

Melbourne Sustainable Society Institute

Growing a clean economy

Opportunities for Australian states and territories

Discussion Paper prepared by the Melbourne Sustainable Society Institute at the University of Melbourne with assistance from Climate Works Australia

Funded by the Lord Mayor's Charitable Foundation (Eldon & Anne Foote Trust).

February 2018

Authors: Dr Laura Schuijers Dr Ben Parr Professor Don Henry

Funded by





ClimateWorks Australia develops expert, independent solutions to assist the transition to net zero carbon emissions for Australia, South-east Asia and the Pacific. It was cofounded in 2009 by The Myer Foundation and Monash University and works within Monash Sustainable Development Institute.

Executive summary

This Discussion Paper presents opportunities for state and territory-level governments to work towards fostering strong economies that facilitate deep emissions reductions by 2050. To achieve these reductions, a multi-sectoral approach will be required. Here, we outline key sectors that can be targeted and highlight important opportunities within each sector. We focus on areas in which state and territory-level governments have regulatory power, arguing that state and territory-level action can be either complementary to or independent of federal action and still lead to significant outcomes. We recommend a coordinated approach beginning as soon as possible, as this will improve the likelihood of transitioning smoothly toward 'clean' economy within the next 30 years. This will be critical in achieving the 'net zero by 2050' commitments of several state governments. Below, each sector covered in this Paper is briefly summarised, followed by a figure highlighting a selection of the key opportunities presented in the body of the Paper (Sections 3-9).

Clean economy agreement

In order to most efficiently and cost-effectively support the transition to a clean economy, we contend that states and territories should work together to achieve their shared goals (Section 2). Recognising that different states and territories have different priorities and different economic contexts, a 'Clean Economy Agreement' would align states and territories in a position to take advantage of each others' experiences and learnings, as well as the benefits of joint action and economies-of-scale, where appropriate.

Sector-based opportunities

Energy

States and territories share what is a broad regulatory capacity over energy policy with the federal government. While states and territories cannot make commitments under international law to the global community, they can take many different measures to support ambitious emissions reductions from energy use, and can set their own individual and joint targets. In particular, states and territories can pursue strong energy efficiency goals through, for example, energy efficiency schemes that target retailers, and they can also help the transition to renewable sources of power by fostering investment in renewables. Experience overseas indicates that strong economic gains and job opportunities could result from state-level action.

Buildings

Nearly a quarter of Australia's emissions are attributable to the building sector. By switching power requirements from gas to electrical and at the same time moving to renewable sources to provide that power, and by also targeting energy efficiency, an emission reduction of 97% could be achieved from the building sector by 2050. When combined with addressing embodied energy, a 'net-zero buildings by 2050' target is achievable. States and territories, which have an important legislative capacity including to give effect to the National Construction Code, can develop policies that target new builds, and can also implement strategies for retrofitting existing buildings or which cover renovations. Upgrading the Code, incentivising compliance with an eight-star energy standard, requiring disclosure of energy efficiency and amending tenancy legislation to target landowner responsibilities are example pathways towards this goal, and represent important opportunities for cleaner economies.

Planning

The planning system governs the way decisions are made at local levels (eg, by councils), and it is principally regulated at the state and territory level. Planning can shape low-carbon development pathways by promoting or requiring low-emissions, energy-efficient infrastructure, buildings and housing, facilitating renewable energy technologies rather than favouring nonrenewable energy, and protecting natural carbon sink assets. Planning laws, as well as environmental impact assessment laws, are key pathways. These laws can require that certain factors - such as climate change mitigation - are taken into account in decisions about the built and natural environment. They can also embed a netzero by 2050 target. Along with measures relating to issues such as consolidation via urban growth boundaries, the regulation of decision-making though planning will have a cumulatively significant effect on emissions reductions and the growth of a cleaner economy.

Just transition

Transport

Transport emissions in Australia are significant, and in almost all states and territories are increasing. Through legislative and policy actions, states and territories can reduce transport emissions by investing in reliable and efficient public transport that is powered by renewables and which has the capacity to reduce reliance on road transport, by promoting non-motorised transport, and by facilitating a transition from petrol and diesel-based passenger and light commercial vehicles to zero emission vehicles. This latter pathway will require bold commitments to increase the number of charging stations and provide incentives like tax and toll exemptions. Transport-sector policies have the potential to support cleaner state and territory economies, including through the creation of new jobs.

Finance

Government treasuries and state-owned corporations can contribute to a cleaner economy by taking the lead in carbon disclosure reporting, and by encouraging other businesses and organisations to do the same. The Climate Disclosure Standard Board's standards for reporting are simple to adopt and incorporate the recommendations of the Task Force on Climate-Related Financial Disclosures. States and territories can also play a strong role in facilitating cleaneconomy lending through green bonds, and can ensure that procurement values lowcarbon options.

Land

Emissions from agriculture and land-use could be significantly reduced in Australia through targeted state and territory-level action. States and territories carry significant legislative capacity, with the EPBC Act guiding federal responsibility. To reach net zero emissions by 2050, the land sector must act as a carbon sink. Agriculture emissions can be reduced if research on low-carbon farming practices with efficiency co-benefits is both supported and disseminated to farmers through practical training (and simple incentives if required to correct market failures). Land-use policies to reduce emissions can target afforestation, reforestation and the protection of native vegetation, as well as fire management, fibre production and soil quality.

Health

The healthcare sector is an important contributor to state and territory emissions, comprising nearly half of governments' direct emissions on account of public hospital energy use. Improving energy efficiency and reducing energy 'wastage' in hospitals will reduce these emissions, as will fuel switching to renewables. The healthcare sector also contributes indirectly through procurement of patient meals, furniture, pharmaceuticals and medical supplies, through vehicle transport, and through waste. Given the sector's strong buying power, states and territories can take actions to change procurement practices and to better support staff and suppliers to reduce emissions.

In order to support the transition in a way that is equitable and just, we recommend that states and territories consider how to support communities dependent on energy-intensive industries when planning to pursue economic decarbonisation (Section 10).

Key policy recommendations by area of state-level power

- Collaborate on a Clean Economy Agreement
- Create a platform to share learnings between states and territories



Energy (p 11)

Strengthen efforts to foster the continued production and uptake of renewable energy, and bring to scale large storage for renewables

Develop/align mandatory energy efficiency schemes and expand schemes to cover fuel switching

Support the deployment of energy efficient technologies, including for households



Buildings (p 16)

Support an ambitious upgrade to the National Construction Code and develop other incentives and guidance toward stricter energy efficiency standards for all buildings

Require energy performance reporting (eg at the time of sale or lease)

Codify a net-zero by 2050 buildings target

Facilitate fuel switching to renewable power for all government buildings including hospitals



Planning (p 19)

Review and amend state-level planning policy frameworks to ensure that climate change, emissions and energy-efficiency are considered in decision-making

Codify the net-zero goal into planning legislation

Use planning frameworks to improve vegetation management for carbon sequestration



Transport (p 22)

Switch to net-zero vehicles for all government fleets including hospital vehicles

Facilitate renewables-powered public transport

Link sustainable transport systems with land-use planning to facilitate low-carbon commuting and accessible neighbourhoods

Support rapid update of electric vehicles through new infrastructure and incentives



Land (p 26)

Develop programmes to support farmers in reducing agricultural emissions

Incentivise carbon-sequestering activities and discourage land clearance on public and private lands



Health (p 29)

Incentivise energy efficient measures for all new buildings and ensure new government buildings meet maximum efficiency standards, including hospitals

Audit, review and adjust procurement in hospitals to favour options with lower embodied emissions

Finance (p 31)

landate sustainability impact assessment and carbon risk reporting

Nobilise finance at the state-level, and facilitate green lending

Contents

Executive summary	1
Key policy recommendations by area of state-level power	3
1. Introduction	5
2. Cooperation to develop a cleaner economy	6
3. Clean energy systems	8
4. Low carbon buildings	15
5. Planning	18
6. Low carbon transportation	22
7. A low carbon land sector	
8. Low-carbon healthcare	30
9. Finance	32
10. Assisting communities in transition	34

1. Introduction

Now is a critical time to grasp opportunities for state-level action on climate change. A window is open to develop and grow cleaner economies that are inclusive of social needs and which cut greenhouse emissions responsible for the dangerous impacts of climate change. Action is being taken around the world at the 'subnational' level which includes states, territories, provinces and cities. This Project Paper focuses on the role of state and territory governments in Australia. It aims to highlight the broad range of powers that these state-level governments can harness across multiple sectors including not just energy but transport, finance, healthcare, land, planning, and the built environment - to deliver progress toward a clean, 'net-zero' economy.

