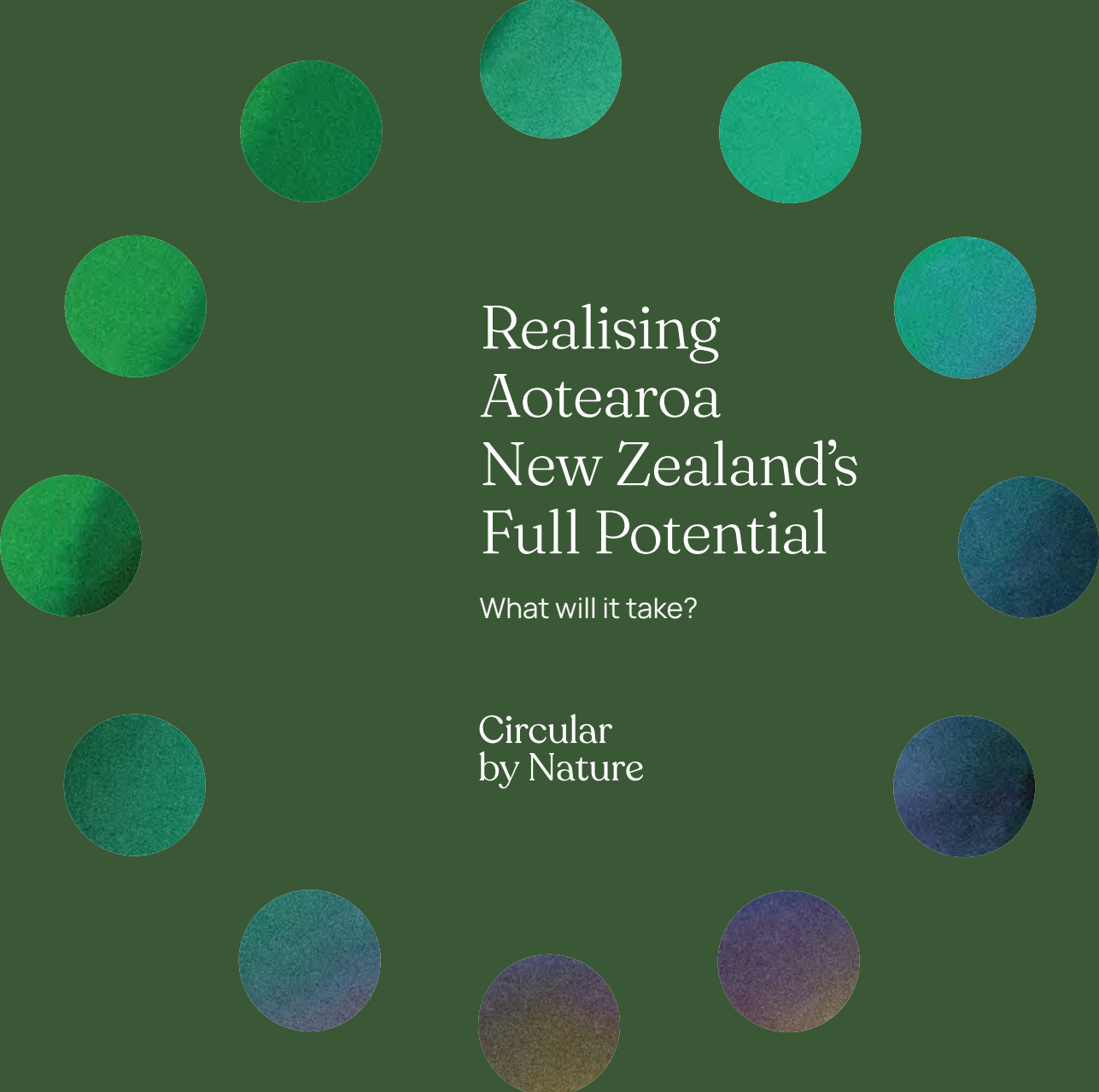




Realising Aotearoa New Zealand's Full Potential

What will it take?

Circular
by Nature



A truly vital and enriching
economy is within our reach.

But it waits for us to realise it.

Opportunity lives in the spaces
in between – beyond neatly
labelled industries, sectors
and communities.

By returning to our nature,
we can shape a circular future
that generates lasting value
for Aotearoa New Zealand.

How to navigate this paper:

PART ONE: Why this? Why now?

Understand where value is being lost, why a circular economy is essential within an increasingly resource constrained world, and the natural edge we can bring as Aotearoa New Zealand.

PART TWO: Circular futures

Explore the costs and complexities of life in Aotearoa New Zealand. Then envision how circular principles and resource flows will enrich our economy, environment, and communities across three areas of our circular future:

- How we live
- How we eat
- How we move

PART THREE: Making it a reality

Use this white paper and its three recommendations as a roadmap to coordinate action, shape a strategic framework and embed circularity into legal settings to progress a stronger economy for us all across Aotearoa New Zealand.

Kia ora.

You are holding a strategic white paper on Aotearoa New Zealand’s future circular economy — designed to be your decision making tool in the boardroom, the minister’s office, and the council chamber.

A note from the authors

My hope is that Circular by Nature not only inspires but also guides decision makers towards a future that benefits people and the planet.

– Louise Nash

I could never truly imagine a circular Aotearoa. The work here changed that. Now I invite you to make it yours.

– Samantha Walmsley-Bartlett

There are so many incredible initiatives underway across the motu - glimpses into Aotearoa's circular future. Let's build it together.

– Kelly McClean

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New Zealand has what it takes to be a prosperous and resilient nation – with natural edge.

We have the resources, the people, the innovative mindset, and the care for place that most countries can only aspire to. But right now, we are leaving an extraordinary amount of unrealised value on the table.

We cannot afford to, and nor should we want to, be a nation that wastes its resources.

Our communities, businesses, and environments that depend on our food, land, and materials are bearing the cost of linear, take-make-waste systems in the form of waste, productivity loss, inequity, insecurity, disconnection and environmental harm. These are challenges that require a system shift to a fundamentally different way of accessing, restoring, realising and retaining the value of resources.

Our current economic constraints provide the opportunity to put circularity into the national conversation. Doing nothing costs more than acting. New Zealanders are already engaging in a wider range of circular behaviours—whether they know it by that term or not—and are open to doing more, but they face systemic barriers to realise this value shift.

This is not a problem that will go away by itself.

According to the UN, global municipal waste is expected to grow from 2.1 to 3.8 billion tonnes a year by 2050 and continuing business-as-usual waste management would cost the world US\$640.3 billion a year by 2050... **Compare that to the projected net gain from a circular economy pathway of US\$108.5 billion a year.**

1/3 of economic value is lost due to extractive practices globally.

Globally, we see that for every €3 of economic value created, around €1 is lost to take-make-waste practices. The five pathways of value loss include; processing losses, energy losses, food losses and waste, end-of-life waste, premature deterioration of fixed capital.

New Zealand is losing value because our economy is geared towards a take-make-waste approach to resource use:

- Of the 130-135 million tonnes of materials we extract from our own land annually, 90% are organic items (food, wood, crops) and non-metallic minerals (limestone, coal, clay). Two-thirds are exported as raw commodities; we retain one third for domestic use.
- We consume 107 million tonnes of natural resources each year, approximately 21 tonnes per person, which is 60–65% more than the global average of 13 tonnes per person. 72% of this is used for food, housing, infrastructure, and mobility.
- Around 60% of our resource use is imported, much of it, like fuel and fertiliser, is virgin and single-use by design.
- New Zealand spent NZ\$1.5 billion importing the fertilisers that grow our food in 2022 and another \$700 million on diesel to run the farms that produce it.
- 100% of New Zealand's refined fuel is imported.
- We've been identified as among the highest waste generators per capita in the developed world by The World Bank.
- Of the roughly 450,000 tonnes of plastic waste we generate each year, only around 15% is recycled.
- 750 kilograms of resources are sent to landfill by every New Zealander each year, 49% above the OECD average.
- Wasted food alone costs the average household over \$1,400 a year.
- The economic output we generate per tonne of material consumed is 40% below the OECD average at just USD\$1,475, meaning the same resource use could be producing significantly more value.

A circular economy is our pathway to value creation, connection and productivity.

An economy based on circular principles will design out waste and pollution before it becomes a cost, keep materials in flow to realise value across full lifecycles, and regenerate living systems to provide for human health and economic prosperity. It does not mean closing our economy to global trade, but rather, it is the practical work of realising and retaining value embedded in our resources, products and services. We mine our economy for valuable resources, rather than our ecology.



Circularity is not a new idea for Aotearoa New Zealand.

“Applied indigenous knowledge, held within a Māori worldview, can provide the holistic blueprint for redefining our relationships with both the planet and each other.”

Kore Hiakai, 2024

In te ao Māori, the reciprocal and cyclical relationship between people, resources, and the environment is foundational.

Kaitiakitanga as an intergenerational responsibility, not an aspiration. The valuable Māori economy can act as a catalyst to help transform Aotearoa New Zealand's economy to be with Mātauranga Māori and systems approaches to guide decision-making. The circular economy, at its best, is a modern expression of principles New Zealand has always carried and is recognised for on the world stage.

Done well, the transition from linear to circular resource use delivers outcomes for all New Zealanders:

- Our homes and products are designed to last, be repaired and shared, rather than a waste burden for ratepayers.
- We produce diverse food that regenerates our land, distribute food to all New Zealanders and turn by-products into ingredients.
- We prioritise connection and return nutrients to soil so that it can nourish production systems over generations.
- Our transport systems are renewable, allow citizens and goods to move efficiently and capture and use critical materials across multiple lifetimes.

Circularity strengthens both our domestic and our export positions by reducing dependency on imported inputs, building resilience against supply chain disruptions, and meeting the standards our trading partners require when our products enter their markets. Nations that circulate more of their own resource flows are less exposed when trade routes close, tariffs shift, or pandemics interrupt supply, lowering costs for households and businesses, creating new jobs and capabilities in every region, and putting less pressure on the natural systems that define and support us. At a time when automation and AI are reshaping work, circularity offers practical pathways into place-based, skilled employment that cannot easily be offshored.

Circularity is no longer only about minimizing waste at the margins. It is about regaining control over resources and operational capacity that determine whether growth plans are realistic or aspirational. No industry is exempt from this shift.

The Circularity Gap Report 2026 identified that the global economy loses €25.4 trillion in economic value every year, that's nearly 31% of global GDP, through linear material practices. International practice bears this out. The latest UNIDO and Chatham House global stocktake, identify 4,319 policy actions across 101 national circular economy roadmaps and strategies, many of which are our trading partners, with 33 embedding circularity into their trade architecture.

Three-quarters of our extracted natural resources flow into markets actively making circular transformations:

- China, our largest trading partner, released a new five-year plan in July 2026 targeting a 16% lift in resource productivity and an 8 trillion yuan recycling industry by 2030.
- India is building a national resource recovery system at pace.
- Australia has committed to recovering 80% of its resources by 2035.
- The EU's Ecodesign regulations and digital product passports are already in force.
- Scotland and Ireland have legislated national circular economy strategies.

Business is moving with circular policy.

This was reinforced at the WEF's 2026 Annual Meeting in Davos, where business and government decision-makers positioned circularity as an industrial strategy that strengthens resilience and resource security, competitiveness and growth, and environmental sustainability at the same time.

The Forum's own Global Risks Report 2026 also ranks natural resource shortages and concentration among the top global risks over the next decade. European data from 222 European companies across 14 industries, found that the more circular a company is, the lower its risk of debt default over both a one-year and five-year time horizon with superior risk adjusted returns.

Crucially, this global transition toward regulations for circularity means that for New Zealand exporters, circularity is becoming a baseline requirement for market access, not a point of difference.

75%

Global business leaders say circularity is important or critical to their organisation.

That demand has rapidly risen from 40% three years ago in 2024, and the figure is expected to rise to 95% by 2027.

While the world increases resilience and reduces the cost of living through circularity – New Zealand's economy is being held back.

Until now, New Zealand legislation has pursued a consistently weak model of circularity.

Peer-reviewed analysis of New Zealand central government circular economy policy, funded by Āmiomio Aotearoa and published in 2025, concluded that between 2017 and 2023, both Ministry for the Environment (MFE) and Ministry for Business, Innovation and Employment (MBIE) pursued a consistently "weak model" of circularity, focused disproportionately on end-of-life recycling and waste management rather than upstream system redesign and producer responsibility, where value is created and retained in our economy.

Since 2023, even that weak model has been partially dismantled, including the removal of circularity as a named strategy in the Emission Reduction Plan.

Independent research which Circular by Nature commissioned with Kantar in 2026 showed that New Zealanders are already engaging in circular practices at a citizen level but New Zealand's lack of policies, standards and system wide engagement with circularity limits adoption and scaling.

This is holding us back from the necessary productivity gains New Zealand needs in an increasingly costly and resource scarce world.

It is time to consider how we stimulate a more valuable economy that is circular by nature.

We have come together to create **Circular by Nature: Realising Aotearoa New Zealand's full potential, what will it take?**

A strategic platform that translates a decade of New Zealand-specific research and on-the-ground implementation for decision-makers, through the lens of everyday life – how we live, how we eat, and how we move in a circular Aotearoa, New Zealand.

In how we live, we make the case that products can be redesigned – not through individual sacrifice, but through better infrastructure, smarter systems and clearer rules that make the circular choice the default choice.

In how we eat, nutrition becomes a priority, not a premium. Nutrients are returned to living soil, diverse crops are made into diverse foods in shared processing facilities that are located much closer to where they are grown. Our public procurement expectations and spaces play a pivotal role in changing the food we eat in our schools, hospitals and homes.

Lastly, in how we move, we look at circular transportation and logistics. What our vehicles and infrastructure are made of, and what happens to those materials over time. The energy systems that power all of it. And whether we're planning for the full cost – financial, social and environmental – of a transition already underway.

By making the circular economy real, we make it actionable.

This is an opportunity for all New Zealanders:

- New Zealanders are already embracing circular behaviours – with room to go much further into reuse, repair and repurpose across clothing, furniture, tools, vehicles and children's items.
- New Zealand households are sitting on \$5.2 billion in sellable pre-loved goods. 75% of us have unused items worth \$1,300 on average.
- A high-ambition textile stewardship scheme could deliver \$602 million in net benefit to the economy by 2038, and grow sector employment up to 6%.
- Mānuka makes up a minority of the honey we produce by volume, but provides 82% of our honey export revenue, contributing to a global market projected to be worth USD\$1.3 billion by 2032.
- MBIE has identified thirty high-value bioeconomy products New Zealand is positioned to produce, from biocosmetics to marine bioactives, feeding a global bioactive ingredients market headed for USD\$402.3 billion by 2033.
- The Energy Transitions Commission estimates that by 2050, more than half of global demand for battery materials like cobalt, graphite and lithium could be met by recycled secondary supply – value New Zealand could capture instead of losing, if we build recovery capacity now.
- Two independent estimates put New Zealand's circular bioeconomy in the tens of billions: PwC values it at NZ\$30 billion in additional GDP by 2030; the Sustainable Business Council and Climate Leaders' Coalition separately size an innovation-driven pathway at \$22–33 billion a year by 2035–2050.
- Circular interventions in construction, manufacturing and food could cut 1.5–1.9 million tonnes of CO₂-e a year, a 2.7–3.4% reduction on 2021 net emissions.
- In Auckland alone, circular would create \$6.3–8.8 billion in additional economic activity by 2030, plus a 2,700 kt CO₂-e cut.
- 351+ organisations, including Zespri, Silver Fern Farms, Lion, Beca, Tauranga City Council and Rescued Kitchen, have invested in XLabs circular economy training, and 88% had implemented their plans within 6–12 months.

“The transition to a circular economy is, ultimately, about designing economic systems in which our capacity to create value is widely distributed.”

– Ken Webster and Emanuele Di Francesco, 2026

Realising our potential with circular resource and value flows.

This whitepaper brings together evidence from over 220 case studies, academic papers and reports – and contributions from over 100 practitioners, industry professionals, and policy makers. From this foundation, we explore the potential of circular futures in our everyday lives and offer a roadmap to start enabling the shift.

National alignment across government, business and communities is critical for shifting circularity from a weakened 'bolt-on' approach to a 'built in' mindset that unlocks productivity and value creation.

This paper presents three strategic recommendations:

1. The Circular Futures Activation Group:

Establish an expert advisory group that guides and coordinates industry leaders with prioritised taskforces. This would be enabled by government and co-designed with industry, iwi/Māori, regions and research partners to coordinate action across four key industry-led workstreams: housing and construction, products and packaging, food and fibre, mobility and energy. The Ministry for Cities, Environment, Regions and Transport (MCERT) could provide stewardship, with named agency officials linked to each workstream and clear roles for Ministry Business Innovation and Employment (MBIE), Ministry for Foreign Affairs and Trade (MFAT), Ministry for Primary Industries (MPI) and other relevant agencies. The purpose is not simply to advise Ministers, but to build an investable pipeline that turns isolated projects into a coordinated national transition.

2. The Circular Framework:

Develop a national circular economy framework. This would be led by (MCERT), with clear roles for MBIE, MFAT, MPI, and other relevant agencies to set national priorities, responsibilities, sequencing and near-term actions. The framework should join up regional plans, industry plans and research programmes rather than replace them, and identify the levers needed to accelerate local and regional manufacturing, secondary materials markets, diversified food production, circular procurement, bio-based resources, trade readiness and recovery systems.

3. The Regulatory Settings:

Embed circularity in policy, planning and regulatory settings. This would identify practical entry points across the Emissions Reduction Plan, Planning Bill, Waste Legislation Reform, Natural Environment Bill, procurement standards, infrastructure planning and sector policy. The aim is to give circularity clearer status in decision-making, with measurable objectives, funded actions, assigned responsibilities and review points that support long-term investment and implementation.

Roadmap to start enabling the shift.



Across all three, circularity in Aotearoa New Zealand must uphold Te Tiriti, protect mātauranga Māori, and recognise Māori-led, place-based approaches as central to the transition.

- (1) **The activation group** prioritises where coordination and expertise are needed.
- (2) **The circular framework** maps how plans, responsibilities and levers fit together towards agreed targets.
- (3) **The policy, planning and regulatory settings** enable long-term investment, implementation and value creation.

“Circular by Nature reflects what the research consistently tells us: progress on circularity accelerates through coordinated action - innovation, supportive policy and standards, strong supply chain governance, and shared goals across the system.”

- Joya Kemper

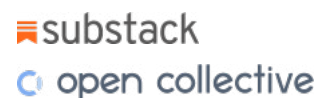
Circular by Nature is an independent, strategic platform to lift ambition and coordinate circular economy action in New Zealand, registered with the Gift Collective as our fundholder.

It was founded by three independent practitioners: Samantha Walmsley-Bartlett, Kelly McClean, and Louise Nash. Coming together to develop a strategic platform to address the gaps in awareness and understanding of the actions required across the system to enable a shift from a linear to circular economy across Aotearoa.

Our Kaupapa | Purpose:

Inspire, educate and enable decision-makers to transition away from take-make-waste resource use reliant on fossil fuels and replace it with circular business models, practices and policies to help all New Zealanders manage our resources within our planetary boundaries, reducing waste, lowering costs and reducing emissions to achieve a resilient, thriving society, nature and economy.

Follow and support our work:



Contact us at: kiaoracircularbynature@gmail.com

This white paper was written by:



Louise Nash is an economist, creator of the *Circular by Design*TM methodology, and founder and CEO of Circularity, Aotearoa's leading circular economy design and advisory practice, and a certified B Corp. She has led over 168 circular transformation strategies across packaging, textiles, food, plastics, transport, timber, and water, keeping over one million tonnes of New Zealand's resources in use and out of landfill. Her XLabs circular innovation labs have built the capability of nearly 400 organisations, from business leaders to community practitioners. A COP30, Sustainability Leaders, and Economic Development Innovation award recipient, Louise has worked across New Zealand, Australia, Singapore, Brazil, Canada, Europe, and Dubai. Her philosophy is simple: work with nature, not against it, and make that work accessible to everyone who wants to be part of it.



Samantha Walmsley-Bartlett is a systems change leader focused on enabling regeneration across landscapes and value chains, shifting relationships, incentives, and decisions at every level, from grower cooperatives to global shipping routes. As Head of Sustainability at Zespri International, she developed the first industry-wide electrification pathway for kiwifruit and built collaborative models between growers and packhouse businesses. At Circularity, she led New Zealand's first measurement of circular solutions using the Circular Transition Indicator tool, co-developed the XLabs Circular Economy Programme, and her 999 Days of Sharing Circular Solutions connected businesses and communities to over 200 practical circular solutions. She co-founded Fairgrow, addressing food insecurity and waste at community level, has contributed to Future Whenua and is on the board of Future Farmers, two networks focused on the long-term resilience of New Zealand's land and farming communities. Samantha brings a rare experience of taking the circular economy from strategy to the ground, with the community relationships to prove it.



Kelly McClean is a strategy, design, and sustainability specialist with over 12 years of experience leading innovation and circular economy projects across textiles, agriculture, manufacturing, FMCG, packaging, and infrastructure. She was a key contributor to MBIE's circular bioeconomy research and engagement programme, focusing on manufacturing, food, the built environment, and digital enablers. Kelly is also co-founder of social enterprises CommonKind and Reuse Aotearoa. She currently leads Future of Fibre Aotearoa, an industry-led enabler. Her work consistently bridges the technical and the human, bringing methodological rigour that gives a document like this its credibility with expert audiences, and the systems design thinking that makes it legible and actionable for businesses, councils, and communities working through the transition on the ground.



This publication carries the experiences and expertise of practitioners, producers, manufacturers, community organisations, iwi, and businesses across Aotearoa New Zealand.

Made with the same interconnectivity that our circular future demands, Circular by Nature drew on evidence and experiences of wide-ranging industries, communities, and experts to create a vision of a circular future and a roadmap to make it a reality.

It is designed to be both authoritative and shared.

50+ organisations.
15+ industries.
Three workshops.
15 interviews.
100+ individuals.
Seven peer reviews.
240 articles, papers and publications.

The Circular by Nature team is grateful to everyone who actively engaged in workshops, kōrero, and review as we developed this white paper.

This is a small snapshot. You can find out more about who contributed to this work within the appendix on page 200.



"Circular by Nature is a comprehensive and insightful document which sets out the case for a transformation in New Zealand: from contributing to a climate wrecking take-make-dispose economy to a circular economy based on innovation and good governance and one which is inclusive and contributes to the wellbeing of every citizen"
– Ken Webster

"Unless New Zealanders can see, feel, and find their place within a more regenerative future, continuing on the current extractive and costly path remains too easy. Circular by Nature is a powerful articulation of evidence and vision that makes redirection possible."
– Bree Asmus

"The missing piece is the connecting infrastructure: coordination, policy settings, procurement, measurement, investment pathways and institutional durability."
– Jodie Bricout

"Moving towards a circular economy in New Zealand is a critical opportunity. Clare is proud to be supporting Circular by Nature in their important work and provide an inclusive space for people to become involved"
– Clare Foundation

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We are nature.

Before we talk about economies, policies, or even systems, we need to talk about where we come from.

We are nature, not visitors to it.

We are not stewards of something separate from ourselves, we are a vital part of it.

The oxygen in the blood moving through your body was made by forests and phytoplankton. The minerals in your bones were laid down in the earth millions of years before you arrived.

The microbes in your gut are the same ancient organisms that first made soil fertile. As you read this – your internal ecosystem, immune system, circadian rhythm, and breath itself are in continuous dialogue with the ecology of Aotearoa New Zealand.

We are, at the most fundamental level, nature in temporary human form.

This is not poetry. It is biology. Reciprocal, circular.

It is how we start to better understand ourselves, and the challenge in front of us.

When we continue to treat the natural world as a resource to extract from rather than a system we belong to, we are not just making an environmental mistake. We are making an error about who we are. And the consequences of that error are showing up everywhere – in our economy, in our land, in our health and in our communities.

Ko au te taiao, te taiao ko au.

I am nature, and nature is me.



Nature produces no waste.

This is perhaps the most important design principle ever observed, and it has been operating for 3.8 billion years.

In a forest, the fallen leaf is food for the fungus, which feeds the tree root, which grows the leaf that falls again.

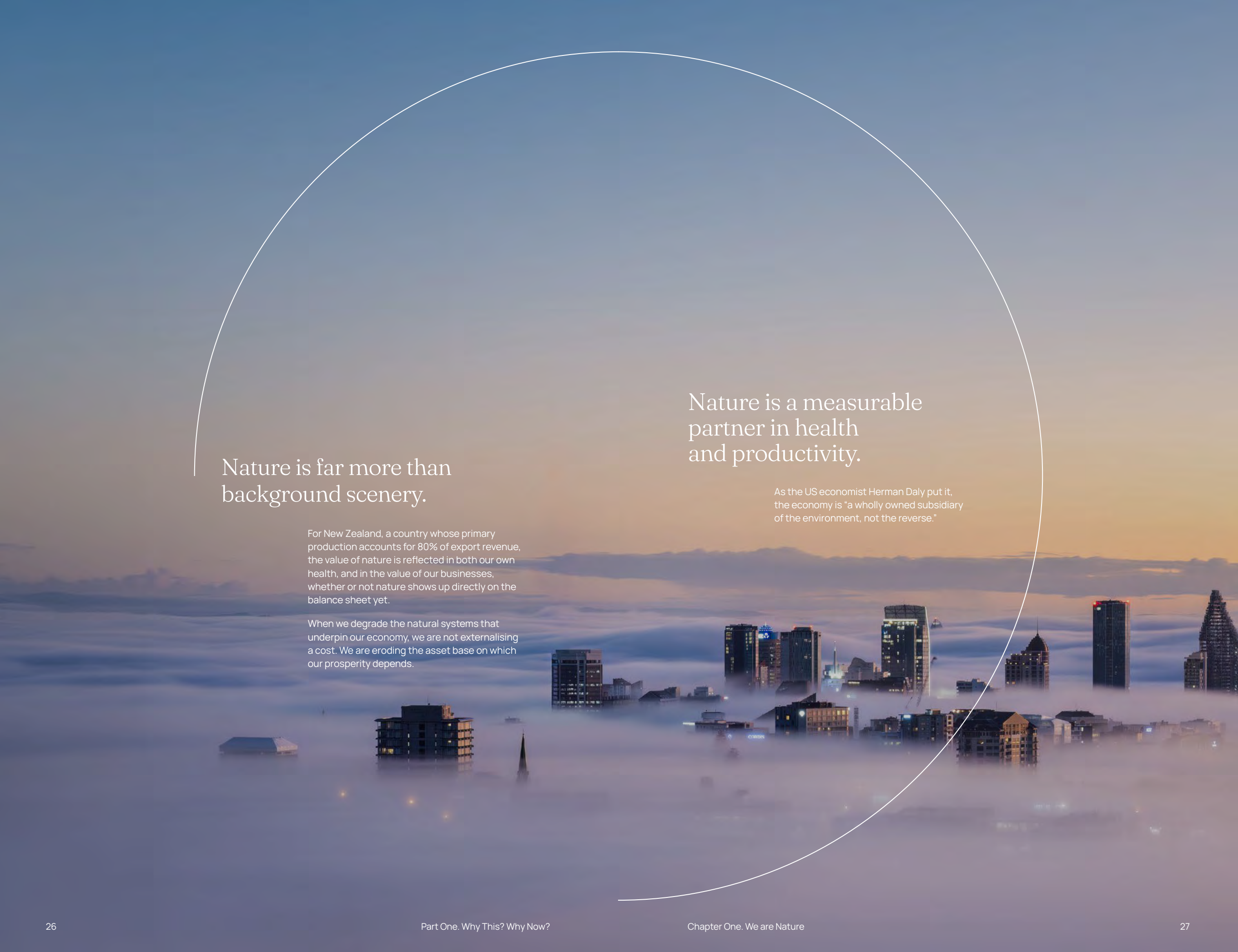
There is no landfill in a functioning ecosystem.

There is no pollution that isn't an error in flow. There is no material 'output' that doesn't become something else's 'input'.

This is not an accident of ecological complexity. It is the foundational logic of living systems: everything is in reciprocal relationship.

What one part gives, another receives.
What one part takes, it returns.

That reciprocity is what makes systems self-sustaining across time. Our linear economy violates the principles of reciprocity, because it takes, makes then wastes and it's harming us and limiting our potential to work with nature, not against it.



Nature is far more than
background scenery.

For New Zealand, a country whose primary production accounts for 80% of export revenue, the value of nature is reflected in both our own health, and in the value of our businesses, whether or not nature shows up directly on the balance sheet yet.

When we degrade the natural systems that underpin our economy, we are not externalising a cost. We are eroding the asset base on which our prosperity depends.

Nature is a measurable
partner in health
and productivity.

As the US economist Herman Daly put it, the economy is "a wholly owned subsidiary of the environment, not the reverse."

The closer we live to nature – the healthier and safer we are.

The evidence for this is consistent and growing.

Access to natural environments is associated with lower rates of anxiety, depression, and chronic disease. Soils that are provided with diverse biology produce food with higher nutritional density. Children who spend time in natural environments develop stronger immune responses and better attentional regulation. Urban green spaces reduce heat, filter water, and connect communities to each other and to place.

The healthier our ecosystems – the higher our profitability.

Recent spatial analysis research on the relationship between biodiversity and business productivity improvements indicate firms operating in areas with healthier ecosystems generate measurably higher sales and profits. 117,000 New Zealand businesses found higher sales and profitability to be associated with improved natural capital when assessed between 2009 to 2022. This relationship held across multiple measures of biodiversity and ecosystem health:

↑ **0.13%**

An increase in New Zealand's **natural capital of just 1%** was associated with 0.13% higher sales

↑ **0.15%**

and 0.15% higher profitability.

The positive impact of operating businesses in areas with healthier ecosystems was strongest where you would expect it: in agriculture and forestry, where business outcomes are most directly tied to the health of surrounding ecosystems.

In primary industry regions, a 1% increase in natural capital was associated with sales 0.71% to 0.81% higher, well above the economy-wide average.

