Too Good To Waste

Discussion paper on a circular economy approach for NSW

October 2018

NSW GOVERNMENT

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Glossary

Term	Definition
APCO	Australian Packaging Covenant Organisation.
Advanced Manufacturing	Manufacturing that uses new technologies or advanced business models.
Business model	An operating method for a business.
China's National Sword policy	Until recently China was a large importer of recyclable materials, accepting more than 30 million tonnes of waste from all over the world every year. Australia sent 1.25 million tonnes of recycled material to China in 2016-17. At the start of January 2018, however, China began to stringently enforce restrictions on the importation of recycled materials. The collective policies that govern the restriction on imports of recovered materials are referred to as China's National Sword policy. This policy has impacted the global market for recyclable material, including the recyclable material that is currently collected in NSW.
Circular economy	A circular economy values resources by keeping products and materials in use for as long as possible. Maximising the use and value of resources brings major economic benefits, contributing to innovation, growth and job creation. A circular economy can help protect businesses from fluctuating resource commodity prices and provides a more stable operating environment for manufacturers, retailers and consumers.
Commodity (including recyclable commodities)	An article of trade or commerce. Recyclable commodities are waste materials that can be recycled (such as plastics, paper and cardboard, glass or metals) and which are bought by local and international markets for use in manufacturing processes.
End-of-life (products or materials)	Products or materials that have been used until they are no longer of value in their current form and have reached end-of-life.
Gross Domestic Product	Gross Domestic Product (GDP) is the total market value of all goods and services produced within Australia in a given period of time (typically one year). Growth in GDP is an indicator of economic growth.
Greenhouse gas	Gases that cause an insulating effect in the Earth's atmosphere, including carbon dioxide (CO_2) and methane (CH_4), often measured in tonnes of carbon dioxide-equivalent or CO_2-e.
Innovation hub	An environment that fosters innovation, through provision of resources and support.
Life cycle (product or service)	The process a product or service goes through from creation to disposal. A typical product life cycle includes the following stages: raw material extraction, manufacturing, assembly, retail, use and disposal.
Linear economy	An economic model which involves extracting resources, using them to make products (which last from minutes to years), then disposing of them in

Term	Definition
	landfill. Also known as a “take, make and dispose” economy.
Modular	Modular products are made of standard units or sections that allow for easy construction, assembly and repair.
Materials Recovery Facility (MRF)	A facility that sorts and processes recyclable materials from yellow-lidded bins owned by households and businesses. The recovered resources typically include various types of paper, plastic, glass and aluminium.
Organics Processing Facility	A facility that sorts and processes organic material, such as the waste deposited in household green-lidded bins. The recovered resources are typically various grades of compost.
Primary or raw material	These are naturally occurring substances or materials that are extracted from the environment and used in manufacturing processes.
Product	An item that is sold commercially for a particular use.
Product life cycle	The process a product or service goes through from creation to disposal. A typical product life cycle includes the following stages: raw material extraction, manufacturing, assembly, retail, use and disposal.
Putrescible	As defined in the NSW EPA’s Waste Classification Guidelines 2014.
Product stewardship	As defined in the *Product Stewardship Act 2011*.
Recyclable material	Material that can be sorted and processed for re-use and remanufacturing using available technologies and processes.
Resource Recovery Facility	A generic term for a facility that sorts and processes waste materials.
Roadmap	A plan or strategy to achieve a particular goal.
Small and Medium Enterprises (SMEs)	Businesses whose personnel numbers fall below specified limits. In Australia a SME is defined as a business with fewer than 200 employees.
Utility	The total benefit that is gained from using a specific quantity or amount of goods or services in an economy.
Waste	As defined in the dictionary of the *Protection of the Environment Operations Act 1997*.
Waste hierarchy	A set of priorities for the efficient use of resources; this underpins the objectives of the *Waste Avoidance and Resource Recovery Act 2001*. The waste hierarchy is (in order of most preferable to least preferable): • avoid and reduce waste • re-use waste • recycle waste • recover energy • treat waste • dispose of waste.

Overview

The NSW Government is adopting fresh ways to think about resource management which will create economic value and preserve valuable resources by using them again and again (circulating them) in the economy and minimising the generation of waste.

The circular economy approach involves a transition away from the traditional linear 'take, make and dispose' model. It aims to keep resources circulating in our economy to maximise value, generate local jobs and minimise waste. It can open up new markets and business models and lead to innovative resource and waste management solutions.

Circular economy approaches have been adopted by cities, states and nations across the world, particularly in Europe, Asia and North America. Most Australian State and Territory Governments, and the Commonwealth Government, are developing circular economy policies and approaches, uniquely matched to their circumstances.

The Discussion Paper and Draft Policy are not limited to specific resources or materials, although recyclable plastic, paper and cardboard, glass and metals are given particular attention. In the wake of China's National Sword restrictions, and the resulting impact to recyclable commodity markets across the world, a circular economy can lead to a more resilient local economy and protect NSW's strong recycling history.

The principles presented in this Discussion Paper cover all aspects of a product or service life cycle and show how the circular economy provides benefits to our society, our economy and the environment. By incorporating circular economy principles into our decisions and behaviour and encouraging consideration of the true value of our resources, we can develop a new, restorative model that builds economic, social and natural capital.

About this Paper

This Discussion Paper presents an overview of the circular economy, how it can be applied in NSW and the benefits it could bring. The Discussion Paper is informed by stakeholder consultation, research on international best practice approaches and an assessment of how these approaches would apply in the NSW context.

This Paper presents key principles and international circular economy case studies. It aims to encourage dialogue on circular economy principles and how these might be applied in NSW. This Paper also proposes next steps and priority focus areas for the NSW Government.

Questions have been provided throughout the Paper to stimulate further discussion. A Draft NSW Circular Economy Policy Statement has also been developed which reflects the themes, principles and priority focus areas presented in this Paper. The NSW Government is seeking feedback on circular economy principles, approaches and priority action areas for NSW. This information will be used to finalise a NSW Circular Economy Policy and develop a NSW Circular Economy Implementation Plan.

Figure 1 Circular Economy Policy Timeline

Why does NSW need a Circular Economy Policy?

Current patterns of resource use in NSW are no longer sustainable and current resource recovery policies and technologies are no longer fit for purpose. This impacts businesses, households, the environment, human health, State and Local Government and the NSW economy. These impacts have been compounded by China's National Sword policy.

That's why the NSW Government is developing a Circular Economy Policy that will minimise these negative impacts and deliver positive economic, social and environmental outcomes for the NSW community.

The circular economy is all about changing the way we produce, assemble, sell and use things to minimise waste, to reduce our environmental impact and to enhance the NSW economy. A circular economy can also be great for business; maximising the use and value of resources, contributing to innovation, growth and job creation.

Understanding the circular economy

The NSW economy has traditionally been a mostly linear system ('take, make and dispose'). We extract raw materials, manufacture goods, use them (often for a short period of time), collect and recycle some of them, then dispose of them to landfill.

The total amount of waste generated in NSW has increased rapidly over the last 30 years. This has partly been driven by population growth, but also partly due to changes in consumption patterns, such as increased purchasing of highly packaged goods.

The circular economy is an alternative to this linear system of 'take, make and dispose'. It aims to maximise the value of resources by keeping products and materials in use for as long as possible. Resources are also recovered at the end of product life for use back into the economy, creating further value.

By 2021, it is expected NSW will need to process nearly 20 million tonnes of waste[1]

Moving to a circular economy will provide long-term economic, social and environmental benefits for NSW. The transition will generate jobs, increase the robustness of the economy, increase accessibility to goods, maximise the value of resources, reduce waste and improve how we use resources.

[1] *KMH Environmental, 2016, NSW Resource Recovery Infrastructure Needs Analysis*

Shaping the Circular Economy Policy

The section above defines the problem that the circular economy policy seeks to solve. An implementation plan to transition to a circular economy will be guided by the principles of re-use, recycling and innovation in key focus areas.

Figure 2 Circular Economy Policy hierarchy

The NSW Economy

New South Wales has a diversified, service-driven economy. In 2012-13 services represented 86% of the value of NSW industry output, while manufacturing and primary industries accounted for 7% and 4% respectively[2]. This highlights the strength of the state's knowledge-based business services, such as information and communication technology and creative industries.

The waste management sector makes up 0.8% of Australia's gross domestic product (GDP)[3]. The Australian Bureau of Statistics (ABS) estimated the supply of waste management services nationwide in 2009–10 was worth over $9.5 billion, including income from recycling waste products valued at $4.5 billion[4]. In 2017 the waste management sector in NSW was worth approximatley $4 billion[5].

Small to Medium Enterprises (SMEs) are also a key part of the NSW economy. These are businesses that employ fewer than 200 people. They make up 99.8% of businesses in the NSW economy, employing 44% of the workforce or over 1.5 million people.[6]

Manufacturing in NSW

According to the NSW Department of Industry (DoI), the manufacturing sector in NSW employs 253,000 people and contributes $33 billion to the NSW economy.