The Paper begins by outlining how joint state-level action could be effected through a 'Clean Economy Agreement' modelled off the successful inter-state/provincial agreement between West Coast US States and the Canadian Province of British Columbia, and through a platform for shared learnings (Section 1). It then overviews opportunities in the Energy (Section 2), Building (Section 3), Planning (Section 4), Transport (Section 5), Land (Section 6), Healthcare (Section 7) and Finance (Section 8) sectors. A holistic and successful approach to developing cleaner economy will require policy and legislative opportunities to be grasped in different sectors or government portfolios. The Paper concludes by exploring how the transition to a cleaner economy can support fossilfuel dependent communities in a just and equitable way (Section 10).

The Paris Agreement has drawn attention to the role that subnational governments can and must play in securing a low-carbon future, and subnational governments around the world including in Germany, China, and North America are realising the benefits that cleaner economies can offer. For instance, a recent analysis of the economic costs and benefits to the 'inland empire' region in California of the key climate policies adopted by the state of California between 2010-2016 found that \$9.1 billion USD more was gained than was spent, and 41 000 more jobs were gained than were lost.¹

It is estimated by the International Energy Agency and International Renewable Energy Agency that global efforts to pursue the Paris Agreement's target to limit global warming to 1.5-2°C above pre-industrial levels will add US\$19 trillion to the world economy and create 6 million new jobs.² Conversely, not taking action, or failing to consider longterm consequences, will come with serious economic risks.³ A business-as-usual path leading to 4°C global warming could cost the global economy US\$23 trillion per year, equivalent to 3-4 2008 Global Financial Crises each year.⁴

In Australia, a country highly vulnerable to the physical impacts of climate change and also their flow-on social and financial effects, modelling by the National Institute of Economic and Industry Research has found that transitioning towards a clean economy by taking action to reduce emissions substantially below 2005 levels by 2030 (ie, pursuing Australia's current Paris Agreement target) could create over 33,000 jobs in electricity, gas, and water sectors by 2030, and almost 80,000 construction jobs.⁵ Renewable energy projects under construction, committed, or completed is expected to deliver over AU\$20 billion in investment and create more than 13,500 direct jobs.⁶ States and territories are already taking meaningful action,⁷ but there is much more that could be done.

In highlighting opportunities for state and territory-level governments, we recognise the concurrent opportunities and responsibilities of the federal government to take action on climate change and create a secure and stable low-carbon economy with certainty for businesses and investors. We argue that, contrary to the way in which climate action has tended to to-and-fro between state- and federal-level leadership in Australia, both levels of government can and should act together. The Federal Government's power to give effect to Australia's treaty obligations and commitments such as its Paris Agreement target does not preclude or interfere with the many opportunities available to states and territories to reduce emissions and foster lowcarbon growth individually and collectively. State and territory governments have a strong suite of legislative options to ensure that their climate policies are robust but flexible, forward-looking, and complementary to, but not dependent on, federal action.

State and territory governments have a strong suite of legislative options for climate policies that are not dependent on federal action

2. Cooperation to develop a cleaner economy

Australian state and territory governments have a significant opportunity to cooperate to reduce emissions - while supporting economic prosperity - through low-carbon development policies. We propose a 'Clean Economy Agreement' as a way for interested states and territories to recognise and give effect to a commitment to joint action. The aim would be to boost individual state and territory efforts through a sharing of learnings and strategies, and by broadening the scale of key initiatives to maximise benefits. The suggestions outlined in the sector-based areas of opportunity in this paper could be incorporated into a Clean Economy Agreement, which could represent a whole-of-government, cooperative approach to generating cleaner state and territory economies. An agreement could help to collaboratively achieve 'net-zero emissions by 2050', a target set by Queensland, New South Wales, Victoria, Tasmania, South Australia and the ACT.

Clean economy agreements have been effective overseas. The Pacific North America Climate Leadership Agreement[®] was made between the states of California, Oregon, Washington in the US, the province of British Columbia in Canada, and the cities of Los Angeles, Oakland, Portland, San Francisco, Seattle and Vancouver in 2016. Together, these state- and local-level governments agreed to work together to:

- Collaborate on the design and implementation of approaches to large building energy benchmarking and disclosure (*low carbon buildings*);
- Develop and implement approaches that encourage consumer adoption of zero emission vehicles (*low carbon transportation*);
- Accelerate deployment of distributed and community-scale renewable energy and work collaboratively on infrastructure and integration into the grid (*low carbon energy* systems); and
- Advance organic waste prevention and recovery initiatives to reduce carbon emissions from the food waste stream and return carbon to soil through composting (low carbon waste).

The Climate Leadership Agreement came out of the Pacific Coast Collaborative, whose aim is to emerge as a region that is 'driven by innovation, energy, geographic location and sustainable resource management, attracting new jobs and investment while enhancing an already unparalleled quality of life.⁹ Each of the broad categories that comprise the Pacific Coast Agreement are discussed in the following sections of this briefing paper, except for waste. This paper also covers other important aspects that could be considered when negotiating the agreement. Ultimately, some aspects could be incorporated into the agreement while others could be adopted by states and territories individually.

An agreement could help to collaboratively achieve 'net-zero emissions by 2050'

Opportunities

- 2.1 Set up a platform for knowledge-sharing so that governments can share lessons, present case studies, and exchange ideas.
- 2.2 Encourage collaboration among states and territories to develop strategies and pathways with supporting policy mechanisms and funding to achieve net-zero emission targets (for example through a Clean Economy Agreement).
- 2.3 Establish a dialogue with California to explore linkages with California's climate and clean economy initiatives

3. Clean energy systems

Transitioning to low-carbon, clean energy systems able to underpin a strong economy will require three key areas to be addressed, each covered in this Section:

- electrification and fuel transition to renewable options (energy transition)
- · energy efficiency; and
- demand management or 'demand-side response' (*demand*).

State and territory governments have regulatory power in all three areas. Although the Federal Government is constitutionally responsible for implementing Australia's international commitments made through agreements such as the UN Framework Convention on Climate Change and the Paris Agreement (and can make national energy policies in order to do so), states retain a strong responsibility over energy as well. Importantly, states and territories will not overstep their jurisdictional capacity by working towards more ambitious goals. Similarly, states and territories do not have to wait for a target or new energy policy to be legislated at the federal level in order to take action.

States and territories can therefore consider what co-benefits independent or joint, proactive action in each of the three key areas in this Section might have in terms of attracting industry, reducing electricity costs, and reducing long-term risk. Action taken now will be required for the pay-off of a smooth, stable, and cost-effective transition. Collaborative action could further individual state and territory goals, or could also involve a shared emissions reduction goal.¹⁰

States and territories do not have to wait for a new target or energy policy to be legislated at the federal level to take action in the energy sector

Division of responsibility

Australia-wide emissions reduction

National target or 'NDC' submitted by the Federal Government to the UNFCCC under the Paris Agreement

Can be implemented through economywide federal energy policy, or other laws (but not mandatory)

Energy efficiency schemes

State and territory governments through state-level legislation

Energy industry regulation

Framework for regulating energy markets set out in the Australian Energy Market Agreement: national legislation implemented by participating states and territories

States and territories can play a leading role if exercise of power does not conflict with existing federal laws

COAG Energy Council (state and territory + Commonwealth governments) drives reform

Clean energy investment

Policies can exist at federal and state/ territory levels, and can be implemented through legislation at either regulatory level

Demand response

State-based but can exist through a federal programme/agency (eg, ARENA)

Energy transition

Developing clean economies will mean transitioning energy systems toward a much greater reliance on **renewable sources of energy** and away from fossil fuels. This process is already well underway in Australia and in many countries around the world. Taking advantage of opportunities to assist the switch to more sustainable fuel sources and pursue decarbonisation of the electricity sector will be a keystone measure that enables important economic sectors to decarbonise in tandem.

There are important opportunities for job creation and cost reduction associated with transitioning toward renewable energy sources:

- A 2016 study by the University of California at Berkeley found that California's Renewables Portfolio Standard (the state-level equivalent to Australia's federal Renewable Energy Target) created 25,500 blue-collar 'job years' between 2002-2015.¹¹
- Closer to home, Victoria is reportedly on track to create more than 6,000 annual jobs through large-scale wind and solar under construction as at August 2018, totalling 5,169 'job years'.¹²

- The International Renewable Energy Agency has reported that renewables should be a consistently cheaper source of electricity than fossil fuels within a few years,¹³ and the cost of renewable energy is falling substantially more than expected.¹⁴ Around the world, onshore wind schemes cost an average of US\$0.06 per kilowatt hour, with some lower, and the cost of solar PV is US\$0.10 per kilowatt hour.¹⁵ The cost of fossil-fuel based electricity by comparison is US\$0.05-\$0.17.¹⁶
- Energy Security Council modelling has also found that policy designed to foster growth in renewables in Australia could significantly reduce annual average electricity bills for consumers within a short timeframe and into the future, with average households being able to save at least \$550 each year.¹⁷

The transition will require improved energy storage capacity so that energy can be dependably supplied at all times. State and territory governments are playing an important role in facilitating this, including through investing in projects which trial and implement storage solutions, and have an opportunity to strengthen this role. South Australia's new Tesla battery for renewable storage has been praised by the Australian Energy Markey Operator for being able to respond quickly to different conditions while pushing down electricity prices.¹⁸ Meanwhile Victoria has recently introduced a new policy to subsidise smaller, household-scale batteries by offering grants, which will reduce costs for households with solar panels and potentially incentivise new uptake.

