

Building a strong green and circular economy for Sydney

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Executive summary

Environmental sustainability is often seen as an economic cost, especially in Australia, whose industries are predominantly underpinned by fossil fuels. The concept of a 'green economy' attempts to shift this mindset by demonstrating that environmental protection also brings opportunities for job creation and economic growth. Widely used in the European Union and some other countries, it is yet to be adopted in Australia.

This report is the first to size the green economy in the Sydney LGA, assess its economic and environmental potential, and consider the role of government in supporting a green and circular economy. It defines the green economy practically and simply as: "the collection of activities in the economy that have a primary purpose of protecting or restoring the environment."

This definition encompasses a broad range of activities, from renewable energy and environmental law through to goods and services that have been adapted to make them more sustainable, like coffee keep cups and green buildings. It also recognises the important contribution that circular economy principles can make to growing the green economy, especially in reducing waste and improving resource efficiency.

Sizing Sydney's green economy

The Sydney LGA has a robust, fast-growing green economy that contributed 2.5-3% of jobs and \$2.4 billion in economic value to the city in 2018. This represents 1.8 percent of the area's Gross Regional Product – which is almost as large as the value added by the retail sector in Sydney. Green economy jobs have grown twice as fast as overall employment in the Sydney LGA in recent years, and there has been a strong demand for green skills in law, sales and marketing. The shift towards green activities in these occupations suggests that the public is becoming more aware and supportive of a green economy.

Most of the Sydney LGA's green economy jobs are in managing and supporting the green economy, in sectors such as environmental advisory and governing and regulating. Sustainable finance is also a major sector, built on the strength of Sydney's financial services industry. These activities support broader economic transformations across the state and country. As a hub of knowledge, capital exchange and innovation, Sydney has a

key role to play in enabling and facilitating Australia's transition to green.

A robust green economy in the Sydney LGA will unlock significant economic benefits not only for Sydney, but the broader state and national economies. Beyond the economic value and jobs created by green businesses locally, the Sydney LGA is also an important link in green value chains that stretch across Australia. For example, waste from the city generates approximately 450 jobs outside of the LGA and up to \$205 million in value from recyclable materials. The city's renewable energy needs fuel demand for about \$10-25 million worth of solar cell production and up to \$50 million of solar farm investment per year.

Role of government in supporting the green economy's growth

While the sector has so far been led by businesses and consumer demand, government policies and programs can help support and accelerate its growth. Sydney's green economy is comparable to that of Vancouver and some US states, but lags global leaders like Oslo and Copenhagen, where three in 40 jobs are green. A number of factors are impacting Sydney LGA's green economy including access to reliable and clear information, uncertainty in the policy environment and challenges in supply chain coordination.

Other city governments globally have adopted a range of strategies and programs to foster the development of green and circular economies. They have set targets and worked on both sides of the market, helping transition businesses and improving awareness and education of residents, workers and visitors. They have also used procurement and their own operations to drive change.

The City of Sydney could support Sydney's green economy through three broad policy directions:

1. Make a clear commitment to the green economy, educate businesses and consumers and identify

opportunities to strengthen existing policies and programs.

2. Develop a more proactive approach to market development, including identifying and supporting priority sectors for Sydney's green economy and establishing Sydney as a circular innovation hub. This report identifies five sectors with particularly strong growth prospects in Sydney: green buildings; sustainable finance; sharing economy; environmental advisory; and green research.
3. Advocate and partner with other levels of government to lift their commitment to the green economy, particularly in green transport and green skill development.

The economic outlook for Sydney's green economy is broadly positive and the opportunities are significant. Continued growth in the sector will not only add to Sydney's economic output but also position the City of Sydney as a global leader in environmental management. Importantly, a strong green and circular economy will help bring about improvements in the quality of the air we breathe, the water we drink and the food we produce, ensuring a prosperous, liveable city for future generations.



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Built	NSW Environmental Protection Agency
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Climate-KIC Australia	Presync
EnergyLab	Smart Cities Council Australia New Zealand
	UTS Institute for Sustainable Futures

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Note

In this report, the terms '**Sydney LGA**', '**the LGA**' and '**Sydney**' refer to the Sydney local government area. The term '**Greater Sydney**' refers to the wider Sydney metropolitan area.

The term '**City of Sydney**' refers to the council that governs the Sydney local government area.

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What is the green economy?

What is the green economy?

The 'green economy' concept was coined in 1989 by London environmental economists, who proposed that governments could help reduce and repair environmental damage by taxing polluting activities and rewarding environmental clean-up. It has since been used to describe an aspirational view of how countries might achieve both environmental sustainability and strong economic growth, and it has been adopted in the European Union and some other countries as a framework for transforming economic activities to a more sustainable basis.

The green economy is comprised of purposeful activities in the economy that protect or restore the environment – both the production of green goods and services such as recycling, as well as the adaptation of other goods and services to be more sustainable, for example electric vehicles. While historically environmental protection was generally viewed as being in opposition to economic growth, the green economy attempts to generate benefits to both simultaneously. For Sydney, these benefits from a strong green economy will also flow outside the LGA, supporting economic transition across NSW and nationally.

1.1 The green economy is made up of activities across the economy that protect or restore the environment

While green economy is a term that resonates with many people, there is not a common understanding of exactly what it means. This presents a challenge for policy development and measurement. There is no standard definition of a green economy that is accepted globally – instead, a range of definitions have been proposed, from the aspirational to the practical.¹ This report defines the green economy practically and simply as:

the collection of activities in the economy that have a primary purpose of protecting or restoring the environment.²

There are several important aspects of this definition of the green economy: the intentionality with which environmental outcomes are sought, and the range of different activities across the economy that are included. Aligning with the definition of green economy, this report defines a green job as

any job in which a substantial share of the activities are performed within the green economy.³

Green economy activities have as their primary purpose achieving positive environmental outcomes

The activities that make up the green economy seek to achieve a range of different green outcomes, including:

- reducing waste, carbon emissions, pollution, water usage and energy consumption;
- improving resource efficiency, reuse and recycling; and
- protecting biodiversity.

Only activities that *intentionally* seek to improve environmental outcomes are included in the green economy. For example, traditional forms of public transport are not considered to be a green economy activity as their primary purpose is to transport a person from one location to another and avoid private vehicle congestion; their impact on reducing pollution and carbon emissions is a secondary benefit. Waste management services, including collecting rubbish to recycle or deposit in landfills, are a green economy activity as their primary purpose is to reduce pollution, as well as improve recycling outcomes.⁴

¹ See Appendix B for a detailed discussion of approaches to defining the green economy.

² This definition of the green economy is based on the types of economic activity related to the environment under the System of Environmental-Economic Accounting Central Framework. It also draws on the United States Bureau of Labor Statistic's distinction between outputs (green goods and services) and processes (greening of other goods and services) in green jobs.

³ This definition of a green job provides a threshold to exclude jobs with only a small share of activities that are green. For example, a solar cell engineer designing solar panels is a green job, however a facilities manager at a bank who is also responsible for recycling the company's coffee cup lids is not.

⁴ Note that the assessment of whether an activity's primary purpose is to achieve environmental outcomes may change over time as community standards and expectations shift and activities. For example, some types of waste management such as landfill may come to be regarded as not green relative to more circular approaches to waste.

There are two categories of goods and services in the green economy: those born green and those that have been adapted

The green economy includes two broad categories of goods and services: those created with the primary purpose of improving environmental sustainability; and those that have been adapted to fulfil their traditional purposes in more environmentally sustainable ways, either by changing the good or service or producing it with less negative impact on the environment.

‘Green’ goods and services are those with the primary purpose of protecting, restoring or alleviating pressure on the environment. Common examples are solar panels to produce renewable energy or waste collection services to facilitate improved recycling and waste processing.

‘Adapted’ goods and services include goods and services that have been modified to improve their environmental impact while maintaining their core purpose for the consumer. For example, electric vehicles are considered green, as they use more sustainable methods to fulfil the core purpose of transportation. Traditional goods and services may also be adapted for the green economy by using more environmentally sustainable methods of production. For example, a toy manufacturer may incorporate renewable energy into its production processes, therefore reducing its environmental impact through more sustainable practices.

The green economy also includes ‘upstream’ activities such as advocacy, education, regulation, and advisory services

It is important to also recognise the critical role of ‘upstream’ economic activities that manage and support the growth of the green economy. These activities do not directly generate green outcomes but play a critical role in enabling other organisations to do so. For example, the discovery through research of a new production process may help an organisation alter its actions to reduce their impact on the environment, while education to increase the pool of workers with green skills supports companies to improve their environmental performance.

Examples of the different types of green economy activities and their potential environmental outcomes are shown in Exhibit 1: Examples of activities in the green economy.



Exhibit 1: Examples of activities in the green economy

		Types of green activities		
		A. Producing green goods and services	B. Adapting other goods and services to be more green	C. Managing and supporting the green economy
Green outcomes	Reduce waste	<ul style="list-style-type: none"> Recycling plants 	<ul style="list-style-type: none"> Plasphalt 	<ul style="list-style-type: none"> Waste regulation
	Reduce carbon	<ul style="list-style-type: none"> Renewable energy services 	<ul style="list-style-type: none"> Green bonds 	<ul style="list-style-type: none"> Low carbon financing
	Reduce pollution	<ul style="list-style-type: none"> Catalytic converter 	<ul style="list-style-type: none"> Low-emissions vehicles 	<ul style="list-style-type: none"> Vehicle emissions standards
	Protect biodiversity	<ul style="list-style-type: none"> Environmental monitoring 	<ul style="list-style-type: none"> Biodegradable plastic bags 	<ul style="list-style-type: none"> Environmental regulation
	Improve resource efficiency	<ul style="list-style-type: none"> Food waste tracking devices 	<ul style="list-style-type: none"> Green buildings 	<ul style="list-style-type: none"> Research into light-weighting materials
	Reduce water usage	<ul style="list-style-type: none"> Rainwater tank 	<ul style="list-style-type: none"> Water-saving showerheads 	<ul style="list-style-type: none"> Water use education campaigns
	Increase re-use and recycling	<ul style="list-style-type: none"> Reverse vending machines/collection depot 	<ul style="list-style-type: none"> Coffee keep cups 	<ul style="list-style-type: none"> Second-hand marketplace
	Reduce energy consumption	<ul style="list-style-type: none"> Insulation 	<ul style="list-style-type: none"> Energy-saving light bulbs 	<ul style="list-style-type: none"> Sustainable architecture

Source: AlphaBeta analysis



1.2 A strong green economy in Sydney can generate both economic and environmental benefits to the LGA, the state and the country

Often objectives of environmental protection and sustainability are cast in opposition to economic growth and development. The green economy offers a model to reconcile the economic and environmental – its significance is its ability to generate benefits to both simultaneously. Of course there will still be trade-offs in the green economy in the short term between these two sets of benefits, where the most environmentally beneficial practices may not generate as much economic opportunity and may displace existing economic activity. However, in the long term the improved sustainability of the economic model should provide profound economic benefits.

A strong green economy in the Sydney LGA will not only benefit Sydney. Given the interconnectedness of the Sydney LGA’s economy with the wider state and national economies, Sydney’s green economy can also support environmental and economic benefits outside of the LGA (see **Exhibit 2**).

Exhibit 2: Benefits of a green economy in the Sydney LGA

	Benefits to the Sydney LGA	Benefits outside the Sydney LGA
Economic benefits	<p>Drive future economic growth and jobs creation for the Sydney LGA</p> <ul style="list-style-type: none"> • <i>Example:</i> growth in employment in sharing economy in the Sydney LGA 	<p>Support growth and employment nationally</p> <ul style="list-style-type: none"> • <i>Example:</i> demand for green building materials can support jobs outside Sydney
Environmental benefits	<p>Improve the environmental performance of the Sydney LGA</p> <ul style="list-style-type: none"> • <i>Example:</i> green buildings reducing emissions from built environment 	<p>Support improved environmental outcomes across NSW and Australia</p> <ul style="list-style-type: none"> • <i>Example:</i> green finance from Sydney LGA funding renewables investments

Source: AlphaBeta analysis

Green practices, goods and services help businesses reduce costs while supporting new markets, economic growth and employment

Demand in the economy is shifting towards 'greener' goods and services as consumers are becoming more conscious of the environmental impact flowing from their everyday purchasing decisions. This change in consumer behaviour, in combination with some financial incentives from government, have presented new opportunities for increased economic activity and jobs. In recent years, new markets have emerged to capture some of these opportunities. Examples of these include the growth in rooftop solar installation, rapid uptake of car sharing in some areas (see

Box 3) and a rise in ethical and green financial investments (see **Box 4**).

In addition to accessing these new markets, businesses also stand to financially gain from adopting more sustainable practices in their production processes. While solar panels require an upfront investment, they significantly reduce businesses' energy costs in the long term.⁵ Generally, the upfront investment is recovered within approximately five years of operation, while the business continues to reap the cost savings for the remainder of the technology's life, which is approximately 25 years.⁶ Other business operations improvements, such as lean and additive manufacturing, have some upfront investments but can significantly reduce production costs through lower input costs.

⁵ Expert interviews

⁶ Expert interviews; Australian Energy Council (2019), *Solar Report January 2019*. Alison Potter (2018), *Solar panel payback time* and Andrew Sedy (2018), *How long do solar panels last? Does their output reduce over time?*

A growing local green economy will generate upstream demand in adjacent regions. Sydney's commercial building construction sector is one of the largest in the country. Increasing adoption of green building approaches and technologies in Sydney's commercial buildings can generate demand for green building materials and other green technologies manufactured elsewhere in Australia.

Finally, Sydney's green economy can also generate export revenue for Australia. Previous analysis has found that the Low Carbon and Environmental Goods & Services sector in Greater Sydney generated export sales of \$1.2b in 2015-16, with average annual growth of 4.6% since 2012-13, with South Korea, Japan and China all leading destinations.⁷ Export demand is likely to remain strong as major markets in Asia wrestle with transition their economies to more sustainable growth pathways.