NSW contributes the largest state share (34%) of manufacturing in Australia, and has strengths in food and beverage product manufacturing, machinery and equipment manufacturing and metal manufacturing (refer to Figure 3 below).

[2] NSW Department of Industry, *Industry Structure,* accessed at: https://www.industry.nsw.gov.au/invest-in-nsw/about-nsw/economic-growth/industry-structure

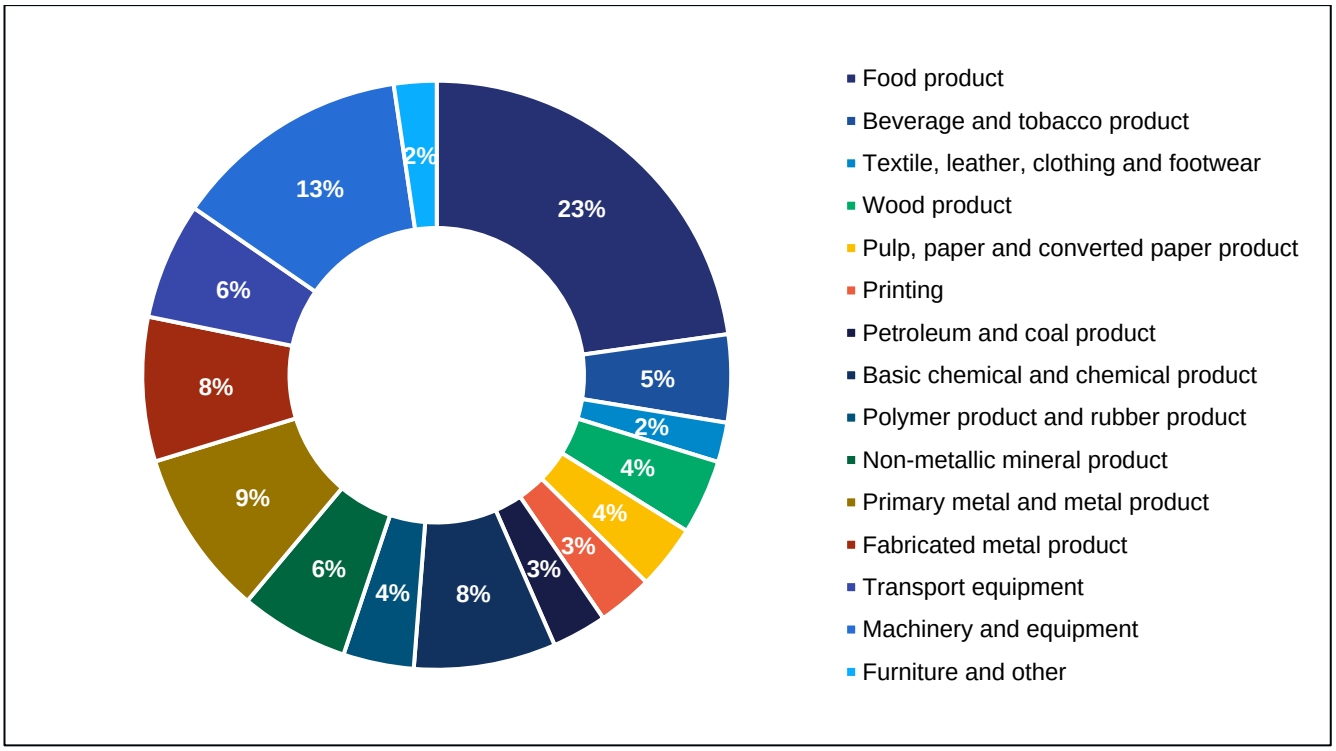
[3] Trading Economics, 2018, Australia GDP, available at: https://tradingeconomics.com/australia/gdp and IBISWorld 2017, Reports 2911, 2921, 2922, Solid Waste Collection Services, Waste Treatment and Disposal Services, Waste Remediation and Materials Recovery Services

[4] Australian Bureau of Statistics 2013, 4602.0.55.005 Waste Account, Australia, Experimental Estimates, Canberra

[5] IBISWorld 2017, Reports 2911, 2921, 2922, Solid Waste Collection Services, Waste Treatment and Disposal Services, Waste Remediation and Materials Recovery Services

[6] Australian Bureau of Statistics, ABS 8165 Counts of Australian Businesses, June 2013 to June 2017

Figure 3 Overview of manufacturing industries in NSW 2016-2017[7]



Manufacturing that uses new technology or advanced business models (Advanced Manufacturing) is a priority area for the NSW Government. Advanced manufacturing could increase the manufacturing sector's value by 35% or $34.6 billion by 2026[8].

The NSW Advanced Manufacturing Industry Development Strategy recognises that businesses are shifting away from competing on cost and are emphasising value creation. The NSW Government recognises that advanced manufacturing can benefit the economy, and is aligned with circular economy principles through the focus on innovation and shifting towards high value, service-oriented business models.

[7] Australian Bureau of Statistics, ABS 8155 Manufacturing Industry by ANZSIC class, 2016-17

[8] NSW Department of Industry, 2018, NSW Advanced Manufacturing Industry Development Strategy

Waste and the economy

In 2009 Access Economics[9] estimated that in Australia, more than 22,000 full-time equivalent workers were directly engaged in recycling activities, compared with nearly 7,000 workers involved in landfill operations. Recycling activities also created close to 19,000 indirect jobs, compared with close to 6,000 indirect jobs for landfill operations. This means for every 10,000 tonnes of waste, there are 9.2 full-time equivalent employees directly involved in recycling, compared with only 2.8 jobs in landfill operations. In NSW alone, it is estimated in 2017-18 more than 10,000 workers were employed in the waste management sector, including collection, recycling and disposal operations[10].

In 2010-11, waste management businesses contributed $3.5 billion to Australia's gross domestic product[11].

Australia generated 64 million tonnes of waste in 2014-15 and almost 60% of this was recovered[12]. NSW generated 17.8 million tonnes in the same period and recovered over 62%[13].

Figure 4 provides an overview of how waste materials flow in NSW. The four main activity areas in the waste management industry are: collection and transfer, sorting and processing, recycling or recovery and disposal. The remaining waste that cannot be recycled or re-used ends up in landfill.

The NSW economy depends on the environment to provide raw materials and manage the waste and emissions we produce.

Re-using, recovering and recycling these valuable materials keeps them in the productive economy for longer. This has the dual benefits of lowering demand for new resources and reducing the need to manage waste. Waste going to landfill is not only a loss of valuable resources, it also shortens landfill lifespans.

Sorted and recovered materials need to be processed to meet the requirements of the end markets, such as local or international commodity markets. This processing occurs at Materials Recovery Facilities (MRFs), which is where recyclable materials, including materials from yelllow-lidded kerbside bins, are sorted.

[9] Access Economics Pty Ltd 2009, Employment in Waste Management and Recycling, report for Department of Environment, Water, Heritage and the Arts, Canberra