Decarbonisation of the electricity sector will be a keystone measure that enables other economic sectors to decarbonise

Opportunities

- 3.1 Commit to sharing knowledge and innovation to accelerate clean, affordable, and secure renewable energy supply.
- 3.2 Work with other states and territories, and possibly also with the Commonwealth, to develop and implement national energy policy.
- Continue to foster the production and uptake of renewable energy.
- 3.4 Continue to pilot and bring to scale large storage projects and home storage units with a focus on cost effectiveness, and share learnings from doing so.
- 3.5 Support federal initiatives to drive the most efficient commercial roll-out of energy storage throughout Australia.

- 3.6 Offer advice to consumers considering new energy technologies to ensure that consumers are appropriately informed of consequences and risks. Support efforts to ensure appropriate regulation of stand-alone power systems, and customer protections with respect to new energy products.
- 3.7 Develop guidelines to assist state and territory decision-makers in adequately taking into account adverse climate change consequences of project proposals – through, for example, environmental impact assessment.
- 3.8 Continue to improve public awareness of the cost-saving benefits of household and community-scale renewable energy.

Energy efficiency

Improving energy efficiency means reducing the amount of energy required to deliver the same outcomes, such as products and services. Greater energy efficiency can deliver cleaner economic growth, reduce future energy costs, manage demand, and enhance productivity and competitiveness. Improving energy efficiency is a key component of policy opportunities in specific contexts – for example building and transport – but it is also a goal that can be set more broadly.

State and territory governments have wide regulatory powers to play a key role in pursuing energy efficiency by placing requirements on energy retailers, encouraging the efficient use of electricity and gas, regulating appliance and industry standards, and fostering industries which supply energy efficient goods and services. Policies that require retailers to assist consumers to save on energy use and energy costs or which require other energy efficiency measures and abatement activities are important and appropriate ways for states and territories to pursue emissions reductions. Several states already have measures in place:

Victoria	Energy Efficiency Target (VEET) scheme	Places liability on retailers to surrender energy efficiency certificates, which they can create or purchase on a market. Certificates represent one tonne of greenhouse gas abatement.
New South Wales	Energy Savings Scheme	Creates financial incentives for investment in energy saving projects such as installing, improving or replacing energy savings equipment, and creates a market with a legislated target for energy retailers to purchase energy savings certificates or otherwise pay a penalty.
	Energy Efficiency Action Plan	Targets not only retailers but households and businesses through measures such as requiring information on energy efficiency for appliances at the point of sale.
South Australia	Retailer Energy Efficiency Scheme (REES)	Provides, among other things, free or discounted energy efficiency activities and installations to households and businesses by requiring the assistance of retailers.
ACT	Energy Efficiency Improvement Scheme (EIIS)	Requires retailers to achieve energy savings in households and small to medium sized businesses, with an added requirement that a proportion of savings are delivered in low income households.

As well as improving these schemes, state and territory governments can also support the development, deployment and commercialisation of technologies that improve energy efficiency. This represents an opportunity to create new jobs in what will be an important field as such technologies are rolled out on large as well as small scales. Further, states and territories can require large energy consumers, such as commercial and industrial users, to identify and implement energy efficiency and emissions reduction actions. This measure could be complemented by an educational support programme designed to help large users to identify where relevant actions would be most cost-effective and where cost savings and overall cost benefits could be achieved in the particular context of the user.

Additionally, because poorly efficient and emissions-intensive operations could become more expensive to build, run and maintain than initially forecast as alternatives become increasingly competitive, projects, buildings, and infrastructure may end up with a shorter lifetime than planned and could require costly replacement or upgrade that could be avoided. When considering the approval of licenses, permits and individual project proposals, government decision-makers can ensure that climate change considerations weigh in to decision-making, including the adverse environmental and social as well as the adverse economic impacts of committing to projects that will generate avoidable emissions.

State and territory governments can offer general support to help mobilise local governments, businesses, organisations and individuals to be better positioned to deliver emissions reductions. Victoria's 'Take2' initiative is an example: it encourages participants to make a pledge to reduce emissions and offers free advice and action plans on how this could be achieved.

Opportunities

- 3.9 Victoria, New South Wales, South Australia and the ACT work towards partial or total alignment of mandatory energy efficiency schemes and consider expanding existing schemes to cover, for example, fuel switching (discussed in the previous section).
- 3.10 States and territories without energy efficiency schemes: consider establishing a scheme that could streamline energy efficiency measures in a cost-effective and transparent manner, such as a market-based scheme that operates on the basis of a legislated emissions abatement goal, which could increase progressively over time.
- 3.11 Develop, strengthen, and coordinate state and territory programmes requiring residential, commercial, and large industrial energy users to identify and implement energy efficiency actions. Support these programmes by identifying and assisting with cost savings.
- 3.12 Support the development, deployment and commercialisation of energy efficient technologies such as electrification of heating processes, natural refrigerants, among others.
- 3.13 Support local government and the community to take appropriate action that will assist state/territory-level efforts.
- 3.14 Share learnings with other state and territory governments.

Demand

Managing electricity demand is an important component of ensuring reliable energy systems. Targeting the 'demand-side response' requires being able to ensure the provision of energy reserves during peaks, thus helping to keep costs stable as well as energy delivery reliable.

Specific and targeted demand management programs can help shift loads to match changing generation profiles and ensure distribution infrastructure can most efficiently meet peak demand and deliver the best value for distributed, renewable generation. There is significant, untapped demand response potential in Australia, in particular in its industrial sector. This potential is estimated at about 3.8 GW, which represents 10.5% of gridconnected electricity demand during system peak (this includes industrial, commercial and residential electricity use).¹⁹ Targeting untapped opportunities could significantly reduce the need for new electricity infrastructure and help lower energy costs for end users, while driving emission reductions.

At the federal level, the Australian Renewable Energy Agency and the Australian Energy Market Operator have collaborated in a demand response trial that involved supporting ten pilot projects projected to deliver 200 MW of capacity by 2020 in Victoria, South Australia and New South Wales. States and territories have opportunities to support future demand management programmes and to develop their own programmes in order to help relieve energy supply issues during high demand periods such as extreme weather events. States and territories that have trialled particular programmes could work on sharing knowledge and learnings in order to save cost and time resources involved in addressing the demand problem.

Opportunities

- 3.15 Establish ongoing demand response programmes for residential, commercial and industrial energy users aimed at reducing peak electricity load and generating cost savings.
- 3.16 Support energy market reform to incentivise demand management at a state/territory level throughout Australia and ensure a secure and affordable national power system.
- 3.17 Share learnings with other state and territory governments.

4. Low carbon buildings

The building sector accounts for almost one quarter of Australia's emissions - around 125 megatons of carbon dioxide equivalent ('CO2e') every year.²⁰ Buildings – including the residential homes, commercial, and administrative premises which make up this sector - are long-term assets, and managing emissions reductions requires careful planning. Decisions made at the time of construction or renovation affect energy performance over many years. States and territories share regulatory power over building design and construction with the Federal and with local governments, and within this context have significant opportunities to influence low-carbon development.

The C40 Cities initiative describes net-zero buildings as green and healthy buildings which 'use energy ultra-efficiently and are supplied by renewables', where 'money isn't wasted on energy bills', where productive workplaces insulated from extreme temperatures, and healthy schools are free from dirty air.²¹ States and territories can work towards net-zero emissions from the building sector by targeting energy efficiency and creating low-carbon energy supplies, since electricity usage is responsible for most of the emissions from buildings. This will mean converting direct fuel combustion appliances, gas hot water and boilers to electrical systems that can be supplied by renewable power sources (see Section 3 on energy). Modelling has supported a prediction that these two pathways could lead to a 97% reduction in emissions from residential and commercial buildings by 2050, even if there is a substantial increase in the number of Australian households and an increased size and output of the commercial sector within this timeframe.²²

State and territory governments are already responsible for the uniform technical provisions that govern the design, construction and performance of buildings contained in the **National Construction Code.** While it is a national code in the sense that the same standards apply in all states and territories, it is given effect by state and territory legislation and regulations. States and territories can play a role in making sure that the standards are sufficiently stringent over time, and are properly monitored and enforced.

