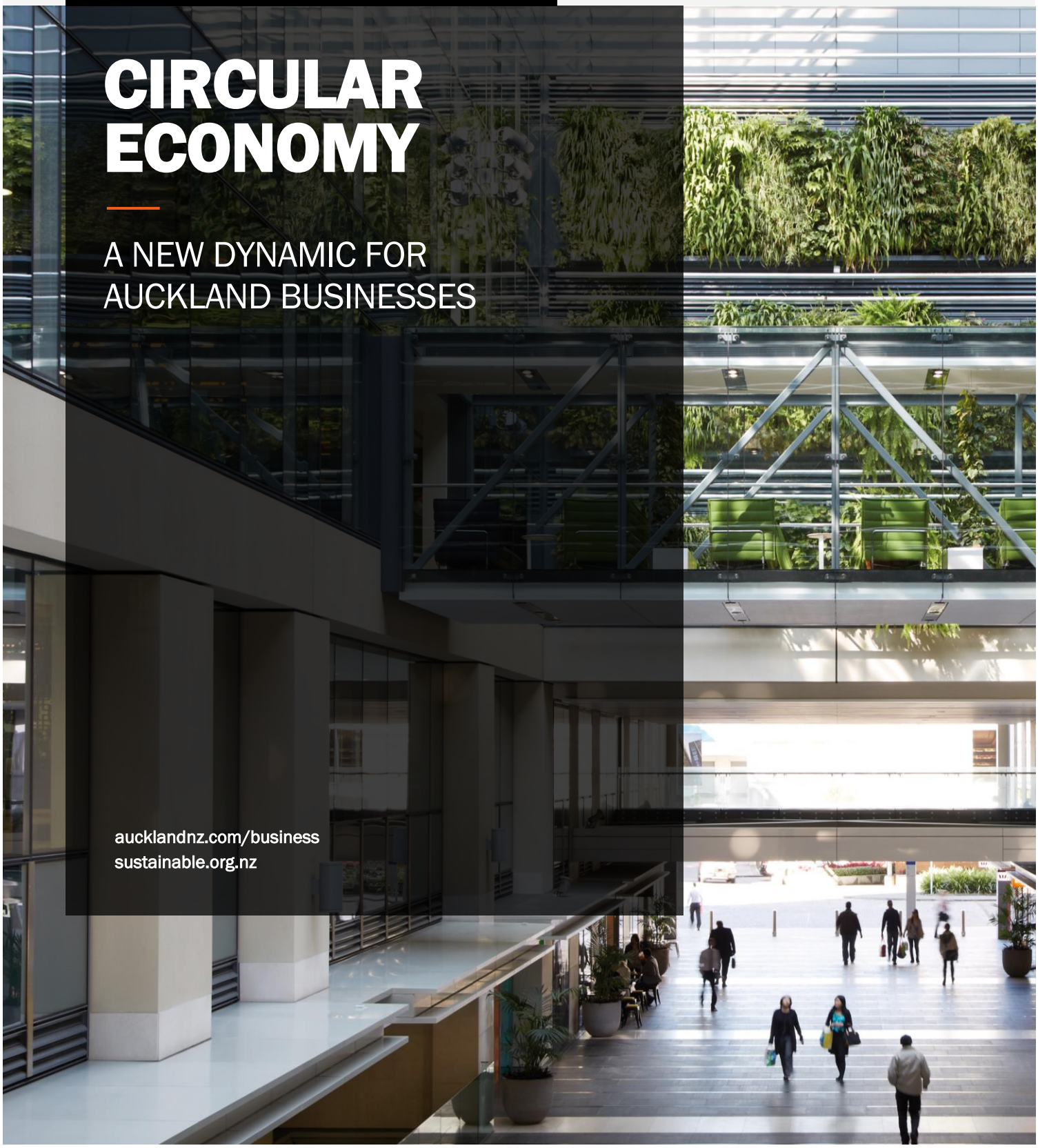
6

MAY 2018

AUCKLAND ECONOMIC INSIGHTS SERIES

CIRCULAR ECONOMY

A NEW DYNAMIC FOR AUCKLAND BUSINESSES



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An Auckland Council Organisation
AUCKLAND

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Reshaping Profit
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Cover image: Atrium on Takutai in Britomart, photo courtesy of Britomart Group.