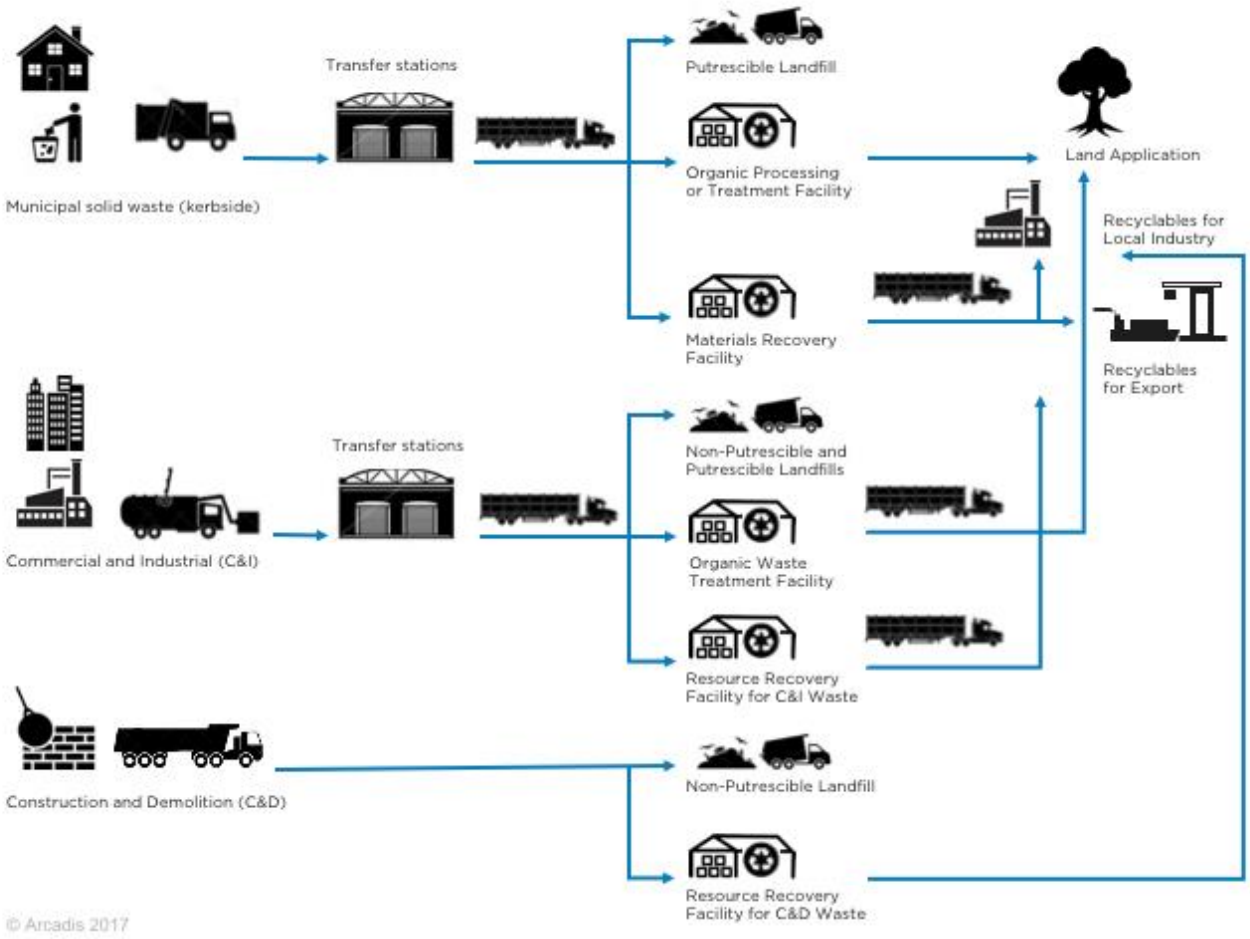
[10] IBISWorld 2017, Reports 2911, 2921, 2922, Solid Waste Collection Services, Waste Treatment and Disposal Services, Waste Remediation and Materials Recovery Services

[11] National Waste Report 2013, accessed at https://www.environment.gov.au/system/files/resources/0a517ed7-74cb-418b-9319-7624491e4921/files/overview-waste-management-industry.pdf

[12] National Waste Report 2016, accessed at http://www.environment.gov.au/system/files/resources/d075c9bc-45b3-4ac0-a8f2-6494c7d1fa0d/files/national-waste-report-2016.pdf

[13] KMH (2017) Infrastructure Needs Analysis Report, unpublished

Figure 4 Overview of waste material flows in NSW



China's National Sword policy and global commodity prices

Recyclable materials collected through kerbside recycling services (yellow-lidded bins) are often traded by waste operators into local or international commodity markets. These markets are subject to short and long-term fluctuations in demand and supply, which can be challenging for operators to manage financially.

Until recently, China was a large importer of recyclable materials, accepting more than 30 million tonnes of waste from all over the world every year. Australia sent 1.25 million tonnes of recyclable materials to China in 2016-17, of which 240,000 tonnes was sent from NSW.

In early 2018, China began enforcing its National Sword policy, which imposed restrictions on the types of recyclable materials that China will accept. Recyclable materials including paper and cardboard, plastics and metals are all impacted by this change. The Australian recycling industry is not currently set up to meet these contamination limits, alternative markets have had to be found.

Recycled materials previously exported to China that are now impacted by the National Sword Policy are summarised in Table 1.

Table 1- Breakdown of recovered materials exported from NSW to China in 2016-17

Material	Exports to China (tonnes)	Value (dollars)
Metals	63,000	$125,000,000
Paper and cardboard	135,000	$24,000,000
Plastics	43,000	$14,000,000
Total	240,000	$163,000,000

Recyclable glass has not been exported in significant quantities from NSW and it is not directly impacted by China's National Sword Policy. However, shifts in the glass industry have resulted in limited markets for recycled glass in NSW and most of Australia.

The impact of China's National Sword Policy, along with limited end markets for recycled glass, has led to a dramatic decline in the value of all these materials. Further impacts are expected to be felt across the world as other international markets struggle to keep up with the influx of recycled materials.

These international markets have also started to implement their own restrictions, including temporarily closing ports, to manage the flow of incoming material that currently has no end market.

It is in this context that the implementation of circular economy principles could minimise dependency on international markets and the quantity of materials entering the recycling stream, through avoiding waste, re-using materials and developing robust local markets for recycled materials.

The Circular Economy

A circular economy values resources by keeping products and materials in use for as long as possible.

Maximising the use and value of resources brings major economic benefits, contributing to innovation, growth and job creation.

A circular economy can help protect businesses from fluctuating resource commodity prices and provides a more stable operating environment for manufacturers, retailers and consumers.

A circular economy can be achieved by implementing initiatives throughout the product life cycle, from design, manufacturing, retail, use and at end-of-product life.

These include long-lasting design, maintenance, repair, re-use, sharing, transforming products into services, remanufacturing, recycling and innovative waste management solutions.

The circular economy approach has been gaining momentum across governments, the business world and non-government organisations around the world. A circular economy supports the delivery of the international Sustainable Development Goals by committing to sustainable consumption and production patterns (United Nations Development Programme (2015) Goal 12: Responsible consumption and production[14]).

This growing international profile of the circular economy due to its ability to deliver environmental benefits, increased resource efficiency and job creation. Similarities amongst countries with ambitious circular economy goals include strong recycling and waste management frameworks, often augmented by specific laws that deal with packaging procurement policies and the design of products. Japan, Europe and China are exploring comprehensive circular economy initiatives that look beyond waste management to reducing the materials used and the economic and environmental impact of products throughout their lifecycle. All have a strong focus on regulation at a regional or national level.

Australia has the opportunity to benefit from this international momentum, by mainstreaming tested circular approaches to production and consumption, and adopting international standards. Doing nothing risks Australia being left behind, and in turn missing out on the opportunities this approach offers in terms of economic, social and environmental benefits.

Figure 5 illustrates the circular loops present at each stage of the product life cycle:

- Production – design products considering life cycle impacts and manufacture products using recovered materials
- Assembly – assemble products with modular components to allow for easy repairs and upgrades
- Retail and service – repair products that breakdown and take back products at end-of-life
- Use – avoid using products where possible, share products to maximise benefits and re-use products before disposing of them
- Collection – separate materials to efficiently sort and recover as much as possible.

[14] http://www.undp.org/content/undp/en/home/sustainable-development-goals/goal-12-responsible-consumption-and-production.html.

Figure 5 The circular economy life cycle

Circular Economy principles for NSW

The NSW Government's key objective is to use circular economy principles to deliver positive economic, social and environmental outcomes for the NSW community.

Principles for a circular economy are outlined in Table 2.

Table 2 Circular economy principles

Principles	Description
Minimise consumption of finite resources	• Replacing raw materials with recovered and recycled products, which will reduce demand for finite natural resources, and minimise environmental impacts from the extraction and processing of these raw materials.
Decouple economic growth from resource consumption	• Maximising the value of resources by keeping materials in use for as long as possible, which will decouple economic growth from resource use.
Design out waste and pollution	• Innovating product design for longevity, re-use, remanufacture and resource recovery to make it easier for customers to share, repair or upgrade goods. • Extending the lifespan of existing landfills and reducing demand for new landfills, which will reduce emissions of greenhouse gases and other pollutants. • Increasing service offerings, as well as increased remanufacture and repair activities, to minimise the amount of resources used and avoid the generation of waste.
Keep products and materials in use	• Developing local markets for high quality post-consumer recycled materials, which keeps materials in use for longer, reduces dependency on international markets and reduces the impacts of commodity price fluctuations. • Improving quality of collected materials and improving sorting of these materials so they are available for re-use. • Increasing access to goods for the NSW populace through a focus on sharing, re-use and repair, with benefits for low-income households.
Innovate in resource efficiency, give preference to higher order re-use and repair opportunities	• Capturing value from cycling resources in new ways, including innovative business models and services across different sectors. • Innovating technologies that increase resource efficiency and preference higher value re-use opportunities, leading to a range of benefits compared to the take, make and dispose status quo.
Create new circular economy jobs	• Creating jobs in new manufacturing, service and resource recovery sectors associated with recycling, re-use, remanufacturing and increased service offerings. • Encouraging repair and refurbishment, re-use and recycling and creating new skills and employment opportunities in these industries.

Moving towards a circular economy

Transition to a circular economy requires cooperation across different sectors, all levels of government and citizens.

Manufacturers will be encouraged to rethink how they design products and use resources, by focusing on the entire life cycle of the product they are producing.

Businesses will be encouraged to focus on innovative design that allows products to be easily disassembled and repaired, as well as new business models that prioritise circular activities. Retailers will be encouraged to move from product sales to the leasing and servicing of products. Retailers, distributors and manufacturers will also be encouraged to take greater responsibility for the return, refurbishment and recycling of end-of-life products.