> Targeting efficiency and a low-carbon energy supply could reduce residential and commercial building sector emissions by 97% by 2050



Image: www.abcb.gov.au/ncc-online/Regulatory-Framework

Efficiency

Another opportunity to target efficiency in the building sector is through energy performance standards. The Green Building Council's green star rating system is a voluntary, internationally-recognised performance standard that could be implemented by state and territory governments through policy measures and incentives which, for example, create financial benefits for compliance with high star ratings. Analysis suggests that a reduction of more than 80% of emissions across major urban centres in Australia compared with current building stock could be achieved if new residential builds met the eight-star energy standard by 2050.²³ Banks can play a role in supporting the achievement of energy efficiency standards in buildings, including voluntary standards, by offering 'green mortgages' - mortgages with favourable terms if the recipient can demonstrate that their proposed building will achieve specified environmental outcomes. States and territories may wish to seek opportunities to support, facilitate, and endorse these types of mortgages for financing the construction of new buildings.

Mandatory reporting of energy

performance for residential buildings at the time of sale or lease could be a useful complementary policy measure. At the federal level, the Building Energy Efficiency Disclosure Act 2010 (Cth) requires energy efficiency disclosure for large commercial office buildings. States and territories could model similar requirements for all – or at least a broader range of – buildings. Overseas, the EU and US have embraced mandatory efficiency reporting and policies which strongly encourage or require efficiency and energy reduction – for example the EU's Energy Performance of Buildings Directive. A lack of requirement on residential property owners to ensure that the properties they rent out meet standards of energy efficiency, combined with the situation in Australia where tenants typically pay energy bills, means there is little incentive for landlords to incur the expenses required to ensure that their properties are energy efficient. State and territory level governments could improve this situation by requiring that their residential tenancies legislation is amended to ensure either that certain basic standards are met, or that energy efficiency is disclosed. In the UK, tenants can request consent from their landlords to install energy efficiency improvements and the landlord cannot unreasonably refuse consent. This type of provision could be included in state and territory legislation in Australia to target the retrofit of older buildings.

A reduction of more than 80% of emissions across major urban centres in Australia could be achieved if new residential builds met the eight-star standard by 2050



Embodied energy

The construction and fit-out of buildings is an important contributor to 'embodied' energy within the building sector. Energy is required to produce common construction materials including concrete, timber, glass and bricks. Materials and fit-outs with lower **embodied energy** but which are also durable, thermally efficient, and can be recycled should be prioritised in order to maximise emissions reductions from construction taking into account the full life-cycle of a building. These can be incentivised by state and territory government regulation.

A coordinated and considered plan to strengthen, adopt, implement, and review energy efficiency targets with a view to creating and enforcing more stringent standards and near-zero emissions buildings by 2050 will not only significantly help states and territories in reaching emissions reduction goals, but will also create cost savings and opportunities for new jobs.

Opportunities

- 4.1 Commit to establishing a long-term target and staged trajectory toward net-zero new buildings and provide guidance to industry to assist in this transition. For example,
 - Ensure through monitoring that new residential buildings meet any existing minimum performance standards; where performance standards are lacking or could be improved, ensure that standards are optimally stringent;
 - Implement and continue to strengthen performance standards requiring levels of efficiency for thermal insulation and for heating and cooling equipment, as well as other appropriate standards, and set targets and timelines for the uptake and periodic review of these standards;
 - Prepare, on the basis of expert advice, guidance for industries to achieve emissions reductions and if necessary introduce appropriate incentive or support measures.
- 4.2 Support an ambitious upgrade of the National Construction Code's energy efficiency provisions at the next scheduled update, including a major improvement to the commercial stringency (including improvements in apartment stringency).
- 4.3 Seek improvements in residential stringency in the National Construction Code, and where this is not possible in the short-term consider increasing state and territory-level requirements.
- 4.4 Develop plans for upgrading the energy efficiency of existing buildings that will facilitate the net-zero emissions by 2050 target. These could include the use of mandatory reporting of energy performance for residential buildings at time of sale or lease.
- 4.5 Implement strong energy performance requirements for state/territoryowned or occupied buildings.
- 4.6 Incentivise construction and fit-outs with low embodied energy taking into account a building's full life cycle.

5. Planning

Planning involves decision-making on important matters relating to both the built and natural environments. Emissions reduction can be achieved through the planning system by incorporating reduction goals and a requirement to consider contribution to climate change within decision-making. The planning system can also strongly influence the uptake of renewable energy projects, as has been observed in South Australia and Victoria. Regulatory powers over planning are exercised by state and territory governments as lead policy-makers through a system that allows key decisions to be made at the local government level via local-level instruments. Local governments (councils, shires, cities) are required to take into account and give effect to any prescribed state- or territorylevel planning policy objectives.

State and territory governments can direct planning in a way that optimises lowcarbon opportunities and better ensures the implementation of strategic goals to promote clean economies and healthier, prosperous communities. They can do this via state and territory planning policies, which include, for example, the State Environmental Planning Policies ('SEPPs') in New South Wales, the State Planning Policy and Victoria Planning Provisions in Victoria, and the State Planning Policy in Queensland, each of which are grounded in state-based legislation. Opportunities for reducing emissions include to ensure that planning frameworks and approvals processes promote or require low-emissions, energy-efficient infrastructure, buildings and housing; facilitate renewable energy technologies (rather than favouring non-renewable energy); and protect natural carbon sink assets. Grasping these opportunities will help to achieve the existing goals already embedded in planning legislation. ²⁴

> Planning frameworks and approvals processes can promote or require low-emissions infrastructure, facilitate renewable energy, and protect carbon sinks

Promoting renewable energy

Some specific examples of how the promotion of renewable energy can be achieved through planning include by:

- reducing or eliminating the permit requirements for small actions like installing rooftop solar;
- directing the way in which decision-makers consider benefits as compared with costs so that long-term, clean economy benefits are not easily outweighed by short-term or poorly quantified financial benefits; and
- introducing relevant guidelines at the state or territory level, such as the Victorian guidelines on siting wind farms.²⁵

Protecting carbon sinks

Protecting carbon sink assets can be achieved through ensuring that existing vegetation management principles are adequate and that any allowance for offsets and reforestation is well managed, for example through appropriate guidance and monitoring. Another avenue for protecting sink assets is ensuring that urban sprawl into green spaces is limited, via appropriate growth boundaries. This has been successful in cities of similar size to Australian cities, including in the US. For example, the state of Oregon's development consolidation strategy has protected more than 1.2 million acres for forest and agricultural land which has maintained the landscape's ability to store carbon.²⁶

Climate change mitigation

Planning frameworks should be treating mitigation as an important priority in order to maximise emissions reduction opportunities within the context of important economic development opportunities. Existing discussions about climate change and planning have tended to focus on adaptation, such as protecting development from sea level rise. However the built environment is not just affected by climate change, it contributes significantly to climate change, and planning frameworks offer a key role in shaping appropriate, low-emissions development pathways that will remain economically viable in a carbon-constrained future. In some US states, including California, decision-makers are required to consider any environmentally friendlier alternatives to proposed projects, and to justify their decisions by including reference to environmental harm. This sets a norm that government agencies and developers or private partners should be thinking strategically about minimising environmental impacts before project proposals are made.

Australian states are making progress. For example Victoria, through its State Planning Policy, currently requires local government authorities to 'promote energy efficient building and subdivision design', 'promote consolidation of urban development and integration of land use and transport' and 'encourage retention of existing vegetation or revegetation as part of subdivision and development proposals'.²⁷ An opportunity exists to strengthen existing requirements through further detail, and to create new requirements that are clear and appropriate.

Environmental impact assessment

Decisions on projects and development activities that are likely to have a significant adverse effect on the environment are typically subject to environmental impact assessment ('EIA') requirements in each state and territory. It is important that state and territory-level EIA laws encompass climate so that climate change can be a relevant and even central consideration in deciding whether or not individual proposals should be approved. Often, state and territory-level decisions on major projects and development activities are accredited at the federal level, meaning state and territory governments effectively make important decisions on federal-level environmental matters as well as matters of state and territory or local significance. Thus, they have a critical role in mitigating climate change and facilitating a cleaner economy through project approvals and EIA-based decision-making across a broad scale.

Finally, state and territory governments can consider how metropolitan climate governance can contribute to a clean economy and be strengthened by investing resources and appropriate powers in existing bodies such as the Greater Sydney Commission, the Western Australian Planning Commission and the Melbourne Planning Authority. This could enable these bodies to take more effective action on climate mitigation.