A strong green economy in the Sydney LGA can improve environmental outcomes locally, regionally and nationally

A strong green economy in the Sydney LGA can play an important role in supporting City of Sydney to achieve its environmental objectives for the LGA. The Sustainable Sydney 2030 strategy sets out the council's aspiration for the Sydney LGA to be internationally recognised as an environmental leader, and become a net zero emissions city by 2050.⁸ For example, growth in the local green buildings sector will help reduce emissions from the Sydney LGA's built environment, which currently accounts for

⁷ kMatrix (2016), *Sydney Low Carbon and Environmental Goods & Services Sector (LC) EGSS*.
⁸ City of Sydney (2013), *Sustainable Sydney 2030: Community Strategic Plan*.

approximately 80% of emissions in the Sydney LGA.⁹

Furthermore, Sydney is an economic hub that delivers important services to the rest of Australia. Expertise, capital, and research from the local green economy will support improved environmental performance elsewhere. Green finance products developed in the Sydney LGA can fund environmentally sustainable investments outside of Sydney, such as renewable energy generation, which in turn will generate environmental benefits across NSW and Australia. The knowledge and expertise of sustainability consultants based in Sydney LGA is already supporting businesses across Greater Sydney to improve the environmental performance of their production processes.

Other benefits from a green economy include better social and health outcomes

A strong green economy will be critical for creating new employment opportunities, sometimes referred to as 'green collar jobs', for workers increasingly forced to transition out of traditional, fossil-fuel based industries. Importantly, emerging sectors such as green buildings and green utilities can provide stable employment for lower-skilled workers that lack tertiary qualifications.

The environmental benefits of a green economy will also flow through to improved social and health outcomes. The impacts of environmental problems, such as climate change, are most likely to be most harmful to population groups that are already disadvantaged, such as low-income households.¹⁰ While this is especially true in developing countries that face major adaptation costs and threats to food security, it also applies in Australia, where already disadvantaged groups are less able to mitigate and adapt to environmental change.

Previous research has also indicated that the physical and mental wellbeing of Australia's population is linked to the health of its natural environment.¹¹ A strong green economy will help bring about improvements in the quality of the air we breathe, the water we drink and the food we produce.

For example, research by the World Health Organisation demonstrates that investment in green buildings and workplaces can help to improve an employee's productivity and health through improved ventilation and lighting in their workspace.¹² Health outcomes can also be achieved through policies that encourage the use of renewable energy over fossil fuels to reduce pollution and greenhouse gas emissions, therefore improving air quality.

⁹ City of Sydney (2018), *Environmental sustainability in new buildings*.

¹⁰ United Nations Research Institute for Social Development (2012), *Social Dimensions of Green Economy*.

¹¹ Australian Institute of Health and Welfare (2018), *Australia's health 2018*.

¹² World Health Organisation, *Health in the Green Economy – Occupational Health*.

1.3 The circular economy has an important role to play within Sydney's green economy

The circular economy is a regenerative model of consumption and production aimed at reducing waste and minimising the consumption of resources (see **Box 1** for a more detailed description of the circular economy).¹³ The idea of a circular economy has received increasing global attention through the efforts of organisations such as the Ellen MacArthur Foundation that have promoted the transition of businesses, institutions and cities away from the traditional, linear model of consumption.

The European Union has been developing and adopting circular economy strategies since 1992 through various policies and programs to reduce waste and increase recycling. The European Commission in 2015 developed the European Union Action Plan for the Circular Economy, and became the first government body to prioritise a transition towards a circular economy. Since then, the trend has blossomed through Europe and Asia, and eventually gained traction in Australia in 2018 in the wake of China's National Sword policy.

The circular economy provides a set of strategies to grow and strengthen the green economy. Greater adoption of circular economy principles in Sydney LGA can contribute significantly to the same green outcomes around which the green economy is focused, especially waste reduction and improved resource efficiency. However, policy development to support the circular economy is still at an early stage in Australia.

China's National Sword policy has increased awareness of the circular economy in Australia

China was Australia's largest export market for recyclable materials until 2018, when its National Sword policy restricted the quality of material it would accept. The policy left as much as a third of all of Australia's recyclable plastics and paper stranded, disrupting our waste and recycling industry and prompting the nation to reconsider its consumption and disposal behaviours.¹⁴ Later last year, the Federal Government's Environment and Communications References Committee recommended the establishment of a circular economy within Australia.¹⁵

These events have created rippling effects at a federal and state level, with the Australian, New South Wales, Queensland and Victorian governments indicating their intention to transition towards a circular economy. The 2018 National Waste Policy committed Australia to a circular economy that would move away from the 'take, make, use and dispose' model of consumption to seeing waste as a resource.¹⁶ The NSW Government released a discussion paper and policy statement on the circular economy soon after, which identified the principles and areas of focus for the NSW economy.

¹³ D D'Amato et al (2017), *Green, circular, bio economy: A comparative analysis of sustainability avenues*.

¹⁴ Sydney Morning Herald (2018), *China's 'National Sword' waste ban hits home for Cleanaway*.

¹⁵ Senate Environment and Communications References Committee (2018), *Never waste a crisis: the waste and recycling industry in Australia*.

¹⁶ Commonwealth of Australia (2018), *National Waste Policy: Less waste, more resources 2018*.

Circular economy principles can contribute significantly to improving waste and resource efficiency

A circular approach to goods and services in the economy can directly reduce the amount of waste generated, improve resource efficiency, and increase recycling and reuse. One example is a subscription model for children's clothing in the US, whereby customers pay a monthly subscription fee for 20 pieces of clothing in a particular size, and later exchange them for a set of clothes one

size bigger. The returned clothes are inspected for quality, professionally cleaned and delivered to another customer.¹⁷

The circular economy will also have flow on impacts in other areas of the green economy, particularly in reducing carbon and energy consumption. It has been estimated that the transformation of the European chemical industry to a more circular model, for example, could enable a reduction in Europe's total energy consumption by up to 37%.¹⁸

Box 1: What is the circular economy?

The circular economy can be defined as a closed loop that maximises the value of resources by keeping them in use for as long as possible to optimise resource yield and eliminate waste. This definition of the circular economy aligns with both the NSW state government and the federal government's approach under their respective policies.¹⁹ The implications of the closed loop for economic activity are visually demonstrated in **Exhibit 3**.

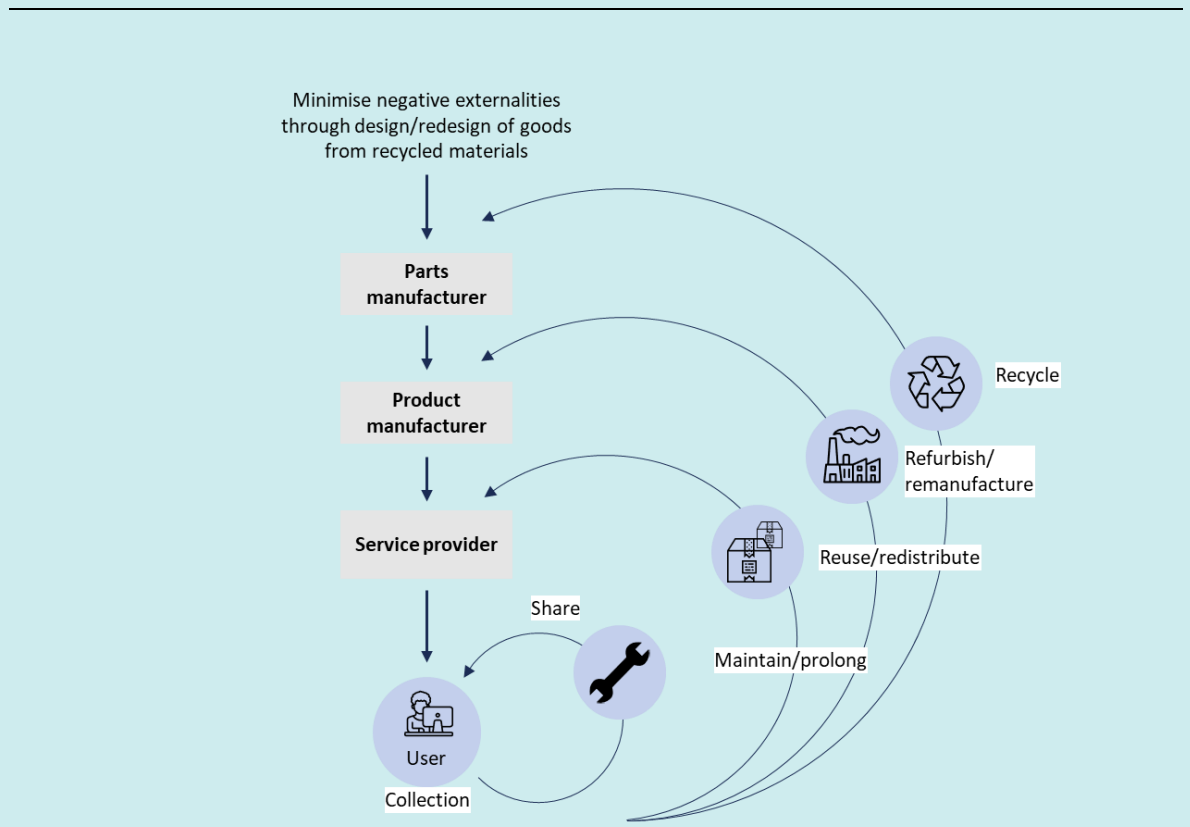
In general, the objective is to create a system that allows for the long life, optimal reuse, refurbishment, and recycling of products and materials to preserve and regenerate the natural stock of resources, while simultaneously designing out waste and externalities to generate a closed loop. For example, prolonging the life of a washing machine through repair and proper maintenance facilitates a closed loop and is therefore less resource intensive, alleviating pressures on natural resources.

¹⁷ Vigga, Press Kit.

¹⁸ Accenture (2017), *Taking the European Chemical Industry into the Circular Economy*.

¹⁹ State of NSW and NSW Environment Protection Authority (2019), *NSW Circular Economy Policy Statement: Too Good To Waste*. Commonwealth of Australia (2018), *National Waste Policy: Less waste, more resources 2018*.

Exhibit 3: Model of a circular economy



Source: Ellen MacArthur Foundation, AlphaBeta analysis

An important component of the circular economy is the sharing economy, in which resource consumption is minimised by increasing the utilisation of existing goods and thereby reducing the need to produce more goods. The sharing economy has grown rapidly in many countries over the last decade, enabled by new technology platforms such as smartphones that make it easier to coordinate 'shared ownership' models.

Integrating the circular economy as a sector within the green economy can contribute substantially to green objectives. For example, a closed loop economy will reduce the reliance on raw materials, as well as reducing an economy's dependence on landfill for waste generated at the end of a product's lifecycle.²⁰

²⁰ Ellen MacArthur Foundation (2013), *Towards the Circular Economy: Economic and business rationale for an accelerated transition*.

The green economy in the Sydney LGA

The green economy in the Sydney LGA

One of the challenges for understanding the green economy is a lack of economic data on its development. Official economic statistics from the ABS, based around the standard classifications of industries and occupations, do not identify many aspects of the green economy.²¹ This makes it difficult for businesses to understand the opportunities and for policy makers to focus their efforts. This report combines various data sources, including online job ads, Census and the City of Sydney's Floor Space and Employment Survey to undertake the first measurement of the Sydney LGA's green economy.

In 2018, the green economy in the Sydney LGA provided employment for almost 16,000 workers, 2.5-3% of local employment, and generated \$2.4 billion in Gross Value Added. Most of those jobs are in managing and supporting the green economy, in sectors such as environmental advisory and governing & regulating. Sustainable finance is also a major sector in terms of value creation, responsible for more than \$400m in value added.

Sydney's green economy is also highly connected to the broader state and national green economies, with complementary economic activities occurring that highlight the Sydney LGA's role as a centre of expertise and capital and its limited role in production. Sydney generates green economic activity elsewhere as a significant supplier, consumer and importer of green goods & services. In waste for example, the Sydney LGA's waste streams create almost 500 processing jobs downstream.

²¹ The classifications systems in use in Australia are the Australian & New Zealand Standard Industrial Classification and the Australian & New Zealand Standard Classification of Occupations.

2.1 The green economy contributes one in 40 jobs and \$2.4 billion in economic value to the Sydney LGA

In 2018, there were almost 16,000 green economy workers in the Sydney LGA, representing 2.5-3% of local employment.²² These workers were identified through an analysis of the tasks required of them by job advertisements, and include people employed in environmental consulting, environmental regulation, waste collection and sustainable building design. The green economy also generated \$2.4 billion in Gross Value Added (GVA) in 2018, which is the standard economic measure for the contribution of a particular industry or sector to the wider economy.

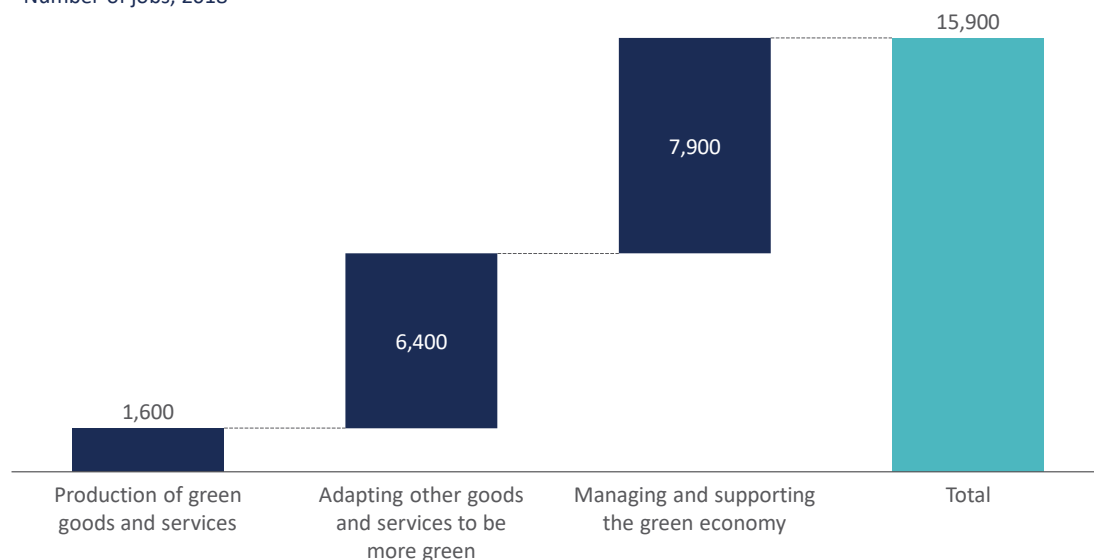
Sydney's green jobs are concentrated in managing and supporting the green economy

As shown in **Exhibit 4**, only half of green jobs in the Sydney LGA relate to the production and development of green products and services. The other half are 'upstream' jobs focused on managing and supporting the

green economy. These include environmental lawyers who help companies understand and meet environmental standards, advocacy groups that educate consumers and businesses about sustainable practices, and research and development jobs, including those at UTS' Institute for Sustainable Futures and CSIRO.