Healthy soils, clean water, fewer pests, and intact native vegetation support food and fibre production while lowering costs. The researchers also tested whether policies that restore and regenerate nature changed the relationship, and found that following New Zealand's Predator Free 2050 programme and the broader package of reforms introduced from 2017, the productivity effect of natural capital increased by a further 0.05%. Investment in ecological restoration generated economic returns beyond the conservation sector itself.

The scale of what we take, make and waste at a global scale.

Take: Extraction

The world extracted ~106 billion tonnes of materials in 2020 – more than triple the 1970 figure (~30bn tonnes) – and is on track for 100–160 billion tonnes/year by 2060 on current trends.

160^B

billion tonnes
extracted by 2050.

Make: From virgin, not reused

The global economy is now only 6.9% circular – its lowest point yet, down from 9.1% in 2018 – meaning 93.1% of everything entering the economy is virgin, newly-extracted material, not recycled or reused.

93.1%

of what enters the economy
is virgin material.

Waste & Pollute: What we lose

The world generated 2.56 billion tonnes of municipal waste in 2022 – a level not expected until 2030. Within that, fast-growing categories are outpacing our ability to deal with them: 62 million tonnes of e-waste a year, growing five times faster than documented recycling can keep up (only 22.3% is properly recycled).

2.56^B

billion tonnes of municipal
waste generated in 2022.

The global economic model still treats nature's resources and services as if they were free, infinite, and indestructible.

They are none of those things.



The economic cost of what we are losing is equally staggering.

+ Dependency on nature

More than half (55%) of global GDP, US\$58 trillion, is moderately or highly dependent on nature and the services it provides for free in 2023, increasing from \$44 trillion USD in 2020.

\$58^T

trillion USD dependent on nature.

- Cost of linear, virgin material use

Linear, take-make-waste practices cost the global economy €25.4 trillion in lost value every year, almost 31% of global GDP. That loss comes through five leak points: processing losses, energy losses, food loss and waste, end-of-life waste, and the premature deterioration of the things we build.

€25.4^T

trillion in lost value every year.

+ Extraction enabled by subsidies

Governments spend at least US\$1.8 trillion a year globally on subsidies (fossil fuels, agriculture, fisheries, forestry) that prop up environmentally harmful extraction.

\$1.8^T

trillion USD annually to prop up extraction.

- Global cost of waste management vs. circular pathway

Business-as-usual waste management will cost the world US\$640.3 billion a year by 2050.

A circular pathway instead delivers a net gain of US\$108.5 billion a year.

\$640.3^B

billion USD cost for waste management by 2050.

The potential within our future economic model is yet to be unlocked – the difference between the cost of business-as-usual waste management compared to a circular pathway is \$748 billion by 2050.

Aotearoa New Zealand is a small economy island nation that is highly reliant on imported, non-renewable inputs.

We are recognised as an innovative bioeconomy, yet right now most of what we design, make, buy, and use follows the same simple linear pattern. Take resources, make something, use it, throw it away. So despite our investment in resources we use—largely imported resources—they are not providing us with good productivity returns and leave us exposed to rising costs and disruption. New forms of value and ways of retaining it are needed.

The scale of our extraction:

21t per NZer

21 tonnes are extracted from the earth per person every year in New Zealand. That's 60–65% more than the rough global average of 13 tonnes per person.

The cost of our loss:

\$ 222.8M disposed per yr

Divertable resources currently going to landfills is costing us \$222.8 million a year.

Our failure to close the loop:

\$1.4k economic output /t

We generate just US\$1,475 of economic output per tonne of material we consume...

New Zealand is among the highest waste generators per capita in the developed world – the tenth as rated by The World Bank.

64.2Mt

60% (64.2 million tonnes) of the 107 million tonnes of natural resources we collectively use in New Zealand is imported - including all of our refined fuel.

\$1.5B imported fertilisers

As a nation we spend NZ\$1.5 billion every year importing the fertilisers that grow our food.

40% ↓

That's 40% below the OECD average.

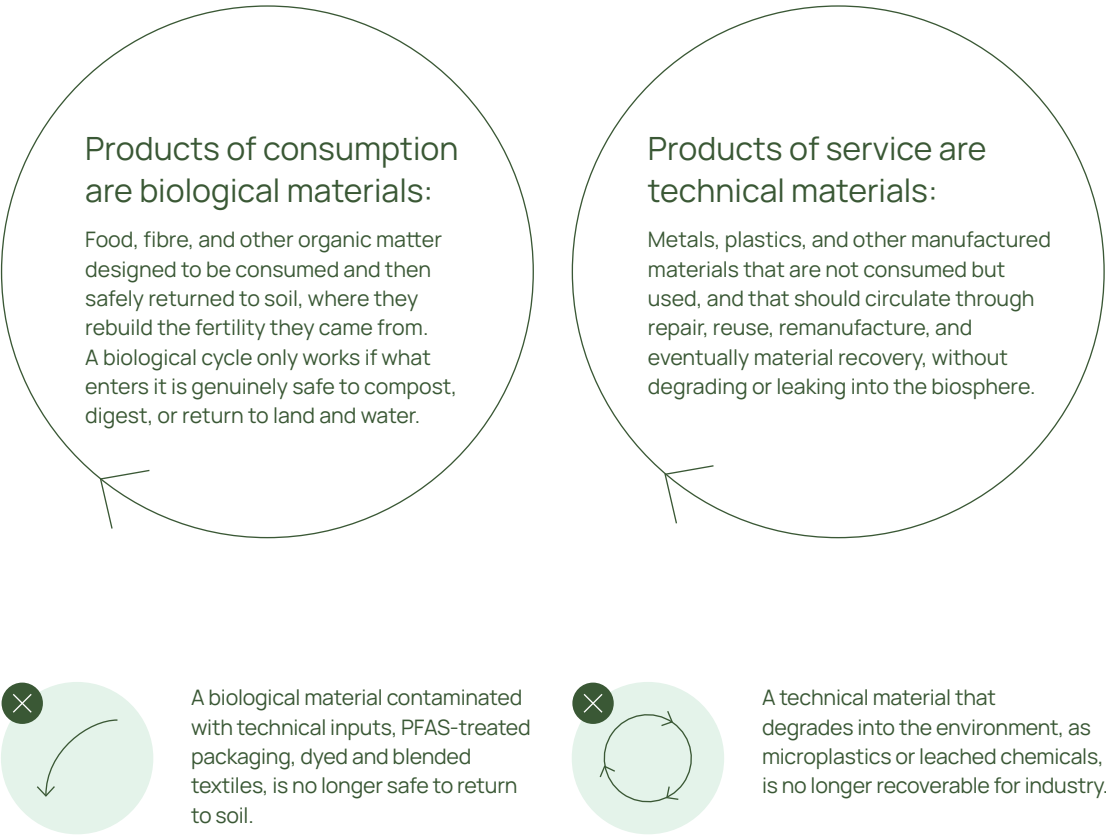
The current linear model is becoming a liability economically, environmentally, and socially. It has increased our dependence on imported materials, exposed us to supply chain shocks and made us complicit in the steady degradation of the natural systems our economy rests upon.

Given the significant pressure the cost of living crisis is putting on households and businesses across Aotearoa, we cannot afford to continue to consume more, and get less value from it.

The war in Ukraine, US tariff shifts, and COVID-19 have shown us how quickly our country at the end of every supply chain loses access to the inputs its economy depends on.

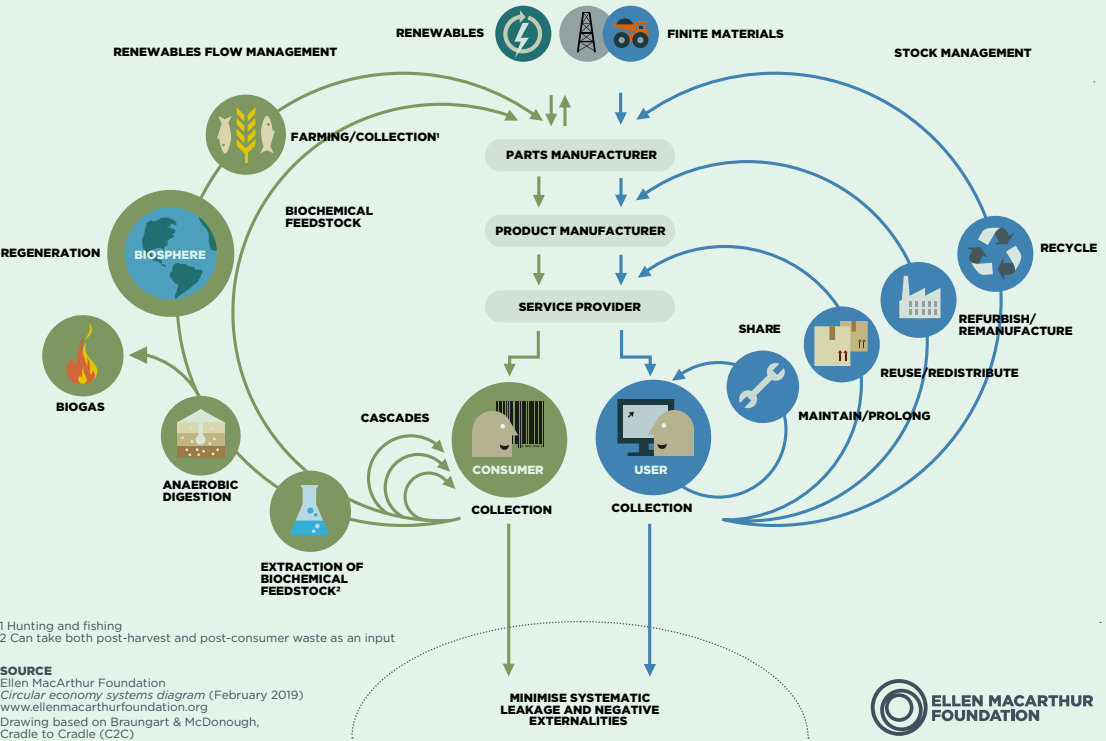
How can a circular economy enable us to retain value and do more with our resources?

Materials resources follow two distinct kinds of flow, with materials source from either biological or from mineral resources. A functioning circular economy keeps the two apart until each can be safely returned to its own cycle with value intact for another or different use.



It is a practical return to the logic of living systems. Creating loops, not lines as we eliminate the use of harmful materials, design for reciprocity to keep resources and value in flow, and regenerate living systems.

Ellen MacArthur Foundation Circular Economy Systems



The principles and enablers for a circular future here in Aotearoa New Zealand.

Drawing on the global foundations, a decade of New Zealand-specific research and the circular practices already underway across Aotearoa, we put forward three principles that describe what a circular economy does – made possible by three enabling conditions; (1) capital that rewards long-term outcomes, (2) technology that keeps materials and their information visible and accessible, and (3) indigenous knowledge and partnerships applied in relationship with living systems.

Circular principles:



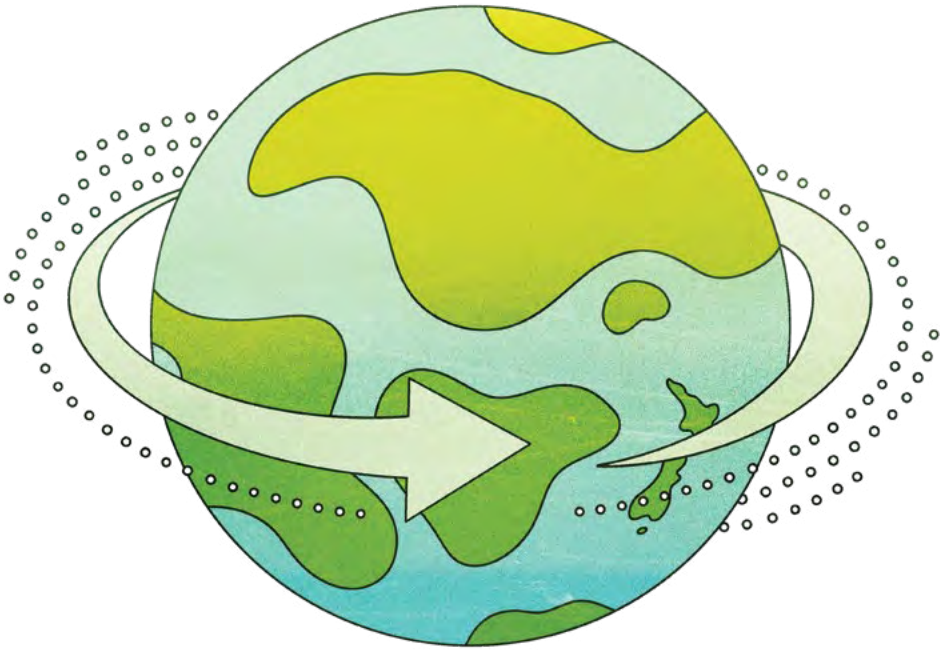
Designs out harm, waste and pollution



Keeps resources in use at their highest value



Regenerates natural systems



Three enablers:



Circulating financial capital



Embedded technology



Applied Mātauranga Māori

What are the principles for our circular future?

01 Design out harm, waste, and pollution.

For circularity to be both circular and restorative, it cannot either create or contain pollutants and waste. The materials moving through the biocycle system must be safe, separated from the technical cycle and returned to the earth as nutrients. That is why in this report, the first principle of the circular economy we apply is not just to design out waste and pollution, but to design out harmful materials.

A circular economy prioritises keeping materials in use and at high value, and utilising bio-based resources to regenerate living systems. But if we use resources that we cannot safely return to the world, we cannot make them circular.

What this means in practice:

Remove and replace toxic materials before designing for reuse and regeneration:

PFAS (per- and polyfluoroalkyl substances), the “forever chemicals” found in food packaging, firefighting foam, waterproof textiles, and an enormous range of industrial applications, do not become less persistent or harmful if we keep them in use longer. They cannot be safely returned to soil or water, meaning they accumulate, contaminate our ecosystems, and ultimately make their way into our bodies through our water and food systems. A strategy that keeps PFAS-containing products in circulation for longer is not circular economy progress. It is the deferral of a contamination problem.

Design for chemical transparency:

If we don’t understand the chemical make up of our products, they cannot be recovered for reuse. The EU’s digital product passport requirements, being progressively implemented under Ecodesign for Sustainable Products Regulation (ESPR), are premised on the understanding that material transparency is the precondition for recovery. New Zealand businesses exporting to European markets or into supply chains that will enter the EU will need to know, and disclose, what is in their products. Building that capability now is not just about access to the European market - it is about building a material economy that can function in loops because we can identify them.

Prioritise the use of safe materials:

The circular economy’s cradle-to-cradle framing distinguishes between biological cycles (for organic, compostable materials) and technical cycles (for metals, plastics, and other manufactured materials). That distinction only works if biological materials are biologically safe, and technical materials are kept separate until they can be recovered and reprocessed.

The scale of what needs designing out is not marginal. Landfills keep filling up. Even those with the most sophisticated technology emit methane, and the liners preventing leachate have a finite life. Old landfills have ruptured due to extreme weather events, and rising sea levels threaten coastal landfills. Many consumables cannot or will not be recycled, and large quantities of plastic are exported to Southeast Asia, promulgating what has been called “waste colonialism.” Plastics contain and leach harmful chemicals and are shed from tyres, clothes, carpets, and upholstery.

While in use and as waste, these products degrade into microplastics, now prevalent in air, water, food, and living organisms, including humans. Making, transporting, and consuming goods creates nearly half of global greenhouse gas emissions. And most products are short-lived, disposable, made from virgin materials, not designed for reuse, repair, or recycling - when they are wasted and not kept in circulation, so too are their embodied emissions, and more energy and raw materials must be extracted to manufacture and transport their replacements.

The first principle, in full:

Design out harm, design out waste, design out pollution.

02 Keep resources in use at their highest value.

The second principle is to keep resources in use, and at the highest value they can hold, for defined use periods. This is where the difference between a circular economy and “less or zero waste” becomes clear.

This creates a clear ladder of levers representing strategies with increasing impact in terms of resource efficiency and decarbonization.

- Recovering and recycling materials at the end of life, so that nothing is wasted, technical materials are restored, and biological materials are regenerated.
- Repurposing, remanufacturing, or refurbishing products, reusing components to build new products.
- Repairing or simply reusing devices so that products have a long life.
- Reducing the material footprint overall and rethinking how a product is used or if a product is needed at all.

But there is also a clear business value that has so far been hiding in plain sight:

Recycling a plastic bottle into broadloom carpet fibre keeps the material out of landfill, but it also downcycles it: the material drops to a lower-value use, where its next 'home' is a landfill. Reuse, repair, and remanufacture keep a product's original value intact instead of letting it degrade, building resilience, regulation readiness, risk reduction and relationships.

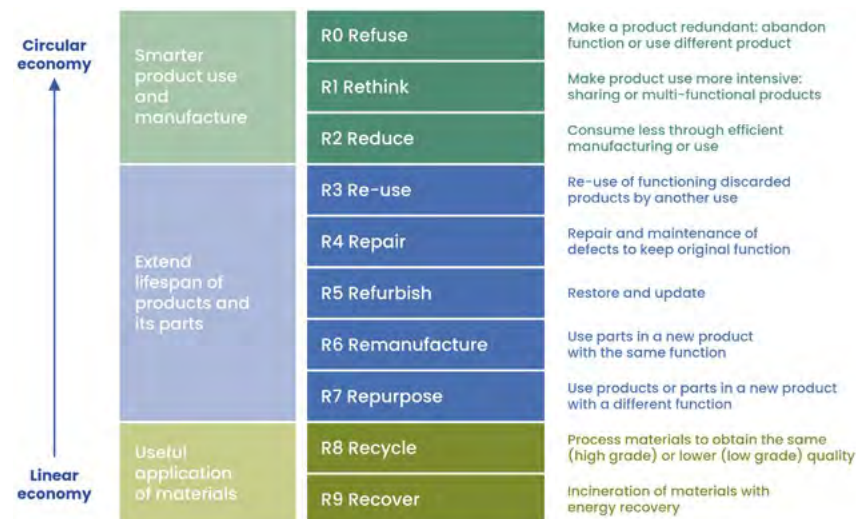
“The critical task for business leaders is not to increase circularity for its own sake, but to convert circular levers into measurable business outcomes. That conversion requires financial discipline. The direct business case may be visible in resale margins, lower material inputs, or improved asset utilization. But the real economic impact often lies beyond those immediate effects. Leaders who evaluate circularity narrowly risk underestimating its value.”

– Binder, J., & Braun, M. 2026

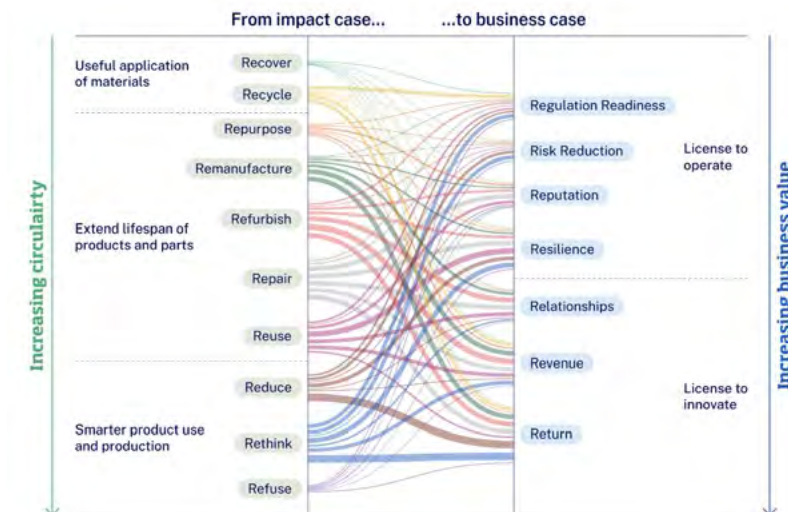
New Zealand's circular economy work has tended to default to recycling, treating end-of-life recovery as the whole strategy rather than a well considered final stage after many reuses. **Elevating the second principle in practice means redesigning products and investing in the systems that let a product be maintained, repaired, or remanufactured before it is ever recycled, not instead of recycling, but well ahead of it in the sequence. It also helps 'slow the flow', avoiding replacement and reducing volumes within a waste system already under stress.**

The measure of success under this principle is in the value unlocked from a single resource across its many forms and uses over time.

Most companies still look at circularity through the lens of these 'R-Levers':



Reframing circularity and R-strategies from impact to business case:



Second principle:

Keep materials in flow and at high value.

03 Regenerate living systems.

An economy that only slows the rate of extraction is still extractive. That's why regenerating living systems sits at the centre of the World Economic Forum's definition of the circular economy, supported by the renewable energy transition and a responsibly sourced material supply, enabling ecosystems to recover and thrive. Systems, products and services that leave soil, water and biodiversity in better condition than they found them, not only avoiding the use of harmful materials, but actively restoring the natural systems our economy and society depend on.

This is the standard for a circular economy.

One where ecosystems are restored through reciprocity: restoring what has already been lost and regenerating nature for future generations.

To give more than we take.

Around 90% of global biodiversity loss linked to land use comes from extracting and processing raw materials. Every existing material we keep in circulation, through reuse, repair and remanufacturing, is a material we do not need to mine, log or drill for again, keeping ecosystems intact. Less extraction means less land cleared, less habitat lost and less pressure on the ecosystems our food, water and climate stability depend on. Material and resource circulation can displace virgin extraction, rather than enable rising demand for both.

We already know that Aotearoa's soils, waterways and native forests do not just need protecting; many need active repair, with systems that allow them to flourish.

In the biological cycle, soil, forests and wetlands hold carbon when they are healthy and release it when they are degraded, ploughed, drained or cleared. A circular economy activates carbon cycling by feeding soil with organic waste rather than extracted minerals, ensuring excess food is returned to soil rather than landfill, and designing products that return excess biological nutrients to the ecosystems they came from.

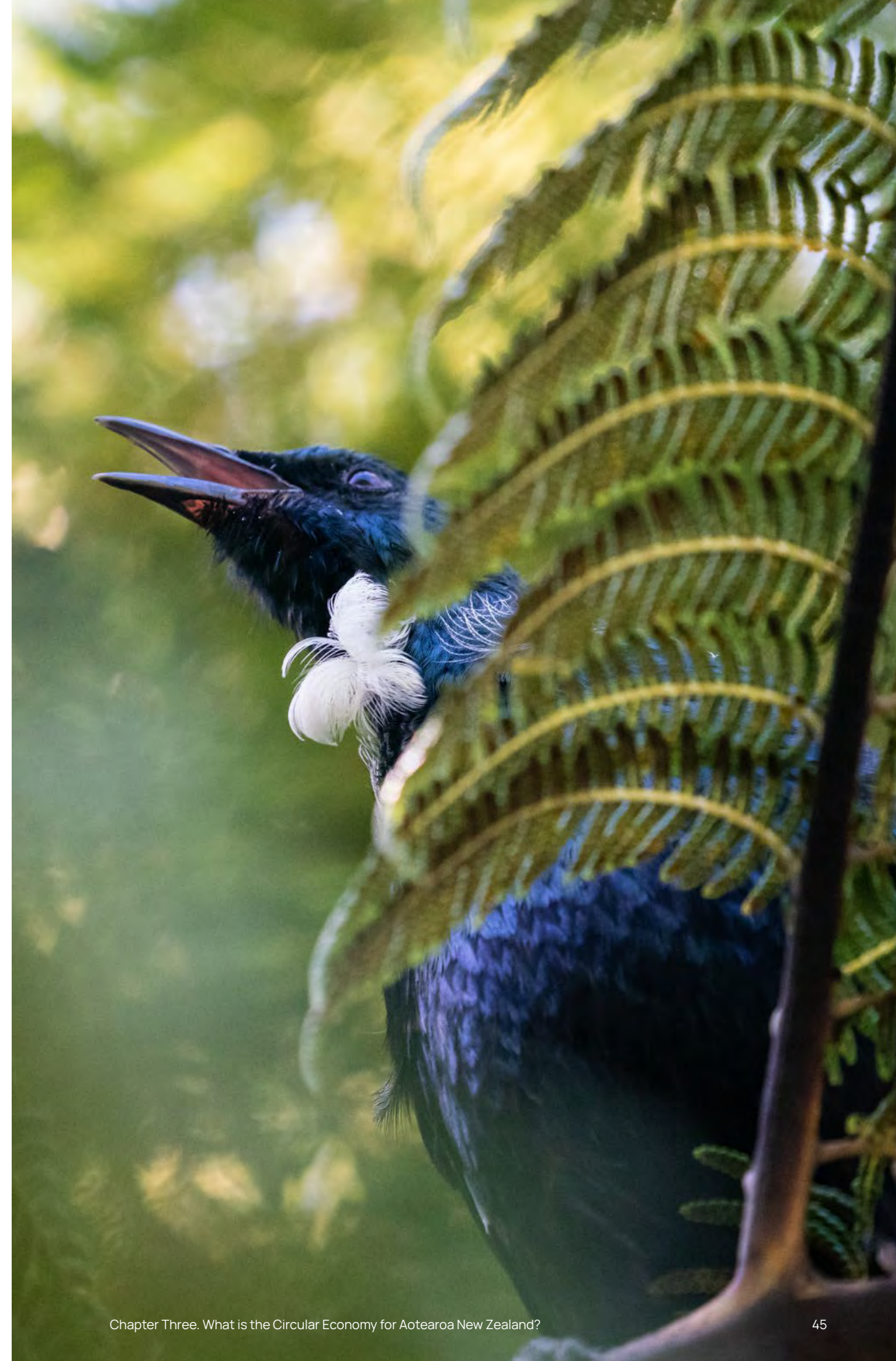
In the technical cycle, carbon that has sat in the ground for millions of years coal, oil and gas, is a different challenge. Once it is extracted and burned, it doesn't return to any natural cycle. It adds new carbon to the atmosphere rather than moving existing carbon around. Keeping materials in circulation alongside a renewable energy transition and a responsibly sourced material supply reduces the pressure to extract more of this stock in the first place. Regenerating living systems means working with the first kind of carbon and reducing our reliance on the second.

For Aotearoa, this principle has a practical edge.

Our economy is built on land, water and living systems: farming, forestry, fisheries and tourism. Regenerating those systems is not a cost we bear just for the planet's sake. It is the maintenance our economic base needs to keep generating meaning and value for generations to come. In practice, this means designing food and fibre systems alongside urban spaces that build social health and biodiversity, with investment decisions that value nature and avoid a reliance on extractive energy systems.

Third principle:

Regenerative living systems.



What are the key enablers for this economy?

We see three key enablers that have the potential to deliver circularity at scale and with depth rather than in isolated pilots. These determine whether the principles can deliver sustained value over time and address the barriers of the dominant take-make-waste system in Aotearoa New Zealand.

→ Circulate Financial Capital.

The three circular principles describe a shift in resource and material use; what we make things from, how long they last, and where they go when they are no longer needed. But equally as important to the redesign of the flow of materials is the flow of financial capital around them.

The financial system that drives our understanding of the health of New Zealand's economy and influences what we invest in is still linear - relatively short investment horizons that do not fit transformation timelines; we lack collateral or security, and funders often have limited patience with impact-driven business models driving collective outcomes.

Our capital allocation, performance metrics, and governance conventions reward take-make-waste business models, benefiting short-term, privately captured returns and, as a result, circular innovations and systems that reward long-term outcomes often never get beyond the pilot stage.

In nature, ecosystems thrive by pooling and cycling resources across scales to survive in volatile and unpredictable environments. In the financial layer, this translates to a mechanism where, at specific intervals, each company within a circular ecosystem contributes a specific, previously agreed upon fraction of its profits or capital gains into a shared pool, which is then immediately redistributed among all ecosystem members.

The circular economy needs a diversity of actors, with dense connections between them, and enough shared coordination capacity to compete with the deeply embedded finance logics of the extractive economy. It requires investment vehicles built at the level of the ecosystem, not just the individual firm, that align the interests and distribute the value across everyone in it.

Circular ecosystems: the reverse logistics networks, regional processing hubs, and material recovery infrastructure that connect farms, businesses, and communities — succeed or fail together. But when a first mover invests in shared infrastructure, they carry the risk alone. Two financial mechanisms help resolve this tension and support ecosystem investment:

- 1. **Cross-entity risk pooling.**
- 2. **Distributed governance and agency.**

In practice, this looks like coordinated, multi-capital strategies where philanthropic, concessional, and market-rate capital reinforce each other. Credit guarantees and concessional financing for shared infrastructure, as Canada has identified as essential for food processing. Low-interest loans to de-risk circular business models in their early years. Micro-credit for smallholder farmers and early-stage innovators. Government co-investment alongside private capital where the returns fall across the system rather than to a single investor. Multi-stakeholder incorporations and employee or community ownership structures.

Circulating financial capital is not entirely new territory. Product stewardship, extended producer responsibility schemes and eco-modulation are a form of circular finance — they shift end-of-life costs from councils and consumers to brands and importers, using taxes to create dedicated funding streams for product redesign and recovery infrastructure. But they operate at the product level.

What is needed alongside them is ecosystem-level finance: capital that builds, maintains, and repairs the shared infrastructure the whole system depends on, and circulates regeneratively rather than being extracted.

We may also consider whether taxing resource use, rather than labour's efforts, may shift the dial on productivity, price the real cost of resources, and help bring together new forms of values-based finance.

Circularity is not only a material design challenge. It is also a financial one. A circular material economy layered on top of a financial system still built for short-term, extractive returns will always be pulled back toward linearity. Genuine circularity requires complementary change in both layers — how materials flow, and how money flows for the majority, not a few.

Enabler:

Circulate capital, not just materials.

→ Make flows visible and accessible through digital technology.

To design out waste, circulate materials and regenerate our living systems, we need to know what exists, what condition it's in, what it could still do, and who could use it next.

That means treating visibility and capability as one enabler, not two. Digital technology is an essential enabler - from accessible, up-to-date data and interoperability standards to practical tools.

Information about our materials, resources and living systems has to move at the level of the whole system - travelling with a paddock, a building or a piece of infrastructure as it changes hands, rather than sitting inside one firm, one platform or one grant-funded pilot. Information about existing resources, materials and infrastructure has to arrive paired with the funding and expertise that let citizens and businesses actually engage with what they can now see, not stop at the fact that they can see it.