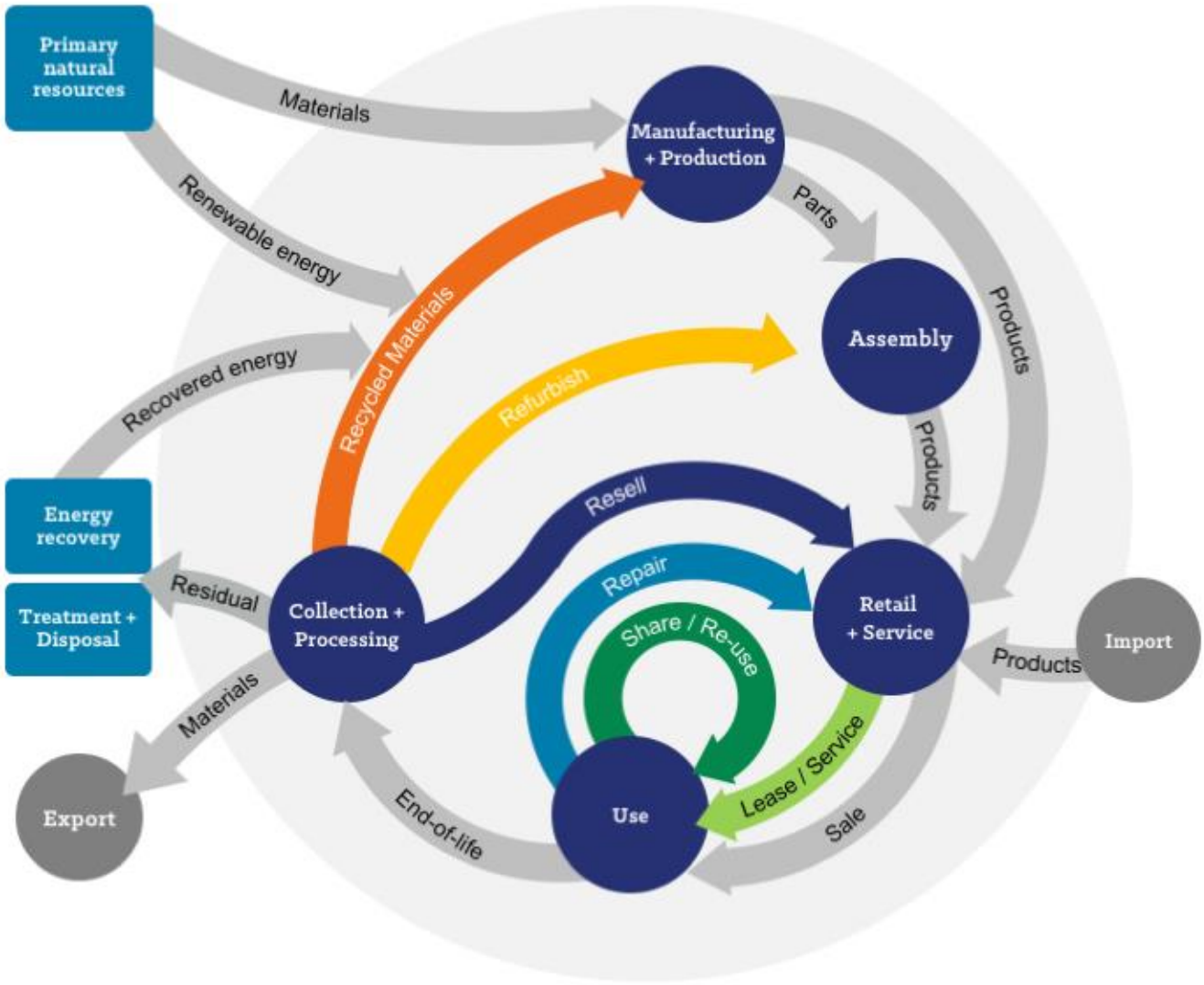
Consumers will be assisted with making informed purchasing decisions that create demand for circular and sustainable products and commodities, including second-hand products and products made from recycled content. Increased use of sharing platforms and repair hubs that extend the use and life of a product are also important.

The waste and recycling industry is critical in collecting waste materials and end-of-life products and processing them for use in new products. These materials need to be processed to a standard that facilitates their re-use in manufacturing processes.

The NSW Government will be an early adopter, implementing those opportunities where the benefits are clear. With any transition to a new approach there will be inevitably winners and losers across businesses and the community, but the Government is working to adopt a staged, planned approach to minimise any risks.

How does a circular economy work?

Figure 6 Circular economy material flows



Circular economy activities aim to keep products and materials in use and minimise the amount of waste generated.

Products, components and materials should remain at their highest utility for as long as possible. The coloured arrows in Figure 6 prioritise circular economy activities from green to orange.

Green and blue arrows represent activities that are the most circular, where resource use and waste generation is minimised. Leasing arrangements, sharing platforms and repair hubs ensure products are used as much as possible, and minimise the amount of resources needed to make these products available to customers. It values products and resources by ensuring they do not go unused and are not wasted.

Yellow and orange activities are important parts of a circular economy but are a lower priority. Recycling and refurbishment ensure end-of-life material is diverted from landfill and re-used in the productive economy. Recycling or refurbishing materials and products also minimises the amount of primary, raw material used in manufacturing processes. Yellow and orange activities are lower priority because they are usually more energy and resource intensive than green and blue activities.

What might a circular economy mean for me?

A circular economy approach will impact - and require cooperation - across all levels of government, industries and citizens. There will be gradual changes across various products and services. Six of these potential changes are described below.

Leasing and servicing

This involves offering products as a service rather than selling products outright. Leasing arrangements, rentals, pay-per-use or performance-based business models are prioritised in a circular economy.

These models minimise the resources used and the waste generated, without compromising customer satisfaction. They create a network where products can easily be tracked, returned, redistributed and repaired. Customers benefit from having increased access to products, without the added costs of repairs, upgrades or disposal. Businesses benefit from building strong customer relationships and repeated transactions with each customer.

There are many current examples of lease-based services such as for vehicles, electronics, formal wear, recreational goods, commercial and industrial machinery.

Share and re-use

Sharing platforms can also be used for products that have low utilisation or ownership rates. These are products that customers do not need to use regularly. This means that fewer products can be accessed by more people and fewer materials are wasted.

The share economy is rapidly expanding in Australia. Examples are short-term house rental services and car share services.

Return and repair

Under a ‘return and repair’ model, products are sold directly to customers, but businesses play a more active role in maintaining these products.

These business models make it easier for customers to return and repair or upgrade products. It aims to avoid disposal or replacement of products with newer models, where possible.

Businesses may offer take-back services that make it easier to collect, repair and redistribute their products.

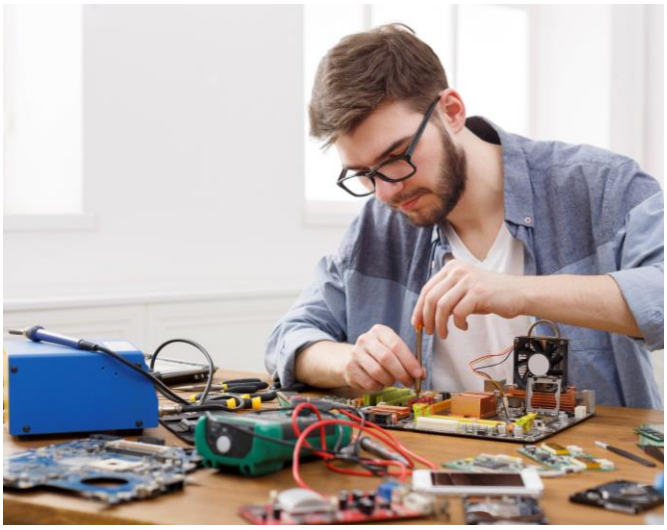
This model suits markets where pre-owned products are common. An example is commercial or industrial equipment.

Many local councils and community organisations already operate small repair and re-use services for toys, bicycles and furniture. These social enterprises play an important role in preventing waste going to landfill, providing employment opportunities for disadvantaged people and providing low cost items for people in need.

Redistribute and resell

End-of-life materials and products will increasingly be collected and processed into new products, which can then be sold back to customers. An example of this is construction and demolition waste being converted into recovered aggregate and used in new construction projects.

There is already a strong economy of resale of all types of products through online platforms and social media.



Component re-use

Products will be designed so they can easily be disassembled, allowing the parts to be used to make other products. This is known as modular design.

This minimises the natural resources needed to make new products and reduces the amount of waste generated.

Modular design is already common with some types of products, for example vehicles.

Recycling

Recycling uses end-of-life materials to create new products.

End-of-life materials are processed to a minimum standard and returned for re-use, often through a manufacturing process.

The recycling process avoids waste going to landfill, replaces natural resources and can reduce energy usage and manufacturing costs.

In NSW we already collect and remanufacture paper for use in newspapers.