> Climate change should be a central consideration in deciding whether individual proposals subject to environmental impact assessment will be approved

Opportunities

- 5.1 Ensure planning policy frameworks recognise climate change in planning decisions. For example, by
 - including a clause in planning policies relating to the promotion of energy efficient building design;
 - ensuring that appropriate mechanisms are in place to incentivise renewable energy opportunities;
 - including a clause in planning policies that promotes effective vegetation management to maximise carbon sequestration; and
 - including net-zero by 2050 commitments in planning legislation.
- 5.2 Consider strengthening urban growth boundaries and consolidating future urban development.

- 5.3 Ensure that EIA legislation includes climate change, by
 - amending state/territory legislation to explicitly include climate change, where necessary;
 - supporting reform of, or at least the addition of a climate change trigger in, the federal Environment Protection and Biodiversity Conservation Act 1999 (Cth), which in practice is often administered by states and territories; and
 - developing government guidelines on EIA-based decision-making which includes detailed guidance for decision-makers on how to factor in climate change considerations when assessing project proposals in light of emissions reductions goals.²⁸
- 5.4 Make sure negative impacts of biodiversity offsets and unplanned reforestation are avoided by developing appropriate planning controls or guidelines.
- 5.5 Assess and identify opportunities within the context of existing metropolitan bodies that could, through extra funding and/or new powers, play a role in reducing state and territory contributions to climate change.
- 5.6 Collaborate with other state and territory governments to share learning and coordinate planning measures relating to climate change.

6. Low carbon transportation

An estimated 19% of emissions are attributable to the transport sector in Australia, on account of the direct combustion of fuel for road, rail, aviation, and shipping.²⁹ In all states and territories except Tasmania, transport sector emissions have increased over the past decade.³⁰ The transport sector is large and multi-faceted; compelling opportunities for state and territory-level governments to reduce emissions in this significant sector centre around strengthening investment in public transport, and working towards the provision of renewable and low-carbon energy sources to power public transport. These actions, particularly when combined with supporting widespread conversion of private road vehicles from petrol and diesel to electric and with promoting non-motorised transport options, will contribute to appreciable emissions savings, while providing new sources of jobs and streams of revenue. States and territories share regulatory capacity with federal and local-level governments in the transport sector, but states and territories carry prime legislative responsibility.

Public transport

Investment by state and territory governments in public transport is already contributing to emissions reductions as well as economic benefits from the transport sector. For example, the Victorian Government has recently secured over AU\$500 million of capital investment to create new solar energy capacity to power Melbourne's tram network – the largest in the world. Victoria's investment in new solar has created and will continue to create positive economic benefits particularly in regional Victoria, which is gaining importance in what has been dubbed 'the new energy economy'.³¹ Upgrades to public transport networks including improved frequency and new routes will make it easier for people to commute using public transport rather than relying on road vehicles, reducing congestion and local pollution as well as emissions.

A net-zero transport sector will require public transport powered by renewables which people elect to use instead of driving

Passenger + light commercial vehicles

Research indicates that uptake of electric vehicles, when linked to a cleaner supply of electricity, is a critical pathway for decarbonising the passenger and light commercial vehicle segments by 2050.32 Most Australians own a car, and many businesses and government departments have fleets of multiple cars that transport goods and people by road. It is therefore important to address road transport as well as public transport. While there is global policy momentum to reduce emissions from passenger vehicles - policy-makers in China, France, Germany, India, the Netherlands, Norway, Scotland and the UK, as well as ten US and Canadian states and provinces have announced the phase-out of petrol and diesel vehicle sales over the 2025-2050 time period - a number of barriers exist in Australia. High vehicle prices, limited vehicle range, and inadequate availability of charging infrastructure are all key factors, compounded by a lack of consumer awareness and lack of national policy framework to support the transition. Various aspects of the switch to electric vehicles offer the prospect of new jobs and income, however, such as the installation and maintenance of charging stations. The charger industry is expected to reach an annual global revenue of \$60 billion by 2025.33

The highest number of electric vehicle sales over the past six years has been in Victoria, with the ACT having the greatest number of sales compared with market size.³⁴ Yet, these figures are still low compared with other countries. State and territory governments have an opportunity to drive progress on low-carbon road transport and help overcome these barriers, which will help to unlock economic value by reducing costs.³⁵ The ACT is leading the way, having recently signed on to the Global Climate Action Summit's 'Zero Emissions Vehicle' challenge; its Action Plan for 2018-2021 outlines government incentives including a 20% discount on registration fees and zero stamp duty. Strong incentives have proven successful in countries that have rapidly transitioned to electric vehicles including Norway, which also offers electric vehicle users toll exemptions and priority lanes.³⁶

Last year, Queensland established a council to provide advice on electric vehicles and has completed stage one of an electric vehicle 'superhighway', although it is yet to release a comprehensive roadmap covering the transition to net-zero transport.³⁷ If states that take pioneering actions can share learnings with other state and territory governments, and if governments can collaborate when creating roadmaps, this will reduce time and costs associated with duplication, and allow all state-level governments to share in the benefits of faster and more efficient progress toward their common goals. Through the Climate Action Roundtable, South Australia, Western Australia and the ACT, along with the City of Adelaide and the City of Hobart, recently signed a Memorandum of Understanding with the Electric Vehicle Council agreeing to develop a plan to increase the share of electric vehicles in state/territory/city fleets and to consider how to promote the public uptake of electric vehicles using combined market power. They agreed to coordinate strategic planning and infrastructure construction, as well as to align standards and incentives. This is an example of how states and territories can collaborate with one another and work together with other levels of government to achieve collective benefits; the particular platform could be drawn upon in future by other states and territories as well.

Uptake of electric vehicles, when linked to a cleaner supply of electricity, is a critical pathway for decarbonising passenger and light commercial vehicle transport



Long-haul transport

Long-haul transport such as heavy-duty road transport, aviation, marine, and rail freight transport are not as amenable to electrification as are light vehicles and public transportation.³⁸ Key abatement strategies for these types of transport aside from modeshifting include focusing on fuel efficiency and reducing demand. Each level of government may have a role to play in these strategies and state and territory-level governments should look out for appropriate future policy opportunities. One may be to implement the International Energy Agency's Technology *Roadmap* which focuses on substituting diesel and jet fuels for sustainably-supplied bio-based fuels.³⁹

Non-motorised transport

While federal and state/territory-level policies tend to focus on technological and fuelrelated aspects of emissions reduction in the transport sector, local governments including cities can play a critical role in facilitating non-motorised, low or zero-emission transport such as walking and cycling. State and territory-level governments can support cities and local councils in endeavours to create bicycle-friendly commuting routes, promote street-level interaction that encourages walking, and eventually change norms and behaviour patterns that presently contribute to the number of vehicles on roads and thus emissions. Hidden economic benefits can derive from these strategies - for example, walking tends to encourage greater interaction with local businesses and services, and thus commercial benefits for these businesses and services, than does direct 'A to B' road travel, and less-congested roads tend to also improve business prospects for local retailers as well as property values along those roads.

Transport planning and management

In order for low-carbon public transport systems to operate optimally and work to reduce vehicle congestion, transport planning needs to be integrated with land-use planning, and regulatory oversight needs to be strategic in nature. For example, planning can facilitate growth in pedestrian areas close to public transport.⁴⁰ Smart planning should mean that people are able to be mobile and to access the services they need and to engage in society without travelling for extended periods of time or relying on cars. State and territory-level transport legislation tends to be fragmented, with different statutes for different aspects of the transport system, and it is often not well integrated into land-use planning. Victoria's Transport Integration Act is an example of legislation which attempts to establish an integrated framework for sustainable transport, but it could be better implemented and enforced. State and territory level governments can play a role in supporting the many authorities and institutes involved in planning to work together to adopt a regional approach. This has been successful in Vancouver, for example, where local authorities are involved in strategic planning in a bottom-up way through Metro Vancouver, under authority from the Province of British Columbia.

Opportunities

- 6.1 Further strengthen investments in public transport.
- 6.2 Transition to renewable energy and low-emissions fuels for public transport.
- 6.3 Work collaboratively with other governments to develop a new market for electric vehicles in Australia. Substrategies could include:
 - Committing to decarbonising government fleets by developing a plan to reduce fleet emissions through, for example, minimum electric vehicle uptake targets;
 - Establishing an aggregated purchasing programme for electric vehicles to signal manufacturers and drive improved availability;
 - Incentivising consumer uptake of electric vehicles for example through registration rebates, stamp duty exemptions, and electric vehicle priority lanes; and
 - Incentivising and coordinating the deployment of charging infrastructure.

- 6.4 Support federal-level implementation of light vehicle CO2 emissions standards for new vehicles, which will have flow-on energy savings effects,⁴¹ and review/ strengthen in-service emissions standards managed by states and territories.
- 6.5 Support local-level efforts to promote non-vehicle transport such as cycling and walking.
- 6.6 Work to bring together transport entities to ensure that sustainable transport systems are well-coordinated and go hand in hand with land-use planning for future lowcarbon cities and regions.

