunities
-

Measures

Short-term

- **Asset write-off threshold:** further increase the instant asset write-off threshold for manufacturers that are developing clean energy technologies

Long-term

- **Increase export subsidies[24]:** increase subsidies for the sale of clean energy technologies and products overseas through the introduction of lower-cost government loans (via the CEFC) or tax relief for exports, or government-financed international advertising or R&D. This could be realised through the existing Export Development Grants Scheme or by a specific renewable energy export mandate for Export Finance Australia (EFA). **Risk hedging**: ensure that risk hedging by the federal and state government and its subsidiary organisations (ARENA, CSIRO, EFA etc.) is compatible with renewable energy and sustainability requirements. Projects that undermine a clean-energy, technologically-driven future, cannot be guaranteed. This can reduce institutional and private investor risk when investing in renewable energy projects as renewable energy projects become more financially secure in comparison to non-renewable energy projects.

[24] Export subsidies are government policies used to encourage the export of goods through direct payment, low-cost loans, tax relief for exporters, or government-financed international advertising. For example, in 2019, the Federal Government announced a Defence Export Strategy worth $3.8 billion, enabling EFA to provide financial assistance to more defence export contractors.

Case study: Tindo Solar

Tindo Solar, Australia's only solar PV panel manufacturer, is expanding its Adelaide factory after an increase in demand as global supply chains are disrupted, forcing customers to consider locally-sourced options. Its current assembly plant can produce up to 60MW of panels each year. Currently, the manufacturer is awaiting the federal government's response to a grant application, which would further increase capacity in the plant and increase production. CEO Glen Morelli indicated that the company has increased production since March 2020, despite COVID-19 hampering some other conventional energy manufacturers – driven largely by an upswell in the Australian community to be self-sufficient producers of renewable energy components and renewable energy itself.

Tindo Solar is an example of a successful and thriving Australian business that is delivering low-carbon technologies to the Australian market, even during COVID-19. Further rounds of funding will allow it to grow, innovate and automate its processes.

Opportunity 2: Cleaning up and modernising existing manufacturing

Supporting the Australian manufacturing industry to improve the energy and emissions efficiency of their machinery and operations. This increases the competitiveness of manufacturing, with studies showing that certain companies could achieve growth in annual profits of 2-13% by increasing their energy productivity to that of their best performing peer within their sector[25].

Objectives

Short-term

- Redeploy displaced manufacturing workers to install and upgrade energy efficient systems and products
- Promote the installation of energy efficient systems and products powered by renewable energy within Australian manufacturers' operations

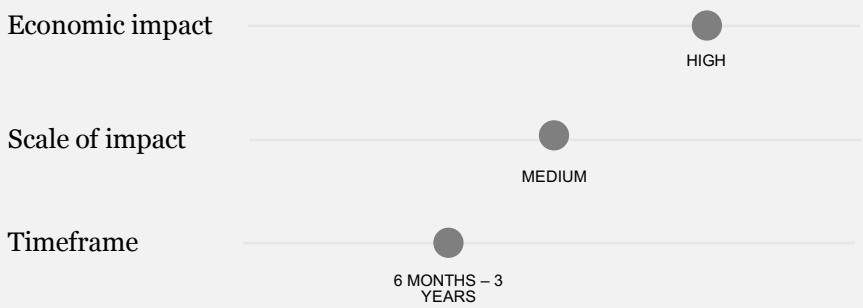
Long-term

- Reduce energy consumption for Australian manufacturers
- Reduce embedded carbon of Australian manufacturing products
- Increase the uptake of renewable energy by Australian manufacturers

Outcomes

- Increased short to long-term re-deployment and re-employment of a portion of the Australian workforce impacted by COVID-19 to install and upgrade lighting, HVAC systems, motors, fans and pumps, compressed air systems etc
- Reduced emissions from the Australian manufacturing sector
- Reduced emissions within the Australian and global economy as individuals and businesses begin purchasing embedded-carbon manufacturing products.

Gravity



Investing in capital and operational improvements could increase employment opportunities for machinery designers, installers and operators while reducing long-term operational costs of manufacturing equipment, and reducing emissions from Australia's manufacturing sector.

Measures

Short-term

- **Asset write-off threshold:** further increase the instant asset write-off threshold for manufacturers that are investing in capital and operational improvements aimed at reducing their emissions profile
- **Enhancement and harmonisation of white certificate energy saving schemes:** Harmonise the individual State-based energy efficiency targets into a Federal scheme with increased target ambition and a broader set of methodologies. This should increase the financial incentive for energy efficiency by increasing demand and broaden the opportunities available for businesses

[25] ClimateWorks Australia, 2016.

Long-term

- **Clean Technology Investment Program (CTIP):** reinstate the CTIP to increase investment and commitment to clean technology development onshore
- **Energy Efficiency Opportunities (EEO) Act:** reintroduce an expanded EEO Act. The original EEO program delivered an additional $291 million in annual net financial savings for participating businesses.[26] The revamped Act should require a lower participation threshold of 0.1PJ, resulting in 399 companies being eligible. Further, the scope of the Act should be extended beyond energy efficiency to include other clean energy options, including renewable energy.

