
CHAPTER 9:

Circular economy and bioeconomy



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Circular economy and bioeconomy



Contribution to our long-term vision

By 2050, Aotearoa New Zealand will have a circular economy with a thriving bioeconomy that seizes the opportunities from global trends and shifting consumer preferences.

Key outcomes include:

- more circular resource and energy use, such as resource recovery
- protecting and restoring ecosystems and ecosystem services, with particular attention to indigenous biodiversity
- more prosperous and climate-resilient people, businesses and communities
- maximising the value of our renewable bioresources for our national wellbeing.



Why a circular economy with a thriving bioeconomy is important

Moving to a circular economy with a thriving bioeconomy will support our economic and social wellbeing and lead to a better balance between the emissions we generate and the environment's ability to store these.



Key actions

- ▶ Commence a circular economy and bioeconomy strategy.
- ▶ Invest in data collection and research.
- ▶ Integrate circular practices across government, communities and businesses.
- ▶ Support businesses moving to circular economy business models.
- ▶ Investigate a circular economy hub.
- ▶ Accelerate the supply and uptake of bioenergy.
- ▶ Support research and development and accelerate investment in the bioeconomy.

Moving to a more circular economy will reduce emissions and lead to many other benefits

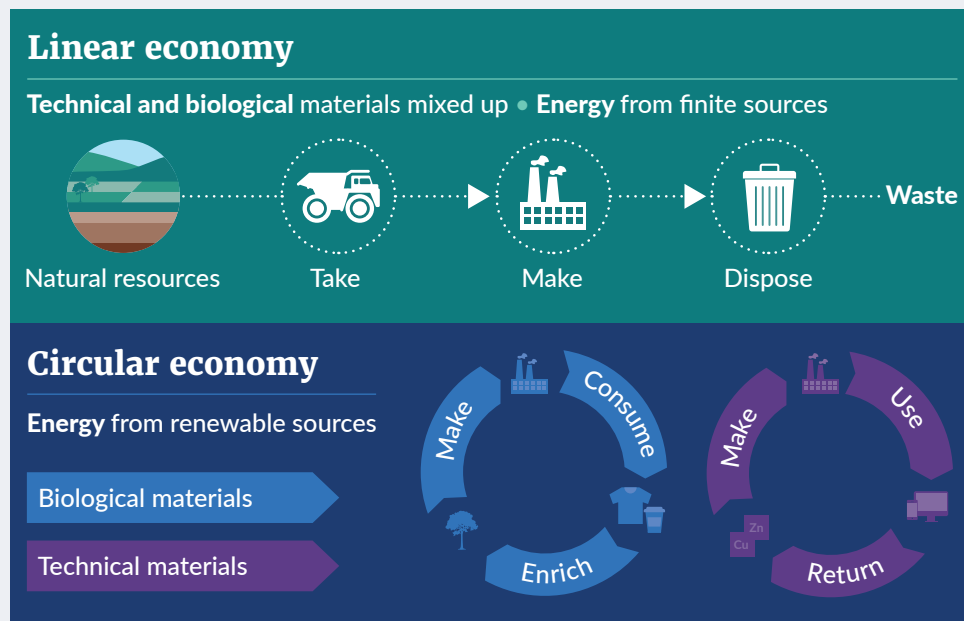
Moving to a circular economy with a thriving bioeconomy is essential to meeting our emissions budgets and our 2050 targets. In addition to helping us reduce emissions, it will create new opportunities (including new jobs such as in resource recovery, bioproducts and design), drive innovation, reduce the amount of waste we produce, and can result in cost savings for households and businesses.

This transition will require us to change the way that we think about – and use – resources.

What is a circular economy?

In a circular economy, we design out waste and pollution, keep resources in use for as long as possible, then recover and regenerate products and materials at the end of their lifecycle. Protecting and regenerating natural systems is key to a circular economy, as is delivering equitable and inclusive outcomes.

Figure 9.1. Linear economy and circular economy



Approximately 45 per cent of global emissions come from making products. Of these emissions, up to 80 per cent are created in the design stage.¹ Moving to a more circular economy is an opportunity to rethink how we design and use our resources to meet our material needs, such as shelter, mobility and nutrition.