In practice, this looks like:

- **Visibility itself.** Sensors, digital twins and material passports that make a wall cavity, a battery or a paddock's soil health visible, rather than left to memory.
- **Matching at speed.** Data and AI that connect a residue to a processor, or a grower to spare processing capacity, faster than any directory can manage.
- **Verification without a gatekeeper.** Records that are decentralised and verifiable, so no single platform ends up owning the information the whole system depends on.
- **Funding that follows the visibility through.** Grants and wraparound expertise that get a producer past the compliance load of using shared infrastructure — not just a database that tells them it exists.

A shared regional processing hub does its job fully only when both things are true at once: everyone knows it exists, and a small producer has the expertise they need to navigate using someone else's infrastructure to build their new circular product or supply chain.

“Digital Product Passports present an opportunity to communicate a range of circularity-related information to EU consumers, increasing transparency and trust in a market which values provenance and sustainability credentials.”

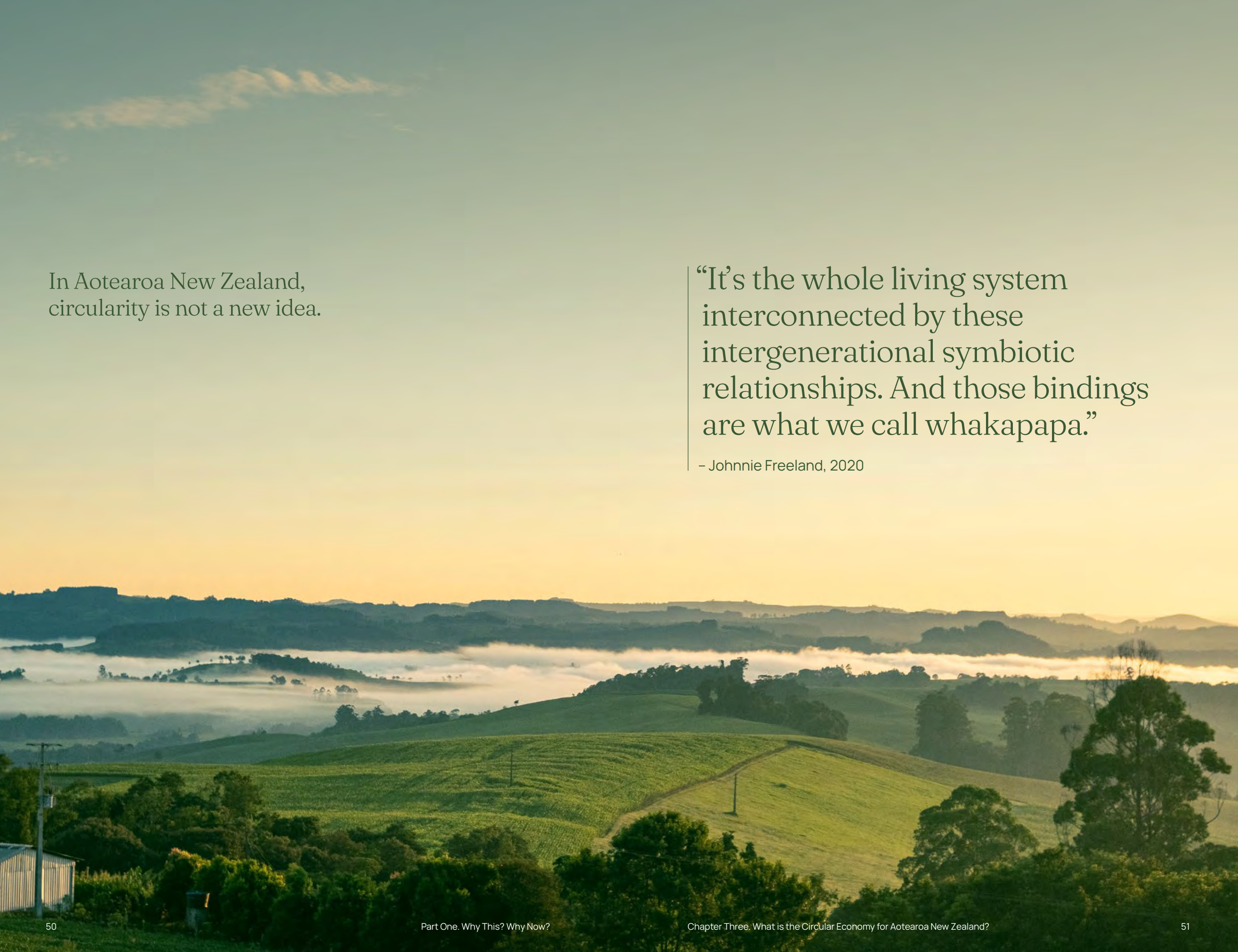
- MFAT, 2025

This is not entirely new territory - digital product passports are already becoming a market access requirement into the EU, and New Zealand businesses are starting to build the domestic equivalent. But most of what exists solves visibility at the level of a single product or platform. What is needed alongside it is ecosystem-level visibility: information that moves with the same reach as the materials and capital it describes, and stays usable by whoever needs it next, under Te Tiriti obligations and Māori data sovereignty protection, rather than owned by whoever built the system that first made it visible.

Built this way, technology carries Te Tiriti obligations, kaitiakitanga and Māori data sovereignty. Built the wrong way, it becomes the newest form of extraction.

Enabler:

Make flows visible and accessible.



In Aotearoa New Zealand,
circularity is not a new idea.

“It’s the whole living system
interconnected by these
intergenerational symbiotic
relationships. And those bindings
are what we call whakapapa.”

– Johnnie Freeland, 2020

→ Apply indigenous knowledge to our relationships with living systems.

Te ao Māori holds a relational understanding of people, place, resources, reciprocity, and responsibility through whakapapa, mātauranga, and lived practice.

Through whakapapa, we understand that we belong to each other and to place. Through kaitiakitanga, we feel the obligation that comes from belonging. And through mauri, we feel the living health of a river, a soil, a community. People are not separate from nature.

In te ao Māori there are a number of principles, belief systems and ways of being that are expressed in, and go beyond, the primary principles of the circular economy. Circularity isn't just a materials framework, but a relational one: recognising the origins, obligations and impacts connected to every resource, product, system and decision through relationships, reciprocity and intergeneration care between whenua, wai, ngahere, moana, kai, materials, communities and those yet to come.

Te Takarangi, developed by Project Moonshot's Teina Boasa-Dean and Juhi Shareef in 2019, reimagines economist Kate Raworth's Doughnut Economics through a Tūhoe Māori perspective, adapting indigenous double spiral concepts into an inversed model with the environment at the centre. Āmiomio Aotearoa, a research programme based at Waikato University, have developed circular and wellbeing frameworks that embed Mātauranga Māori, helping expand circularity beyond materials and waste into outcomes for oranga, mauri, place, long-term system health, tapu and noa.

“The Māori economy can act as a catalyst, to help transform Aotearoa, New Zealand's economy to be more circular with Mātauranga Māori and systems approaches to guide decision-making across key priority areas of housing and food.”

- The Connective, ARUP, Project Moonshot (2024),

There is no single universal 'te ao Māori framework' for circularity or reciprocity.

Different iwi, hapū, whānau, researchers and practitioners carry different knowledge and responsibilities, shaped by place and whakapapa that help locate circularity in Aotearoa as something already being explored, practised and led here, from whakapapa-centred framings of wellbeing (oranga) and mauri, to contemporary reinterpretations like Te Takarangi and other Māori doughnut perspectives, to kaupapa like Āmiomio and place-based initiatives in kai systems. Here, we highlight just some of these written and practiced frameworks and kaupapa -

- **Para Kore** works from a Māori worldview toward zero carbon, zero waste whānau, hapū, iwi and hapori Māori, connecting circular practice with mātauranga Māori, behaviour change, community resilience and climate action.
- **Kore Hiakai's Kai Motuhake** guides us with pathways to food sovereignty through re-indigenisation, relocalisation and the right of communities to determine their own kai futures.

- **Murihiku Good Food Road Map** gives this a place-based expression through five pou: Whakanui Murihiku / Celebrate Southland, Nō tātou / Locally led, Hei oranga / Food that nourishes, Kore hiakai / Zero hunger, and Pakari tonu / Resilience. This was built on the Good Food Road Map framework developed in South Auckland. Mana Kai, Aotearoa Circles' values-led framework for shaping a national food roadmap, is also grounded in te ao Māori.
- **Rautāpatu's** work also shows how circularity is being actively tested through kaupapa Māori and community-led change. Through He Kāhui Mano, a 2024 tribal summit with more than 100 participants from across Aotearoa, Rautāpatu explored what a Taiao-centric, regenerative and circular economy could look like in practice. Their conclusion was clear: circularity cannot only focus on keeping materials in circulation; it must also redesign the economic system that shifts the true environmental and social costs of production onto te taiao, communities and future generations.

Enabler:

Actively apply Mātauranga Māori.

Our circular future can go beyond closing material loops to create self-healing systems that build resilience and unlock equitable value for our people.



Restoring relationships and the whenua, upholding Te Tiriti, enabling rangatiratanga and community self-determination, and creating value in ways that are accountable to place are central to unlocking a potential within our future that goes deeper and further than materiality.

Here in Aotearoa New Zealand Te Tiriti o Waitangi is foundational. How we transform our economy must honour and strengthen leadership by Mana Whenua, navigating together who decides, who benefits, and how we restore what has been taken, shifting policy and investment to elevate mātauranga Māori practices, te ao Māori frameworks and kaupapa Māori initiatives.

This report utilises the primary principles of a circular economy – which is a Western framework. We use this because it is the language of our trading partners, regulators, and financial systems and using these principles connects New Zealand to the language, measurement tools, and policy architecture of our global markets and international standards. The technical principles formed under the definitions of a circular economy help us imagine a new economy for Aotearoa New Zealand.

The values that are held by tangata whenua are how we understand who we are and how we hold ourselves. In Aotearoa circular economy principles can align to the foundation of te ao Māori principles and worldviews in ways that must be honoured and strengthened by all of us.

We can show the world what it means to retain and restore value as humans in relationship with place.

Circular policy is emerging as a proven path to meeting the needs of our citizens, economy, and Aotearoa New Zealand’s place in a changing world.

A circular economy promises long-term value creation, resilience and supply security. Which is why we see enabling legislation and investment for circularity being implemented across our trading partners’ economies.

China, our largest trading partner, released a new five-year plan for the circular economy in July 2026, targeting a 16% lift in resource productivity, 510 million tonnes of secondary resources recycled annually, and an 8 trillion yuan recycling industry by 2030.

India is moving in the same direction, with NITI Aayog’s January 2026 reports on vehicles, tyres and batteries feeding a rapidly expanding Extended Producer Responsibility regime. Australia has committed to recovering 80% of its resources and increasing material productivity by 30% by 2035, and is implementing the trade policies to match.

The EU Circular Economy Act, Ecodesign for Sustainable Products Regulation, and supply chain disclosure requirements are progressively reshaping what it means to access European markets. Digital product passports will soon be mandatory for almost all physical goods entering the EU, including those manufactured or processed in Aotearoa New Zealand. The EU’s Carbon Border Adjustment Mechanism is adding a further layer of trade compliance that rewards low-emissions, circular production.

Scotland has legislated circular economy targets through its Circular Economy Act 2024, and Ireland has built a coordinated national strategy with dedicated investment and measurement systems.

No country can achieve a circular economy on its own.

Rather, all are dependent on international trade to secure affordable and reliable access to a wide range of different materials, goods and services.

This includes the trade in circularity-enabling goods (such as remanufacturing and recycling equipment), services (circular design skills, leasing or rental services, and repair services), relevant intellectual property rights, affordable second-hand goods, secondary raw materials and non-hazardous waste and scrap that can be recovered for use in primary production, and food and biomass (regeneratively produced, diverse or upcycled).

The combination of all of these types of trade flows can be considered as ‘circular trade’. With 101 national circular economy roadmaps and strategies, many of which are our trading partners, 33 of which are embedding circularity into their trade architecture. These countries are aligning industrial policy with circular economy principles to build sovereignty through retention and efficiency, positioning themselves for competitive advantage in a resource-constrained world. We are well positioned to build on what has worked in countries implementing circular economy strategies and also learn from policies that have not worked well, as there is mixed effectiveness of international circular policy.

“Policymakers at local, national, regional and global level should pay urgent attention to how the bioeconomy could shape the climate path going forward – the resource efficient circular bioeconomy alone is projected to reach a value of USD 7.7 trillion in 2030 (WBCSD, 2020)”

- Gomez San Juan, M., Harnett, S. and Albinelli, I. 2022.

Globally we’re seeing leading companies shift from using this as a sustainability commitment, to a core competitive strategy.

Redesigning products for durability and repair, capturing value through resale and remanufacturing, securing their material base against price volatility and supply disruption. The more circular a company is, the lower its risk of debt default.

To stimulate investment and redesign for circularity, B Lab's 2026 overhaul of B Corp certification replaced its old blended scoring system with seven mandatory, independently audited standards, one of them a stand-alone requirement for circularity. A business can no longer offset weak environmental performance with strong governance elsewhere. For the growing number of New Zealand exporters who hold or are pursuing B Corp status, currently around 183 in New Zealand, circularity has stopped being one signal among many and become a baseline they are independently audited against.

The question is no longer whether New Zealand will need to engage with circular economy requirements, it's whether we engage proactively, building capability, setting standards, and capturing the advantage of early alignment – or scramble to comply with rules set by others, at a cost we have not yet priced in.

Here in Aotearoa New Zealand, over 80% of businesses agree transitioning to a circular model is critical to their future, nearly half admit they lack the confidence, skills, or practical tools to actually execute.

- XLabs participating businesses

This knowing-doing gap stems largely from historic reliance on end-of-the-line management rather than upstream solution redesign. We know that up to 80% of a product or asset's environmental impact is locked in during the initial design stage.

Standard business-as-usual frameworks leave teams ill-equipped to map complete material lifecycles or engage in the radical, cross-sector collaboration required to keep materials and data in continuous flow. Consequently, many organisations remain stuck in theoretical strategy, passive reporting, or isolated incremental tweaks.

Bridging this gap requires moving beyond generic sustainability theory into rapid, hands-on capability building and system mapping. Insights from Circularity and XLabs circular design program demonstrate that when cross-functional teams are equipped with practical design tools that bring together science, technology, design, and regional stewardship, the shift from strategy to solution design and execution can happen rapidly. By creating dedicated space to prototype solutions alongside ecosystem partners, over 88% of participating businesses successfully implemented circular changes within 12 months.

However the gap remains when siloed structures are unchanged, and the system is not set up to enable circular transformation.

“New Zealand’s small steps towards a circular economy have to date mostly epitomised ‘weak’ circularity, focusing on economic growth rather than human and environmental wellbeing, and on waste management rather than reducing the amount of waste that needs disposing of.

The need for greater circularity in our production and consumption systems, however circularity is understood, is undeniable given the scale of interlocking ecological and social challenges we face.”

- Hodge, Barrett, and Kurian (2025)

Circularity can fully redesign the system — or only solve for short term solutions at its end.

01 Weak circularity.

Weak circularity has a narrower focus on market-led approaches, entrepreneurship, and changing consumer behaviour, with an expectation that economic growth will be maintained or accelerated. Thus, it places more emphasis on recycling and technological innovation for materials at the end of their (short) life, without redesigning products and business models to avoid the use of harmful resources and retain value.

Āmiomio Aotearoa research distinguishes between these two approaches as: weak circularity or strong circularity, the former being our current trajectory.

02 Strong circularity.

Strong circularity focuses on the economy's entire flow of materials across the full spectrum of impacts at extraction, production, transportation, consumption, and disposal, with the government taking active leadership through regulation, incentives, and education to support all principles and enablers of circularity. Unlike weak circularity, the strong version balances environmental, economic, social, and cultural value.

This paper advocates for strong circularity.

Shifting from a weakened circularity 'bolt-on' approach to 'built in' by embedding a systems view of circularity into policy, legislation and future thinking. **That's our unlock.** Aotearoa New Zealand has the potential for a version of strong circularity that's grounded in te ao Māori. One that measures success not only in material productivity and emissions reduction, but in te ora, in the health of whenua, wai and communities, in the restoration of relationships that the linear economy disconnects.

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CIRCULAR

FUTURES

Progress towards a circular future already exists in pockets across Aotearoa New Zealand.

We have the natural resources, the renewable energy, and the innovative capacity to circulate materials, nutrients and value in ways most countries cannot. Most of what Aotearoa New Zealand needs for a circular future already exists; but it is unevenly supported and disconnected.

- **Māori enterprises are here.** Practising closed-loop food and fibre enterprises grounded in values that predate the language of circularity by centuries.
- **The regenerative producers are here.** They are running solar-powered, fossil-fuel-free and regenerative operations that would have seemed implausible five years ago.
- **The researchers are here.** They are producing globally cited work on nutrient recovery, biological systems and circular design.
- **The natural resources are here.** MBIE has identified thirty bioeconomy platforms that could help New Zealand create more value from the biological resources we already have, rather than relying on higher extraction and lower-value commodity pathways. The Sustainable Business Council and Climate Leaders Coalition have valued an innovation-driven, low-emissions pathway at \$22 billion in additional GDP per year by 2035, rising to \$33 billion by 2050.
- **The businesses are here.** Forest Lodge runs a fossil-fuel-free orchard at commercial scale. Ecogas operates the country's first commercial-scale anaerobic digestion facility. Phoenix Recycling recovers solar panels and batteries. Green Gorilla recovers and recycles construction materials.
- **The innovative systems and technologies are here.** Wellington's buses and NZ Post's fleet are electrifying deliberately. Solar panels are becoming more and more affordable. The Bioeconomy Science Institute is turning by-products into high-value ingredients.
- **The community organisations are here.** Reuse Aotearoa identified 456 discrete reuse, repair and share initiatives across the Wellington region alone. Whenua Warrior has built more than 250 māra kai with communities. Murihiku networks move kai daily through marae, growers and food hubs. Zero Waste Aotearoa have established a social enterprise, Localised. Repair Network Aotearoa and Repair Cafes Aotearoa are supporting a new generation of skilled repairers.

These are just a few of the many examples that exist in our economies and our communities. We have strategies related to food, fibre, energy, waste, freight, infrastructure, manufacturing, climate and regional development, and we have circular solutions within each.

The challenge we now face is that whilst each industry or sector may have its own map, mandate and logic, the full value potential of circularity sits in the spaces in between. To realise that, we need to join the dots on resource use, material flows and the circular systems that make it valuable.

“A circular future cannot work as a programme bolted onto government, a habit asked of citizens, or a compliance line for business. It has to be built into the system - from policies that assume it, standards that design it, investment that backs it, and a future being designed for rather than reacted to.”

– Circular by Nature (2026)

We are yet to realise the full potential of the circular economy in Aotearoa New Zealand.

Opportunities exist in connecting the spaces in between industries, sectors & regions.

Part of why the full potential of the circular economy has been difficult to realise is that the value it creates does not sit neatly inside one sector, industry or business.

When biomaterial waste from housing material production is used to heat boilers for glasshouse food production. When the EV battery leaves the transport system and enters a rural community to provide off-grid energy storage in its second life. When the farmer sends his produce for processing, its biological residues are used by the processor to create biomaterials, high-value ingredients and energy.

When locally grown harakeke, wool, hemp and forestry products are used in our homes, interiors, packaging and everyday goods, replacing imported fossil-based materials. When the deconstructed buildings are the material bank for the school upgrade. When school lunch contracts connect growers, kitchens, marae and food hubs, keeping kai, money and capability circulating locally.

These opportunities have not been realised.

They exist in the spaces between sectors, and are largely invisible to policy in Aotearoa, New Zealand. What bridges this gap is connection, powering networks with data and transparency. In a cost-of-living and productivity crisis, these are opportunities Aotearoa New Zealand can no longer afford to lose.

By making the circular economy real for decision-makers, we make it actionable.

Circularity exists in Aotearoa New Zealand, but it has yet to be leveraged by decision-makers to improve everyday life.

The values exist. The research exists. The community of practice exists. Business innovation exists. What has been missing is the picture of where it all leads, the translation into the language of decision-makers and the policy decisions that would turn existing momentum into a national system.

The question is not whether there is value in circularity. It is whether we have the courage to envision circular futures so that we can do what it takes to build it strategically and systematically.

Circular by Nature builds on all of it by creating:

- 01 **A vision that makes circularity real.** Expertise and evidence has been drawn on to create a picture of what the circular economy looks like in practice, through the everyday lens of how we live, eat and move: the landscapes where farms generate their own energy amongst diverse foods, and by-products become ingredients. The street where repair is the easy option and buildings are made to be unmade. The transport corridor where batteries live twice and cargo bikes replace diesel vans. These are not aspirations. They are already operating in fragments across Aotearoa New Zealand and at scale in other countries, assembled into a single vision so that a farmer, a manufacturer, a council officer, and a minister can all see what they are building toward and find their role in it.
- 02 **The evidence is translated for decision-makers.** This paper draws on a decade of New Zealand-specific research, case studies, and the practical knowledge of communities, businesses, and iwi across the motu, and translates it into the language of boardrooms, ministerial offices, and council chambers. It is written for the people who have not yet made circularity a priority, not for the practitioners who already understand the case.
- 03 **The policy architecture to make it happen.** Our opportunity is to shift circularity from a weakened, bolt-on approach to one that is built in: embedded in policy, legislation, and the way we plan for the future. That starts with restoring momentum, prioritisation, and coordinated actions across the system.

Circular by Nature exists to make our circular future visible — with the strategic recommendations to make it actionable.

Before publication, we engaged with industry and communities to test, challenge, and build on its findings. It is designed to be authoritative and shared.

Visioning the circular future we experience through the way we live, eat and move in our everyday life.

Given 72% of all natural resource use in Aotearoa New Zealand are for the basics of food, housing, infrastructure, and mobility – we've chosen to focus on how we live, how we eat, and how we move in a circular future.

Each opens with the a reminder of what our everyday life looks like, followed by a vision of what circularity looks like in practice, grounded and guided by named New Zealand examples.

Together they make the case that the circular economy is not a theory, a policy preference, or an environmental programme. It is how we build an economy that generates value rather than destroys it.

With strong circularity applied to how we live, how we eat and how we move.

How we live.

Our homes, our communities, our places of work and learning. How we build, power, and maintain these spaces; and how we care for and share our resources locally. Whether what we make and what we buy can be repaired, reused and recovered into perpetuity.



How we eat.

Our flow of nutrients and nutrition from soil to shelf to soil again. How we grow, process, distribute, and consume food, and whether the value embedded in what we produce is accessible across our communities.



How we move.

Our transport, our freight, our energy systems. How we move people and goods, what our vehicles and infrastructure are made of, and whether we plan for the full life of assets or let their materials end up in the ground as pollution.



HOW WE LIVE

We start in the household, because that's where New Zealanders recognise themselves first. From there, we follow the flows of valuable resources and reciprocity.

LIVE

At a glance.

This chapter follows what comes into a home, what happens while it is there, and what is left when we stop using it. It makes the case that the flow of products through our lives can be redesigned — not through individual sacrifice, but through better infrastructure, smarter systems and clearer rules in partnership with businesses, communities and councils. That way, the circular choice becomes the default choice.

Industries

Construction and building, infrastructure and utilities, packaging and fast moving consumer goods (FMCG), textiles and clothing, household goods and appliances, electronics and technology, retail, waste and recycling services, repair trades.

Materials

Building materials (timber, steel, concrete, plastic), packaging, textiles and fibres, e-waste and electronics, household and consumer goods.

Focus areas

Local resource resilience · repair, reuse and sharing networks · design for durability and disassembly · digital material passports · waste and pollution reduction · place-based community systems



CURRENT STATE

Kia whakatōmuri te haere whakamua.

I walk backwards into the future with my eyes fixed on my past.



The linear economy is an increasing cost and a risk for New Zealanders.

Walk down any street in New Zealand on collection day and it **looks** like a system working.

Recycling bins at the gate in a row, one household after the next, out before seven and emptied by nine.

There are 1.78 million households doing this, on the way to more than two million this year, home to 5.3 million people. They sit inside 2,700 defined urban and rural communities, 306 of them suburbs of Auckland alone, governed by 67 territorial authorities, alongside 650,000 business locations and more than 7,400 places of learning.

But the bin is not the system. It is the last two metres of it, and by the time something arrives there every decision that matters has already been made somewhere else... in a factory overseas, in a design meeting, in a building consent, in a procurement contract signed a decade earlier.

The household is handed the object and the obligation at the same moment, and when it comes to understanding what to do with it at end of its life, they are given instructions for the packaging if they are lucky.

Our consumption-based resource use grew by 85 to 90% between 1994 and 2019 while our economy roughly doubled, which means we are using more for every dollar of growth, not less.

21t resources used per person annually

A typical New Zealander uses the equivalent of ten passenger cars of natural resources to support their lifestyle.

60% of these resources are imported

The majority of our resources are extracted overseas to meet our domestic demands.

2% of our inputs are from recycled materials

Recycled materials account for just 2% of our resource consumption.

Inside the house, the linear economy stops being a statistic and becomes a set of small, familiar defeats.

Most of what we send to landfill however, never passes our kerbside waste and recycling system.

None of that is an accident either.

The appliance that costs more to fix than replace, because it was never designed to be repaired. The jacket that came apart after one season. The old mattress, the broken office chair, the cot that no longer fits anyone, hiding in the garage because nobody knows where else it could go. The packaging that had one job and one journey.

Households pay for products designed for replacement, and then they pay again to dispose of them, and the second payment is treated as a council service rather than a design consequence.

Construction and demolition waste made up about 69% of everything disposed at levied landfill facilities in 2023, roughly 5.25 million tonnes, and soil accounted for around 78% of that.

There is a truck leaving a building site somewhere in this country right now carrying dirt to a hole in the ground.

Building rules do not require circular outcomes at scale. Consents do not require material passports or deconstruction plans. Procurement is not used consistently as a market signal for durability, repairability, reuse or secondary materials, despite the size of the public purse in the built environment.

The decisions being made this year determine what can be recovered across the next thirty to fifty years. We are currently living inside the consequences of choices made before the 1970s.



We are sending soil to landfill. In a country losing 182 million tonnes of eroded soil a year to its rivers, we are burying the one material we cannot manufacture.

4.1Mt

We send millions of tonnes of soil to landfill every year.

Then there is the plastic, which is in almost everything and almost never alone.

Complex household goods such as textiles, furniture, mattresses, electronics, appliances have plastic bonded to foam, to metal, to adhesive, to fabric, in combinations no recovery system can separate economically.



And some of what is in these products is why they cannot come back at all.

Meanwhile New Zealanders are doing everything they have been asked to do.

People are already doing the work. What is missing is the supporting infrastructure.

The additives that make things durable, fire-resistant or water-repellent also make them problematic, and when a product's chemistry is unknown, disposal quietly becomes the only option because of contamination risk.

Harmful content does not close one circular pathway. It closes repair, resale, remanufacture and recovery at the same time, which is why the intervention has to happen before the product is made rather than after it is finished.

At the design stage.

In 2025 kiwis passed around 22 million individual items through more than 700 op-shops, diverting 8,800 tonnes of clothing and textiles. In the same year, 107,000 tonnes of clothing went to landfill, with only 6% reused or recycled. Including carpet and every other textile flow and the figure passes 240,000 tonnes a year. Behind any op-shop in the country is a back room with bags stacked past the point anyone can sort them, and a volunteer triaging donations due to low quality fast fashion imports.

The structural barriers our citizens face are compounded by everyday constraints on households and small businesses, including time, cost pressure and awareness, which is why the system has to make circularity the default.

Reuse Aotearoa's 2026 research for Wellington City Council counted 456 discrete reuse, repair and share initiatives across the Wellington region – a far larger base than most decision-makers assume. Commercial operators run 78% of them. Community and non-profit organisations run 18%. Council-run services account for 5%. Māori-led initiatives are fewer than 2%.

These initiatives are well-used and valued by communities. Public demand is not the problem. **The problem is viability and geography.** The key barriers are financial sustainability and access to appropriate premises, not lack of interest.

Without structural support, the most community-oriented and accessible services such as repair services, community swap events, shared tool libraries, remain the most financially precarious.

The systems that send material to landfill get long-term contracts. The systems that keep material in use get grant cycles.

For every tonne of plastic we recover, close to six tonnes go into the ground.



Wasted resource: 1.5 million tonnes of plastic enter our economy each year, and of the roughly 450,000 tonnes that emerge as waste, only 15% is recycled.

PCE and Eunomia estimate



We cannot buy our way of this, because the products we would need to buy are not made here.

The constraint has never been what this country can grow. It is what this country can transform. And we have incredible science and innovation ideas.

Emerging insights from Future of Fibre Aotearoa found wool, hemp, leather and hides, harakeke, alpaca, forestry residues and food and agricultural side-streams all hold potential for higher-value use across global clothing and footwear, interiors, the built environment and technical applications.

Value leaks at every point where transformation should happen. We see raw commodity export and offshore processing, thin domestic manufacturing, and weak pathways from research to scale.

It makes sense for businesses to minimise waste and avoid landfill costs. In 2024, research by Aurecon, thinkstep-anz and the Sustainable Business Network for MBIE mapped manufacturing activity across New Zealand and found existing circular activities within their **own** operations that establish energy, water, scrap, by-product, packaging and take-back initiatives. **But the wider opportunity for circular manufacturing depends on place-based relationships, upstream material choices and downstream markets those firms do not control.**

We also have a gap that flows underneath the street.

We currently have a linear approach to our water systems too. Water New Zealand's research shows wastewater treatment plants can shift from end-of-pipe disposal into resource recovery hubs, using advanced treatment, membranes, anaerobic digestion, nutrient recovery and modular technologies to recover water, energy, fertiliser and biomaterials.

Technology is not the challenge.

Source separation, safe inputs, public trust, regulation, cultural acceptability and affordability are what decide whether the loop closes or the pipe simply gets longer.

This recovery challenge now extends to what is on the roof and in the garage: solar and batteries.

The information we are not collecting now is the market access problem of the next decade.

The energy transition is about to run the same test on all of this. Overseas, we have seen what happens when decentralised solar adoption expands faster than the systems to repair and recover. E-waste, pollution and lost local value all arrive together. Are we ready for this? In New Zealand, Phoenix Recycling's nationwide solar panel service, with an EPA-issued Hazardous Waste Export Licence and the ability to recover up to 98% of panel components, is a genuine start. It is also close to the whole of our domestic capability.