7. A low carbon land sector

Land sector emissions include emissions from land use, forestry and agriculture. Within each of these areas, opportunities exist to reduce emissions and to create negative emissions – that is, take abatement actions that will lower net emissions by offsetting or sequestering carbon. States and territories have regulatory power over key areas in this sector including relating to agriculture, forestry, biodiversity protection, and land-use planning.

Agriculture

Agriculture accounts for 14% of Australia's total emissions.⁴² Main emission sources are methane from cattle, manure management, and agricultural soils. Field burning, rice cultivation and the application of urea and lime are also important contributors.⁴³ State and territory governments can strengthen incentive measures to encourage farmers to adopt new technologies or processes that would significantly reduce emissions from these source, and also have positive economic outcomes through improved efficiency. For example, changing feed to reduce methane and increase productivity

through digestive efficiency, and improving pasture quality. To encourage uptake, education and training is important in this sector. For measures with high implementation costs or which will take time to see commercial advantages, governmentbacked incentives should be considered. A state- or territory-based scheme similar in structure to, but broader in application than the federal Emissions Reduction Fund, which provides incentives to farmers but which is relatively narrow and which has a low uptake rate due to participation barriers, may be one way to coordinate incentive measures and maximise emissions reductions.

State and territory governments can strengthen incentive measures to encourage farmers to adopt technologies and processes that reduce emissions and improve efficiency Linking the land sector and in particular agriculture with **carbon reporting and disclosure**, discussed in Section 9, will help to ensure that Australian states and territories remain competitive, particularly as Asian countries such as China – which receives the greatest proportion of Australian exports – put a price on carbon and are responsible for transparent supply chains.

Further scientific research and development is required to provide pathways to make existing farming operations less carbonintensive. The present federal Emissions Reduction Fund effectively relies on state and territory-level input through research and technology development, but state and territory contributions to research and technology have declined post abolition of the federal carbon pricing mechanism and Carbon Farming Initiative. Investing in research will continue to unlock the mechanisms required to reduce farm-based emissions in a cost-effective manner that allows farms to stay productive and profitable.

Land-use and forestry

Trends in land-use vary markedly across the states and territories. The net emissions recorded in Australia's National Greenhouse Gas Inventory from activities relating to land use, land use change and forestry account for -4% of total emissions across Australia⁴⁴ – ie, they represent a carbon 'sink' – although not one that is able to offset agriculture (let alone any other sectors). Individual states and territories contribute to this Australia-wide figure variously: whereas NSW and Tasmania tend to have the lowest net emissions, Queensland and to a lesser extent the Northern Territory and Western Australia tend to exhibit positive emissions. Australia's accounting system follows international land sector accounting rules, which do not necessarily paint the full picture: relevantly, they exclude bushfires, which release stored carbon.

Opportunities to protect native forests and vegetation from clearing and logging as well as to promote afforestation and reforestation (and thus carbon sequestration) are likely to prove to be efficient ways to meet emissions reductions goals while delivering co-benefits to biodiversity, protected areas, fibre and water resources. Policies can target reduced woodland clearance, fire management (including through indigenous fire management), soil enhancement, plantation forestry and fibre management, and the valuing of carbon in forests as well as more broadly across landscapes.

State and territory environment protection laws operate to protect heritage areas and areas of high conservation significance on public and private lands as well as endangered species and ecosystems. This is a major contribution to carbon management. States and territories can ensure that these laws, including environmental impact assessment procedures, are sufficiently comprehensive in scope and application to assist as a tool in achieving emission reductions and carbon sequestration goals.

Local-level governments manage certain aspects relevant to the land sector such as permits under relevant planning schemes for vegetation clearance and bushfire management. Local-level governments are also required through planning law to create and maintain green spaces in urban areas, but there is significant disparity between local governments' policies and strategies, particularly with respect to vegetation on private land. Coordination between state/ territory governments and local councils will be important in reducing unhelpful regulatory fragmentation and overlap and maximise effectiveness of action.

Afforestation, reforestation and protecting forests and vegetation from clearance are likely to be efficient ways to meet emission reduction goals while delivering co-benefits to biodiversity, protected areas and fibre and water resources Environment and heritage protection laws significantly contribute to carbon management

Opportunities

- 7.1 Invest in programmes to support farmers in reducing agricultural emissions, including through:
 - Research and technology development;
 - Education and training programs for farmers;
 - Bringing farmers together via regional action groups;
 - Incentive measures that reward small- and largescale emissions reduction actions, possibly through a coordinated scheme; and
 - Ensuring regulatory frameworks encourage emission reductions and reward sequestration.
- 7.2 Take further action to minimise and de-incentivise the clearance of native vegetation.
- 7.3 Incentivise and reward land management that sequesters carbon.

- 7.4 Create pathways that promote afforestation and reforestation such as through a scheme for payments to landholders for plantings that sequester carbon.
- 7.5 Coordinate carbon sequestration initiatives with biodiversity initiatives, and incentivise carbon sequestration projects which incorporate mixed plantings of species that yield both carbon and biodiversity benefits.
- 7.6 Take further action to ensure that any credit-generating programmes such as offsets programmes create real, additional, verifiable, and permanent benefits, and ensure these programmes are monitored and reviewed; link state initiatives with federal level policies.
- 7.8 Ensure that state forests are being appropriately managed to deliver maximal benefits for fibre, carbon sequestration, biodiversity conservation, and recreation.

8. Low-carbon healthcare

State and territory healthcare systems contribute to emissions due to the direct consumption of energy in buildings such as hospitals, and through procurement, transport, and waste. Australia-wide, the healthcare system is responsible for 7% of emissions (including from public and private hospitals, medications and capital expenditure for buildings).⁴⁵ Targeting the healthcare sector presents a number of key opportunities to reduce emissions with co-benefits including lower energy costs and improved health and wellbeing for patients and visitors.

Regulatory responsibility over healthcare is shared between the Federal and state/ territory governments. States and territories are responsible for managing public hospitals, delivering health services, ambulance and emergency services and patient transport schemes, food safety and handling and regulation, as well as regulating, licensing and inspecting health premises. The Federal Government is responsible for, among other things, national schemes including Medicare and the Pharmaceutical Benefits Scheme, Therapeutic Goods Administration, insurance, and has various funding responsibilities. Accordingly, states and territories have capacity to take action in the key areas linked to healthcare sector emissions.

In Victoria, public hospitals – large, 24-hour buildings – account for around half of the government's direct carbon emissions.⁴⁶ Ensuring hospitals are more energy efficient will have a significant impact on healthcare sector emissions and will appreciably reduce government emissions. As well as exploring retrofit options for old hospitals, states and territories can ensure that all new hospitals are designed with high efficiency in mind, maximising natural light and passive heating and cooling where possible, and can support the supply of green electricity.

The data from Victoria broadly aligns with a recent national study in Australia⁴⁷, and with a comprehensive study in England by its National Health Service (NHS)⁴⁸ – both studies found that most of the emissions attributable to the health sector in the respective locations were indirect, from the procurement of goods and services. This includes pharmaceuticals, patient meals, furniture, and medical aids and supplies. The health sector has significant buying power, and thus an opportunity to pressure suppliers to adopt more sustainable practices. Regulations can also make sure medical facilities limit wastage and unsustainable use of goods.

The English study, which looked at life cycle carbon from the NHS, found that the three actions with maximum potential for emissions reduction and associated financial savings are: (i) installing combined heat and power generation in hospitals, (ii) improving heating and lighting controls and switching to energy-efficient lighting, and (iii) reducing temperature settings by 1 degree in winter. These were linked with a saving of over €214 million per year. In the US, a study of five hospitals estimated that interventions designed to reduce energy and other environmental impacts could lead to a savings of over US\$5.4 billion over five years if implemented nation-wide.49

The NHS study found that one in five vehicle trips in England is related to the healthcare sector, principally from staff commuting. A further opportunity to achieve emissions reductions in the healthcare sector and to alleviate pressure on carparks is to reduce transport-related emissions. Some Australian hospitals are located in metropolitan areas, but not all are easily accessible by public transport. Improving accessible public transport options, promoting low-carbon commuting such as cycling, incentivising car-pooling in areas less accessible by public transport, and reviewing the efficiency of fleets are all important opportunities to lower transport-related healthcare sector emissions.