Case study: Unilever Australia switches to 100% renewable energy

In January 2020, Unilever Australia joined Unilever globally in switching to 100% renewable electricity to power all of its operations, well ahead of its end-2020 target. The majority of Unilever's Australian renewable electricity supply is met through a five-year Power Purchase Agreement (PPA) with energy retailer Red Energy, which directly supports a number of wind and solar farms across NSW, Victoria & South Australia. The remainder of Unilever's power supply is covered by purchasing Renewable Energy Certificates.

As a result of making this switch, Unilever is reducing its greenhouse emissions by about 30,840 tonnes of CO_2, each year. This is equivalent to the emissions generated by powering more than 3,600 Australian homes or 6,600 cars annually. The switch is not only good for the environment, but it also makes good business sense for Unilever by delivering a combination of flexibility, cost savings and certainty on energy costs. It also gives Unilever's consumers reassurance that they are purchasing sustainably produced products, for which demand is increasingly growing.

This local milestone demonstrates how Unilever is decoupling its growth from its environmental impact. But there is still more to be done and Unilever recognises the ongoing urgency of addressing climate change, which is why it also set itself the ambition of becoming carbon positive by 2030. The next step will be looking at electrifying more of its manufacturing processes. Unilever will also directly support the generation of more renewable energy than it needs for its own operations, making the surplus available to the markets and communities in which it operates.

Opportunity 3: Manufacturing, using and exporting hydrogen

Hydrogen is a versatile, safe, readily storable and transportable fuel with early opportunities in the fertiliser industry, heavy road transport and through direct gas injection into the existing gas network. While longer-term opportunities exist in the manufacture of zero carbon embodied building materials (e.g. green steel), shipping and as an export commodity. Renewable energy can be used to electrolyse water to generate renewable hydrogen. Research from the Grattan Institute suggests Australia could generate approximately $65 billion in annual export revenue and 25,000 manufacturing jobs by supplying 6.5% of the global steel market. Whilst a significant amount of work is already being done by the public and private sectors in this space, and this should continue, new policies could further support and develop the hydrogen industry in Australia.

[26] ClimateWorks Australia Submission to the Senate Economics Legislation Committee into Energy Efficiency Opportunities (Repeal) Bill 2014.

Objectives

Short-term

- Redeployment and reskilling of the manufacturing workforce
- Commercialise hydrogen production in Australia and support the development of infrastructure and capabilities within the sector
- Update the regulatory environment to support safety and industry standards

Long-term

- Promote the production of green steel and green ammonia (for agricultural fertilisers) locally and supporting the export of embodied renewable energy in the form of these high-value products
- Promote the use of hydrogen in heavy transport and injection in the existing gas infrastructure

Outcomes

- Increased short to long-term employment, especially in regional and remote Australia
- Enhanced economic growth in the medium to long-term
- Reduced dependence on imported fuels
- Increased export of fuels and embodied products (made with hydrogen)
- Reduced GHG emissions nationally and globally.

Gravity

The APEC region includes markets which have identified hydrogen as a strategic opportunity (consuming over 50% of current global hydrogen production),[27] and energy-rich countries with access to ample low-cost renewables. Large energy users in the APEC region (South Korea, Japan, China and the USA specifically) have national level hydrogen strategies. In the short-term, these strategies mainly focus on building demand for hydrogen, investing in fuel-cell technology and developing the supply chain. Further, energy-rich countries with access to cheap renewable resources (Australia, New Zealand, Chile, Canada and the USA) also have national strategies that focus on strategic partnerships with larger energy consuming countries, R&D and piloting green hydrogen projects. As such, in line with the National Hydrogen Strategy, investing in manufacturing and storing hydrogen could have positive long-term benefits for all Australian hydrogen exporters by creating international growth opportunities with large APEC energy users and allowing exporters to employ more workers.

Measures

Short-term

- **Investment in R&D:** reduce production costs, resulting in increased demand. Increased demand will incentivise private investment, which would further advance technological development, this would be best delivered through ARENA
- **Commercialisation**: Continue co-funding through the CEFC commercialisation projects growing in size over the next decade
- **Regulation:** Harmonise regulation across the states with a common criterion, ensuring correct safety standards

[27] IHS Markit, Chemicals Economic Handbook.

	Long-term ► **Legislation:** Legislate and net zero emissions target as discussed further below ► **Increase export subsidies:** similar to the manufacturing of low-carbon technologies ► **Regulatory consistency:** embed regulatory consistency with a nationally coordinated approach, with buy-in from all states and territories. For example, R&D can be driven in NSW, QLD and Victoria that already have established innovation hubs while the physical processes can be conducted by WA and NT that have advanced manufacturing infrastructure ► **Hydrogen hubs:** creation of hydrogen hubs in urban, regional and remote regions to support infrastructure and economic growth, foster innovation and facilitate the sharing of expertise and services. This could be financed through ARENA and CEFC in the form of grants and government-backed loans.