Exhibit 4: Green jobs in the Sydney LGA

Estimated number of green jobs in the Sydney LGA
Number of jobs, 2018



Source: *Burning Glass Technologies: Labor Insight (2019)*, *Census 2016*, *City of Sydney Floor Space and Employment survey 2017*, *ABS*, *AlphaBeta analysis*

²² Full details of the methodology for sizing the green economy in the Sydney LGA can be found in Appendix A.

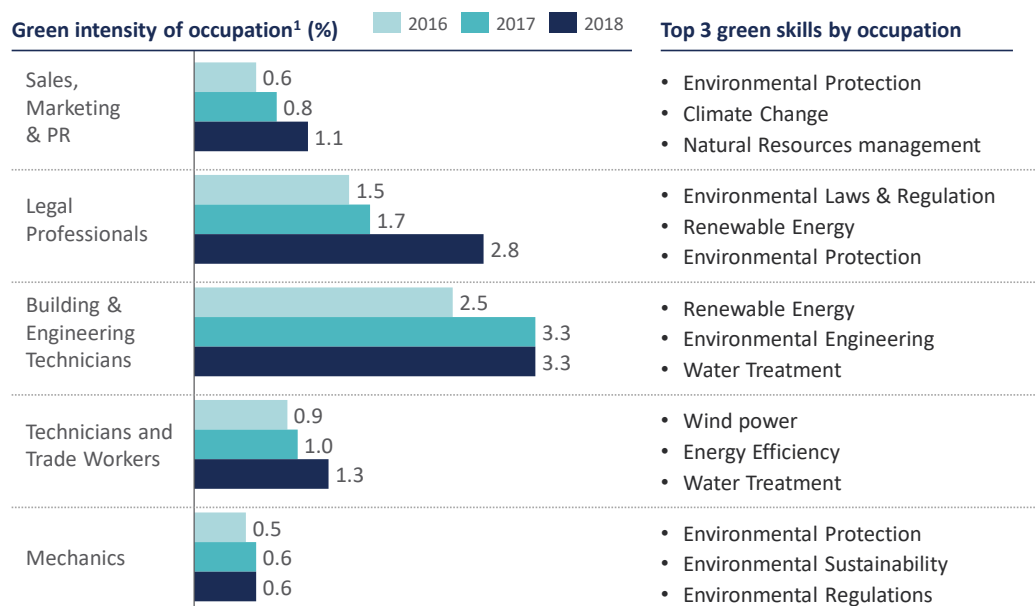
Job advertisements reveal rising demand for more green skills in a range of different occupations

While green jobs are scattered across many different occupations and industries, certain occupations are undergoing a noticeable shift towards green activities and skills. **Exhibit 5** provides examples of occupations that have become significantly greener in the two years to 2018, as observed in real-time job advertisement data. This is measured by the ‘green intensity’ of the occupation, which is the frequency with which green skills are

requested in job ads for that occupation. The data highlights a growing need for green equipment installers and engineers, including energy-efficient equipment technicians and engineers who design and test roads made with plasphalt.

There has also been a growing demand for green skills in occupations with public-facing or regulatory elements like law, sales and marketing. The shift towards green activities in these occupations suggests that the public is becoming more aware and more supportive of a green economy.

Exhibit 5: Demand for green skills in different occupations



Note: Examples only, not an exhaustive list of occupations.

¹ Green intensity is the share of job ads by occupation requiring green skills such as environmental sustainability, renewable energy. Occupation groups consist of sales, marketing and public relations professionals; legal professionals; building and engineering technicians; miscellaneous technicians and trades workers; automotive electricians and mechanics

Source: Burning Glass Technologies: Labor Insight (2019), AlphaBeta analysis

Box 2: Adapted goods and services in the Sydney LGA

Many goods and services have already been adapted for the green economy. Examples include electric vehicles, reusable shopping bags, and production processes that are powered by renewable energy. Measuring the full scale of these different adaptations is challenging given available data, so this report focuses on the key types of adapted goods that are most likely to be significant to the Sydney LGA given its existing economic mix:

- **Green buildings** (*\$250m GVA and 1,490 jobs*)
Green buildings are resource efficient residential, commercial, industrial buildings. Features of a green building could include solar panels, timber windows with triple-glazed glass, energy-saving taps and building design that maximises natural heating and cooling.
- **Green transport and infrastructure** (*\$55m GVA and 370 jobs*)
Green transport involves vehicles that can be powered by renewable energy such as electric cars, buses and trains. Green infrastructure either avoids materials that are high in emissions, such as cement, or promotes cleaner modes of transport such as bike paths.
- **Sustainable finance** (*\$410m GVA and 900 jobs*)
Sustainable finance is the modification of financial products to target climate-friendly and sustainable investments, such as green bonds and sustainability-linked loans, green or ethical investing, and green super.
- **Green hospitality and retail** (*\$45m GVA and 600 jobs*)
Green hospitality and retail involve decreasing the negative environmental impacts of the whole supply chain for hospitality and retail, such as minimising waste, maximising recycling and increasing reuse.
- **Sharing economy** (*\$80m GVA and 990 jobs*)
A sharing economy aims to maximise the use of existing goods and services through sharing, thereby reducing pressure on additional resources. Examples include home sharing like Airbnb and car sharing services.

The green economy is also a key contributor to Sydney's Gross Regional Product

The green economy contributed \$2.4 billion in Gross Value Added (GVA), or about 1.8 percent, to the Sydney LGA's Gross Regional Product (GRP) in 2018 (GRP is the sum of the value added from all the different economic activities that occur within the region). For comparison, this is almost as large as the GVA of the retail sector in Sydney LGA.

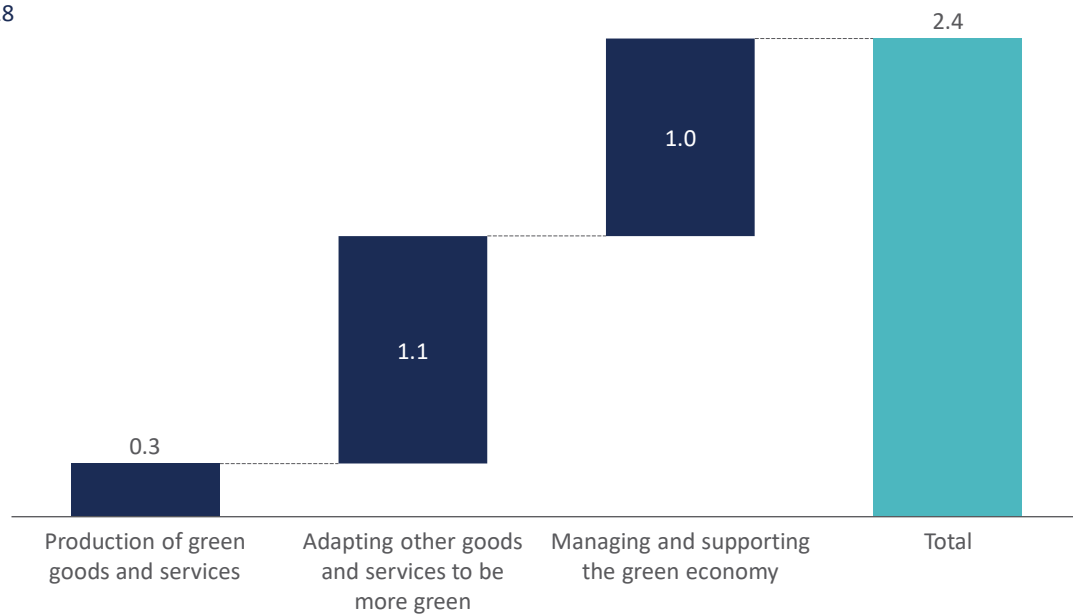
About half of value added by the Sydney LGA's green economy comes from adapting other goods and services to be greener, as shown in **Exhibit 6**. As discussed in Chapter 1,

'adapted' goods include environmentally friendly versions of traditional products and services (for example, electric cars and energy efficient light bulbs), as well as products and services whose production processes have been improved to reduce environmental costs, like beer brewed in solar-powered breweries, or operations that are managed from wind-powered offices. As described in

Box 2, five key categories of adapted goods in the Sydney LGA have been sized. The most significant are green buildings and sustainable finance, which together contribute 28% of Sydney's green economy GVA, reflecting the LGA's heavily urbanised and services-based economy.

Exhibit 6: Value of the green economy in the Sydney LGA

Estimated GVA of green economy in Sydney LGA
\$b, 2018



Source: *Burning Glass Technologies: Labor Insight (2019)*, *Census 2016*, *City of Sydney Floor Space and Employment survey 2017*, *ABS*, *AlphaBeta analysis*

Box 3: How local government policies helped encourage car sharing

Sydney LGA is Australia's most successful car sharing market. There are four service operators with over 50,000 members registered within the LGA

The council has supported car sharing since 2007, when it commenced a trial that sought to improve the city's environmental impact by reducing residents' reliance on private vehicles. So far over 850 on-street car sharing spaces have been approved by the Traffic Committee, with additional spaces off street and in the peer-to-peer network. Four operators, Car Next Door, Flexicar, GoGet and Popcar, are helping more than one-third of local households to go car free as of 2016, up from 29% a decade earlier.²³

The City of Sydney's Car Sharing Policy facilitates the installation of dedicated, on-street parking spaces to eligible car share vehicles.²⁴ Car sharing benefits cities and the environment in several ways.

Firstly, individuals and businesses may use car sharing vehicles instead of purchasing their own vehicles.

The pay-per-use model of vehicle usage could also encourage individuals to more carefully consider whether they need to drive to their destination, or whether they would be better off walking or catching public transport. A 2011 survey found that car share members spend on average 62 additional minutes walking and 56 additional minutes on public transport per year, compared to non-member residents of the Sydney LGA.

Thirdly, the Policy requires car sharing operators to utilise vehicles with low emissions. Several operators are currently transitioning to a hybrid fleet and it is expected that in the long term, use of full electric vehicles will be introduced. For consumers, car sharing may provide a more cost efficient and environmentally friendly way to access a vehicle.

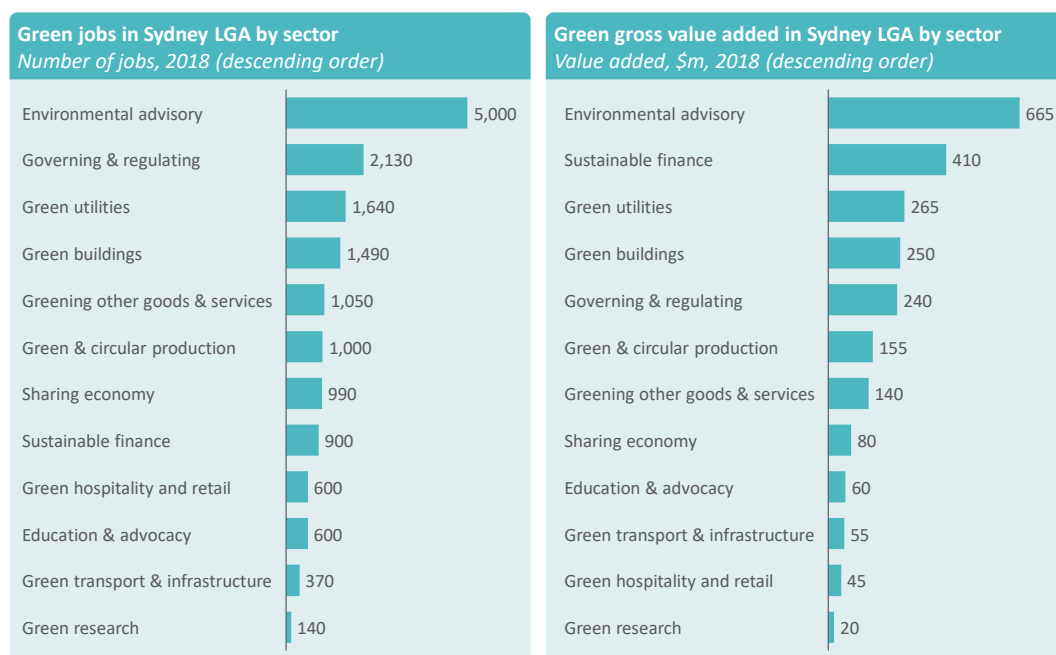
²³ NIEIR (2019), "City of Sydney: Number of cars per household". Based on ABS Census data.

²⁴ City of Sydney (2016), *Car Sharing Policy*.

2.2 There are 12 distinct sectors of the green economy in the Sydney LGA

The three components of the green economy in Sydney can be further broken down into 12 different ‘sectors’, as shown in **Exhibit 7**. The largest sector in terms of both employment and contribution to GVA is environmental advisory, highlighting the Sydney LGA’s role as a centre for the knowledge economy. Other major sectors include governing & regulating and sustainable finance, as well as green utilities and green buildings. The growth potential of each sector is discussed in Chapter 3.

Exhibit 7: Sectors in the Sydney LGA's green economy



Note: Clean tech is closely embedded across other sectors in the green economy and is not measured separately. Greening other goods & services is the greening of the administrative & support services and health care and social assistance industries. Green & circular production is greening the agriculture, mining, manufacturing, wholesale, IT & telecommunication, rental and hiring (excl. real estate), and other industries.

Source: *Burning Glass Technologies: Labor Insight (2019)*, *Census 2016*, *City of Sydney Floor Space and Employment survey 2017*, *ABS*, *AlphaBeta analysis*

Environmental advisory, governing & regulating and sustainable finance are the most significant sectors

In terms of both jobs and economic value, environmental advisory is by far the largest green economy sector within the Sydney LGA, accounting for almost one in three jobs and more than one-quarter of GVA. This category

includes the green activities of large professional services providers like the major accounting firms and more specialised consulting firms such as Arup. Environmental law is also part of this significant sector.