Finally, reducing hospital waste through reviewing demand, making careful purchasing decisions, reusing/recycling, and processing organic waste on-site may lead to lower waste management fees, cost savings through less products and services, and also reduced indirect emissions.⁵⁰

State and territory governments can strengthen incentive measures to encourage farmers to adopt technologies and processes that reduce emissions and improve efficiency

Opportunities

- 8.1 Conduct a state/territory-wide audit of emissions from the health sector and estimate where emissions reductions and cost savings are possible and would be most beneficial.
- 8.2 Require or encourage environmental impact/ sustainability analysis and periodic reporting for all major healthcare facilities.
- 8.3 Ensure that hospital design is energy efficient in maximising natural light and ventilation, and including open and green spaces. This may include through building codes and standards applicable to the health sector (eg, by requiring a minimum green star rating).
- 8.4 Ensure that the energy purchased to power facilities comes from renewable sources.
- 8.5 Encourage health-sector businesses including hospitals to audit procured goods with a view to limiting waste by recording whether excess goods are being ordered and disposed of, as well as the extent to which they are reused and recycled, and by changing procurement strategies accordingly. New procurement strategies can prioritise local supply chains, minimise packaging and support energy efficient production.

- 8.6 Promote low-carbon transport alternatives for hospital workers and visitors including non-motorised and public transportation. Eg, through installing bike racks and creating a commuter club with discounted public transport tickets. Work with suppliers to consolidate deliveries to reduce transport emissions.
- 8.7 Reduce emissions from hospital fleets by ensuring inefficient vehicles are replaced as appropriate and that new vehicles meet zero emission goals.
- 8.8 Review waste management processes and make changes aimed at improving effectiveness and reducing operational costs. Eg, process organic waste on-site where possible and appropriate.
- 8.9 Create or review hospital staff training strategies with a view to increasing awareness about reducing emissions and educating staff about the environmental impact of health systems.
- 8.10 Encourage data management programmes to facilitate new policy development, analysis of impacts across the health sector, and ultimately improved performance with associated cost savings.

9. Finance

A whole-of-economy approach to cleaner growth through emission reductions should involve the treasuries of state and territory governments, and engagement with the business and finance sectors. Carbon reporting, carbon risk disclosure, and clean economy lending are three cross-cutting categories of opportunity for state and territory governments in this important area.

Carbon reporting and risk disclosure

Carbon risk management is an increasingly essential aspect of good business, and carbon risk disclosure is a way in which governments and the public can gain necessary information on exposure to liabilities as well as on opportunities. Treasuries and state-owned corporations can take the lead in complying with carbon risk best-practices. For example, they can adopt the Climate Disclosure Standards Board's reporting framework and incorporate climate change-related information, including risks, in mainstream financial reports. The Climate Disclosure Standards Board is an international consortium of businesses and environmental NGOs that have produced a 'standards-ready' framework that can be immediately adopted or referenced by regulators. The latest 2018 version of this framework incorporates the recommendations of the Task Force on Climate-Related Financial Disclosures ('TCFD'), a market-driven initiative designed to help companies to disclose climate-related risks in mainstream reporting.⁵¹

State and territory governments (and individual government departments) are increasingly starting to report on their emissions, although there are gaps in scope in current reporting practices, and there is a need for quality auditing and independent verification. Improving carbon reporting across all sectors of state/territory-level government is an important starting point for understanding where emissions are coming from and thus how they can best and most cost-effectively be reduced. In 2017 the Senate Economics Reference Committee made federal-level recommendations on carbon risk relating to disclosure, such as that Australia's Corporations Act 2001 (Cth) be reviewed to require holistic consideration of a company's prospects, and that ASIC should review its guidance to company directors on disclosing exposure to carbon risk. State and territory governments can help to assist businesses and protect shareholders by supporting federal initiatives. In taking the lead at the state and territory level, state and territory governments can collectively drive bottom-up progress in this area.

Lending

Lending which is conditional upon a demonstrable promise to meet emission reduction criteria is a measure that state and territory governments can support in order to drive investment in projects that will achieve co-benefits to states and territories. By for example issuing green bonds, states and territories can attract capital as well as project-related new jobs and at the same time reap environmental benefits that are ultimately achieved by project proponents. Already, Queensland's Treasury Corporation is issuing certified green bonds to investors who choose environmentally responsible projects that are partially funded by the Queensland Government. Victoria also issues green bonds and is the world's first state or federal government to issue bonds with the international Climate Bond Certification. State and territory governments can emulate these approaches through separate (and potentially coordinated) green bonds schemes that ensure investments funded by state and territory governments are likely to lead to sustainable outcomes and, importantly, will not jeopardise ability to achieve emissions reduction goals.

State and territory governments can also ensure more generally that procurement processes **appropriately value low-carbon options,** and they can leverage enhanced private sector investment in a clean economy. State and territory governments can ensure that publicly funded projects and public-private partnerships are subject to appropriate environmental and sustainability impact assessment procedures, which will assist in reporting on climate-related outcomes holistically, and which could also facilitate lending for projects that will support a cleaner economy. For the purposes of lending, state and territory governments may wish to consider emulating a state-level Clean Energy Finance Corporation (CEFC). The federal CEFC was set up to mobilise capital investment in renewable energy, lowemission technology and energy efficiency, and state-level governments could create a similar corporation tasked with mobilising investment for state-level projects. Alternatively, they could work towards adding an additional component of the existing CEFC designed to meet state needs.

Opportunities

- 9.1 Ensure that state/territory government treasuries and corporations comply with carbon risk and carbon disclosure best-practices.
- 9.2 Ensure that all government departments undertake carbon reporting.
- 9.3 Improve voluntary and mandatory sustainability impact assessment practices through regulations and/or the issuance of guidance. Ensure that publicly funded projects and public-private partnerships undertake – and make publicly available – sustainability impact assessments.
- 9.4 Support appropriate federal-level measures relating to carbon risk and carbon disclosure.
- 9.5 Develop and implement lending schemes that promote clean economies, for example through the issuance of green bonds. Consider linking schemes with international certification procedures. Ensure treasury coordinates with other government departments in the issuance of these bonds for investment in project across sectors.
- 9.6 Ensure procurement processes appropriately value low-carbon options.
- 9.7 Create a state-level finance corporation to mobilise capital investment in state-level clean energy projects, or extend the Clean Energy Finance Corporation.

10. Assisting communities in transition

Managing the transition away from reliance on emission-intensive, polluting activities will highlight political, social and economic concerns relevant to state and territory governments. The transition will inevitably affect communities and families whose livelihoods are dependent on these activities, but it could also open needed employment opportunities. State and territory governments should take care and plan ahead in order to maximise economic gains in a way that is just and equitable.

Important issues likely to arise include financial and social impacts to communities and workers in places where primary household incomes have historically depended on the coal industry; unnecessary fluctuations in electricity prices on account of poorly managed plant closures; reputational, strategic and financial risks for emissionsdependent companies; and a general lack of certainty around transitions, affecting all stakeholders. To minimise the impact of these issues both on community and corporate stakeholders and on governments, state and territory level governments can consider opportunities for targeted and appropriate policy interventions.

Policy options to assist with transitions centre around creating safeguards that increase certainty, keep prices stable and supply reliable, protect communities from loss and long-term unemployment, and support communities to develop new opportunities. Experiences from other coal dependent areas around the world have indicated that key priorities could include:

- introducing age-based regulatory limits on coal fired power stations, to ensure plants do not continue to operate indefinitely and to facilitate pre-closure planning;
- introducing a minimum notice period for plant closures, to allow regional governments, communities, individual employees and other stakeholders time to consider transition options;
- providing support to workers and their families to transition to new jobs to avoid early worker retirement (for example payouts, retraining schemes, relocation assistance); and
- thinking strategically about whole-of-region revitalisation including cleaner economic opportunities.

Key policy experts in this field have recommended that regional revitalisation is a critical aspect of managing transitions especially in regions that have opportunities for economic diversification. This means ensuring that communities and their economies are able not only to adjust to plant closures, but renew, by seizing opportunities in other sectors as appropriate - such as tourism, horticulture/agriculture, and renewable energy. Long-term and wider-reaching implications should not be ignored: transitioning away from coal will have cross-sectoral and inter-generational implications across society. From a policy perspective, this might mean that measures like educating younger generations in coal mining communities so that they do not suffer educational disadvantage, seeking to promote new opportunities for workers that do not lead to a loss of pride, motivation, or socio-economic status, and finding ways to ensure that the social fabric and shared identity of communities is not eroded by the transition.

State and territory level governments, together with other levels of government and with industry and community stakeholders, can think in advance about how the costs of transition will be managed and distributed, and what the most cost-effective methods are likely to be in the region or community in question, taking into account social costs as well as direct economic costs. In general for state and territory level governments, investing in transitions is likely to be more cost-effective than bearing the costs of poorly planned and managed plant closures.

As this is an issue which is likely to affect Australian states in similar ways, states and territories would benefit from sharing learnings and best practice in Australia and internationally.