Foreword

We live in a world of massive urban population growth driving increasing pressure on the resources, infrastructure and environment on which we rely. More than half of the world's population now live in cities and this is predicted to rise to 70 per cent by 2050. How cities manage this growth is a critical world issue as the current trajectory of growth and resource use can't be sustained.

Cities need to embark on a new form of growth: one that is not reliant on ever-increasing resource use, and where the natural environment can be restored, new technology is embraced, economic prosperity is accessible, and communities are more resilient.

The circular economy is gaining traction around the world as it provides a compelling, prosperous, low carbon model for the future.

Leading cities and the businesses that operate within them have a key opportunity to lead, influence and speed up this transition. The circular economy will unlock new economic development and innovation opportunities. It will contribute to improved resilience and better environmental and societal outcomes.

A transition towards a circular economy for Auckland will play a fundamental role in achieving long term economic growth as well as delivering on low carbon commitments.

'Circular Economy: A new dynamic for Auckland Businesses', is an Auckland Tourism, Events and Economic Development (ATEED) insights paper which provides economic perspectives on a circular economy.

This insights paper is based on a comprehensive report facilitated by the Sustainable Business Network (SBN) entitled, 'The Circular Economy Opportunity for Auckland and how business can realise it'.

This is the first time the economic benefits of a circular economy have been quantified for a city in New Zealand.

For Auckland businesses, pursuing process and product innovations that reflect circularity will create new forms of value, open up new markets and support sustainable growth by reducing reliance on finite resources.

We trust this report encourages and motivates a co-ordinated approach to drive Auckland towards a circular economy.

With its innovative, entrepreneurial business culture and connected community Auckland can not only achieve the benefits outlined in this report but establish itself as a model circular economy city for the world.

To do this we must embark on an unprecedented level of co-operation and co-ordination with individuals, communities, businesses, central and local government working together.

The time to act is now.

Patrick McVeigh
General Manager
Business, Innovation and Skills
Auckland, Tourism, Events and Economic Development

James Griffin
Circular Lead
Circular Economy Accelerator
Sustainable Business Network

What is a circular economy and how does it work?

Traditionally developed economies work on a linear basis where resources are extracted, converted into a useable product or commodity, used and then disposed of after the product or commodity is considered past its use.

A circular economy is an alternative to this in which resources are kept in use for as long as possible so that the maximum value can be extracted from them. The focus then shifts to recovering and regenerating products and materials at the end of each service life. A circular economy is one where the lifecycles of materials are maximised and usage optimised.

A circular economy is underpinned by the use of renewable energy and is environmentally restorative by design. Advocates of a circular economy see it as a viable and sustainable alternative to the linear economy. Shifting towards a circular economy represents an entire system shift to a new global operating system generating sustainable economic, environmental and societal benefits.

Advocates also envisage that moving towards a circular economy will:

- reduce waste,
- drive greater resource productivity,
- deliver a more competitive advantage,
- better address emerging resource security/scarcity issues in the future,
- help reduce the environmental impacts of production and consumption.

In the product development and creation process of a circular economy, value is maximised and leakages in the system are minimised via feedback loops. Technical materials (e.g. manufactured products such as electrical equipment) are kept separate from biological materials (e.g. food) to keep technical materials in continuous high value circulation and out of the biosphere, while biological materials can be used to regenerate nature (e.g. return to soil as compost).

Figure 1 (opposite) illustrates how materials flow through a circular system.