Effective recycling by the public is required to reduce contamination of recycled products and ensure high quality materials are available for re-use. Buying products made with recycled content is also an important part of the recycling picture and should be purchased in preference to products made from finite natural resources. This helps grow markets for recycled products and makes recycling more viable.

Questions for consultation

- *Do you support NSW having a circular economy policy? Why or why not?*
- *What would you like to see in a Circular Economy Policy?*
- *How could the Government support a transition towards a circular economy?*
- *What are the main barriers to the implementation of a circular economy? (pick up to three)*
    - *government policy and legislation*
    - *consumer awareness and preferences*
    - *technology*
    - *funding for research and development*
    - *collaboration across supply chains*
    - *other – please specify*.

Benefits of a circular economy

A circular economy can deliver a wide range of benefits. These can be broadly categorised as economic, social and environmental benefits.

A circular economy could provide material cost savings up to $9 billion a year for NSW[15]

Economic benefits

Circular economy **increases the resilience of local markets and industry** to external shocks and stresses, particularly in resource commodity markets. The impacts of China's National Sword Policy have highlighted a dependence on international commodity markets. The development of local markets for recycled materials reduces this dependency and minimises potential risks from any future changes to international trade policy or commodity pricing.

Increased service offerings and capabilities, as well as increased remanufacturing and repair could lead to a more **robust economy and diversification of the industry**. Circular economy requires innovation in process and product design, and in the development of new business models across a variety of sectors.

A study for the EU found GDP could potentially increase by 0.8% by 2030 compared to a baseline scenario[16]. Another study for the EU forecast €1.8 trillion in benefits by 2030 from reduced resource costs, spending costs and externalities. This equals a 7% increase in GDP compared to business-as-usual[17]. In Australia, it was found that a 5% improvement in the effectiveness of recycling and resource recovery could benefit Australia's GDP by as much as $24 billion.[18]

Studies have also been undertaken on benefits to specific sectors. A study across the food and beverage, construction and real estate, machinery, plastic packaging and health sectors in Denmark estimated an 8% increase in resource productivity, resulting in a 1.4% increase in GDP[19]. NSW has

[15] Wealth from Waste Cluster (2017) *Australian Opportunities in a Circular Economy for Metals*, available at: http://wealthfromwaste.net/wp-content/uploads/2017/11/Wealth_From_Waste_Report_WEB.pdf

[16] Cambridge Econometrics (2014), Study on modelling of the economic and environmental impacts of raw material consumption, available at: http://ec.europa.eu/environment/enveco/resource_efficiency/pdf/RMC.pdf

[17] Ellen MacArthur Foundation (2015) G*rowth Within: A circular economy vision for a competitive Europe*, available at: https://www.ellenmacarthurfoundation.org/assets/downloads/publications/EllenMacArthurFoundation_Growth-Within_July15.pdf

[18] Centre for International Economics (2017) Final report: Headline economic value for waste and materials efficiency in Australia)

[19] Ellen MacArthur Foundation (2015a), Potential for Denmark as a circular economy: A case study from: delivering the circular economy – a toolkit for policy makers https://www.ellenmacarthurfoundation.org/assets/downloads/20151113_DenmarkCaseStudy_FINALv02.pdf

strengths in services as well as food and beverage, and machinery manufacturing. Similar benefits could be achieved in these sectors.

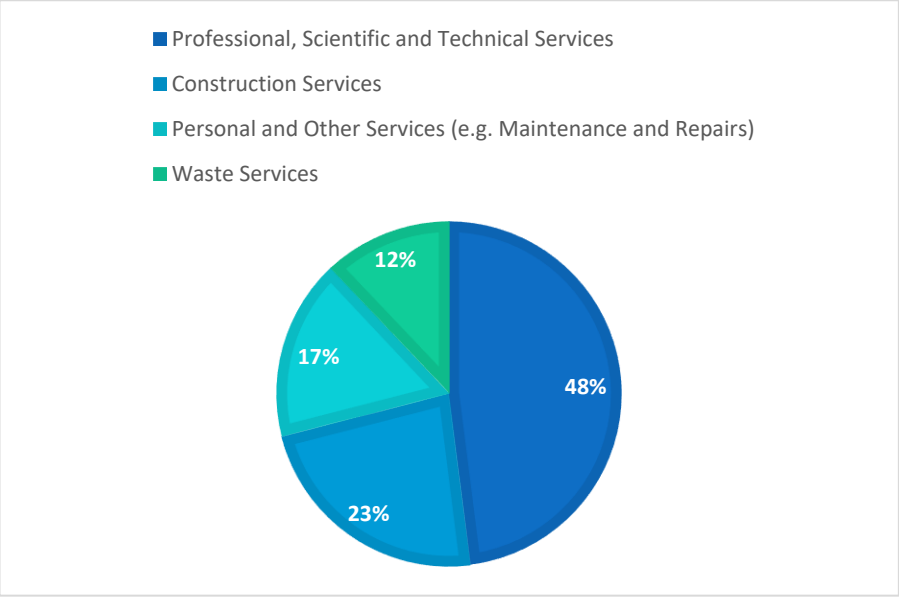
Social benefits

Job generation is the main social benefit of a circular economy. Specifically, job generation is expected in the recycling, repair, re-use, remanufacturing areas and through increased service offerings.

A UK study on jobs associated with a circular economy found that re-use and recycling jobs would be geographically dispersed across the country, while remanufacturing jobs are likely to be more concentrated near existing manufacturing hubs.[20] Geographically dispersed job opportunities are particularly beneficial for areas of regional NSW.

The estimate of the breakdown of additional jobs generated from a circular economy approach is shown in Figure 7[21].

Figure 7 - Estimate of additional jobs from a circular economy



NSW is well placed to benefit from the overall job generation in the transition to a circular economy. An Australian study on jobs in recycling and landfill found the ratio of jobs in landfill to recycling is 1:3 for an equal amount of waste processed[22]. This study included jobs in waste or recycling collection, sorting, material transformation, material transfer and site management. Based on data collected as part of the EPA's Waste Less, Recycle More program, 845 jobs were created in the recycling industry from July 2012 to June 2016 by diverting more waste from landfill. These studies indicate the social value that could be gained from shifting the focus from landfilling to recycling and recovery.

Another social benefit includes **increased access to goods**, through a focus on sharing, re-use and repair. This provides a greater benefit for low-income households.

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[20] WRAP and Green Alliance (Julian Morgan and Peter Mitchell), (2015), *Opportunities to tackle Britain's labour market challenges through growth in the circular economy,* available at: http://www.wrap.org.uk/sites/files/wrap/Opportunities%20to%20tackle%20Britain's%20Labour%20Market%20Challenges%20full%20report.pdf

[21] Lifecycles, (2016), *Creating Value: The potential benefits of a Circular Economy in South Australia,* available at: https://static1.squarespace.com/static/5900aad637c581564bbf6bb4/t/5927b99a3e00be74ac7f35de/1495775661217/CE+Report+May+2017+-+2.pdf

[22] Access Economics, (2009), *Employment in waste management and recycling*, available at: https://www.environment.gov.au/system/files/resources/5cc6a848-a93e-4b3f-abf7-fc8891d21405/files/waste-and-recycling-employment.doc

Environmental benefits

Through a focus on greater **material efficiency and reduced waste**, a circular economy provides a range of environmental benefits compared with a linear economy.

By focusing on maximising the value of resources and keeping material in use for as long as possible, a circular economy decouples economic growth from resource use. Replacement of raw materials with recovered and recycled products reduces demand for valuable and finite natural resources. It also minimises potential environmental impacts from the extraction and processing of these raw materials.

A South Australian study found that materials efficiency strategies could reduce the State's greenhouse gas emissions by 10% [23]. Studies focused on the impact of materials efficiency in Europe found a decrease in carbon emissions of 7-8%[24, 25]. This represents an emissions reduction of about 13,000 kilotonnes by 2030.

A focus on diverting organic material from landfill would also result in **greenhouse gas emissions reductions**. One tonne of food waste in landfill emits 1.9 tonnes of CO_2-equivalent emissions, which is equal to the emissions from a household's electricity consumption for about half a year.[26]

Material efficiency and waste reduction measures would increase the lifespan of existing landfills and reduce the demand for new landfills.

The waste hierarchy and WARR Strategy

The waste hierarchy is a set of priorities for the efficient use of resources. It underpins the objectives of the *Waste Avoidance & Resource Recovery (WARR) Act 2001*, encouraging resource recovery and preventing unnecessary waste.

The waste hierarchy can be summarised as:

1. **avoidance** including action to reduce the amount of waste generated by households, industry and all levels of government
2. **resource recovery** including re-use, recycling, reprocessing and energy recovery, consistent with the most efficient use of the recovered resources
3. **disposal** including management of all disposal options in the most environmentally responsible manner.