Households can return, repair, reuse and sort. They cannot build the place the material goes next. Nor can they see what they are holding.

Most people do not know whether a product can be repaired, what it is made from, whether it is safe to reuse, or where it should go when it is finished, because nobody was ever required to tell them.

These are the failures of the linear household economy, and they have been designed in. They can, and should be, redesigned.



FUTURE STATE

A vision for how we live - caring for what we use.



A house is a place where materials rest in our care for a while.

So we start our vision in the kitchen, because that is where most of us meet the material economy every day.

The shelves hold staples in containers built for return – not lighter or smarter packaging, but containers owned by the system rather than by the household.

The list that filled them was built from what this house actually used last month rather than from what happened to be at the end of an aisle.

The empties go back as unremarkably as the recycling routine.

Those containers do not vanish at the door.

They travel a few kilometres to a wash-and-refill facility that employs people from the suburb it serves, where they are cleaned, checked and returned to circulation, and where somebody's first job is a job that did not exist five years ago.

It is unglamorous infrastructure... a shed, a line, a fleet of crates.

It works because the containers are standardised, the return points are close, and local wash capacity is funded as infrastructure.

It starts in our places of living.

These systems, services and products weave through our homes, our communities, our places of work and learning. Shaped by place and reciprocity, diverse in nature, and enriched by te ao Māori.

Step outside and you'll see the street doing the work the household cannot do alone.

Widen out and the pattern repeats down the street, and the next street, and across the region.

Value accumulates in the places people live and supports skilled jobs, instead of leaking to a landfill.

None of these loops is a stand alone initiative – they are simply the infrastructure of a place that decided to care for what is in use.

The repair café is open more than one Saturday a month, because it has funding skilled staff and ongoing venue hire. There is a tool library and a toy library, and a clothes swap that runs to a schedule people can plan around. Things are passed on, repaired and shared before anyone thinks about recycling, and recycled before anyone thinks about a bin. None of this asks people to care more than they already do. Kantar's circular behaviours research for Circular by Nature found the willingness sitting there in the population, unused. What was missing was somewhere to take it nearby or the reverse logistics to make it easier.

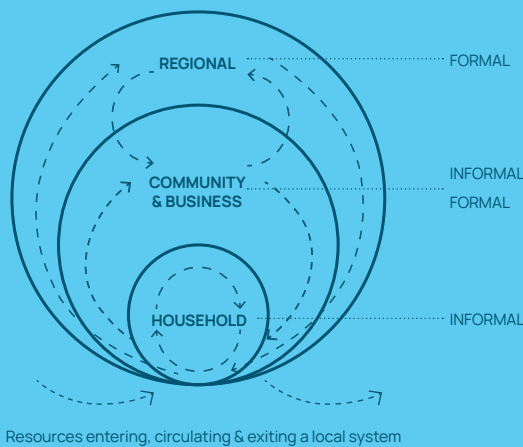
The house itself was built to be disassembled later. Most of it was made off-site, which cut both waste and weeks. A digital product passport records what went into the walls, so that the family repairing a kitchen in fifteen years knows what the cabinetry is made of, whether it can be reused, and who will take it. When components come out they go to a materials recovery hub down the road, or straight to someone who has been waiting for exactly that, and the crew that takes a building apart is as ordinary a trade as the crew that put it up. On the roof, solar. In the garage, a battery that spent its first decade in a car and will spend its second here, moving the hot water and the charging into the hours when the grid has power to spare. When it finally gives out, a take-back scheme recovers what is inside it, and those critical minerals stay in Aotearoa New Zealand.

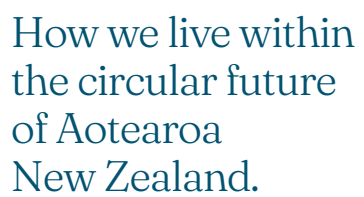
The wool in the carpet was grown four hours away and processed locally. The harakeke in the interior panels has been harvested from a plants that are restoring the whenua and wai. The aluminum windows can be removed and used again, because of the specifications provided through digital product passport information. Clothing is donated to the local op-shop and if it cannot be resold, it is sent to a regional textile recovery facility for decommissioning, sorting and recycling.

The test of whether it is real is what happens when one part is missing. No wash capacity, and the returnable container becomes a nuisance. No sorting capability, and textile waste becomes a cost. No market for a recovered beam, and the deconstruction crew becomes a demolition crew again. The loop breaks at its weakest point, and the cost falls back onto the household that did everything it was asked to do.

Circular living should be designed with mana whenua and Māori enterprises from the outset, uphold Te Tiriti, and protect mātauranga and Māori data sovereignty.

Success should be measured not only by tonnes diverted, emissions reduced or materials recovered, but by whether mauri, oranga, local capability and intergenerational resilience are strengthened.





Key circular flows & features:

1. Consumer goods: Everyday products are reused, taken for refill, repaired locally, remade regionally - all supported by circular packaging systems.
2. Built environment: Buildings are crafted from local, natural materials (such as harakeke and wool) and digitally captured for future repair and reuse.
3. Renewable energy: Decentralised, locally produced renewable energy is shared seamlessly between houses, schools and workplaces.
4. Water loops: Recovery hubs collect nutrients from water systems to renew home gardens and shared parks.

SYSTEM SHIFTS

We need to do more with less, and keep what we do use in circulation. Loops of everyday material flows that help households, communities and businesses retain value locally. Enabling infrastructure is critical.

What system change looks like in order to realise this circular way of living:

- Buildings designed to be unmade and adaptable.
- Bio-based materials become everyday materials and ensure value is retained and circulated within our local economies.
- Nature as infrastructure, not amenity, to grow flood resilience, food security and ecological health.
- Reuse infrastructure that works, from sharing models to reducing single-use packaging.
- Textiles are a valued resource – quality and durability is incentivised and reprocessing infrastructure established.
- Repair as the affordable first option instead of replacement.
- Products designed for repair, reuse, remanufacturing and recycling; including transparency through digital product passports and safe chemistry to enable recoverability.
- Circular water flows that keep valuable nutrients in use.
- Local resource resilience that creates jobs and keeps value within communities.

On the following pages we outline key shifts that address:



How we design, build and choose materials.



How we care for what we use.



How we share across circular households and communities.

HOW WE BUILD

People can donate clothing, but they cannot build national textile sorting infrastructure. They can try to repair an appliance, but they cannot compel a manufacturer to supply the part. They can carry a container, but they cannot build the wash line. They can sort their waste, but they cannot create a market for what comes out of it.

We need connected systems that enable New Zealanders, communities, and businesses to play their role within this future state.

Buildings designed to be unmade.

A building is the largest material decision most people are ever part of, and almost nobody is in the room when it is made. It is also the biggest single flow into landfill in this country, at over half of everything landfilled. Modular construction, adaptive design, material passports and deconstruction planning are the upstream interventions that prevent expensive, irreversible downstream waste. Written into consenting and procurement, they change what a building is: not an object with an end date but a store of materials with a next use.

There is real momentum from industry already, as shown by New Zealand Green Building Council rating tools and certifications - including commercial interior fit outs which are replaced every 5-7 seven years. This is not yet matched by government procurement signals, consenting requirements or the market infrastructure that would make circular building normal rather than exceptional.

Bio-based materials become everyday materials.

Wool grown hours from the house it insulates. Harakeke, hemp, timber, forestry residues and food-system side-streams turned into safe, durable, recoverable material for homes, interiors, clothing, packaging, furniture and community infrastructure. Getting there means building the processing, testing, design, manufacturing and recovery pathways that keep that value circulating here, and designing these materials from the start with standards, traceability, safe chemistry and a defined end-of-use pathway.

Nature as infrastructure, not amenity.

Restored urban waterways, wetland, community food forests, neighbourhood green corridors and soil-healthy food systems, funded for what they do rather than how they look: flood resilience, food security, ecological health. The test is the same one that runs through this whole chapter. Is it in the infrastructure budget, or is it in the community grants round?

Transparent, accesible digital information.

MBIE's 2024 circular bioeconomy research found New Zealand's digital twin development driven primarily by cost efficiency rather than circular outcomes, with barriers around data governance, interoperability standards, skills gaps and Māori data sovereignty... all solvable, with leadership and co-ordination.

Industry is innovating to solve this for itself. We see this in the example of Mutu, a construction materials platform endorsed by the New Zealand Certified Builders Association, which lets site teams list, search and transfer surplus materials between projects before they are rebought, forgotten in storage or sent to landfill. It is not a digital product passport in the ESPR sense but it proves there is working commercial demand for material visibility.



HOW WE CARE

Repair as the affordable first option.

A repair bench is a small thing to look at. A bench, a light, a set of drivers, and someone who knows how to diagnose what has gone wrong – whether that is a broken appliance, a torn garment or a piece of furniture. What it needs in order to exist is not enthusiasm but a lease, reliable parts supply, and the legal right to carry out repair.

Repair Network Aotearoa and Repair Cafés Aotearoa have proved the demand many times over. What they have not been given is standing. The system still treats repair as a community activity rather than an essential service. It leans on volunteer labour, goodwill and under-resourced spaces rather than treating repair as critical local infrastructure.

Scotland's circular economy evidence shows repair and reuse generates eight times more jobs per tonne of material than recycling. These are local, skilled roles that cannot be offshored, in the places where the material already is. Right-to-repair rules, affordable premises, parts obligations, skills training and retailers who stock what they can service are what turn a volunteer Saturday into a trade.

Products are designed with the end in mind.

Products are designed for durability, repairability and useful lives. Parts are available, products can be opened and maintained, and businesses have an incentive to make products that last rather than depend on replacement.

A washing machine that a manufacturer still owns is a washing machine that is made to be used and reused in full and in part. Product-as-a-service models, including leasing, subscription and managed equipment, can reinforce this shift by moving the commercial incentive from selling replacements to providing a durable, repairable product over its useful life. The EU's Ecodesign for Sustainable Products Regulation is accelerating this shift globally, and New Zealand exporters will need to engage with these requirements regardless. Businesses that adapt early can build capability for both domestic and export markets.

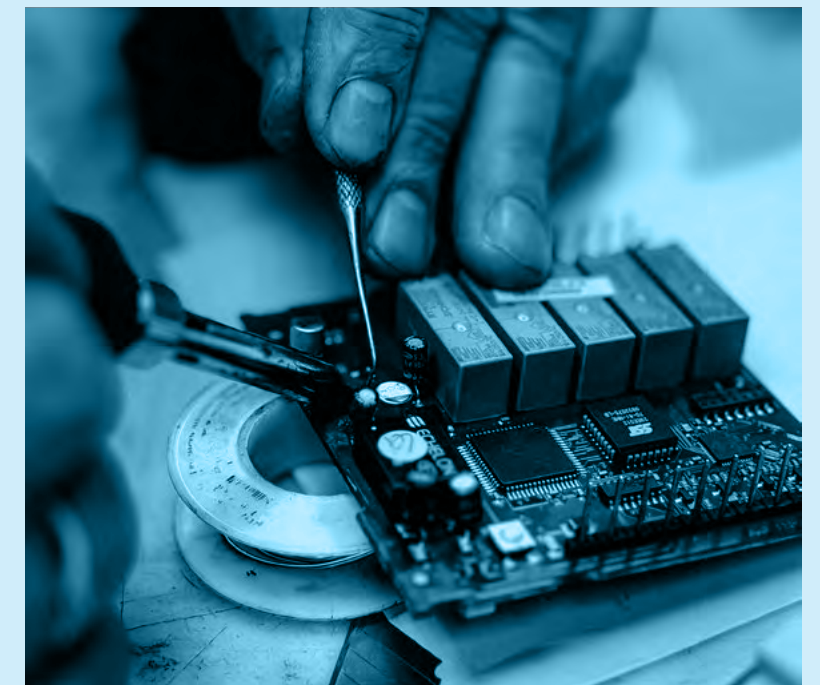
Circular water flows.



Our water infrastructure is designed to do more than supply and dispose. Water, wastewater and natural systems work together to retain value, recover resources and build resilience. Resource recovery hubs connect recovered water, energy, nutrients and biomaterials to productive uses, while wetlands and waterways provide natural infrastructure for managing water and supporting biodiversity.

Safe chemistry to enable recoverability.

Every other mechanism in this chapter depends on knowing what is in the product. Better product information and transparency, right-to-repair, and effective product stewardship shift the default from managing hazardous waste at the end to designing it out at the start. This is also where the circular economy and the bioeconomy meet: forestry, natural fibres and bio-based raw materials can cut import dependence and build resilience, but only if we keep them safe, traceable and recoverable from the outset.



HOW WE SHARE

Reuse infrastructure that works.

Standardised returnable containers for everyday food and drink, with return points as routine as a recycling bin. Local wash-and-refill capacity supporting jobs in logistics and redistribution. Reuse built into workplace and school procurement rather than added to it. Shared tools, equipment and goods through community libraries and hire networks, designed and funded to be reliable rather than merely available. And proper support for the secondary market already carrying this country: more than 700 op-shops, and business-to-business materials visibility tools like Mutu. New Zealanders saved an estimated \$844 million through reuse in 2025.

Textile flows managed as a system.

Textiles are designed to last and stay in use for longer, with repair, reuse and resale supported by the sorting, grading and redistribution infrastructure needed to operate at scale. The quality and volume of what enters the market also matters. Design standards, import requirements and extended producer responsibility shift responsibility upstream to the brands and retailers making and importing clothing, with eco-modulation creating a stronger incentive to move away from low-quality fast fashion.

When textiles can no longer be worn or reused, their materials remain a resource. Textile waste can become insulation or a roading additive, as Australia has shown through Jeanius and New Zealand through the cleantech scale-up UsedFULLY. Households who prioritise natural fibres garments can return them to the gardens as biochar like Kowtow has already proven. A high-ambition regulated product stewardship scheme could generate significant economic value while building the infrastructure needed to keep these materials in circulation, with a potential a net benefit of \$602 million. Yet textiles are still not a priority product for extended producer responsibility in New Zealand.

New Zealanders cannot solve this by making better choices alone. The willingness exists. What is missing is the enabling system.

Local resource resilience.



When resources circulate locally, so do jobs, skills and economic value. A repaired appliance creates local work. Recovered building products sold through a materials hub. A refill system creates activity in local washing, logistics and redistribution. Domestic demand for renewable materials made here can connect growers with manufacturers, keeping more value within Aotearoa. Digital product and material information helps make these flows visible, trusted and recoverable, while enabling rules, finance and infrastructure allow them to operate at scale.

Systems and choices designed to be desirable.

Over 50% of New Zealanders already practice circular behaviours. Imagine if those choices were not just accessible, but the most convenient, rewarding, and desirable option available.

How people perceive, experience, and buy into these products and services will drive their uptake and success. Ease is non-negotiable. Complex systems must feel simple, authentic, and rewarding. Authenticity and belonging matter. Beyond digital passports, objects might be imbued with their whakapapa and future lives. Connecting New Zealanders directly to both source and story of what they buy.

Design is the interface, the invitation, and instruction. Shaping what we desire, what we buy, and how we use, repair and return it. It touches every corner of our lives – from the clothes we wear, the appliances we lease, the apps we use, the food on our shelves, and the brands we align with as markers of culture and identity.

With 80% of environmental impacts locked in at the start, this is creative potential that can't be ignored. Done right, the design of how a product, service or system is made, branded, communicated, and experienced can make these shifts feel like a balm or a delight – simply as a more natural way of living.

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HOW WE EAT

Food is central to our lives.
We follow its flow of nutrients from the
vital soil and waters of place, to the
nutrition on our plates. Tracing the loops
of a living food system that restores value
through diversity and connection.

EAT

At a glance.

Here we explore the circular future of how we grow, make, share, and enjoy our food. We start by understanding what is lost across our current system, and what a food system valuing nutrients and nutrition would look like in its place. This chapter demonstrates our interconnected potential to diversify nutrition, enrich diets, generate better energy, and return nutrients to our soil – replacing short-term extractive productivity with long-term resilience. In doing so, connecting citizens more closely with their kai, and evolving our role on the world stage as a trusted food provider.

Industries

Agricultural, horticultural and crop production, renewable energy, food manufacturing and processing, functional foods and nutraceuticals, retail and grocery, food distribution, education and rescue.

Materials

Soil and nutrients, organic waste and by-products, fertiliser inputs, food product design and processed food, bioactive compounds and energy.

Focus areas

Regenerative practices and soil health · bioeconomy · regional and shared processing infrastructure · by-product valorisation · nutrient cycling · food waste and redistribution · procurement reform · diverse crops and land use · community and connection.



CURRENT STATE



Homogeneous landscapes and expensive, inaccessible foods are harming our health and creating vulnerability for citizens.

When you look out your car window and drive through the New Zealand landscape, to many of us it looks natural.

Nearly half our total land cover is native and the Department of Conservation manages 8.6 million hectares of native forest, tussock and grassland. We have inherited productive landscapes and both rare and unique biodiversity.

But these landscapes don't reflect the true potential of our diversity, they reflect what was left over.

Land that was too steep, too cold, too wet or too remote to farm, and therefore unproductive, became conservation land. Almost everything else became monoculture.

Today, our land is:

40% exotic grassland

with that 40% translating to roughly 10.7 million hectares of sheep, beef and dairy.

8% exotic forestry

eight percent of our land grows a single species of tree, and more than half of it leaves the country as raw logs.

2% Only a fraction of space is for diverse foods in cropping & horticulture

in this space sits every vegetable, every orchard, every vineyard, and every grain paddock in the country.



Eight percent of our land cover is in exotic forestry, and almost all of it is radiata pine.

Most of it arrived by converting grassland between 1990 and 2008 – the single largest land-use change in this country was pasture becoming forest.

Forest can hold erosion-prone hill country together, store carbon and earn income. But it is a monoculture on a thirty-year clock, and the risk is concentrated into the moment we cut it down. In 2010, the Ministry for the Environment was warning that harvest and replanting had to be carefully planned to avoid soil erosion and nutrient loss. In 2023, Cyclone Gabrielle showed what happens when it is not.

Rivers were choked with woody debris, beaches buried in logs and farmland and bridges filled with slash. The ministerial inquiry that followed singled out large-scale clear-felling as a key driver, and recommended a 40-hectare cap on individual harvests, a five-year green-up period between adjoining sites, and a limit of 5% of any catchment harvested in a single year. **Three years on, Lincoln University researchers found that five of the six forestry consents granted in Tairāwhiti since the cyclone imposed no clear-cut limits at all.**

We have the sixth highest proportion of forest in the OECD and the second lowest proportion of land in cropping and horticulture. We have chosen scale and single species – in our pasture, in our pines, and in the limiting of land to feed ourselves.

We now have generations of tangata whenua growing up in a landscape their tūpuna could interpret, and they cannot.

Conversion of land comes with a dispossession of diversity in both our landscapes, and our culture.

Traditional Māori diets were diverse and nutrient-rich, including cultivated crops, seafood, freshwater fish and food from our native forests.

As access to land and customary harvesting been removed or lost, traditional diets have been replaced by the refined carbohydrates, processed meats and packaged products of an industrial, globalised food system.

We have lost not only the nutrition, but the taste, the smell, the seasonal knowledge, and the whakapapa of our food in relationship with te taiao.



Our foods are primarily produced in monocultures – concentrated in regions in which they grow best and have adapted to the soil and climate.

We have 15,000km of coastline, and yet we are importing four dollars of prepared fish for every one we sell.

Prior to clearance for productive purposes, rural land supported a wide range of native species. Today, most native flora and fauna have disappeared and the majority of species found on productive land are introduced. On private land native species are largely marginalised to small pockets of native forest and wetland areas, where biodiversity and landscape protection by farmers is largely voluntary and unrecognised.

Our wool industry meant food and fibre used to grow together, from the same animals, on the same farm, in the same season. But today, food and fibre are increasingly separate, and exported. Around 80% of our wool leaves the country as raw fibre, and only about 15,000 tonnes is used in domestic manufacturing, while the textiles we wear here are imported. **Our strong wool growers have spent decades being outcompeted on price by plastic fibres.**

Most of our largest seafood companies process their catch in China. The fish is headed, gutted, frozen and shipped, with value-added work happening 10,000 kilometres away.

China takes around 31% of our frozen seafood exports by volume. And then it comes back to us. In 2024 we exported \$19.7 million of processed fish and imported \$73.1 million worth of fish, most of it from Thailand and China. The places that supply healthy mahinga kai sit outside this system entirely, unmeasured and unprotected as productive assets.

About 180,000 hectares of land is in arable production, concentrated in Canterbury. Around 30% of that land grows cereals, and of the cereal land, 9% grows grain for people. Wheat is 8% of it. Oats are 1%. The remaining 91% grows feed and silage for animals, or barley for malting.

Trucking a tonne of wheat to Auckland costs around \$250. Coastal shipping would cost \$60 to \$70, if the silos, grain elevators and port capacity still existed. They don't, so it is cheaper to ship milling wheat across the Tasman than to move it from Canterbury to a mill in the North Island. Nearly two-thirds of our total grain and feed supply is imported.

If you live in the North Island, the flour in your bread almost certainly came from Australia.



There is a reason our landscape looks like this.

Our dairy, meat, kiwifruit, seafood, wine and a growing range of high-value food products reach markets across Asia, Europe and North America.

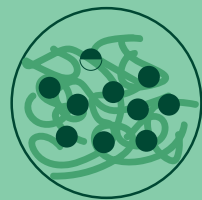
New Zealand holds 22.1% of world dairy exports, the largest single-country share globally. Food and fibre make up a considerable proportion of our trade, employment and GDP in Aotearoa New Zealand, accounting for around 80% of our total export revenue, 15% of employment, and 11% of GDP. We have designed for efficiency, which has lifted our productivity, but on the way we have lost our ability to create and retain value through diversity and access onshore.

We are rapidly depleting the natural resources we depend on to grow our food.

182 million tonnes of topsoil wash into our waterways each year, almost half our rivers are now unsafe to swim in, and 89% of our native freshwater fish, which includes tuna and whitebait, are threatened or at risk. We are masking the significance of long-term losses in soil health with short-term bandaids like imported fertiliser.

Our dependency on imported inputs to maintain our productivity in production runs across the food system. Palm kernel is brought in from Indonesia and Malaysia for animal feed in agriculture, \$1.5 billion is spent on imported fertiliser each year, and roughly \$700 million for diesel used on agricultural farms. These resources are extracted, move through a global supply chain, are exposed to distribution disruptions that sit outside of our control and pollute the landscapes we apply them to.

If you imagine our lamb production as a plate of ten meatballs, New Zealanders eat half of one. With mutton, 98 percent is exported. This mismatch between production and access is a major structural failure in our national food system.



We traded the ‘infrastructure of the middle’ for cheaper imports and streamlined corporate balance sheets. Leaving New Zealand as a raw commodity exporter that must buy processed food overseas.

As a nation, we export most of what we grow, and import most of what we eat.

New Zealanders consume an increasingly high percentage of food that is both imported and highly processed. Our focus on producing foods we can export means that our landscapes and food production system focuses heavily on sheep, beef and dairy and highly specialised fruit crops for export, instead of the foods necessary for everyday domestic consumption, and raises our food prices to their value as an export. Butter prices are up 46.5% in the past year, mirroring international demand rather than domestic affordability.

We have dismantled the domestic infrastructure required for self-reliance.

Competition with imports means we continue to lose onshore food processing and packing infrastructure - the ‘infrastructure of the middle’. Wattie’s, McCain, Unilever and Cadbury were large single-owner facilities that faced the challenges of reduced retail space as competition for shelf space with imported products grew. Their closures have significantly reduced the cold storage, the by-product income streams, and the route to market for the regional and national growers who supplied them.

Between 2002 and 2022, our vegetable growers reduced from 2,820 to 900. With our limited processing infrastructure, the majority of the foods that New Zealanders consume which require drying, heating, packaging or transforming (like crackers, muesli bars and tinned vegetables) are imported.

The natural health and bioactive products sector, worth \$8.3 billion globally in 2023 and growing at 9% annually, is largely being developed offshore.

Food is increasingly processed and unhealthy for us – with evidence of our tamariki and ourselves as adults bearing the weight of that burden.

We access our food by visiting one of two large supermarket players.

A few of us go to local veggie shops, farmers markets, or bakeries, but 82% of the national grocery and packaged food market share comes from a major supermarket. Our supermarket aisles are filled with products that are either engineered for impulse, fortified with the nutrition their core components lost in production, or travelled over water when they could have been grown just down the road.

We have fast food outlets on every corner of every town - there are about three times as many fast-food outlets and convenience stores per 10,000 people in the most deprived communities compared to the least deprived.

New Zealand ranks alarmingly low in food security among high-income nations, with one in five children experiencing food insecurity. One in three (33%) New Zealand households have experienced some form of food insecurity in the last year.

Only 8.2% of our children meet the recommended daily vegetable intake. Around 35% of tamariki Māori have lived in a household using food grants or foodbanks during early childhood, compared with roughly one in fifteen European children.

64% To meet our domestic consumption needs we need to import two thirds of the food needed to feed our own population.

Where the food system has failed,
communities are filling the gap.

In 2025, over 60 food hubs nationwide supplied food to more than half a million New Zealanders. That number continues to grow. Food banks and hubs provide a critical service to an estimated 10% of our population.

Where people do come together around kai, they are largely doing it outside the system.

For most New Zealanders, our diverse, locally owned restaurants and cafes are the most accessible places to buy from local food producers and bakers.

Our food is consumed in our homes, but increasingly it is being delivered there, in the meal kits and take-away meals that get delivered. It is in our homes that the highest proportion of food goes to waste - New Zealand households waste \$3 billion worth of food annually - food that took imported nutrients, imported fuel, and imported machinery to produce.

As the climate changes, the distances and disconnection between production and consumption means our rural communities are at risk of food isolation in emergencies. During Cyclone Gabrielle, Tairāwhiti was severely disconnected, with main roads under water and food, water and fuel at critical levels across the region. Residents passed food parcels to each other across broken roads while generator diesel ran low and freezers full of kai defrosted, with no confirmation of when or how food or fuel would arrive.



Our land is disconnected from the people who live on it. Our growers are disconnected from the people who buy and make meals with their produce and products.

Our food is disconnected from our fibre, and both are disconnected from the ecosystems that support them and us.

Our choice of food is disconnected from our culture, and from our health. Our communities are disconnected from places that allow them to nourish themselves.

The places we have left to connect with food are rarely places of joy or connection. They are 'infrastructure' in a food system optimised for rapid throughput, convenient purchasing or consumption.

When you look out across our landscapes, the
absence of connection and diversity repeats itself.

These are the failures of the linear food system, and they have been designed in.

They can, and should be, designed out.

FUTURE STATE

A vision for how we eat
– when nutrients flow, nutrition follows.



Food is not a commodity.
Food is aroha. A food system built
from love is one that values nutrition
through the cycling of nutrients.
That system starts at the soil.

Soil that is fed by a diversity of plants, organic materials, bacteria, fungus, and insects, is visibly alive, rich and textured as a result. Its roots are visible and run deep beneath the surface.

It is soil that looks like it smells good.

If you look up across a landscape, you see a māra kai sitting prominently in the foreground. This is a place where people come to grow food, connect, learn, harvest and return to their community.

The flow of energy is inward and outward.

Outward through the food that is produced and the mana of the people who are part of that process - and inward through the food scraps and food and fibre byproducts that are brought in to create compost and organic fertilisers.

It is a central, grounding place for the community
and their relationship to land, food and each other.

Diverse, mutually-beneficial systems interconnect across landscapes.

Food is being produced and shared everywhere – local schools, streets, backyards, parks.

We see farms, orchards and production systems that are visibly diverse with trees for honey, fibre and shelter growing within and between arable, horticulture and agricultural land and renewable energy produced in the spaces in between.

Apple orchards have solar panels over the rows, and batteries storing energy for electric tractors and machinery, with the excess shared with the community.

Sheep are grazing pasture alongside wheat, oat and quinoa fields in rotation so that they can chew down the cover crops planted after harvest, rebuilding soil nutrition.

Anaerobic digesters sit beside dairy sheds, converting excess processed food from the community into energy for milking and biofertiliser to spread across pasture.

Imported fertiliser bills have shrunk, and soil organic matter is building. The milk produced from these soils carries measurably higher levels of bioactive compounds (omega-3s and plant-derived metabolites linked to human health) echoing what Lincoln University researchers found when they compared regeneratively and conventionally farmed pasture over a three-year Canterbury trial.

Fonterra's existing pasture verification standard, already independently audited every year, extends to evidence the connection between ecosystem health and nutrient density in our milk.

The economic influences on our food system have reorganised. Procurement officers across public and private sectors have changed their contract requirements, prioritising diverse, regenerative foods. That security of domestic demand means farmers shift a portion of their land from winter wheat to diverse cropping, including oats, hemp, legumes, because there is a guaranteed buyer, a processing facility that can handle mixed volumes, and a price that reflects nutritional value rather than commodity rate. Their soil health improves, input costs fall and within five years their land outperforms the farms around them in drought.

The bread on the shelf next to the standard white loaf is no longer more expensive because the health of their soil means they no longer need imported fertiliser, and regionalised, renewable-powered processing and distribution has dramatically reduced the cost to consumers.

Across our landscapes we see that the food system has changed not through a single policy decision or a single company's commitment, but through enough people in enough parts of the food system making different choices that the circular option slowly, then suddenly, becomes the commercial one.

We frequently sit at the same table, eat from the same pot, work side by side in our schools, workplaces, marae and public spaces. Citizens across Aotearoa eat our native and indigenous foods and have access to learning on how to gather, grow, hunt, store and cook kai, applying principles of the Hua Parakore framework.

We all participate in the harvesting, preparing, giving and receiving of food.





How we eat within the circular future of Aotearoa New Zealand.

Food is central to our lives. We trace the flow of nutrients grown and harvested from our soil and waters, to their local transformation into nutritious food options, through to nourishing our communities with diverse kai. Closing the loop sees leftover nutrients enriching the whenua or powering our lives as biofuel. This is a living food system that restores value through diversity and connection.