Governing and regulating is the second-largest sector in terms of green jobs, accounting for 13% of jobs. The Sydney LGA is currently a

hub for most of the NSW government's environmental agencies, as well as the environmental activities of the City of Sydney. However, several state government agencies including the NSW Environmental Protection Agency plan to relocate to Parramatta within the next year. This would reduce the size of the governing and regulating sector within the Sydney LGA significantly.

The second-largest sector in terms of GVA is sustainable finance, which contributes only

6% of local green economy jobs but 17% of GVA. Its relatively large GVA contribution reflects the critical role that financial services play within Sydney's economy, and LGA's status within the national economy as a financial hub. Within the Sydney LGA, the finance sector as a whole, including traditional banks, insurance and financial services providers, accounts for 19% of all jobs and about 41% of GRP.²⁵

Box 4: ANZ is growing Australia's sustainable finance sector with innovative new loan products

ANZ began offering sustainable financial products in Australia in 2015 when it issued its first green bond to meet demand from institutional investors. Since then, the Australian green bond market has grown strongly, with almost A\$3b in bonds issued in 2018, much of it by state governments to fund public transport infrastructure. However the market still lags behind Europe, where green bond issuance has tripled over the past the three years.²⁶

According to Andrew Lawson of ANZ's Sustainable Finance team, fund managers are under increasing pressure from their investors to grow their green assets. Green bonds are marginally more expensive to issue than regular bonds, due to costs associated with certification, assurance and reporting on the environmental impacts of the projects they fund, but investors are still expecting the same returns.

ANZ's Sustainable Finance team, located at the bank's Sydney office, is now pioneering use of loans in Australia to improve sustainability. In December 2018 it completed Australia's first Sustainability Linked Loan (SLL) with Adelaide Airport, a seven-year, \$50 million facility which comes with a set of environmental, social and governance targets. The airport gets a discount on the interest rate if those targets are met. More recently, ANZ jointly led a A\$1.4 billion syndicated SLL for Sydney Airport.

Its first green loan, issued to the Investa Commercial Property Fund in January 2019, requires Investa to ensure that office buildings funded by the loan are among the top 15% of buildings in their cities in terms of environmental performance.

The bank expects its SLLs to appeal to companies with a strong sustainability ambition and a motivation to link their cost of capital to sustainability, no matter their industry sector and starting point.²⁷ "We are keen to work with customers that are deeply invested in the same things we are: improving environmental outcomes in a meaningful way" said Lawson.

²⁵ AlphaBeta analysis

²⁶ Bloomberg (2018), 'Europe green-bond boom may cool next year after breakneck growth'. KangaNews (2018), 'TCorp takes Australia's green-bond market to the next level'.

The Fifth Estate (2019), 'Australia's sustainable finance transition simmering below the surface'.

²⁷ ANZ (2019), 'The rise (and rise) of green loans in Australia'.

Green utilities and green buildings are also large contributors to Sydney's green economy

The third and fourth largest sectors in the green economy are green utilities and green buildings respectively, reflecting the dense, urban landscape of the Sydney LGA.

Green utilities include waste management, renewable energy generation and management, and water treatment. These services are essential to living in Sydney, especially with the council's Sustainable Sydney 2030 goal of reducing carbon

emissions in the LGA by 70% by 2030 and of having 100% renewable energy to power all buildings and facilities owned by the City of Sydney. In waste management, the principal activity occurring in the Sydney LGA is collection, with most sorting and processing of waste occurring outside in Greater Sydney.

The green building sector includes construction, fit-out and refurbishment companies like Built and Lendlease, demand for which is driven by the many commercial and residential buildings within the Sydney LGA (see **Box 5**).

Box 5: Built's projects show shift to sustainability by default

When Sydney construction group Built was established in 1998, the green building concept was still new to the market. By 2017, more than a third of its clients would ask for sustainable components to be included in their commercial or residential projects. Sustainability has become one of Built's five core pillars, with its 1,000 staff all trained in environmental management and sustainability awareness.

Built aims to reuse or recycle 90% of materials from its construction and demolition activities. Most of its construction, fitout and refurbishment projects also use energy-efficient LED light fittings, low-emitting engineered wood products, and concrete mixes that substitute cement with fly ash to improve their environmental outcomes.²⁸

"Sustainability was initially viewed as an add-on premium for office buildings ... Today it's simply expected," Built's National Sustainability Manager Joe Karten explains.

"When the 2012 Property Council of Australia Quality Matrix started requiring Green Star ratings for A Grade Buildings, the cost of delivering a green building started to become incorporated into standard building rates.

"Additionally, the business case is now established amongst the REITs and building owners. A green asset is a de-risked asset and makes more sense from an investment point of view."

Built is now working on integrating sustainability requirements into its supply chain. It runs training programs to give contractors a better understanding of construction site impacts, such as energy and water consumption, low toxicity materials and waste.

According to Joe Karten, Built's Environmentally Sustainable Development (ESD) requirements have led its supply chain partners to employ their own ESD experts. This has helped to create more green jobs across the nation, and more green activity overall.

²⁸ Built (2015), *Built exceeds Green Star expectations at 20 Martin Place*.
Built (2019), *Barrack Place awarded 6 Star Green Star As Built Rating*.

2.3 Sydney's green activity generates significant activity elsewhere in Australia

Like Sydney's overall economy, Sydney's green economy is intimately connected to regional and national supply chains and should not be considered in isolation. The city's longstanding role as a finance and services hub means jobs – including green jobs – in the area are more heavily skewed towards advisory, governing and finance sectors. Other activities, such as waste management, renewable energy, and green buildings, are supported by suppliers and service providers outside of the Sydney LGA, generating significant activity along the regional and national supply chains.

Differences in green roles between Sydney and wider NSW reflects the city's role as a services hub

In 2018, the share of green jobs in total employment in Sydney was comparable to the share state-wide, with Sydney accounting for approximately 15% of all green jobs in NSW. However, the mix of sectors employing green workers in Sydney is very different to the mix at the state level, as shown in **Exhibit 8**.

While Sydney's green jobs mostly involve governing & regulating the green economy and providing environmental advice, green jobs across the state are primarily to do with adapting goods and services to be greener. Green & circular production, for example, is the second largest employer in the state's green economy but only ranks sixth in the Sydney LGA. This stark difference reflects the city's critical role as a services hub and enabler of the green economy beyond its geography.

Exhibit 8: Comparison of green economies of Sydney LGA and NSW

Sector rank	Ranking of green sectors by green jobs (descending order)	
	Sydney LGA	NSW
1	Environmental advisory	Green buildings
2	Governing & regulating	Green & circular production
3	Green buildings	Green utilities
4	Green utilities	Environmental advisory
5	Greening other goods & services	Governing & regulating
6	Green & circular production	Greening other goods & services
7	Sustainable finance	Education & advocacy
8	Education & advocacy	Green transport & infrastructure
9	Green hospitality and retail	Green hospitality and retail
10	Green transport & infrastructure	Sustainable finance
11	Green research	Green research
12	Sharing economy	Sharing economy

Source: Burning Glass Technologies: Labor Insight (2019), Census 2016, City of Sydney Floor Space and Employment survey 2017, ABS, AlphaBeta analysis

Sydney is a significant supplier, consumer and importer of Australia's green goods and services

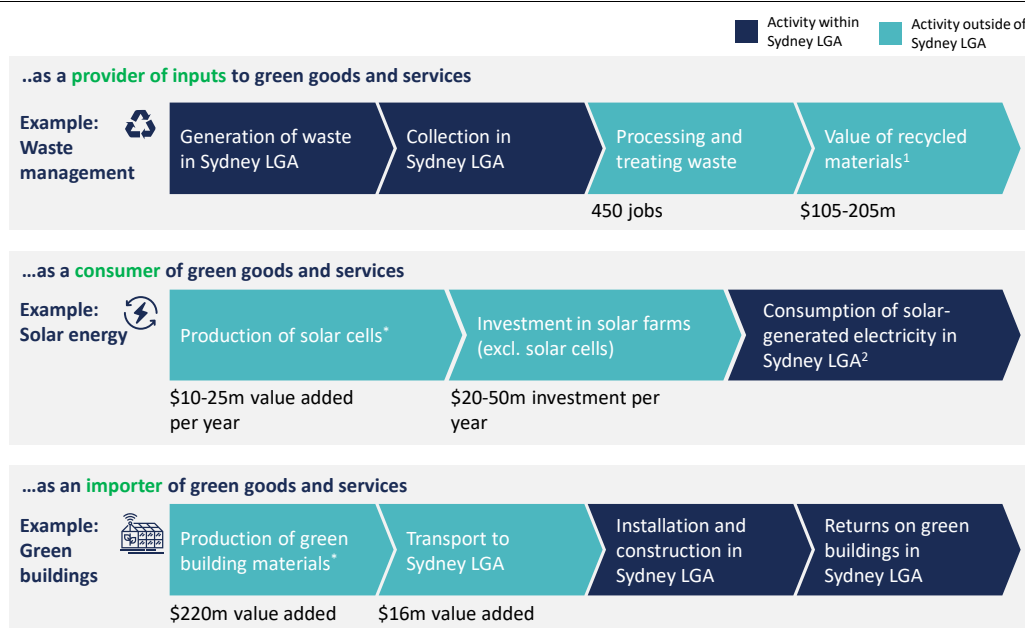
Sizing the green economy in the Sydney LGA may overlook the impact of Sydney's green economy on value chains that stretch into the rest of the state and the country. The green economy in the Sydney LGA provides inputs to green sectors elsewhere; it is also a significant importer and consumer of green goods and services from outside the LGA, generating demand that is not reflect in the GVA of Sydney's green economy. As shown in

Exhibit 9 9, the Sydney LGA's waste management activities create 450

downstream, waste processing jobs outside of the LGA, and about \$105-205 million in value from recyclable materials.

Demand from Sydney LGA also drives economic activity outside the city. Sydney is a major consumer of electricity and residents and businesses in the LGA are increasingly demanding renewable electricity. This is generating demand for approximately \$10-25 million worth of solar cell production and \$20-50 million worth of solar farm investment per year. In the green building supply chain, Sydney is a key importer of materials such as timber and energy-efficient equipment. Sydney's green building construction generates demand for approximately \$220 million of green materials and \$16 million in transporting these goods into Sydney.

Exhibit 9: Connections between Sydney LGA's green economy and the broader economy



Note: Figures represent high level estimates only.
 1 Lower bound represents the value of recycled materials after China's ban on recycling (National Sword Program) and the upper bound is the value from before China's ban on recycling.
 2 Only ~3% of NSW electricity generation was through solar PVs in 2017. NSW is ~90% self-sufficient in meeting local electricity demand so it is reasonable to assume sources of electricity generation is similar to sources of electricity consumption. Note that actual amount of solar-generated electricity is approx. a third of capacity due to weather.
 3 CAGR over 3 years up to 2016-17 for NSW.
 4 This assumes the same mix of sources for renewable energy in NSW. Solar PV currently represents around 20% of electricity generated by renewable energy.
 * Value added figure includes all upstream components of production from sourcing raw materials to manufacturing.

Source: City of Sydney, Australian Packaging Covenant Organisation, Clean Energy Council, Dept. of Environment and Energy, NSW EPA, ABS, Census, Australian Renewable Energy Agency, AlphaBeta analysis

Future opportunities for Sydney's green economy

Future opportunities for Sydney's green economy

Sydney's green economy has grown rapidly over the last few years, with employment increasing twice as fast as overall jobs growth in the Sydney LGA. However, the share of jobs in the green economy still lags global leaders like Oslo and Copenhagen – our performance is more comparable with Vancouver and the US. Experts suggest that a number of factors are impacting green economy, including access to reliable and clear information, policy uncertainty and challenges in supply chain coordination.

Despite these challenges, the economic outlook for Sydney's green economy is broadly positive. Major opportunities for Sydney's green economy are shaped by Sydney's existing competitive advantages, including high urban density and a strong financial and professional services sector. The most prospective sectors are green buildings, sustainable finance, sharing economy, environmental advisory and green research. Clean tech and green transport & infrastructure are also attractive.

Beyond the pure economic opportunities for Sydney, it is important to consider the contribution that Sydney's green economy will make to the broader economic transformation across the state and country. Cities play a vital role in the economy as sites of knowledge and capital exchange and innovation. Sydney's green economy will need to be an enabler and facilitator of activity outside its borders, and an innovator that shows the path for other LGAs to follow.

3.1 Sydney's number of green jobs is growing fast but still lags behind its international peers

While Sydney's green jobs have grown strongly in recent years, employment figures indicate the local green economy is less mature than its European counterparts. Leading European cities have almost three times the share of green jobs in total employment than Sydney. Even if historically high levels of growth continue, Sydney will still lag global leaders.

Green jobs have grown twice as quickly as overall jobs within the Sydney LGA since 2015

As consumers become more aware and concerned about the environmental impacts of their purchasing decisions, businesses are seeing more benefits of going green. As a result, employers have increasingly called for environmental skills in customer-focused jobs like sales and marketing, business advisors including consultants and lawyers, and supply chain roles such as procurement managers.

In the three years to 2018, green jobs in the Sydney LGA grew by almost 8% a year, achieving more than twice the growth rate of overall jobs in the area. Much of this growth came from occupations that were not traditionally associated with green economy, such as sales and marketing professionals, as illustrated in **Exhibit 5**.

Leading cities like Oslo and Copenhagen have almost three times Sydney's share of green jobs

Despite this rapid recent growth, the size of our green economy is still small relative to global peers. As shown in **Exhibit 10**, leading cities like Oslo and Copenhagen have almost three times the share of green jobs in Sydney. At current rates of growth, Sydney's share of green jobs may rise to around 5% in 2030 – but even then, the city would be lagging behind its peers.

Sydney's performance is more comparable to that of North American peers. Vancouver's share of green jobs at 3.4% is slightly above Sydney's 2.5-3%. Part of Vancouver's success is attributable to effective policy intervention and ambitious sustainability targets. For example, Vancouver's introduction of green building standards to its local building codes won it the global title of "Best Green Building Policy" by the World Green Building Council in 2013. This has helped the city's green building jobs to grow 9% a year, which is 1.5 times the overall growth rate for green jobs in Vancouver.²⁹ Further detail on the types of policy measures undertaken by leading peers are explored in Chapter 4 of the report.