5.2 Incentivising renewable electricity generation, transmission and storage, and energy exports

Opportunity 4: Rolling out local solar PV

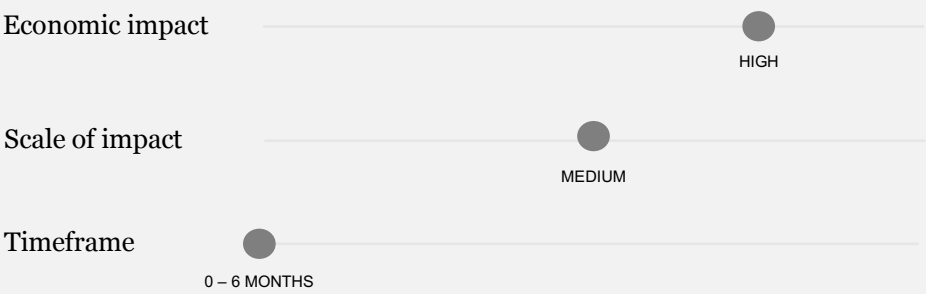
Local solar PV can provide low-cost, distributed energy in the community while delivering large employment benefits as part of a Covid-19 recovery. This would complement the already high uptake rates of residential rooftop and utility scale solar PV.

Objectives	**Short-term** ► Widespread creation of jobs and redeployment of displaced workers, especially for tradespeople ► Installation of rooftop solar PV and batteries on public housing, low-income rental housing and state infrastructure, including schools and hospitals ► Installation of rooftop solar PV and batteries on council and community-owned buildings like kindergartens, rural fire stations, libraries, ATSI organisations and sports clubs ► Respecting and protecting land while deploying community solar
	Long-term ► Creation of long-term employment as installed solar and community batteries require ongoing maintenance and support ► Greater community resilience

Outcomes

- Increased employment within communities, including ATSI communities as labourers and contractors are employed to install and maintain solar PV
- Increased domestic manufacturing of rooftop solar PV (e.g. Tindo Solar) as demand increases and global supply chains are disrupted
- Decreased electricity costs for those living in public housing, low-income rental housing, private homeowners and businesses
- Decreased electricity costs for states
- Reduced dependency on non-renewable forms of energy generation
- Reduction in Australia's energy sector GHG emissions
- Increased private and public resilience to extreme climactic events (as transmission lines may be damaged during floods, bushfires, extreme heat etc.)
- Increased support and benefits for ATSI communities relating to lower electricity prices.

Gravity



COVID-19 has provided an opportunity for state and federal governments to mobilise the labour workforce, who may have been displaced during the crisis. Governments can quickly dispatch workers across the nation to install rooftop solar PV for all public housing, low-income housing and state infrastructure. This would create jobs and boost the economy in the short term, while providing individuals living in these homes with more disposable income due to decreased electricity bills. Although wholesale electricity prices have fallen recently, this is unlikely to be sustained in a post-COVID-19 world, especially as the economy starts ramping up production.

Measures

Short-term

- **Community Energy Efficiency and Solar Grants Program:** expand the program to include a $500 million solar grant program to install rooftop solar on community facilities and in remote communities, covering the full cost of development and installation
- **CEFC Local Government Finance Program:** expand this funding to $400 million, releasing low-interest loans for state and local council governments, land-councils and other ATSI organisations to develop solar farms, rooftop PV on assets such as schools and hospitals, and community batteries.
- **Electric Heat Pumps:** Increase funding for and awareness of electric heat pumps across application (including space, water and industrial heating)

Long-term

- **Procurement Guidelines:** develop joint procurement guidelines to allow councils to enter into a buying consortium in utility solar through mechanisms such as corporate PPAs

Opportunity 5: Improving local and international transmission and distribution of electricity

Creating high quality, integrated transmission networks that unlock strategic REZ, increase interconnection capacity between NEM regions and reduce electricity prices in the long term.

Objectives

Short-term

- Design high quality electricity transmission networks and upgrading current networks
- Fast-track the development of new transmission network projects such as interconnectors: VIC-NSW, SA-VIC, TAS-VIC, SA-NSW, NSW-QLD, Darwin-Alice Springs
- Identify and accelerate the development of renewable energy zones (REZs) and connecting the zones to the grid.

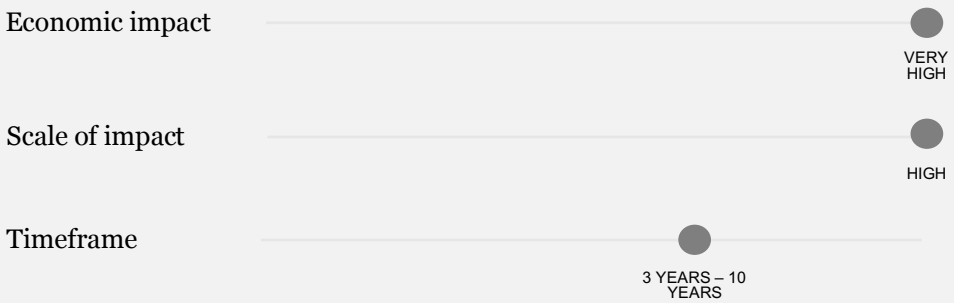
Long-term

- Investigate the opportunity for more international electricity transmission networks (undersea cables between Australia and the Asia-Pacific region)
- Promote the export of Australia's renewable energy

Outcomes

- Increased employment of scientific and technical workers to design and innovate high quality electricity transmission networks, new transmission networks, international networks, REZs and microgrids
- Increased employment of labourers and industrial electricians
- Increased economic growth as demand for the materials used in transmission networks increases
- Increased accessibility to renewable energy for businesses and consumers through larger renewable energy penetrations in the grid
- Better and more technologically and geographically innovative transmission networks will effectively lower the cost of electricity for customers
- Export support will help manufacturers and electricity retailers to invest in capital and maintain operational efficiency
- Unlock more than 50,000 jobs that would flow from currently approved renewable energy projects[28]

Gravity



Efficient and effective transmission networks, both domestically and internationally, are vital to ensuring a clean energy future and promoting economic and jobs growth. Although Australia's networks have evolved over time and there is a shift towards integrating renewables, there are still inadequate infrastructure to unlock much of Australia's renewable energy potential. The NSW Government's REZ Plan, outlined below, will likely create a redistribution of financial sector investment and create technical and construction jobs.