Key circular flows & features:

1. Nutrient loops: Nutrition is valued and retained through the cycling of nutrients - soil is the foundation, fed by diverse crops, compost, biofertiliser and digestates.
2. Scale and diversity coexist: one landscape, many systems, none dominant Export-scale kiwifruit orchards and wool alongside seaweed, goat, hemp, native and traditional foods, in valleys, on mountain sides, in backyards and shared spaces.
3. Natural productivity: Nature and renewable energy serve as the connective tissue across our landscapes, integrating trees, cover crops, insects, and waterways.

SYSTEM SHIFTS

We don't lack the ingredients of a circular food system – the species, the skills, the facilities are already here – we lack the ability to see them and the means to combine them.

What system change looks like in order to realise this circular food system:

- Local nutrient recovery and cycling – returning water and nutrients to create living soil, which produces more flavourful and nutritious food.
- On-farm energy generation powering over half of our nation's electricity usage.
- Diversified crops and food sources with regional processing to enrich our diets, landscapes, and our local economy.
- By-product valorisation ensures every residue becomes an ingredient.
- Procurement is utilised as the major lever to connect health and food systems.
- Policies that allow food to be produced everywhere, and by everyone. In our streets, our parks, our backyards – by citizens, communities, councils, and producers.
- Everyone has access to healthy, culturally appropriate kai and Te Tiriti ō Waitangi is honoured in shaping our food system.

On the following pages we outline key shifts that address:



How we grow our food.



How we make and share it.



How we connect and consume it.

HOW WE GROW

Local nutrient recovery
– returning water and nutrients to soil.

In a circular food system, growing food and restoring soil are the same act.

Through Hua Parakore, Dr Jessica Hutchings teaches “Growing food and restoring the soil is an act of tino rangatiratanga.” It is a path of self-determination and food sovereignty, and therefore the starting point of circular conversations and changes to our food. Hua Parakore is a kaupapa Māori verification system for mahinga kai, bringing together six kaupapa drawn from mātauranga Māori and woven into how food is produced and shared. It is the first Indigenous verification system for Kai Atua, pure food, developed by Te Waka Kai Ora, the National Māori Organics Authority, which has been developed into a soil health framework and a food sovereignty framework for Māori communities, kaitiaki, farmers, growers, and policymakers. It is a full expression of what a circular food economy looks like when it is grounded in values, one that cannot be fully captured here, but is placed here as the foundation.

The fertility cycle is the most fundamental feedback loop in any food system, absolutely everything taken from the soil must be returned to it. A national nutrient recovery system collecting excess organic materials, food and biosolids from households, processors, and farms, and processing them through regional composting infrastructure, anaerobic digestion, constructed wetlands, and biochar would capture those nutrients before they leave the local area or degrade our waterways, and return them to productive soil.

Crop residues can become bioenergy. Black soldier fly larvae can recycle food waste into high-protein animal feed and organic fertiliser simultaneously. Integrated crop-livestock systems can replace synthetic fertilisers with the nutrient cycling that animals and diverse pastures provide naturally. While pine forestry waste, the material left behind after harvest, can be collected and converted into biochar – a stable carbon material that is worked into the soil, increasing soil carbon, raising pH, and reducing topsoil nitrate concentrations by up to 73%.

Watercare, New Zealand's largest water utility serving 1.7 million Aucklanders can utilise the \$13.8 billion planned for investment in water and wastewater infrastructure over the next decade for circular recovery systems that return biological value to the land.

When we return nutrients to soil, we increase its microbial activity and organic matter, and in turn increase the nutrients that are carried up into crops and products that we consume.

On-farm energy
generation could power
over half of our nation's
electricity usage.



New Zealand needs more renewable electricity and farmers are perfectly placed to provide it.

If each of the approximately 50,000 farms in New Zealand installed mid-scale solar systems they could generate an additional 28-33,000GWh of electricity each year. This is equal to between 63-75% of the country's current total electricity consumption.

If each of these farms also installed 300kWh of batteries, and even if only half of these batteries were fully charged, they could provide around two hours of 3,750MW peak support or nearly 50% of the country's current peak demand. This would significantly reduce the need for fossil fuel electricity generation during winter peaks.

Farmers can create new revenue streams by installing solar panels and batteries – Forest Lodge Orchard saves around \$40,000 per year on operational costs across the farm and home through electrification of its fossil fuel machines, and is expected to make around \$20,000 per year by producing and storing cheap power and timing export perfectly for when it is most needed by the grid – and most valuable for them.

Farms can play a role in the national electric vehicle charging network and create another revenue stream, and are a perfect home for second-life EV batteries, retired from vehicles but with years of storage capacity remaining, to be utilised as on-farm energy storage.

Agrivoltaics, the co-location of solar panels on horticultural or agricultural land, is gaining momentum in New Zealand, allowing solar panels to be installed over apple trees in place of hail netting. The micro-climate created under solar arrays produces cooler temperatures in summer, warmer temperatures at night, less frost damage, better soil moisture retention, and better-protected livestock. Here solar is used not just to produce energy, but to improve the production systems beneath it.

3/4

Imagine up to 75% of our electricity consumption is powered by the sun from farms across Aotearoa NZ.

HOW WE MAKE

Crop diversification for resilience and new value streams, that connect people and place.

Of the more than 50,000 edible plant species in the world, just 15 provide 90% of the world's food energy. Our landscapes in New Zealand mirror this reduction in edible plant diversity. A diverse food system increases our consumption of our wild and traditional food resources and continued access to areas supplying healthy mahinga kai. These are places of important culture and sovereignty.

Our Land and Water identified six crops with high potential for New Zealand farmers: soy, hemp, chickpeas, oats, buckwheat, and quinoa. Canterbury grows lentils, buckwheat, quinoa, hemp, oats, rye, and spelt but most of it leaves as a commodity or goes to animal feed rather than onto a New Zealand plate. Pure New Zealand Buckwheat started with one farming couple in Canterbury, who brought in two other local farmers, significantly increasing payments for their grain and making it a viable rotation crop.

Hemp, leafy green proteins, seaweed, and fungi have been evidenced as protein sources that can be grown here, use waste streams as inputs, and have growing global demand.

Nutrition from Water has developed a microalgae-based whey protein with an amino acid profile comparable to traditional animal proteins. **Daisy Lab** has received EPA approval to scale its precision fermentation dairy platform. **Jooules** is turning greenhouse gas emissions into protein ingredients. **Leaft Foods** extracts Rubisco, the most abundant protein on Earth, from lucerne grown by Canterbury arable farmers, producing a complete amino-acid protein at a fraction of the carbon footprint of animal protein in Southland. **Hopefield Hemp** presses its own seed into oil on-farm, then works with regional manufacturers to turn it into wellness capsules and skincare products, building a local supply chain around a single rotation crop.

0.03%

We are yet to access nutrition from over 50,000 edible plant species in our diets.

Growing diverse, lower-extraction crops rebuilds soil, reduces input dependency, creates new revenue streams for farmers and produces food that connects New Zealanders to their own health and the health of our whenua.

The world is actively looking for high value ingredients and products from Aotearoa New Zealand.

MBIE identified thirty high-potential, biologically-derived ingredients and products for New Zealand across biocosmetics, sports nutrition, marine bioactives, native botanicals, essential oils, high-value wood products and farm inputs. **Eight come from materials we barely produce despite having validated markets and the climate to grow them.**

We have yet to tap the bioeconomic potential of what we naturally have right here. Mānuka is a minority of the honey we produce by volume, yet it accounts for 82% of New Zealand's honey export revenue – proof that layering certification, science and story onto a raw material multiplies its value far beyond what producing more of it ever could. That same product is projected to reach USD\$1.3 billion globally by 2032, growing at 10.4% annually.

Yet much of the value-added processing and pharmaceutical development that built that value happens offshore, meaning we lose the value, the innovation capacity, and the margin.

Our green-lipped mussel extracts contain PCSO-524, a blend of omega-3 fatty acids, phospholipids, and bioactive lipids found in no other species on earth. By the time it reaches a pharmacy in Seoul, it will be worth more per gram than the whole mussel was worth per kilogram when it left the water in Marlborough. The global bioactive ingredients market is projected to reach USD\$402.3 billion by 2033, growing at 8.1% annually. We have nutrient dense species. What we don't have is the shared capability and infrastructure to create diverse foods from them.



AND SHARE

By-product valorisation ensures every residue becomes an ingredient.

By-products are the secondary, unavoidable outputs from food production and processing. When by-products are treated as ingredients, we dramatically reduce demand for land, secondary, unavoidable outputs from manufacturing, agriculture, or food processing. **Instead of being thrown away as waste, a circular economy treats by-products as valuable inputs for new products or biological nutrient cycles.**

The **Ellen MacArthur Foundation** modelling found that upcycling just 1.5% of on-farm crop residues into sugars would meet global glucose syrup demand and free an area the size of Luxembourg from farming.

At **Fonterra's** Hautapu plant, whey and skim milk streams are processed into lactoferrin, a specialised bioactive protein in high demand across Asia for infant formula, health foods and yoghurt. It takes 10,000 litres of milk to produce just one kilogram, and very few dairy manufacturers in the world have the capital and research investment to do it. One dairy stream, reimagined as an ingredient, created a high-value category.

Canterbury-grown peas are already the subject of active New Zealand research into extracting high-value protein. **University of Canterbury** has developed a process to concentrate pea protein using ultrafiltration, and a feasibility study found a dedicated New Zealand extraction facility processing around 15,000 tonnes of peas a year could be commercially viable. Fractionating the whole pea rather than just the protein - separating it into protein, starch and fibre, with the hull going to animal feed- would mean the entire pea and its pod become sources of value, not just the fraction we currently extract.

The Māori-owned, intergenerational family business **AgriSea** hand-harvests native brown kelp (*Ecklonia radiata*) that washes ashore after storms (deliberately leaving a third behind to protect the shoreline ecosystem it supports) and ferments it into biostimulants now replacing synthetic fertiliser on dairy, vineyard and horticultural properties across the country. Rescued Kitchen has proven that upcycled flour made from bread previous going to waste can be a viable ingredient for Remarkable Tortillas.

New Zealand's horticultural, dairy, and meat processing sectors generate residues every season – whey from cheese, pomace from fruit, brassica residues from vegetable cropping. Our residues are a pathway to creating new forms of value. A quarter of the beef in a burger could be replaced with green-lipped mussels. Muesli could combine Canterbury oats, hemp protein, and buckwheat.

Functional food bars could use upcycled whey bioactives. We don't need new crops, we just need investment in the technology and to make different procurement choices about what goes in the product and where it comes from.

A resilient, accessible food system requires more than agricultural and horticultural producers.

The critical 'middle piece' – the aggregation, storage, transformation and distribution infrastructure that enables diverse foods to reach our local communities, is at the heart of a Mana Centred Local Food System. Think of this as the modular, renewably-run processing and storage infrastructure designed for the geography, the species, the accessibility and the tikanga of the communities around them. The regional on-farm milling, the micro-mobile abattoirs, the community fishing hubs and the on-farm pasteurisation.

Every piece of technology necessary to create and expand these regional processing and transformation systems exists. The convergence of automation and self-generated and stored renewable heat and energy from solar and biomass can dramatically reduce the labour and energy costs that have previously sent our processing facilities offshore.

This kind of infrastructure has never been built by asking one grower, one processor, or one community to carry the cost alone. It will get built the way in which all our primary shared infrastructure always has been – through public investment at first, private capital that follows, and distributed financing that allows for the longer time horizon needed for shared infrastructure to pay for itself.

Our Land and Water. (2023). Mana-centred local food system model demonstrates the importance of the infrastructure of the middle



Food is produced everywhere, and by everyone.

In our streets, our parks, our backyards - by citizens, communities, councils, and producers.

Communities and their small producers are actively seeking to overcome the costs of existing freight and logistics systems by closing the physical distance between food production and people.

In **Waihōpai Invercargill and Motupōhue Bluff**, the city council's Parks and Recreation team have started integrating edible plants into community green spaces, with people welcome to take fruit and vegetables home when they are ready.

The **Spirit Army** operates spray-free gardens dotted across Invercargill, growing vegetables passed on free of charge or used in community cook-ups. Families receiving support participate in gardening and communal cooking sessions, building connections and confidence, until they move from being helped by volunteers to helping each other.

South Alive has built fruit and nut orchards in local parks, a community garden, a bulk food store and café. Crop swap events and pay-it-forward boxes facilitate sharing of kai. Workshops teach people to grow, prepare, ferment food and compost their scraps.

The **Longwood Loop**, established by Robyn Guyton and the South Coast Environment Society, delivers local food to rural Western Southland communities every Thursday by electric vehicle, creating a 'route to market' and low-emissions freight option for local growers where none existed. Robyn's vision is to see Southlanders once again have 80% of their food home grown or bought locally.



New professions are forming around circular, regional food production and distribution.

Community composters, regenerative educators, food hub coordinators, biochar technicians, circular food designers, all in one region. They are not funded as a system, they do not know they are a system, but they are the communities who stopped waiting for the national food system to change. They combine technical knowledge with relational, place-based practice, working both in and on the systems they are changing.



HOW WE CONNECT

Shifting power through procurement to connect health and food systems.

A school kitchen in Waikato. The menu this week lists buckwheat and vegetable fritters, kūmara wedges, mussel chowder. Every ingredient sourced from within 80 kilometres. The cook knows the growers by name. The five-year-old eating lunch does not know this is a policy outcome. She just knows it tastes good.

This school's procurement contract specifies regional sourcing, seasonal menus, and nutritional density targets. That single contract change meant fifty farmers in the surrounding district shifted a portion of their land to diverse cropping, because for the first time there was a guaranteed buyer. The hospital down the road followed six months later. Then the aged care facility. Each contract is another anchor of demand flowing back through our food system. The growers are not just producing for a commodity market anymore. They are producing for institutions that want nutrition, provenance, and shorter supply chains. The soil is recovering through diversity in demand.

New Zealand's government agencies spend \$51.5 billion annually on goods and services. School lunch programmes that source regionally, hospital food services that prioritise nutritional density, council procurement pledges that favour local growers.

These are procurement levers available across our economies that can positively influence what farmers plant and what products we can create and consume.

It is a lever that is being used to shift food consumed globally. Brazil's constitution requires that 30% of school meal ingredients come from local family farms, supporting nearly four million smallholder farmers. The Good Food Purchasing Programme in the United States is reshaping institutional supply chains city by city. In Wales, public institutions buy directly from regional producers.

New Zealand has run one of the world's longest-running green prescription programmes, prescribing physical activity through primary care since 1998. Extending that model to kai, enabling people struggling with food-related health concerns to be prescribed fresh, local food by health professionals, would connect the health system directly to the local food system for the first time.

Legitimate nutritional diversity on our shelves – beyond marketing.

When you look at the cracker aisle in any New Zealand supermarket you see dozens of boxes with different brands, different packaging and different price points. This is the illusion of food choice and diversity.

Turn any ten of them over and read the ingredients and nine will list the same four crops in different order or formulation: wheat flour, vegetable oil, sugar, salt. Almost all of these will be imported, and none chosen for their nutritional content, diversity or impact on soil health. 69% of the packaged supermarket products in New Zealand are classified as ultra-processed and unhealthy. Most of them are created from a small number of the same imported commodity inputs recombined into different configurations and sold under different brand names in new plastic packaging.

The choice is real. The diversity is not.

New Zealand could have very different crackers on that same shelf, made from Canterbury buckwheat, oats, and heritage wheat milled down the road from where they were grown, with the packaging listing ingredients you can trace to specific paddocks. When we create the processing infrastructure, nutritional traceability of New Zealand grown grains, we enable supply, and increase demand. The ingredients required by processors becomes a regenerative rotation plan.

Growth of the category becomes good for the soil because growth drives the crop rotation.



The systems described in this chapter are how we redesign the economics of Aotearoa New Zealand’s food system.

This is not a future that asks people to pay more for food.

It is a future where the food that costs less to produce over time - because the soil is healthier, the energy is locally produced, the nutrients are cycled, and the processing is shared - becomes the food that reaches everyone in Aotearoa.

It is a future where the regions that grow the food also hold the capability to make things from it, so that decisions about what gets made, and who benefits, are made close to where it was grown.

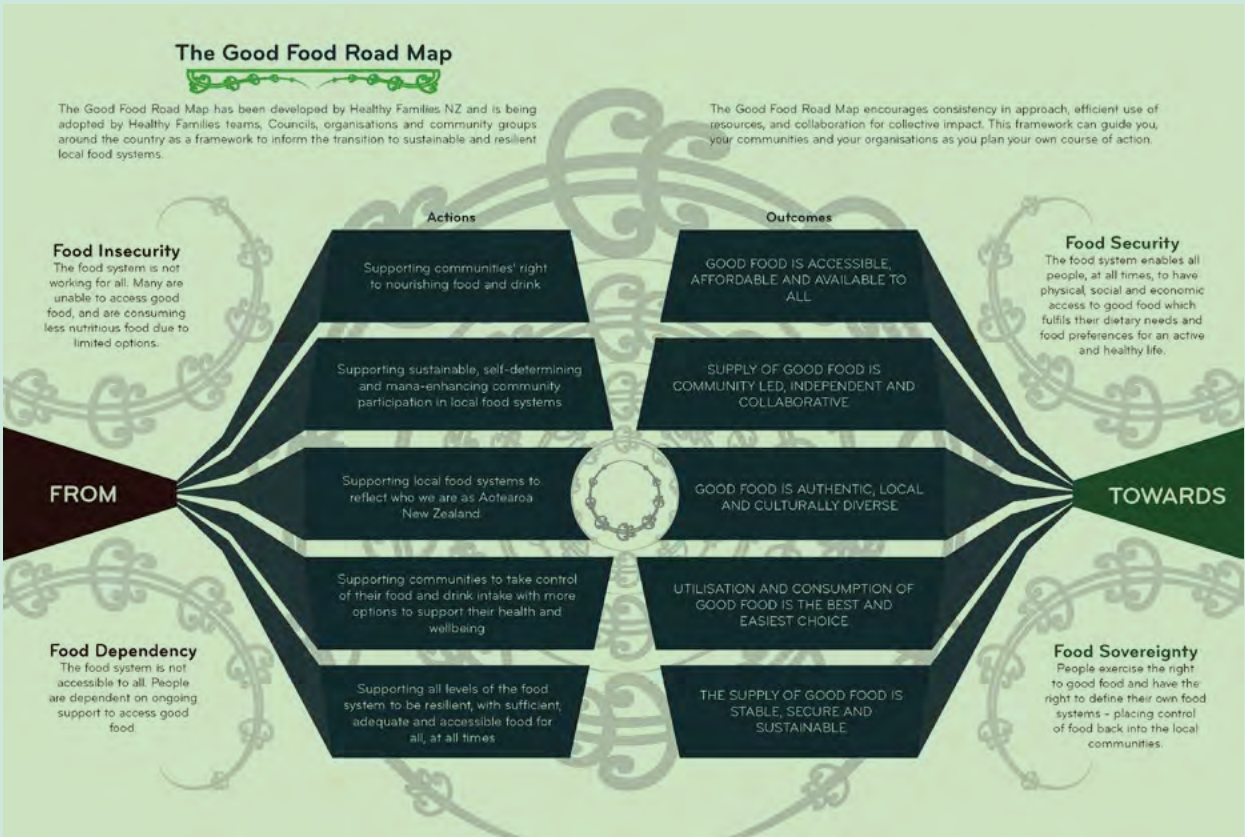
Where the crops, the seasons and the kai that belong to this place have somewhere to go, so that what ends up on our shelves tastes familiar.

Where nutrients that begin in living soil end up in the food we eat, so that nutrition is a property of how the system works rather than a claim on the packaging.

And where risk sits across many producers, many crops and shared and accessible infrastructure, rather than in a handful of processing sites and a few export markets.

This is what good food looks like in Aotearoa.

The Southern Initiative and Healthy Families South Auckland’s Good Food Road Map shows us the actions and outcomes that come from a move toward good food, where food security and food sovereignty are how we redesign our food system



A circular future for food will does not solve affordability by making good food cheap through subsidy. It will solve it by redesigning the economics so good food is genuinely less expensive to produce, distribute and consume.

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HOW WE MOVE

Mobility is critical. We examine how citizens move. How goods arrive and return. How the materiality and circularity of our vehicles, transport infrastructure, and services are optimised for timely access, lifecycles and efficiency.

MOVE

At a glance.

Done right, mobility will be an enabler for all circular futures. We can unlock productive resource use, drive industry innovation, and address the inefficiencies of an extraction-only approach. But to date, transport conversations in NZ largely focus on emissions, leaving better end-of-life options unanswered or unviable. This chapter widens the lens to an integrated transition – linking material lifecycles, total costs, and how we prioritise energy sources to power it all. That is the gap in current policy and practice, and now is the critical decision window to address it.

Industries

Public transport & fleet operators, freight & logistics, automotive, energy & electricity, infrastructure & construction (roads, rail), shared mobility & micro-mobility, EV & battery manufacturing.

Materials

Vehicles and vehicle parts, batteries & critical minerals, road materials (asphalt, steel), charging infrastructure, renewable energy infrastructure.

Focus areas

Lifecycle materials recovery · second-life battery deployment · shared mobility and micro-hubs · decentralised energy · lifecycle cost disclosure in procurement · materials registers for public assets.



CURRENT STATE



We are planning the energy transition without planning the materials.

There is a car parked outside your house right now, or outside the house across the road. It has been there since last night and it will be there most of tomorrow.

As a privately owned vehicle it is estimated to sit idle over 90% of the time, and yet around these low productive assets we have built a material intensive roading network, a fuel import chain, a parking economy and a tax base. It is often the most expensive thing most households own after the house itself, and it depreciates in value from the day it is owned.

It is also a material store. Steel, aluminium, copper, glass, plastics and rare earth elements, extracted somewhere else, shipped to the end of the longest supply chain in the world, and increasingly wrapped around a battery whose minerals were mined on the other side of it.

An average vehicle entering New Zealand in 2020 will not be scrapped until around 2040. Every decision about what eventually happens to the material inside it was made at the point of purchase, twenty years or so before anyone will need to act on it, by someone who was thinking about making the monthly payment required to retain their ownership.

Transport is our largest source of long-lived greenhouse gas emissions, yet almost half can be cut using existing technology.

It is responsible for 36.3% of total emissions and most of the growth over the past thirty years. The **Climate Change Commission** found that 47% of transport emissions could be cut by 2035 using technology that already exists, in a ten-year window that is already half expired.

That conversation is necessary and New Zealand is already having it. **The two conversations underneath are the ones we are not and need to:**

01

The first is that electrifying the fleet is materially intensive, not materially neutral.

Global demand for the critical minerals behind EV batteries is projected to rise up to fivefold by 2040, and a transition that swaps one set of extraction dependencies for another is a more expensive version of the same linear system even if material pressures are abated.

02

The second is the car outside your window, still parked.

Reducing how many assets we need at all, through shared options, consolidation and design for utilisation, is as powerful a circular intervention as changing what powers them, and it is the only one that costs less rather than more.



An electrified transport system is only a circular one if all three, emissions, materials, and asset productivity, are designed together.

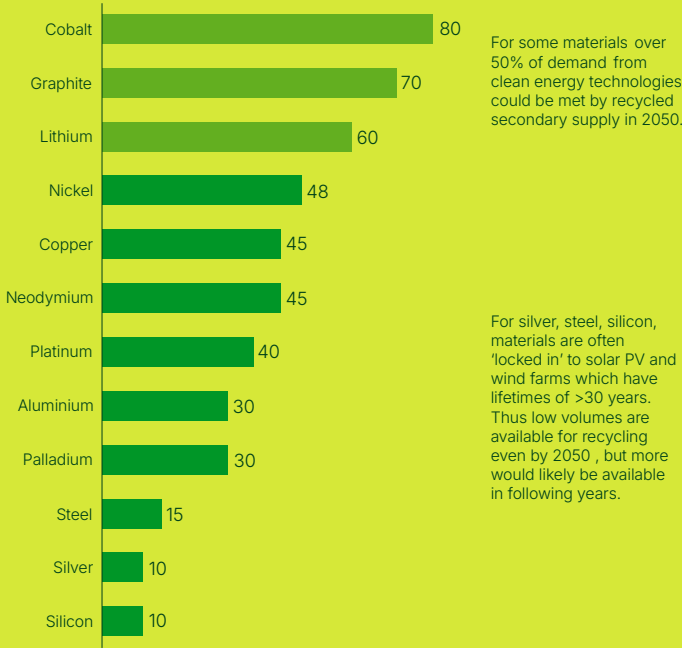
Mobility is one of four categories, alongside food, housing and infrastructure, that together account for 72% of New Zealand's total natural resource consumption. We drew on 107 million tonnes of natural resources in 2019 alone, roughly 21 tonnes per person, around 60% of it imported.

If we meet the growing mineral demand with the same extract-use-waste mindset, we lose the value these resources could have provided across their whole lifecycle to other markets.

The global economy loses €25.4 trillion in value every year, nearly 31% of global GDP, through linear material practice, and that only 6.9% of materials entering the global economy are secondary, down from 9.1% in 2018. One of its five identified pathways of value loss is the premature deterioration of fixed capital, which is a technical description of an under-maintained bus fleet and a road resurfaced too late.

New Zealand rarely gets to set the global design specification for a vehicle or a battery. What we can specify is our own market: procuring for full lifecycle utilisation, buying assets sized to how much we will actually use them, reusing them for alternative applications, and making sure the minerals inside them stay in circulation here once they have arrived.

Average share of annual materials demand for the energy transition that could be met by secondary supply (High Recycling scenario), 2050 %



Source: Energy Transitions Commission (2023)

Rewiring Aotearoa and Circularity put it precisely in Closing the Loop: an electrified economy can be a more circular economy, but only by design.

The Energy Transitions Commission estimates that, by 2050, more than half of the demand for materials like cobalt, graphite, and lithium could be met by recycled secondary supply.

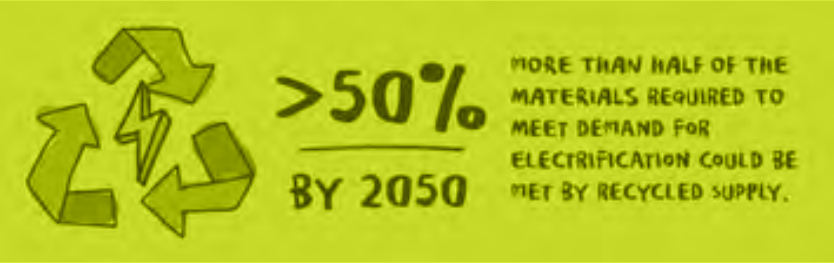
Every battery imported today is a stock of future material. This is what mining our economy rather than our ecology looks like in transport.

Phoenix Recycling runs the country's first nationwide battery recycling service, accepting EV and hybrid batteries from anywhere in New Zealand. The large EV batteries then go on a ship to Australia, because there is no facility here yet that can process them. Whoever reprocesses them over there gains the yield, the quality control and a position in the secondary materials market that our own recovered minerals could have unlocked at home.

This is a half-loop. We capture value as an exporter of the problem, not as a recoverer of the resource to be used again.

And a half-loop today becomes a closed door tomorrow. Countries that build domestic materials recovery capacity now are the ones clean-tech manufacturers will keep buying from, because those manufacturers need the critical materials back, not just the finished product sold once. An Aotearoa that keeps sending EV batteries and solar panels offshore, or to landfill, at the end of life is not just missing a recovery opportunity; it is opting out of the next generation of the transition before it has begun.

Energy Transitions Commission (2023)



As of 2022, only 1% of cars in Aotearoa are electric and estimates suggest this is getting closer to 3%. According to Commission analysis, this number needs to be over 35% by 2035 – or roughly 1 in every 3 cars. Heavy transport (trucks, buses planes and ferries) contributes 26% of transport emissions and remains dominated by fossil-fuelled. Full battery-electric vehicles make up less than 3% of new heavy vehicle registrations.

There are exceptions, and they are real.

NZ Post has reached 70% electric across its own fleet and committed to transitioning last-mile to low-emission vehicles by 2032. **Wellington's Nocar Cargo** has run a cargo bike micro-hub since 2015, now moving up to 200 parcels a day from Mt Victoria with Aramex. Micro-hub operations keep inner-city delivery loops tight, fast, and highly repeatable: cutting roughly 270g of CO₂ emissions per kilometre. **Foodstuffs North Island** put the country's first long-haul battery-electric truck and trailer on the road in 2025. Every one of them is an individual decision by an individual organisation, often made without a procurement standard, a designated site, or a tender that asked for it.

We are early into the transition and material demands are yet to be coordinated.

What we buy now, and whether we plan for its full lifecycle, will shape the cost and resilience of our transport system for decades. It also decides how much value we recover from the resources locked inside it. New Zealand sits at the end of the longest supply chain in the world. Distance makes getting this wrong more expensive.

Value is being lost from procurement to recovery, with little material or asset tracking connecting the two ends of that chain. What connects the failures is that nobody is required to know anything. Public and private fleet procurement still optimises for purchase price rather than lifecycle cost, so assets can be replaced early, maintenance is deferred until failure, and the value embedded in components is destroyed rather than recovered. When a bus or a truck or a stretch of roading reaches end of life, there is rarely a viable pathway to recover the high-value parts: the remanufactured parts market is thin, refurbishment capacity is fragmented, and a public tender often doesn't require lifecycle cost disclosure or battery recovery planning. We do not systematically and transparently know what materials are in our vehicle fleets, our roads or our transport assets at all.



The materials we install today are invisible to the people who will need to recover them in twenty years.

There is still no New Zealand standard, no legal requirement, and no date by which one will exist.

The infrastructure we are not building now, will be the market access problem of the next decade.

This matters commercially, not just environmentally. The IEA projects that recycling critical minerals from energy transition technologies could cut new mine development needs by 40% for copper and cobalt and 25% for lithium and nickel by 2050. **It values the market for recycled transition minerals at \$200 billion globally.**

In 2025 the UK clean-tech company **Altilium** and **Jaguar Land Rover** unveiled EV battery cells made with cathode material recovered from end-of-life batteries. Meeting automotive-grade performance standards and the EU's 2036 minimum recovered-content targets, with independent assessment finding around 32% lower emissions than virgin-material cells and no compromise on quality. That is the destination our exported batteries are currently sailing past.