The success of peers does demonstrate the substantial opportunity in the green economy for the Sydney LGA. If Sydney was able to grow its share of green jobs in 2030 to the average of leading peers, it could create

²⁹ Vancouver Economic Commission (2018), *State of Vancouver's Green Economy 2018*.

40,000 new green jobs over the next decade, more than tripling the size of its green economy.

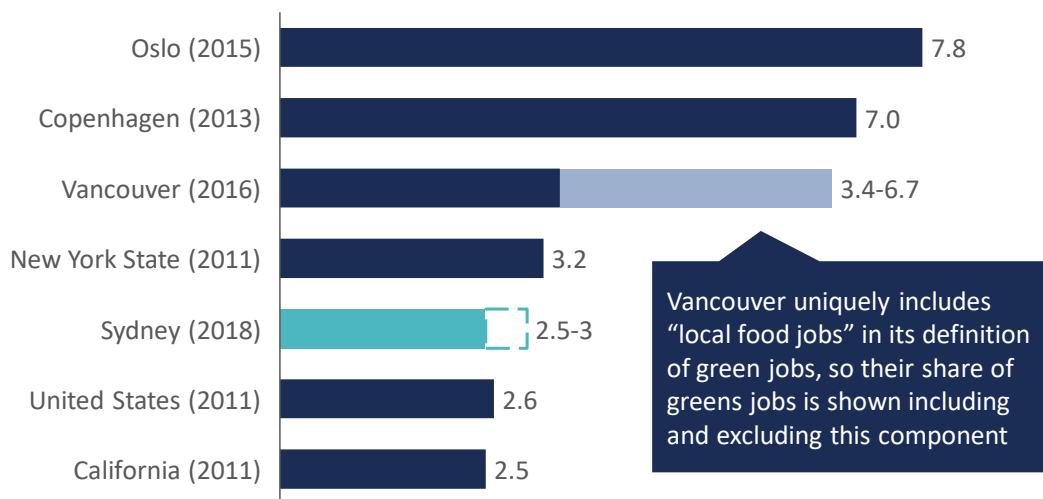
It is important to note that there is no standard way to measure or define green

jobs, so the figures in **Exhibit 10** are not directly comparable. However, as discussed in Chapter 1, this report uses a relatively broad definition of the green economy, so it is reasonable to compare Sydney's performance with better-performing peers.

Exhibit 10: Comparison of Sydney's share of green jobs with global peers

Green employment in other cities and countries

% of jobs that are 'green jobs'



Source: European Commission, OECD, Vancouver Economic Commission, Economic Policy and Competitiveness Research Center (EPCRC), US Bureau of Labour Statistics, Partnership for Action on Green Economy (PAGE), AlphaBeta analysis

3.2 Access to reliable and clear information, policy uncertainty and supply chain constraints are impacting the growth of the green economy

While Sydney's green economy has grown rapidly and now makes a substantial economic contribution, it has not reached the level of development of global leaders – and even projecting current trends forward to 2030, it will not. Interviews with businesses and industry groups highlighted three key factors impacting the green economy in Sydney. These are access to reliable and clear information to guide both businesses and consumers, an uncertain policy environment that restricts investment, and constraints in the supply chain.

Reliable and clear information is critical for both businesses and consumers in the green economy

Businesses need reliable market information to make informed decisions about the green economy. For example, in the green buildings sector, there are still many businesses that are poorly informed about the benefits and costs of becoming greener. Green Star shows that green buildings cost only 3% more to build than traditional buildings on average, which is less than most businesses expect.³⁰ This cost is also likely to be offset by savings from reduced water and energy usage.

Reliable data is even more difficult to come by in other sectors in the green economy. Good Environmental Choice Australia (GECA), a trusted ecolabel provider, suggests the information challenge is further worsened by some businesses taking advantage of the weak regulation and consistency in environmental certification to 'green wash' their goods and services. This not only erodes any pricing benefit for businesses that have high environmental standards, but also misleads consumers about their consumption choices.

Similarly, information about goods and services for consumers is also vital for making informed purchasing decisions and triggering businesses to act. For example, providing

residential tenants with visibility of a building's construction and its materials can incentivise developers to build greener buildings. This model of having consumer demand drive more green business activity has already been successful in other sectors.

Policy uncertainty reduces confidence of businesses to make investments

The green economy tends to be highly susceptible to changes in government position and associated policy changes. In renewables, for example, there have been dramatic fluctuations in employment in Australia as different government support schemes have come and gone (see **Exhibit 11**).

Heavy industry, including mining firms, have called for more certainty around the National Energy Guarantee to inform their investments.³¹ Similarly, ASBEC and other businesses have raised issues around the enforcement of building standards and compliance as signals of government commitment to sustainability practices.

The potential for policy or regulatory change is likely to remain the greatest risk to the continued strong growth of the green economy. While green regulation or 'green tape' can be an important stimulus for innovation and economic development,

³⁰ Expert interviews

³¹ Sydney Morning Herald (2018), *BHP pushes Labor to back 'national interest' on energy*.

unfavourable regulatory decisions can equally undermine new forms of economic activity. The growth of sustainable finance, for example, is highly vulnerable to changes in prudential rules and other regulatory frameworks that govern financial services in Australia.

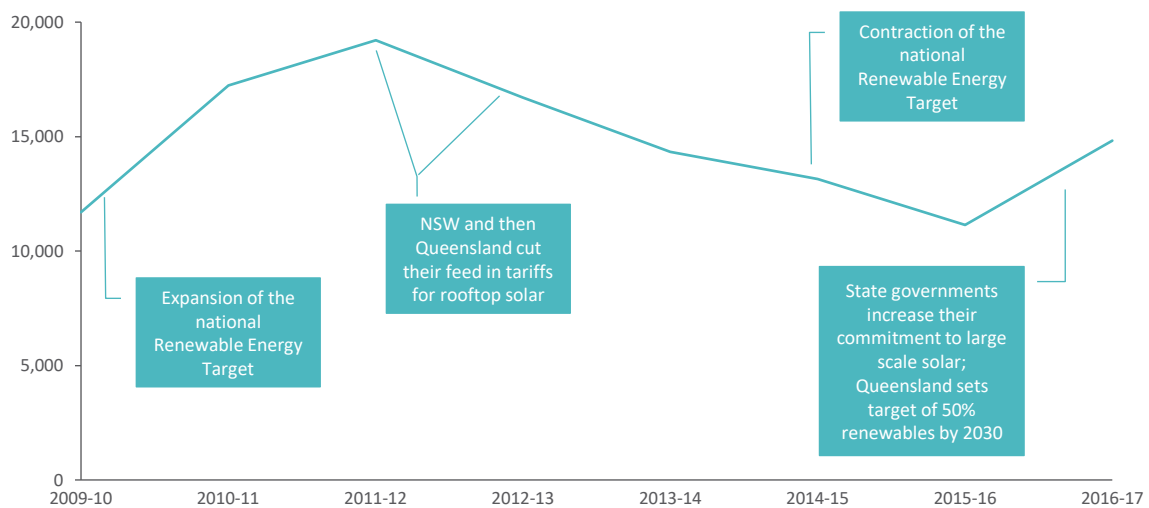
Lack of supply chain coordination makes transition to green economy challenging

The growth of green or circular practices in businesses is also constrained by coordination in the supply chains. For example, applying circular principles of a ‘closed loop’ supply

chain can only work if product designers factor in multi-use and maximum resource recapture, manufacturers develop new techniques for remanufacturing, and waste collectors sort and return disposed products back to the manufacturer for remanufacture.³² Even simpler changes such as procuring sustainable inputs for a manufacturing firm can significantly restrict its pool of suppliers. One large construction firm, Built, has integrated sustainability requirements into its construction process through vertical integration, enabling coordinated investments and implementation of green practices through the production process to construct green buildings.³³

Exhibit 11: Renewables employment in Australia

Annual direct employment in renewables and selected policy changes
Full-time equivalent employment



Source: ABS, IRENA, APH Library, AlphaBeta analysis

³² Example of a closed loop organisation: <https://www.ellenmacarthurfoundation.org/news/worn-against-journey-to-closed-loop>

³³ Expert interviews

3.3 The greatest economic opportunities for Sydney’s green economy build on the LGA’s traditional strengths

Exhibit 12: Outlook for sectors in the Sydney LGA's green economy

Study	Green economy sectors	Market outlook	
		Market outlook	Rationale
Producing green goods and services	Green utilities	Moderate	<ul style="list-style-type: none"> Renewable installation capacity in CoS has increased by 9% p.a. over the last five years Waste collection volumes have remained relatively flat
	Clean tech	Strong	<ul style="list-style-type: none"> Growing recognition of the importance of cleantech, with global patents in cleantech growing four times faster than the average number of tech patents
Adapting other goods, services and processes to be more green	Green buildings	Strong	<ul style="list-style-type: none"> As of 2018, 46% of office buildings in the Sydney CBD are certified by the Green Star or NABERS scheme The global green building materials market is expected to grow by 11.9% between 2016 and 2022
	Green transport & infrastructure	Moderate	<ul style="list-style-type: none"> NSW Government to trial electric buses in Inner West from 2019 Although penetration of EVs remains low, there is potential for growth with a number of projects in the pipeline
	Sustainable finance	Strong	<ul style="list-style-type: none"> Australian green bond issuance increased in 2018, with NSW's TCorp setting AUD record for deal size Total responsible investment AUM grew by 39% in 2017 Launched Mar 2019, the Australian Sustainable Finance Initiative brings together leaders in the financial sector to develop plan on how the sector can help deliver a sustainable economy
	Sharing economy	Strong	<ul style="list-style-type: none"> Sharing economy services, such as GoGet and Airbnb, have expanded their service offering in the CoS over the last 5 years, supported by Sydney's high density population
	Green hospitality and retail	Moderate	<ul style="list-style-type: none"> Significant players beginning to shift the market towards sustainable practices through committing to the City of Sydney Sustainable Destination Partnership
	Green & circular production	Moderate	<ul style="list-style-type: none"> Strong outlook in greening in primary production, but limited activity in Sydney New focus on circularity at present, but yet to see significant market response
	Greening other goods & services	Moderate	<ul style="list-style-type: none"> Moderate growth and limited growth potential in demand for green skills across industries including administration and support services, personal services, health care, and social assistance services
Managing and supporting the green economy	Environmental advisory	Strong	<ul style="list-style-type: none"> Strong growth in demand for green skills in professional & technical services
	Governing & regulating	Weak	<ul style="list-style-type: none"> At risk if NSW Government relocates environmental functions to Parramatta
	Education & advocacy	Moderate	<ul style="list-style-type: none"> Strong presence of organisations advocating for stronger sustainable practices, but growth is relatively flat
	Green research	Strong	<ul style="list-style-type: none"> Demand for green skills in research has almost doubled over last 4 years

Source: IBISWorld, World Intellectual Property Organisation, RIAA, TCorp, Burning Glass Technologies: Labor Insight (2019), expert interviews, AlphaBeta analysis

While there are strong prospects for growth across most parts of the green economy, some areas of the green economy are more likely to present significant growth opportunities for the Sydney LGA. This is due to both a stronger outlook for specific sectors, as well as the greater capacity for Sydney to take advantage of this outlook based on its competitive position. For example, sustainable finance appears particularly prospective for the Sydney LGA because of the rapid growth trajectory of the sector and Sydney’s strong incumbent position in financial services.

Exhibit 12 considers the growth trend and potential of each of the green economy sectors and provides a high-level qualitative assessment.³⁴ Five sectors stand out as having particularly strong growth prospects: green buildings, sustainable finance, sharing economy, environmental advisory and green research. Clean tech and green transport & infrastructure are also potentially attractive, though the latter is highly dependent on policy actions from the NSW government.

Remaining sectors with moderate or weak prospects may become more important in the future as the circular economy grows. Green

³⁴ The clean tech sector was not included in the measurement of the Sydney LGA’s green economy as it is difficult to identify startups in available

data. However, it is included here as an area of opportunity for Sydney.

& circular production and green hospitality & retail are two such sectors. However, businesses in these sectors rely heavily on partners or suppliers outside the Sydney LGA, so while demand from Sydney LGA for improved environmental performance in these areas could drive new activity elsewhere in the economy, it is less likely to generate economic benefits to Sydney itself.

Five green economy sectors have particularly strong economic prospects within the Sydney LGA

Green buildings

For a major metropolitan city like Sydney, green buildings represent a significant opportunity to reduce emissions and create jobs. A recent report by McKinsey and C40 found that heating and cooling in buildings generates nearly 40% of all urban emissions.³⁵ As of 2017, there were over 26,000 buildings in the Sydney LGA.³⁶ Although 46% of office space in Sydney's CBD is Green Star or NABERS certified (with a rating of at least 5 stars), there is significant room for improvement, particularly in the residential and low- to mid-tier commercial buildings where voluntary green star certifications are currently low.³⁷ One of Sydney's iconic features as a long-established Australian city is the large stock of historical buildings. Retrofitting these existing, older buildings to be greener is also a significant opportunity for Sydney's green economy.

Sustainable finance

The financial sector is typically at the forefront of the economy, as investors seek new areas for growth. As Australia's biggest financial hub, Sydney has seen a rise of sustainable finance products, such as superannuation and green bonds that support climate-friendly and sustainable investments (see **Box 4**). The growing flow of financial capital into the green economy is an encouraging signal that the market also believes there is economic opportunity in this space.

Several innovative global banks such as ING and BNP Paribas are already integrating climate goals into their business to align with the 2016 Paris Agreement.³⁸ For example, the Global Real Estate Sustainability Benchmark score can be used to provide discounts on interest rates for loans. Furthermore, the opportunity that sustainable finance represents has prompted big Australian finance players to sign on to fight climate change. In March 2019, leaders and executives from major banks, insurance firms, superfunds, peak bodies and academia joined forces to develop a plan on how the finance sector can help deliver international climate agreements and transition to a more sustainable economy.³⁹

³⁵ McKinsey Centre for Business and Environment and C40 Cities (2017), *Focused Acceleration: A strategic approach to climate action in cities to 2030*.