Figure 1: Circular economy – an industrial system that is restorative by design

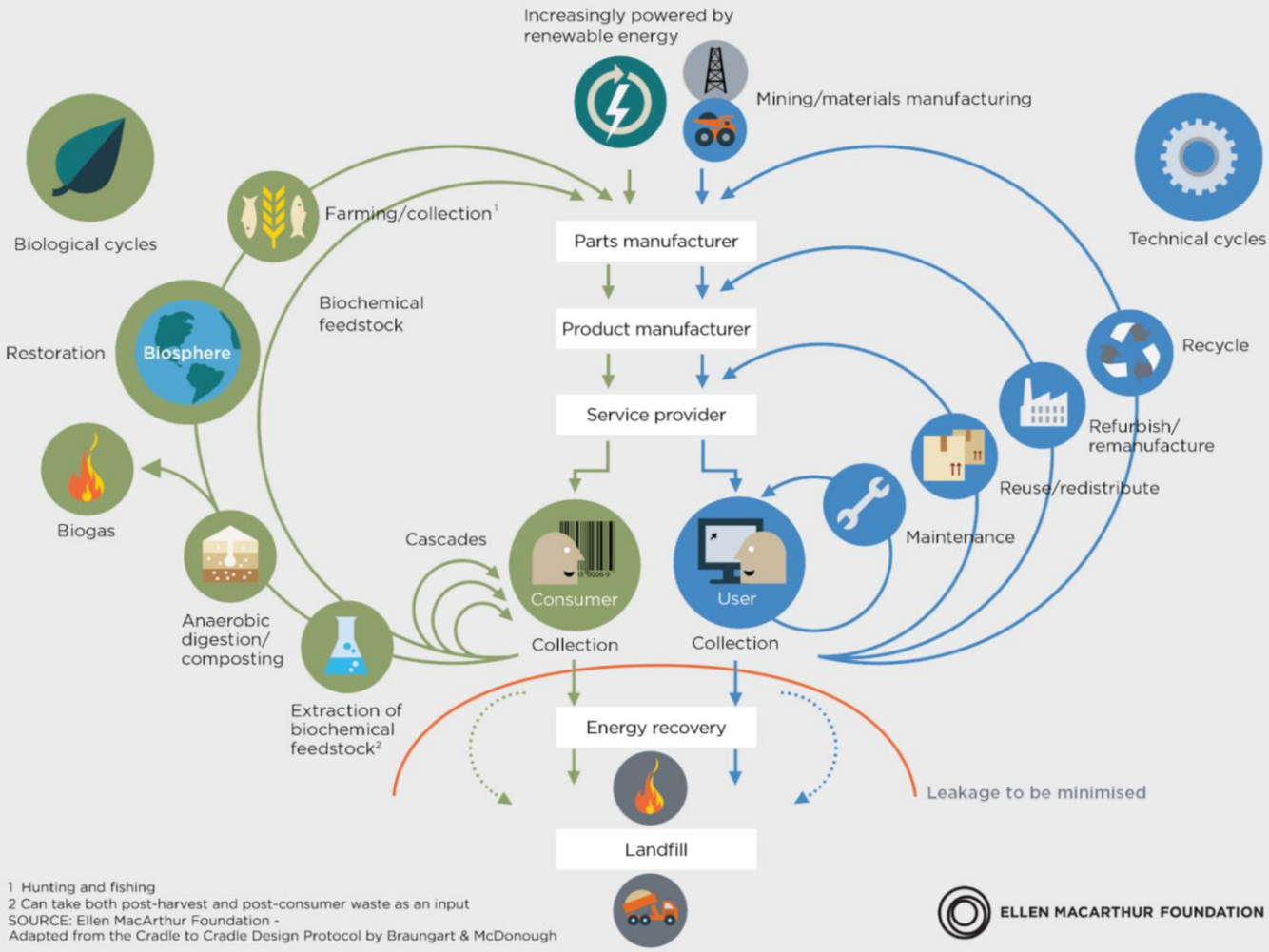

Figure 1 source: Ellen MacArthur Foundation.

Economic perspectives on a circular economy

In considering the economic perspectives, a 'transition to a circular economy' can be seen as involving any process that might lead to lower rates of demand for natural resource extraction and use, and in turn, reduce environmental impacts due to reduced levels of disposal.

Three main mechanisms for reduced demand are considered to be:

1. **Creating material loops** – involving the substitution of secondary materials (i.e. derived from the recycling of industrial or household waste) as well as second–hand, repaired, or remanufactured products for those derived from previously unused resources.
2. **Slowing material flows** – the emergence of products which can remain in use in the economy for longer, usually due to more durable product design. Products that are designed to be robust and more easily repairable will last longer and slow the introduction of new natural resources into the economy.
3. **Narrowing material flows** – more efficient use of natural resources, materials and products either through the development of new production technologies, increased utilisation of existing assets, or shifts in consumption behaviour away from goods that are material intensive.[1]

Benefits of moving to these mechanisms is that more value is being produced from a particular amount of resources (or fewer resources are being used).