[28] Clean Energy Council, A Clean Recovery, 2020.
Australian renewable export COVID-19 recovery package report – WWF-Australia

Measures	**Short-term** ► **Funding:** Government leadership on a co-funding model between government, transmission companies and generation firms to efficiently and equitably allocate capital and operational costs, including funding the next phase of early planning works for the priority transmission lines ► **Regulation:** Fast-track approval for key projects through the Regulatory Investment Test for Transmission (RIT-T) ► **Renewable Energy Zones (REZ):** Each state and territory to identify at least 3 strategic REZs for development and establish the business case for each ► **Infrastructure fund:** Develop a national transmission infrastructure fund that expedites the approval of new network projects and allows for planning by transmission companies paid for by consumers due to the very low cost when distributed **Long-term** ► **Training and qualifications:** provide subsidised training and qualifications for front-line constructions workers and technical support staff ► **National Electricity Objective (NEO):** Introduce a climate imperative in the National Electricity Objective (NEO) to AEMO's ISP so that it can consider far north Queensland transmission, emissions consistent with the IPCC and the option of RE export ► **Far North Queensland:** Greater prioritisation of transmission to far north Queensland to unlock its valuable wind resource required for a high penetration renewables grid ► **HVDC:** Develop HVDC transmission expertise for the development of the Marinus Link or a HVDC link to far north Queensland or the proposed SunCable project in the NT.

NSW GOVERNMENT

CASE STUDY: NSW Government Renewable Energy Zones (REZ)

The NSW Government's Electricity Strategy outlines the development of three Renewable Energy Zones in the states Central-West, South-West and New England areas by unlocking them with transmission infrastructure. Construction of the initial central west region is expected to start in 2022. The key objectives of the program are:

- Improving electricity reliability
- Increasing affordability
- Supporting emissions reduction
- Engaging communities

The plan will unlock approximately 3GWs of renewable energy generation while supporting up to an expected $23 billion of private sector investment and 2,000 annual construction jobs.

Opportunity 6: Improving distributed storage of electricity

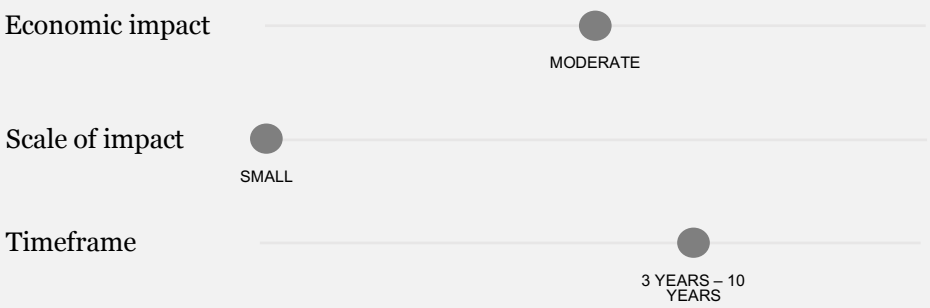
Incorporating distributed energy storage increases reliability and flexibility and provides an opportunity for increased renewable energy in the electricity market. Distributed storage can play a vital role in improving stability and energy security.

Objectiv	**Short-term** ► Increase distributed energy storage in communities and homes **Long-term** ► Increase coordination and utilisation of distributed energy resources

Outcomes

- Greater network stability and reduced network augmentation costs
- Greater distributed storage capacity and utilisation in the grid
- Greater opportunity for variable renewable energy in the electricity market
- Large employment opportunity increases due to the labour-intensive nature of installation (similar to rooftop PV)
- Increased technical knowledge regarding installation, operation and system design of batteries
- Growth of an Australian battery supply chain

Gravity



As technologies improve, distributed storage would support Australia's energy stability, affordability, security and environmental impact. It will also create jobs in the short-term as a workforce is required to install the batteries.

Measures

Short-term

- **National Storage Target:** introduce a National Storage Target operating parallel to the RET and in a similar fashion with regards to the mechanism, regulatory bodies, participants and other elements
- **Battery subsidies:** introduce subsidies for home batteries as a direct per-unit-energy-stored rebate upon installation
- **Regulatory requirements:** create a regulatory structure for VPPs with adequate incentives for and requirements of participants

Long-term

- **Peer-to-peer energy trading:** facilitate peer-to-peer energy trading to increase the economic attractiveness to households and communities
- **Battery discharge:** encourage or mandate all electricity retailers to provide households the option to discharge their batteries at times of network peak demand in return for credit commensurate with the value provided to the network (similar to how Mojo Power engaged with a sample of volunteer customers to trial demand response in 2017)