³⁶ City of Sydney's latest Floor Space and Employment Survey (FES) in 2017

³⁷ CBRE and Maastricht University (2018), *International Green Building Adoption Index 2018*.

³⁸ BNP Paribas (2018), *#COP24: BNP Paribas and 4 leading banks commit to global climate goals*.

³⁹ Australian Sustainable Finance Initiative (2019), *Financial sector leaders join forces to steer Australian economy through 'critical decade': Australian Sustainable Finance Initiative launches*.

Environmental advisory

Environmental advisory is already the largest sector in Sydney's green economy, and its outlook remains strong. Growing demand for goods and services that minimise negative environmental impacts have subsequently triggered demand from both business and government for environmental advisors in areas such as business consulting, law and accounting. Growth is unlikely to slow as Sydney plays catch-up to its international peers and industry leaders begin to set the trend for the rest of the market to follow. Furthermore, as Sydney deepens its expertise in environmental advisory, knowledge and services from this sector can be exported to other parts of Australia to enable and strengthen Australia's green economy.

Sharing economy

Although the sharing economy only accounts for approximately 3% of GVA and 6% of green jobs in Sydney's green economy, the high density of people living and working in a small geographic area provides the ideal foundations for the sharing economy to thrive. The economics of sharing economy businesses require a large number of users to share the cost of ownership of an asset, whether it be a vehicle or a property (see **Box 3**). Growth in Sydney's sharing economy will be driven by increased uptake of existing services (e.g. through policies aimed at further reducing car ownership) and the potential for new services to be established, such as sharing office spaces (night occupants).

Green research

Sydney is a diverse knowledge hub, attracting talent and resources from all over Australia. There are two academic research facilities within the Sydney LGA that focus on environmental sustainability: the Institute for Sustainable Futures at UTS and the Centre for Sustainable Energy Development at the University of Sydney. The Australian Technology Park in Redfern is also home to CSIRO's Data61, which is driving data and digital innovation to support improved environmental outcomes. Demand for green skills in research occupations has almost doubled over the last four years, as environmental concerns impact a wide range of areas of academic research. Increased demand from business for the green economy should stimulate funding for green research, which will benefit the Sydney LGA given the strength of its research infrastructure.



3.4 Sydney's green economy can play several important roles for NSW and Australia beyond its pure economic potential

The future opportunity for the Sydney LGA in the green economy is not only economic. While the economic benefits from Sydney's green economy are already significant and are likely to grow, prioritising opportunities for Sydney's green economy purely on local economic grounds may obscure the significant economic and environmental benefits that the Sydney LGA can generate for the state and nationally. It is important to recognise the distinctive roles that Sydney's green economy can play in the broader economic and environmental transformation that is required today:

- **Sydney as a role modeller**
Sydney can lead by example through continuing to improve sustainability and environmental protection across significant local industries such as hospitality, retail and buildings. This will require businesses in the area to more quickly embrace green activities, products and services, so their approach can be replicated across Australia. In the hospitality and entertainment sectors for example, the City of Sydney has led the establishment in 2018 of the Sustainable Destination Partnership to improve environment performance and build Sydney's reputation as a leading sustainable destination. Sydney also has an important role in influencing consumer demand as a key trend-setter for Australia.

sectors, Sydney can directly grow and support the green and circular economy beyond its geography. Sydney is home to a significant share of head offices of organisations around Australia and plays a critical role in facilitating the exchange of knowledge between some of the most influential business, community and thought leaders in the country. It is a world-class city with the infrastructure and facilities to host events, such as the UN Environment Programme Finance Initiative conference in 2018.⁴⁰ These events are opportunities for green economy leaders to discuss new ideas and to share the lessons learned in various jurisdictions.
- **Sydney as an enabler and facilitator**
Sydney's large and sophisticated environmental advisory and financial sector serves not only organisations within the Sydney LGA but also clients across NSW and Australia. By exporting its expertise in these
- **Sydney as an innovator and lab**
Sydney provides an ideal environment to promote innovation and pioneer new ideas. Sydney not only has high population density that is great for business models that require scale, it also has attracted some of the best talent and large funding pools to support start-ups. As a lab, Sydney

⁴⁰ UNEP Finance Initiative (2018), *UNEP FI Conference: Financing a resilient and sustainable economy*.

LGA can provide a market to prove and scale innovative goods and services, especially if regulations are supportive (see **Box 6** for an example). A local example of this has been the role that Sydney LGA has played in stimulating the development of car-sharing services through supportive policies, providing

a platform for those to expand to lower-density residential areas.

Sydney's green economy has important roles to play beyond its economic contribution to Sydney's GRP, and the approach of government to supporting the green economy needs to recognise and respond to these roles.



Box 6: How the City of Sydney can incubate start-ups to tackle climate change

Sydney is fertile ground for entrepreneurs, with more than four in ten Australian start-ups headquartered within the nation's unofficial capital as of 2018.⁴¹ These businesses are not only vital to Australia's continued economic growth; start-ups are also responsible for some of the world's most transformative innovations. Energy financing start-up Brighte and plastic recycling technology firm Licella are two examples that have made waves in the green economy in recent years.

Climate-KIC Australia was established in 2016 to connect researchers, government, businesses and investors to help identify and accelerate the development and commercialisation of green technologies. "Start-ups play an important and powerful role as disrupters in the green and circular economy," said Chris Lee, CEO of Climate-KIC Australia. "Start-ups provide different ways of thinking and doing things, and prove to be relatively 'nimble' in comparison to incumbent businesses."

Chris noted a rise in the number of entrepreneurs setting their sights on climate change. Those start-ups tended to be led by two types of people: those extremely passionate about environmental issues; or savvy entrepreneurs who recognised the business opportunities in this space.

The key challenges for Australian start-ups – green or otherwise – are access to capital and access to markets that are slow to shift away from traditional suppliers or products. Sydney start-ups already have access to a range of support programs from local, state and federal governments, including workspace in the state-supported Sydney Startup Hub. However, these governments can do more to help.

The City of Sydney council could provide more opportunities for green start-ups in its procurement of goods and services; these contracts would benefit the successful tenderer financially as well as reputationally. The council could also do more to facilitate collaboration among entrepreneurs, policymakers and the market.

"Large organisations such as the City of Sydney have the opportunity to support new entrants through green public procurement – which can transform markets, stimulate green industrial growth and create incentives to invest in, innovate and scale up green solutions when demand is secured and well directed. By acting as a leader, the City through knowledge exchange can lead commercial uptake of green technologies."

⁴¹ Startup Muster (2018), 2018 *Startup Muster Annual Report*.

The role of the City of Sydney in Sydney's green economy

The role of the City of Sydney in Sydney's green economy

A robust green economy in the Sydney LGA will unlock significant environmental and economic benefits not only for Sydney, but the broader state and national economies. However, while much of the transformation that has already occurred towards a green economy has been led by businesses and consumers, government policies and programs still play a critically important role in creating the enabling conditions for growth.

Other city governments globally have adopted a range of strategies and programs to foster the development of their green and circular economies. They have typically set targets and worked on both sides of the market, helping transition businesses and improving awareness and education of residents, workers and visitors. They have also used procurement and their own operations to drive change.

The City of Sydney could support Sydney's green economy through three broad policy directions (see **Exhibit 15**):

1. Make a clear commitment to the green economy, educate businesses and consumers and identify opportunities to strengthen existing policies and programs;
2. Develop a more proactive approach to market development, including identifying and supporting priority sectors for Sydney's green economy and establishing Sydney as a circular innovation hub; and
3. Advocating and partnering with other levels of government to lift their commitment to the green economy, particularly in green transport and green skill development.

4.1 Other city governments have set targets and worked in collaboration with industry to support the growth of their green and circular economies

The experiences and strategies of cities such as Copenhagen and Vancouver provide a demonstration of the active role that city governments can play in fostering a successful green economy. At the core of most green and circular economy strategies is a strong set of targets – typically environmentally targets that drive demand for the green economy, but in some cases cities have also set explicit economic targets.

To achieve these targets, city governments usually work through three sides of the market. They support businesses to adopt more green and circular practices; they educate and train their residents, workers and visitors to drive demand; and they set high standards both in their own operations and through procurement. Most city governments possess less regulatory levers to force change than regional or national governments so they tend to establish partnerships and collaborations with the private sector, build capacity and focus on enablement and removing barriers.

Metrics like jobs growth, emissions reduction and recycling allow cities to assess their environmental performance

Strategies by city governments to grow their green and circular economies are almost all based around targets. Typically these are short, medium or long-term goals focused on improved environmental outcomes: reducing waste, increasing recycling, and reducing emissions and pollution. These goals allow them to measure their environmental performance and assess their progress. For example, Copenhagen's CPH 2025 Climate Plan commits it to becoming the first carbon neutral capital by 2025.⁴² The city also has a target of increasing the amount of household waste recycled to 70% by 2024.⁴³ This is comparable to the approach taken by the City of Sydney in Sustainable Sydney 2030 and the

City's Environmental Action Plan 2016-2021, which highlights a range of targets including 70% emissions reduction by 2030 and net zero emission by 2050.⁴⁴

Some cities have supplemented their environmental targets with explicit economic targets. One notable example of this approach is the City of Vancouver, which has placed a significant emphasis on the growth of green jobs and has spent almost a decade working towards its green jobs target of 33,400 jobs by 2020.⁴⁵ This jobs target is underpinned by strategies to support green start-ups and to encourage existing businesses to go green. The UK City of Bristol also set a green jobs target and measured the number of businesses providing environmental goods and services as a means to drive green economy performance.⁴⁶

⁴² City of Copenhagen (2012), *CPH 2025 Climate Plan: A green, smart and carbon neutral city*.

⁴³ Let's Recycle (2018), *Copenhagen – Will its waste be wonderful?*.

⁴⁴ City of Sydney (2017), *Environmental Action 2016 – 2021: Strategy and Action Plan*.

⁴⁵ Vancouver Economic Commission (2018), *State of Vancouver's Green Economy 2018*.

⁴⁶ European Commission (2015), *2015 – Bristol*.

City governments are able to work on both supply and demand side, as well as through their own operations and procurement, to build their green economies

Global cities have employed a range of policies and programs, from encouraging a greater range of suppliers and industries to go green to educating and supporting consumers in order to drive demand for green goods and services. Cities around the world have also recognised the importance of environmental improvement in their own operations, and especially the use of their significant procurement activities to help develop their green economies. **Exhibit 13** provides some examples of initiatives that global peers have undertaken.

Supporting green or circular principles in businesses

While driving innovation and transformation through supply-side policy is more often the domain of regional and national governments that have control of tax policy, city governments can also play a role in supporting businesses in developing or adapting their products and services for a green economy. City governments internationally have offered a range of financial grants, loans and subsidies targeted at the green economy. Amsterdam's Sustainability Fund and Climate and Energy Fund are revolving financing facilities with €85 million in total to support projects in energy generation, efficiency and other areas of sustainability.⁴⁷ Other comparable vehicles have been developed or supported by governments at regional or national level, such as Scotland's Circular Economy

⁴⁷ C40 Cities (2016), *C40 Good Practice Guides: Amsterdam – Sustainability Fund and Amsterdam Climate & Energy Fund*.

⁴⁸ Zero Waste Scotland (2019), *Circular Economy Investment Fund*.

Investment Fund, using grants instead of loans.⁴⁸

Governments have also employed various policy measures to limit pollution, forcing consumers and suppliers to switch to greener products, services and production methods within a certain timeframe through standards and prohibitions. For example the City of Vancouver introduced a Green Demolition Bylaw in 2014 that requires homeowners and property developers to recycle a minimum of 75% of demolition waste.⁴⁹ Since the bylaw's introduction, approximately 10,000 tonnes of waste have been diverted from landfill per year, creating a range of new circular economy opportunities.⁵⁰

Working with residents, workers and visitors

Sydney's international peers have also focused on educating their local communities on environmental impacts and risks. These actions have reduced demand for goods and services with negative environmental impacts, while also altering consumer behaviour. For example, the City of Vancouver holds a Zero Waste Conference annually to educate consumers and industry of the circular economy opportunities associated with waste and how they can be realised in practice.⁵¹

International jurisdictions have also played a key role in engaging their local workforce to facilitate a smooth transition to a green and circular economy. City governments have implemented training and education programs that focus on increasing the supply of green skills in their respective localities to support the development of green industries. For example, the UK Green Skills Partnership seeks to bring together local councils, trade unions, businesses, workers and other groups

⁴⁹ City of Vancouver (2018), *Green Demolition By-law Update*.

⁵⁰ REMI Network (2018), *Vancouver Green Demolition Bylaw expanded*.

⁵¹ Metro Vancouver, *2019 Conference Details*.

to deliver training for green skills in areas such as construction, retrofitting, horticulture and waste management.⁵²











Government's own operations and procurement

Global cities have utilised their own operations and procurements to support their green economy in two ways: (1) demonstrating leadership by setting high environmental standards for its own operations; and (2) demanding environmentally green goods and services in its procurement. By embedding green principles and procurement policies in their own operations, these governments provide

an example for other organisations to benchmark themselves against, as well as encouraging suppliers to produce green goods and services. For example, the City of Oslo requires zero emissions from its construction sites, including vehicles and construction machinery.⁵³

Public procurement is recognised as being one of the most significant drivers for green and circular economy development. An evaluation of circular economy projects in the Municipality of Amsterdam in 2018 found that procurement, as the main connection of the city government with physical products, is a critical tool that has been successful and could be significantly expanded.⁵⁴

Exhibit 13: Actions by global peers to support green economic development

Supporting green or circular principles in businesses	
Grants, subsidies, & investments	<ul style="list-style-type: none">  Oslo's Climate and Energy Fund: the City introduced several subsidy schemes to support businesses innovate and invest in the production of green goods and services  Amsterdam Sustainability and Climate & Energy Funds: the City invests in sustainability and energy related projects, such as biofuel generation, solar roofs and electric vehicles
Incentivising behavioural changes	<ul style="list-style-type: none">  Vancouver's Green Demolition Bylaw: the City has generated circular economy opportunities by requiring materials from old homes to be either recycled or deconstructed  New York City Building Energy Performance Mandates: the City increased demand for greener buildings by requiring all buildings to decrease fossil fuel use by 80% by 2050
Working with residents, workers and visitors	
Educate, train and inform	<ul style="list-style-type: none">  UK Green Skills Partnership: UK local councils have partnered with unions, industries, workers and other groups to facilitate the development of a labour force with green skills  Vancouver Zero Waste Conference : the City holds an annual conference to educate the public and businesses about the circular economy opportunities available in different sectors
Government's own operations and procurement	
Government's own operations	<ul style="list-style-type: none">  Oslo Procurement Strategy: the City requires that all construction vehicles and machinery used for public procurement purposes produce zero emissions  Greater London Authority Environment Strategy: investing in green infrastructure such as installing green roofs across their own buildings to support demand in the green economy
Government procurement	<ul style="list-style-type: none">  Copenhagen Partnership for Green Public Procurement: the City has implemented sustainability requirements for businesses tendering for government contracts  New York City Environmentally Preferable Purchasing Standards: the City has developed and follows a set of minimum standards for purchasing goods and construction materials

Source: City of Oslo, City of Amsterdam, City of Vancouver, New York City Council, Union Learn, Greater London Authority, Ministry of Environment Copenhagen, AlphaBeta analysis

⁵² Union Learn, *Green Skills Partnership*.