The WARR Strategy is a key component of the NSW Government's vision for the environmental, social and economic future of the state. The Waste Avoidance & Resource Recovery Strategy provides targets across six key result areas. These targets reflect the waste hierarchy priorities and include by 2021-22:

- reduce the rate of waste generation per capita
- increase recycling rates for:
    - municipal solid waste from 52% (in 2010–11) to 70%
    - commercial and industrial waste from 57% (in 2010–11) to 70%
    - construction and demolition waste from 75% (in 2010–11) to 80%
- increase the waste diverted from landfill from 63% (in 2010–11) to 75%.

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[23] Lifecycles, (2016), *Creating Value: The potential benefits of a Circular Economy in South Australia,* available at: https://static1.squarespace.com/static/5900aad637c581564bbf6bb4/t/5927b99a3e00be74ac7f35de/1495775661217/CE+Report+May+2017+-+2.pdf

[24] Ellen MacArthur Foundation (2015a), Potential for Denmark as a circular economy: A case study from: delivering the circular economy – a toolkit for policy makers https://www.ellenmacarthurfoundation.org/assets/downloads/20151113_DenmarkCaseStudy_FINALv02.pdf

[25] TNO (2013) Opportunities for a circular economy in the Netherlands

[26] Australian Department of the Environment and Energy, 2017, *National Greenhouse Accounts Factors*, available at: https://www.environment.gov.au/system/files/resources/5a169bfb-f417-4b00-9b70-6ba328ea8671/files/national-greenhouse-accounts-factors-july-2017.pdf

Circular economy reflects waste hierarchy principles, as both approaches value resources and aim to minimise waste. Circular economy builds on waste hierarchy priorities by encouraging innovative approaches and new business models that rethink resource use and waste management. It provides a framework that prioritise circular activities from product manufacture through to re-use of end-of-life material.

A circular economy approach has economic, social and environmental benefits that will help the NSW Government meet the amibitious targets provided in the WARR Strategy.

The NSW Government will investigate opportunities to incorporate circular economy principles into the WARR Strategy, as part of the five-yearly review process, and the WARR Act, if required.

Proposed Next Steps

This Discussion Paper and the Draft NSW Circular Economy Policy Statement aim to encourage dialogue on a circular economy approach for NSW. Feedback from this consultation process will be used to finalise the Circular Economy Policy for NSW and inform the development of the Implementation Plan.

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Figure 8 Circular Economy Policy timeline

A road map for NSW

After the Policy has been finalised, the NSW Government will develop a Circular Economy Implementation Plan for NSW.

This Implementation Plan could leverage and expand on existing policies and programs that are already in place. It will provide an overarching approach for NSW, unifying existing requirements and initiatives where possible and building on these with new circular actions and guidance. It may also recommend reviewing regulatory mechanisms to support these actions and include any provisions required to strengthen existing legislative requirements.

By 2020, the NSW Government will develop this Implementation Plan, along with recommended amendments and enhancements to existing policies and programs, including the Waste Less Recycle More initiative, to embed circular economy principles and drive innovation.

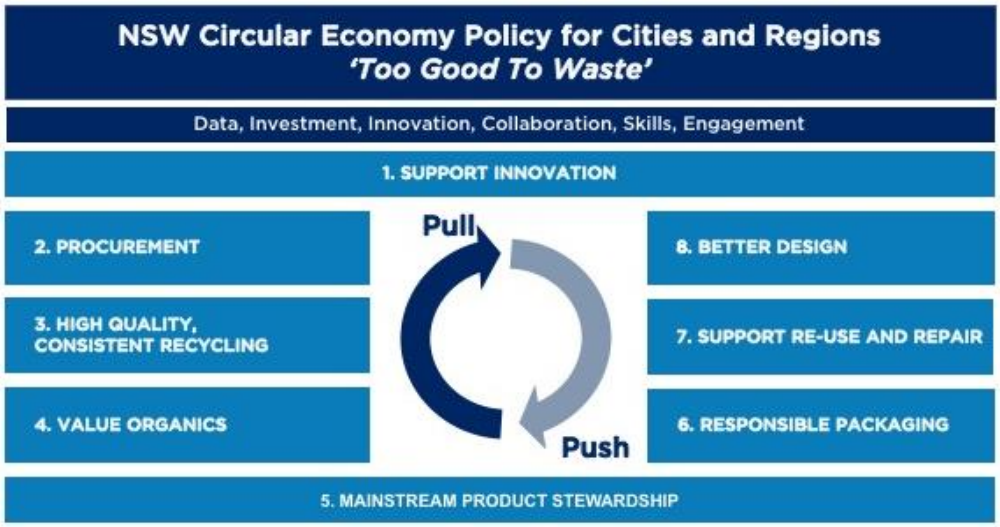
To help develop this Strategy, the NSW Government is seeking feedback on proposed key focus areas, as outlined in the following sections.

Focus areas for the NSW Government

Following a review of circular economy approaches in other jurisdictions against the NSW context, eight key focus areas were selected as NSW's first steps towards a more circular economy.

These focus areas are considered to be the most meaningful to NSW, linking and strengthening existing initiatives while addressing current market challenges associated with kerbside recyclables. They are based on international case studies and examples where similar initiatives have been successfully applied overseas.

Figure 9 NSW Circular Economy Policy focus areas



1. Support innovation

Innovative solutions are required to accelerate and facilitate a transition to more circular activities. This includes solutions that develop new markets and uses for end-of-life products, processing solutions and technologies that support the use of recycled material and the development of new business models.

This could be through:

- Private sector commitment and investment.
- Government support and funding for Small and Medium Enterprises which are a critical part of the NSW economy but have less capacity and capital to transition towards new solutions and approaches.
- Supported collaboration across public and private sectors, such as an innovation hub or council. NSW's current strengths in food and beverage, machinery and advanced manufacturing, research could focus on these key sectors.
- Modification of the existing NSW Waste Less, Recycle More program, linking with NSW Sustainability Advantage and Innovation NSW, complementing their existing objectives.

Case study: UK Innovate, UK

United Kingdom Research and Innovation (UKRI) has been established as an independent organisation to support research and innovation progress across the region. UKRI prioritises innovation through training, developing research programs, investing in research capabilities, supporting businesses to harness new technologies and commercialise them, and supporting impact-related capabilities. One of UKRI's innovation priorities is circular economy-related projects. Innovate UK has invested £1.8 billion into emerging technologies, infrastructure systems and manufacturing innovation and other areas. The funded projects have added more than £16 billion to the economy and created nearly 70,000 jobs.

Questions for consultation:

- *How could a new or improved research support platform support a circular economy?*
- *What services and support would you like to see a circular economy innovation hub provide?*
- *Do you have a comment about this focus area?*

2. Proactive procurement

Sustainable procurement practices by business and government will drive market demand for recovered materials and reusable products, as well as circular business models.

Purchasing criteria that prioritise recycled materials:

- create an incentive to improve quality collection, sorting and processing
- overcome cost barriers by creating a level playing field with raw materials
- grow recovered material markets to create economies of scale
- provide industry with certainty in the demand and size of the market, to encourage investment in infrastructure and promote innovation.

Purchasing criteria can also include adherence to circular economy principles, mandatory targets for recycled content and weighting towards more circular activities (such as leasing or sharing options, or procurement of repaired and second-hand goods).

Case study: Integrating CE within Nantes Procurement, France

Nantes has developed numerous initiatives in the field of responsible procurement. Targets include:

- 100% recycled paper procured
- materials waste recovery in building and road construction contracts (70% re-use or recovery)
- recovery of organic waste in catering contracts

- recovery and recycling of lamps from street lighting contracts.

Each initiative has been developed in partnership with local business networks and public bodies across all levels to ensure their acceptance.

Nantes achieved an 86% increase in the use of recycled paper within one year of implementation and resulted in the purchase of many other eco-friendly and energy efficient vehicles, equipment and supplies.

Questions for consultation:

- *What purchasing decisions do you make where circular economy principles can be applied?*
- *How do you think the NSW Government could increase the use of re-usable and recyclable material through its purchasing decisions?*
- *Do you have a comment about this focus area?*

3. High quality, consistent recycling

One of the key principles of a circular economy is to keep products and materials in use for as long as possible. Producing high-quality recycled materials is an important part of ensuring they can be easily re-used through the manufacturing process. Contamination of recycled material with other wastes is a key issue. It impacts the quality of these materials and limits their end uses. Recycled material needs to be separated from other wastes to ensure a clean, consistent stream, then processed to meet the requirements of end-users.

Case study: Collections Blueprint, Wales

The Collections Blueprint describes the Welsh Government's recommended service profile for the collection of household waste. The Blueprint's model for the collection of waste from households includes:

- Weekly separate collection of recyclables via 'kerbside sort', with material being collected separately in boxes and/or in re-usable sacks, with two or more boxes provided per household, and recyclables being sorted into separate compartments on the collection vehicle by the collection staff.
- Weekly separate collection of food waste.
- Fortnightly chargeable garden waste collections.
- The use of modern lightweight, multi-compartment vehicles for a single pass collection of dry recyclables and food waste.
- Fortnightly collection of residual waste, from containers with reduced residual waste capacity, where 'no side waste' policies are enforced.
- Household Waste and Recycling Centres achieving at least 80% recycling rate.
- A maximum of 30% non-recyclable waste to be sent to energy from waste facilities.