5.3 Directing infrastructure investment towards zero carbon activities

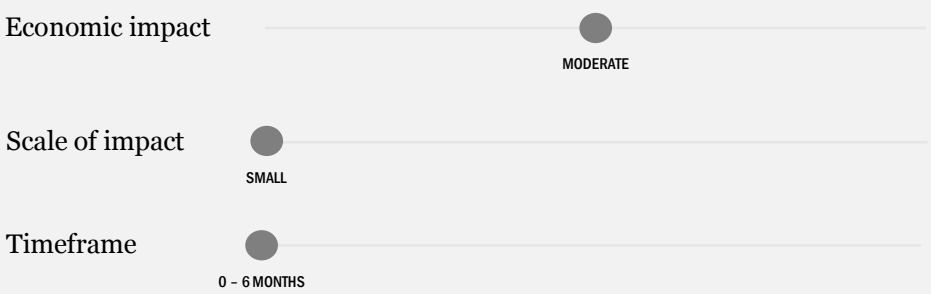
Opportunity 7: Building renovation and retrofitting of State and Federal infrastructure

Energy efficient renovations and retrofitting of government buildings positively contributes to economic growth, job creation, cost savings and environmental protection.

Objectives

Short-term

- Identify government buildings that are energy-intensive, and use this data to invest in strategic renovations and retrofitting
- Maintain the historical significance of state and federal buildings

Outcomes	► Increased employment as planners, architects and labourers are tasked with designing innovative renovation and retrofits ► Renovating and retrofitting allows technical workers to innovate and experiment with novel building concepts, expanding Australia's technical knowledge base ► Retrofitting can increase the commercial value of buildings, which can help governments lease office space ► Improving government buildings' energy efficiency may incentivise private commercial building owners to improve their buildings' energy efficiency
Gravity	 Renovation and retrofitting provide near-term job creation for those who may have been stood down during COVID-19. In addition, a reduction in the energy-related costs of state and federal buildings and a reduction in emissions from state and federal infrastructure could result from these activities. The expected increasing in remote working may also heighten the benefits of this opportunity.
Measures	**Short-term** ► **Investment:** investment in renovating and retrofitting all state and federal buildings with energy efficient upgrades ► **Local manufacturing**: strategically supporting local, onshore manufacturers for the required construction products.

5.4 Rethinking transport

Opportunity 8: Constructing infrastructure for low-carbon government and private transport

Electric vehicles (EVs) are becoming increasingly common, for both government fleet vehicles and privately-owned vehicles. Investing in EV charging infrastructure would help incentivise private vehicle owners to switch to EVs as it would provide more options for them to charge their vehicles.

Objectives	**Short-term** ► Incentivising the uptake of private vehicle owners purchasing EVs
	Long-term ► Supporting current EV owners (including government EV fleet) through greater access to charging infrastructure
Outcomes	► Increased employment to design and construct charging infrastructure, especially in regional towns and along major highways ► Reducing costs for government EV fleets (greater access to charging stations) ► Long-term reduction in costs for private vehicle owners and government fleet as the maintenance costs of EVs are significantly lower than conventional petrol or diesel engines ► Reducing Australia's emissions from the transport sector.

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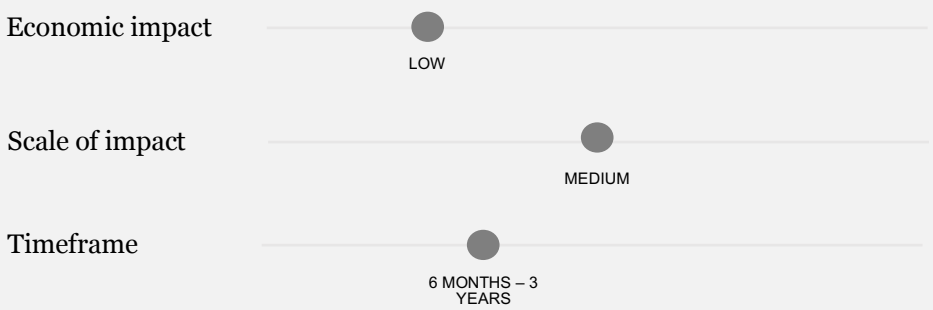

Promoting EVs and their associated industries offer new opportunities for expanding local businesses and employment: businesses could supply and install charging stations, manufacture EV components and systems, conduct R&D and innovation and maintenance of batteries and recycling of parts. This creates substantial economic growth and employment opportunities across many industries and sectors. EVs are also more environmentally conscious (with no exhaust emissions) and if charging infrastructure utilises renewable energy, then emissions are reduced even further. Additionally, due to the reduction in emissions, there are other co-benefits, such as health benefits, especially for communities located close to busy roads. Finally, Australia is heavily dependent on other nations for petroleum imports, and EVs can support with Australia's energy security as they can be powered from domestic renewable energy sources.

Measures

Short-term

- **Approvals:** accelerate approvals of charging infrastructure proposals. For example, in 2018, the NSW Government's Department of Planning removed the requirement for planning approvals for the installation of EV chargers in carparks and depots
- **Building codes:** require all new buildings, including apartment blocks, shopping centres and office buildings to incorporate EV charging stations (via the National Construction Code and Wiring Rules)
- **Regulatory guidelines**: develop regulatory guidelines for the installation of charging points within existing service stations

Long-term

- **Charging infrastructure investment:** co-investment in EV charging infrastructure, including fast charging stations (especially on major highways to ensure comfortable long-distance driving)

Opportunity 9: Decarbonising public transport services, government fleet vehicles, freight and private vehicles

Transport is often the greatest contributor to air pollution in urban areas and contributes to around 25% of global greenhouse gas emissions. Globally, cities and states are deploying electric public transport options which would result in zero exhaust emissions.