⁵³ City of Oslo (2019), *Zero-Emission Construction Sites*.

⁵⁴ Municipality of Amsterdam (2018), *Amsterdam Circular: Evaluation and action perspectives*.

Critical levers for city governments include collaboration with industry, building capacity and removing barriers

Fostering collaboration between government agencies and industry bodies is essential to create the right market conditions for growth of the green economy. Stakeholders have called for a similar approach in Australia, where green economy industry groups are seeking to coordinate different government agencies and the private sector.⁵⁵ A high degree of harmonisation is needed to ensure that industries are equipped to transition towards 'greener' practices, while also generating economic opportunities. This convening power of government is particularly important given the supply chain coordination challenge that often slows transition to greener business practices.

The Brussels' Circular Regulation Deal has brought together different public and private sector organisations to coordinate actions and

remove regulatory barriers that prevent the uptake of circular practices in various sectors.⁵⁶ In Scotland, Zero Waste Scotland – funded by the Scottish Government to drive the development of the circular economy – has partnered with the Glasgow Chamber of Commerce and Glasgow City Council to develop a circular economy vision and action plan for the city.⁵⁷

Building capacity and capability is a critical component for any city to grow their green economy. Various global cities have implemented training and education programs for workers to develop green skills for a smooth transition to a green economy, while also ensuring businesses are equipped with the capabilities to deal with a shift in their business model. For example, New York City and Solar One provide training and education programs to help people transition into green jobs, such as solar panel technicians and installers.⁵⁸



⁵⁵ Expert interviews

⁵⁶ Ellen MacArthur Foundation (2019), *Brussels: Regional programme for a circular economy*.

⁵⁷ Glasgow Chamber of Commerce, Zero Waste Scotland, Circle Economy and Glasgow City Council

(2016), *Circular Glasgow: A vision and action plan for the city of Glasgow*.

⁵⁸ Watts Up New York (2019), *Solar One: An interview with Chris Collins, Executive Director at Solar One*.

4.2 The City of Sydney should commit to develop Sydney's green economy, and strengthen its existing policies and programs to support its growth

While Sydney's green economy has grown significantly in recent years, its scale is still limited relative to global peers. Many existing City of Sydney policies and programs do support the green and circular economy, such as the Better Buildings Partnership and recycling policies, which drive activity up and down supply chains. However, there has not been an explicit focus by City of Sydney on either green or circular economy. A clearer commitment would be an important first step to support the growth of the green economy in the Sydney LGA and could generate substantial economic and environmental benefits both to the Sydney LGA and the wider state and national economies.

City of Sydney should commit to grow and develop its green economy as a source of economic opportunity and environmental benefit

The green economy and circular economy are relatively new concepts within Australia. Governments in Australia have mostly not explicitly prioritised the development of a green economy, though some state governments have identified high growth opportunities in the environmental sectors of their economies.⁵⁹ The most notable exception is South Australia, which established Green Industries SA (then Zero Waste SA) in 2003 to increase recycling and reduce reliance on landfill.⁶⁰ While various levels of government have recently begun planning to establish more circular economies, these concepts have yet to be widely understood and applied to the Australian context.

In this context, an important first step for the City of Sydney would be a strong commitment to grow and develop a green economy in the Sydney LGA, including significant growth in the circular economy as a major aspect of the green economy. This would build on the City's 2013 *Economic Development Strategy*, which

identified the green economy as a new and emerging sector.⁶¹ City of Sydney already has in place a range of environmental targets that are supporting the green economy. These could be accompanied by economic targets for the contribution of the green and circular economies, as other cities such as Vancouver and Bristol have done.

A clear commitment to the growth of its green economy will also enhance Sydney's national and global brand as a leading city for liveability and sustainability, and will enable City of Sydney to take a leadership role within global forums such as C40.

Improving the awareness and understanding of the green economy by both businesses and consumers will be essential

There are significant economic opportunities for businesses to transition to green practices, but many businesses are still held back by outdated information about their costs. An example of this is the lack of awareness around the relatively low cost of green buildings. Market information on the green economy is limited because green activities

⁵⁹ See for example NSW Innovation and Productivity Council (2019), *Innovation in the NSW environmental goods and services sector*.

⁶⁰ EPA SA (2018), *History of the EPA – 2000 to 2004*.

⁶¹ City of Sydney (2013), *Economic Development Strategy*.

are poorly identified in existing economic data.

Accordingly, the City of Sydney council can adopt a role as an educator, similar to other cities such as Vancouver where local government educates industries on the benefits of circular economy through annual zero-waste conferences.⁶² This may also include extending City of Sydney's existing activities in green capacity building. While the skills system remains primarily the purview of state and Federal governments (see 4.4 below), City of Sydney may need to address short-term skills gaps to support the growth of the green economy.

One of the key barriers preventing the growth of green industries is the abundance of inaccurate information available to the public. In particular, various certification peak bodies found that the practice of 'green washing' has become quite common, and accordingly has misrepresented to consumers the true environmental benefits of a good or service.⁶³

Through recognition of certification and labelling programs, the City of Sydney can have an influential role in arming consumers with substantiated evidence and information regarding the environmental outcomes associated with goods and services. For example, Good Environmental Choice Australia provides an 'ecolabel' that indicates a product has better environmental as well as health and ethical outcomes.

There is an opportunity to strengthen existing policies and programs that have already proven successful in supporting the green economy

The City of Sydney already has a range of environmental program and policies that support a green economy. Environmental performance innovation grants, for example, aim to support innovative new technologies or approaches that can mitigate greenhouse gas emissions. Other programs such as the Better Buildings Partnership are focused on improving the Sydney LGA's environmental performance but are also likely to be generating demand for green economy sectors, such as green buildings and environmental advisory. **Exhibit 14** showcases some examples of the policies and programs the City of Sydney have already implemented to support a green economy.

An important step for City of Sydney will be to review its environmental policies and programs in the context of a commitment to grow the green economy, and identify opportunities to strengthen and developing these existing efforts. This should include consideration of the implications of circular economy principles for the design of policies and programs.

The green economy is impacted not only by environmental policies and programs, but local planning policies as well. While the role of NSW local governments in planning decisions has been reduced through recent planning reforms, City of Sydney still has responsibility for a range of important instruments. These include the Local Environment Plan and Development Control Plans. There are also policies that manage Sydney's public spaces, such as landscaping, outdoor dining and on-street parking.

Many of these policies already address some aspects of sustainability. For example, the

⁶² Zero Waste Conference (2019), *2019 Zero Waste Conference*.

⁶³ Expert interviews

2012 Development Control Plan for Sydney includes general provisions on Ecologically Sustainable Development that address a range of issues such as water and energy efficiency, as well as materials and building components.⁶⁴ There may be opportunities to further develop these policies, in particular to further reflect circular economy principles. These are complex and technical areas of

policy that require careful review before any changes could be proposed. However, they are also one of the most important ways city governments can drive transformation. Amsterdam’s review of its programs found spatial planning and land issue to be critical means to accelerate the transition to a more circular economy.⁶⁵

Exhibit 14: Existing City of Sydney policies and programs that support the green economy

Supporting green or circular principles in businesses	
Grants, subsidies, & investments	<ul style="list-style-type: none"> ▪ Environmental performance grants: encouraging innovation and investment from businesses to produce green goods and services, and develop greener production processes ▪ Building tune-up program: supporting building owners to implement cost-effective measures to improve the environmental performance of their building
Incentivising behavioural changes	<ul style="list-style-type: none"> ▪ Better Buildings Partnership: working with commercial property owners to reduce their environmental footprint, and support the development of greener buildings ▪ Sustainable Destination Partnerships: working with the accommodation and entertainment sectors to implement standards to improve energy, waste and water efficiency
Working with residents, workers and visitors	
Educate, train and inform	<ul style="list-style-type: none"> ▪ Waste & recycling information: informing local residents of the correct disposal method for products and also encouraging the purchase of products made from recycled materials ▪ Smart Green Apartments Program: working with local residents to implement water and energy efficiency measures to reduce costs and increase demand for green goods and services
City of Sydney’s own operations and procurement	
City of Sydney’s own operations	<ul style="list-style-type: none"> ▪ Renewable energy transition: installing solar power across its own buildings and assets, as well as negotiating new supply contracts, to achieve 100% of electricity from renewable sources by 2021 ▪ Sustainable Design Technical Guidelines: incorporating sustainability requirements for each of the City of Sydney’s major asset types, such as community buildings and aquatic centres
City of Sydney’s procurement	<ul style="list-style-type: none"> ▪ Sustainable procurement policy: requiring tendering companies to meet certain environmental standards to be eligible for local government contracts

Source: City of Sydney, AlphaBeta analysis

⁶⁴ City of Sydney (2019), *Sydney Development Control Plan 2012*.

⁶⁵ Municipality of Amsterdam (2018), *Amsterdam Circular: Evaluation and action perspectives*.

Procurement policies are also an important way for City of Sydney to promote the green and circular economy

The City of Sydney has a significant role to play in the green economy as a major customer for goods and services in the economy. The council awards a total of \$126m worth of contracts each year.⁶⁶ Setting a high environmental standard for its

suppliers will demonstrate the City of Sydney's leadership in the market, and encourage a transition to 'greener' practices. Industry experts have reinforced this role for the City of Sydney in order to shift incumbents and the market to develop a green economy.⁶⁷ Existing City of Sydney procurement guidelines already incorporate some sustainability principles, but information about these is difficult to obtain.



⁶⁶ City of Sydney (2018), *City of Sydney Annual Report: General Purpose Financial Statements 2017/18*.

⁶⁷ Expert interviews

4.3 City of Sydney should consider playing a more proactive role by identifying priority sectors and fostering circular innovation

Strong commitment to a green and circular economy, educating businesses and consumers and adaptation of its existing policies and programs will enable City of Sydney to mobilise Sydney's green economy. City of Sydney could also play a more proactive role in the growth of the green economy in two ways: by identifying and supporting priority sectors in Sydney's green economy; and by establishing the Sydney LGA as an innovation hub for the circular economy.

Identifying and supporting priority sectors in Sydney's green economy could boost growth and foster Sydney's role as a leader and enabler in the green economy

While a broad commitment to the green economy is a recognition of the importance of green outcomes to all parts of the economy, the Sydney LGA does not have a comparative advantage across the whole green economy. In green and circular production, for example, Sydney will struggle to compete with other regions with greater availability of and lower cost for agricultural and industrial land.

In sustainable finance and environmental advisory, however, Sydney has substantial incumbent sectors, brand capital and is already exporting services across the broader state and federal economies. The substantial share of commercial building stock and new investment that occurs in the Sydney LGA offers an obvious opportunity for Sydney to be a leading market for green buildings.

These competitive sectors are also attractive because they fulfil some of the key roles for Sydney's green economy to play in supporting the broader economic transformation across the state and country. Sustainable finance and environmental advisory are the two key sectors for Sydney as an enabler of the green economy elsewhere, exporting capital and knowledge to foster sustainable economic

development. In green buildings Sydney can be a leader and role model, using its substantial demand to drive improved practices and standards across other markets, such as construction materials and solar panels.

The ability of City of Sydney alone to generate progress in these priority sectors would be limited because it does not have all the resources or policy levers required. However, it can act as a convenor, bringing the private sector together with state and federal governments to identify shared goals and develop an action plan. One example of this is the opportunity to position Sydney as a centre for sustainable finance in the Asia-Pacific. Such a strategy would be a natural fit with Sydney's traditional role as a financial hub; it would provide both economic benefits to Sydney as well as helping generate capital to fund green economies nationally and regionally. Singapore is already competing aggressively for this position, providing government grants to support green bond issuance.⁶⁸

⁶⁸ Channel News Asia (2017), *MAS to offset cost of issuing green bonds with new grant scheme*.

City of Sydney could establish Sydney as a hub for innovation in the circular economy

The last twenty years have seen substantial innovation driving improving sustainability, especially in water and energy efficiency and renewable generation technologies. As a result, the energy system is already undergoing a major transformation. The sustainability of our materials system however is much less developed, as the impact of China's National Sword policy has demonstrated. The transformation to a more circular economy is only just beginning in Australia, and innovation will be a critical driver of success.

The Sydney LGA is well positioned to play a leading role. Firstly, there is already a strong startup ecosystem in the LGA and good access to talent. Secondly, the density of Sydney is a significant asset for proving and scaling new circular innovations. For example, the concentration of residents in the Sydney LGA has enabled car sharing schemes to grow rapidly. Other forms of goods sharing are also more viable with proximity. Density also provides concentrated waste streams, which are the raw ingredients for many circular economy innovations – such as commercial building fitout waste and food waste.

There are several ways that City of Sydney could help establish Sydney as a circular innovation hub:

- **Access to resources:** City of Sydney should consider how it can make its resources available to support organisations developing circular innovations. That could include providing office space, access to the

City's waste data, and considering in the future access to the waste streams that the City is responsible for collecting. City of Sydney could also enable experimentation on its own facilities – for example, enabling office sharing schemes in some of its office space.