Since the introduction of the Collections Blueprint, Wales has seen an increase in recycling rate from 49% to 64%, a reduction in contamination, lower collection costs and higher quality recovered products.

Material Recovery facilities (MRFs) sort materials from yellow-lidded recycling bins into different material streams. Collection systems that allow for separation at the kerb tend to produce higher quality material streams.

- Recovering high quality plastics, glass, paper and metals requires different bins and collection schemes for each waste and recycling stream.
- Clear and consistent messaging on how to separate different waste and recycling streams is also important to ensure the bin systems are used correctly.

Minimum standards are useful in defining what a 'high quality recycled material' is and providing assurances to end markets on the quality and consistency of these materials. Minimum standards can be applied to a product or material, or to a process.

A protocol could be developed for MRFs, with clear minimum standards and criteria for the processing of kerbside recyclables. This would mean consistent, high quality streams of recyclable material.

Case study: MRF Code of Practice, Scotland

The Scottish Government has established a code of practice for Materials Recovery Facilities (MRFs) to improve the quality of materials processed by standardising testing processes and reporting mechanisms for all input and output materials.

This provides a better understanding of material composition, seasonal variation and sources of contamination while also ensuring consistent quality of output materials.

Since establishing the code of practice, Scotland has improved its understanding of circular material flows, problem waste streams and destinations for poor quality materials. The data collected under the code of practice has informed policy and funding decisions to improve circular economy outcomes.

Questions for consultation:

- *What would help you with recycling more of the products you use?*
- *What can the NSW Government do to better support the recycling industry?*
- *Do you have a comment about this focus area?*

4. Value organics

A key objective of a circular economy is to maximise the value of resources and minimise waste. A significant amount of organic waste, in particular food and garden waste, is sent to landfill in NSW.

Food businesses in NSW throw away around 30% of their food. Householders throw away around $77 worth of edible food every week. When this waste ends up in landfill, it produces a greenhouse gas that is 25 times more powerful than carbon dioxide and a major cause of climate change.

Case study: Food and garden organics waste collection, Australia

Embracing a program to collect and recycle food organics and garden organics (FOGO) has saved Shellharbour City Council ratepayers $219,000 in waste levy payments in the first year alone and extended the lifespan of the region's landfill facility. The program has saved 9,114 tonnes of organic waste from landfill in the first year of operation, reducing greenhouse gas emissions by about 2,000 tonnes of CO_2-equivalent. This was made possible with $2.2 million from the Waste Less, Recycle More initiative.

There is a significant opportunity for NSW to reduce waste, capture these valuable resources and improve environmental outcomes. While reducing waste is the priority, there is also an opportunity to maximise the value of biological resources through composting and other processing technologies.

NSW could aim to divert more of its organic waste from landfill, including all food and garden organic waste.

Potential actions to divert more organic waste from landfill could include:

- mandatory separate bins for food and garden organics for all householders across NSW
- mandatory separate collection for all businesses that generate food waste over a certain amount
- work with supermarkets to donate more unsaleable products to charity
- increasing the capacity of organics processing facitlities in NSW
- increasing the waste levy for certain types of organic waste sent for disposal.

Case study: Food waste ban, France

France has passed legislation that bans supermarkets from discarding unsold food, forcing them instead to donate to charities. All supermarkets with an area of 400m^2 or greater were expected to sign contracts with charities by July 2016 to reach an agreement regarding the terms of regular food donation. The law also simplified the donation process for excess products manufactured by factories.

Questions for consultation:

- *Would you support zero food and garden waste to landfill?*

- *What measures do you think would help organics become more circular and reduce food waste to landfill in NSW?*
- *Do you have a comment about this focus area?*

5. Mainstream product stewardship

This approach requires businesses supplying products (producers) to take responsibility for the life cycle management of these products. It provides an incentive to design products with reduced environmental and social impacts, and to facilitate re-use and recycling options. This requires collaboration and participation from industry and other State and Territory Governments, including the Commonwealth Government. Although action would need to happen on a national level, there are steps that NSW could take to help move this forward. These steps may include:

- supporting existing schemes and emerging product stewardship schemes
- facilitating access to existing product stewardship schemes, including expanding the use of community recycling centres to act as collection points for multiple products
- advocating for the broadening and strengthening of product stewardship schemes
- drive new product stewardship schemes for different product streams.

Questions for consultation:

- *How do you think product stewardship schemes can be expanded, and what products should be included in a product stewardship scheme?*
- *Do you have a comment about this focus area?*

6. Responsible packaging

The Australian Packaging Covenant Organisation (APCO) is an organisation that partners with government and industry to reduce the impact of packaging in Australia. APCO has proposed targets for improving the sustainability of plastics and packaging including:

- 100% of packaging to be re-usable, recyclable or compostable
- phase out problematic or unnecessary single-use plastic packaging through redesign, innovation or alternative (re-use) delivery models by 2025
- 70% of plastic packaging to be recycled or composted by 2025
- 30% average recycled content across all packaging by 2025
- all State Government departments to implement a procurement standard that includes the purchase of recycled content.

Questions for consultation:

- *What actions would you like the NSW Government to take to better support these national targets?*
- *Do you have a comment about this focus area?*

7. Support re-use and repair

Re-use and repair are critical circular economy activities that keep products in use for longer, reduce waste, provide a lower cost source of goods and create skilled jobs.

Supporting this industry could include:

- statewide coordination and support programs for re-use and repair hubs, including support for community initiatives and hubs already in operation
- promote and support professionalism or certifications systems into the re-use industry.

Case study: 'Making Things Last' re-use/repair initiatives

As part of Scotland's circular economy strategy ('Making Things Last') there is a section on re-use and repair which provides measures to encourage these activities. These include:

- trialling large scale re-use and repair hubs
- expanding re-use certification standards. These standards provide further confidence for customers purchasing second-hand products
- training and infrastructure for the repair sector and customers.

The re-use and remanufacturing sector in Scotland adds over £1.3 billion to the Scottish economy, supports over 23,000 jobs and re-uses over 89,000 tonnes of material each year. It is expected to grow by over £620 million by 2020 and add 5,700 new jobs.

Questions for consultation:

- *What would encourage you to repair products you already own or choose second-hand products?*
- *Do you have a comment about this focus area?*

8. Better design

Improving the design of products can increase product lifetimes and reduce environmental impacts. Better design can reduce material volumes and waste, and promote the circular use of materials.

This may include exploring the potential to include circular design principles in buildings, infrastructure and other industries in NSW. It may also include modular design of products so parts can be easily replaced, or more efficient designs that use less resources and can be more easily re-used and recycled.

Case study: EcoDesign Directive, Europe

The EU legislation on EcoDesign sets minimum requirements for energy efficiency and provides guidelines and information on the material efficiency, durability, repairability and modularity of products. Products are assessed to understand the amount of materials and energy consumed and the expected emissions from production and use. The type and amount of waste is also considered, including opportunities for re-use, recycling and recovery. This allows consumers to make informed purchasing decisions and encourages designers to consider the life cycle impacts.

The EcoDesign Directive has saved an estimated 314 million tonnes of CO_2-equivalent emissions and added an estimated €55 billion to the economy.

Questions for consultation:

- *How would information on durability and repairability of products impact your purchasing decisions?*
- *Do you have a comment about this focus area?*

Appendix A

Current policies and programs

Existing legislation, policies and programs at the state and national level support a circular economy approach.

Table 3 below provides a summary of relevant policies and programs which show an ongoing government commitment to increase the efficient use of resources, minimise waste and improve environment and community outcomes.

The policy context in which NSW operates, in terms of national policy and that of other states and territories, also needs to be taken into account. By taking complementary approaches across different states and territories and harmonising rules, regulations and levies, certainty can be created for industry and recycling encouraged. Consistent standards for facilities, processes and products can aid in achieving better quality of recycling and higher prices for recycled materials. Talking a common language on circular economy, whether for data and reporting purposes, or for how resources are managed, is also useful for removing confusion and costs to business.

These existing policies and programs provide a framework or guidance which reflect circular economy principles or support circular activities. While these policies and programs are a good starting, there is a need for a more wholistic and systems-based approach for a circular economy to be realised.