A range of significant opportunities arise for business:

- New opportunities will emerge in various industries and sectors. These include secondary material production, repair and remanufacture, the services sector, and the sharing economy.
- Early adopting countries and regions could realise additional benefits by becoming exporters of circular economy expertise and technology.
- Individual businesses will experience cost reducing changes (e.g. more efficient design or production processes that reduce raw material inputs) and/or revenue increasing changes (e.g. waste conversion to biofuels as a new product).
- Cost reductions, or revenue growth, increase the value added (i.e. revenue less intermediate consumption) at the firm level, and its industry or sector.

This shift is also likely to trigger changes in consumer behaviour, which should be taken into account. For example, lower prices may mean consumption spending is diverted into other products. Meeting the demand for these additional products will require further resource use to produce them. This is likely to result in waste output. This 'rebound effect' will partially offset the potential reductions in resource extraction and waste.

What are the city level opportunities?

With cities playing a dominant role in how the modern economies function, there are a range of opportunities at a city level which can have cumulative impacts.

A circular city embeds the principles of a circular economy across all its functions, establishing an urban system that is regenerative and restorative by design. In such a city, the idea of waste is minimised and eliminated. Assets are kept at their highest levels of utility at all times and digital technologies underpin all processes.

[1] OECD (2017). *The macroeconomics of the circular economy transition: a critical review of modelling approaches*. As cited in Blick, G. and Comendant, C. (2018). *A circular economy for Auckland – scoping the potential economic benefits*. Auckland, New Zealand: Sapere Research Group.

A circular city aims to generate prosperity and economic resilience, while separating value creation from the consumption of finite resources.

Across the globe, cities are seeing rapidly growing populations and are having to deal with increases in consumption, waste volumes and associated negative environmental impacts. As such, the limits of a linear economy may be most apparent in an urban context. Equally, cities are also likely to play a leading role in the transition to a circular economy due to their proximity and scale: [2]

- **Proximity** – the concentration of resources, capital, data and talent means that circular economy activities may be more viable, for example reverse logistics (where goods are moved from their typical final destination for the purpose of capturing value or for proper disposal).
- **Scale** – most of the population lives in cities and this means sufficient scale for new business models to emerge, given the large and varied supply of materials and the high potential demand for goods and services.

Furthermore, there is the potential for policy influence within cities. City level governance aligned with central government has an ability to shape urban planning settings, transport system design and urban infrastructure in a way that supports circular economy principles.

The Ellen MacArthur Foundation has indicated that a circular city would likely include the following elements: [2]

- A built environment that is designed in a modular, flexible manner, built with efficient construction techniques that minimise virgin material use, and is highly utilised
- An urban mobility system that is accessible, affordable and effective comprising a multi-modal approach that includes public transformation with on-demand cars as a flexible last-kilometre solution
- Energy systems that are renewable and allow effective energy use.

A number of cities including Amsterdam, Glasgow and London have developed route maps to support their transition to a circular economy. In the case of London, the opportunities in its route map are estimated to be worth between £1.2 billion to £7.8 billion (NZ$2.3 billion–NZ$15.0 billion[3]) in GDP annually by 2036.

What is the Auckland opportunity?

Economic analysis indicates the economic potential for Auckland's transition to a circular economy could increase GDP by up to $8.8 billion by 2030.

The initial analysis draws on international research and applies it to the Auckland economy. This methodology suggests the opportunity ranges from NZ$0.8–NZ$8.8 billion. Further analysis of specific opportunities in Auckland, drawing on local data, indicates a range of NZ$6.3–NZ$8.8 billion benefit to the economy – towards the upper end of the initial estimation.[4]

These figures provide an initial sense of the potential 'size of the prize' for Auckland. There are a number of specific sector opportunities that can help stimulate enhanced outputs, and several initiatives already underway.

NZ$6.3 – NZ$8.8 billion benefit to the economy.

[2] Ellen MacArthur Foundation (2017). *Cities in the Circular Economy: an initial exploration*. As cited in Blick, G. and Comendant, C. (2018). *A circular economy for Auckland – scoping the potential economic benefits*. Auckland, New Zealand: Sapere Research Group.
[3] New Zealand dollar equivalent was manually converted from GBP to NZD using average exchange rate for the month of March 2018 published by Reserve Bank of New Zealand.
[4] Blick, G. and Comendant, C. (2018). *A circular economy for Auckland – scoping the potential economic benefits*. Auckland, New Zealand: Sapere Research Group.