- **Funding:** City of Sydney could continue to use its grants program to encourage innovation in the circular economy within the Sydney LGA. Several international peers have developed similar schemes to improve access to finance for circular innovations, including Amsterdam and Oslo. Other social impact funds have been developed by the private sector with low cost financing, such as the Close Loop Fund in the US.⁶⁹ There are a number of important design choices in creating a funding vehicle that would need to be further considered, such as the type of funding instruments, the organisations targeted and the scale of investments.
- **Facilitation & market making:** Finally, City of Sydney could act as facilitator and market maker for circular innovations, using its existing business-facing programs such as the Better Buildings Partnership and Sustainable Destinations Partnership to connect larger businesses with innovation startups.

⁶⁹ Closed Loop Partners (2019), *Closed Loop Fund*.

4.4 The City of Sydney can also advocate for the green economy and partner with other levels of government

Developing a strong green economy in Sydney requires alignment and coordination between the City of Sydney and other levels of government. As a local government, the council is limited in its capacity to directly effect change in some areas; however it is well-placed to influence the NSW state government to support the development of Sydney's green economy.

There are various areas in which the City of Sydney may be able to leverage the support of the state government. For example, the City of Sydney could pressure the NSW state government to implement industry standards on emissions for public transport vehicles. The NSW government will soon begin trials of four electric buses in the Inner West council area.⁷⁰ This is an opportunity for the Sydney LGA, which is a critical transportation hub for workers, residents and visitors, to advocate for greater investment in green public transport in Sydney.

Another area where City of Sydney could advocate with state and federal governments

is green skills development. Building Sydney's green employment by ensuring that job seekers have the right training avenues and are aware of the opportunities that green skills can provide will be vital to the growth of the green economy. It will also help ensure that the transition to a more sustainable economic model is just. The Sydney LGA also plays host to a range of universities and VET providers that could be centres of green skill development, but growth in the education sector of the green economy has been relatively slow.

Most of the skills system policy levers are controlled by state and federal governments. In 2009 the Council of Australian Governments adopted a new Green Skills Agreement to ensure the readiness of the VET system to provide skills for sustainability.⁷¹ However, since then progress has been relatively limited, apart from some individual VET providers. City of Sydney could partner with other governments to renew the focus on green skills as a critical enabler for a green and circular economy.



⁷⁰ Transport for NSW (2018), *Transit system boosts Inner West bus services*.

⁷¹ COAG (2019), *Green Skills Agreement*.

Exhibit 15: Policy directions and strategies for City of Sydney to grow its green economy

Policy direction	Strategy
1  Demonstrating commitment and leadership in the green economy	Commit to growing and developing Sydney's green economy as a source of economic opportunity and environmental benefit Improve the awareness and understanding of the green and circular economy by both businesses and consumers/residents Strengthen existing policies and programs which have already generated positive results in supporting the green economy Leverage procurement policies to generate demand in the green and circular economy
2  Identifying and fostering new economic opportunities	Identifying and supporting priority sectors in Sydney's green economy that could support Sydney's role as a leader and enabler in the green economy Establish Sydney as a hub for innovation in the circular economy
3  Advocating and partnering with other levels of government	Encourage state and federal governments to support the development of the green economy, e.g., through investment in green skills development, green public transport



Appendices

- **Appendix A**

Measurement methodology for the green economy

- **Appendix B**

Approaches to defining the green economy

Appendix A: Measurement methodology for the green economy

A.1 Green jobs in the Sydney LGA

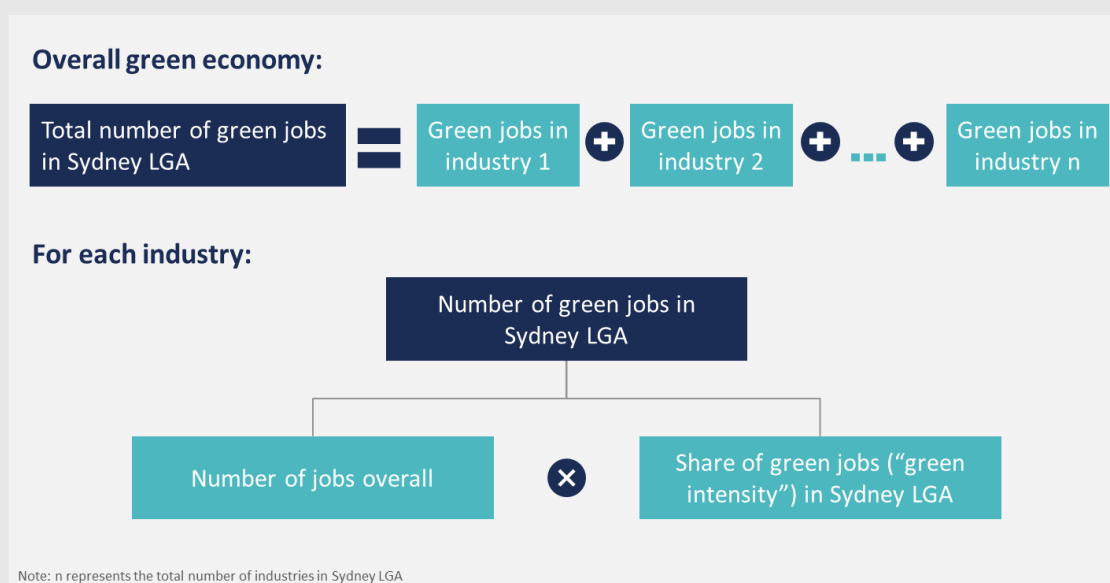
While the total number of jobs in the Sydney LGA is easily accessible from publicly available data such as the Census and City of Sydney’s Floor Space and Employment survey, identifying the share of jobs that are green is more difficult. Our national statistics agency, the ABS, does not currently measure the economic impacts of environmental activity.⁷² To address this data gap, this report uses skills requirements in online job ads as a proxy to estimate the current and historic share of green jobs in the Sydney LGA.

Online job ad data is a rich data source containing detailed information about jobs being demanded by employers including the industry, occupation, job type, skills required and location of jobs. Another advantage of job ad data is its timeliness. Job ad data is updated in real-time compared to traditional data sources that can be outdated by months or even years.

The overall approach to estimating the number of green jobs in Sydney LGA is shown in **Exhibit 16**. A job is classified as a green job if environmental skills such as clean energy or sustainability are explicitly requested in the job ad. The key assumption is that job ads requesting environmental skills are likely to have a substantial share of activities that are green activities, thereby meeting the definition of a green job.

The “green intensity” of jobs is estimated for each industry and multiplied by the total number of jobs in that industry in the Sydney LGA. The green intensity ratio is the total number of green job ads in the industry divided by the total number of job ads in the industry. For example, in the construction industry, architects designing green buildings, trades workers installing solar panels and sustainability managers improving the environmental performance of production processes are all captured as green jobs. The sources for inputs can be found in **Exhibit 16**.

Exhibit 16: Methodology for estimating green jobs in the Sydney LGA



Source: AlphaBeta analysis

⁷² The ABS has only conducted preliminary measurements of environmental expenditure accounts. See ABS (2014), *Towards an Environmental Expenditure Account, Australia*.

A.2 Economic value of the green economy in Sydney LGA

Measuring economic value creation in small geographical areas is challenging given available data. The commonly used metric for economic value at a sub-national level is gross value added (GVA). The ABS only measure value creation at the state level as Gross State Product (GSP). More geographically granular measurements of GVA are typically not produced as supply chains can span across states and even countries. This report builds on the approaches taken by several different organisations such as the Grattan Institute and the National Institute of Economic and Industry Research (NIEIR) that have modelled GVA at a sub-state level.⁷³

The GVA of the green economy in the Sydney LGA was estimated by multiplying the green intensity observed by job ads for each industry and the total GVA of the industry, then calculating the total green GVA for all industries. Capital adjustments were used to account for the likely level of capital present in the Sydney LGA compared to the national average for each industry. The Sydney LGA's GVA by industry is calculated based on its share of employment in the industry nationally and labour productivity, with an adjustment to productivity based on the assumption that productivity varies in proportion to wages.

For some industries where the green intensity ratio was difficult to construct or where value is created primarily through capital rather than labour, alternative 'bottom-up' methodologies were constructed. In green buildings, the value of the existing capital stock of green buildings was calculated based on rental returns and the share of construction costs attributable to 'greening' buildings. For the sharing economy, which is not a traditional industry in ABS data, a range of data sources were used to estimate the revenue and GVA of two key sub-sectors: car sharing, and accommodation sharing. The sources used are described in

Exhibit 17.

⁷³ See for example Grattan Institute (2014), *Mapping Australia's economy: Cities as engines of prosperity*. NIEIR (2019), "Welcome to the City of Sydney Economic Profile".

A.3 Inputs and sources used

Metrics and sources used for the measurements of the green economy are outlined below in **Exhibit 17**.

Exhibit 17: Sources for sizing the green economy

Area of measurement		Metric	Source
Green jobs in the Sydney LGA	Number of jobs in Sydney LGA	Number of full-time, part-time and casual workers in Sydney LGA	Census 2016, ABS Labour Force Survey (Dec 2019), City of Sydney Floor Space and Employment Survey (2017)
	Green intensity by industry	% of job ads requiring green skills for each industry	Burning Glass Technologies: Labor Insight (2019)
GVA of the green economy in the Sydney LGA	Gross output (national)	Total Australian production by industry	ABS Input-Output tables
	Number of jobs in Australia	Number of full-time, part-time and casual workers in Australia	Census 2016, Labour Force Survey (Dec 2019)
	Labour productivity adjustment for Sydney LGA	The ratio of median income in Sydney LGA to the national median income for each industry	Census (2016)
	Output to GVA ratio (national)	Gross output (obtained above) divided by GVA for each industry	ABS Input-Output tables
	Number of workers in Sydney LGA	Obtained from earlier analysis	Obtained from earlier analysis
	Capital adjustment for Sydney GVA	% capital input used for each industry nationally	ABS Input-Output tables
		% capital input used for each industry in Sydney LGA	Assumption driven based on Sydney LGA's industry mix relative to the national mix and sense-checked against various industry reports.
GVA of the sharing economy in the Sydney LGA	Gross output of Airbnb in Sydney LGA	Revenue generated by Airbnb listings in Sydney LGA	Inside Airbnb

	Number of residential Airbnb listings in Sydney LGA	% of residential Airbnb listings in the Sydney LGA	Assumption driven based on previous research and sense-checked against Inside Airbnb data
	Revenue generated by car sharing market in Australia	Total output of Australian car sharing industry	IBISWORLD industry reports
	Number of car sharing vehicles in Sydney LGA	% of car sharing vehicles in Sydney LGA	Data provided by CoS car sharing operators
GVA from stock of green buildings in the Sydney LGA	Value of buildings in Sydney LGA	Value of existing stock of residential and non-residential buildings in the Sydney LGA	Geoscience Australia National Exposure Information System Building Exposure (2017)
	Number of green buildings	Ratio of green buildings to all buildings	Green Building Council, industry reports and expert interviews
	Cost of greening a building	% increase in cost associated with greening a building	Green Building Council Australia, industry reports and expert interviews
	Rental return in Sydney LGA	Net yield (%) from properties in Sydney LGA	Assumption driven based on Sydney rent and value of property, and sense-checked with industry reports

Appendix B: Approaches to defining the green economy

Internationally, there is no general consensus or agreement on what the definition of the green economy should be. While the United Nation’s definition has often been quoted by various academics, organisations governments and industry groups, there are still many other definitions that have been considered. Definitions that have been proposed to date can be placed on a spectrum of aspirational definitions of what a green economy should be to practical definitions that outline the activities that fall within its boundaries. **Exhibit 18** highlights some of the definitions that have been used by various international organisations.

Exhibit 18: Other definitions of a green economy⁷⁴

Source	Green Economy Coalition UNECE (2012)	International Chamber of Commerce (2012)	United Nations Environment Program (2011)	Partnership for Action on Green Economy (2017)	System of Environmental-Economic Accounting (2012)
Definition	<ul style="list-style-type: none"> Green economy is “a resilient economy that provides a better quality of life for all within the ecological limits of the planet” 	<ul style="list-style-type: none"> A green economy is “an economy in which economic growth and environmental responsibility work together in a mutually reinforcing fashion, while supporting progress on social development” 	<ul style="list-style-type: none"> Green economy is one “that results in improved human well-being and social equity, while significantly reducing environmental risks and ecological scarcities. It is low carbon, resource efficient and socially inclusive” 	<ul style="list-style-type: none"> “An inclusive green economy is one where growth is driven by investments that reduce carbon emissions and pollution, enhance energy and resource efficiency, prevent the loss of biodiversity and ecosystem services, increase the number of decent jobs and ensure equitable distribution of income and wealth” 	<ul style="list-style-type: none"> Environmental activities include those “economic activities whose primary purpose is to reduce or eliminate pressures on the environment or to make more efficient use of natural resources”

Aspirational: provide a long-term vision for the transformation of the economy to greener principles

Practical: identify specific types of activities and practices that could be considered as green economy

Source: Green Economic Coalition, International Chamber of Commerce, United Nations, AlphaBeta analysis

⁷⁴ For details see: United Nations Environment Program (2012), *Towards a Green Economy: Pathways to Sustainable Development and Poverty Eradication*. Available at: <https://sustainabledevelopment.un.org/index.php?page=view&type=400&nr=126&menu=35>; International Chamber of Commerce Commission on Environment and Energy (2011), *ICC Comments on the UNEP draft Green Economy Report*. Available at: <https://cdn.iccwbo.org/content/uploads/sites/3/2011/05/ICC-comments-on-the-UNEP-draft-Green-Economy-Report.pdf>; Green Economy Coalition (2017), *The Green Economy: A Primer*. Available at: <https://www.greeneconomycoalition.org/news-analysis/the-green-economy-a-primer> and United Nations, European Commission, Food and Agriculture Organisation of the United Nations, Organisation for Economic Co-operation and Development, International Monetary Fund and the World Bank Group (2012), *System of Environmental-Economic Accounting 2012 – Central Framework*. Available at: https://unstats.un.org/unsd/envaccounting/seearev/seea_cf_final_en.pdf