Europe is legislating the information – problem closed. From 2027 the **EU's Batteries Regulation** mandates a digital battery passport for every EV and industrial battery including light means transport batteries (like e-bikes and e-scooters on the European market), tracking composition, carbon footprint, recycled content, and performance across the full lifecycle. The **Ecodesign for Sustainable Products Regulation** extends the same logic to motor vehicles, electronics and construction materials through to 2030.

Large batteries have been a declared priority product (e-waste) under New Zealand's Waste Minimisation Act since 2020, and the Battery Industry Group has spent years co-designing a stewardship scheme, including work on a domestic battery traceability platform. **But priority status has no deadline attached, and of the six product categories declared priority in 2020, only tyres have a regulated scheme actually in force.**

New Zealand's own Battery Industry Group has already warned that the country "must keep pace with international developments like the EU Battery Passport to remain connected and competitive."

The truth is, our own strategy points in the opposite direction to global shifts. New Zealand has a minerals strategy, published by MBIE in January 2025, with a goal of doubling mineral exports to \$3 billion by 2035. It is an extraction strategy aimed at a global destination – faster permitting for new mining, foreign investment, and scaling gold, coal and critical mineral production for export. Circular economy thinking appears once, in a single sentence, "Production may come from the ground, from the re-processing of wastes and slags, or potentially from recycling and recovery. Circular economy thinking is part of our future."

However we are yet to see targets follow, nor programmes or the mechanism for recovering critical minerals from the vehicles, batteries and energy infrastructure.

Our incentives need to shift, to mining the value we already have.

The most expensive mile is also the easiest one to change.



Where other countries are removing tax from secondary materials to make recovery viable, we appear to be incentivising and fast-tracking the continued extraction of virgin resources as our only priority.

Meanwhile, every litre of diesel imported is value leaving the economy. New Zealand generates around 85% of its electricity from renewable sources and runs its transport system overwhelmingly on imported fossil fuel, which means each petrol fleet vehicle is a standing decision to buy energy from somewhere else when we already make it here.

RethinkX's 2025 Understanding Stellar Energy report projects solar, wind and battery systems approaching an inflection point at which clean electricity becomes superabundant at near-zero marginal cost, which turns electrification of transport from an environmental argument into a structural one.

The last leg is the one hiding in plain sight. Last-mile delivery, the final run from distribution hub to doorstep, is still overwhelmingly diesel – short, frequent trips at the highest cost per kilometre in the whole freight chain. It is also, of everything in this system, the most tractable.

Globally it is where the transformation of material and asset use is furthest advanced. Amsterdam and Rotterdam moved from talking about this to legislating it. Since January 2025, zero-emission zones mean only emission-free freight vehicles can enter their city centres at all, with 15 more Dutch municipalities following by 2030. London's cargo bike use more than doubled between 2022 and 2024. None of this required new technology. It required a line drawn on a map and a deadline attached to it.

Stand back and the pattern is the same at every link.

Our fleet buyers are disconnected from the lifecycle cost of what they buy. Our vehicles are disconnected from any record of what is inside them. Our batteries are disconnected from domestic reuse or a reprocessor. Our roads are disconnected from the materials bank beneath them. Our minerals strategy is disconnected from the minerals already sitting in the assets we own. And our exporters, who will meet EU passport requirements whether or not we build the systems, are disconnected from any national infrastructure that would make compliance affordable.

These are the failures of a linear mobility system, and every one of them has been designed in.

They can, and should be, designed out.

FUTURE STATE

A vision for how we move:
mobility that is renewable and circular by design.



Within a street where all of this already works – picture a delivery arriving to a suburb in Wellington.

It did not come in a diesel or electric van making 40 individual drops. It came by cargo bike.

Ridden by a local worker from a micro-hub in the old goods yard at Wellington Station, a few kilometres away.

It was here that a larger truck consolidated loads before handing them to a fleet of bikes for the last mile – the same model Wellington's Nocar Cargo has run from a Mt Victoria hub since 2015.

The cyclist makes 15 drops in the time a van makes four, with no congestion or parking costs, and no diesel.

On the rider's phone, an app shows the bike battery's digital passport – its chemistry, how many charge cycles remain, and what it is cleared to do next once it can no longer carry a full day's round. The same record the European Union requires for every vehicle and battery sold, and the kind which NZ's Battery Industry Group has already called for. That record lets someone trust the battery enough to give it a second job, rather than retiring it to an offshore recovery centre or landfill the moment it dips below spec.

When it is finally too worn for delivery runs, the app identifies its next job – a small storage unit behind the local library, storing daytime solar energy so the library can run its evening reading programme on power that never touched the grid at peak.

Mobility is not just an asset you own. It's the freedom to move.

A transport system designed for flow lets people and goods move freely through a network. Its assets are made, used, and remade as demand shifts towards abundant clean energy.

The crate on the back of that bike is not cardboard, it is recycled plastic made from the packaging of the goods it carries.

It does not belong to the retailer, the carrier, or the household that received it. The crate belongs to a shared pooling alliance, a model run globally by operators like CHEP and IFCO, who own the asset across its life and leases it to whoever needs it next. No single company has to justify the cost of a crate spending most of its life empty or in transit, because the alliance amortises it across thousands of users sharing the risk and reward.

At the micro-hub, empty crates are stacked, inspected, and sorted. Most go straight back into circulation while others go to a small repair operation that patches it before rejoining the pool. The same crate is just as likely to be carrying something other than empty air, like a jacket sent back for exchange, or one being resold by a charity shop.

When that jacket was first bought, it was registered to the wearer's digital wardrobe the moment he checked out online, the same way AirRobe lets shoppers do today. Brand, size, material, and purchase history are saved to his account rather than lost the moment the tag came off. That record is what makes the return worth something, rather than a write-off. **The shared crate system is the infrastructure that makes it moveable.**

The jacket arrives back at the hub already known, is steamed, relisted at a price the registration system estimated, and finds its next wearer within days. A returned blender can move through the same system – assessed, repaired at a local bench, and resold as a certified reconditioned unit at a lower price, no GST added. The same logic AirRobe has proven for fashion, extended to a category it does not yet serve.

The cargo bike passes a mother walking her child to school.

No engine idling at the corner. No diesel haze catching in their throats. Just the tūi calling through the pōhutukawa outside the dairy. The council bus running past runs on renewable electricity. Its battery carries the same kind of record, built up over eight years of service. This lets the depot retire it with confidence rather than caution. Knowing that instead of landfill, it will power the lights and chiller at the marae down the road for another decade before anything in it is recycled.

The station itself is no longer just a place to catch a train, it offers so much more.

Wellington and Auckland's stations have become multifunctional mobility hubs. Here we see cargo consolidation for delivery bikes, EV charging bays, secure e-bike storage, a car share pickup point, a stop for the regional bus, all under one roof that used to hold nothing but ticket queues. The same model already operates in London.

A commuter steps off a train and unlocks a shared car for the final leg home rather than keeping her own vehicle idle in a driveway five days out of six. In Wellington, each shared car on the road already replaces eleven private ones.

The buildings along the street were designed the way engineers now think about resilient infrastructure. Short-life elements kept separate from long-life structure, so a shopfront's charging point or a car park's EV bay can be swapped out or upgraded as technology moves, without touching the frame or foundations. Nobody had to guess what vehicles would look like in 2040. They just made sure the building would not need to be demolished to find out.

The street itself was repaved last year using recycled rubber from end-of-life tyres blended into the asphalt binder.

This is not a future vision, but it is yet to be realised in full value across New Zealand's transport system.

Following the same approach **Waka Kotahi** already permits on New Zealand roads, and which research shows can stretch a low-noise surface's life from 8 years to 40. Alongside it, sit materials recovered from a demolished overpass rather than freshly quarried aggregate. The old asphalt processed on site and returned as base course, and the steel barriers sourced from a bridge replacement project three years prior. The old asphalt keeps its mauri rather than being discarded for something new, extracted, and empty of history.

Nearly every part of it is already happening – in pieces, right here. Cargo bike logistics and shared mobility in Wellington and Auckland, recycled tyre rubber in New Zealand's own road specifications, garment registration and resale already proven here and in Australia through AirRobe. The rest are already working overseas and ready to be brought home, such as reusable packaging pools run globally by CHEP and IFCO, battery passports, and second-life pilots across Europe, multifunctional mobility hubs in London.





How we move within the circular future of Aotearoa New Zealand.

People, goods, and materials move freely through fit-for-purpose networks that are highly efficient and fully utilised. Micro-hubs enable this from port to doorstep, with low-emission last-mile delivery of products that are tracked for usage and material recovery. Mobility is an integrated, accessible service which prioritises human movement alongside renewable, electric-powered shared cars, bikes, ferries, and buses.

Key circular flows & features:

1. Critical material loops: Items like batteries are continuously reused and repurposed. Digital records determine usage and value – from car shares and cargo bikes to powering buildings in their next lifecycles and finally critical materials recovery.
2. Product stewardship: Citizen's products move back and forth in reusable packaging systems – from being purchased, shared or leased, through to delivery, local repair, and reuse. With componentry tracked in a globally transparent material passport.
3. Regenerative infrastructure: Access to nature is opened and interwoven in our mobility spaces and cities – a valuable part of our built ecology, biodiversity, citizen wellbeing and climate-resilient infrastructure.
4. Remade economy: Materials are mined from our existing economy and reused in building future infrastructure, such as our roads remade from used materials such as tyres and other industrial waste streams.

SYSTEM SHIFTS

What we see as missing to make this future possible is not new technology. It is coordination, procurement reform, and deliberate market development, connecting what already works, here and elsewhere, into a system.

Here is what makes systems change towards circular mobility possible:

- Mobility as an integrated, accessible service, shared cars, bikes, and buses replacing the dependence on individually owned vehicles.
- Materials registers and passports, tracking a battery, a garment or an appliance across its whole life, not just its first sale.
- New financial models that share risk and reward, pooled ownership of assets like crates and batteries, rather than every business bearing that cost alone.
- An interconnected system that enables affordable reverse logistics making returns worthwhile, infrastructure that gets a product, component or material back into use rather than into landfill.
- Infrastructure as a materials bank, roads, buildings, and stations designed to be recovered from and adapted, not demolished, and to regenerate the living systems they run through, not only the materials within them.
- Electrification with full lifecycle planning.
- The micro-hub model for last-mile logistics.
- Decentralised and abundant energy.

On the following pages we outline key shifts that address:



How we use demand and utilisation.



How we power energy and materials inputs.



How we connect infrastructure and systems.

HOW WE USE

Demand and utilisation

Fewer, fully-used assets across more compact mixed-use cities.

The circular economy does not begin with electrification. It begins by asking how we design the system so that moving people and goods requires fewer, fully used assets across their full lifecycle.

Compact, mixed-use cities mean shorter trips. Local goods consolidation means fewer vehicles covering less distance. Shared mobility means assets are used most of the time, not parked 90% of the time. The circular economy reduces how much moving needs to be done with fewer assets with as little material and energy as possible.

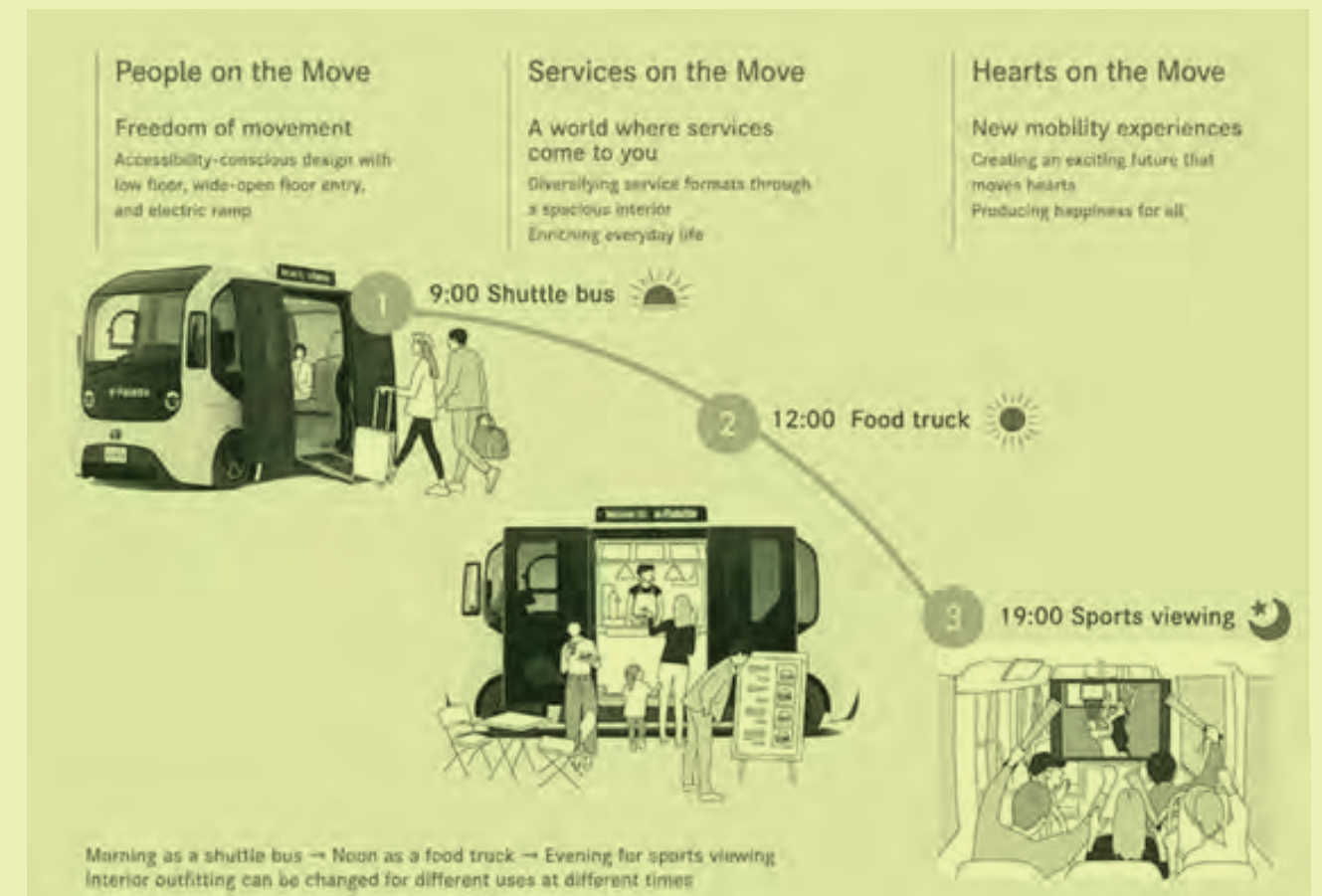
Only then can we reduce our risk and reliance on finite materials extraction as our cities grow and transition to new low-emissions energy sources and systems.

Liberating vehicles and creating value with mobility as a service.

Private car ownership is one of the most resource-intensive consumer choices available. The average vehicle is mostly just parked – yet it still requires the extraction, manufacture, and shipping of steel, aluminium, copper, glass, plastics, and rare earth elements to produce.

Shared mobility restructures this logic entirely. Shared e-bikes, e-scooters, and shared EVs available via app mean one vehicle serves many users across its life, dramatically improving the productive ratio of use to material intensity. Mobility becomes a service accessed when needed for both goods and people, not an asset stored at the kerb. These options have flexibility and modularity designed to offer services for both goods and people.

Toyota's e-Palette is a good example of this shift, designed from the outset for utilisation rather than idle ownership. Now in its second generation, it is a fully automated, battery-electric vehicle built to be scalable and customisable across a range of mobility services rather than fixed to one purpose. Its interior can be reconfigured through the day: the same vehicle can run as a shuttle bus in the morning and evening, then operate as a store or entertainment space in between. Toyota frames it as a symbol of the company's shift from automaker to mobility provider, a vehicle built to offer services and value beyond the traditional scope of a car.



HOW WE POWER

Energy and materials inputs

The energy stack
- moving beyond fuel
substitution.

To achieve this, transport
could follow a clear
priority order:

Not every kilometre travelled has the same energy cost, and not every mode can decarbonise the same way. Some can run on human effort alone. Some can only run on fuel too energy-dense to replace with a battery. Getting this right means matching each mode to what it actually needs, not defaulting to one technology for everything across different horizons.

1. Human power — walking and cycling for people and light goods. Zero energy cost, zero emissions, co-benefits for health and public space.
2. Electric, human-assisted — e-bikes and e-cargo bikes powered by renewable electricity. The most energy-efficient motorised form of movement available for commuters and last mile deliveries.
3. Electric, prioritise shared — electric buses, trams, shared EVs, multiuse electric vehicles for people and goods, and light rail, powered by New Zealand's existing renewable electricity generation.
4. Battery-electric for heavy road freight — the default for the great majority of freight, not a fallback behind biofuels or hydrogen. Global modelling of road freight decarbonisation now finds battery-electric trucks the most cost-effective option across most truck segments, particularly regional transport, with battery-electric increasingly outpacing hydrogen even on long-haul routes as battery prices fall and battery-swap infrastructure solves charging time.
5. Hydrogen, reserved for the narrowest freight segment — the heaviest trucks running the longest daily distances, where battery weight and charging time genuinely do not work. Not a general substitute for electrification, a precise tool for a small edge case.
6. Biomass-derived fuels for marine and aviation — the two modes that cannot electrify at meaningful scale, not on a technology timeline but on physics: batteries lack the energy density for long-haul flight or ocean shipping. New Zealand's forestry residue and purpose-grown biomass feedstock, the same base already discussed in EAT, is directed here instead, through pathways like the Scion, Air New Zealand and LanzaJet sustainable aviation fuel programme. That feedstock only closes the loop if the forestry systems supplying it are regenerating the land they draw from, residue recovered from production forests managed for soil, water and biodiversity outcomes, not a fresh demand signal for clearance. Aviation in particular has few other options: feedstock is prioritised for SAF because long-haul flight has limited decarbonisation pathways, whereas ground transport can draw on both electrification and hydrogen.

The proposed Marsden Point Biorefinery shows the more complete version of the same logic.

Alongside biodiesel and sustainable aviation fuel, the consortium's alliance with Ballance Agri-Nutrients would turn biorefining byproducts into fertiliser, closing a loop that would otherwise leave a waste stream behind. It is a useful model for what full-system planning looks like in a biorefinery. It is also, as yet, unbuilt: the project remains subject to a final investment decision and regulatory approval, with construction timing not yet confirmed.

The critical insight is that this is not just about swapping fuel.

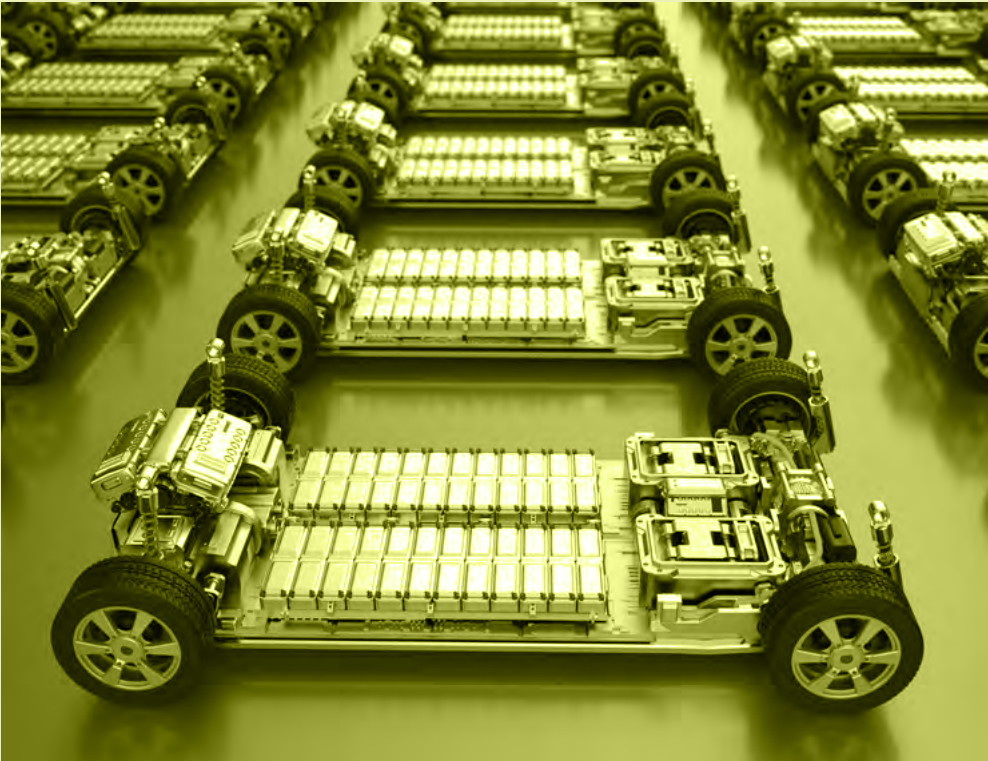
It is about redesigning the system so you need far less energy per trip, with fewer assets utilised across their full lifecycle, and matching each remaining fuel to what that mode cannot electrify with current or foreseeable battery technology, not for lack of trying. Applied to the last mile, this means zero fossil fuels by design, not aspiration: the final delivery leg is human-powered or electric, with no diesel beyond the micro-hub.



Electrification with full lifecycle planning.

Public procurement of electric fleets is both a direct emissions reduction and a market signal — but electrification without asset lifecycle planning simply transfers the linear problem to a new material set. Batteries are the most expensive and material-intensive component of an electric vehicle. An electric bus battery in the Netherlands does not retire when the bus does. It is pulled, tested and redeployed into local energy storage, where it works for another decade before anything in it is recycled.

Battery size is a lever New Zealand can pull even though it cannot set the terms of vehicle design. Because New Zealand’s fleet is overwhelmingly imported rather than manufactured domestically, our country has little to no influence over the battery specifications built into the vehicles arriving here. But global research shows that a shift toward rightsized batteries, matched to real duty cycles rather than defaulting to the largest available pack, alongside chemistry innovation and recycling could reduce annual global battery and mineral demand by around a quarter by 2030. For New Zealand, that lever sits in procurement, not design: fleet buyers, particularly government and large corporate fleets, can specify vehicles sized to actual use rather than maximum range, and in doing so shape demand signals that ripple back up an import-dependent supply chain.



The question is whether New Zealand builds the procurement requirements and market infrastructure to capture this model domestically — or watches the value in our retiring EV batteries leave the system entirely.

The battery’s second decade.



The same principle is proving its value at the other end of the development spectrum. Research across Africa’s solar mini-grid sector (where 600 million people still lack electricity access) shows that second-life EV batteries can significantly reduce the capital expenditure of new mini-grid installations. Keeping high-value components in use longer while bringing energy access to communities that would otherwise remain off-grid.

The CEPREC research programme (operating across Nigeria, South Africa, Kenya, Sierra Leone, Namibia and Rwanda) is actively developing the business models, testing protocols, and technician training needed to make this viable at scale. Their model is to use second-life batteries where new batteries would be prohibitively expensive, extend the value of the original asset by a decade, and then recover the materials at the true end of life.

For New Zealand, this is directly relevant. Not because we face the same energy access challenges, but because it demonstrates that closed-loop battery systems are technically viable, commercially developing, and no longer theoretical.

The connection to RethinkX’s Stellar Energy framework is significant here. As clean electricity moves toward superabundance, the economics of battery storage become increasingly attractive — making second-life deployment of vehicle batteries into grid storage not just environmentally sensible but financially compelling. New Zealand, with its high renewable generation share, is well-positioned to develop this model.

At present, it appears there is no nation-wide programme to do so.

HOW WE CONNECT

Infrastructure and systems

Intelligent decentralisation.

The RethinkX Stellar Energy analysis underlines a principle relevant across the MOVE system: the future of energy is not centralised and scarce, but decentralised and abundant. This changes the logic of transport infrastructure. Distributed solar-charged EV charging points, community-managed shared fleets, neighbourhood-scale micro-grids powering last-mile logistics, these are the architecture of a transport system built on the energy economics of the next decade, not the last.

The micro-hub model for last-mile logistics.

The most tractable shift in urban freight is a structural one: large diesel trucks stop at neighbourhood consolidation points: micro-hubs near the edge of urban areas. From the hub, goods are sorted and delivered by cargo bike or on foot. No diesel beyond the micro-hub. This is not experimental. In London, Amazon and the local council converted 39 car park spaces into a last-mile logistics hub, with parcels now delivered by cargo bike and on foot. The scheme removes up to 85 vans a day and around 23,000 vehicle journeys a year. In Seville, 200 cargo bikes serve street cleaning. Vienna and Brussels run cargo bike fleets for city services across multiple municipalities.

These assets are infrastructure for not only getting goods including food to citizens, but also getting them back to organisations cheaply, for repair, returns and redistribution preventing them from going to waste.

The infrastructure is already available in New Zealand.

Converted car parks, underutilised loading zones, or deploying underutilised fossil fuel (petrol) stations, and the logistics case is strong in any dense urban area. What is missing is potentially a council willing to designate the sites and a tender willing to deliver the model.

Infrastructure as a materials bank.

Every road, bridge, tram line, and piece of transport infrastructure is a materials bank. When a tram line comes up, the old rails are reused. Network Rail in the UK has recovered 2.6 million tonnes of track ballast for reuse over the past decade, saving £9 million in material costs, and has committed to embedding circular economy thinking across the industry by 2035. SNCF Réseau in France discards a similar 2.6 million tonnes of track materials annually, and is targeting full recovery of structural materials by 2025, cutting material-related emissions by 25% by 2030. That outcome required deliberate planning: materials audits before projects began, specifications that prioritised recovery, and market relationships with processors who could take recovered materials. New Zealand infrastructure projects rarely start with this question.

They should.



A circular system for New Zealand's roads is starting to come together, from two different directions.

Put those two pieces together and the outline of a circular road system appears.

Materials are not the only thing that infrastructure needs to account for when it is rebuilt.

Futurity's lignin-based product LIMA claims to substitute up to 30% of the bitumen in asphalt, reducing exposure to imported bitumen at a time when New Zealand has relied entirely on shipped supply since Marsden Point stopped refining in 2022. Separately, reclaimed asphalt pavement, old road surface milled up and reprocessed into new mix, is already standard practice here. NZTA's M/10 specification currently caps reclaimed content at 15%, and Acon Industries has built a plant specifically to push past that ceiling, targeting mixes with up to 30% reclaimed material.

A lower-carbon input at construction, and a reclamation pathway at resurfacing. What has not yet been tested, as far as we could find, is whether lignin-modified asphalt can go through the same milling and remilling process as conventional bitumen mixes across successive resurfacing cycles. If it cannot, LIMA delivers a one-time material substitution. If it can, New Zealand has the beginnings of a renewable road surface utilised across its full working life, before it is remade again and again.

The actors who could answer this are already active. Futurity holds the input chemistry, Acon Industries has committed capital to higher reclamation rates, and NZTA Waka Kotahi holds the specification that sets the national ceiling. What perhaps is missing is the trial connecting them, and a specification pathway ready to respond once it runs.

Every road or rail corridor that cuts through forest, wetland or waterway also cuts a wildlife population in two, and each resurfacing or realignment is a decision point to reconnect what was severed, not only to recover what was buried.

Overseas, wildlife crossings and vegetated overpasses, known internationally as ecoducts, let animals move safely across a road rather than into its path with design standards for the structures themselves now well established from decades of monitoring. Along an 82-kilometre stretch of Canada's Trans-Canada Highway through Banff National Park, a network of overpasses and underpasses paired with fencing has cut wildlife-vehicle collisions by more than 80%, and by 96% for deer and elk specifically. Kaitiakitanga does not end at the boundary of the road corridor. A materials bank that regenerates asks what the corridor returns to the living systems it runs through, not only what it recovers from the ground beneath it.

The framework that holds it together.

Right now Scotland's 2026 Circular Economy Strategy explicitly identifies transport as one of five priority sectors for circular transition. Across these priorities, procurement reform, product stewardship for end-of-life vehicles and batteries, and skills development as the central mechanisms.

New Zealand has no equivalent, and building one is the work.

Unlocking this opportunity closes the gaps between linear and circular mobility with strategic, prioritised and coordinated reform that considers materials and asset productivity in the context of the energy transition already underway.



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Circularity through everyday life - when energy and water flow, everything connects.

The chapters before this one explored how we live, how we eat and how we move, one at a time. Here, we provide you with the opportunity to visualise what it might look like together.

This is a single imagined place - a street, a farm, a marae, a town - in a region where the circular systems run through the same ground, the same water, the same currents, all seen through the lens of everyday life for people. It is one way of making a circular Aotearoa visible all at once.

Valuable biological resources are recovered and circulate locally as nutrients and energy. Forest slash that would once have been burned off, washed downstream causing damage to rural infrastructure and waterways, or left to rot becomes biochar, feeding soil and producing energy as it's made. Food waste collected from processing sites becomes biogas, heating and powering the modular hubs that turn diverse crops into diverse food, its digestate returning to the land next door as fertiliser.

Our connection is renewable energy and the minerals that enable it. This is evident everywhere transport touches our everyday life. Light electric vehicles are registered on materials passport platforms, batteries store and share power for homes during a blackout before returning through a national take-back scheme to become off-grid storage for farms, marae and community halls, and eventually critical minerals recovered here in New Zealand build the next generation of batteries. Energy in this place has more than one life.

Water moves from rain to river to root, irrigating crops, filling taps, generating New Zealand-made energy as it flows. It moves through homes, workplaces and schools, and instead

of leaving the system at the drain, it's recovered - for water, for energy, for nutrients, for biomaterials - before being returned as something the citizens can use again. Water was never allowed to become waste. Wetlands and restored waterways aren't set aside from this system; they're built into it, filtering water and holding the space where farming, the built environment, our communities and nature meet.

When repair hubs and food sit close to where we already are, more of what moves is powered by us - a bike home with a fixed blender, vegetables picked up on the school run - meaning we demand less energy overall.

What moves between the home, the farm, the marae, the repair hub and the city moves both ways: what's taken out is matched by what comes back, whether that's a battery, a crate, a repaired appliance or a bag of compost. That reverse loop is what makes this a system rather than a supply chain, as it builds the foundations required for people and goods to move with freedom, not barriers.