Globally, many businesses and governments are adopting circular practices to improve efficiency, support climate goals and meet growing demand for low-emissions and low-waste products and services. A study commissioned by the Sustainable Business Network estimated that a more circular Auckland could reduce emissions by 2.7 Mt CO₂-e and add NZ\$8.8 billion in additional economic activity by 2030.²

A more circular economy in action can include:

- ▶ right-to-repair legislation that protects consumers who seek to repair products
- ▶ greater use of the sharing economy, such as car sharing
- ▶ digital services, such as online conferences, which provide alternatives to physical products and reduce the need for travel
- ▶ designing waste out of food production systems and reusing or composting food surplus
- ▶ durable insulated homes which require less repair and less heating.

A thriving bioeconomy will help Aotearoa move to a renewable future

Aotearoa New Zealand's natural resources, which make up our bioeconomy, provide a significant competitive advantage as the world moves away from fossil fuel-based products to bio-based materials, products and chemicals.

What is the bioeconomy?

Bioeconomy describes the parts of the economy that use renewable biological resources to produce food, products and energy.

1 Ellen MacArthur Foundation: <https://ellenmacarthurfoundation.org/>; European Commission: EU Science Hub. Sustainable Product Policy web page. Retrieved from https://joint-research-centre.ec.europa.eu/scientific-activities/sustainable-product-policy_en#:~:text=It%20is%20estimated%20that%20over,throughout%20their%20entire%20life%20cycle (accessed 21 April 2022).

2 Sapere Research Group. 2018. A circular economy for Auckland - scoping the potential economic benefits. Retrieved from <https://www.srgexpert.com/wp-content/uploads/2018/05/A-circular-economy-for-Auckland-9-May-2018.pdf> (accessed 27 April 2022).

Scion estimates that the bioeconomy could create an extra NZ\$30 billion for our economy and help reduce emissions by 12.5 Mt CO₂-e by 2030.³

We need an integrated approach to sustainably manage our biological resources that supports the transition of workers and businesses to a low-emissions economy and meet the needs of rural communities.



NGAWHA INNOVATION AND ENTERPRISE PARK

Ngawha Innovation and Enterprise Park (Ngawha Park) is founded on circular economy principles, enabling it to operate with low emissions. The development uses and reuses the Northland region's abundant raw materials – extracting maximum value from them before returning them to Papatūānuku (the earth). This regenerates the whenua (land) and protects our awa (rivers).

Ngawha Park is a 240-hectare green fields development nestled in the heart of Northland, just east of Kaikohe. It converts and restores land that was used for dairying into a centre for value-added manufacturing and innovation.

The park is a collaboration between organisations representing physical development, economic and business development, education and training, research and development, resource recovery, renewable energy, mana whenua, and local business and community groups.

Emissions reductions measures proposed at the site include:

- ▶ a biodigester processing biowaste from park businesses and the community to create biogas for energy and digestate for fertiliser and compost
- ▶ liquid digestate used as a nutrient carrier for hydroponic horticulture
- ▶ biomethane used to supply heat and energy for a local Māori land trust's manuka oil distillery.

³ Scion. 2018. *Right tree, right place, right purpose: Scion strategy to 2030*. Retrieved from https://www.scionresearch.com/_data/assets/pdf_file/0014/64310/Scion_strategy_4web.pdf (accessed 21 April 2022).

Actions to support emissions reductions

This plan outlines key actions for stepping Aotearoa towards a circular economy and a thriving bioeconomy that delivers equitable and inclusive outcomes.

Actions to create greater circularity and develop our bioeconomy will also need to uphold Te Tiriti o Waitangi, apply te ao Māori and mātauranga Māori principles, and protect Māori interests. This will require meaningful engagement with Māori. Actions should also align with the [Te Tumu mō te Pae Tawhiti](#) cross-agency work programme led by Te Puni Kōkiri.

Action 9.1: Commence a circular economy and bioeconomy strategy

Within the first emissions budget period, the Government will start the work needed to deliver a circular economy and bioeconomy strategy (the Strategy). This will align with the Waste Strategy's vision and principles and will include the five areas outlined below.

Meaningful engagement – including with Māori – is essential to ensuring that we move to a circular economy in a way that delivers equitable and inclusive outcomes. It will also improve our understanding of the impacts and opportunities of a circular economy and bioeconomy.

Action 9.1.1: Move to a more circular public sector

The Strategy will enable the public sector to lead by example; it will align with the [Carbon Neutral Government Programme](#) as well as other programmes to reduce emissions, pollution and waste.