Opportunities

- 10.1 Impose necessary requirements on coal fired power plants that allow stakeholders to plan for closure such as age limits and minimum notification periods.
- 10.2 Develop appropriately tailored policies to assist workers and their families in transitioning to new employment opportunities, minimising long-term costs and losses.
- 10.3 Encourage businesses to develop and implement alternative business strategies
- 10.4 Create incentives for both existing and new businesses in affected communities for example through tax reliefs, grants, concessional loans, and encouraging businesses to hire ex-coal workers.
- 10.5 Develop, together with local and regional governments, regional strategies to enhance community resilience
- 10.6 Set up channels for knowledge-sharing and collaboration between state and territory governments, inter-regionally, and internationally, so that communities facing a transition can learn from experiences.

Notes

- ¹Betony Jones et al, *The Net Economic Impacts of California's Major Climate Programs in the Inland Empire* (UC Berkeley Labor Center, 2017).
- ² Perspectives for the Energy Transition Investment Needs for a Low-Carbon Energy System (OECD/IEA and IRENA, 2017).
- ³TCFD, Final Report: Recommendations of the Task Force on Climate-related Financial Disclosures (June 2017) <fsb-tcfd.org/ publications/final-recommendationsreport/>.
- ⁴Tom Kompas, Van Ha Pham and Tuong Nhu Che, 'The Effects of Climate Change on GDP by Country and the Global Economic Gains from Complying With the Paris Climate Accord' (2018) 6 Earth's Future 1153.
- ⁵Australian Conservation Foundation and Australian Council of Trade Unions, Jobs in a Clean Energy Future (2015) 21.
- ⁶Clean Energy Council, *Jobs and Investment in Large-Scale Renewables* (2018).
- ⁷ Parliament of Australia, *State and Territory Government Responses to Climate Change*.
- ⁸ State of California, Province of British Columbia, State of Oregon, State of Washington, City of Los Angeles, City and County of San Francisco, City of Oakland, City of Seattle, City of Portland and City of Vancouver, *Pacific North America Climate Leadership Agreement*, 1 June 2016, San Francisco, California.

- ⁹<pacificcoastcollaborative.org>.
- ¹⁰ An independent review into the national electricity market in Australia recently recommended that states and territories agree to a national emissions trajectory together and with the Federal Government: Alan Finkel et al, *Independent Review Into the Future Security of the National Electricity Market – Blueprint for the Future* (Commonwealth of Australia, 2017) <energy. gov.au>.
- ¹¹ Betony Jones, Peter Philips and Carol Zabin, 'The Link Between Good Jobs and a Low Carbon Future' (UC Berkeley Labor Center, 2016).
- ¹² Calla Wahlquist, 'Victoria's Renewable Energy Boom Set to Create Thousands of Jobs', *The Guardian* (online) 2 October 2018.

- ¹⁴Alan Finkel et al, above n 9.
- ¹⁵ IRENA, *Renewable Power Generation Costs in* 2017 (2018) <irena.org/publications>.
- ¹⁶Ibid.
- ¹⁷ Energy Security Board, *National Energy Guarantee – Final Detailed Design* (COAG Energy Council, August 2018).
- ¹⁸ Stephen Long, 'Tesla Battery Proves a Leading Source of Dispatchable Power, AEMO Says', *The Age* (online) 2 October 2018.

- ¹⁹ ClimateWorks Australia and Australian Government Department of Industry, Industrial Demand Side Response Potential – Technical Potential and Factors Influencing Uptake (February 2014).
- ²⁰ Centre for International Economics, *Capitalising on the Building Sector's Potential to Lessen the Costs of a Broad Based GHG Emissions Cut* (prepared for ASBEC Climate Change Task Group, 2007).
- ²¹ <c40.org/other/net-zero-carbon-buildingsdeclaration>.
- ²² ClimateWorks Australia, ANU, CSIRO and CoPS, Pathways to Deep Decarbonisation in 20150: How Australia Can Prosper in a Low Carbon World (ClimateWorks Australia, 2014).

²³Ibid.

- ²⁴ Maddocks, *Planning Policy and Practice: The Right Mechanism to Tackle Climate Change?* (September 2010).
- ²⁵ Policy and Planning Guidelines for Development of Wind Energy Facilities in Victoria (2009).
- ²⁶ Pacific Northwest Research Station, 'Land Use Planning: A Time-Tested Approach for Addressing Climate Change' (2009) 113 Science Findings 1.

²⁷ Clause 15.12.

¹³ Ibid.

- ²⁸ The now-withdrawn US Council on Environmental Quality's guidance to federal agencies on how to consider climate change in impact assessment and California's equivalent state guidelines could provide assistance as a reference point. See CEQ Final Guidance for Federal Departments and Agencies on Consideration of Greenhouse Gas Emissions and the Effects of Climate Change in National Environmental Policy Act Reviews (2016, withdrawn, <ceq.doe. gov>); CEQA Guidelines for Greenhouse Gas Emissions, implemented by SB97, 2007.
- ²⁹ Australian Government Department of the Environment and Energy, Quarterly Update of Australia's National Greenhouse Gas Inventory: December 2017 (Commonwealth of Australia, May 2018), 14.
- ³⁰ Australian Government Department of the Environment and Energy, *State and Territory Greenhouse Gas Inventories 2016* (Commonwealth of Australia, February 2018).
- ³¹ Lily D'Ambrosio MP, 'Regional Victoria Leading the Way to a Renewable Future' (Media Release, 26 October 2017).
- ³² ClimateWorks Australia, ANU, CSIRO and CoPS, Pathways to Deep Decarbonisation in 20150: How Australia Can Prosper in a Low Carbon World (ClimateWorks Australia, 2014), 65.
- ³³ Tim Washington, Transcript of Evidence to Parliament of Victoria, Inquiry into Electric Vehicles (9 November 2017).
- ³⁴ ClimateWorks Australia, *The State of Electric Vehicles in Australia* (June 2017).

- ³⁵ Natural Capital Economics, Draft Report to the Queensland Conservation Council: Analysis and Discussion of Emissions Scenarios for Queensland (June, 2018).
- ³⁶ ACT Government, The ACT's Transition to Zero Emissions Vehicles – Action Plan 2018-2021 (2018).
- ³⁷ Lisa Cliff, *Recommendations for Queensland's Climate Transition* (Queensland Conservation Council, 2018).
- ³⁸ ClimateWorks Australia, ANU, CSIRO and CoPS, Pathways to Deep Decarbonisation in 20150: How Australia Can Prosper in a Low Carbon World (ClimateWorks Australia, 2014), 57.
- ³⁹ (November 2017) <webstore.iea.org/ technology-roadmap-deliveringsustainable-bioenergy>.
- ⁴⁰ Lisa Cliff, above n 36.
- ⁴¹ See Climate Change Authority, Opportunities to Reduce Light Vehicle Emissions in Australia (web document updated 2018) <climatechangeauthority.gov.au/ Node/241>.
- ⁴² Australian Government Department of the Environment and Energy, *Quarterly Update* of Australia's National Greenhouse Gas Inventory: December 2017 (Commonwealth of Australia, May 2018).
- ⁴³ Ibid.

⁴⁵ Arunima Malik et al, 'The Carbon Footprint of Australian Health Care' (2018) 2 *The Lancet 27.*

- ⁴⁶ Victoria State Government, *Carbon Emissions in Healthcare Facilities* <www2. health.vic.gov.au/hospitals-and-healthservices/planning-infrastructure/ sustainability/carbon-emissions>.
- ⁴⁷ Malik et al, above n 44.
- ⁴⁸ Sustainable Development Commission, Stockholm Environment Institute, NHS England Carbon Emissions Carbon Footprinting Report (2008); NHS Sustainable Development Unit, Carbon Footprint Update for NHS in England (NHS, 2013) <sduhealth.org.uk/documents/carbon_ footprint_summary_nhs_update_2013. pdf>; NHS Sustainable Development Unit, Saving Money by Saving Carbon -Decision Making in the NHS Using Marginal Abatement Cost Curves (2010) <sduhealth. org.uk/documents/publications/ savemoney1.1.pdf>; P Brockway, 'NHS at Forefront of Carbon Modelling' (2010) 64 Health Estate 33.
- ⁴⁹ Lawrence H Brown et al, 'The Energy Burden and Environmental Impact of Health Services' (2012) 102 *American Journal of Public Health* 76.
- ⁵⁰ World Health Organisation Regional Office for Europe, *Environmentally Sustainable Health Systems* (2017) <euro.who.int/___ data/assets/pdf_file/0004/341239/ESHS_ Revised_WHO_web.pdf?ua=1>.
- ⁵¹Carbon Disclosure Standards Board, CDSB Framework for Reporting Environmental Information, Natural Capital and Associated Business Impacts – Advancing and Aligning Disclosure of Environmental Information in Mainstream Reports (2018) <cdsb.net/ framework>.

⁴⁴ Ibid.



Melbourne Sustainable Society Institute