This is one region, one version of the future, drawn from research that already exists, from businesses, communities, marae and citizens already building parts of it across Aotearoa today. It is not the finished picture - it's what became possible when we let ourselves imagine these systems connected, rather than apart.

Turning it into Aotearoa New Zealand's future isn't something this illustration can do on its own. That depends on what comes next: the three recommendations that follow, and on the people, businesses, communities and government who choose to build a circular future with us.





The energy system that powers our circular future for Aotearoa New Zealand.

Electricity and infrastructure:

- Renewable power is distributed across sectors, industry, and communities.
- Surplus energy from farms and orchards power the region around them.
- Solar sits within crops and stock.
- Electric batteries power light and highly efficient transport modes.
- Material passports monitor and measure battery usage, storage, and life spans to enable reuse locally.

- Homes use EVs to store, share, and back up energy.
- Take-back programs convert used batteries into off-grid storage.

Excess plant material:

- Plant material such as forest slash is valued and collected alongside timber.
- Used to produce biochar, nutrient rich soil amendments, and processing energy.
- Output energy helps produce sustainable aviation fuel in modular facilities.

Excess food:

- Manufacturing waste generates biogas for heat and power, plus digestate for fertilizer.
- Quality food surplus is redistributed into the community or upcycled into new food products.
- Food waste is converted into regional compost.

Human-powered energy:

- Repair hubs are conveniently located and local food easily available.
- Neighborhood proximity cuts our overall transport energy demands.
- Walking or cycling etc become the easy and preferred choice for taking a broken appliance in for repair, or picking up fruit and veges on the way home, or going to the local school or marae.

Water systems:

- Wai sustains us—from rain, rivers, lakes, creeks—and its systems are interconnected; Water generates hydro power, irrigates crops and gardens, and provides drinking water.
- Wastewater systems capture nutrients, and biomaterials for valuable reuse.
- Restored wetlands filter water, support biodiversity, and create climate resilience.

MAKING IT

A REALITY

We have momentum, now we need transformation.

“New Zealand’s productivity performance has lagged that of other advanced economies in recent decades, and the make-up of the economy has shifted towards lower complexity, lower productivity sectors. New Zealand can be more prosperous and enjoy higher standards of living in the period ahead with a renewed focus on productivity growth through the creation and capture of greater value, not just greater quantity, through all economic activities.”

— New Zealand's productivity in a changing world, MBIE & MFAT Long-term Insights Briefing, 2026

For a circular transition, we need more joined-up, long-term thinking, requiring both national and regional-level leadership.

In 2026, MBIE and MFAT published a Long-term Insights Briefing on New Zealand's productivity – it reaches the conclusion that productivity is about value over volume:

Unlocking greater value from Aotearoa New Zealand's biological resources can enable a more sustainable, low-emissions bioeconomy that strengthens resilient growth and supply chains while reducing waste and pollution.

One where value gets made, the briefing states directly that Aotearoa New Zealand is better understood not as one economy but as a network of small regional economies, each with its own climate, industries, capabilities, history and partnerships with local iwi.

That, it concludes, calls for place-based policy. It also finds underdeveloped dispersed population drives structurally higher costs and limited scale in infrastructure, transport and manufacturing, and that our industrial clusters, meaning groups of related industries close enough to share infrastructure, labour and ideas, are thin or missing.

The briefing provides clear evidence that a values-driven Maori enterprise grounded in whai rawa, oranga and taiao is aligned with growing global demand for ethical, sustainable products, that Māori authorities and SMEs outperform the broader economy in employment, innovation, R&D and exports. This is important because Māori will be a fifth of our workforce by 2040.

Five principles were recommended for lifting long-term productivity:

- Adopt a coherent, long-term economic approach.
- Strengthen strategic assessment and market intelligence.
- prioritise internationally oriented, knowledge-intensive clusters.
- build a productivity ecosystem where innovation, talent and infrastructure work together.
- Use trade policy as a productivity lever.

Regional productivity is being held back

A region can build a food hub, but it cannot make government procurement create a reliable market for regional supply. It can build a composting or biogas facility, but it cannot make recovery cheaper than landfill. It can establish repair and reuse services, but it cannot change tax settings that favour replacement, single-use and virgin materials.

It can begin recovering batteries and other materials, but it cannot establish the national standards, product passports or producer responsibility needed to create viable secondary markets. And it cannot give investors confidence that the policy and market conditions supporting shared infrastructure will still be in place in the long-term.

Productivity cannot be enabled from a single site or a single model. We need connected, practical place-based approaches. Our regions are not interchangeable and should not be made so. Ōpōtiki, Motueka, Murihiku and Kaitiāia each hold different soils, different species, different industries, different iwi and different histories, and what gets built to circulate and create value in each can look different as a result.

We are seeing the early beginnings of this place-based approach with the Taranga Circular Precinct and the Hawkes Bay Circular Opportunity Scan in partnership with local businesses and councils. Scaling and adapting this across regions is the work to be done.

Australia is activating place-based opportunities through circular precincts: places where repair, reuse, remanufacturing and processing sit close enough together that one enterprise's residue becomes its neighbour's input, and where shared renewable energy, water and recovery infrastructure gets built once for everyone on site. The Hunter, generating \$64 billion in gross regional product, has been assessed as able to unlock \$600 million of precinct investment. The Wagga Wagga precinct projects 2,077 full-time jobs. Their success has depended not simply on local initiative, but on dedicated governance, early investment and incentives, regulatory support and sustained political commitment.

How can Aotearoa New Zealand progress regional investment in place-based approaches? National-level policy settings are critical to building confidence and certainty.

Four shifts unlock the circular business models and innovations.

1. Capital designed for circular business models.

Circular economy investment mechanisms needed - these could include credit guarantees for shared infrastructure and circular precinct development, concessional financing for processing facilities, and micro-credit for smallholder farmers, small business, early-stage innovators and scale-ups.

2. Tax settings that even the playing field.

Current tax incentives advantage virgin materials and imports. Repair has to be cheaper than replacement before it becomes the default, which is why other countries are removing tax from repair services, remanufactured goods and recycled inputs. We tax labour, rather than resource use, making it challenging to retain value in circular resource use.

3. Government procurement as a lever.

All of Government procurement and capital investment guidance to consider lifecycle cost rather than purchase price. This could unlock \$51.5 billion of annual spending better incentivising durability, recovery and local supply.

4. Producer responsibility extended upstream.

Regulated product stewardship for textiles, electronics, mattresses and furniture, moving end-of-life cost from councils and communities to the brands and importers who put the products on the market. Moving beyond just recycling integrating reuse, repair and remanufacturing into these programmes as mandatory options.

Central Government leadership is needed.

Regional capability can only become regional productivity when national settings enable it to scale. If our regions are ready, but the settings around them are not, the work in front of us becomes a national commitment to:

1. See the whole system - map what exists (product and material flows, capabilities, investment), identify the gaps in connectivity and connect through regional, industry and research plans.
2. Create the conditions for investment - align procurement, standards, regulation, tax and financial incentives so circular options can compete and markets can develop.
3. Invest for the long term - treat shared processing, repair, reuse, recovery and other circular infrastructure as productive infrastructure, particularly where costs are front-loaded and benefits are distributed across the wider system.

Plan it. Derisk it. Fund it. Make it last.



A starting point to reframe how we value, use and steward resources into the future as Aotearoa New Zealand.

The three recommendations we present are not a fixed blueprint, but a set of system levers that can be strengthened through co-design with policymakers, iwi, business, local government, communities, and sectors already leading circular practice.

It is an ambitious, critical call for a cross-sector approach.

Central government has a pivotal role in setting direction, aligning incentives and creating the long-term confidence needed for investment. But circularity will not be delivered by the government alone.

The next chapter of Circular by Nature focuses on what Aotearoa New Zealand can collectively achieve across the system.

Whether the priority is productivity, resilience, export competitiveness, resource efficiency, waste minimisation, emissions reduction, nature restoration, wellbeing, value creation or easing cost-of-living pressures, the evidence is clear: a take-make-waste linear economy is costing us significantly as a nation. A pivot is needed.

We therefore recommend a roadmap of three mutually reinforcing levers.

1. First, New Zealand needs **coordinated leadership** to connect and activate circular economy work across sectors, fill gaps between isolated initiatives, and support system-wide change.
2. Second, it needs a practical, **action-focused framework** that maps how existing plans, responsibilities and levers fit together towards targets.
3. Third, it needs durable **policy and market settings** that provide business certainty to act long-term – including through procurement, infrastructure planning, emissions reduction planning, resource management settings and legislation where appropriate.

These levers are concurrent, not sequential. Coordination can begin while a framework is developed. The framework can identify where existing mechanisms are sufficient and where new tools are needed. Policy and legislative opportunities can be assessed as they arise, rather than treated as the only pathway for change. The Planning Bill and Natural Environment Bill, waste reform, the next Emissions Reduction Plan, infrastructure planning, procurement settings and sector-specific work programmes all provide potential entry points. The phasing is tight, so the work must overlap by design.

Across all three foundations, circularity in Aotearoa must uphold Te Tiriti o Waitangi, protect mātauranga Māori, and recognise Māori-led, place-based approaches as central to the transition. This means resourcing kaupapa already practising circularity, protecting Māori data sovereignty, and measuring success through restored mauri and shared wellbeing alongside emissions reduction, waste reduction and productivity gains.

Recommendation 1.

Establish a **Circular Futures Activation Group** that guides and coordinates industry leaders with prioritised taskforces.

We have found that for circular models to be commercially successful, four conditions are required. Strong convening, clear roles, stable enough funding signals to justify investment beyond the pilot stage, and physical infrastructure that makes participation easy.

Someone has to lead and plan these transitions.

This could begin with a National Circular Futures Expert Activation Group as a formal cross-sector body: established with ministerial accountability, with its secretariat housed in the MCERT, working alongside MBIE, MFAT and MPI.

The group would go beyond a conventional advisory panel. Its role would be to provide the coordination, expertise and delivery focus needed to turn isolated circular economy activity into an investable national pipeline.

The group would work across three modes:

1. **Setting direction** – by developing the evidence, frameworks and shared priorities that help businesses, iwi, councils, researchers and government act.
2. **Enabling collaboration** – supporting shared infrastructure, co-investment and coordination across sectors and regions.
3. **Advising on enabling settings** – identifying the policy, procurement, investment and regulatory changes needed to level the playing field.

The Sustainable Business Council (SBC) reflecting the collective views of more than 140 leading businesses that together contribute more than 42 percent of New Zealand’s private sector GDP, recommend that the Government should establish a cross-industry circular economy and resource efficiency business advisory panel to guide and coordinate industry leaders with prioritised taskforces: connecting the evidence and the investment required for circularity to be implemented across the systems where the most value is unrealised, for example in products, food, mobility and housing.

– 2026 Election Priorities: Policies for Driving Sustainable Growth

Establish a **Circular Futures Activation Group** that guides and coordinates industry leaders with prioritised taskforces.

As a starting point, the group would need a balanced mix of capability rather than organisational representation.

A core group could include:

- Iwi and Māori enterprise leaders, with Te Tiriti obligations and partnership arrangements built into the group's establishment.
- Business leaders from high-material-flow sectors, including manufacturing, food and fibre, construction, retail and logistics.
- Local government and regional economic development representation, reflecting the role of councils and regions in infrastructure, procurement, planning and implementation.
- Community and social enterprise leaders, especially those working in reuse, repair, food resilience, local enterprise and resource recovery.
- Science and research expertise, including the Bioeconomy Science Institute and universities.
- Practitioners already implementing circular business models and systems, including reuse, repair, remanufacturing, processing, recovery and shared infrastructure.
- Finance, investment and procurement expertise, to ensure credibility around the investable pipeline, public-private funding models and market creation.

Convening of taskforces to guide and integrate opportunities in the transitions.

Once established, the Activation Group would be well placed to convene **four** standing, industry-led taskforces in key areas such as housing and construction, products and packaging, food and fibre, and mobility and energy.

Each taskforce would include a named counterpart official from the relevant agency, regional representation from councils and iwi, and a research partner.

The taskforces would identify the research, development, infrastructure, investment and policy needs of business, government, iwi and communities in their area.

Structured briefs would turn taskforce-identified gaps into applied research projects with commercial outcomes attached, for example bioeconomy feedstocks to materials tracking and reverse logistics. This would give postgraduate researchers, scientists and entrepreneurs a direct route into the transition opportunity, while giving industry access to the talent and research required.

The Activation Group would be responsible for ensuring opportunities that sit between taskforces are integrated, sequenced and progressed as part of one national pipeline. Each taskforce would report to the Activation Group. The Activation Group would report publicly on progress and provide advice to the Minister.

This structure draws on learnings from Australia, one of our primary trading partners, whose Ministerial Advisory Group reported to a named minister, was serviced by a department, and produced the evidence base for a National Circular Economy Framework.

First year priorities:

- Engage key stakeholders and establish task forces to determine priorities and action plans.
- Address the gaps in the quantification of resource flows (in volume and value) across the economy, including the development of New Zealand baselines using the Circularity Gap methodology and international standards, tracking progress, and publishing a public dashboard.
- Lead across the system by connecting the food system transition, the built environment, and the transport and energy transition into a single national pipeline rather than three separate conversations. This includes creating a map of what exists, the gaps to achieve circularity and make it publicly available.
- Honour Te Tiriti by ensuring equitable, place-based approaches progress in partnership with mana whenua, supporting Kai Motuhake as the foundation for food system self-determination, and championing kaupapa Māori initiatives including Hua Parakore.
- Assess international developments and policies, building on initial circular bioeconomy research carried out by MBIE in 2023 to understand what has worked and not worked well in countries implementing circular economy policies.
- Build the investable pipeline by connecting research, commercial opportunities, and capital.

This could include:

- Completing robust economic assessments to build a costed, sequenced set of projects that private investors and government agencies can fund. E.g. circular precincts and critical onshore recycling/remanufacturing infrastructure gaps.
- Making clear recommendations to government on how to shift the demand signal for circularity. The first priority would be to influence public and private procurement. The panel convenes retailers and exporters, alongside the growers and processors who could supply them differently, and builds the commercial frameworks that make it rational for everyone involved.
- Develop science and technology briefs by connecting each cross-industry taskforce directly to universities, research institutions, Young Entrepreneurs, Bioresource Processing Alliance and the New Zealand Product Accelerator - linking real-world problems to masters, PhD, Young entrepreneurs, applied research projects and industry to address circular challenges.

Goodwill is not a funding mechanism. A household cannot repair what was not designed to be repaired. A builder cannot reuse materials if consenting, insurance and supply chains do not support deconstruction. A food business cannot turn by-products into value if regulation still calls them waste.

Recommendation 2.

Develop a National Circular Economy Framework.

Engage MCERT with MBIE, MFAT and MPI, to develop and agree on a National Circular Economy Framework: a single set of levers, targets and responsibilities that joins up what already exists rather than authoring another standalone document. This would sit alongside the 101 countries including our trading partners who have a call to action, roadmap or strategy.

A great deal already exists and none of it is connected. Regional waste minimisation and management plans, Industry sector plans, The Minerals strategy, Research and development programmes, Procurement rules, National Infrastructure Plan, Product stewardship schemes and Regional economic development priorities.

Australia's National Circular Economy Framework sets national targets and assigns responsibility across government, industry and states, without replacing the plans already underway. Australia is working towards a national ambition of doubling its circularity by 2035. It is the precedent this recommendation follows.

New Zealand's National Circular Economy framework should join up regional plans, industry plans and research programmes rather than replace them, and identify the levers needed to accelerate local and regional manufacturing, secondary materials markets, diversified food production, circular procurement, bio-based resources, trade readiness and recovery systems. It should also make visible the workforce and youth employment pathways created by this transition, from repair, reuse and recovery to circular design, regional processing, bio-based manufacturing, logistics, science, data and engineering.

The role of the Framework is to define:

- The vision for New Zealand's circular economy, including measurable targets.
- Where the government will regulate, and where it will leave the market to lead.
- Where it will invest and on what terms, including how public procurement will be used as a demand signal.
- Where extended producer responsibility applies, and to which products.
- What standards and data are required, and who sets them. Leveraging existing platforms such as Ecochoice.

The transition must be developed with mana whenua – with Te Tiriti as the foundation.

The framework should be developed using the three principles of te Tiriti o Waitangi – **partnership, protection and participation.**

Existing frameworks like Kai Motuhake and Hua Parakore would be foundations for how it is scoped, governed and implemented, working with communities directly.

It doing so it should include the following areas:

- Te Tiriti governance: co-design with mana whenua, Māori leadership in priority-setting, and recognition of rangatiratanga and Māori rights and interests.
- A Māori-led circular pipeline: funding for kaupapa Māori initiatives, and support for iwi, hapū and community-owned processing, repair, reuse, kai and nutrient infrastructure. Community food infrastructure and marae-based systems are essential infrastructure, not charitable add-ons, and the strategy should fund them on that basis.
- Measures beyond material efficiency: mauri, oranga, local capability, food sovereignty, intergenerational resilience, and value retained in place.
- Protection of mātauranga Māori: not extracted into national frameworks without governance, consent and benefit-sharing, with Māori data sovereignty built into digital product passports, material flow data and circular dashboards from the outset.

“The Māori Economy is inextricably linked to Oranga-Wellbeing. Anchored within a set of Te ao Māori values that encompasses the wellbeing of people, place and nature.”

The Connective, Arup and Project Moonshot, 2024

Recommendation 3.

Embed circularity in policy, planning and regulatory settings.

To give circularity clearer status in existing decision-making with measurable objectives, funded actions, assigned responsibilities and review points that support long-term investment and implementation.

We do this by embedding circularity into policy, planning and regulatory settings. Circularity is a values shift in how New Zealand prices resources, allocates risk, and defines prosperity, and that shift needs legal frameworks sturdy enough to last generations and provide certainty for business and household decisions.

This requires the identification of practical entry points across the Emissions Reduction Plan, Planning Bill, Waste strategy and legislation reform, Natural Environment Bill, procurement standards, infrastructure planning and sector policy. Potential areas outlined in Appendix B.

Infrastructure is priced on duration. A processing hub, a reusable packaging company, a repair network, a land transition, a critical materials innovator and a recovery system all carry front-loaded capital and capability costs, with returns that are made over a decade or more. An investor assessing these productivity increasing systems is asking whether demand signals, levies, standards and procurement rules will still exist to support their success over the years to come. Where the answer is uncertain the project does not get built, regardless of how strong the underlying economics are.

New Zealand's circular settings have moved in both directions over the past decade. Upstream work in system redesign, packaging, plastic, producer responsibility and bioeconomy development took shape between 2017 and 2023; several of those settings have since been narrowed, paused or defunded.

Whatever one's view of any individual decision, the pattern itself is what gets priced. Uncertainty is a key reason why 45% of New Zealand's sustainability innovators describe the policy environment as unsupportive and only 18% describe it as supportive.

Ensuring circularity is embedded in New Zealand's policy, planning and regulatory settings will help provide business certainty and encourage resource reallocation from extractive, linear activities to activities better aligned with the circular economy.

Legislation is what converts a policy intention into an investable one. It is the same instrument New Zealand has used for every other infrastructure class it has built, and it is aligned with this government's stated priorities on growth, productivity, resilience and export competitiveness rather than in tension with them. Circularity lowers input costs, shortens supply chains, reduces import dependence and creates regional jobs. Those are the outcomes the economy is being asked to deliver.

There is a difference between a weak circularity that keeps materials moving while leaving the extractive system intact, and the strong circularity this paper argues for, grounded in Te Tiriti, whakapapa, kaitiakitanga, mauri and oranga. Legislation helps ensure that distinction is not a preference but becomes binding: definitions that uphold Te Tiriti and recognise place-based leadership by mana whenua, iwi, hapū and Māori enterprise; measurement that includes mauri, oranga, local capability, Māori data sovereignty and value retained in place alongside emissions and material productivity; and funding, procurement and stewardship settings that resource kaupapa Māori initiatives as transition infrastructure.

“Business action alone cannot transform markets. It can demonstrate what’s possible, but without supportive policy frameworks progress stays fragmented and first-movers remain disadvantaged.”

The Work Ahead: Our Strategy for Scaling the Circular Economy, Ellen MacArthur Foundation

How the three recommendations work together.

(1) The **Circular Futures Activation Group** provides the coordination and expertise to turn system gaps into an investable pipeline. (2) The **Framework** maps how existing plans, responsibilities and levers fit together towards agreed targets. (3) **Policy, planning and regulatory settings** keep the direction stable enough for people to invest time, capital and resources into. Building a circular future into New Zealand's core economic infrastructure.

Together we have coordination, alignment and certainty.



The 2026 election offers a timely opportunity to bring these issues into the public policy conversation and consider what the next phase of action could look like.

Circular by Nature sets out a practical way to connect the work already underway, align the next set of decisions and create the conditions for greater investment and collaboration. Done well, this is not about creating another layer of activity. It is about connecting what is already happening, strengthening what is working, and creating the conditions for new ideas, businesses and value chains to grow.

That is what it means to be Circular by Nature.

Not a single programme or policy, but an economy designed to keep value in flow, through our citizens' materials, resources, communities and regions. Building on the strengths we already have here in Aotearoa New Zealand, and bringing that natural edge to work for our future.

Closing thoughts:

The linear economy extracts. It takes minerals from the earth and sends them to landfill. It takes fertility from our soils and ships it offshore as a commodity. It takes the energy we could generate from our own sun and wind and substitutes fuel imported from the other side of the world. It takes the connection between people and the places they live, the food they eat and the things they use, and replaces it with products and supply chains no one can see, trace or hold to account.

The circular economy returns. It returns nutrients to soil. Materials to use. Energy to our communities. Value to by-products, to buildings, to the components inside the vehicles we drive. Jobs and money to local economies, and capability to the people who do the work of keeping things in flow.

None of that is new knowledge here. In te ao Māori, the understanding that everything taken must be returned is not a circular economy principle but a founding one.

“When we plan hand in hand across government, industry, iwi, and community, better food and a better future is well within our reach.”

Kore Hiakai

Aotearoa New Zealand has the resources, the landscapes, the renewable energy, the indigenous knowledge, decades of science and both proven and willing businesses. Our regions have already begun. What they need now is the leadership to connect what they are building, the rules that make change possible, and the confidence that both will still be there in ten years.

The decision is not whether a circular future is worthwhile, but whether we treat it as vital economic infrastructure that unlocks our potential, or leave it as a good idea that never got a budget line while the people already doing the work carry it on goodwill.

Markets are moving, and Aotearoa New Zealand has an opportunity to build on the capability, knowledge and momentum already here. The opportunity is to shape a circular future with a food system, an energy system and a material economy that keeps value in circulation: strengthening our communities, our economy and the natural systems that sustain us.