Action 9.1.2: Innovation, skills and investment

The Strategy will consider the skills, public and private investments, and innovation needed to achieve a shared vision and accelerate the move to a circular economy and thriving bioeconomy by:

- ▶ co-creating 'circular missions' or climate innovation platforms that use mission-led innovation (see [chapter 8: Research, science, innovation and technology](#))
- ▶ enabling infrastructure, such as resource recovery centres
- ▶ supporting high-impact innovations and their deployment in Aotearoa
- ▶ building future-ready skills and helping workers transition to low-emissions industries.

Action 9.1.3: Align regulatory systems and the business environment

The Strategy will identify how regulatory systems and business environments can enable this shift by:

- ▶ developing principles for aligning regulatory systems and the business operating environment (eg, principles to protect consumers through regulations on the right-to-repair)
- ▶ enabling businesses that seek broader outcomes that align with a circular economy
- ▶ building on initiatives to transform the waste sector (eg, the proposed new Waste Strategy).

Action 9.1.4: Enable Māori to shape and benefit from the transition to a circular economy and thriving bioeconomy

The Strategy will uphold Te Tiriti and be informed by te ao Māori and mātauranga Māori. Supporting actions will need to be developed collaboratively and provide for – and protect – the interests of Māori. It will also be important to reflect the local context and connections between systems

Action 9.1.5: A bioeconomy framework to guide the use of our bioresources and maximise wellbeing

This part of the Strategy will focus on establishing a baseline of natural resources and an analysis of supply and demand. It will also develop a framework for a bioeconomy that supports the wellbeing of all New Zealanders, and aligns with *Te Mana o Te Taiao – Aotearoa New Zealand Biodiversity Strategy 2020*.

Action 9.2: Invest in data collection and research

Aotearoa can learn a lot from other countries. However, we also need to build our own evidence base to develop circular approaches that will work in our unique context. The Government will:

- ▶ measure the circularity of our economy, identifying a baseline and a measurement framework with indicators
- ▶ develop maps that show the flow of resources across systems and sectors
- ▶ build evidence about impacts through data collection and research.

Action 9.3: Integrate circular practices across government, communities and businesses

The Government will build on public and private sector achievements to unlock the potential of a circular economy. Examples include:

- ▶ the Government's 'broader outcomes' procurement policy which supports a circular economy
- ▶ Kāinga Ora – Homes and Communities' aim to lead industry in circular waste minimisation practices.

Action 9.4: Support businesses moving to circular economy models

The Government will investigate opportunities to support industry-led and regional programmes that enable businesses to adopt circular economy models. For example, the Government has provided funding for the circular Ngawha Innovation Park (see case study in this chapter).

Action 9.5: Investigate a circular economy hub

The Government will consider partnering with key industry, Māori and local government stakeholders to launch a circular economy hub, to support deployment of circular practices in Aotearoa.

A circular economy hub could include an innovation hub and demonstrate circular practices, such as resource recovery.

For more information about the innovation hub, see [chapter 8: Research, science, innovation and technology](#). For more information about resource recovery, see [chapter 15: Waste](#).

Action 9.6: Accelerate sustainable and secure supply and uptake of bioenergy in Aotearoa

The Government will set up a work programme that is consistent with the bioeconomy objectives, the energy strategy, and takes account of the needs of rural communities. This will consider:

- ▶ establishing a baseline for the supply and demand of bioenergy feed stocks
- ▶ developing a framework to choose the right type of bioenergy supply from our bioresources
- ▶ considering the regulatory framework for bioenergy markets
- ▶ helping to match the supply of bioenergy with demand
- ▶ undertaking demonstration projects and private/public partnerships.

The Government will investigate ways to increase woody biomass supply to replace coal and other carbon intensive fuels and materials and stimulate private sector investment (see [chapter 14: Forestry](#)).

Action 9.7: Support research and development and accelerate investment in the bioeconomy to commercialise bioeconomy technology and products

This action will build on existing research and development funding in this area, as well as potentially new initiatives to turn our bioresources into new bio-based products and biomaterials (eg, low-carbon wood products, marine derived pharmaceuticals)

We all have a role to play in the circular economy and bioeconomy

Local government is a key player in moving to circular economy. Councils have a role to play in designing circular urban plans, enabling resource recovery and using procurement to design out waste and reuse resources in infrastructure building (eg, concrete). They will need to work with businesses to encourage them to move to circular business models and co-locate to form circular hubs. The circular economy and bioeconomy will need to be well coordinated for success – local governments are well-placed to do this at a local level.

The **private sector** has a key role to play in unlocking the significant potential of the circular economy and bioeconomy. We need business to design out pollution, make better use of resources and innovate circular solutions. It is the private sector who will provide biomass and seize the opportunities of the growing bioeconomy.



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