Table 1 presents a summary of select sector opportunities, specific areas of action, and what the combined economic value of these could be:

Table 1: Auckland's key sectors of opportunity

Sector	Opportunities	Example interventions	Combined potential economic value
Construction	Construction is the sector that produces Auckland's single biggest waste stream and involves significant material and labour costs.[7] These characteristics will be amplified as the sector continues to grow, given housing and infrastructure demands. There are significant economic opportunities to be seized from incorporating more circular principles into the sector. This would lead to cost savings and reduced impact on the environment. Incorporating a circular focus into procurement within the sector provides a substantive opportunity to achieve the benefits.	• New construction projects adapt new circular materials processes, e.g. reuse and high-value recycling. • Industrialised processes and use of 3D-printing technology. • Increase multi-purposing of space for non-residential use.	NZ$2.5 billion
Food	Food waste in Auckland represented 19 per cent of total landfill in 2016.[7] Food is lost or wasted throughout the production process and supply chain, often resulting in inefficient use of land, water, energy and other resources. There is considerable scope for the food sector to improve its productivity by adopting circular processes aimed at reducing food waste. Furthermore, new technologies can help create new products from organic waste, such as extracting biochemical or generating biogas.	• Reduce food waste. • Divert food waste away from landfill to create new products (e.g. biogas).	NZ$0.3 billion
Transport	Auckland's transport system is carbon-intensive and could be more efficient. Road transport is the highest contributor to Auckland's carbon footprint and New Zealand vehicle ownership is the highest in the OECD and growing. A circular transport system creates opportunities for travel-related cost savings for improved productivity, and for a reduced carbon footprint.[8,9,10]	• Encourage ride sharing in private vehicles and taxis. • Refurbish commercial vehicles. • Reduce congestion.	NZ$1.8 billion

Table 1 source: SBN and Sapere Research Group (2018)

[7] Auckland Council (2018). *Draft Auckland Waste Management and Minimisation Plan 2018*. As cited in Griffin, J. (2018). *The Circular Economy Opportunity for Auckland and how business can realise it*. Auckland, New Zealand: Sustainable Business Network.

[8] Xie, S. (October 2017). *Auckland's Greenhouse Gas Inventory to 2015.*

[9] Leung, C., Destremau, K., Bealing, M., and Pambudi, D (2017). *Benefits from Auckland Road Decongestion.* Auckland, New Zealand: New Zealand Institute of Economic Research.

[10] Statistics New Zealand (2013). *2013 Census QuickStats about transport and communications*. As cited in Griffin, J. (2018). *The Circular Economy Opportunity for Auckland and how business can realise it.* Auckland, New Zealand: Sustainable Business Network.

How does Auckland capitalise on this?

The first step is for Auckland to collectively embrace the concept of a circular economy. This requires collaboration and a systems approach with city, government, council and industry all fully on board. SBN has identified seven areas of focus which will act as the levers to creating a circular economy in Auckland:

1. **Think and operate in systems** – No one organisation has the power to shift a system, let alone an economy.
2. **Reset procurement** – Evolution of procurement criteria to enable circular solutions to compete including a focus on whole life costs rather than initial purchase costs. Auckland Council can lead this transformation as a major procurer of goods and services each year in the city.
3. **Make the circularity desirable** – Stimulating a demand for more circular solutions to be implemented. Leveraging marketing and influencing opportunities to highlight the benefits of circular solutions.
4. **Fund the transition** – Linear solutions are the norm and the status quo, therefore there is a need for strategic funding of circular solutions to level the playing field.
5. **Share knowledge and develop skills** – As the circular economy is a new concept and many are not aware of its role or potential, there is a need for knowledge transfer and skills development.
6. **Use data** – Understanding material flows, where value is lost and where waste is created will quantitatively highlight the potential benefits. Improving business understanding of what they are losing will stimulate demand and in turn investment in circular solutions.
7. **Set policy to enable transition** – Use national policy levers to accelerate the move towards a more circular economy. These can range from regulation to fiscal measures, such as tax reliefs and like at a local government level, innovative procurement solutions.

GET IN TOUCH

Auckland, Tourism, Events and Economic Development and Sustainable Business Network welcome comment and feedback on this insight paper.

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