Objectives

Short-term

- Financing higher rebates, tax incentives or subsidies for public transport organisations and private freight and fleet owners

Long-term

- Accelerating the electrification of all public transport (buses, trains, ferries and trams)
- Research and development and construction of electric public transport infrastructure (including manufacturing vehicles or components, and the charging infrastructure)

Outcomes

- Increased demand for local manufacturers to construct the key components of EVs, as global supply chains are disrupted
- Increased employment as charging infrastructure is constructed in Australia
- Boosting Australia's understanding and innovation capabilities in relation to electric public transport vehicles
- Lowering operating and maintenance costs of electric public transport
- Longer ranges and short refuelling times
- Lowering reliance on imported fuels
- Increased corporate and private EV ownership

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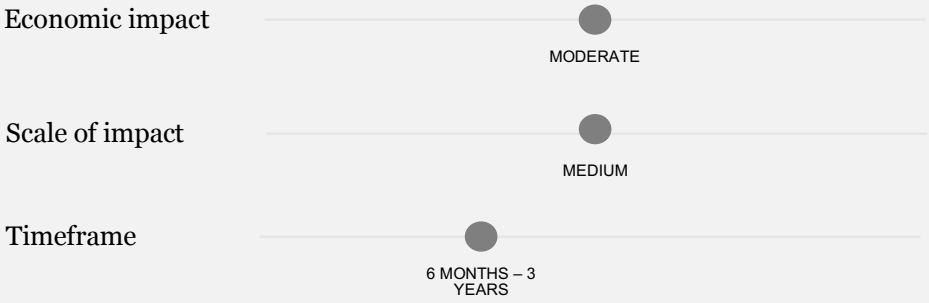

Electric public transport and its associated industries offer exciting opportunities for expanding local businesses and employment. State governments could contract companies to supply and install charging stations, develop EV components and systems, conduct R&D and innovation and maintenance of batteries and recycling of parts. This creates substantial economic growth and employment opportunities across many industries and sectors. Strategic federal government spend could further unlock these opportunities. New technologies are also showing that electric public transport batteries can also be used as part of a distributed electricity storage network, essentially feeding surplus energy back into household supplies or the grid. As discussed earlier in this Report, Australia has a large dependence on foreign fuels and therefore, a transition to electric public transport will increase domestic fuel security.

Measures

Short-term

- **Green loans and financial incentives:** federal government green loans and grants to support state governments with capital injection into the decarbonisation strategy, as well as financing higher rebates, tax incentives or subsidies for corporate and private vehicle owners looking to purchase EVs, either through a one-off payment or reducing buyers' stamp duty or Luxury Car Tax. For example, in the ACT, brand new EV purchasers pay $0 stamp duty and receive a 20% discount on annual registration.
- **Electric bus fund:** establish an electric bus innovation fund to support operators and manufacturers commercialise projects at increasing scale similar to New Zealand's Low Emission Vehicle Contestable Vehicles Fund.
- **Electric public transport**: trialling the use of electric public transport.

Case study: Sydney Airport – Electric blue emu buses

Sydney Airport is at the forefront of utilising electric buses for moving passengers from its long stay car park to its various terminals. The buses, provided by Carbridge, have been popular with customers due to their smooth and quiet operation while improving the Airport's environmental performance. The Airport indicated that the low costs of charging and maintenance have allowed it to lower costs – resulting in a good business decision that positively benefits the environment. The Airport indicated that the low maintenance costs make up for the higher upfront capital costs of purchasing an electric bus.

5.5 Investing in Australian research, training, innovation and technology

Opportunity 10: Investing in data-driven renewables solutions and innovation

Promotion of the development of onshore technological advancements and investment in Australian renewable energy innovation. Currently, there is no systematic, holistic approach to ensure a comprehensive and consistent information base across the technology, innovation and R&D sectors.

Objectives

Short-term

- Increase funding for renewable energy innovation hubs, including ARENA, CEFC and CSIRO's Energy Business Unit
- Increase R&D tax incentives
- Allow entities that have carried out R&D for another entity to claim the R&D tax offset, rather than the entity for which the R&D has been carried out for

Long-term

- Incentivise data collaboration between government and non-government actors.

Outcomes

- Direct technical and scientific employment within Australia (for ARENA, CEFC, CSIRO and other smaller technical organisations and universities), and indirect employment via funding and grants to develop solutions and technology (e.g. manufacturing)
- Stronger base of renewable energy information within the Australian technology sector
- Better financial sector understanding of climate-induced risks, which would allow insurers to effectively cover real economy transition risks
- Greater and more streamlined access to information as all grants/funding/incentives are housed in the one website, reducing the need to monitor different grants/funding/incentive channels
- Enhance professional, scientific and technical skills which can be exported overseas
- Improve collaboration between local technical bodies, government entities and commercial organisations
- Improve and more efficient technologies in the long-term.