Table 3 - Current NSW policies and programs

Instrument	Description
New South Wales	
Innovation and Productivity Council Act 1996	The object of the IPC Act is to establish an Innovation and Productivity Council to assist in the creation of jobs, investment, exports and interstate trade by raising the level of innovative activity in NSW.
NSW Innovation and Productivity Council (IPC)	The IPC was established by the *Innovation and Productivity Council Act 1996*. It advises the Government on priorities for innovation-led economic development and productivity and reports to the Deputy Premier. The Department of Industry is the Secretariat.
Protection of the Environment Operations Act 1997	The objects of the PoEO Act include the protection, restoration and enhancement of the quality of the NSW environment. The Act defines 'waste' for regulatory purposes, establishes management and licensing requirements for waste, and sets out offences relating to waste and sets penalties. It also establishes the ability to set various waste management requirements via regulation.
Waste Avoidance and Resource Recovery (WARR) Act 2001	The WARR Act promotes waste avoidance and resource recovery to achieve a continual reduction in waste generation. The Act provides for the development of a statewide waste strategy.
NSW Sustainability Advantage Program	A business program overseen by NSW Office of Environment and Heritage (OEH) which assists organisations across NSW to achieve increased competitiveness and improved bottom lines through better environmental practices. It provides training, tools and support to member organisations. Over 12 months businesses undertake several of the nine modules. The relevant module is *resource productivity* which aims to build businesses' capacity for lean manufacturing, cleaner production and supply-chain efficiency, leading to tangible cost-benefits by reducing waste and using less materials, energy and water. This program won second place in the Global Circular Awards at the 2015 World Economic Forum.
Instrument	**Description**
NSW Waste Less Recycle More initiative 2012-2021	The NSW Government is investing $802 million over nine years through the *Waste Less, Recycle More* initiative to deliver waste and recycling services to the community. It is the largest waste and recycling funding program in Australia and provides funding for a range of recycling and litter reduction programs, market

	development and waste management and infrastructure for business and local councils.
Protection of the Environment Operations (Waste) Regulation 2014	The Waste Regulation sets out regulatory requirements for the waste industry, including the waste levy, waste tracking and reporting requirements. Specific initiatives that fall under this regulatory framework and may be relevant to the development of a circular economy are: • *WasteLocate* system for tracking the transport of used tyres and asbestos waste (commenced in 2015) • *Waste and Resource Reporting Portal* - an online tool for waste facilities to fulfil their reporting duties under the Act (commenced in October 2015).
NSW Waste Avoidance and Resource Recovery (WARR) Strategy 2014-21	Prepared every five years, the WARR Strategy sets clear directions for a range of priority areas over the next seven years and aligns with the NSW Government's waste reforms in *NSW 2021: A plan to make NSW number one*. It provides a clear framework for waste management to 2021-22 and provides an opportunity for NSW to continue to increase recycling across all waste streams. The EPA is required to report progress against the WARR Strategy every two years.
NSW Government Resource Efficiency Policy 2014	An internal government policy, overseen by NSW OEH, which aims to reduce the operating costs of NSW Government agencies and ensure they provide leadership in resource productivity. It involves seven energy measures, three water measures, two clean air measures and one waste measure. The waste measure requires annual reporting on the top three waste streams for each government agency. The aim is to encourage strategies to reduce waste volumes and costs and encourage improved recycling practices across all waste streams.
Waste Levy Guidelines 2015	The Levy guidelines specify how to measure waste to calculate waste levy liability, the deductions waste operators can claim and the EPA's requirements for records, surveys and reports. The current NSW levy is set at $141.20/tonne (in metropolitan areas, 2018-19).
NSW Energy from Waste Policy Statement 2015	Sets out the policy framework and overarching criteria that apply to facilities in NSW proposing to thermally treat waste or waste-derived materials for the recovery of energy. This provides an opportunity to recover the embodied energy from waste, offset the use of non-renewable energy sources and avoid methane emissions from landfill.
Waste Avoidance and Resource Recovery Amendment (Container Deposit Scheme) Act 2016	The *Waste and Resource Recovery Amendment (Container Deposit Scheme) Act 2016* recognises the responsibility the beverage industry shares with the community to manage waste generated by beverage product packaging. It establishes a cost effective statewide container deposit scheme to assist the beverage industry to promote the recovery, re-use and recycling of empty beverage containers.
Waste Avoidance and Resource Recovery (Container Deposit Scheme) Regulation 2017	This Regulation supports the implementation and operation of the container deposit scheme established under Part 5 of the WARR Act. This scheme is designed partly to counteract litter but is also producing high quality recycling streams.
Draft NSW Waste and Resource Recovery Infrastructure Strategy 2017-2021	Aims to assist councils and waste industry participants to understand the expected increase in waste streams and to ensure sufficient infrastructure capacity is available to process the projected volumes. Consultation was undertaken in 2017.

Instrument	Description
	National
National Waste Policy 2009	Provides the strategic national framework for waste management and resource recovery in Australia to 2020. Contains16 strategies, but only one has been implemented at the national level (the *Product Stewardship Act 2011*). The National Waste Policy 2009 is currently being reviewed and an updated Policy is anticipated by the end of the year.

	The National Food Waste Strategy establishes a framework to support actions that work towards halving Australia's food waste by 2030. Implementation of the strategy is supported by a $1.37 million investment over 24 months.
Product Stewardship Act 2011	Provides the framework to effectively manage the environmental, health and safety impacts of products, and their disposal. The framework includes options for voluntary, co-regulatory and mandatory product stewardship. A review of the Act is underway. Relevant schemes include: • *National Television and Computer Recycling Scheme 2011*: The only co-regulatory scheme under the Act, is funded by government and requires large manufacturers to join an approved scheme responsible for collection and recycling of products (most of which happens within existing recycling services which export the waste for recycling offshore). • *Product Stewardship for Oil (PSO) Scheme 2001*: The scheme operates under the national legislation with the aim of encouraging the management and re-refining of used oil and its re-use. A mandatory levy is applied to sales of targeted oils (new or recycled) to generate funds for benefit payments made to oil recyclers. *Voluntary industry-led product stewardship schemes*: Two voluntary stewardship arrangements are accredited under the Act: *MobileMuster*, a recycling program for the mobile phone industry and *FluoroCycle,* which provides a recycling program for mercury-containing lamps. Accredited voluntary stewardship arrangements are required to provide audited annual reports to the Department of the Environment and Energy. In addition to these accredited arrangements there are about 20 industry-led product stewardship schemes including *Paintback* and *Tyre Stewardship Australia.*
National Environment Protection (Used Packaging Materials) Measure 2011 (NEPM)	Aims to reduce environmental damage from used packaging and conserve virgin materials by encouraging the re-use and recycling of used packaging waste by supporting and complementing the voluntary strategies in the Australian Packaging Covenant (including design, recycling and stewardship).
Australian Packaging Covenant 2017	A co-regulatory product stewardship scheme for the packaging industry, established by the NEPM. Takes an entire value-chain approach to stewardship/sustainability, including design, material selection, operations as well as post-consumer recovery.

Questions for consultation

Questions for consultation are provided throughout this Discussion Paper and are summarised in the table below.

You can respond to these questions on our website at www.engage.environment.nsw.gov.au/circular.

Share your view on a NSW circular economy

1. Do you support NSW having a circular economy policy? Why or why not?
2. What would you like to see in a Circular Economy Policy?
3. How could the Government support a transition towards a circular economy?
4. What are the main barriers to the implementation of a circular economy? (pick up to three)
    - government policy and legislation
    - consumer awareness and preferences
    - technology
    - funding for research and development
    - collaboration across supply chains
    - other – please specify.

Support innovation

- How could a new or improved research support platform support circular economy?
- What services and support would you like to see a circular economy innovation hub provide?
- Do you have a comment about this focus area?

Procurement

- What purchasing decisions do you make where circular economy principles can be applied?
- How do you think the NSW Government could increase the use of re-usable and recyclable material through its purchasing decisions?
- Do you have a comment about this focus area?

High quality, consistent recycling

- What would help you with recycling more of the products you use?
- What can the NSW Government do to better support the recycling industry?
- Do you have a comment about this focus area?

Value organics

- Would you support zero food and garden waste to landfill?
- What measures do you think would help organics become more circular and reduce food waste to landfill in NSW?
- Do you have a comment about this focus area?

Mainstream product stewardship

- How do you think product stewardship schemes can be expanded, and what products should be included in a product stewardship scheme?
- Do you have a comment about this focus area?

Responsible packaging

- What actions would you like to see the NSW Government take to better support these national targets?
- Do you have a comment about this focus area?

Support re-use and repair

- What would encourage you to repair products you already own or choose second-hand products?
- Do you have a comment about this focus area?

Better Design

- How would information on durability and repairability of products impact your purchasing decisions?
- Do you have a comment about this focus area?

Have your say

Send your feedback on the proposals in this paper to the NSW Environment Protection Authority by:

Email: circular@epa.nsw.gov.au

Web: www.epa.nsw.gov.au or www.engage.environment.nsw.gov.au/circular

Post: Too Good To Waste – A circular economy approach for NSW
NSW Environment Protection Authority
Level 12, PO Box A290
Sydney South NSW 1232

Fax: 02 9995 5922

Please provide any comments by **midnight 25 November 2018**.

All submissions will be published on the EPA's website unless you identify in your submission that you do not wish the content to be released.