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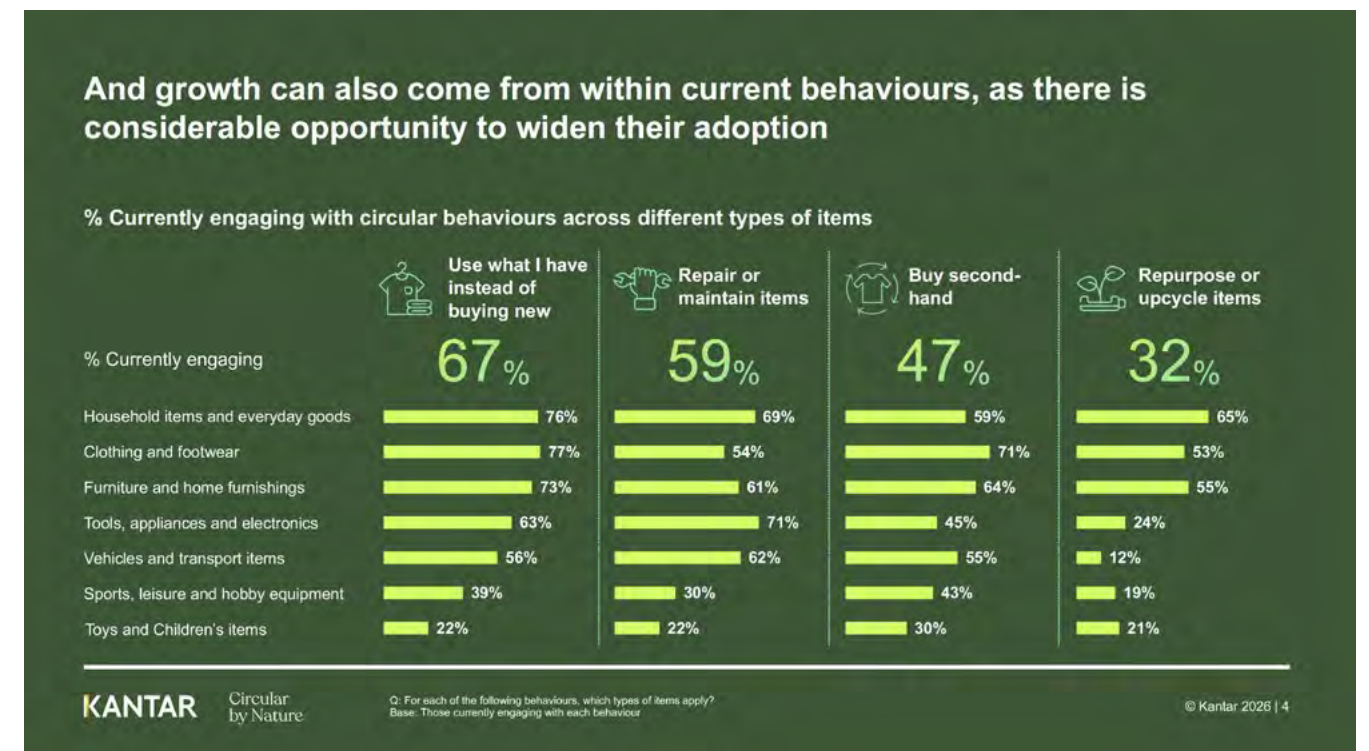
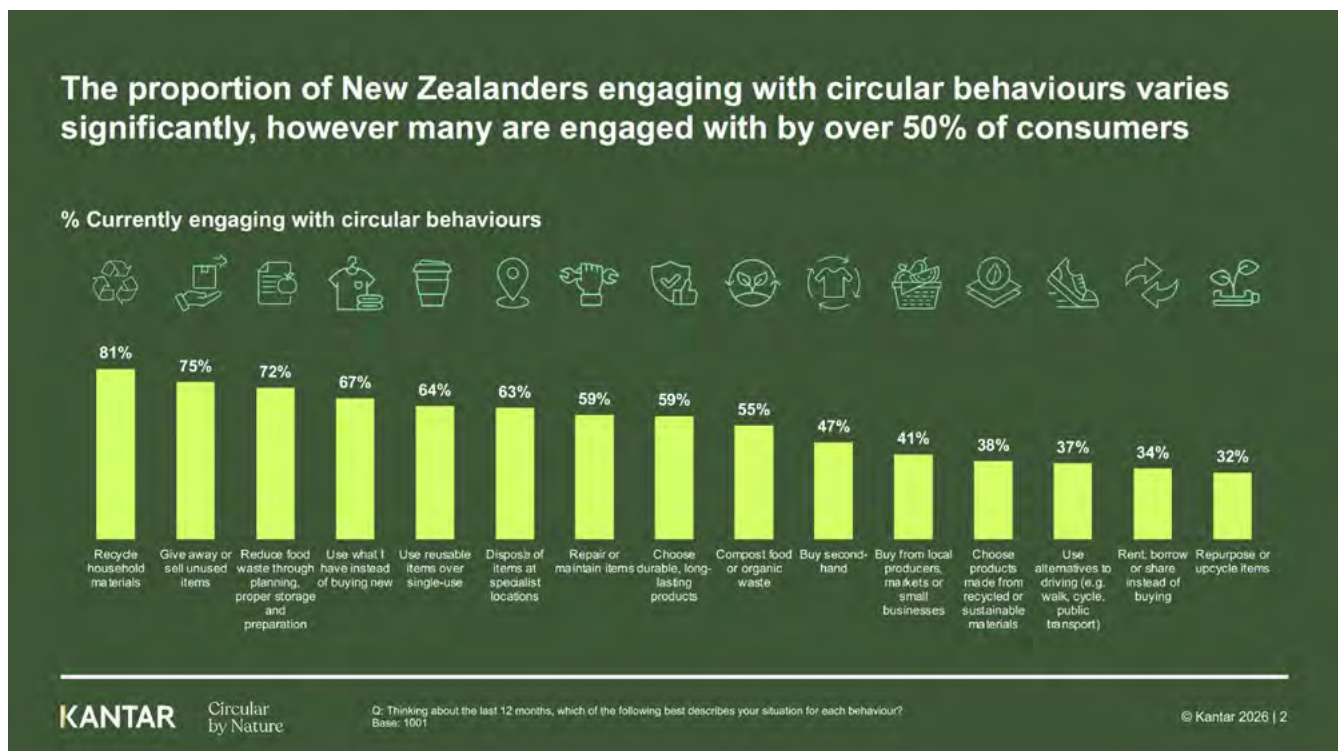
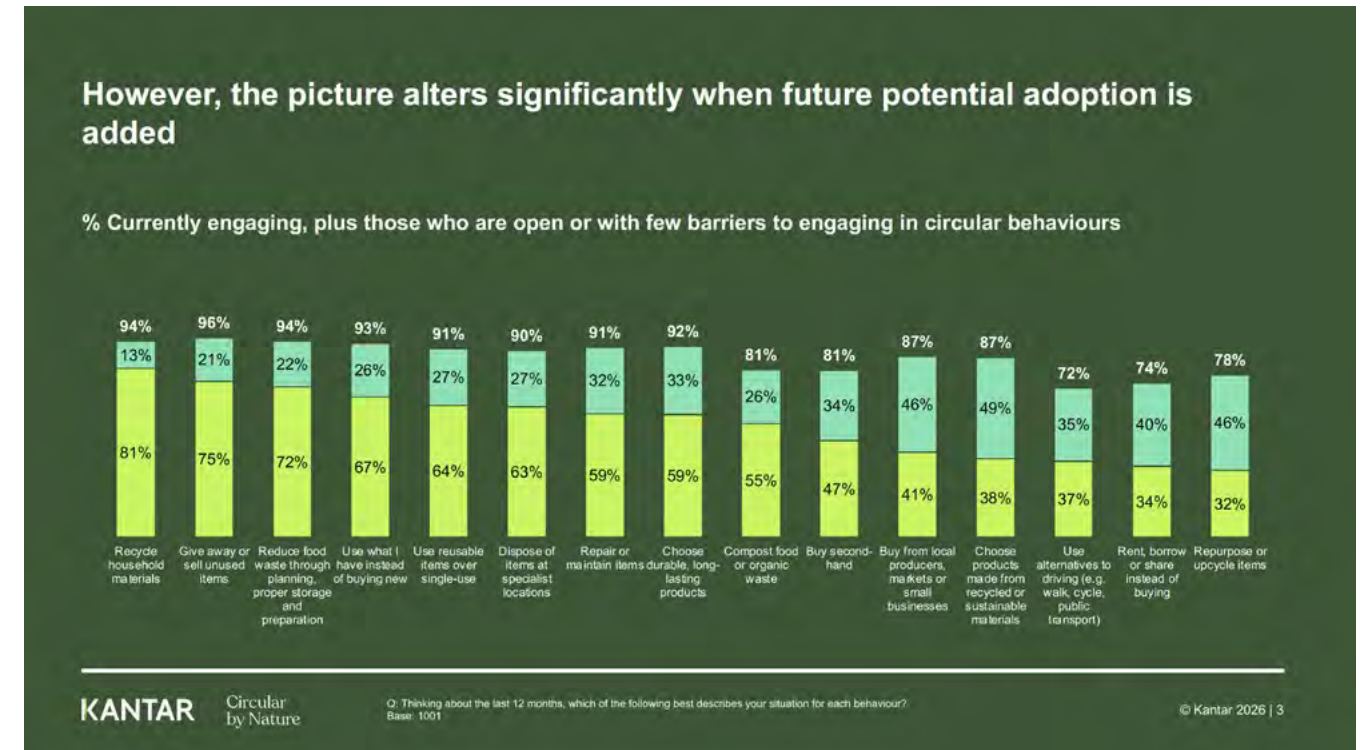
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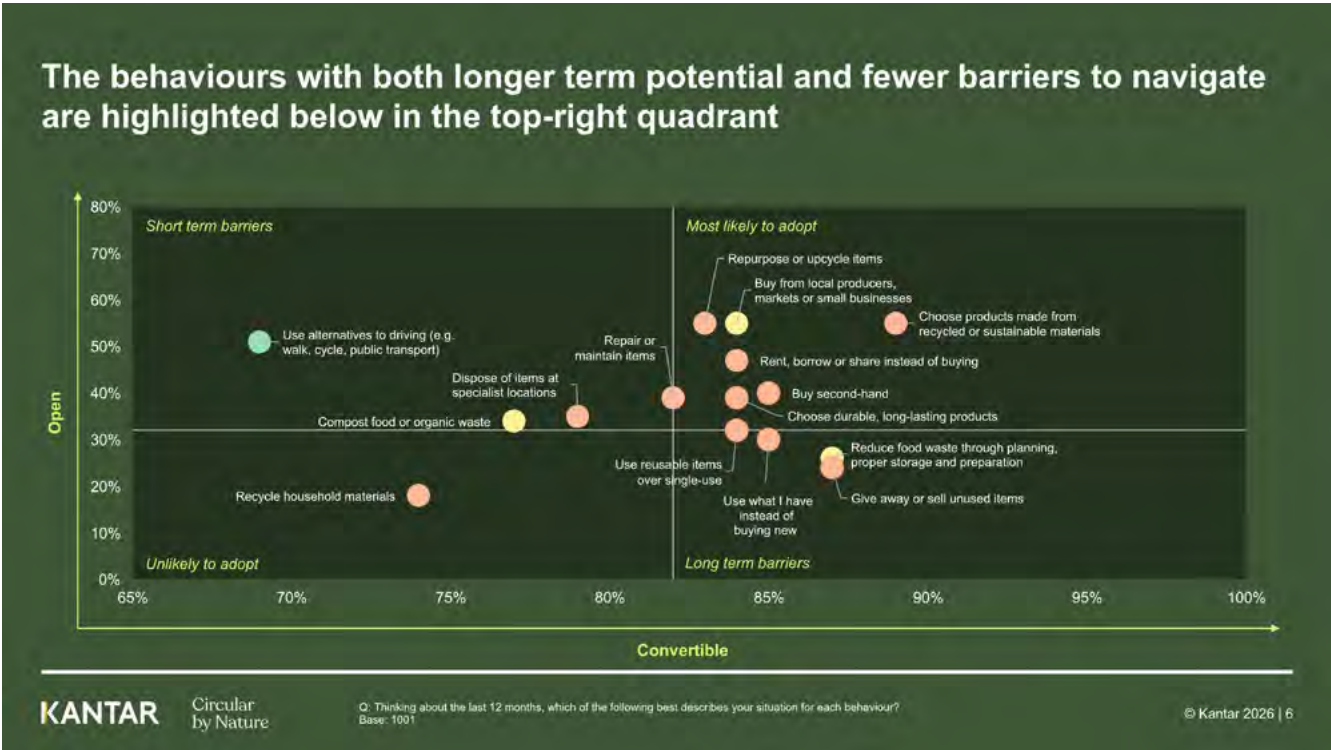
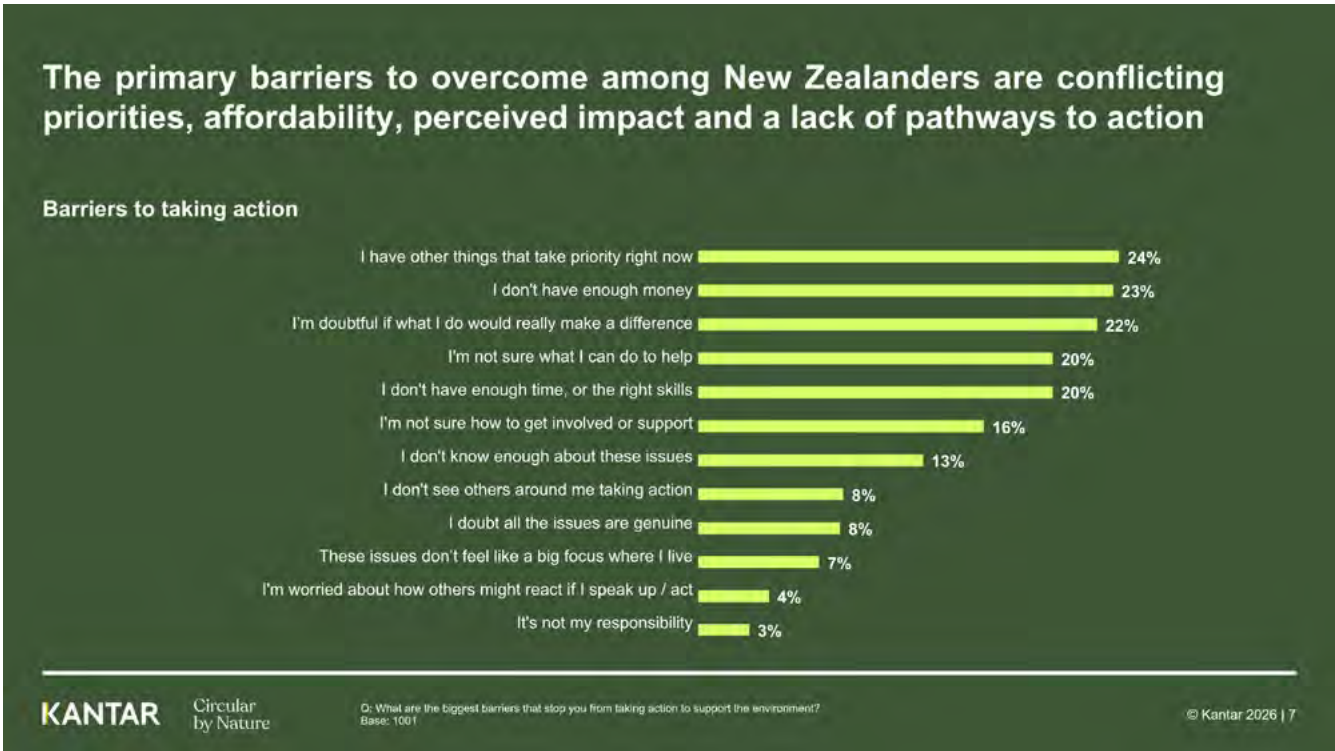
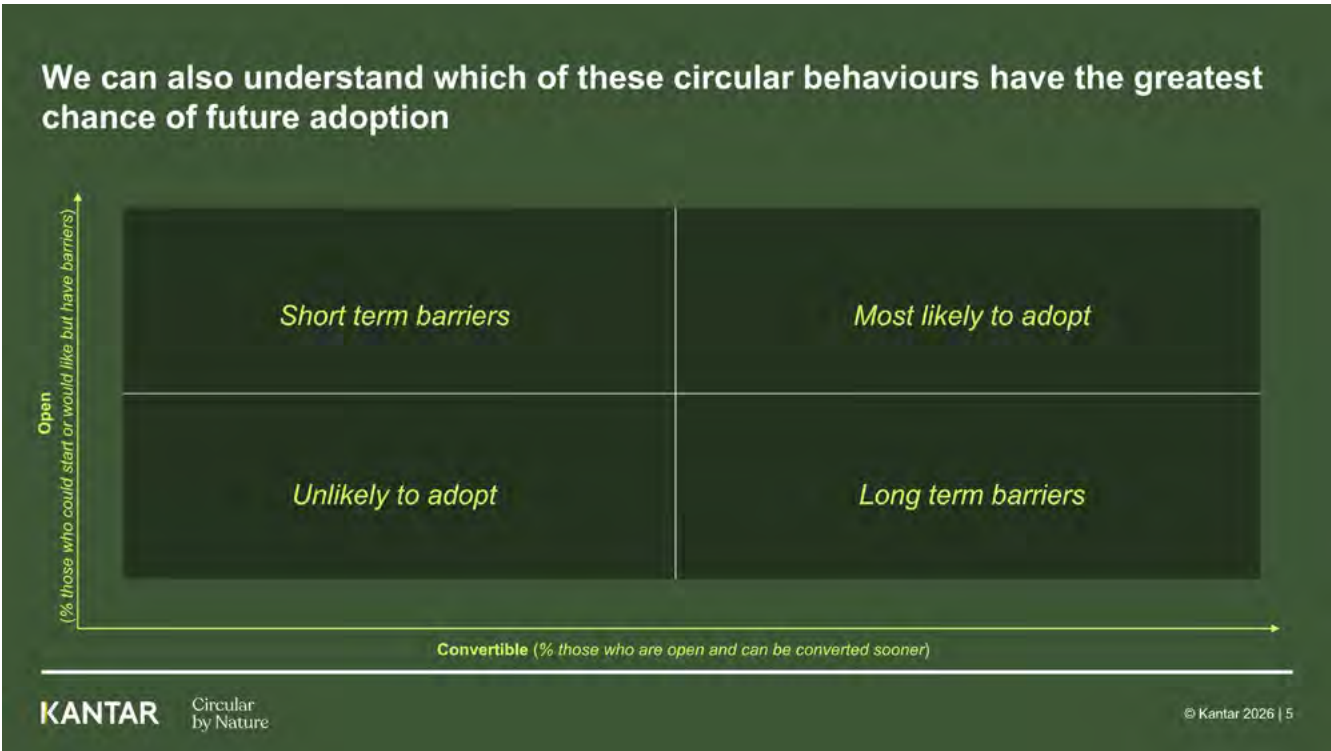
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Appendix A - Circular behaviours in New Zealand

Kantar for Circular by Nature, research conducted May 2026.





Kantar for Circular by Nature, research conducted May 2026.



Key points to takeaway



There is considerable uptake of a range of circular behaviours already and the impact of previous public and private sector actions have clearly made an impact



There is a clear opportunity for greater uptake of circular behaviours, with significant proportions of New Zealanders expressing a desire to increase their adoption. There is also significant upside in broadening current behaviours such as reuse, repurpose and repair across more categories



The new behaviours that can be most successfully extended / activated are...

- Repurposing / upcycling
- Buying from local or smaller businesses
- Choosing products made with recycled or sustainable materials
- Renting, borrowing or sharing
- Buying second-hand
- Choosing durable products



These can be supported by a range of program designs, targeted communications and policy settings...

...alongside some targeting of urban younger families, potentially with a male skew



Circular by Nature

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Research carried out by Jason Cate and Mikayla Bourne, Kantar NZ in collaboration with Louise Nash, Kelly McClean and Samantha Walsmley-Bartlett, Circular by Nature.

Appendix B – Relevant New Zealand policies, plans and regulations

Instrument	Potential areas of inclusion
Emissions Reduction Plan	Circularity embedded within ERP3. Construction and demolition waste is 69% of levied landfill; farm electrification and nutrient recovery are emissions actions as well as circular ones. The Commission has evidenced a 9.2 MtCO2e gap for 2031–2035 – nearly three times what ERP2 achieved – and waste, critical materials and circularity are absent from its headline recommendations.
Planning Bill & Natural Environment Bill	Material passports and deconstruction planning for major builds; freshwater farm plan provisions supporting nutrient recovery; consenting pathways and incentives for on-farm energy generation.
National Infrastructure Plan/ Strategy	Include circularity explicitly as a long term infrastructure objective. Te Waihanga New Zealand Infrastructure Commission 2022 plan had circular economy objective, 2026 less emphasis but still mentions waste and resource recovery. Strengthen.
Waste Minimisation Act	A legal definition of the circular economy, a zero-waste hierarchy, and the seven legislative strategies Āmiomio identified with international precedent: bans, mandates, targets, economic instruments, design specifications, recovery standards and transparency requirements.
Hazardous Substances Act	The chemicals in packaging, electronics and everyday objects that make products unsafe to recirculate. A circular economy that regenerates nature cannot be built on materials that spread contamination when recovered.
NZ Building Code	Longer building lifespans, sorted construction and demolition waste streams, deconstruction focus, and material passports.
Tax settings	Removal of the advantage given to virgin material extraction with tax incentives for repair, recovery of materials and remanufacturing.

Appendix C – Global circular economy leadership

Country	What they did	What we can learn
Australia	Advisory group, then national framework with binding targets, then Circular Australia as permanent peak body – about two years. Productivity Commission inquiry reported August 2025. Australia is working towards a national ambition of doubling its circularity by 2035.	The closest available comparator on economics and geography. Material productivity \$1.20/kg against an OECD benchmark of \$2.50 similar to NZ.
Scotland	Circular Economy Act 2024 legislated targets; 2026 strategy names transport, built environment, food, textiles and electronics as priority sectors; £16 billion of public procurement positioned as the market-making lever.	56,000 people now employed in circular roles, and evidence that repair and reuse generate significantly more jobs per tonne than recycling. Government procurement is a fast lever.
Ireland	Coordinated national strategy with dedicated investment and measurement; digital product passports and traceability named as enabling objectives.	Circularity framed explicitly as economic competitiveness.
China	Circular Economy Promotion Law since 2009, strengthened 2024. July 2026 five-year plan targets a 16% lift in resource productivity, 510Mt of secondary resources recycled annually, and an 8 trillion yuan recycling industry by 2030.	Our largest trading partner, progressively tightening resource recovery requirements across manufacturing and construction.
European Union	ESPR in force. Digital product passports being implemented. Battery and textiles DPP mandatory from 2027. Carbon Border Adjustment Mechanism rewarding low-emissions circular production. Circular Economy Act under consultation.	Current trade compliance, NZ exporters must meet, risk to market access as it impacts raw material inputs that are sold into the EU indirectly.
Canada	Strategic food policy review named midstream food processing infrastructure a national security priority, recommending credit guarantees, concessional financing and long-term capital structures.	Food processing infrastructure positioned as strategic assets - similar to ports, power grids and telecommunication
Brazil	Constitutional requirement that 30% of school meal ingredients sourced from local family farms, supporting four million smallholders. Federal tax incentive let's individuals and companies deduct income tax for funding approved recycling-chain projects. The 2023 VAT reform goes further, building presumptive tax credits for recycling material suppliers and second-hand goods resellers.	A single procurement rule is transforming rural food economies at national scale. Brazil is also removing tax barriers from secondary materials at the structural level, not just through standalone incentives.
Singapore	Zero Waste Masterplan legislated 2019, with mandatory packaging reporting for producers.	Resource constraint driving circularity innovation.

Appendix D – About Circular by Nature

D1. Our mission, purpose and principles

Circular by Nature is an independent, strategic platform to lift ambition and coordinate circular economy action in New Zealand.

Louise Nash, Kelly McClean, and Samantha Walmsley-Bartlett have come together to develop a strategic platform to address the gaps in awareness and understanding of the actions required across the system to enable a shift from a linear to circular economy across Aotearoa.

Our Whāinga | Mission

Make the circular economy tangible and actionable, through activities that accelerate New Zealand’s transition to a circular economy by designing out waste, keeping materials in use and regenerating natural systems for a resilient future. Creating the foundations for communities of practice to flourish.

Our Kaupapa | Purpose

Inspire, educate and enable decision-makers (with a core focus on government and business decision-makers) across communities to transition away from take-make-waste resource use reliant on fossil fuels and replace it with circular business models, practices and policies to help all New Zealanders manage our resources within our planetary boundaries, reducing waste, lowering costs and reducing emissions to achieve a resilient, thriving society, nature and economy.

Our Mātāpono | Principles

- Applied systems thinking and circular design for resilient and regenerative outcomes in Aotearoa, New Zealand
- Thought leadership through evidence-led insights and communication; grounding all insights, tools, and recommendations in robust data, while making them clear, practical, and relevant to New Zealanders.
- Inclusive, accessible & actionable guidance; ensuring our work is non-partisan, actionable and investable across communities, sectors, and government, both local and central.

Circular by Nature is registered with charitable fundholder Gift Collective as a purpose-led Collective. More information can be found at <https://opencollective.com/circular-by-nature>.

D2. How this paper was developed

The engagement record: more than 100 practitioners, industry professionals, and policy makers, between June and August 2026 via four webinars and consultation period; Feedback sessions. Three peer-review rounds.

This report was developed through a human-led process, supported by AI tools. AI was used to assist with research synthesis, structuring, drafting support, and review of alternative framings.

The evidence base, interpretation, writing, recommendations and final editorial decisions were led by the authors. All material developed with AI assistance was subject to human review, fact-checking and editorial judgement before inclusion.



Together, this team spans the full chain from evidence to lived experience, from boardroom strategy to community implementation.

They have spent careers building relationships with industry, with government and with communities doing this work every day, which will make the engagement process genuine and the document’s reach real.

D3. Peer reviewers and partners

It is an important cornerstone of this project that we lift and share the work of experts across communities of practice in the circular economy, to bring rigour and experience to our work.

Our peer review panel includes:



"Circular by Nature is a comprehensive and insightful document which sets out the case for a transformation in NZ : from contributing to a climate wrecking take-make-dispose economy to a circular economy based on innovation and good governance and one which is inclusive and contributes to the wellbeing of every citizen".

Ken Webster is one of the world's foremost thinkers on circular economy — an architect of the intellectual framework that has shaped the field globally. As former Head of Innovation at the Ellen MacArthur Foundation from its inception in 2010 through to 2018, he helped establish the intellectual basis of their approach — the most influential circular economy organisation in the world. He is a major contributor to the development and communication of ideas in this field, and the author of the seminal The Circular Economy: A Wealth of Flows. He is a Visiting Professor at Cranfield University, a Fellow of the Cambridge Institute for Sustainability Leadership (CISL), and was awarded a DSc from the University of Brighton in 2023. He is a lead author on the circular economy for UNEP's GEO-7 report and a contributor and editor on Earth for All from the Club of Rome.



"The old model of 'dilution is the solution to pollution' no longer holds as we breach environmental limit after limit. If we want to leave an inhabitable and prosperous planet for future generations, we need to redesign our systems to eliminate pollution and keep precious resources in use. Governments, businesses, iwi, and communities all have influence over the systems that shape how we eat, how we move, and how we live. This report points the way."

Francesca Eggleton is a former Treasury economist turned emissions mitigation expert, with nearly 20 years of experience across public, private, and not-for-profit sectors. She led climate strategies at Fonterra and Zespri International, unlocked significant investment in methane innovation and decarbonisation, and was a lead author of New Zealand's first emissions reduction plan, including its Circular Economy chapter. An expert in agricultural emissions reduction, she was invited to speak at COP23 on the role of technology in reducing agricultural emissions. She is currently Activation and Delivery Lead at the New Zealand Climate Foundation.



"Circular by Nature is a beautiful, serious and much-needed piece of work, making the transition to a circular economy practical and politically useful, without reducing it to recycling, waste management or a list of disconnected case studies. The paper's greatest strength is the way it shows Aotearoa New Zealand doesn't lack examples, values, knowledge or capability. The missing piece is the connecting infrastructure: coordination, policy settings, procurement, measurement, investment pathways and institutional durability. Legislation is why it lasts."

Jodie Bricout is one of Australia's foremost circular economy experts — an environmental engineer and systems thinker with two decades of experience across Australia, Europe, and the Middle East. She currently serves as Chair of Circular Australia, the national peak body for circular economy transition. As Chief Strategy & Commercial Officer at Adelitics, she's taking circularity into the water sector, using AI-enabled diagnostics to extend asset life and cut material, cost and carbon waste across water networks. She is also a ministerial appointee to the Cooperative Research Centres Advisory Committee and a PhD candidate at Adelaide University. Previously, Jodie was Director and Circular Economy Leader at Aurecon, one of the Asia-Pacific region's leading design and engineering firms and contributed to MBIE's circular bioeconomy research programme. During 13 years in France, she helped dozens of businesses seize the benefits of circular approaches, shaped state, federal, and European policy, and collaborated with 100 of the planet's leading corporates, innovators, governments, and cities through the Ellen MacArthur Foundation's CE100 programme. She has worked closely with the French Government, the European Commission, and the United Nations Environment Programme (UNEP) on circular economy and life cycle approaches.



"Unless New Zealanders can see, feel, and find their place within a more regenerative future, continuing on the current extractive and costly path remains too easy. Circular by Nature is a powerful articulation of evidence and vision that makes redirection possible."

Bree Asmus is a multifaceted strategist whose practice intersects brand, design, storytelling and circularity. Originally trained in industrial design, well versed in brand ecosystems and Aotearoa's emerging circular economy – she applies her expertise to shaping brands, experiences, and systems across Aotearoa NZ. Recent highlights include rebranding Toitū Envirocare, co-founding XLabs circular design program alongside Louise Nash, and redesigning One NZ's onboarding experience with Hula. Her work is grounded in the belief that design and creative intent have a critical role to play in addressing the significant challenges our world is facing. She brings this lens to her role as Strategy Director at Hula Design and in guiding Uno Loco Group's impact and B Corp certification.



"I appreciate the opportunity to contribute to the 'navigational' conversation for Aotearoa New Zealand regarding the 'shift' (and from an indigenous Māori perspective) a return of humanity to circular-spiral systems thinking-knowing-doing. Ancestral Intelligence (AI) through indigenous wisdom can play a significant role in not only help navigate the return 'home', but we can also locate ourselves 'home' and 'karanga' humanity home. I liken these conversations we are having, we are stimulating through this work, to the koorero our tupuna had on the 'beach' in Hawaiki, looking to the stars, the migration patterns of the whales and birds, contemplating the voyage of exploration and discovery beyond the horizon - Te Pae Tua. Not everyone was able to see, or comprehend the opportunity for whatever reason, and not everyone got on the waka."

Johnnie Freeland is a wayfinder, systems navigator and whakapapa centred designer. He brings more than 30 years of experience serving community and guiding a range of Iwi, Māori community and public sector organisations in working to achieve better outcomes with Māori. He utilises mātauranga Māori: Māori systems thinking, knowledge and practice in navigating systems. He draws on knowledge and practice of maramataka (lunar celestial cycles) and whakatare waka (waka navigation) in designing oranga motuhake (well-being pathways). Johnnie contributed to the New Zealand Government's circular economy and bioeconomy work with MBIE.



Jason Mika is one of Aotearoa New Zealand's leading voices on Indigenous business and the circular economy — a Māori management scholar whose work bridges mātauranga Māori and Western systems thinking. He is a Professor of Māori Management and Associate Dean Māori at the University of Auckland Business School, and is affiliated with the Circular Economy in Business (CEBUS) Research Beacon. He also holds an Adjunct Professorship at the University of Waikato, where he served on the leadership team of Āmiorio Aotearoa, an MBIE-funded, transdisciplinary programme uniting mātauranga Māori and Western science to advance circular, regenerative production-consumption systems for Aotearoa. Of Tūhoe, Ngāti Awa, Whakatōhea and Ngāti Kahungunu descent, Jason has spent his career researching Indigenous entrepreneurship, enterprise, and policy, working across academia, government, and iwi organisations to bring Māori economic philosophy into national conversations on sustainable and regenerative business.



"Circular by Nature reflects what the research consistently tells us: progress on circularity accelerates through coordinated action — innovation, supportive policy and standards, strong supply chain governance, and shared goals across the system. Where transitions stall, it's usually because stakeholders, policies, incentives and practices are misaligned. This paper does the work of bringing policymakers, industry and communities into that alignment, and gives them a shared basis for the cross-sector collaboration that system-wide circular transformation actually requires."

Joya Kemper is Senior Lecturer and CEBUS Stakeholder Manager at the University of Auckland, Senior Lecturer in Marketing at the University of Canterbury, and an Associated Researcher of the University of Otago's Food Waste Innovation. Her research focuses on transitioning towards circular, sustainable, ethical, and healthy consumption and production. Her research explores the barriers and enablers to change in practices and behaviour at all systemic levels (individual, organisation, market, institutional). She has published over 50 journal articles and has received numerous national and international awards and grants, including from the Health Research Council and the Ministry of Business, Innovation and Employment.

Thank you to everyone who contributed their advice and support.

Our Strategic Partners



Clare foundation provided funding to enable the white paper development, launch and engagement



Kantar undertook consumer research on circular behaviour for the first time in New Zealand, for this platform to share.



University of Auckland - academic and cross-disciplinary CEBUS teams joined our online feedback sessions and will host the report launch on campus for a wide audience.

Our Creative Partners



Hula worked closely with Circular by Nature to bring this kaupapa to life in design. This saw Hula leading creative expression and creating bespoke artworks for the report to help make Aotearoa NZ’s circular future feel immediately more imaginable and accessible. Hula brought together a dedicated team of local specialists to realise the vision in its physical form.

“This is incredibly important and timely work for Aotearoa. We’re proud to be bringing our creative skills, efforts, and hearts to work with Circular by Nature in helping it resonate and connect even more deeply with decision-makers and New Zealanders.” – Josh Daly

Ngā mihi nui to our team and partners for their contribution: Jenna Billman (Design Lead and Artist), Mark Benseman (Creative Director), Tamar Hawkins (Production Design) Josh Daly (Co-GM), and Bree Asmus (Strategy Director).

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Dave Black – Our collaborator and print production specialist who made every detail and dream for the hard copy of this white paper possible.

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Printing specs: A mix of recycled paper and virgin paper stock have been used to produce this document. It is 100% recyclable. However when you are finished with it, we invite you to pass it on or return it to either Circular by Nature or Hula.

Use of AI: No artificial intelligence was used in the design of this document. The photographs are real and the illustrative artworks were completed entirely by human hand and the creative interpretation of our Hula designer and artist, Jenna Billman.

About the authors

Louise Nash is an economist, creator of the *Circular by Design™* methodology, and founder and CEO of Circularity - Aotearoa's leading circular economy design and advisory practice, and a certified B Corp. Over more than 20 years, she has led over 168 circular transformation strategies across packaging, textiles, food, plastics, transport, timber, and water, keeping one million tonnes of New Zealand's resources out of landfill. Her XLabs circular innovation labs have built the capability of nearly 25,000 professionals, from business leaders to community

practitioners. A COP30, Sustainability Leaders, and Economic Development Innovation award recipient, Louise has worked across New Zealand, Australia, Singapore, Brazil, Canada, Europe, and Dubai. Her philosophy is simple: work with nature, not against it, and make that work accessible to everyone who wants to be part of it.

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Samantha Walmsley-Bartlett s a systems change leader focused on enabling regeneration across landscapes and value chains - shifting relationships, incentives, and decisions at every level, from grower cooperatives to global shipping routes. As Head of Sustainability at Zespri International, she developed the first industry-wide electrification pathway for kiwifruit and built collaborative models between growers and packhouse businesses. At Circularity, she led New Zealand's first measurement of circular solutions using the Circular Transition Indicator tool, co-developed the XLabs Circular Economy Programme and her 999 Days of Sharing

Circular Solutions connected businesses and communities to over 200 practical circular solutions. She co-founded Fairgrow - addressing food insecurity and waste at community level - and has contributed to Future Whenua and is on the board of Future Farmers, two networks focused on the long-term resilience of New Zealand's land and farming communities. Samantha brings a rare experience of taking the circular economy from strategy to the ground, with the community relationships to prove it.

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Kelly McClean is a strategy, design, and sustainability specialist with over 12 years of experience leading innovation and circular economy projects across textiles, agriculture, manufacturing, FMCG, packaging, and infrastructure. At Aurecon she was a key contributor to MBIE's circular bioeconomy research and engagement programme, focusing on manufacturing, food, the built environment, and digital enablers. As Sustainable Packaging Programme Manager at Foodstuffs NZ she worked internally and externally to support circular systems change in the retail sector. Kelly is also co-founder of social enterprises CommonKind and Reuse Aotearoa, and an active member of the Textiles Advisory Group. She currently leads Future of Fibre Aotearoa, an industry-led enabler

delivered through a Fashion & Textiles New Zealand and AGMARDT partnership. Kelly is also founding trustee and chair of award-winning Ahu Charitable Trust ki Pukerua Bay, which runs 'Pukerua Bay Hub' community events and pop-ups spanning the arts, clothing and crop swaps, planting, kai and repair workshops and local markets. Her work consistently bridges the technical and the human, bringing methodological rigour that gives a document like this its credibility with expert audiences, and the systems design thinking that makes it legible and actionable for businesses, councils, and communities working through the transition on the ground.

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