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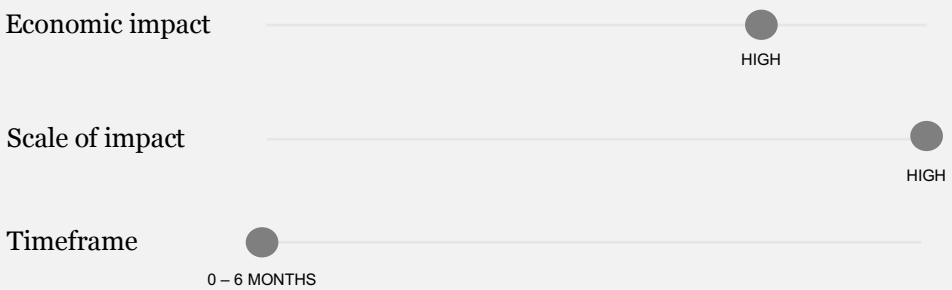

Investing in technical energy workers aligns with Australia's roadmap to reduce emissions. ARENA, CEFC and the CSIRO Energy Business unit partner with local and global companies to deliver energy solutions for a sustainable future, as well as working with state and federal governments, universities, research agencies and industry groups. These important partnerships range from the provision of testing services and short-term contracts, to in-business scientists for SMEs, or longer-term research and strategic alliances.

Increased tax incentives boost the Australian economy by encouraging Australian companies to conduct R&D that may otherwise not have been financially viable. Further, it creates an incentive for smaller organisations, such as start-ups to undertake renewable energy R&D while turning a profit. Lifting the aggregated turnover amount allows larger entities within the industry to begin or continue their existing R&D in renewable energies.

Measures	**Short-term** ► **ARENA funding:** since its establishment in 2012, ARENA has invested approximately $1.46 billion to over 490 projects, ranging from battery storage, to hydrogen fuel, PV power stations and wave energy. To grow this impact and generate an urgent two-year extension for ARENA, consider the Australia Institute's pre-budget proposal of a $460 million top-up of ARENA before funding finishes in mid-2020 ► **Tax offset**: increase the refundable R&D tax offset, which currently sits at 43.5% and non-refundable R&D tax offset, which currently sits at 38.5%, for all eligible entities ► **Regulatory reform:** undertake regulatory reform to allow companies that are conducting R&D activities for another entity to still claim the R&D tax offset **Long-term** ► **Climate risk research:** expand the fundamental research being conducted on the ramifications of climate change to allow the financial sector to better forecast climate-induced risk ► **Incentivise R&D:** develop a consolidated website for all grants, funding and incentives (tax offsets or otherwise). Similar to a Google Search, allow organisations to enter in key words, e.g. 'renewable energy', 'hydrogen' to see all the grants/funding/incentives that are available to them. The website should include information on what the type of funding is, when it will be released, how many weeks organisations have to respond/apply, what documents may be required to respond and any other relevant information.

ARENA
Australian Government
Australian Renewable Energy Agency

Case study: ARENA $70 million funding for large scale renewable hydrogen

ARENA recently announced a $70 million round of funding to expedite the development of renewable hydrogen in Australia. This funding, during COVID-19, is a strategic move to boost the economy and create jobs. The funding aims to support two or more large scale renewable hydrogen projects, with electrolysers of a minimum of 5 MW capacity. It will help fund some of the largest electrolysers in the world and the funding is contingent on projects being powered by renewable energy (either directly or through power purchase agreements (PPAs) or large-scale generation certificates (LGCs).

ARENA has already committed to $55 million in funding to accelerate pre-commercial activities including power to gas and renewable ammonia and has conducted in-depth feasibility assessments for commercial-scale deployments of hydrogen including Dyno Nobel, Queensland Nitrates, Yara and Stanwell. The results of these assessments indicated significant commercial gaps, warranting further funding for hydrogen production facilities in the short-medium term.

This financial support indicates ARENA's goal to take advantage of Australia's vast resources and harness the potential of hydrogen. It also signals its intention to share knowledge and work collaboratively with technical and commercial partners for the construction, production and exportation of renewable hydrogen domestically and internationally.

Opportunity 11: Supporting renewable energy upskilling opportunities

Australia faces a renewable energy and sustainable finance capacity and skills shortage. Strategic investment in software, services and skills is required for a clean energy future.

Objectives

Short-term

- Providing subsidised renewable energy education and training opportunities for the current workforce through upskilling and recognised certification programs.

Long-term

- Future-proofing Australia's professional, scientific and technical workforce in relation to renewable energy, economics and climate change
- Providing greater and more highly paid opportunities for future workers.

Outcomes

- Current and future workforce that is well-versed in renewable energy technologies and identifying climate-related financial risks
- Better understanding of climate-related financial risk across government and non-government entities (where relevant)

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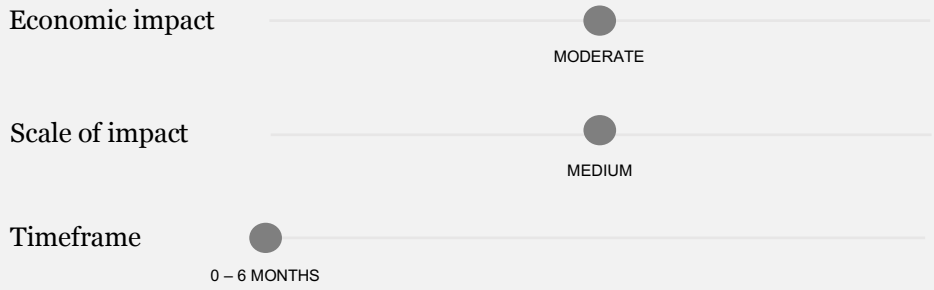

Teaching and upskilling will prepare Australia's workforce for major economic shifts and employment opportunities due to COVID-19. Future-proofing Australia's workforce ensures that all members of society are supported in the transition to net zero emissions. This includes alignment of clean economic priorities and employment opportunities.

Measures

Short-term

- **Tertiary education:** require all economic, commerce, business university and vocational courses to incorporate compulsory sustainability units (e.g. sustainable finance, climate change related financial risks etc.)
- **Education subsidies:** provide subsidised university and vocational renewable energy training for existing students and workers (e.g. via scholarships or university grants)
- **Upskilling trades:** upskill tradespeople to undertake energy efficiency renovating, retrofitting and upgrades, as well as the installation of rooftop solar PV and household and community batteries
- **Regulatory reform:** regulate mandatory requirements for companies to report on their climate-related financial risks (e.g. TCFD)

Long-term

- **School education:** require all primary and secondary education facilities to teach sustainability and climate change-related subjects to students until year 10
- **Risk management:** incorporate the inclusion of environmental risks in risk management systems and calibrate this to capital adequacy requirements (via APRA)
- **Executive training:** promote ongoing sustainability and climate-related training at the senior executive level across private and public-sector organisations.

5.6 Regulatory and government driven climate action

Implementing a net-zero emissions target linked to a 1.5°C outcome

Establish an economy-wide net-zero emissions target by 2050. This will allow flexibility in approach and certainty in outcome for business and industry, allowing Australia to develop a carbon competitive advantage.

Objectives

Short-term

- Establish an economy-wide emissions cap and trajectory consistent with the requirements of keeping global warming below 1.5°C

Long-term

- Transition our economy to a productive, low-carbon one

Outcomes

- Provide business certainty on climate outcomes
- Create a regional comparative advantage for business and the broader economy
- Reduce national emissions to avoid reaching a tipping point of global warming
- Incentivise innovation and greenhouse gas abatement

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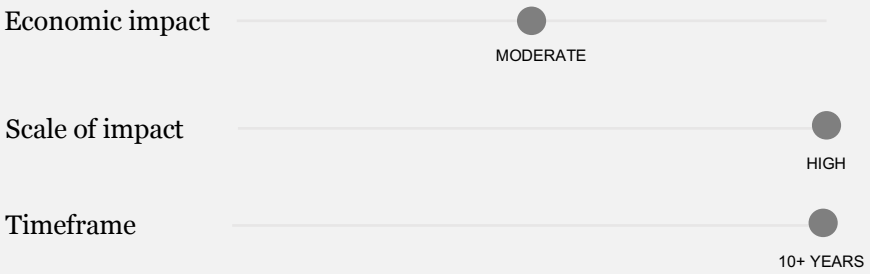

Implementing a target of zero emissions, in line with the Paris Agreement, will reshape Australia's economy, promoting new jobs in existing and new sectors and creating new export opportunities.

Measures

Short-term

- **Budget:** Establish Australia's carbon budget in-line keeping global warming below 1.5°C and continue tracking these emissions
- **Legislation:** Legislate a net zero emissions target by 2050 to allow for flexibility in achieving the outcome
- **Communication:** communicate economic benefits and costs of the policy clearly to the public with a particular focus on obtaining business support

Long-term

- **Expansion:** Conduct economic modelling to determine the least cost approach to achieving net zero emissions
- **Offsets:** Expand the Carbon Farming Initiative to include additional methodologies and funding to allows offsets programs to advance from a simple carbon accounting tool to a method of shared value creating between agriculture and other sectors.

Case study: Lion

Lion is a leading beverage company headquartered in Sydney, Australia. In April 2020, Lion announced its certification to Climate Active's Carbon Neutral Organisation standard. This announcement follows an impressive history of drawing on carbon reduction innovation and technology to reduce greenhouse gas emissions by 28 per cent from a 2015 baseline. Examples of low-carbon expertise drawn from the Australian economy include energy auditing, bio-gas plants, industrial rooftop solar PV installations, and renewable power purchase agreements linked to large scale solar farms in NSW.

The carbon neutral commitment also comprises Australian Carbon Credit Units from shared value projects to support the financial viability of rural communities. Longer term, Lion plans to direct this investment towards regenerative agriculture and building climate resilience within its supply chain.

This multi-dimension success shows the strength and diversity of Australia's emerging low-carbon industry and the potential for further growth with targeted stimulus.

A RENEWABLE FUTURE

CLIMATE CHANGE

As the world moves to act on climate change and fulfil the promise of the Paris Climate Agreement, places that have the best renewable resources in the world have a significant opportunity.

CLEAN ENERGY

Renewable energy such as solar and wind is critical to decarbonising more than two thirds of global emissions, in the electricity, transport, building and industrial sectors.

POPULAR CHOICE

With over 2.1million rooftop solar systems, you just have to walk down the street to see how Australians have embraced renewable energy.

A JUST TRANSITION

WWF-Australia supports a climate action plan that ensures nobody is left behind.

RENEWABLE LEADER

Our goal is for Australia to be a leading exporter and investor in renewable energy with a zero-carbon economy achieved well before 2050.

WWF

Why we are here

To stop the degradation of the planet's natural environment and to build a future in which humans live in harmony with nature.

wwf.org.au

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